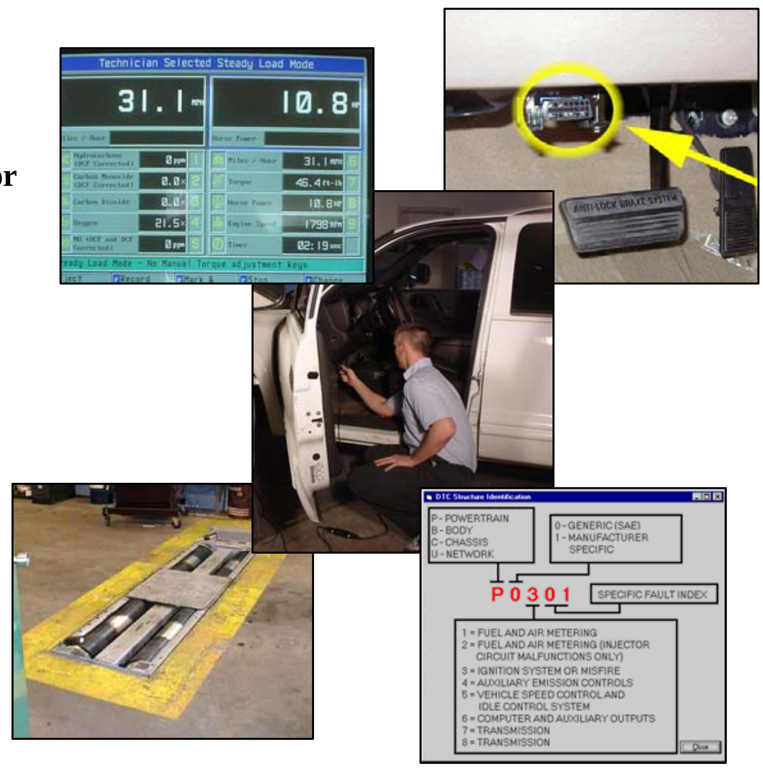
FINAL REPORT FOR

EVALUATION, CONSULTATION, AND PROCUREMENT SERVICES FOR THE NEW JERSEY MOTOR VEHICLE INSPECTION SYSTEM

Contract No. A62116



Submitted to:

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January 3, 2007

MACTEC

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January 3, 2007

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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

Appendices

LIST OF TABLES

LIST OF TABLES (continued)

Page

LIST OF FIGURES

LIST OF ACRONYMS

AAA	American Automobile Association
AAMVA	American Association of Motor Vehicle Administrators
AASP/NJ	Alliance of Automotive Service Providers in New Jersey
ABS	Anti-lock Braking System
AC	Alternating Current
AQ	Air Quality
ARB	California Air Resources Board
ASM	Acceleration Simulation Mode
ATP	Acceptance Test Protocol
AWD	All-Wheel Drive
BAR	Bureau of Automotive Repair
CAC	Charge Air Cooler
CAN	Controller Area Network
CARS	Compliance Analysis Reporting System
CBA	Collective Bargaining Agreement
cc	cubic centimeter
CDAS	Connecticut Decentralized Analyzer System
CID	Calibration Identification
CIF	Centralized Inspection Facility
CO	Carbon Monoxide
CTP	California's Continuous Testing Pilot
CVN	Calibration Verification Number
DC	Direct Current
DEC	Department of Environmental Conservation
DEP	Department of Environmental Protection
DEQ	Department of Environmental Quality (Oregon or Virginia)
DLC	Diagnostic Link Connector
DMV	Department of Motor Vehicles
DOT	Department of Transportation
DTC	Diagnostic Trouble Code
ECM	Electronic Control Module
ECU	Electronic Control Unit
EDBMS	Emissions Database Management System
EGR	Exhaust Gas Recirculation
EM	Equipment Manufacturer
EPD	Environmental Protection Division (Georgia)
ERF	Emissions Repair Facility
ESC	Electronic Steering Control
ESP	Environmental System Products Holdings, Inc.
ETC	Electronic Throttle Control
FTP	Federal Test Procedure
g	gram
GAO	U.S. General Accounting Office
GM	General Motors

LIST OF ACRONYMS (continued)

GPS	Global Positioning System
GVWR	Gross Vehicle Weight Rating
HC	Hydrocarbons
HDDE	Heavy Duty Diesel Engine
HDDV	Heavy Duty Diesel Vehicle
HEI	Higher Emitter Index
HEP	High Emissions Profiling
HEW	High Emissions Weighting
IEPA	Illinois Environmental Protection Agency
I/M	Inspection and Maintenance
ISA	Integrated Starter-Alternator
km	kilometer
KPI	Key Person Interviews
LDDV	Light Duty Diesel Vehicle
LDGV	Light Duty Gasoline Vehicle
LEP	Low Emissions Profiling
LEV	Low Emission Vehicle
LEW	Low Emissions Weighting
LIRAP	Low Income Repair Assistance Program
MDE	Maryland Department of the Environment
MEA	Mechanics Education Association
MIL	Malfunction Indicator Light
MIT	Mobile Inspection Team
MSHP	Missouri State Highway Patrol
MVA	Motor Vehicle Administration
MVC	Motor Vehicle Commission
MVIS	Motor Vehicle Inspection System
NHTSA	U.S. National Highway Traffic Safety Administration
NYS	New York State
NJ	New Jersey
NJGRA	New Jersey Gasoline Retailers Association
NO_X	Nitrogen Oxides
OE	Original Equipment
OEM	Original Equipment Manufacturer
OBD	On-Board Diagnostic
OIT	Office of Information Technology
OTAQ	USEPA's Office of Transportation and Air Quality
OTR	Ozone Transport Region
PATA	Professional Automotive Technician Association
PCM	Powertrain Control Module
PID	Parameter Identification
PIF	Private Inspection Facility
PM	Particulate Matter
PZEV	Partial Zero Emission Vehicle

LIST OF ACRONYMS (continued)

RD&M	Remote Diagnostics and Maintenance
REC	Repair Excellence Council
RFI	Request for Information
RFID	Radio Frequency Identification
RFP	Request for Proposal
RSD	Remote Sensing Device
SBQC	Service Bay Quality Control
SIP	State Implementation Plan
T&R	Test-and-Repair
TAC	Technical Assistance Center
TCP/IP	Transmission Control Protocol/Internet Protocol
TO	Test-Only
TPS	Throttle Position Sensor
TSI	Two-Speed Idle
USEPA	U.S. Environmental Protection Agency
VDC	Volts Direct Current
VID	Vehicle Inspection Database
VIN	Vehicle Identification Number
VIP	Vehicle Inspection Program
VIR	Vehicle Inspection Report
VMT	Vehicle Miles Traveled
VRT	Vehicle Reference Table
VOC	Volatile Organic Compound
WAN	Wide Area Network
WD	Wheel Drive
ZEV	Zero Emission Vehicle

GLOSSARY

COMMONLY USED INSPECTION AND MAINTENANCE TERMS

ASM (Acceleration Simulation Mode) Test: A test that measures tailpipe emissions when a vehicle is running under marginal load and at a steady rate or revolutions per minute (rpm). The test measures concentrations of HC, CO and NOx, relative to applicable cutpoints, during two modes: a high load / low speed condition and a moderate speed /moderate load condition.

Centralized System: A state-appointed contractor or state agency purchases and constructs test-only stations, hires inspection personnel and performs all vehicle emissions testing functions.

Centralized Inspection Facility (CIF): A facility owned or leased by the State with inspection lanes available for conducting both safety and emissions inspections. There were 31 CIFs operating in New Jersey in 2006, and the CIF inspection program is currently operated and managed by a contractor.

"Check Engine" Light: See the definition for Malfunction Indicator Light (MIL) below.

Clean Screening: The use of methods such as remote sensing or vehicle profiling to excuse cars from a scheduled IM emissions test.

CAN (Controller Area Network): Beginning with model year 2003, automobile manufacturers are phasing in a new vehicle communication protocol called CAN (Controller Area Network). By model year 2008 all vehicles will be using this new protocol to connect electronic devices such as engine management systems, active suspension, ABS, gear control, and air conditioning. CAN will allow more information, including data from the On-Board Diagnostic II (OBD II) system, to be processed in a shorter period of time resulting in better error-handling capabilities.

Cutpoints: the emissions level above which a car is considered to have failed the emission test.

Decentralized System: Testing is conducted by independently owned businesses not exclusively dedicated to vehicle testing (e.g., repair shops).

Diagnostic Trouble Codes (DTCs): An alphanumeric code which is set in a vehicle's onboard computer when a monitor detects a condition likely to lead to (or has already produced) a component or system failure, or otherwise contribute to exceeding emissions standards by 1.5 times the certification standard.

Dynamometer: A treadmill-like device that simulates vehicle inertia and road load to derive results under conditions similar to everyday driving.

GLOSSARY (continued)

Emission Repair Facility (ERF): A shop registered by the MVC to perform emission-related repairs on vehicle that fail the emissions portion of the inspection. An ERF is required to have at least one certified Emission Repair Technician (ERT), specially trained in motor vehicle emissions repair, to perform or supervise these repairs. Alternatively, vehicle owners are permitted to make repairs to their own vehicles for re-inspection purposes.

Evaporative Emissions: Hydrocarbon emissions that do not come from the tailpipe of a car. Evaporative emissions can come from evaporation, permeation, seepage, and leaks in a car's fueling system.

Evaporative System Test: A test of a vehicle's evaporative control system to determine if the system is 1) leaking and/or 2) purging properly. Commonly referred to as the "Evaporative Pressure Test" or simply "EVAP Test", the test identifies the presence of vapor and intermittent liquid leaks in the fuel and vapor containing portion of a vehicles evaporative system from the gas cap up to the carbon canister which captures the vapors and prevents them from being released to the atmosphere.

Gas Cap Test: A Gas Cap Test is a functional check that tests whether harmful evaporative emissions (fumes) are escaping from a vehicle's gas tank into the atmosphere. The gas cap is removed and inserted into a device that performs either a pressure-decay test or flow measurement. The testing unit will verify that the gas cap holds pressure and will determine whether or not fumes are escaping.

Hybrid Program: Any emissions inspection program utilizing both centralized test-only sites and decentralized test-and-repair facilities. It is also used to describe any program that is not strictly a centralized or decentralized system.

I/M 240 TEST: The name for the emission test used in some IM programs. It is a transient high-tech inertia weight dynamometer I/M test for HC, CO and NOx tailpipe emissions, which lasts for 240 seconds and utilizes lab quality bench analyzers.

Loaded-Mode Test: A reference to a test that uses a dynamometer.

Malfunction Indicator Light (MIL): Also known as a Check Engine light, the Malfunction Indicator Light of MIL is illuminated on the dashboard when conditions exist likely to result in emissions exceeding standards by 1.5 times or worse. Alternatives include "Service Engine Soon," as well as an unlabeled picture of an engine.

MOBILE6: The computer model currently approved by the USEPA to model fleet emissions based upon estimated baseline emissions from various categories of vehicles and the effect of various control measures such as IM programs. The model estimates emission factors for gasoline-fueled and diesel highway motor vehicles.

On-Board Diagnostics Generation 1 (OBD I): An on-board automotive diagnostic system comprised of a computer with diagnostic software and sensors. OBD I was initially required by the California Air Resources Board in 1988.

On-Board Diagnostics Generation 2 (OBD II): OBD II expands upon OBD I to include the emission systems and sensor deterioration sensors. The OBD I/M Check can be performed on most 1996 and newer model-year gasoline powered passenger vehicles, vans and light-duty trucks weighing 8,500 pounds and less, since these vehicles were required by the EPA to be manufactured with OBD systems. The OBD II system monitors the performance of the ignition, fuel metering and emissions systems, including the sensors and the computer itself, while the vehicle is being driven to insure they are working "as designed." When the OBD system detects a problem, a diagnostic trouble code is stored in the vehicle's computer.

On-Board Diagnostics Generation 3 (OBD III): Currently under development, OBD III would take OBD II a step further by adding telemetry. Using miniature radio transponder technology similar to that which is already being used for automatic electronic toll collection systems, an OBD III-equipped vehicle would be able to report emissions problems directly to a regulatory agency. The transponder would communicate the vehicle VIN number and any diagnostic codes that were present. The system could be set up to automatically report an emissions problem via a cellular or satellite link the instant the MIL light comes on, or to answer a query from a cellular, satellite or roadside signal as to its current emissions performance status.

OBD Data Link Connector (DLC): The interface – usually located under the dashboard on the driver's side – between a vehicle's OBD computer and the OBD scanner. Connecting an OBD scanner to the DLC allows IM inspectors and vehicle repair technicians to read the readiness status of the vehicle's various onboard monitors as well as any diagnostic trouble codes (DTCs).

Pressure Test: A test that checks for leaks in the evaporative system that would allow fuel vapors to escape into the atmosphere. (See Evaporative System Test above)

Private Inspection Facility (PIF): A privately owned facility that operates and maintains their own inspection facilities. In 2006, the PIF network consisted of 1,327 independent shops and companies licensed by the MVC to perform inspections. The PIFs operate in an open market environment and are funded directly through funds they receive from the motorists.

Readiness Code: A status flag stored by a vehicle's onboard computer which is different from a DTC in that it does not indicate a vehicle fault, but rather whether or not a given monitor has been run (i.e., whether or not the component or system in question has been checked to determine if it is functioning properly).

GLOSSARY (continued)

Scanner or Scan Tool: A PC-based or handheld device used to interface with a vehicle's onboard computer for the purpose of reading DTCs and monitor readiness status.

Specialty Inspection Facility (SIFs) – a specialty site run by the state where specialized inspections are conducted and customer disputes are resolved. SIFs are not in general use for inspections.

Tailpipe Test: A Tailpipe Test uses a tailpipe probe to collect a sample of the exhaust and an emissions analyzer to measure pollutants while the engine is idling. The Tailpipe Test can be performed on many gasoline-powered passenger vehicles, vans and light-duty trucks and may refer to either idle or loaded-mode tests. Inspection requirements are based on each vehicle's model year, with an allowance for normal wear.

Test-and-Repair: An I/M program which allows the same facility that inspects a vehicle to also repair the same vehicle and retest it to determine whether or not the repairs performed were adequate. Test-and-repair programs are also generally decentralized, though not all decentralized programs are necessarily test-and-repair.

Test-Only: An I/M program – usually, though not exclusively centralized – which requires that the functions of testing and repair be performed by different, financially unrelated parties.

Two-Speed Idle Test: A Tailpipe Test that checks emissions at two different engine speeds, the regular idle and a fast idle around 2500 rpm. Typically, vehicles idle for 30 seconds, and are then accelerated to 2500 revolutions per minute for 30 seconds, and then back to idle for 30 seconds. A probe, placed in the tailpipe, collects information on the vehicles hydrocarbon, carbon monoxide, oxygen and carbon dioxide exhaust emissions concentration levels, that are measured in a four-gas analyzer.

Vehicle Inspection Database (VID): The telecommunications and computer infrastructure and software used to manage information on vehicle inspections.

EXECUTIVE SUMMARY

MACTEC Federal Programs, Inc. (MACTEC) was issued a contract by the State of New Jersey to provide evaluation, consultation, and procurement services for the New Jersey Motor Vehicle Inspection System (MVIS). In accordance with Section 3.2.6 of the contract's Statement of Work, MACTEC has prepared this Final Report. The Final Report provides research information that will allow the State of New Jersey to evaluate and understand the various program management and technology options, as well as stakeholder interests and opinions, while designing the future direction of the MVIS.

The Motor Vehicle Commission (MVC) and the Department of Environmental Protection (DEP) oversee the MVIS. Over 2.5 million vehicles are inspected per year. Vehicles are inspected for both emissions and safety requirements. The program operates as a hybrid program - motorists have a choice between obtaining an inspection from a centralized inspection facility (CIF) or from a private inspection facility (PIF). There are 31 CIFs that are owned or leased by the State and operated by a vendor. The PIF network consists of 1,327 independent shops and companies licensed to perform inspections. Vehicles failing the inspection must have repairs performed either by certified emissions repair facilities (ERFs) or by the motorists themselves.

The State asked MACTEC to conduct research to investigate options and alternatives to help the State design the next generation of the inspection and maintenance program. Specifically, MACTEC conducted research to provide information to help the State answer the following questions:

- Should the new I/M program continue as a hybrid program, or should it transition to a CIF-only or PIF-only design? If there is a CIF component to the program design, should the CIFs be contractor operated or State operated?
- Should the safety program be separated from the emissions program?
- Should the vehicle inspection data (VID) management system be contracted separately from the CIF operations contract? If so, should the VID be State operated?
- What are the implementation issues that the State needs to consider in transitioning to a new program?

MACTEC was not tasked with providing recommendations or specific answers, but instead to provide the factual information the State needed to evaluate potential options.

In conducting our research, MACTEC maintained an open public process. All stakeholders, including State personnel, the repair industry, equipment vendors, labor unions, health organizations, environmental groups, automobile dealers, and the motoring public have participated in stakeholder meetings. We researched trends in other state programs and evaluated their applicability in New Jersey. We also evaluated information provided by equipment vendors concerning the commercial availability of their innovative and emerging technologies. Based on this research, we prepared quantitative evaluations of options and alternatives for the next generation of the MVIS.

TRENDS IN I/M PROGRAMS

MACTEC reviewed trends in I/M programs worldwide, with emphasis on U.S. programs. We focused on U.S. programs because most I/M innovations have been developed in the U.S. Our review included the following: literature searches, written and verbal communication with state agencies, program visits and detailed discussions with selected states, and collection of data from state I/M programs. MACTEC conducted the following activities to identify trends in I/M programs:

- summarized the status of North American I/M programs for gasoline powered vehicles with respect to key parameters including the type of network, program coverage, contractor support, use of OBD II inspections, type of tailpipe tests, and diesel coverage;
- analyzed results of research conducted by other states with respect to the effectiveness of different emission control technologies and I/M test procedures; and
- gathered and analyzed information on vehicle safety programs operating in other states to determine if data were available to allow for simplification of safety inspection programs and to assess the impact on accident rates of safety inspection programs.

Key findings from the review of state programs are provided in Table ES-1.

TABLE ES-1: KEY FINDINGS REGARDING TRENDS IN I/M PROGRAMS

- There are good examples of effective and efficient I/M programs for each of the major types of inspection network: centralized, decentralized, and hybrid.
- There are good examples of effective and efficient centralized I/M programs managed and operated by contractors, and there are good examples of effective and efficient centralized I/M programs managed and operated by state employees.
- States are beginning to implement innovative and drastically different approaches to vehicle inspections. For example, Oregon is setting-up self-service OBD II testing kiosks where motorists can perform their own OBD II tests anytime of the day.
- Low cost OBD II-only systems have been developed for decentralized programs.
- Trigger reports can effectively eliminate fraud in OBD II tests.
- Several states successfully manage their own vehicle information database (VID).
- Several states plan to simplify tailpipe and gas cap test procedures. Illinois is considering dropping inspections on 1995 and older models, and performing OBD II-only tests on 1996 and newer models. Oregon is eliminating loaded-mode tests and plans to conduct idle or two-speed idle (TSI) tests on pre-1996 vehicles. Connecticut, Delaware, and Oregon have dropped gas cap tests for 1996 and newer light-duty vehicles.
- States have major research projects underway, and the results from these programs (when completed) may provide useful information to address many I/M options being considered. California and other states have major research projects underway to evaluate OBD II inspection technologies, remote sensing, magnitude of emissions from liquid leaks, and diesel I/M.

VIEWPOINTS OF STAKEHOLDERS

The stakeholder process was a very important part of our evaluation because the State must seek participation and input from all affected parties to obtain buy-in on any changes to the future MVIS. Stakeholders included both internal stakeholders from the State of New Jersey and external stakeholders (current contractor, Federal regulators, representatives from the repair industry, environmental groups, the motoring public, organized labor, and equipment vendors). MACTEC conducted the following activities in reaching out to stakeholders:

- conducted a series of key person interviews to orient stakeholders to the evaluation process, identify key issues, and to clarify expectations;
- facilitated a public meeting on October 4, 2005, to allow the public to voice their views on the current MVIS and how it should be improved;
- held a stakeholder meeting on November 30, 2005, to facilitate stakeholder discussions regarding key issues associated with the design of the MVIS;
- held a second stakeholder meeting on January 30, 2006, to allow stakeholders to comment on alternative scenarios for the design of the next generation MVIS; and
- established an electronic "opinion poll" on the NJ MVC website to solicit input from the general public about MVC's inspection system and plans for improving it.

Key findings from the stakeholder process are provided in Table ES-2.

TABLE ES-2: KEY FINDINGS FROM THE STAKEHOLDER PROCESS

- Stakeholders disagree on whether an entirely decentralized program or an entirely centralized program could be as successful in terms of motorist convenience and satisfaction as the current hybrid program.
- Stakeholders disagree on whether CIF lanes should be operated by the State or a private contractor. Some stakeholders feel a contractor can provide knowledge of other programs, operational flexibility, and previous operating experience. Other stakeholders perceive that the contractor-run CIF operations are too costly and that the state could operate the CIFs at a lower cost to the taxpayers.
- Stakeholders tended to agree that safety and emissions programs could be conducted independently, especially by virtue of technological advances such as the increasing prevalence of OBD II and the variety of mechanisms for transmitting data.
- Stakeholders tended to agree on the use of a single vendor for CIF, PIF, and VID equipment/services. Possible benefits include lower costs through economies of scale, ease of coordination, and greater accountability for program performance.
- Stakeholders agreed on the need for a public education program regarding any changes to emissions or safety inspections, and to educate motorists about the reasons for the program: clean air improvements, motorist safety, and vehicle performance.
- Stakeholders agreed that despite the cost, gas cap and tailpipe testing would be necessary for at least the 2007-2010 timeframe.

EMERGING INSPECTION TECHNOLOGIES

With the advent of enhanced on-board diagnostics (OBD II) on vehicles manufactured after 1995, there has been a significant change in the way vehicles are inspected, serviced, and maintained. Technologies continue to evolve and changes to the ways we inspect and repair cars are inevitable. MACTEC conducted the following activities to identify emerging inspection and repair technologies and their effect on I/M programs:

- evaluated vehicle automotive technologies such as on-board monitors, controller area network protocols, automotive electrical systems, electric vehicles, advanced traction control technologies, evaporative emissions control systems, light duty diesel vehicles and alternative fueled vehicles;
- evaluated vehicle inspection technologies such as self-service OBD inspections, remote OBD inspections, liquid leak checks, gas cap tests, low-pressure evaporative emission system inspections, remote sensing devices, extended emission component warranties, and inspection security enhancements;
- evaluated vehicle repair technologies such as wireless interfaces for repair and diagnostics, OBD drive-cycle dynamometers, just-in-time training, intelligent vehicle demonstration systems and advanced leak detection (visible smoke); and
- evaluated various request for information (RFI) submittals from inspection industry vendors related to hardware, software and test equipment for potential application to and use in I/M programs.

Key findings from our evaluation of emerging technologies are provided in Table ES-3.

TABLE ES-3: KEY FINDINGS REGARDING EMERGING TECHNOLOGIES

- While the vendors have developed new and innovative equipment, it has not been proven over the long term in actual use within a functioning I/M program. Some technology is in prototype status only, some is undergoing pilot testing on a subset of vehicles, and some equipment has been installed in test lanes but has been operated less than a year.
- The consensus opinion from the New Jersey staff is that full commercial availability of the new solutions is still in the future and that this equipment may not be fully demonstrated in time to rely solely on it for their next I/M contract. However, it would be prudent to include flexibility in the new program to transition to new technology as it becomes proven.
- Emerging inspection technologies include self-service OBD kiosk inspections, wireless and remote OBD inspections, liquid leak checks, and remote sensing devices. As these technologies are proven in full-scale applications, they have the potential to reduce or eliminate the need for testing at fixed locations such as PIFs and CIFs.
- Emerging repair technologies include wireless interfaces for repair and diagnostics, just-in-time and wireless access to training, and advanced leak detection technology. The increasing availability of such tools has the potential to improve the rate of effective repairs.
- Emerging technologies specific to the vehicles themselves include enhancements to on-board (OBD) monitors, implementation of a standardized communication protocols (controller area network or CAN) for vehicle electronic systems, changes to the evaporative emissions control systems on OBD II vehicles, and increases in the number of non-gasoline-fueled vehicles.

EVALUATION OF OPTIONS AND ALTERNATIVES

MACTEC identified and evaluated over 100 options and alternatives available to the State for consideration in their future I/M program. Some of these involved very significant changes (e.g., in the basic design of the inspection network); others involved more focused changes to specific program elements or procedures. Our evaluation focused the technical details, emission and cost impacts, and implementation issues associated with each option and alternative.

To address the big-picture question regarding the future program design, MACTEC, in consultation with stakeholders, developed program scenarios that incorporated likely program elements for the next generation of the MVIS. We developed these scenarios to allow for the comparison of the relative cost and emission changes from the current system that would likely occur if the program option was implemented. MACTEC structured the scenarios to allow for the evaluation of the three major program design issues: test type, program type, and type of operational support for the centralized inspection facilities.

Table ES-4 defines each of the program scenarios and summarizes the emissions and cost impacts of each scenario. Under each future program scenario, emissions are projected to increase as a result of changing the test type from the current dynamometer-based tailpipe test. Two options for simpler test procedures were analyzed – (1) an on-board diagnostics only test (OBD-only) for 1996 and newer vehicles with no tailpipe testing, and (2) a test procedure option that includes OBD testing for 1996 and new vehicles and two-speed idle tailpipe test for pre-1996 vehicles (OBD/TSI). For the OBD-only test program, total estimated program costs ranged from $56.0 million for the CIF-only State-operated program to $122.5 million for the PIF-only program. The cost range for the OBD/TSI scenarios range from $61.9 million for the CIF-only State-operated program to $142.7 million for the PIF-only program.

Since each of the scenarios analyzed resulted in an emission increase (i.e., a loss in emission reductions and SIP credit), we evaluated additional emission reductions attributed to I/M control measures beyond those included in the scenarios to make up for the associated loss of SIP credit. Four measures, implemented either alone or in combination with other measures, are available to offset any loss of SIP credit. These measures include (1) annual inspections for commercial vehicles, (2) enhanced liquid lead checks, (3) enhanced roadside inspections using remote sensing devices to identify high emitting vehicles for roadside pullovers, and (4) using remote sensing devices to identify gross polluters for off-cycle inspections.

MACTEC evaluated options for separating the safety inspection program from the emissions inspection program. We found some states that have successfully separated the schedules for safety and emissions inspection. Advantages resulting from separation include allowing for different inspection schedules (less frequent emission testing) or new alternatives for emission inspection (self-serve kiosks or remote OBD). Disadvantages were associated with the State's ability to accommodate different schedules in the VID and other MVC databases and the need for separate notices for safety and emission inspections.

TABLE ES-4: COMPARISON OF CURRENT PROGRAM TO FUTURE SCENARIOS

Program Type	**CIF Operations**	**Test Type**	**Increase in emissions compared to baseline[1] (tpd)**	**Program Costs ($ million/year)**
Current Hybrid, Contractor-Run, ASM/OBD Program				
Hybrid	Contractor-run	ASM/OBD	0.0	121.6
Possible Future Program Scenarios				
Hybrid	Contractor-run	OBD-Only	1.1	89.0
Hybrid	State-run	OBD-Only	1.1	86.5
CIF-only	Contractor-run	OBD-Only	1.1	58.7
CIF-only	State-run	OBD-Only	1.1	56.0
PIF-only	None	OBD-Only	1.4	122.5
Hybrid	Contractor-run	OBD/TSI	0.2	113.7
Hybrid	State-run	OBD/TSI	0.2	111.8
CIF-only	Contractor-run	OBD/TSI	0.1	63.9
CIF-only	State-run	OBD/TSI	0.1	61.9
PIF-only	None	OBD/TSI	0.7	142.7
Scenario Definitions				
Program Type	Hybrid - program utilizing both centralized test-only sites and decentralized test-and-repair facilities			
	CIF-only – program using facilities owned or leased by the State with inspection lanes available for conducting both safety and emissions inspections			
	PIF-only – program using only privately owned independent shops and companies licensed to perform inspections			
CIF Operations	Contractor-run – CIF operations are provided by a private contractor			
	None – there are no CIF operations under the PIF-only program			
	State-run – CIF operations are provided by employees of the state			
Test Type	ASM/OBD – current test procedure consisting of a dynamometer-based tailpipe test known as the Acceleration Simulation Mode (ASM) test for pre 1996 vehicles and an On-board Diagnostic (OBD) test using the vehicles computer system for most model year 1996 and newer vehicles			
	OBD-only – test procedure option with OBD testing only for 1996 and newer vehicles; no tailpipe testing required for pre-1996 vehicles			
	OBD/TSI – test procedure options with OBD testing for 1996 and new vehicles; two-speed idle tailpipe test for pre-1996 vehicles			

1) Increase in hydrocarbon and oxide of nitrogen emissions compared to current system

MACTEC evaluated the cost savings associated with the safety advisory program for the existing and future I/M scenarios. Safety advisories are items that that will continue to be inspected, but failing the inspection will not require a retest or re-inspection. Cost savings would be realized from reduced fees for re-inspections, reduced motorist time for re-inspections, and reduced fuel use for travel for re-inspection. Cost savings ranged from $4.4 million per year for the PIF-only scenario to $9.4 million per year for the CIF-only scenario.

MACTEC analyzed four options for future VID operations ranging from complete in-house control of the VID to full outsourcing. These options included: (1) a complete in-house VID component (State designs, builds, operates, and maintains the VID), (2) a complete outsourcing of the VID, (3) a hybrid option where a contractor designs and builds the VID and the State operates and maintains the VID, and (4) a complete outsourcing of the entire inspection program, including the VID component. Each option has each advantages and disadvantages that the State must carefully consider in moving forward.

MACTEC identified several implementation issues that the State must consider in designing the next generation of the inspection program. These issues include the possible preparation of a request for proposal (RFP) or RFPs, proposal evaluations and contract awards, public outreach and education, system/equipment/workforce transition, and regulatory or legislative changes.

SECTION 1.0 – INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

MACTEC Federal Programs, Inc. (MACTEC) is under contract to the State of New Jersey to provide evaluation, consultation, and procurement services for the New Jersey Motor Vehicle Inspection System. In accordance with Section 3.2.6 of the contract's Statement of Work, MACTEC has prepared this Final Report. The Final Report will allow the State of New Jersey to evaluate and understand the various program management and technology options explored by MACTEC during the period of the contract. It also provides the State with information concerning stakeholder interests and opinions on the future direction of the New Jersey Motor Vehicle Inspection System.

The Final Report was designed to comply with the requirements specified by the State and includes the following:

- The long-term advisability of continuing the current hybrid program that combines both centralized inspection facilities (CIFs) and private inspection facilities (PIFs), as well as other alternatives such as a CIF-only program or a PIF-only program. The costs of such programs and their impacts on motorists and other stakeholders are described (see Section 5.2).
- The advisability of continuing a program or any parts of the program with contractor assistance versus a program run by the State (see Section 5.2).
- A discussion of other state programs (see Section 2).
- A list of options or alternatives for the inspection program and each of its components (see Section 5)
- A discussion of general implementation issues (see Section 5.5).
- A description and report of the stakeholder research process, relevant information collected, and how the information was utilized (see Section 3).

This study is an outgrowth of a report to the Governor prepared in 2002 on the State's enhanced motor vehicle inspection contract. The original report produced a number of findings and recommendations that became the basis and need for and the focus of this document.

MACTEC assisted the New Jersey Motor Vehicle Commission (MVC) and the New Jersey Department of Environmental Protection (DEP) to conduct the necessary research to collect the data and obtain information to aid the State in the decision-making process and to analyze the technical and cost implications of the components of each inspection program alternative. An alphabetical list of the references that MACTEC used in collecting the data and conducting the analyses is provided in Appendix A. All references cited in this report are identified according to the author (or company) name and publication date from Appendix A. MACTEC's work was portioned into several phases and deliverables. These are:

- Project startup and work plans
- Project research and consultation plans
- Technical and cost research
- Stakeholder research

- Development of an options and alternatives list
- Analysis of options, alternatives and issues and identification of pros, cons, and potential implementation issues
- Briefing the State on the development of the options analysis and the supporting research information
- Preparation of Interim and Final reports
- Working with the State as directed on transition plans, procurement and bid development and evaluation

This document consists of the Final Report of our findings. In addition to this introduction and background section, the report contains four sections. Section 2 provides a review of trends in I/M programs. The stakeholder process used for MACTEC's evaluation of the future New Jersey I/M program is documented in Section 3. We provide information on emerging inspection technologies and summarize presentations by and materials from I/M equipment and services companies in Section 4. Section 5 describes the identification and evaluation of options and alternatives for the New Jersey program. The report contains the following appendices: Appendix A (references), Appendix B (information on the current State emissions and safety inspection programs); Appendix C (information on stakeholder process); Appendix D (information on options and alternatives); and Appendix E (analysis of options for separately contracting the vehicle information database).

1.2 BACKGROUND

In order to understand the options and alternatives associated with future New Jersey I/M programs, it is important to understand the existing program. The first subsection provides an overall summary of the existing motor vehicle inspection program. The second subsection provides additional details on the current CIF program, which handles about 80% of State-wide inspections.

1.2.1 Summary of Existing Program

The State of New Jersey has an enhanced motor vehicle inspection program that performs over 2.5 million vehicle inspections per year. The program consists of both emissions and safety inspections and operates as a hybrid program. The hybrid program provides motorists with a choice between obtaining an inspection from a centralized inspection facility, or CIF, or from a private inspection facility, or PIF.

Currently there are 31 CIFs located throughout the State. Table 1-1 identifies the 31 CIFs and the number of lanes at each. The CIFs are owned or leased by the State. Each facility has from one to eight inspection lanes available for conducting both safety and emissions inspections. The State also owns and operates three specialty facilities (located in Winslow, Asbury Park, and Morristown) for use in inspecting certain classes and types of vehicles. The CIF inspection program is currently operated and managed by a contractor. The CIF program is partially funded by registration fees and partially funded by other State revenues.

TABLE 1-1. CIFs IN NEW JERSEY

CIF Name	Lanes	CIF Name	Lanes	CIF Name	Lanes
Baker's Basin	6	Lodi	5	Randolph	6
Bridgeton	1	Manahawkin	3	Ridgewood	2
Cape May	1	Mays Landing	4	Salem	1
Cherry Hill	6	Milville	2	Secaucus	6
Delanco	3	Montclair	2	South Brunswick	6
Deptford	4	Newark	5	Southampton	4
Eatontown	6	Newton	2	Washington	1
Flemington	3	Paramus	5	Wayne	8
Freehold	6	Plainfield	3	Westfield	2
Kilmer	6	Rahway	6	Winslow	3
Lakewood	6				
TOTAL LANES - 124					

In addition, the State has three specialty sites (Specialized Inspection Facilities, or SIFs), consisting of one lane each. The SIFs conduct specialized inspections and resolve customer disputes. These specialty sites are run by the State and are not in general use for inspection purposes.

The current PIF network consists of 1,327 independent shops and companies licensed to perform inspections. The PIFs operate in an open market environment and are funded directly through fees they charge the motorists for inspections. The PIFs own, operate, and maintain their inspection facilities. There are also approximately 100 private garages that are fleet licenses. These only inspect vehicles owned or leased by the licensee and are not open to the general public.

Currently the program includes both a safety and an emissions test according to applicable MVC and DEP rules and regulations. All inspected vehicles receive either a pass or fail sticker that is affixed to the windshield. If a vehicle fails the safety portion of the inspection, the owner must complete repairs and the vehicle must be re-inspected. If a vehicle fails the emissions portion of the inspection, the owner must have the repairs completed by a registered Emissions Repair Facility (ERF) or make the repairs themselves. After the necessary repairs are made, the motorist has the choice of having the vehicle re-inspected at either a CIF or a PIF.

MVC registers ERFs to perform emission-related repairs on vehicles that fail the emissions portion of the I/M test. All such emission failure-related repairs must be made by an ERF and are recorded to the Vehicle Inspection Database upon re-inspection. An ERF is required to have at least one certified Emission Repair Technician (ERT), specially trained in motor vehicle emission repairs, to perform or supervise these repairs. Alternatively, vehicle owners are permitted to make repairs to their own vehicles for re-inspection purposes.

In summary, the current State inspection program consists of the following major functions:

- Inspection network consisting of the CIF lanes owned by the State and operated by a contractor

- A vehicle inspection database (VID) that is operated and maintained by the State's contractor and is linked to the MVC's vehicle registration system
- Emission repairs (performed either by certified ERFs or by the motorists)
- A licensing program (operated by MVC's Driver Management & Regulatory Affairs) for the PIFs and CIFs that includes licensing persons who wish to perform inspections and repair vehicles and training for those who wish to perform emissions and safety inspections
- Program assistance and outreach to the motorists that includes a call center to receive complaints, answer questions, schedule appointments and operate and maintain a website of program information and requirements (provided by the Contact Center, which is part of MVC's Customer Operations Support)
- Maintenance and repair of State owned or leased inspection facilities and grounds (conducted jointly by the State and the CIF operations contractor)
- A public information and education program (provided by the CIF operations contractor as part of their contract requirements)
- Specialty inspection shops that provide motorists with referee services, complaint resolution and inspections for specialty cars (operated by the Specialty Inspection Operations portion of MVC's Driver & Vehicle Testing Branch)
- A roadside inspection program consisting of three mobile inspection teams (managed and operated by MVC)
- An enforcement system that includes State covert and overt audits of the CIF and PIF stations and operations (program enforcement performed by State and local authorities)
- Program evaluation and effectiveness studies (performed by MVC and DEP) that include specialized testing at the specialty shops, roadside inspections conducted by mobile inspection teams, and data analysis and reporting of inspection data collected by the CIFs and PIFs

1.2.2 Review of Current CIF Program

The requirements of the CIF operating contract include designing, building, maintaining and operating the enhanced safety and emissions inspection program at 31 facilities owned or leased by the State. The CIF contractor is currently managing operations at the State's 31 facilities and is also responsible for all staffing and operations in the lanes. The contract requires a minimum of 55 hours per week per facility. The contractor currently meets that requirement with a workforce of up to 700 full-time and part-time inspectors and managers working shifts that allow for extended operations on one night per week and on Saturdays. In addition to the requirement for working hours, the contract requires that the CIF operations contractor meet wait time criteria established to maximize customer convenience and satisfaction at the stations. Failure to meet these wait time criteria subjects the company to liquidated damages. The company has developed and implemented a staffing plan in an attempt to minimize wait time exceedances, benefiting both the motorist (increased convenience and satisfaction) and the contractor (less liquidated damages paid).

The CIF contractor currently uses emissions inspection equipment and operating software developed by Environmental Systems Products Holdings, Inc. (ESP). Hunter Engineering manufactured and installed the safety equipment (suspension and brake tester) currently used in the lanes. The original equipment, installed at the inception of the program in 1999, is still in place. There have been several software upgrades and enhancements made over the last several years. These have all been tested by the State for acceptance and approved for use in the program. Both ESP and Hunter supplied warranties and maintenance of the equipment for the first several years of the program. With the expiration of the warranties, the CIF contractor elected to develop and staff its own maintenance workforce for the Acceleration Simulation Mode (ASM) systems and subcontract the repair and maintenance of the safety equipment to a vendor. The contractor's decision to conduct its own maintenance of the ASM systems was based on cost and service time.

In addition to implementing the wait time program and operations requirements, MVC and the CIF contractor both conducted several surveys of motorist acceptance and satisfaction (see Appendix C-7, Summary of First Stakeholder Meeting, Attachment 1, key question 1). The survey results indicate that the current centralized program is operating efficiently and providing a good level of acceptance, customer service and convenience to the public.

The State commissioned analyses of the effectiveness of the enhanced program in achieving emission reductions as submitted in the State Implementation Plan (SIP). The most recent analysis is documented in a September 2005 report by Sierra Research, entitled "Effectiveness Assessment of New Jersey Enhanced I/M Program Based on Analysis of In-Program Data" (Sierra Research, 2005b). New Jersey submitted a SIP to USEPA in 1996 that claimed the decentralized portion of the enhanced program was 80 percent as effective as the centralized program. Both the centralized contractor-operated program and the PIF-operated program were analyzed for their effectiveness in reducing emissions from the fleet, identifying out-of-compliance vehicles, and repairing those vehicles.

In the September 2005 report, the failure rate for CIFs in New Jersey is compared with the failure rates for CIFs in Arizona and California. It was determined that failure rates for New Jersey were similar to those in the other two States, with the exception of the older passenger cars (the CIF failure rate in New Jersey was significantly higher). The CIF program thus seems to be generally doing a good job in failing out-of-compliance vehicles. In conclusion, the CIF program in New Jersey appears to be achieving comparable performance to other state programs and supports the conclusion that the CIF program is performing at an acceptable level equivalent to USEPA's enhanced I/M performance standard. For vehicles equipped with on-board diagnostic (OBD II), the failure rates for both the PIFs and CIFs are very similar for model year and vehicle type.

On the other hand, the September 2005 study indicates that the PIF program as a whole appears to be falling somewhat short of the USEPA 80 percent effectiveness criterion for non-OBD II vehicle emissions testing. The reason for this lower effectiveness is primarily the lower durability of repairs made at the PIFs. Improving repair durability will be a key factor in improving the overall effectiveness of the current New Jersey I/M program. For purposes of the emissions calculations performed later in this report, however, we continued to apply the 80 percent effectiveness value used by DEP in their SIP.

SECTION 2 – REVIEW OF TRENDS IN INSPECTION/ MAINTENANCE (I/M) PROGRAMS

MACTEC reviewed trends in I/M programs worldwide, with emphasis on U.S. programs. We focused on U.S. programs because most I/M innovations have been developed in the U.S. Our review included the following:

- Literature searches
- Written and verbal communication
- Program visits and detailed discussions with selected states
- Collection of data from I/M programs

This section of our report contains three subsections. Section 2.1 contains a review of existing and planned I/M programs in the U.S. and Canada. Section 2.2 contains a summary of major I/M research projects undertaken by several States (California, Arizona, Virginia and Texas). Section 2.3 contains a review of safety inspection programs and safety inspection research.

2.1 REVIEW OF EXISTING AND PLANNED I/M PROGRAMS

Studying existing I/M programs in other areas provides useful information to evaluate different options for New Jersey's future I/M program. Table 2-1 summarizes the status of North American I/M programs. The table shows the type of network, program coverage, the test or data collection network provider, whether OBD II inspections are performed, type of tailpipe test, coverage of diesels, and whether NOx emissions are tested.

After extensive review of current I/M programs, MACTEC decided to focus our analysis on a few State programs because these programs have innovative elements already included, or the States running them plan to incorporate innovative elements. The following identifies the State I/M programs we reviewed and the reason each program was selected for further study.

- California –Decentralized program with many special testing and consumer features
- Connecticut – Limited decentralized program with extensive anti-fraud provisions
- Delaware – State operated safety and emissions test and State operated vehicle information database (VID)
- Georgia – Decentralized program with extensive anti-fraud provisions
- Illinois – State is about to drastically change its program, including elimination of centralized network and tailpipe tests
- Maryland – Well-enforced, low cost centralized contractor operated program
- Missouri – Centralized program with remote sensing based clean screen tests
- New Hampshire – Contractor provides test equipment and data collection system for a low per test fee
- New York – State implemented OBD II-only system in Upstate New York; contractor provided low cost test equipment and data collection system
- Oregon – State operated program with innovative features to maximize customer convenience
- Wisconsin – Well-enforced, low cost centralized contractor operated program with extensive technician training

TABLE 2-1: STATUS OF NORTH AMERICAN I/M PROGRAMS

State / Province	Existing Program Features						
	Net-work Type[1]	Current Geographic Coverage	Test Contractor[2] or Data Network Provider	OBD included?	Tailpipe Test TSI (Two Spd Idle), ASM, IM240, BAR31, Other	Diesels covered?	NO_x as well as HC and CO tested?
AK	T&R	Fairbanks	none	Yes	TSI	No	No
AZ	TO	Phoenix, Tucson	Test: Gordon Darby	Yes	IM240 (AZ147)	Yes	Yes
British Columbia	TO	Lower Fraser Valley	Test: ESP	No	IM240/ASM	Yes	Yes
CA	Hybrid	Statewide	Data: Testcom	Yes	ASM/TSI	No	Yes
CO	Hybrid	Front Range	Test: ESP	Yes/Advisory	IM240/TSI	Yes	Yes
CT	T&R	Statewide	Test: Agbar Data: Systech	Yes	ASM/TSI	No	Yes
DC	TO	areawide	None	Yes	IM240	No	No
DE	TO	Statewide	None	Yes	TSI	Yes	No
GA	T&R	Metro Atlanta	Data: MCI	Yes	ASM	No	Yes
IL	TO	Metro Chicago	Test: ESP	Yes	IM240	No	NO_x-Info Only
IN	TO	Metro Chicago	Test: ESP	Yes	IM240	No	Yes
KY	The I/M programs in the Louisville area and 3 counties in the Cincinnati area ended in 2005						
MA	T&R	Statewide	Test: Agbar Data: MCI	Yes	BAR31	Yes	Yes
MD	TO	Metro Balt.	Test: ESP	Yes	IM240	No	No
ME	T&R	Metro Portland	None	Yes		No	No
MO	Hybrid	Metro St. Louis	Test: ESP	Yes	IM240	No	No
NC	T&R	Raleigh, Charlotte	Data: MCI	Yes	TSI/none	No	No
NH	T&R	Statewide	None	Yes	None	No	No
NJ	Hybrid	Statewide	Test: Parsons Data: MCI	Yes	ASM	Yes	Yes
NV	T&R	Reno, Las Vegas	Data: MCI	Yes	TSI	Yes	No
NY	T&R	Upstate: OBD only	Data: Testcom	Yes	None	No	No
NY	T&R	Metro NY	Data: Testcom	Yes	IM240	No	Yes
OH	TO	Cleveland	Test: ESP	Yes	IM240/TSI	Yes	Yes
OH	The I/M programs in the Cincinnati and Dayton areas ended in 2006.						

[1] TO=test only, T&R=test and repair, Hybrid=combination of test only and test and repair
[2] Unless noted otherwise, the testing contractor also processes data. Most T&R programs only have a data contractor. The state usually manages test facilities.

State / Province	Existing Program Features						
	Net-work Type[1]	Current Geographic Coverage	Test Contractor[2] or Data Network Provider	OBD included?	Tailpipe Test TSI (Two Spd Idle), ASM, IM240, BAR31, Other	Diesels covered?	NO_x as well as HC and CO tested?
Ontario	T&R	Southern Ontario Smog Zone	Test and Data: Protect-Air	No	ASM	Yes	Yes
OR	TO	Metro Portland	none	Yes	BAR31	No	Yes
PA	T&R	Metro Phila. & Pittsburgh	Data: MCI	Yes	ASM/TSI	No	Yes
RI	T&R	Statewide	Test & Data: Agbar	Yes	BAR31	No	Yes
TX	T&R	DFW & Houston	Data: MCI	Yes	ASM	No	Yes
UT	T&R	Salt Lake, Weber, Davis and Utah Counties	SLC: Test: Agbar, Other areas: none	Yes	ASM, IM240, TSI	Yes	Yes
VA	T&R	No. VA	Data: Testcom	Yes	ASM	No	Yes
VT	T&R	Statewide	None	Yes	None	Yes	No
WA	TO	Metro Seattle, Spokane	Test: Agbar	Yes	ASM (No NO_x)	Yes	No
WI	TO	Metro Milwaukee	Test: ESP	Yes	IM240	No	Yes

We compiled reports, requests for proposals (RFPs), and specifications from the above programs, and logged them into MACTEC's docket of information. We visited Delaware's I/M program, and we conducted phone interviews with I/M personnel in California, Connecticut, New York and Oregon. Information from these activities was used to compile detailed fact sheets on each I/M program. Appendix B-1 contains a fact sheet derived for each State program evaluated and provides a summary of the key I/M program features.

Based upon our review of these programs, we identified several key facts that will be of value to New Jersey as they prepare for their next generation I/M program.

- Good examples exist for effective and efficient I/M programs in various network designs
  - Connecticut's new decentralized I/M program is virtually fraud free and costs the same per test ($20 with one free retest) as the centralized program it replaced.
  - Delaware and Oregon provide high quality, low cost emissions tests in a centralized, State-operated scenario.
  - Georgia's decentralized contractor-managed program includes extensive anti-fraud checks.
  - Centralized contractor-operated programs in Maryland and Wisconsin provide low cost, well enforced I/M tests.

- States are beginning to implement innovative and drastically different approaches to vehicle inspections
  - – Oregon is setting-up self-service OBD II testing kiosks where motorists can perform their own OBD II tests on a 24/7 basis. Also, Oregon plans to equip vehicles, on a voluntary basis, with wireless OBD II systems that will allow motorists to bypass conventional inspections.
  - – Illinois is reviewing proposals to eliminate its test-only centralized I/M network and allow tests to be done in a wide variety of station types. As part of this change, Illinois plans to drop inspections on 1995 and older models, and perform OBD II-only tests on 1996 and newer models.

- Low cost OBD II-only systems have been developed for decentralized programs
  - – New Hampshire has implemented a new OBD II and safety inspection program where stations are charged about $3 per test, which covers inspection equipment and data collection.
  - – New York has implemented an I/M program (Upstate) where stations purchase equipment for around $1,700 to perform OBD II inspections and collect OBD II and safety inspection data, and their contractor charges about $1 per test to collect data and transmit it to the State's VID.

- Trigger reports can effectively eliminate fraud in OBD II tests
  - – Georgia and Connecticut generate extensive trigger reports to identify inspection fraud, particularly during the OBD II test. These reports look for anomalies in data recorded during inspections that might indicate if a passing vehicle has been substituted for the vehicle that should have been inspected.
  - – An independent audit of Connecticut's program found little evidence of fraud.

- Several states successfully manage their own vehicle information database (VID)
  - – Delaware set up and manages its VID. Delaware's VID has gone through several program equipment iterations, including the recent addition of OBD II inspections.
  - – Oregon, Missouri, and Wisconsin had testing contractors or equipment contractors set-up the VID; the States manage collection of data and reporting.

- Several States plan to simplify tailpipe and gas cap test procedures
  - – Delaware, Connecticut and Oregon dropped gas cap tests for 1996 and newer light-duty vehicles.
  - – Oregon is eliminating loaded-mode tests and plans to conduct idle or two-speed idle (TSI) tests on pre-1996 vehicles. Illinois plans to eliminate all tailpipe tests except possibly for special situations.

2.2 REVIEW OF MAJOR I/M RESEARCH ACTIVITIES

MACTEC was also tasked with analyzing results of research conducted by other states. Several states have conducted studies on the effectiveness of different emission control technologies and I/M test procedures. The following States have major research projects underway in connection with their I/M programs:

- California – Multiple I/M research projects – OBD II, remote sensing, liquid leakers, heavy-duty diesel I/M
- Arizona – Multiple I/M research projects – I/M test procedures and vehicle emissions profiling
- Virginia – Remote sensing research
- Texas – Diesel I/M strategies

This research provides useful information to address many of the I/M options being considered by New Jersey. Following is a summary by State of these major research projects.

2.2.1 <u>California – Multiple I/M Research Projects</u>

Several research projects are underway in California. Descriptions for each of those projects are provided under the following headings.

2.2.1.1 OBD II/OBD III Research by California Bureau of Automotive Repair (BAR)

The California Air Resources Board (CARB) continues to evaluate OBD II systems and recommend new features (CARB, 2005a). In addition, California continues to evaluate OBD III – remote identification of vehicles with faults. BAR is studying false failures and false passes for the OBD II test. BAR also is studying alternatives for performing OBD inspections and whether OBD II-equipped vehicles should receive tailpipe tests. Currently, in California's Smog Check Program, vehicles receive comprehensive inspections that include two-mode ASM tests, visual inspections for the presence of emission control devices, and OBD inspections (if the vehicle is a 1996 or newer model). California believes that the program would lose significant benefits if it eliminated the tailpipe test on OBD vehicles. However, preliminary evidence shows that vehicle profiling techniques in conjunction with OBD inspections can identify almost all the vehicles that will fail an ASM test. A fairly simple screening test that uses revised OBD II inspection criteria, vehicle mileage, and vehicle history (e.g., whether the vehicle's OBD system adequately identifies emissions related malfunctions) can identify a majority of the additional failures that would be detected by a combined tailpipe test plus USEPA criteria inspection. California intends to use these profiling techniques in the Smog Check Program, thereby allowing some vehicles to pass inspection without receiving full Smog Checks. With this scenario, approximately 75 percent of the 1996 and newer vehicles would only get OBD II inspections. (Klausmeier, 2004)

2.2.1.2 CARB Study of Gross ASM Polluters That Pass Their OBD II Inspection

The California Air Resources Board (CARB) is studying 1996 and newer vehicles that have high emissions but pass the Smog Check OBD II inspection. Since 2003, CARB has been testing vehicles that appear to fail Smog Check as gross polluters but pass the OBD II inspection.

CARB procures vehicles from private owners and tests them at the El Monte emissions laboratory. Vehicles are tested using the Federal Test Procedure (FTP) in the as received condition and after a series of repairs. To date, 20 vehicles have been procured and tested by CARB. Following is a summary of results (Klausmeier, 2004):

- Most of the vehicles tested had high FTP emissions and identifiable problems. FTP emission levels on average were much greater than the standard.
- Most vehicles with high tailpipe emissions have some indication through the OBD system that there is a problem or they had known defects. Either of the following obtained from the on-board computer could indicate that the vehicle has high emissions: diagnostic trouble codes[3] (DTCs) or readiness status[4]. An OBD II screen that displays the vehicle's known OBD II deficiencies, DTCs, or incomplete monitors would allow most of the vehicles with high FTP emissions levels to be identified.
- Seventy percent of vehicles that failed the ASM in the field also failed the ASM at CARB's lab; 93 percent of vehicles that failed the lab ASM failed the FTP that followed. This indicates that the ASM test, which is used in New Jersey, correctly identifies vehicles with high emissions.
- Eighty-three percent of vehicles that failed the lane ASM and passed the lab ASM also passed the FTP, indicating that these vehicles either had intermittent problems or were improperly tested in the lane.

2.2.1.3 Program Evaluation

California conducts extensive on-road tests to evaluate its I/M program. With assistance from the California Highway Patrol, the BAR pulls in-use vehicles over and performs an ASM test, as well as a limited functional and visual inspection when time permits. These on-road tests are conducted by state inspectors and therefore provide an independent measure of the emission readings and the condition of vehicular smog equipment for California's vehicle fleet. Results of the 1999 program evaluation found that vehicles certified at test-only stations had significantly lower emission rates after their I/M test than those certified at test-and-repair facilities. Subsequent evaluations identified performance parameters that allowed BAR to determine which test-and-repair facilities had similar performance to test-only facilities.

In 2003, BAR and CARB completed another evaluation. This evaluation included cost effectiveness estimates for the Smog Check program. The overall cost effectiveness of Smog Check was calculated to be $4,500 per ton of HC+ NO_X emissions reductions.
(CARB, 2003a)

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[3] Diagnostic trouble codes (DTCs) are how OBD II identifies and communicates to technicians the nature and location of detected malfunctions. Whenever the MIL is illuminated, a DTC is stored and can be read by a scan tool. In addition, if the OBD II system determines a previously detected fault is no longer present and extinguishes the MIL, the DTCs are stored for a period of time to assist repair technicians.

[4] OBD II systems have up to 11 diagnostic monitors. Diagnostic monitors are periodic tests run on specific systems and components to ensure that they are performing within their prescribed range. OBD II systems must indicate whether or not the onboard diagnostic system has monitored each component. Components that have been diagnosed are termed "ready", meaning they were tested by the OBD II system.

2.2.1.4 Remote Sensing

BAR and CARB are completing a pilot remote sensing device (RSD) program for use in Smog Check to determine if it is cost-effective. Unofficial results indicate that using RSD to identify high emitters is much more expensive than requiring older vehicles to receive annual inspections.

2.2.1.5 Liquid Leakers and Other Vehicles with Evaporative Emission Problems

BAR is developing an easier and more comprehensive evaporative emissions test for I/M programs. BAR is evaluating an improved pressure test, an evaporative canister condition check, a liquid leak check, an I/M lane “sniffer test”, and a targeted thorough mechanic check up. Only some of these tests will become real options for their I/M program. At this point, the liquid leak test and the improved pressure test seem to be likely candidates. A liquid leak test is estimated to reduce fleet HC emissions by 4 percent for little additional inspection cost. (Amlin, 2000)

2.2.1.6 Reducing In-Use Emissions from Heavy-Duty Diesel Powered Vehicles

CARB has completed extensive research in reducing in-use NO_X emissions from on-road heavy-duty diesel vehicles. These efforts are in support of SIP measure M17, which calls for a ten ton/day reduction in in-use NO_X emissions from on-road heavy-duty diesel vehicles operated in the South Coast Air Basin. SIP measure M17 has the following elements:

- Heavy Duty Diesel Engine (HDDE) NO_X field screening program
- HDDE in-use compliance program
- Heavy duty on-board diagnostic program
- NO_X reduction incentive program

As part of SIP measure M17, CARB developed a NO_X screening test for high emitters. A heavy-duty dynamometer was set up at CARB’s Stockton Laboratory and emission tests were conducted on heavy-duty trucks. The trucks were primarily tractors[5] (Class 8a and 8b) and were rented from used truck facilities. High emitting trucks were sent to factory authorized repair facilities for repairs and then retested. The diesel vehicle screening program attempted to answer the following questions:

- Are there excess NO_X emissions in the vehicle population that are caused by tampering and improper maintenance?
- Is there a practical field test that can identify those vehicles with high NO_X emissions?
- Can excess NO_X emissions be reduced through repairs and maintenance?
- Can NO_X reductions be made cost-effectively?

CARB tested 101 heavy duty diesel vehicles (HDDVs), 32 of which were sent out for repairs and retested afterwards. Many of the vehicles showing the largest emission reduction had on-board

[5] The lightest truck tested was "medium heavy duty" at a gross vehicle weight rating (GVWR) of 34,000 lbs.

computer reprogramming (termed reflash) listed as one of the repair items[6]. CARB commented that early on in the program, they would reflash vehicles that had not yet received the reflash mandated by the Consent Decree. However, CARB stopped doing this after management decided that the program should focus on correcting improper maintenance and non-regulatory driven malfunctions. The program has been on hold pending further direction from the Board.

Following are the key results of CARB's research (CARB, 2003b):

- About 15 percent of the HDDV population may have excess NO_X emissions, but it is difficult to clearly identify high emitters with repairable problems.
- An analysis of the test data showed that repairs (including reflash) reduced NO_X emissions by 20 percent at an average repair cost of $1,098[7] per vehicle.
- NO_X reductions for vehicles that had repairs other than reflash were not significant, even though the repairs cost an average of $1,150 per vehicle.
- Other than reflash, there is no clear trend as to which repairs would be cost-effective, as many of the repairs had no impact on NO_X emissions, or resulted in an increase in NO_X emissions, and cost more than $1,000. Repairs that included engine tune-ups and servicing of the charge air cooler (CAC) sometimes significantly reduced NO_X emissions. Many vehicles received tests of the CAC, but only a few received repairs. The few vehicles with repaired CACs did show reductions in NO_X emissions. For these diesel engines, an engine tune-up involved replacing the air filter and fuel filters, checking the timing and checking for leaks.
- CARB concluded that it will be difficult to develop a NO_X screening test because average per vehicle emission reductions from repair appear to be small, and no clear cutpoint exists to screen repairable high emitters.

2.2.2 Colorado – OBD II Effectiveness Study

The State of Colorado is studying 1996 and newer vehicles that have high emissions measured by the IM240 test. Colorado's goal is to determine if OBD II systems identify vehicles with high emissions. From 2002 until the end of 2003, Colorado performed FTPs on vehicles that failed IM240 tests in the inspection lane. Vehicles were tested in the as received condition and after a series of repairs. Overall, 107 vehicles were procured and tested. (Barrett, 2005)

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[6] Many engines built since 1990 were designed to advance the injection timing during steady-state highway operation' thereby improving fuel economy, but also greatly increasing NO_x emissions during this mode. Heavy-duty diesel powered vehicles frequently operate under steady-state highway conditions, so this practice caused NO_x emissions to be higher than previously expected. The heavy-duty diesel engine manufacturers were sued by USEPA because of these alleged defeat devices. The suit was settled by a Consent Decree whereby the engine manufacturers agreed to make reflash kits available at no cost to retard timing during highway operation, thereby reducing NO_x emissions. Detecting and reflashing vehicles that should have been reflashed, but were not, should reduce NO_x emissions by 20 to 30% for the heaviest engines operating over freeway cycles.

[7] This cost does not include the very real costs of time out of service, which can be quite significant for truck owners and operators.

FTPs were performed on 89 of the 107 vehicles tested; 85 of the vehicles receiving FTPs failed their initial IM240 test in the lane. The analysis of this test data is presented below.

- A majority of the vehicles that failed the IM240 test but passed the OBD II inspection (over 70 percent of the vehicles tested) had high FTP emissions and identifiable problems. FTP emission levels on average were much greater than the standard.
- An OBD II screen that displays vehicles with known OBD II deficiencies, DTCs or incomplete monitors would identify most of the high emitting vehicles tested in Colorado's study. OBD II screens identified over 90 percent of the excess FTP emissions in this sample.
- 61 percent of the vehicles that failed the IM240 field test also failed the IM240 test at the State's lab. All vehicles that failed the lab IM240 test failed the FTP that followed.
- 56 percent of the vehicles that failed the lane IM240 but passed the lab IM240 also passed the FTP, indicating that some of these vehicles either had intermittent problems or were improperly tested in the lane.

2.2.3 Arizona I/M Research Projects

Two research projects are underway in Arizona. Descriptions for those projects are provided under the following headings.

2.2.3.1 OBD II vs. IM147 Study

To date, the best data to evaluate the emission reductions from repairing vehicles that fail an OBD II-only test come from Arizona's study of IM147 and OBD II test results. Since January 2002, Arizona has been enforcing mandatory OBD II-only I/M checks using the USEPA OBD II inspection criteria. In July 2002, Arizona's I/M contractor began performing IM147 tests on a stratified random sample of vehicles that had undergone an OBD II-only inspection. About 50 percent of the stratified sample failed the OBD II inspection. Each vehicle received three IM147 tests.[8]

The Arizona dataset includes IM147 test results on vehicles that failed their initial OBD II inspection and passed their final OBD II inspection. Neither the technician nor the motorist had knowledge of tailpipe test results. The emission reduction for each vehicle for HC, CO, and NO_X can be calculated based on the before and after IM147 test average. In 2002, data were analyzed for the first 1,500 vehicles tested. The contractor continued to collect these data and the dataset now contains test results on about 5,000 vehicles.

The analysis indicates that repairs completed to pass the OBD II-only inspection significantly reduced IM147 emissions. After repair emission levels of initially failing vehicles were close to the average emission levels of initially passing vehicles, which is close to the ideal scenario for an I/M program (as opposed to after repair emission levels that are typically at higher but "good

[8] The IM 147 test consists of the last 147 seconds of the IM240 test. It includes the hill up to 57 mph. Experts believe that the IM147 test has lower false failure rates than the IM240 test.

enough to pass" emission levels). A majority of the vehicles that exceeded IM147 cutpoints before repairs passed them after repairs.
Fleet emission reductions were estimated for the following combinations of OBD and tailpipe tests:

- Fail IM147 – Requires all vehicles to receive tailpipe tests
- Fail OBD II – Requires all vehicles to receive OBD II tests
- Fail IM147 and OBD II – Requires all vehicles to receive OBD II tests; those that fail both tests fail the inspection
- Fail IM147 or OBD II – Requires all vehicles to receive OBD II and IM147 tests. Those that fail either test fail inspection
- Fail OBD screen (MIL-On or >0 Not Ready) – those that fail the screen receive IM147 tests. Vehicles fail if they fail either IM147 or OBD standards (MIL-On or >2 Not Ready).

Results of this analysis indicate that OBD II tests alone get equal HC reductions and slightly greater NO_X reductions than the IM147 test alone. The greatest reductions come from combining both tests. However, it is unlikely that USEPA will give states additional emission reduction credit for dual testing. (Klausmeier, 2003)

2.2.3.2 AZACTS Study

The State of Arizona is conducting the Arizona Alternative Compliance and Testing Study (AZACTS). This study includes an assessment of different vehicle emissions reduction technologies that are currently available, or will be available in the near future. These include:

- On-road and controlled remote sensing device (RSD) measurement
- Centralized and decentralized lane and remote scans of OBD systems, including methods to encourage drivers to respond to illuminated MILs
- High emitter profiling
- Profiling in conjunction with RSDs
- PM measurement techniques
- Techniques to identify vehicles with high evaporative emissions
- Use of existing and improved repair data

The results are not yet publicly available on this study.

2.2.4 Virginia – Remote Sensing Device (RSD) Research

The Commonwealth of Virginia has research underway considering the use of remote sensing for identifying high emitters in existing I/M areas. Virginia is also considering having remote sensing become the basis of a new I/M program and serve as a means to claim additional credit for its I/M program. Those research efforts are described in the following paragraphs.

Virginia established a comprehensive remote sensing program that uses RSDs to identify high emitting vehicles operated in the Northern Virginia I/M area. The goals of the program are to:

- Identify high-emitting light duty vehicles and trucks operating in the program area for out-of-cycle "verification" testing and subsequent repair
- Use RSD for "clean screening" of very clean vehicles, enabling these vehicles to avoid the regularly scheduled biennial emissions inspection
- Identify vehicles regularly driving in the I/M area that have not been inspected at a Virginia Certified Emissions Inspection Facility
- Evaluate fleet emissions and I/M program effectiveness

Several areas in Virginia are likely to be designated as nonattainment for the 8-hour ozone standard. DEQ must develop a state implementation plan to show how it would bring these areas into compliance with the ozone standard. One of the strategies under consideration is to identify high emitting vehicles and require that they be repaired. DEQ is considering using RSDs as the primary method to identify these high emitters. These vehicles would then be subjected to a confirmation test to confirm that the vehicle is indeed a high emitter or that the problem causing it to be a high emitter has been corrected.

Virginia estimates that using remote sensing to identify high emitting vehicles can significantly improve the cost effectiveness of an emission test program in new ozone nonattainment areas. DEQ evaluated using remote sensing as the basis of an emission test program in the Richmond area, which is expected to be designated as nonattainment for the 8-hour ozone standard. The study recommends the following elements for a remote sensing based I/M program in Richmond:

- RSD would be used to identify high emitting 1995 and older model vehicles that would then be subject to a confirmation tailpipe ASM or TSI test at an authorized test facility. All 1996 and newer vehicles would receive an OBD test at OBD-only facilities.
- RSD equipment would be set up and operated throughout the Richmond nonattainment area on a year round basis. Three remote sensing vans would be needed to obtain valid measurements on 80 percent of the vehicle fleet at an annual cost of $900,000. Using remote sensing instead of testing all pre-1996 vehicles would reduce total testing and repair costs to Richmond vehicle owners by $4,000,000 in 2007. (Virginia DEQ, 2003)

Using data from a remote sensing pilot program conducted in 2002 in Northern Virginia, Virginia estimated emission reductions from its I/M program. Emissions were compared for the following cases:

- Non-I/M registered fleet – Model year adjusted
- I/M area registered fleet before I/M – Model year adjusted
- I/M area registered fleet after I/M – Model year adjusted

These comparisons are shown in Tables 2-2 and 2-3. Table 2-2 shows that the I/M program in Virginia with remote sensing has significant emission reductions compared to the non-I/M registered fleet (16 percent reduction for CO, 30 percent reduction for HC and 21 percent reduction for NO_X). The data presented in Table 2-3 indicate that the Virginia I/M program emission reductions with remote sensing are much greater than MOBILE6 credits. (ESP Remote Sensing, 2003)

TABLE 2-2 OBSERVED EMISSION REDUCTIONS FROM VIRGINIA'S I/M PROGRAM

Scenario	Pollutant		
	CO (ppm)	HC (ppm)	NO_X (ppm)
Non I/M	0.25	72	375
I/M Vehicles Before Test	0.22	52	274
I/M Vehicles After Test	0.21	50	258
% Reduction: After vs. Before	**5.0%**	**4.5%**	**5.9%**
% Reduction: After Test vs. Non I/M	**15.9%**	**30.4%**	**20.9%**

TABLE 2-3 COMPARISON OF MOBILE6 I/M CREDITS VS. RSD OBSERVED I/M EMISSION REDUCTIONS

Pollutant	Model Yr Adjusted	MOBILE6 Estimate
VOC	30%	15%
CO	16%	12%
NO_X	21%	3.3%

2.2.5 Texas – Diesel I/M Strategies

Texas investigated diesel I/M strategies that could achieve measurable state implementation plan (SIP) credits for NO_X. Following are the major findings of this study. (Baker, 2003)

- Substantial NO_X emission reductions are possible by identifying vehicles that have not yet received the required reflash of their electronic control module (ECM). The SIP-creditable reduction is only a fraction of the total reduction , however, because MOBILE6 already assumes that reflash has occurred.
- In the future, a diesel I/M program should achieve significant NO_X reduction through checks of the ECM for proper calibration, the exhaust gas recirculation (EGR) system, and other components such as the charge air cooler.
- Currently, 1997 and newer model light-duty diesel powered vehicles (less than 8,500 lbs. gross vehicle weight or GVW) are equipped with OBD II systems; these vehicles could be immediately included in an OBD II inspection program.
- Beginning in model year 2005, vehicles with gross vehicle weights between 8,500 and 14,000 lbs are required to be equipped with OBD II systems, and heavy-duty engines

will be required to be equipped with OBD II systems beginning approximately with the 2008 model year.

- Although NO_X emission reductions from a diesel I/M program are theoretically possible, it is currently difficult for states to claim additional NO_X emission reduction credits. Through its MOBILE6 model, USEPA assumes that diesel-powered vehicles always meet their NO_X emission standards (that is, heavy diesel engines are assumed to have little to no deterioration in their NO_X emission rates over time).

2.3 SAFETY INSPECTION PROGRAM RESEARCH

As part of our review of other state programs, we gathered information on vehicle safety programs operating in other states. This information is summarized in tabular form in Appendix B-2. Inspection intervals vary from annual to biannual to only when the vehicle is sold. The inspection elements also vary and are included in Appendix B-2.

In addition to summarizing existing state vehicle safety programs, we analyzed whether data were available to allow simplification of safety inspection programs, based upon published data that certain inspection items do not have any impact on accident rates. We located four reports that generally discuss safety programs:

- Missouri State Highway Patrol Fatal Crash Analysis 1998-2000, December 2001
- Missouri State Highway Patrol Fatal Crash Analysis 2000-2002, September 2003
- Vehicle Roadworthiness in Victoria, 1999
- Motor Vehicle Safety NHTSA Should Resume Its Support of State Periodic Inspection Programs, GAO, July 1999

While these reports do not provide details on the effects that specific safety defects have on accident rates, the studies do support the premise that having vehicle safety programs reduce vehicle accidents. On average three percent of all fatal accidents in the late 1990s and early 2000s were caused by or had contributing factors related to vehicle defects. Additionally, 6 percent to 13 percent on average (some reports say as high as 28%) of all accidents are caused by or have vehicle defects as contributing factors. These reports across the board state that it is probable that vehicle defects are underreported as the cause/contributing factor due to investigator training, non-standard report writing, etc. Vehicle age was a significant factor in vehicle accidents according to these reports. In general, the reports support that there is a one to four cost benefit ratio (or more) in investing in vehicle safety programs. All the reports tend to support that vehicle safety programs, where they are implemented, significantly lower accidents.

Both Missouri State Highway Patrol (MSHP) reports show data nationwide that two percent (or more due to under reporting) of fatal crashes are due to vehicle defects. Out of 111,533 fatal crashes nationwide during one three-year period, one out of 61.4 fatal vehicle crashes were caused by vehicle defects (one out of 58.7 in states with no vehicle inspection, compared to one out of 74.2 in states with vehicle safety programs). The State of Missouri had a ratio of one out of 123.3 vehicles. The data support the conclusion that vehicle age is a contributing factor in fatal vehicle accidents, especially when vehicles are two years old or older. According to the report “Vehicle defects as a causation factor continue to increase in relation to the age of the vehicle.”

The MSHP 2000-2002 report data show nationwide that 1.8 percent (or more due to under reporting) of fatal crashes are due to vehicle defects. Out of 113,513 fatal crashes nationwide during this three-year period, one out of 73.4 fatal vehicle crashes were caused by vehicle defects (one out of 72.9 in states with no vehicle inspection compared to one out of 82.7 in states with vehicle safety programs). The State of Missouri had a ratio of one out of 117.6 vehicles. These data also support the conclusion that vehicle age is a contributing factor in fatal vehicle accidents, especially when vehicles are two years old or older. New models had a one out of 245.1 ratio, one year old models had a one out of 162.6 ratio, while three year old models had a one out of 106.3 ratio (with later models going steadily downward).

The 1999 Vehicle Roadworthiness in Victoria report identifies vehicle defects as a significant factor in road accidents. Defects were found to be the primary or contributory cause of between three and eight percent of all accidents in Victoria, Australia. Defective brakes, tires and steering wheels were found to be the most common defects. This report (Victorian Automobile Chamber of Commerce, 1999) references a large number of reports (mostly from the late 1970s and 1980s) conducted worldwide to support its data. This report states that “the weight of the findings supports the conclusion that periodic motor vehicle inspection can significantly reduce accidents by detecting defects and requiring rectification.” The study estimates that a program costing $63 million would conservatively save more than $220 million in human and environmental impacts (including repair costs, health care, fuel savings, air emissions, etc.) This report also concludes that “Studies show a positive relationship between the age of a vehicle and the number of defects it is likely to have.” The report discusses the positive link between vehicle maintenance (and safety) to vehicle emissions and increased public health costs.

The 1990 U.S. General Accounting Office (GAO) report concludes that the 1989 U.S. National Highway Traffic Safety Administration’s (NHTSA’s) report “accurately concluded that state periodic inspection programs reduce the number of poorly maintained vehicles on the highways.” The GAO reviewed the NHTSA’s data and found that the “safety benefit from periodic inspections justifies a conclusion that these programs reduce accident rates.” This report concluded that police accident reports may understate the percentage of accidents caused by defective vehicle equipment. The report also contains information from a historical study done in New Jersey that compares total accident rates for a number of years before and after the State adopted its inspection program. Taking into account a number of other factors, the study still estimated an accident reduction of 23 percent from the State’s inspection program. This study also concludes that vehicle age did play a part in fatal accidents, especially in states not requiring periodic inspections. The GAO report finds that the NHTSA report and other reports it researched show that vehicle inspection programs play a role in accident reduction just not in a consistent quantifiable amount (anywhere from 1% to 27% reduction from all the reports reviewed by GAO).

SECTION 3 – STAKEHOLDER PROCESS

The stakeholder process was a very important part of our evaluation since the State wanted participation and input from all affected parties to obtain buy-in on any changes to the future New Jersey Motor Vehicle Inspection System (MVIS). To this end, MACTEC allotted significant resources to engage the stakeholders in this process.

The stakeholder process started with research on how to obtain stakeholder views regarding the New Jersey vehicle emissions and safety program. Stakeholders included both internal stakeholders from the State of New Jersey (Motor Vehicle Commission {MVC}, Department of Environmental Protection {DEP}, and Office of Information Technology {OIT}) and external stakeholders (current contractor, Federal regulators, representatives from the repair industry, environmental groups, the motoring public, organized labor, and equipment vendors). The process for identifying and reaching out to stakeholders is summarized in Section 3.1.

Once the stakeholders were identified, MACTEC conducted a series of key person interviews. These interviews were used as an opportunity to orient stakeholders to the evaluation process and to clarify expectations. We developed criteria as we interviewed the stakeholders to determine whether a stakeholder policy dialogue was appropriate and if so, what kind, including possible gains and risks. The results of the key person interviews are summarized in Section 3.2.

MACTEC organized and facilitated three meetings to further solicit input from stakeholders:

- October 4, 2005 Meeting. The meeting provided the public an opportunity to voice their views and opinions on the current MVIS and how it could be improved. A summary of the information obtained during this meeting is provided in Section 3.3.
- November 30, 2005 Meeting. MACTEC facilitated a stakeholder discussion regarding key issues associated with the design of the MVIS. That meeting is summarized in Section 3.4.
- January 30, 2006 Meeting. The meeting provided an additional opportunity for stakeholders to comment on alternative scenarios for the design of the next generation MVIS. That meeting is summarized in Section 3.5.

In addition to these meetings, MACTEC established an electronic “opinion poll” on the NJ MVC website to solicit thoughts about MVC's inspection system and plans for improving it. Information collected from the opinion poll is summarized in Section 3.6.

Section 3.7 summarizes the important viewpoints of the various stakeholders. The information provided through the stakeholder process was used to develop, evaluate, revise, and enhance the analysis of options and alternatives presented in Section 4 of this report.

3.1 IDENTIFY STAKEHOLDERS AND MAKE INITIAL REQUEST FOR INFORMATION

MACTEC initially met with the State Project Team to discuss issues and concerns regarding the design and implementation of the stakeholder research process. Following the meeting we:

- Identified the stakeholders;
- Determined how we would conduct the stakeholder research process;
- Developed a plan to collect and analyze stakeholder information; and
- Established a process for reporting stakeholder information to the State Project Team.

Our approach was to work with—and listen to—all stakeholders to explore their interests and needs concerning both process and substance.

3.1.1 Identify Stakeholders

We first interviewed the State Project Team to develop a comprehensive list of stakeholders who needed to be engaged in the evaluation process. These interviews began at the July 25–26, 2005, project kickoff meetings and included the following members of the State Project Team:

- MVC - Catherine Schafer, Thomas Bednarz, Tom Wright;
- DEP - Robert Schell, Bill Wanschura; and
- OIT - Tina Pastor, Dawn Dowd.

We coordinated with the State Contract Manager to revise and expand the initial list of key State stakeholders and to develop a comprehensive list of external stakeholder groups. External stakeholders included representatives from the repair industry, labor organizations, new car dealers, the motoring public, Federal regulators, environmental groups, vendors, training providers, and law enforcement. The initial list of stakeholders is included as Appendix C-1.

3.1.2 Advertise Request for Information

As the first step in initiating dialogue with potential external stakeholders and the public, MACTEC worked with the MVC in posting a Request for Information (RFI) on State websites, including the MVC and DEP websites. The RFI, shown in Appendix C-2, addresses the following items:

- Background (i.e., New Jersey is beginning to analyze options and alternatives for the next generation of the MVIS);
- Information request (i.e., strongly encourage stakeholders to transmit comments about their experiences with and opinions of the current MVIS, as well as recommendations for options and alternatives to improve the program);
- Public meeting schedule (i.e., the date, time, and location of any public meetings);
- Email comment box (i.e., identify an email address for stakeholders to provide electronic comments, e.g., NJMVIScomments@mactec.com);
- Regular mail comment box (i.e., identify a U.S. Postal Service mail box in Trenton for stakeholders to provide hard copy comments); and
- Point-of-contact (i.e., MACTEC representative with a phone number to call).

We have maintained an information center (similar to a regulatory docket) to serve as the repository for information collected through the RFI process. Most of the responses to this RFI were provided by technology vendors. Further discussion concerning responses to the RFI from technology vendors can be found in Section 4 of this report.

3.2 CONDUCT KEY PERSON INTERVIEWS

MACTEC conducted extensive interviews with key stakeholders from mid-August through mid-November 2005. The purpose of the key person interviews (KPIs) was to identify and crystallize project issues, gather ideas on the stakeholder and public involvement process, and build relationships. MACTEC conducted approximately 50 KPIs.

3.2.1 Develop Protocol for Conducting Key Person Interviews

The State Project Team assisted MACTEC in developing a draft interview protocol. The protocol includes a brief description of how to conduct interviews, the process for analyzing interview responses, a discussion of the need for confidentiality of the interviews to ensure full and complete responses, and a list of substantive and procedural questions. The protocol is presented in Table 3-1.

3.2.2 Compile Results of KPIs with Internal Stakeholders

The information gathered from the interviews was summarized into themes to further define the direction of the study and refine the stakeholder involvement process. The themes are listed below:

- I Program Management
- II Program Oversight
- III Vehicle Coverage
- IV Vehicle Compliance
- V Network Design
- VI Station Performance
- VII Inspection Equipment and Processes
- VIII Equipment Upgrades
- XI Vehicle Repair
- X Safety
- XI Data Management
- XXX Process
- YYY Other

A detailed compilation of internal stakeholder input obtained during the interview process is included as Appendix C-3. We conducted interviews with the following internal stakeholders:

- New Jersey Motor Vehicle Commission (Facilities Management, Driver and Vehicle Testing, Purchase and Property, and Program Management & Systems Development)
- New Jersey Department of Environmental Protection (Air Quality Planning and Transportation Control)
- Office of Information Technology (Data Processing and Information Processing)
- Treasury Contract Compliance & Administration Unit

The view from within the State regarding the future direction of the inspection program was not consistent. It became clear from KPIs with State personnel that there is a variety of opinions within the State about how the program should be operated.

TABLE 3-1 PROTOCOL FOR CONDUCTING KEY PERSON INTERVIEWS

Purpose: The purpose of key person interviews was to identify issues, gather ideas for stakeholder involvement, and build relationships with affected business, trade, civic, and environmental organizations. The State Project Team used the information collected during the key person interviews to identify issues and themes, including those that reflect stakeholder perceptions. Attribution of specific points was not made.

Interview Questions: The Key Person Interviews (KPIs) will include questions of both substance and process.

Questions related to study issues

- What inspection and maintenance (I/M) issues should the project consider?
- What concerns do you think will emerge during the project process?
- Who will hold these concerns and how can they be addressed?
- What community needs should be met by the I/M Program?
- What needs to be resolved (from your organization's perspective/others)?
- What other initiatives are occurring which may impact this project, or vice versa?
- What criteria would you suggest for evaluating the I/M Program?
- (REQUEST) What information/data do you have that may be useful?
- How well does the current program meet your needs?

Questions related to public involvement

- What advice do you have on reaching out to your organization and/or constituents, disseminating information, and eliciting comments and ideas?
- Would you be willing to distribute information yourself to your organization/constituents? What is the best way to get information to you?
- What other groups/individuals will be interested in the project?
- Who do you know that could represent [group or area] well?
- What criteria would you use to evaluate the public involvement program?
- (REQUEST) Do you have a mailing list that we could include in our data base?

3.2.3 Compile Results of KPIs with External Stakeholders

A compilation of external stakeholder input is included as Appendix C-4. The following is a brief summary of the information obtained from the KPIs with the external stakeholders:

- Private inspection facility (PIF) operators were dissatisfied with the program and with the process by which the State was consulting with them. They suggested that unless their concerns were heard and responded to by the State, the PIF organizations (e.g., the New Jersey Gasoline Retailers Association {NJGRA}, the Professional Automotive Technician Association {PATA}, the Alliance of Automotive Service Providers in New Jersey {AASP/NJ}, the Mechanics Education Association {MEA}, and the PIF Group) would lobby their members to withdraw from the program.
- The union representing the inspectors at the centralized inspection facilities (CIFs) supports the current system. Their first choice is for the State to extend the current contract at the CIFs for as long as possible. To the extent that contract extension is not possible, they want the State to re-bid a contract based on the current program and, as for the last contract, require the winning bidder to either novate the collective bargaining agreement or recognize the union, maintain current salary and benefits, and agree to a union shop. If the State took over operation of the CIFs, the unions would not, in principle, oppose this, assuming that the union and the State are able to negotiate employment details and a mutually agreeable collective bargaining agreement.
- The environmentalists did not express a major interest in the program, at least during the key person interviews. However, they do have major concerns about air quality in New Jersey (the Lung Association, for instance, has produced several position papers about air quality). While they are not sure that the MVIS is as effective as they would like, they are skeptical that any potential overhaul of New Jersey's testing system – even moving all testing to State facilities – would have a significant impact on emissions.
- USEPA indicated relative satisfaction with the New Jersey program as it believes that the emission testing program is working – other than DEP sometimes fails to submit required reports to the agency on time.
- The equipment vendors expressed their interests – that they have bidding opportunities, that the bid process be fair and there is a level playing field for all potential contractors, and that the State not 'spec out' or 'spec in' any particular contractor(s).
- The contractors (entities that would compete to manage the CIF program) obviously did not express any support for the State to staff and run the central lanes as they want the opportunity to bid on a well-written RFP to perform that function. If the State took over operation of the CIFs, the contractor community would have major concerns.

3.2.4 Develop Plan for Soliciting Comments from the Public and Stakeholders

After completing most of the KPIs, MACTEC met with the State Project Team to discuss the design and structure of a stakeholder dialogue, including specifically whether to conduct stakeholder meetings or public meetings. MACTEC recommended that the State conduct a combination of both types of meetings. Stakeholder meetings are different than public meetings. Public meetings are designed to invite members of the general public to attend a presentation to hear what the government is considering in very general terms and to offer their views and opinions. Stakeholder meetings, on the other hand, are composed of specific organizations invited to participate based on their interest and involvement in the success of the program.

Stakeholder meetings are based on the assumption that there are identifiable organizations that have a role or a particular and identifiable interest in a program and that it is in the State's interest to seek participation, input, and buy-in on any changes. This buy-in is important for obtaining expressions of support to the broader public, implementation assistance, and political support. In the course of these meetings, participants can consider technical analysis and other program details, address policy issues, and formulate recommendations. The size and structure of stakeholder meetings enables participants to provide thoughtful and nuanced responses to the policy and program options under consideration—including what might or might not work.

Among the considerations MACTEC outlined to the State as it considered whether to conduct stakeholder meetings were:

- Is there compatibility between stakeholder interests around program options?
- Do the right conditions and relationships exist for a collaborative effort to be successful?
- Do the parties believe that such a process can meet their interests?
- Would the effort be contingent on the participation of certain stakeholders?
- What are the benefits and risks of pursuing a stakeholders' dialogue approach?

The State Project Team and MACTEC concluded that it would be helpful to conduct a public meeting, described above, and an initial meeting of all stakeholders to solicit their input on several key issues. The question of whether to hold future meetings would then be contingent upon the utility of these first meetings. The public meeting was held on October 5, 2005. The first stakeholder meeting was held in Trenton on November 30, 2005. Based on the success of that meeting, the State decided to conduct an additional stakeholder meeting on January 30, 2006.

It was important to clearly communicate the purpose of the public and stakeholder meetings, the roles of the participants, and the process for providing recommendations, among other things, to ensure a successful meeting. A set of protocols, included as Appendix C-5, was developed in coordination with the State Project Team and provided to the stakeholders for comment in advance of the meeting. The protocols assured stakeholders that all voices would be heard, that all necessary perspectives would be represented, and that all parties would understand how, when, and what decisions would be made.

3.3 CONDUCT PUBLIC MEETING (OCTOBER 4, 2005)

Public meetings provide an opportunity for the general motoring public and other stakeholders to learn about the vehicle emissions study and provide input to the State Project Team. MACTEC organized and facilitated a public meeting held on October 4, 2005. The goals of the public meeting were to provide an opportunity for members of the general motoring public to learn about the vehicle emissions study project, have questions answered in one-on-one and group formats, and to express their concerns and ideas to MVC, DEP, the project team, and other members of the public. The intent was for public participants to feel that they had been heard and that their questions had been directly answered. The purpose of the meeting, the agenda, and the meeting format, including meeting presentation materials and handouts, were developed by MACTEC with guidance from the State Project Team.

MACTEC arranged for notice of the public meeting to appear in four New Jersey newspapers: the Asbury Park Press, the Bergen Record, the Newark Star Ledger, and the Trenton Times. MACTEC also assisted with the development of a press release, shown in Appendix C-6. The State distributed the press release to its existing network of media contacts.

The format for the October 2005 public meeting was:

- The meeting was approximately two hours in length, from 7:00 PM to 9:00 PM.
- After Bob Norton, MACTEC Senior Vice President, welcomed meeting participants, facilitator Dan Dozier conducted an open discussion enabling participants to state their views, raise concerns, and offer suggestions.
- Each attendee received a meeting information sheet describing the purpose of and agenda for the meeting, explaining where and how to obtain information and make comments, and including the names, email addresses, and telephone numbers of the applicable project managers.

Approximately 70 people attended the public meeting in Trenton. The following identifies the individuals who spoke at the meeting:

- Bob Everett, Alliance of Auto Service Providers
- David Rich, Dave’s Automotive
- Rick Allen, Rick Allen’s Auto Repair
- Rick Ferber, PATA, President of Repair Excellence Council (REC)
- Enzo Olivieri, REC Council Member and leader of the PIF Group
- Brian Cowen, PATA
- Joseph Oswald, Public
- Roland Bonner, Association of Automobile Service Providers
- Jack Hagopian, Kingsway Auto Service
- Pat Fiumara, New Jersey Gasoline Retailers
- Keith Shaw, Quality Auto Centers
- Steve Whesthof, PRO-CAT
- James Valero, Applus Technologies
- Robert Zapulo, Patrick’s Auto
- Frank Reston, Public
- Dave Scaler, Mechanics Education Association
- Joe Erickson, AAA
- James West, Public
- Jack Reeves, Jack’s Auto

A written summary of the meeting was prepared and posted on relevant State websites. The meeting summary is included as Appendix C-6.

3.4 CONDUCT FIRST STAKEHOLDER MEETING (NOVEMBER 30, 2005)

MACTEC arranged for public notice of the first stakeholder meeting in four New Jersey newspapers. MACTEC also assisted with the development of a press release, shown in Appendix C-7. The State distributed the press release to its existing network of media contacts. MACTEC also developed a meeting agenda, which is shown in Table 3-2. The following is a summary of the questions that guided the discussion and the major themes that emerged.

Key Question 1. Should the program design be centralized inspection facility (CIF) only, private inspection facility (PIF) only, or the current hybrid program?

- Several stakeholders observed that the hybrid MVIS is serving motorists well.
- Still, there is disagreement regarding the underlying reasons for customer satisfaction with and utilization of different elements of the hybrid program and a suggestion that other criteria, such as PIF operator satisfaction and cost to the State, are also important in considering the effectiveness of the program.
- PIF representatives contend that their return from the current hybrid program is very different than promised and that their continued participation in the program will require significant changes and perhaps decentralization of the inspection program.
- Stakeholders disagree on whether an entirely decentralized program or even an entirely centralized program could be as successful in terms of motorist convenience and satisfaction as the current hybrid program.

Key Question 2. If CIFs continue to be part of the design, should they be State or contractor operated?

- With the exception of one of the two individuals representing organized labor, there was a shared sense among the participants that a contractor could operate the CIFs more effectively. Participants mentioned that a contractor can bring knowledge of other programs, operational flexibility, and previous operating experience to the program.

Key Question 3. Should safety inspections be separated from emissions inspections?

- Responding to concerns, State policy-makers first clarified for participants that there will be a motor vehicle safety inspection program for the foreseeable future.
- While it was agreed that mandatory safety inspections encourage vehicle maintenance and repair and that this generally reduces vehicle accidents, injuries, and deaths, the precise reduction in accidents or lives lost from increasing inspection frequency is unclear (and for reasons of technical complexity will continue to remain so for the immediate future).

TABLE 3-2 AGENDA FOR FIRST STAKEHOLDER MEETING (NOVEMBER 30, 2005)

FIRST MEETING
THE STAKEHOLDER CONSULTATION GROUP FOR THE NEW JERSEY MOTOR VEHICLE INSPECTION PROGRAM

New Jersey Motor Vehicle Commission Headquarters,
Room 8 East, 225 East State Street, Trenton, NJ 08666

November 30, 2005 from 9:30 a.m. to 3:30 p.m.

Draft Agenda

Welcome, Introductions and Agenda Review

- Welcome by State of New Jersey
- Introduction of MACTEC team, meeting participants and observers – Dan Dozier
- Introduction and explanation of the facilitators' role
- Description of the convening and representative selection process
- Agenda review and approval of the agenda for the meeting

An Evaluation of the NJ Motor Vehicle Inspection System

- Goals and objectives of the MACTEC Contract – Bob Norton, MACTEC
- Consultation with interested parties and Mandate of the Stakeholder Group – Dan Dozier
- Commitment of the State of New Jersey to participate in the process

Operating Protocols and Ground Rules for the Stakeholder Process (Dan Dozier)

- Roles and responsibilities of individual members of the Stakeholders Group and the facilitators
- Representation of interest group views
- Not a decision making process
- Constituent responsibilities
- Technical information
- Observers
- Schedule
- Communication with the broader public and public input processes
- Attendance at meetings
- Discussion Guidelines

Break

The NJ Safety and Emissions Inspection Programs (State Representatives)

- DEP - Air Quality Impacts of Mobile Sources/ Benefits of I/M in NJ
- MVC - Overview of NJ Enhanced Safety and Emissions Program

Lunch

Stakeholder Interests Regarding Key Questions (facilitated discussion)

- Program Design – Should the program design be Centralized Inspection Facility (CIF) only, Private Inspection Facility (PIF) only, or continue with the current Hybrid system?
- If CIF program part of design, should CIF be State or Contractor operated?
- Should Safety inspection be separated from the emissions inspections?
- Should Vehicle Inspection Database (VID) be separated from the emissions/safety contract? If separated, should the VID be State or contractor operated?
- Other Issues?

Next steps and adjourn

Key Question 3 (cont.) Should safety inspections be separated from emissions inspections?

- It was largely agreed that the incidence and timing of safety and emissions-related equipment failures are not necessarily related and that the safety and emissions programs should be able to prove their value independently. Additionally, the two inspection systems could be conducted independently, especially by virtue of technological advances (namely, increasing prevalence of OBD II technology and the variety of mechanisms for transmitting data). However, it was generally agreed that decoupling the programs operationally at this time would be inconvenient for and therefore unpopular with motorists (to the extent motorists perceive they are required to undergo two separate inspections).

Key Question 4. Should Vehicle Inspection Database (VID) be separated from the emissions/safety contract? If separated, should the VID be State or contractor operated?

- There seemed to be little concern about separating the VID in the contract. Stakeholders similarly had little concern or objection regarding a requirement for data to be reported via the internet.

Key Question 5. Other Issues?

- Stakeholders largely agreed that registration denial is an effective mechanism for enforcing compliance with inspection requirements. The accuracy of the State's databases and how to make it happen are the real concerns.
- There was broad agreement that despite some good efforts there is a need for new mechanisms for identifying and punishing uncertified repair technicians.
- There was broad agreement that the State should identify to motorists, whose cars are undergoing inspection, what is occurring at each step in the process (as in a car wash), e.g., "here we are determining how your brakes are operating, etc."
- There were no major objections to the idea that the State Inspector's Manual would benefit from updating and that this should occur in collaboration with representatives of those training, inspection, and repair facilities that would be using the manual.
- There was also broad agreement that motor vehicle manufacturer curriculums were often a suitable replacement for the State of New Jersey's approved curriculum. In fact, during its most recent update to the curriculum, the State offered that it had welcomed car dealers and manufacturers to submit their curriculums for approval by the State but that many dealers had failed to do so.
- There was also support from many stakeholders for the suggestion that the State do a better job publicizing the program, explaining the reasons cars are tested in New Jersey and outlining the benefits of the tests, especially at the stations. The State could provide the CIFs and PIFs with signs and perhaps a brochure for motorists describing the purpose and benefits of both the safety and emissions inspections.

MACTEC prepared a written summary of the meeting that was posted on relevant State websites and distributed to the meeting attendees. The complete summary can be found in Appendix C-7. After the conclusion of the stakeholder meeting, MACTEC emailed a meeting evaluation form to all participants in the stakeholder meeting. Appendix C-8 presents a summary of the responses to the meeting evaluation.

3.5 CONDUCT SECOND STAKEHOLDER MEETING (JANUARY 30, 2006)

Based on the success of the first stakeholder meeting, the State Project Team directed MACTEC to hold an additional meeting, which occurred on January 30, 2006. MACTEC arranged for public notice of the meeting in four New Jersey newspapers. MACTEC also assisted with the development of a press release, shown in Appendix C-9. The State distributed the press release to its existing network of media contacts. MACTEC also developed a meeting agenda, which is shown in Table 3-3.

The purpose of the second stakeholder meeting was to obtain input from stakeholders and the public on the pros/cons of scenarios under consideration but not yet decided on by the State. The State first set out some preliminary assumptions regarding program design as follows:

- Both safety and emissions inspections will be retained in some form.
- Based on USEPA modeling and vehicle population distribution, dynamometer and tailpipe testing will eventually be eliminated. New private inspection facility (PIF) equipment may at some point not require a dynamometer component.
- Existing PIF and CIF equipment will eventually become obsolete.
- At different stages in the program, different facilities may conduct different emissions tests (on-board diagnostics, dynamometer, and tailpipe).
- Current emission repair facility and repair technician programs will remain the same for the short term but be evaluated for improvement.
- All inspector and repair technician training will be evaluated for improvement and automation.
- Emissions repair data capture will be improved.
- The new VID/software infrastructure will be flexible and scalable to allow for additional components in the future.

The State then identified the following four scenarios and solicited stakeholder reaction and comments on each.

1. Scenario 1 – Hybrid program (contractor or State run)
2. Scenario 2 – Private inspection facility only program
3. Scenario 3 – Central inspection facility only program
4. Scenario 4 – Separated safety and emission program

Each scenario is discussed in the following subsections. A complete summary can be found in Appendix C-9.

TABLE 3-3 AGENDA FOR SECOND STAKEHOLDER MEETING (JANUARY 30, 2005)

SECOND MEETING
THE STAKEHOLDER CONSULTATION GROUP
FOR THE
NEW JERSEY MOTOR VEHICLE INSPECTION PROGRAM

New Jersey Motor Vehicle Commission Headquarters,
Room 8 East, 225 East State Street, Trenton, NJ 08666

January 30, 2006 from 10:00 a.m. to 4:00 p.m.

Draft Agenda

Welcome, Introductions and Agenda Review

- Welcome by State of New Jersey – Sharon Harrington, Commissioner, NJ Motor Vehicle Commission (MVC)
- Introduction of meeting participants and observers – Dan Dozier, meeting facilitator
- Introduction and explanation of the facilitator's role
- Review of the meeting ground rules
- Agenda review and approval of the agenda for the meeting

Scenarios for the NJ Safety and Emissions Inspection Programs and Facilitated Discussion Regarding Stakeholder Interests

- Assumptions Regarding Program Design Options – Catherine Schafer, NJ MVC
- Hybrid System – Contractor or State Run
- PIF Only Network
- CIF Only Network
- Separated Safety and Emissions Inspection System

Lunch – during the facilitated discussion, above

Next steps and adjourn

Scenario 1 – Hybrid inspection program (contractor or State Run)

Under this scenario, the State would maintain the current program consisting of both CIFs and PIFs. Characteristics of this scenario include:

- Motorist choice continues.
- CIF Equipment, PIF Equipment, and VID would be provided by one contractor.
- CIF test would include OBD, gas cap and tailpipe testing.
- CIF lanes could be operated by the State or by a contractor.
- PIF test could be OBD and gas cap.
- PIF equipment could be paid for by sale or by transaction.
- PIF inspection fee could be capped or market driven.
- Safety advisories could reduce retest inspections.
- State audits would be reviewed.

Themes from this discussion and supporting conversations are summarized below.

There seemed to be agreement that the program could use a single vendor for CIF, PIF, and VID equipment and services. Possible benefits include lower costs through economies of scale, greater system efficiencies and ease of coordination (for example, in designing and implementing software updates), and greater accountability for overall program performance. PIF representatives are open to the idea but would like continued involvement in discussions of this approach. In any case, PIF representatives believe that the State should invite PIF involvement in writing the specifications for new equipment and services.

Participants disagreed on the need for retaining a gas cap test should OBD be implemented and on whether PIFs should continue to test pre-1996 vehicles under this scenario. The State will check with USEPA on the emissions credit that the State would receive for continued gas cap testing if it were to implement OBD.

There was concern about reducing the number of safety items that must be operational for a vehicle to pass inspection. The group agreed that any such review would require a broad consultation process and that, even if there were no changes, a public education campaign concerning safety requirements would be a good idea.

There was disagreement about whether CIF lanes should be operated by the State or a private contractor.

Scenario 2 – Private inspection facility only (PIF-only) program

Under this scenario, only PIFs would provide inspection services. Characteristics of this scenario include:

- No motorist choice.
- Equipment and VID provided by one contractor.
- Equipment may be paid for by sale or by transaction.
- Emissions test to include OBD, gas cap and tailpipe testing.

- Inspection fee may be capped.
- Safety advisories may reduce retest inspections.
- State audits will be reviewed.

Themes from this discussion and supporting conversations are summarized below.

Participants seemed to agree that capping the labor hours for PIF-conducted inspections (but not specifically the price of the inspection or the labor unit cost) could work in a PIF-only program. PIFs expressed opposition to capping such costs under the hybrid scenario, however, unless motorists are able to credit the relevant portion of their vehicle registration fees toward the cost of a private inspection.

There was uncertainty about the reaction of motorists to an all PIF program. Among the concerns expressed were the impact of any added cost to the motorist, familiarity and seeming satisfaction with the current program, and possible transition problems (for example, at least in the short term, accommodating all the motorists requiring tests).

Participants agreed that despite the cost, gas cap and tailpipe testing would be necessary for at least the 2007-2010 period. (Advances such as partial zero emission vehicles, low sulfur fuels, and so on and their widespread use are still too far off to allow eliminating these tests at present.)

Among the alternatives discussed for making testing equipment more affordable was a transaction-based pricing system.

The use of centrally based computers and the internet could reduce the cost to private shops of the OBD component of emissions testing.

An additional drawback of an all PIF program is that it would require laying off 500 union employees. Transition assistance and alternative employment options were not discussed at length.

Participants would like to see an estimate of the costs to the State of transitioning to an all PIF program (as well as the other scenarios).

Scenario 3 – Central inspection facility only (CIF-only) program

Under this scenario, there would be no private inspection facilities and only State facilities would provide initial and reinspection services. Characteristics of this scenario include:

- No motorist choice.
- Equipment and VID provided by one contractor.
- Some lanes would be OBD-only and some would include tailpipe testing.
- Gas cap testing would be included.
- Same hours of operation.
- Lanes may be operated by State or by contractor.
- Safety advisories may reduce retest inspections.
- State audits will be reviewed.

Themes from this discussion and supporting conversations are summarized below.

While the central inspection facilities may have sufficient capacity for all New Jersey motorists (they currently test about 80% of the vehicles), participants seem to agree that reducing the total number of testing facilities available would represent a significant reduction in motorist choice and convenience. (There are currently over 1,300 public and private testing facilities of which 31 are CIFs.)

Most participants seemed to agree that a move toward more centralized facilities was contrary to the larger trend of decentralization that is occurring nationwide, in part because of technology changes.

Some PIFs might prefer this option rather than the current hybrid program (though not as much as an all private program).

Scenario 4 – Separated safety and emission inspections

The program would involve safety inspections being performed at PIFs and all emissions inspections being performed at CIFs. Characteristics of this scenario are:

- Motorists must go to two places for inspections.
- Equipment and VID provided by one contractor allowing new technology for future inspections.
- Equipment may be paid for by sale or by transaction.
- Emissions test to include OBD, gas cap and tailpipe testing.
- Safety or emission inspection fee may be capped or market driven.
- Safety advisories to reduce retest inspections.
- Easier to implement program changes for the future.
- State audits would be reviewed.

Themes from this discussion and supporting conversations are summarized below.

Participants seemed to agree that implementing separate safety and emissions inspections (and therefore separate enforcement mechanisms) would not necessarily require separating the locations where the tests are administered and that having separate locations would in fact be a significant and unwelcome inconvenience, depending upon expiration dates and other issues.

Participants seemed to agree that while advances in technology would facilitate decoupling emissions and safety tests in the future, the reverse is not true; that is, separating the administration of emissions and safety tests would not foster or ease the transition to the use of new testing technologies. At any rate, the question of decoupling, it was largely agreed, is a different issue than whether the inspection program is hybrid, private, or centralized.

3.6 INFORMATION COLLECTED FROM MVC OPINION POLL

MACTEC established an electronic "opinion poll" on the NJ MVC web site to solicit input regarding the MVC's inspection program and plans for improving it. The web site address is: http://www.state.nj.us/mvc/Inspections/publiccomment.htm A screen shot of the web site is shown below in Figure 3-1. The web site includes an email link for submitting comments about the program (NJMVIScomments@mactec.com). MACTEC reviewed all responses to the opinion poll. The responses were generally grouped into broad categories associated with different aspects of the program. Table 3-4 shows these broad categories and provides a brief synopsis of the nature of the comments made.

FIGURE 3-1: MVC WEB-SITE FOR OPINION POLL

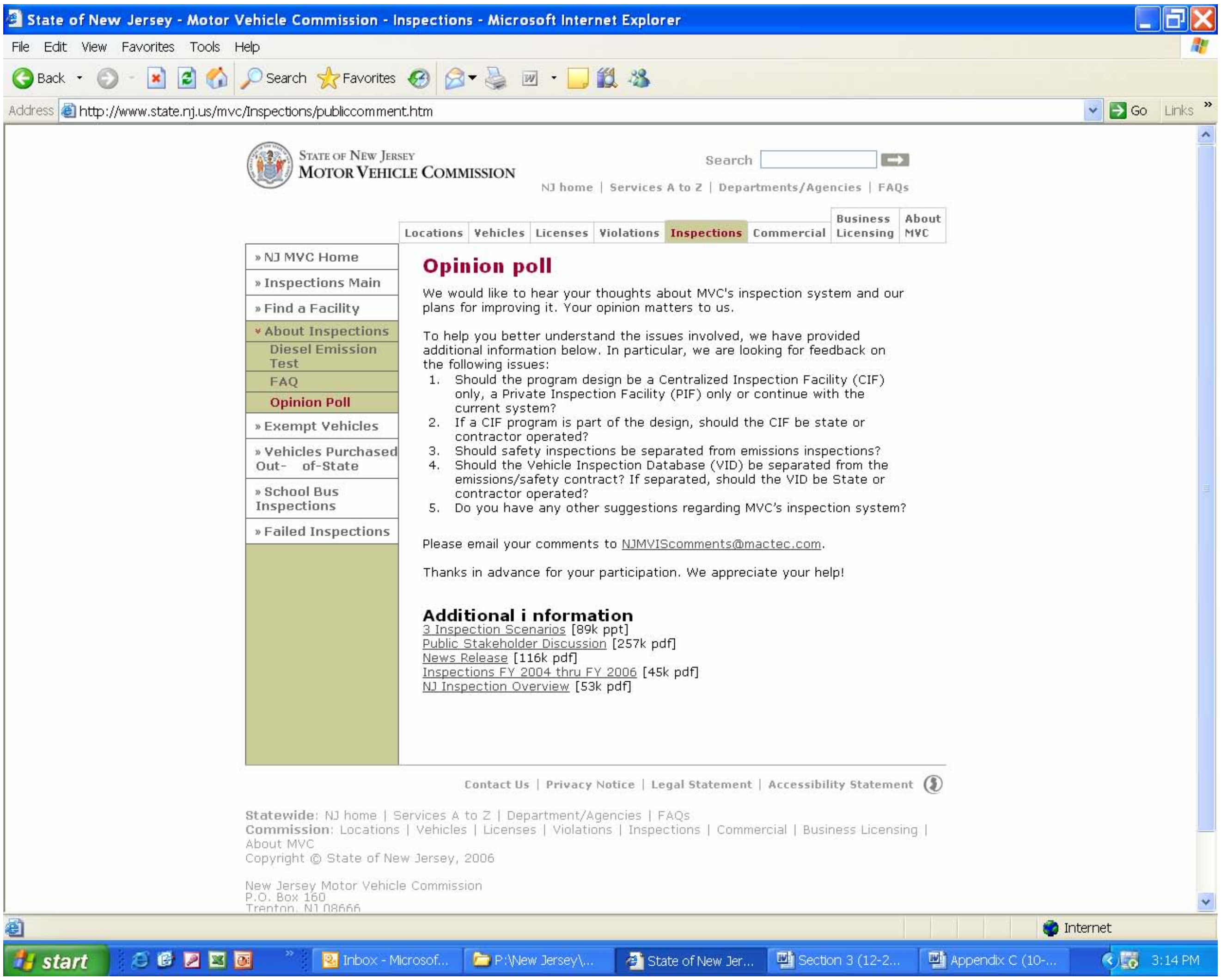


TABLE 3-4: SUMMARY OF THEMES FROM THE MVC WEB-SITE OPINION POLL

Representative Comments from the MVC Web-site Opinion Poll
Broad Theme: Current System Should be Left As-Is **Number of Responses: 19**
"I don't mind the current system as long as it stays quick and efficient. People can choose to go wait in line at the state stations or pay a few dollars with no line at the local garage." "The current CIF system is fine, but the CIF may be overloaded if PIF is eliminated. So I would go with the status quo." "…remain as is and emissions be done at the same time as the equipment/safety inspection." "The current system provides for a central point for inspections, both mechanical and emissions and, albeit somewhat slow at times, I feel is effective. The residents of NJ already pay for these services thru the tax collections as well as thru registration fees, so any course that would likely raise the cost for this service would not be deemed welcome. "Keep both the State and Private facilities operable." "Could there be improvements yes, but in general 'if it is not broken don't fix it', and it is not broken at this time." "Since the inspection process has gone to the company that is doing it now, the process has improved dramatically. I am a 67 year old life-long resident of NJ. I have been going through the inspection process for 50 years. Don't change it. It isn't broken." "I think the current system should be continued. It works very well and everything is done in one step." "Leaving the program the way it is I will definitely say is best. The reason why is people like the option of choosing where they want to go and if they want to pay an extra fee to go to a PIF."
Broad Theme: CIFs Should be Operated by State Employees **Number of Responses: 10**
"The CIF program should definitely be State operated. Privatizing doesn't always work and in this case it hasn't worked well." "Why should we pay a Private contractor to run the Inspection System when it has been proven that the State can operate the system cheaper? Let's cut out the middle man..." "I don't think the inspection station should ever be operated by a private contractor. It would cost the state more money to hire private contractors and it would cost the taxpayers more money." "The article explains why the failure rate is so high at … CIFs (555,000/2.5million about 20%). The contractor charges government more if the inspection volume at its CIFs is larger. Therefore, it is in the best interest of the contractor to fail more vehicles...The system needs to be changed. CIFs can be operated by Contractors. But please never pay them based on the volume at the CIFs." "I think the inspections stations should be state run due to the fact that the state is paying zillions of dollars for a private company to run operations. Some of the safety failures are completely silly and it makes people have to make 2 or 3 trips back and they have to usually take off of work to do so." "I would like to think that a program in private hands would be more efficient, but as Parsons has proven, this isn't necessarily so. Of course, when there's no competition between competing companies, there's no incentive for one to outperform the other(s) or to bring their costs down, so it's hard to see how a contractor would be much less ensconced in bureaucracy than a state-run program."

TABLE 3-4: SUMMARY OF THEMES FROM THE MVC WEB-SITE OPINION POLL (continued)

Broad Theme: Inspections Are Not Necessary **Number of Responses: 4**
"The notion of inspection is a waste of time...most cars from 96 till today were built with superior emissions equipment...give the local and state police the ability to impound any vehicles they feel are truly unsafe" "The check engine light has been in place inside the vehicles for over 20 years and can detect if there is a problem… a roadside detector has been developed to acknowledge if a passing vehicle has the proper amount of pollution from its exhaust. This would prevent the outrageous fees that have gripped this state for years." "Abandon the inspection system, like some other states already have. The cost is prohibitive and the results questionable. Police are able to identify poorly maintained autos"
Broad Theme: Re-Inspections Are Not Necessary or Unduly Burdensome **Number of Responses: 3**
"There is a problem with some of the reinspection process, for instance my last inspection I failed for a gas cap. I immediately replaced the defective part but now will have to wait in line again, for who knows how long. Its a waste of my time, gas and resources. I'm sure there are better ways of this - maybe a line for reinspection." "I just took my car through vehicle inspection in Randolph. It failed because modules in the OBD were "not ready" to be read, not because there was anything wrong with the car. I will now have to take my car out and waste gas to drive it around just so I can have it reinspected. I will then have to waste another hour waiting for inspection" "The reinspection line, too, is problematic. One often needs to wait in line just as long as for a regular inspection, even if only one item needs to be checked again."
Broad Theme: Concern About Changes to the Safety Program **Number of Responses: 8**
"(Safety) system may be changed to eliminate many items from the "failure" list. I was expecting to see things like cracked windshield or inoperative windows, but was shocked beyond belief to see things like horn, speedometer or 3rd brake light! Or even license plate light, which can affect the police's need to identify cars. This appears to be a step in the wrong direction for public safety." "With the advent of "high-intensity" & '4lights' on the front of today's autos, some type of 'intensity' check should be performed at the stations. There is NO check for headlight alignment, any more, at any of the Inspection stations in my area!" "I request that headlight alignment be reinstated, at least to the point of not shining on the roof of the car in front. New style lights are too bright to be reflecting in rearview mirrors, blinding the driver that the offending car is overtaking." "Please add HEADLIGHTS back into the Inspection Process"

3.7 SUMMARY OF STAKEHOLDER INPUT

Table 3-5 provides a summary of the viewpoints and themes stressed by each stakeholder group. All stakeholders agreed that the State must design an effective public education program. This is particularly important if the current emissions or safety inspection changes. An important aspect of the public education program is to educate motorists about the reasons for the program: clean air improvements, motorist safety, and performance of the vehicle.

TABLE 3-5: SUMMARY OF STAKEHOLDER THEMES

Stakeholder Group	General Theme
Labor Unions	• Unions likely to resist an all-PIF program because it would require laying off 500 union employees. • Unions suggest that motorists will see a PIF-only system as a "tax" increase because PIFs currently charge for inspections while there is no charge for inspections at CIFs. • One union supported keeping the privatized, contractor-run CIF operation. • Another union supported a State-run CIF operation. • Unions would not, in principle, oppose the State running the CIFs as long as the union and the State are able to negotiate employment details and a mutually agreeable collective bargaining agreement.
Current and Potential CIF Contractors	• Supported continued operation of contractor-run CIFs. • Expressed concern about motorist reaction to increased inspection fees under a PIF-only program (i.e., elimination of the perceived "free test" at CIFs). • Stressed the need for a well-written RFP for future contractor operations at CIFs.
PIF Operators	• Generally support use of a single vendor for equipment and/or VID but need more information on how single vendor concept would work. • Representatives for some PIFs say they will not participate in a hybrid program without significant changes (i.e., eliminate perceived free test at CIFs). • Some PIF operators expressed dissatisfaction with current program and are reluctant to participate in a future hybrid program. • Can live with an inspection fee cap in a PIF-only program, if cap based on hourly rate, not on dollars. • Strongly believe State should not abandon safety program and concerned about reducing number of safety items inspected. • Can understand why State may want to separate emissions and safety inspection programs, as long as testing is conducted at one location.
Equipment Vendors	• Can adapt and respond to just about any option. • Very supportive of single equipment vendor concept. • CIF-only program contrary to current trends in other States. • Requested that the equipment bid process be fair with a level playing field for all contractors (i.e., the State should not prescribe equipment specifications that overtly favor any particular contractor(s)).

TABLE 3-5: SUMMARY OF STAKEHOLDER THEMES
(continued)

DEP/MVC	• No consensus on the future direction of the inspection program. There are a variety of opinions within the State about how the program should be operated. • Any SIP credits lost with I/M changes must be made up somewhere else. • There is a need for flexibility to implement advances in inspection, enforcement, and maintenance technologies.
USEPA	• Indicated relative satisfaction with the New Jersey program as it believes that the emission testing program is working.
Motorists	• Some motorists support keeping the current hybrid program that offers the choice of going to a no-charge CIF or paying extra to go to a local PIF. • Some motorists perceive that State tax dollars are being wasted on contractor-run CIFs and believe that the State can run CIFs at a lower cost. • Some motorists feel that emission and safety inspections are not necessary and that the police have the capability to identify poorly maintained vehicles. • Several motorists expressed concern that the safety program may be changed to eliminate many items from the "failure" list.
Environmental Groups	• Have major concerns about air quality in New Jersey. While they are not sure that the MVIS is as effective as they would like, they are skeptical that any potential overhaul of New Jersey's testing program – even moving all testing to State facilities – would have a significant impact on emissions.

SECTION 4 – EMERGING INSPECTION TECHNOLOGIES

4.1 INTRODUCTION

This section describes emerging inspection technologies and changes taking place that are affecting I/M programs. The section is divided into two additional subsections: (1) changes in vehicle, inspection and repair technology and (2) results of a request for information to solicit input from interested parties regarding:

- Current or soon to be proven emission and inspection technologies
- Inspection data management systems
- Remote sensing
- Training programs
- Repair/maintenance programs
- Security and anti-fraud programs
- Program costs and benefits
- Air quality considerations

4.2 CHANGES IN TECHNOLOGY AND EFFECT ON I/M PROGRAM

With the advent of enhanced on-board diagnostics (OBD II) on vehicles manufactured after 1995, the typical vehicle fleet subject to emissions inspection has been segregated into two distinct groups: (1) the older, pre-1996 fleet that must rely upon external instruments to detect excess emissions and (2) the newer, OBD II fleet that has the capability to continuously monitor its own operating conditions, identify malfunctions that could lead to excess emissions and signal the operator that maintenance is required (via the *check engine* or malfunction indicator light, *MIL*). Previously, the only way to obtain a comprehensive indication of vehicle emission status was for skilled operators to measure exhaust and evaporative emissions using costly and complex equipment. The modern OBD program allows the inspector to make sure the MIL is correctly signaling the need for maintenance by connecting a simple PC-based analyzer to the standardized diagnostic link connector (DLC) on the vehicle.

This radical change from earlier technology marked a shift in traditional I/M programs. It was no longer necessary to measure vehicle emission levels grossly above the standard using external inspection equipment before problems could be detected, reported, and eliminated.

As inspection programs throughout the United States begin to transition from tailpipe and functional component tests to the simpler OBD II inspections, it has been generally difficult to determine the point at which inspection of the older fleet may be avoided entirely. This appears largely due to a phenomenon that, concurrent with the advancements in self-inspection capabilities featured on OBD II vehicles, these newer cars are “cleaner” when produced and can remain that way much longer because their emission control systems are more robust than those of their predecessors. When operators of OBD II vehicles are compelled to heed MIL warnings (as in an OBD II I/M program), high-mileage studies have indicated that these vehicles may contribute very little excess emissions throughout their useful lives when compared to their pre-1996 counterparts. *Consequently, while vehicle miles traveled (VMT) by the pre-1996 fleet may be diminishing in proportion to the VMT by the entire fleet, the emissions consequence of this diminishing ratio of vehicles may still contribute a disproportionate share of excess emissions, well past the timeline originally anticipated by inspection program planners.*

This change has not only left its mark on inspection programs, but has had just as much influence on vehicle service and maintenance. While OBD II has had the greatest influence on emission inspection program design of any vehicle technology before or since, many other evolving motor vehicle technologies continue to change the way we inspect and repair cars as described in the following sections.

4.2.1 <u>Automotive Vehicle Technologies</u>

Emerging technologies specific to vehicles and their effect on I/M programs are discussed in the following paragraphs. These technologies are on-board monitors, controller area network protocols, automotive electrical systems, electric vehicles, advanced traction control technologies, evaporative emissions control systems, light duty diesel vehicles and alternative fueled vehicles.

4.2.1.1 On-Board Monitors (OBD II)

OBD II monitors include a variety of vehicle-specific functions that may not necessarily have an influence on emissions but can either add to the challenges a repair technician faces or provide diagnostic information that was previously unavailable. Such OBD II-monitored functions now include *fuel mixture control, cylinder misfire, exhaust gas recirculation, fuel cap leakage, evaporative emission controls, engine operating temperatures, catalytic converter efficiency,* etc. In addition to these and other parameters, the OBD II system may also monitor functions that may seem to have less direct influence on vehicle emissions such as *certain braking parameters*, *transmission slip* and *air conditioning.*

Any OBD II vehicle may feature a host of "manufacturer-specific" codes and functions. MODE 6, for example, is very specific to each manufacturer and facilitates advanced diagnosis and detailed analysis of systems for pinpointing the source of malfunctions. MODE 6 refers to the OBD II operating mode that "captures" expanded vehicle-specific diagnostic information for non-continuous on-board monitors. MODE 6 diagnostics have been identified by many technical trainers to be a prime area of deficiency for emission repair technicians. A scan tool that may be compatible with the full range of generic OBD II communications required by the USEPA for inspections does not necessarily support the full range of MODE 6 vehicle-specific applications. Many training professionals agree that comprehensive equipment and instruction to take advantage of MODE 6 OBD II data is important for assuring appropriate OBD II repairs. Repair shops need improved diagnostic technology and training to make use of MODE 6 information available on all newer OBD II vehicles.

4.2.1.2 Controller Area Network (CAN) Protocols

As OBD II model years progress, vehicle systems are becoming increasingly automated and inter-connected with a host of computerized modules. The most recent communications protocol, controller area network or CAN, brings the capacity to unite vehicle technologies into one seamless network. The CAN OBD protocol is the latest in the series of communications methods prescribed by the USEPA for use in automotive on-board computers. For vehicles produced after 2002, CAN was permitted to be the exclusive OBD II protocol, although Mercedes incorporated CAN with other OBD protocols as early as 1992. From 2008 forward all vehicles offered for sale in the US are required as part of the Federal Test Procedures (FTP) to use the CAN protocol for generic OBD II communications. Due to its inherent flexibility and improved error handling, CAN has been generally accepted as the only protocol required for full generic OBD II emissions inspection in the foreseeable future.

Given that CAN is rapidly becoming the common protocol among all vehicles sold in the US, each state inspection program must determine, according to their fleet make-up and current model year exclusions, at what point it will become essential to upgrade their OBD II inspection capabilities to be able to interface with CAN-equipped vehicles. CAN was implemented at the New Jersey CIFs as of mid October 2006. Although CAN protocol capability has not yet been integrated with the existing PIF inspection analyzers, the PIFs are currently using portable CAN capable scan tools to conduct stand-alone OBD II inspections.

4.2.1.3 Automotive Electrical Systems

Electrical systems in early automobiles used a standard six-volt direct current (VDC) system. That system was eventually replaced on nearly all vehicles with the modern 12-VDC systems. However, some industry websites report that 25 to 50 percent of new vehicles by 2010, and all new cars by 2020, will incorporate 42-volt electrical systems. Not only does this higher voltage allow for smaller wiring but may eventually be indispensable to supply the growing power needs of newer cars (i.e., mega sound systems, TVs, VCRs, navigation systems, power seats, windows, doors, etc.). (Murray, 2002; Klasco, unknown)

Higher voltages have created a new set of challenges for service technicians. With hybrids for example, where voltage levels can reach 276, the importance of avoiding metallic contact with live conductors is critical. Disconnect procedures are not always obvious, especially with collision damage where repair shops and first responders may be subject to lethal shock hazards. Even with 42-volt systems that may eventually become common, the damage potential from arcing and sparking is much greater during repairs. As these vehicles age, their higher voltage systems may become subject to higher rates of deterioration for some components. Depending upon the extent of future problems, additional safety check items could emerge.

Even as some industry sources tout 42-volt systems as the ultimate evolution of vehicle electrical systems, not all original equipment manufacturers (OEMs) agree. "Forty-two volts is done with," says Stephan Wolfsried, head of DaimlerChrysler's Electrical/Electronic Systems unit in a 2004 report published by Ward's Auto World. (Kelly, 2004) According to Wolfsried, the transition to a 42-volt system would involve "uncontrollable complexity."

The current 12-volt system (actually 14 volts when the engine is running) is supported by a well-established development and production network. Although a 42-volt system offers many technological advantages, they are outweighed by economic disadvantages. Citing 42-volt light bulbs as an example, Wolfsried says they are not currently in production, so "it would have been necessary to transform the power supply to every LED and every microprocessor down to 14 volts instead of 42 volts." Wolfsried believes the cost of switching to a 42-volt system "cannot be justified by direct consumer benefits." He adds in summation that "Functions that nobody uses, and which benefit nobody, have no place in the car."

Besides the lack of attractive selling points to new-car buyers, adoption of a 42-volt standard has been delayed by the production of 12-volt systems that perform tasks previously thought to require 42 volts. A 12-volt DC motor drives the electronic power steering system featured on the 2004 Chevrolet Malibu, Saturn Vue and Saturn Ion. The integrated starter-alternator, a fuel-saving device that allows engines to automatically stop and restart on demand at traffic stops, and long thought to be dependant upon the switch to 42 volts, is now available as a 12-volt product. Even 12-volt electromechanical valve actuators are poised for production in 2008. These actuators will eliminate camshafts, valve lifters and timing belts.

Despite these developments and lack of consensus among automakers, 42-volt systems are alive and well, and currently at work in some of today's most advanced vehicles. Power requirements for a typical hybrid electric vehicle range from 12 volts for lighting and accessories to more than 200 volts for the motors that drive the wheels. Hybrids are where 42-volt systems seem to have come into their own.

The distinction of producing the "first 42-volt architecture in North America" is claimed by General Motors for the 2004 Chevy Silverado and GMC Sierra hybrid pickups. These are equipped with 42-volt lead-acid battery packs that power each pickup's integrated starter-alternator (ISA) and electro-hydraulic power steering system and help power its four 120-volt alternating current (AC) outlets. The first 42-volt ISA was produced in Japan by Denso for the 2001 Toyota Crown hybrid. The Toyota Highlander and Lexus RX300h hybrids sold in the US are equipped with ISAs and 42-volt electric power-steering systems.

The 42-volt system may eventually become the norm rather than the exception, but not until the cars we drive depend more upon advanced electrical devices that exceed the limitations of even the most advanced 12-VDC systems.

4.2.1.4 Electric Vehicles

Electric vehicles are now appearing as hybrids and hydrogen-fueled as well as the original types with batteries that are still dependent on recharging stations. Hybrid vehicles are really electric vehicles that feature their own on-board fuel-powered battery charger. Some hybrids are capable of delivering power to the drive system from the combustion engine and the electric batteries independently, while others simply maintain the charge level of the battery pack, which alone supplies power to the electric motor. Hydrogen-fueled vehicles, on the other hand, are closer to pure electric vehicles in that the hydrogen gas is converted directly to electrical energy within a type of battery called a fuel cell. Hydrogen-fueled vehicles meet the original intent of the zero emission vehicle (ZEV) program, phased-in by California regulations in CCR Title 13, as their long term strategy for improving air quality and controlling greenhouse gases. With more states, including New Jersey, adopting the latest low emissions vehicle (LEV II) programs along with a ZEV or partial-ZEV component, the proportion of the overall fleet composed of these low emitting vehicles will rise very rapidly in coming years, according to the LEVII phase-in program. Along with the challenge of repairing the hybrids' high voltage electrical systems, the normal OBD II inspection routine, requiring a vehicle to "idle" during the inspection, is not conducted exactly the same way with a hybrid vehicle whose engine may remain dormant until the batteries need to be recharged.

4.2.1.5 Advanced Traction Control Technologies

Advanced traction control technologies and all wheel drive (AWD) are beginning to dominate new vehicle production. One example, electronic throttle control (ETC), was introduced by BMW in 1988 and is now used on about one-third of all new cars sold in the US. ETC severs the mechanical link between the accelerator pedal and the throttle. Most automobiles already use a throttle position sensor (TPS) to provide input to traction control, antilock brakes, fuel injection, and other systems, but use a cable to directly connect the pedal with the throttle. An ETC-equipped vehicle has no such cable. Instead, the electronic control unit (ECU) determines the required throttle position by performing calculations using data measured by other sensors such as an accelerator pedal position sensor, engine speed sensor, vehicle speed sensor etc. The electric motor within the ETC then drives the throttle to the required position via a closed-loop control algorithm within the ECU.

The benefits of ETC are largely unnoticed by most drivers because the aim is to make the vehicle power-train characteristics seamlessly consistent irrespective of prevailing conditions, such as engine temperature, altitude, accessory loads etc. However, because the ETC system overrides direct throttle control by the gas pedal, it may be difficult or impossible for inspectors to maintain the speed ranges required by loaded-mode testing programs such as New Jersey's ASM program.

Much of the engineering involved with drive-by-wire technologies including ETC deals with failure and fault management. Most ETC systems have sensor and controller redundancy. Calculations from these redundant components are compared to check for possible errors and faults.

The anti-lock braking system (ABS) is a similar safety-critical technology. While not completely 'by-wire', it has the ability to electronically intervene contrary to the driver's demand. Such technology has recently been extended to other vehicle systems to include features like brake assist and electronic steering control, but these systems are much less common, also requiring careful design to ensure appropriate back-up and fail-safe modes. Electronic steering control (ESC) compares the driver's intended direction in steering and braking inputs to the vehicle's response via monitoring lateral acceleration, rotation (yaw) and individual wheel speeds. ESC then brakes individual front or rear wheels and/or reduces excess engine power as needed to help correct under-steer (plowing) or over-steer (fishtailing). ESC also integrates all-speed traction control, which senses drive-wheel slip under acceleration and individually brakes the slipping wheel or wheels and/or reduces excess engine power until control is regained. While these are valuable safety features, they also influence vehicle emissions inspections and may interfere to the point of creating hazards with conventional dynamometer testing with the potential for inadvertent braking during the drive cycle.

4.2.1.6 Evaporative Emissions Control Systems

Evaporative emissions control systems on OBD II vehicles have recently changed with the addition of natural vacuum type systems. These changes continue to make this one of the emissions control systems most challenging to technicians. During the roll-out period, only half of the vehicles manufactured in 1996, 1997 and 1998 had an enhanced evaporative monitor of any kind. When a vehicle fails its OBD II inspection, depending upon model year and the diagnostic trouble code (DTC) that commanded the MIL to illuminate, even an experienced technician has to work through a long list of possible system types before he can begin the troubleshooting process.

Even after the system type is determined, the diagnostic tree remains unusually complex. Fortunately, the new natural vacuum systems employed on vehicles manufactured within the past few years are simpler and overcome some of the limitations of the earlier more complex systems.

4.2.1.7 Light Duty Diesel Vehicles

The USEPA estimates that about one-third of the air pollution generated by motor vehicles comes from diesel-fueled cars, trucks and buses. Small particles found in diesel smoke are considered to be health hazards, particularly for children and the elderly. Increased lung disease and asthma rates have been associated with diesel pollution. The USEPA has concluded that long-term exposure to diesel exhaust is likely to cause cancer in people.

While many states, including New Jersey, have a heavy-duty diesel testing component within their inspection program, states are slating light duty diesels as likely for inclusion due to their similar particulate contribution to the emission inventory.

With light duty diesels becoming increasingly popular due to their fuel efficiency and low maintenance characteristics, the desirability of including them in the OBD II inspection cycle increases as well. Since they feature a slightly different set of emissions system criteria, software and hardware updates to the OBD II interface, and possibly the vehicle inspection record, may become necessary.

In March 2006 the USEPA made minor amendments to the light-duty diesel vehicle rules under the Tier 2 program. The alternative compliance options will last for only three model years (MY) — 2007 through 2009 — during which time advancements in diesel emissions control technologies will be further implemented. The two voluntary compliance options affect a very limited set of standards for nitrogen oxides (NOx), including only high altitude and high speed/high acceleration conditions. These temporary options are designed to be environmentally beneficial. Any vehicle certified under these options, while allowed to meet a less stringent NOx standard when new, would have to meet a 30 percent more stringent NOx standard and a 50 percent more stringent particulate matter (PM) standard for their entire regulatory life. Further, that regulatory life would be extended from 120,000 miles to 150,000 miles.

4.2.1.8 Alternative Fueled Vehicles

Alternative fueled vehicles may be powered by alcohol, bio-diesel or flex fuels and must be identified as such for any type of tailpipe testing to be appropriate. Since the majority of these vehicles were produced after 1996, they would not likely be subject to NJ MVIS tailpipe testing unless they happen to require a back-up tailpipe test in lieu of OBD. The greater the likelihood of back-up tailpipe tests, the more important it is to maintain an accurate and current means for identifying alternative fueled vehicles to avoid improper testing of these vehicles.

As long as vehicle reference tables used for inspection are kept up-to-date and reflect the fuel type of the vehicle being tested, alternative fueled vehicles that require back-up tailpipe tests can, for example, receive a two-speed idle test in lieu of an ASM test, which may not yield accurate results.

4.2.2 Inspection Technologies

Emerging technologies specific to inspections and their effect on I/M programs are discussed in the following paragraphs. These technologies are self-service OBD inspections, remote OBD inspections, liquid leak checks, gas cap tests, low-pressure evaporative emission system inspections, remote sensing devices, functional component checks, extended emission component warranties, keyless ignition systems and inspection security enhancements.

4.2.2.1 Self-Service OBD Inspections

Self-service OBD kiosks are being offered by several companies in the state inspection industry as evidenced by responses to the NJ MVIS RFI process. Several vendors have expressed interest in providing their kiosk technologies to the State for use in beta and pilot demonstrations. These technologies have some unique features. One vendor has a radio frequency identification (RFID) interface that permits wireless identification of the vehicle to prevent fraud and avoid troublesome VIN scans by the motorist. Another vendor offers an assortment of wireless OBD fast lanes, drive-through kiosks, “OBD on-the-go” mobile testing systems and “easy link” kiosks staffed by the contractor. However, until a state program finalizes a kiosk and/or other wireless technology specification to which a specific system can be mass produced, the technology should not be considered ready to deploy. The State of Oregon is in the final stages of deploying both OBD II kiosk and wireless OBD II solutions. While a number of states have expressed a desire to implement a wireless inspection network using kiosks, wireless technologies such as E-ZPass and GPS-based systems such as OnStar, there are no programs currently using this technology in a production environment. Oregon may therefore be the first state I/M program to implement a self-serve and assisted wireless OBD II system as part of their centralized program.

4.2.2.2 Remote OBD Inspections

Although the term OBD III had been commonly used to refer to wireless remote OBD systems, the variety of technical solutions now offered has caused this generic reference to be replaced with more specific terms for each system. Remote OBD II has recently become the subject of pilot programs in Maryland, Oregon and California, and is of interest in New Jersey as well. In the Oregon program, motorists purchase the remote transponder for $39 in addition to their normal test fee (presumably so that they do not wait in line at inspection facilities). Several companies now offer a system of land-based stations, somewhat like E-ZPass, that can "ping" the on-board transponder to report a vehicle's OBD II status to the vehicle information database (VID). Among other benefits, remote OBD may be a reasonable alternative to excluding additional model years from the program, thus easing concerns that some vehicles will be out of warranty, have high mileage and have substantial defects by the time of their initial state inspection. In addition, this option is likely to be more acceptable to the private repair industry because repair revenues may increase in proportion to the increased rate of identifying OBD II defects for vehicles that are continuously monitored as opposed to periodically inspected.

Another important aspect of this technology is the potential to mitigate inspection overloading at centralized facilities. With sufficient remote OBD participation, the growth of New Jersey's fleet need not result in costly expansion of centralized inspection facilities.

The Maryland and California pilot studies of various remote OBD technologies are primarily for voluntary participation by fleet operators.

California's Continuous Testing Pilot (CTP) was established by their Bureau of Automotive Repair (BAR) to assess remote wireless OBD II inspection technology as a voluntary option to physical inspection. The remote OBD II program may replace the current requirements for tailpipe emissions testing if the OBD II systems operate as intended. The pilot program's data will prove helpful in assessing public acceptance, program effectiveness, and permanence of a remote wireless OBD II program. This pilot program is open to any current providers of wireless OBD II telematics that meet the requirements of the CTP specification. (California Air Resources Board [CARB], 2005a) The BAR anticipates involvement of as many as 2,000 vehicles in the pilot, which will end on December 31, 2010. Depending on the results of the program, the BAR may extend the program or make it permanent. Companies that currently offer some type of remote OBD inspection system include Networkcar, Mark IV IVHS, Inc., BanaLogic Corporation, SysTech International, Environmental System Products Holdings, Inc., and Applus+ Technologies, Inc.

The Maryland program conducted by MACTEC will begin with a "drive-by" transponder that can secure the emissions status of the vehicle whenever it passes by any one of a network of dedicated radio frequency receivers. The initial phase will involve about 125 high mileage vehicles with resulting continuous inspection data transferred directly to a VID utilizing a web-based interface for custom reporting and queries.

Based upon meeting comments made by the USEPA's OTAQ Chief of Staff, Gene Tierney, USEPA may offer states the option to request extra I/M program credit for program design elements like remote OBD II inspection that allow for continuous monitoring as opposed to the periodic inspection methods represented by annual or biennial programs.

4.2.2.3 Liquid Leak Checks

A liquid leak check for the presence of visible fuel under the car or in the engine compartment was recently added to the California Smog Check Program as a means of identifying very concentrated sources of hydrocarbon (HC) emissions that cannot be detected by other means. Although this is a visual test only and is subjective by nature, the value of the test is significant in that emissions from a single liquid leaker can exceed the rate of emissions from a substantial number of non-liquid leaking vehicles. In a September 2000 report prepared for the California Bureau of Automotive Repair titled "Evaporative Emissions Impact of Smog Check," it was estimated that about 2% of California vehicles with model years from 1974 through 1992 had liquid leaks resulting in HC losses to the atmosphere of about 33 tons per day. (Amlin, 2000) Since this purely visual inspection can be performed quickly, the cost/benefit factor is very favorable when compared to other traditional inspection/repair measures.

4.2.2.4 Gas Cap Tests

The gas cap test is still one of the elements most common to I/M programs across North America. Because most OBD II equipped vehicles have an evaporative monitor for detecting gross leaks including gas cap leaks, the functional cap test would seem redundant. However, based upon a recent report by one emissions equipment manufacturer comparing test data between the OBD EVAP and functional cap test, more than 70 percent of cap failures could be missed by relying on the OBD EVAP monitor alone. (Hickok Incorporated, 2005a)

Potential problems with the functional cap test include enforcement difficulties. There has been concern on the part of auditors in various jurisdictions that cap testing is frequently circumvented in decentralized programs by substituting a cap known to be in compliance for the cap on the vehicle being inspected. At least one manufacturer of fuel cap testing equipment offers a little-known feature that would aid in trigger reports to identify such fraud automatically. The Waekon division of Hickok Incorporated fuel cap tester stores relative leak rate data for about 1,000 of the most recent test records. The Environmental System Products Holdings, Inc. cap tester in New Jersey CIFs may also be capable of delivering relative leak rate history for failed caps. These features may permit auditing of data to distinguish between results that do not vary due to fraudulent repetitive testing of a fuel cap calibrator as opposed to the variability that should be associated with actual vehicle caps. Whether the cap test is retained in the future for the entire fleet or just the pre-OBD portion, such features may be requested in future software and data-record specifications.

4.2.2.5 Low-Pressure Evaporative Emission System Inspections

Evaporative emission control system inspections were based on early USEPA guidance that coupled the EVAP pressure test with the ill-fated purge test. The purge test was intended to measure the charcoal canister's ability to vent its captured fuel contents before the charcoal became saturated and ineffective. Because no acceptable method for inspecting purge systems ever emerged, the USEPA allowed most of the States that originally committed to the purge and pressure test to drop it from their State Implementation Plans (SIPs) without adverse consequence.

However, with significant advances in EVAP pressure test technology and improved cost effectiveness values based on the most recent California data, the EVAP pressure test appears to be one of the most cost-effective options that remain for reducing HC emissions from pre-OBD II vehicles. While the California Air Resources Board has suggested that applying this test to the pre-1996 fleet would result in emission reductions of 14 tons per day, the Bureau of Automotive Repair has recently offered justification for reductions of almost twice that magnitude. Based upon evaluations performed by ARB and BAR, the cost effectiveness of the low-pressure evaporative test is estimated at $6,688 per ton of HC reduced. (CARB, 2005b)

4.2.2.6 Remote Sensing Devices

Remote sensing devices (RSDs) are currently being used in some jurisdictions for clean screening as well as high emitter detection. Remote sensing of in-use vehicle exhaust plumes involves directing a beam of light through exhaust gases to determine the concentration of pollutants that are present. Separate video capture technologies that translate and record license plate numbers are frequently a part of the remote sensing package.

Improvements to the sensor systems and protocols used in RSD measurement have resulted in greater accuracy and lower costs over recent years. Costs per usable record of $25 to $50 that had previously made remote sensing unattractive have been reduced to less than $2 per test in some instances according to Environmental Systems Products Holdings, Inc., the dominant contractor in this field.

Missouri has been conducting a clean screening program with RSD. It allows motorists that elect to participate and pay a fee similar to the physical inspection cost to avoid physical inspection requirements as long as their vehicle passes the RSD clean screening criteria.

Northern Virginia has included RSD clean screening and high emitter detection in their SIP and inspection program. Texas, Arizona and Colorado have performed pilot evaluations for the purpose of including some form of RSD in their vehicle inspection programs.

4.2.2.7 Functional Component Checks

Functional component checks may be used for most engine and fuel systems in pre-OBD II vehicles when tailpipe testing is not advisable or available. In addition to the gas cap test, evaporative pressure test and liquid leak check discussed earlier, catalyst efficiency, exhaust gas recirculation (EGR) valve, O_2 sensor, and visible smoke are all functional checks that combine instant fault diagnosis with the inspection result. In the case of the EGR valve check, for instance, at least one company has prototype inspection grade equipment that in pilot studies showed NO_x reductions equivalent to ASM tailpipe testing. (ERG, 2001) Although there is no current precedent in other state programs, if New Jersey were to eventually discontinue tailpipe testing in favor of OBD II inspection only, the right combination of functional inspection elements could prevent loss of significant emission reductions from the higher emitting older fleet.

4.2.2.8 Extended Emission Component Warranties

Extended warranties and super warranties brought about by the more aggressive provisions of LEV II represent one of the latest emission control strategies. For those states that have adopted the ZEV mandate portion of the LEV II regulations, the so-called “super warranty” of 15 years or 150,000 miles on emission components and systems is already a reality. While there is benefit in ensuring that the lowest-emitting vehicles stay that way, there are side effects that need to be addressed. Oregon recently amended their newly adopted LEV II policy to exclude the PZEV (partial zero emission vehicle) super warranty, based on overwhelming pressure from the independent service industry that perceives the PZEV “lifetime factory warranty” to effectively deprive them of business opportunities and deprive motorists of their choice of repair facility. Whatever the fate of super warranties, the potential problem is that vehicles with this warranty may escape an OBD inspection for up to 15 years, with the potential to have accumulated a decade and a half of defects, unless OBD II inspection programs continue to monitor this class of vehicles.

4.2.2.9 Keyless Ignition Systems

Keyless ignition systems featured on certain high-end vehicles have added an unexpected complication to the very simple MIL function check made at the start of an OBD inspection. Manufacturers of keyless ignition vehicles typically offer a vehicle-specific MIL bulb check procedure to be followed as part of the standard OBD II inspection. Adjusting standard inspection procedures to accommodate these checks for keyless vehicles may involve additional training to familiarize inspectors with manufacturer-specific procedures to turn the ignition on and off with a key. It may also be desirable to change analyzer prompts to display “ignition” on and off rather than the word “key”.

4.2.2.10 Inspection Security Enhancements

Inspection security enhancements are offered by several emission equipment manufacturers to help simplify and automate fraud detection and preserve inspection data integrity from both intentional and accidental corruption. Features such as visual inspector ID, video surveillance, radio frequency identification (RFID) tags for remote VIN entry, automated trigger reports and VIN-derived model characteristics can all contribute to better economy and effectiveness of audit programs. The availability of commercial off-the-shelf software, such as the CARS product developed by BanaLogic Corporation for compliance reporting and fraud detection, may result in cost savings compared to custom software. To maximize cost-effectiveness, such measures should be specified in any request for proposal for comprehensive program change.

4.2.3 Repair Technologies

Emerging technologies specific to vehicle repairs and their effect on I/M programs are discussed in the following paragraphs. These technologies are wireless interfaces for repair and diagnostics, OBD drive-cycle dynamometers, just-in-time training, intelligent vehicle demonstration systems and advanced leak detection (visible smoke).

4.2.3.1 Wireless Interfaces for Repair and Diagnostics

Wireless interfaces are being used for repair and diagnostic applications, both as part of vehicle systems and for remote communications with vehicle systems. For example, the powertrain control module can deliver OBD II status upon remote request. Such remote communications can be accomplished by standard radio frequency ground-based stations like the "E-ZPass" toll system or by satellite such as GM's OnStar system. GM's OnStar system has evolved from being an option on Cadillacs to standard equipment on nearly all GM vehicles. OnStar integrates cell phone service, roadside assistance, emergency service, and simple remote diagnostics based on diagnostic trouble codes (DTCs). In addition to increased availability on GM models, other car manufacturers, including Toyota, Volkswagen and BMW, are working on similar telematics systems and are rolling out models with integrated early-generation remote diagnostics technology as well.

NEXIQ Technologies Inc., ATX Technologies Inc., Toyota, Vetronix Inc., Jentro AG, BMW, Volkswagen, IBW, and Dearborn Group either already have or are actively developing what are known as remote diagnostics and maintenance (RD&M*)* applications.

RD&M is one of most fascinating evolutions in technology and has the greatest potential to revolutionize the way vehicles are inspected and repaired. Advances in wireless communications, model-based diagnostics, human-machine interfaces, electronics and embedded system technologies have created the foundation for a dramatic shift in the way vehicle problems are diagnosed and repaired. These advances enable remote computers to obtain in-vehicle sensor and diagnostic information, which then allows vehicle diagnosis and maintenance to be performed remotely while the vehicle is being driven. In addition, vehicle parameters can be monitored while the vehicle is being driven to determine when maintenance is necessary. These enhanced in-use monitoring capabilities include everything from emissions defects to tire pressure, and with OnStar type satellite telematics, they can be accessed continuously whenever the vehicle is in use. One aspect of this emerging technology involves issuing remote instructions to the vehicles' powertrain control module to temporarily circumvent a crippled engine system, thereby allowing the vehicle to be driven to a service facility.

To make RD&M a viable alternative to periodic inspections, however, linkages between industry and government must be built that facilitate the use of factory data and provide an auditable trail of defect identification, repair and repair verification.

When RD&M is implemented, the capture of real time data concerning vehicle defects will be extremely beneficial to the repair community, providing for timelier repair of vehicles with resulting benefits to the inspection repair cycle.

4.2.3.2 OBD Drive-Cycle Dynamometers

OBD drive-cycle dynamometers have only recently been introduced to the repair industry as a means of more thorough OBD II fault diagnosis and repair verification by professional repair technicians. One of the most difficult challenges many repair shops face with OBD is the elaborate conditions necessary to allow certain OBD monitors to become enabled in order to ensure that a particular repair has been fully effective. One of the biggest problems for an OBD inspection program occurs when a vehicle's MIL becomes illuminated after post inspection repairs have been completed. If a shop does not have convenient access to open highways where cruise speeds can be maintained, some monitors may be difficult or impossible to reset.

Conversion of an existing inspection dynamometer for drive-cycle use may be possible for as little as $3,000, according to Mustang Dynamometer. This conversion would allow any of the different make and model specific drive cycles to be performed easily and without regard to traffic or atmospheric conditions. Complete new equipment packages are available for about $14,000, delivered and installed. Mustang Dynamometer, one of the RFI respondents, provided further information on the use of dynamometers for OBD diagnostics. (Mustang Dynamometer, 2005b)

4.2.3.3 Just-In-Time Training

Just-in-time training and wireless platform-based shop management systems are now available. An integrated service writing application, diagnostic charts, repair manuals, electronic parts catalogues, on-line technical support hotline service, customer service and maintenance history, parts ordering and inventory system, wiring diagrams, integrated OBD II scan tool and repair verification procedures (service bay quality control or SBQC) are some of the applications available. A wireless handheld device is used that permits even entry level technicians to access the latest and most pertinent information on the repair process, wirelessly, from the driver's seat or under the hood.

The availability of such tools has the potential to improve the rate of effective repairs for any I/M program.

4.2.3.4 Intelligent Vehicle Demonstration Systems

Intelligent vehicle demonstration systems, such as Delphi's AutoIQ, are designed to help service technicians demystify the maintenance and repair process for car owners. These interactive systems can be tailored to the specific vehicle year, make and model to provide vehicle owners an opportunity to better understand the repair process.

Whether these demonstrations are featured at dealerships or private repair locations, they are expected to promote willingness on the part of vehicle owners to authorize repairs and maintenance that may otherwise seem unnecessary.

4.2.3.5 Advanced Leak Detection (Visible Smoke)

Advanced leak detection technology has gained popularity among many of the shops involved with emissions repair for its unparalleled ability to identify leak sources that are otherwise invisible and largely undetectable. This technology utilizes a special form of "visible vapor" developed by domestic automakers. The automakers were able to narrow several different technologies down to one approved version in recent years. The approved technology has been proven to be safe for application to the wide variety of automotive systems in existence. The

"EVAP approved" version of visible vapor, otherwise known as diagnostic smoke, provides the service technician with the means to locate and mark even the smallest leaks by using both visible vapor and a special fluorescing dye that is visible under a strong UV light source even days after the diagnosis was performed. This technology is often referred to as "smoke machines" but is limited to a specific and proprietary technology licensed to about five major producers of diagnostic tools for OEMs and the aftermarket.

4.3 RESULTS OF REQUEST FOR INFORMATION

As part of the collection and assessment of information on technologies, hardware, software and test equipment under research and development for potential application to and use in I/M programs, we developed a request for information (RFI) from the inspection industry and vendors. In August 2005, we posted the RFI on the State and AAMVA websites and emailed it to prospective vendors, suppliers, and contractors of I/M products and services.

The RFI was intended to solicit general information from all interested companies and individuals to include the following:

- Current or soon to be proven emission and inspection technologies
- Inspection data management systems
- Remote sensing
- Training programs
- Repair/maintenance programs
- Security and anti-fraud programs
- Program costs and benefits
- Air quality considerations

Specific information on emerging OBD II technologies involving wireless and GPS-based systems, discussed earlier in this Section, was of particular interest and was specifically requested. Responses to the RFI were received and presentations and/or equipment demonstrations were provided during the period from September 2005 through January 2006. The following companies responded to the RFI with written materials, presentations and/or equipment demonstrations:

- MARK IV IVHS Inc., Flemington, New Jersey
- Environmental Systems Products Holdings, Inc., East Granby, Connecticut
- Applus+ Technologies, Inc., Chicago, Illinois
- Waekon division of Hickok Incorporated, Cleveland, Ohio
- BanaLogic Corporation, Markham, Ontario, Canada
- SysTech International, Murray, Utah
- Parsons Inspection & Maintenance Corporation, Lawrenceville, New Jersey
- Gordon-Darby, Inc., Louisville, Kentucky
- SGS Testcom, Inc., Albany, New York
- Networkcar, San Diego, California

A brief summary of the presentations and demonstrations for each respondent is provided in the following paragraphs.

4.3.1 MARK IV IVHS Inc. (MARK IV)

MARK IV presented and demonstrated their OBD II transponder system in September 2005. They proposed a demonstration study using their in-vehicle transponder and roadside antenna to receive OBD II data stream transmissions. The data would be transmitted to a backend computer that stored the OBD II data sets for study and analysis. A demonstration of the equipment and technology was performed at the DEP offices on Scotch Road and a demonstration system was installed at DEP for further testing by DEP. MARK IV proposed a pilot program to be set up and run in the Bakers Basin centralized inspection facility to correlate with actual OBD II test results in the central lanes.

4.3.2 Environmental Systems Products Holdings, Inc. (ESP)

ESP provided a company profile and information on their services, equipment and lines of business. ESP designs and manages centralized and decentralized I/M programs. They have developed and patented remote sensing technology, operated safety programs, and developed software and data management systems for I/M programs. ESP is also working on development of kiosks, wireless OBD, heavy duty and light duty diesel emissions testing, and diesel OBD.

4.3.3 Applus+ Technologies, Inc. (Applus)

Applus provided information in September and made a presentation to DEP and MVC in Trenton in mid November. Applus provides a variety of I/M services and technologies including decentralized program management, centralized program management, safety testing, used automobile certification, and fleet optimization. In addition they provide inspector training, public education, repair diagnostics, waiver and referee assistance, and covert and overt auditing. Applus demonstrated emerging OBD technologies including its ECOSystem line of standalone OBD kiosks. The kiosk is designed to work in a manner similar to a bank automated teller machine (ATM). It can be used either in a test lane environment or by customers in a drive through manner. The system has an embedded computer system and a locking cabinet.

4.3.4 Waekon division of Hickok Incorporated (Waekon)

Waekon manufactures and supplies among other things OBD II test platforms and standalone OBD equipment. The company presented their "E-Test" platform to MVC and DEP in October. They also manufacture and distribute scan tools to access on-board electronic systems. While this platform was originally developed in cooperation with Delphi specifically for the Pennsylvania inspection program, it already incorporates standard features that would most likely be required in New Jersey, such as a printer, barcode scanner, etc., and could be adapted to meet future NJ MVIS specifications by means of software modification alone.

4.3.5 BanaLogic Corporation (BanaLogic)

BanaLogic has created several software packages to monitor and detect inspection fraud through statistical methods and by analyzing data on a real time basis. CARS (Compliance Analysis Reporting System) is an off-the-shelf software package that supports data mining, quality assurance and auditing of inspection stations and inspectors. It is unique and different from the standard trigger software programs. CARS can identify the root cause of a data anomaly, allows users to create their own triggers and can use data from a variety of sources. It includes the capability to create an "intelligent auditing" system that generates risk based, focused audits customized by the user. BanaLogic developed a software package that uses artificial intelligence to detect "clean screening" of OBD vehicles. The company has developed an OBD II test system that supports all protocols and CAN. The design features are flexible to allow the unit to be packaged as a standalone, kiosk or "black box" interface.

4.3.6 SysTech International (SysTech)

SysTech is a privately-held systems technology company that is exclusive to the I/M business. SysTech is working or has worked in ten other state I/M programs. Their core products and services include development and support of an emissions database management system (EDBMS) as well as a variety of remote OBD II applications. Their database is an Oracle-based system with a variety of hardware support. It is accessible via a WAN over the internet. Software applications and services include standalone audit applications, report suites, video monitoring, data analysis and custom reports. The CDAS (Connecticut Decentralized Analyzer System) web service supports database transactions between the central database and the inspection stations and provides secure, accurate transfer of data via the internet.

4.3.7 Parsons Inspection & Maintenance Corporation (Parsons)

Parsons is the current contractor for centralized program management in New Jersey and provides I/M services in six other States. In addition to managing decentralized and centralized I/M programs, the company has developed an audit management system (AMS). It is a risk-based audit system that plans and deploys audit resources, schedules audits, manages the results and monitors the process. As a subcontractor to Parsons, MCI manages and processes all vehicle data and prepares required reports. MCI developed a web portal and reporting system that can be customized to provide a dashboard of program metrics, reporting tools, and customized applications. Parsons developed a wireless OBD II tablet and standalone four-gas OBD II analyzer. The standalone unit has a visual scan recognition system and features such as immediate access to regulations and inspection procedures. Parsons presented their OBD II and data management solutions to the State in December 2005.

4.3.8 Gordon-Darby, Inc. (Gordon-Darby)

Gordon-Darby, headquartered in Louisville, KY, provides both technology and management solutions to the I/M industry. The company currently manages and operates several I/M programs that use innovative and unique technologies. The company has developed a self service, voice command kiosk and a cost-effective, rugged OBD II solution for New Hampshire's decentralized OBD II test program. The company has developed and implemented several vehicle information databases for use in supporting the data management and reporting requirements for programs it has supported. Gordon-Darby presented the New Hampshire OBD II hardware and software system and prototype kiosk to the State in December 2005.

4.3.9 SGS Testcom, Inc. (Testcom)

Testcom provided a presentation and demonstration of their vehicle inspection database and reporting system to the State in November 2005 in Trenton. Testcom's core competencies include developing and implementing information management systems for I/M, program management of decentralized and centralized I/M programs, and system integration. The November presentation focused on program management, equipment and operations of the New York vehicle inspection program in both upstate and downstate areas. The upstate program is an OBD II only test network of over 10,000 decentralized stations. Testcom provides equipment to the stations and amortizes the cost through the inspection fees collected. Testcom is responsible for all maintenance and service on the OBD and computer system. The base unit system consists of a computer, printer, OBD scan tool, bar code scan tool, and cart. Testcom provides the data collection and communication services. Computer-based training of licensed inspectors is a requirement of the program. System maintenance is provided at no cost to the inspection station and help desk services are provided to the shops.

4.3.10 Networkcar

Networkcar, a designer and supplier of GPS-based monitoring and fleet management systems, provided a presentation to the State in January 2006 on the use of their multifeature GPS transponder system that communicates via a standard cellular network. (Networkcar, 2006) One of the many features of their product is its ability to report the emission status of an OBD II vehicle in real time and provide alerts to motorists, fleet operators and public agencies at the very instant an OBD II fault is recorded.

Their presentation emphasized the commercial availability of their product and details of their participation in the California Continuous Testing Pilot and a high emitter detection program for 1,000 California vehicles funded by a Carl Moyer grant. The cost effectiveness resulting from early detection of OBD II failures on high-mileage vehicles was estimated at about $1,500 per ton of NO_x reduced, including the cost of repairs.

4.3.11 Summary

Along with demonstrations of I/M testing programs used in other States, most of the vendors presented new and innovative approaches to I/M testing. While the vendors provided examples of new and innovative equipment, the equipment had not been proven over the long term in actual use within a functioning I/M program. Some of the equipment presented was in prototype status only, some equipment was undergoing pilot testing on a subset of vehicles and some equipment had been installed in test lanes but had been operated less than a year.

The consensus from the New Jersey staff that attended the RFI presentations/demonstrations was that full commercial availability of the new innovative solutions was still in the future and that this equipment may not be fully demonstrated in time for New Jersey to rely solely on it for their next I/M contract. However, it would be prudent for New Jersey to include flexibility to transition to new technology as it becomes proven in the RFP for the next I/M contract.

SECTION 5.0 – OPTIONS AND ALTERNATIVES

This section describes the analyses performed on a series of options and alternatives available to the State for consideration in their future I/M program. During the research phase of this study, we sought information on alternatives that would affect any and all aspects of a future program (i.e., program design, enforcement, technology advances, data management, etc.). Over 100 options and alternatives were identified, based upon previous reports to the State, recent program changes considered and/or adopted by other states, interviews with stakeholders, information from vendors, and discussions with MVC and DEP staff. Section 5.1 describes how we identified and evaluated these options and alternatives.

As our research process evolved, we identified several major issues that needed to be addressed to help focus our analysis. Any decision made concerning these major issues could reduce or eliminate some options and put greater emphasis on others. For example, if the State decided to continue with a Hybrid program similar to the current program, the CIF-only or PIF-only options could be discarded. Conversely, if the State decided on a PIF-only scenario, CIF and Hybrid options could be dropped. The major issues we presented to the State are:

- Should the I/M program design be CIF-only, PIF-only, or Hybrid (CIF/PIF)? If there is a CIF component to the program design, should the CIFs be contractor operated or State operated? Section 5.2 describes the analyses conducted to help answer these questions.
- Should the safety program be separated from the emissions program? Section 5.3 presents information to help answer this question.
- Should the VID be contracted separate from operations? If so, should the VID be State operated? Section 5.4 discusses options for the VID.
- What other implementation issues need to be considered in transitioning to a new program? Section 5.5 identifies and discusses these implementation issues.

We took care in our report not to provide any opinions or recommendations (as instructed in the RFP); rather, we concentrated on the technical details, emission and cost impacts, and implementation issues associated with each option and alternative.

5.1 IDENTIFICATION AND EVALUATION OF PROGRAM ELEMENTS

This section discusses the process used to identify options and alternatives. Section 5.1.1 describes the modeling analysis to determine emission impacts of the options and alternatives. Section 5.1.2 describes the methodology used to analyze incremental cost impacts of the options and alternatives. Section 5.1.3 summarizes the emission and cost impacts.

The starting point for developing the options/alternatives in this document is a memorandum from Sierra Research to the State in 2003 entitled *Five Year Planning Elements* (Sierra, 2003). The Sierra report identifies options and alternatives the State should consider in any future I/M program. This report contains pros and cons for each alternative but no quantification of emission or cost impacts. Through discussions with MVC and DEP, analysis of other state programs, and meetings with stakeholder, additional options and alternatives were identified.

At first, it was determined that the discussion of options/alternatives would be very brief. However, as the options/alternatives were being developed, we soon realized that more detailed discussions were necessary to thoroughly describe and explain each option/alternative.

The options and alternatives were organized by the following 11 major themes. These themes and the full list of options are shown in Table 5-1. A full description of each option and alternative can be found in Appendix D-1.

For each of these options we gathered information as input to the State for their decision making process. We took care not to provide our opinions or recommendations, rather we concentrated on the technical details, implementation impacts, and stakeholder perceptions and provided this information to the State. For each option, we presented the following data:

- Option Description
- Proof of Demonstration
- Air Quality Impacts
- Cost of Implementation
- Cost Benefit
- Practicality of Technology
- Ease of Implementation
- Stakeholder Impacts and Perceptions
- State Impacts
- Safety Related Issues

Clearly, many of these options and alternatives are interrelated, so for each option we identified other related options.

Provided below is a list of data sources used to develop the analysis of each option/alternative:

- Current New Jersey I/M program costs provided by NJ MVC and NJ DEP
- Current New Jersey I/M statistics provided by NJ MVC and NJ DEP
- Reports and/or analysis of the New Jersey I/M program by NJ MVC and NJ DEP
- Reports and/or analysis of the New Jersey I/M program by contractors
- Feedback generated at stakeholder meetings
- Cost quotations from equipment manufacturers
- Cost quotations from software developers
- Data from RFI responses as well as from technical interviews with emission and safety equipment manufacturers
- Reports from the California Air Resources Board
- Reports and presentations from the California I/M Review Committee
- Reports from USEPA Office of Air and Radiation
- Meetings/teleconferences with other states

Emission reductions for options and alternatives that would affect emission rates were calculated using the MOBILE6.2 mobile source emission model. Cost data were obtained from a variety of sources and applied to alternatives as appropriate.

TABLE 5-1: LIST OF OPTIONS AND ALTERNATIVES

Theme Number	Option Number	Description of Option/Alternative
I Program Management/Operations		
I	1	*Rebid of CIF Contract* - Rebid current contract for CIF and VID operations. Thorough procurement process prior to end of current CIF contract.
I	2	*State Operation of CIF Lanes* - The State would take over the operation of the CIF lanes.
I	3	*Contractor Overview of PIFs* - Change oversight for PIFs from State to contractor.
I	4	*VID Operation* - VID would be separated from the overall program management contract.
I	5	*Sole Source Provider for PIF Equipment* - State would select a single vendor of emissions measurement equipment through a competitive procurement process.
I	6	*Universal Inspection Software* - Require all the equipment vendors to install so-called universal software.
II Program Oversight		
II	1	*Enhanced Program Evaluation* - Option would involve developing and implementing a semi-automatic process for ongoing program evaluation.
II	2	*Program Audit* - Audit of program to determine strengths and weaknesses, and areas of possible or needed improvement.
II	3	*CIF Equipment Audit* - If transition to a new contractor or state-run program, conduct a comprehensive audit of CIF test system performance.
II	4	*PIF Equipment Audit* - Comprehensive audit of all PIF test systems performance would be performed to document the current status of each test system and to aid the State in getting the vendors to address any identified deficiencies.
III Vehicle Coverage		
III	1	*Increased Model Year Exemptions* – Increase existing new car model year exemptions from 4 years to 5 or 6 years.
III	2	*Low Emissions Weighting/Exemption* – Use database analysis from VID and Clean Screening to identify and exempt expected clean vehicles from inspection.
III	3	*Motorcycle Inspections* – Subject motorcycles to emissions testing in addition to safety inspections.
III	4	*Four Wheel Drive Vehicle Inspections* – Expand number of 4WD dynamometers to one per CIF.
III	5	*Problem Vehicle List* – Develop/improve system to list problem vehicles for use by DEP and MVC.
III	6	*Light-Duty Diesel Vehicle Inspections* – 1997 and later LDDVs required to be OBD II-compliant.
IV Vehicle Compliance		
IV	1	*Registration Denial Program* – Switch from sticker enforcement system to registration denial.

TABLE 5-1: LIST OF OPTIONS AND ALTERNATIVES (Continued)

Theme Number	Option Number	Description of Option/Alternative
IV Vehicle Compliance (Continued)		
IV	2	*Address Disappearing Vehicles* – Attempt to identify underlying reasons, and develop suggested methods for addressing disappearing vehicles.
IV	3	*Increase Sticker Enforcement Efforts* – Increase sticker enforcement program through added inspections.
IV	4	*Increase Non-Compliance Penalties* – Use in addition to or in lieu of other enforcement-related efforts.
IV	5	*Increase Inspection Compliance* – Improve compliance
V Network Design		
V	1	*Full Test-Only Network* – Convert existing hybrid network to full test-only network.
V	2	*Full Test-and-Repair Network* – Existing CIFs would be closed and all testing would occur at licensed PIFs.
V	3	*Limited PIF-Only Network* – Convert hybrid system to system that has limited number of higher volume PIFs licensed to conduct inspections and also performs repairs.
V	4	*Test-Only PIFs* – Individual PIFs licensed as test-only facilities if they choose to only perform vehicle testing and no repairs.
V	5	*CIF-Only Reinspections* – All reinspections must occur at the CIFs.
V	6	*Gross Polluter Standards/Testing Requirements* – Gross polluters could be required to obtain retests at the CIFs.
V	7	*High Emissions Weighting* – Vehicles identified could be required to obtain both initial and after-repair tests at Test-Only facilities.
V	8	*OBD-Only Stations/Lanes* – Begin to license OBD-only PIFs, but all CIF lanes would be required to retain tailpipe test capability.
V	9	*Remote Self-Service-OBD II Inspections* – Allow motorists to conduct their own OBD II inspections at test kiosks.
V	10	*OBD III Motorist Choice Option* – Motorists given option of having vehicle equipped with a transponder connected to the OBD II system in their vehicle and monitored remotely.
V	11	*Remote Sensing Clean Screening* – Identify vehicles that do not need to come in for their regularly scheduled periodic inspection.
V	12	*Remote Sensing High Emitter Detection* – Use RSD units to identify dirty vehicles.
V	13	*Equalize Inspection Fees* – Inspection fees would be discounted or eliminated at the PIFs by having the State reimburse the PIFs for any such fees.
V	14	*Impose CIF Inspection Fees* – Inspection fees equal to current average PIF fees would be imposed at the CIFs.
V	15	*Retest-Only Inspection Fees* – Inspection fees would only be charged for retests at PIFs.
V	16	*PIF-Only Reinspections* – All reinspections must be done at PIF/ERF.
V	17	*Evaluate and Optimize Present CIF Appointment System* – Look at improvements in leveling CIF load and motorist convenience to determine value of continuing or improving system.

TABLE 5-1: LIST OF OPTIONS AND ALTERNATIVES (Continued)

Theme Number	Option Number	Description of Option/Alternative
V Network Design (Continued)		
V	18	*Enhanced Roadside Inspection Program* – Would complement fleet exemptions and provide credit for off-cycle inspection
VI Station Performance		
VI	1	*Automatic Inspection Trigger Analysis* – Implement automatic trigger analysis of inspection results that is designed to prevent and/or detect improper testing.
VI	2	*Video Surveillance of Test Stations* – Video surveillance systems would be installed on either a network-wide basis or at selected inspection stations that were previously identified as problem performers.
VI	3	*Streamlined Enforcement Procedures* – Streamlined enforcement procedures would be implemented that would allow problem stations to be shut down relatively swiftly.
VI	4	*Reevaluate Enforcement Penalties Against Inspectors and Stations* – Regulations to make documented instances of clean piping or clean screening a monetary penalty.
VI	5	*Enhanced Equipment Audit Enforcement* – Implement enhanced enforcement procedures aimed at addressing test system problems found during CIF and PIF equipment audits.
VI	6	*Equipment Triggers* – Implement an automated equipment-related triggers analysis system either on the VID or a separate data warehouse that would be designed to identify problem test systems.
VII Inspection Equipment and Procedures		
VII	1	*OBD II CAN Communications Functionality* – Add OBD II CAN testing functionality. OBD II CAN communications protocol is incorporated for generic I/M communications on some model year 2003 vehicles, with all 2008 and later models required to use CAN for OBD-I/M communications.
VII	2	*OBD II Light-Duty Diesel Inspections* – OBD II testing would be initiated on 1997 and later LDDVs and LDDTs.
VII	3	*OBD II Heavy-Duty Gasoline Vehicle Inspections* – OBD II testing would be initiated on 1996 HDGVs.
VII	4	*OBD II Plus Tailpipe Inspections* – Would also subject OBD II vehicles to ASM5015 tailpipe test.
VII	5	*Transient Loaded Mode Tailpipe Testing* – Current ASM5015 procedure would be upgraded to a transient tailpipe test procedure (IM240).
VII	6	*Back-up Tailpipe Inspections for Special Cases with OBD II Vehicles* – Would also subject OBD II vehicles to ASM5015 tailpipe test for special cases (e.g., retests of previous failures with CAT DTCs, if CAT monitor is not ready).
VII	7	*Tailpipe Test Procedure Changes* – Current ASM5015 procedure would be downgraded to an idle test.
VII	8	*Final or New EPA ASM Standards* – Implement final EPA ASM5015 standards.

TABLE 5-1: LIST OF OPTIONS AND ALTERNATIVES (Continued)

Theme Number	Option Number	Description of Option/Alternative
VII Inspection Equipment and Procedures (Continued)		
VII	9	*ASM Drive Cycle Change* – Existing ASM5015 drive cycle would be modified.
VII	10	*Annual Inspections of Failing Vehicles* – Implement annual inspections of previously failing vehicles.
VII	11	*Annual Inspection of Older Vehicles* – Implement annual inspections of older vehicles.
VII	12	*Off-Cycle Inspections* – Suspected dirty vehicles would be identified and required to report for off-cycle testing and repair.
VII	13	*Liquid Leak Check* – Require liquid leak check to be conducted on vehicles undergoing I/M testing.
VII	14	*Enhanced Evaporative Emission Inspection for Older Vehicles* – During one biennial inspection cycle for older vehicles, current inspection procedures would either be added to or replaced with a comprehensive evaporative emissions inspection.
VII	15	*Inspection and Repair of Aging OBD II Vehicles* – Include the OBD II Model Year Retest field in SYSTEM.DAT OBD II specifications.
VII	16	*Annual Inspections for High Mileage Vehicles* – High mileage vehicles defined as greater than 20,000 miles/year.
VII	17	*Evaluate Smoke Test with OBD Vehicles* – Use a functional opacity test to determine the extent of visible smoke in OBD vehicles that have not commanded a MIL on.
VII	18	*Audit Fleet Self Certification Program Effectiveness* – Evaluate certification for commercial and government fleets.
VII	19	*Evaluate Gas Cap Testing on OBD Vehicles* – Drop gas cap check requirement on OBD II vehicles.
VII	20	*Evaluate Pre-OBD Fleet Emission Consequence* – Evaluate pre-OBD fleet emissions consequence relative to what is known of 1998 and newer fleet performance.
VII	21	*Examine Combination of Functional Tests* – Examine combination of functional tests that may replace tailpipe testing and provide OBD surrogate for older vehicles.
VIII Equipment Upgrades		
VIII	1	*PIF Equipment Upgrade* – Purchase new test systems beginning in early 2006.
VIII	2	*CIF Equipment Upgrade* – Equipment to be completely replaced as part of rebid or in event of further extension of current contract.
VIII	3	*Automated VRT Updates* – New model years must be added to VRT on a continual basis, which requires an updated table to be distributed to all CIF and PIF test systems.
VIII	4	*Replacing PIF NOx Cells with Analyzer Benches* – Change required due to response time of NOx electrochemical cells being too slow for transient testing.

TABLE 5-1: LIST OF OPTIONS AND ALTERNATIVES (Continued)

Theme Number	Option Number	Description of Option/Alternative
IX Vehicle Repair/Motorist Assistance		
IX	1	*Station Report Cards* – Prepare monthly "report cards" of station performance and provide this information to owners.
IX	2	*Enhanced Enforcement of ERF Requirements* – Increase enforcement of the ERF requirements.
IX	3	*ERF-Only Repairs* – Existing repair requirements would be expanded to require all emissions repairs be performed by ERFs.
IX	4	*Evaluate Repair Costs (Waiver Limits)* – Should $450 limit be changed and include cost of living adjustment.
IX	5	*No Waivers for OBD II Vehicles* – Eliminate waivers currently allowed for OBD II vehicles.
IX	6	*Repair Assistance Program* – Implement a repair assistance program versus allowing worse emitters to receive waiver and continue operation.
IX	7	*Vehicle Scrappage Program* – Implementation either separately or in combination with repair assistance program.
IX	8	*Oxygen Sensor and/or Catalyst Replacement Program* – Implementation of voluntary replacement program.
IX	9	*More Stringent Repair Cutpoints* – More stringent repair cutpoints would be applied to after-repair test.
IX	10	*Track OBD II Repair Costs by DTC* – Develop reliable statistics on repair costs according to the DTCs reported by the vehicle.
IX	11	*Track Retest Pass Rates by DTC* – Determine percent of failed vehicles that pass retest by DTC. This could help define areas where more training is needed.
IX	12	*Enhanced OBD II Diagnosis and Repair Training* – Enhanced training in OBD II diagnosis and repair provided to interested repair technicians.
IX	13	*Streamline ERF Certification for OE Shops* – If service managers have ERF training, and/or web based training is completed.
IX	14	*Revise Training Program* – Revise training program for adequacy and completeness as regards OBD repairs, CAN, etc.
IX	15	*Develop Ongoing Training Program Audit System* – A means of keeping pace with the increasingly rapid evolution of vehicle systems and related diagnostics.
IX	16	*Develop Web-based PIF/ERF Training Program* – Provide web-based training and updates to technicians.
IX	17	*Evaluate Drive-cycle Dyne Conversion* – If loaded-mode testing is obsolesced, provide PIFs option to convert ASM to drive-cycle dyne for OBD.
IX	18	*Convert Obsolete Centralized Facility(ies) to Technical Assistance Center(s)* – As per Wisconsin model.
IX	19	*Develop Incentive Based System for High Performing Shops* – California Gold Shield model.
IX	20	*Evaluate Essential Tool Program* – Evaluate Essential Tool Program and acceptability criteria for diagnostic systems at ERFs.

TABLE 5-1: LIST OF OPTIONS AND ALTERNATIVES (Continued)

Theme Number	Option Number	Description of Option/Alternative
X Safety Inspection		
X	1	*Safety Failure Profiling* – Apply a safety failure profile to determine if certain vehicles can be exempted from specific safety inspection requirements.
X	2	*Change of Ownership (CoO) Inspection* – Required for all CoOs, except exempt new cars.
X	3	*Revision of Safety Inspection Program Requirements* – Procedures need to be reviewed and optimized for cost effectiveness and performance. Change normal maintenance items to advisory only.
X	4	*De-couple OBD Vehicle Emission Inspections from Safety Inspection Cycle* – Program design change to make emissions and safety inspections independent of each other.
X	5	*QA/QC Services to CIF, Fleets, Etc.* – Should become more integral with program design.
XI Data Management/Network Maintenance		
XI	1	*VID/Network Upgrade* – Upgrade to current technology including TCP/IP transfers and industry standard communications protocols.
XI	2	*Separate Safety Record from Emissions* – If OBD inspection and safety inspection cycles are de-coupled, inspection records must be separated.
XI	3	*Access to PIF/ERF Repair Data* – Access to PIF/ERF repair data and maintenance history to promote effective maintenance and use of clean screen triggers.
XI	4	*Improvements to Data Entry and Validation of Records* – More automation in rejecting bad entries to help minimize on-site audits.
XI	5	*Financial Consequence for Bad Data Entry* – CIFs/PIFs only get paid by State for good records in VIID.
XI	6	*Evaluate Potential to Streamline (Scrub) Data Records* – Evaluate potential to streamline data records and remove obsolete data.
XI	7	*Evaluate Use of Barcodes* – Evaluate use of barcodes on vehicle documents for more automated and failsafe entry of vehicle data.
XI	8	*Migrate OIT Vehicle Database from Maintenance to Web-based Transactions* – Once OIT VID assessment document is finalized, this option will be completed.
XI	9	*Evaluate Bifurcation of VIID* – Evaluate Bifurcation of VIID between MVC and DEP for State managed VIID option.

5.1.1 Changes in Emissions

MACTEC used the latest version of USEPA's mobile source emissions model, MOBILE6.2, to estimate the impact of the current I/M programs as well as different I/M options. Emissions were estimated for 2010. MOBILE6.2 estimates emission rates for each pollutant in terms of grams per mile, i.e., grams emitted per vehicle mile traveled (VMT). Emission factors are calculated for different vehicle types; then they are multiplied by appropriate weighting factors to develop a composite emission factor for each VMT in an area. Corrected for actual ambient temperatures and vehicle driving characteristics (e.g., average speed), these emission factors take into consideration the following:

- Vehicle emission control technology (i.e., the emission standards that the vehicles were designed to comply with)
- Owner maintenance and tampering habits (including the impact of motor vehicle inspection/maintenance, I/M, programs)
- Altitude
- Fuel oxygenate content
- Fuel volatility
- Distribution of model years operating on the highway

Initially, the MOBILE6.2 emissions model was used to estimate emissions reductions associated with the current Hybrid program in New Jersey. Several assumptions had to be made to allow completion of the MOBILE6.2 modeling. Table 5-2 contains a list of these assumptions. One of the most important assumptions is that OBD II inspections at PIFs are 96% as effective as those at CIFs. This was based upon a trigger analysis that estimated variation/fraud rates with PIFs. The advent of OBD greatly reduces the potential for fraud and the model inputs reflect this increased effectiveness. A copy of this trigger analysis can be found in Appendix D-2.

Using the assumptions in Table 5-2, emission reduction impacts were estimated with multiple MOBILE6.2 runs using assumptions associated with each option. Table 5-3 contains a summary of the MOBILE6.2 results for each of the options where the emission reductions could be quantified. For several options, it was not possible to quantify the change in emissions resulting from the option. In those cases, a qualitative assessment of the emission impact was made and is contained in the description of the option in Appendix D. MACTEC Team members met in New Jersey on December 8, 2005, to discuss the assumptions and the model outputs. Concurrence was obtained from NJDEP staff that the assumptions and the approach appeared reasonable.

TABLE 5-2: ASSUMPTIONS FOR MOBILE6 MODELING PARAMETERS

Parameter	Value	Reference
Key MOBILE6 Assumptions		
Compliance Rate	98%	NJDEP
Waiver Rate	Pre-1981 models = 0% 1981+ models = 3%	NJDEP
Registration Distribution	Matrix-- heavy weight on New Vehicles	NJDEP
VMT Distribution	Matrix- heavy weight on higher speeds	NJDEP
Ambient Temp	61 - 88 degrees Fahrenheit	NJDEP
Fuel	9.0 psi RVP, reformulated gas	NJDEP
I/M Program Parameters	Varies by options	
Daily Vehicle Miles Traveled (VMT) in 2010	213,808,924	NJDEP
Current Hybrid Program Performance		
OBD PIF Effectiveness relative to CIF	96%	dKC analysis of CIF/PIF data (see Appendix D-2 of this report)
Overall OBD Effectiveness	99%	Calculated based on PIF effectiveness and % PIF
Tailpipe/Gas Cap PIF Effectiveness	80%	DEP assumption in SIP
Overall Tailpipe/Gas Cap Effectiveness	96%	Calculated based on PIF effectiveness and % PIF
PIF Effectiveness	100%	dKC projection based on demonstrated performance of CT's limited decentralized network
Test Volumes - PIF Tests	724,000	22.11% of total tests
Test Volumes - CIF Tests	2,550,000	77.89% of total tests
Test Volumes – Total	3,274,000	

TABLE 5-2: ASSUMPTIONS FOR MOBILE6 MODELING PARAMETERS (continued)

Parameter	Value	Reference
Hybrid with Auto Trigger Analysis		
OBD PIF Effectiveness relative to CIF	99.0%	dKC projection based on future OBD II anti-cheating parameters
Overall OBD Effectiveness	99.8%	Calculated based on PIF effectiveness and % PIF
Clean Screen Impact		
% of No Clean Screen Credits	HC 96% CO 97% NOx 97%	MO Rapid Screen Program data
Remote Sensing Impact		
% Excess Emissions Identified by RSD	HC 29% CO 29% NOx 30%	MO Rapid Screen Program data
Diesel OBD II Estimates		
HC Emission Benefit	0.01 g/mi 0.0047 tpd 1.7972 tpy	Texas LDDV OBD II Study
NOx Emission Benefit	0.0069 g/mi 0.0032 tpd 1.178 tpy	
HC + NOx Emission Benefit	0.0169 g/mi 0.0079 tpd 2.8852 tpy	
Annual LDDV VMT	12,000	
Number of LDDVs	12,918	
Liquid Leak Credit		
VOC Impact	4.26 g/mi	CA Evap study
# of Fleet with leaks	1016	NJ Data on Vehicle rejected due to fuel leaks
Annual VMT	12,000	Assumed
Inspection and Repair effectiveness	100%	Assumed
I/M Credit	57.2 tpy	Calculated based on % effectiveness and impact

TABLE 5-2: ASSUMPTIONS FOR MOBILE6 MODELING PARAMETERS (continued)

Parameter	Value	Reference
Emission Reductions from Roadside Inspections		
# Fail	2,000	2005 data from Mobile Inspection Teams
HC Reduction g/mi	1.93	NJ ASM data converted to g/mi
CO Reduction g/mi	27.59	NJ ASM data converted to g/mi
NO_x Reduction g/mi	0.95	NJ ASM data converted to g/mi
Annual Miles per vehicle	12,000	Assumed
Tons/day HC	0.14	Calculated
Tons/day CO	2.00	Calculated
Tons/day NO_x	0.069	Calculated
Tons/yr HC	51.07	Calculated
Tons/yr CO	729.14	Calculated
Tons/yr NO_x	25.06	Calculated
Emission Reductions from RSD Enhanced Roadside Inspections		
# Fail	4,000	Assumes that RSD doubles fail rate for Mobile Inspection Teams
HC Reduction g/mi	1.93	NJ ASM data converted to g/mi
CO Reduction g/mi	27.59	NJ ASM data converted to g/mi
NO_x Reduction g/mi	0.95	NJ ASM data converted to g/mi
Annual Miles per vehicle	12,000	Assumed
Tons/day HC	0.28	Calculated
Tons/day CO	4.00	Calculated
Tons/day NO_x	0.14	Calculated
Tons/yr HC	102.14	Calculated
Tons/yr CO	1458.29	Calculated
Tons/yr NO_x	50.13	Calculated
Emission Reductions from Scrappage		
# Scrapped	2,000	2% of failed vehicles
HC Reduction g/mi	1.93	NJ ASM data converted to g/mi
CO Reduction g/mi	27.59	NJ ASM data converted to g/mi
NO_x Reduction g/mi	0.95	NJ ASM data converted to g/mi
Annual Miles per vehicle	12,000	Assumed
Tons/day HC	0.14	Calculated
Tons/day CO	2.00	Calculated
Tons/day NO_x	0.069	Calculated
Tons/yr HC	51.07	Calculated
Tons/yr CO	729.14	Calculated
Tons/yr NO_x	25.06	Calculated

TABLE 5-3: EMISSIONS IMPACT FOR OPTIONS AND ALTERNATIVES

Option*	Reduction in g/mi			% Reduction in g/mi			Change in g/mi Compared to Current			% Change in g/mi Compared to Current			Change in tons/day Compared to Current			Change in tons/yr Compared to Current		
	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X
Current Hybrid Program	**0.045**	**1.126**	**0.071**	**12.6%**	**16.6%**	**8.1%**	**0.000**	**0.000**	**0.000**	**0.00%**	**0.00%**	**0.00%**	**0.000**	**0.000**	**0.000**	**0**	**0**	**0**
III-1 Current+ 6yr Exempts	0.040	0.993	0.062	11.2%	14.6%	7.1%	0.005	0.132	0.009	1.59%	2.34%	1.12%	1.180	31.166	2.122	**431**	**11376**	**774**
III-2 & V-11 Clean Screen	0.044	1.092	0.069	12.1%	16.1%	7.9%	0.002	0.034	0.002	0.58%	0.60%	0.26%	0.428	7.953	0.502	**156**	**2903**	**183**
III-4 4WD Dynamometer	0.045	1.127	0.071	12.6%	16.6%	8.1%	0.000	-0.001	0.000	0.00%	-0.02%	-0.03%	0.000	-0.262	-0.049	**0**	**-96**	**-18**
IV-1 to IV-5 Improved Enforcement	0.046	1.138	0.072	12.9%	16.8%	8.2%	-0.001	-0.012	-0.001	-0.32%	-0.21%	-0.12%	-0.236	-2.833	-0.236	**-86**	**-1034**	**-86**
V-1 All CIF OBD+ASM/Idle (max for V-5)	0.046	1.140	0.072	12.7%	16.8%	8.2%	-0.001	-0.014	-0.001	-0.19%	-0.25%	-0.09%	-0.139	-3.314	-0.179	**-51**	**-1210**	**-65**
V-2 & V16 100% PIFs (TRC)	0.043	1.056	0.067	11.8%	15.6%	7.7%	0.003	0.070	0.004	0.92%	1.23%	0.48%	0.681	16.422	0.919	**249**	**5994**	**335**
V-3 Limited PIF Network	0.046	1.140	0.072	12.7%	16.8%	8.2%	-0.001	-0.014	-0.001	-0.19%	-0.25%	-0.09%	-0.139	-3.314	-0.179	**-51**	**-1210**	**-65**
V-7 High Emitters Directed to CIFs	0.046	1.136	0.072	12.7%	16.7%	8.2%	0.000	-0.010	-0.001	-0.13%	-0.17%	-0.07%	-0.098	-2.320	-0.125	**-36**	**-847**	**-46**
V-8 OBD-Only PIFs/ OBD + Tailpipe at CIFs	0.046	1.132	0.071	12.7%	16.7%	8.1%	0.000	-0.006	0.000	-0.09%	-0.11%	-0.03%	-0.066	-1.458	-0.054	**-24**	**-532**	**-20**
VI-1 & VI-2 Automatic Inspection Triggers	0.046	1.132	0.071	12.6%	16.7%	8.1%	0.000	-0.006	0.000	-0.07%	-0.10%	-0.05%	-0.055	-1.392	-0.093	**-20**	**-508**	**-34**

* A full description of each option can be found in Appendix D-1. The Roman numeral designation corresponds to the option number in Appendix D-1.
A negative number in the above table indicates more reductions will be obtained compared to the current program (i.e., emissions will decrease).
A positive number in the above table indicates less reductions will be obtained compared to the current program (i.e., emissions will increase).

TABLE 5-3: EMISSIONS IMPACT FOR OPTIONS AND ALTERNATIVES (continued)

Option	Reduction in g/mi			% Reduction in g/mi			Change in g/mi Compared to Current			% Change in g/mi Compared to Current			Change in tons/day Compared to Current			Change in tons/yr Compared to Current		
	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X
Current Hybrid Program	**0.045**	**1.126**	**0.071**	**12.6%**	**16.6%**	**8.1%**	**0.000**	**0.000**	**0.000**	**0.00%**	**0.00%**	**0.00%**	**0.000**	**0.000**	**0.000**	**0**	**0**	**0**
VII-2 Inspect LDDVs with OBD II Systems													-0.0047	0.000	-0.0032	**-2**	**0**	**-1**
VII-3 Perform OBD II inspections on HDGVs	0.045	1.126	0.071	12.6%	16.6%	8.1%	0.000	0.000	0.000	0.00%	0.00%	0.00%	0.000	0.000	0.000	**0**	**0**	**0**
VII-4 Perform ASM & OBD II inspections on 1996+ vehicles	0.045	1.126	0.071	12.6%	16.6%	8.1%	0.000	0.000	0.000	0.00%	0.00%	0.00%	0.000	0.000	0.000	**0**	**0**	**0**
VII-5 Perform Transient Tests instead of ASM tests on 1981-1995 vehicles	0.048	1.178	0.076	13.3%	17.4%	8.6%	-0.003	-0.052	-0.005	-0.87%	-0.93%	-0.57%	-0.649	-12.331	-1.082	**-237**	**-4501**	**-395**
VII-6 Back-up tailpipe tests for certain OBD II vehicles	0.045	1.126	0.071	12.6%	16.6%	8.1%	0.000	0.000	0.000	0.00%	0.00%	0.00%	0.000	0.000	0.000	**0**	**0**	**0**
VII-7a Hybrid OBD+Idle+GC	0.045	1.101	0.066	12.6%	16.2%	7.6%	0.000	0.025	0.005	0.00%	0.44%	0.57%	0.000	5.841	1.082	**0**	**2132**	**395**
VII-7b Hybrid OBD +GC	0.041	0.977	0.065	11.2%	14.4%	7.5%	0.005	0.149	0.006	1.52%	2.63%	0.69%	1.130	35.002	1.308	**413**	**12776**	**477**
VII-7c Hybrid OBD-Only	0.039	0.977	0.065	10.7%	14.4%	7.5%	0.007	0.149	0.006	2.13%	2.63%	0.69%	1.582	35.002	1.308	**578**	**12776**	**477**

* A full description of each option can be found in Appendix D-1. The Roman numeral designation corresponds to the option number in Appendix D-1.
A negative number in the above table indicates more reductions will be obtained compared to the current program (i.e., emissions will decrease).
A positive number in the above table indicates less reductions will be obtained compared to the current program (i.e., emissions will increase).

TABLE 5-3: EMISSIONS IMPACT FOR OPTIONS AND ALTERNATIVES (continued)

Option	Reduction in g/mi			% Reduction in g/mi			Change in g/mi Compared to Current			% Change in g/mi Compared to Current			Change in tons/day Compared to Current			Change in tons/yr Compared to Current		
	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X
Current Hybrid Program	**0.045**	**1.126**	**0.071**	**12.6%**	**16.6%**	**8.1%**	**0.000**	**0.000**	**0.000**	**0.00%**	**0.00%**	**0.00%**	**0.000**	**0.000**	**0.000**	**0**	**0**	**0**
VII-8 Current + Final ASM Std	0.047	1.157	0.075	13.1%	17.1%	8.5%	-0.002	-0.031	-0.004	-0.58%	-0.55%	-0.46%	-0.433	-7.355	-0.865	**-158**	**-2685**	**-316**
Current + Annual	0.050	1.253	0.081	14.0%	18.5%	9.2%	-0.005	-0.127	-0.010	-1.59%	-2.25%	-1.24%	-1.180	-29.986	-2.358	**-431**	**-10945**	**-861**
VII-10 Annual Inspections of Failing Vehicles	0.045	1.134	0.072	12.6%	16.7%	8.2%	0.000	-0.008	-0.001	0.00%	-0.14%	-0.12%	0.000	-1.889	-0.236	**0**	**-689**	**-86**
VII-11 Annual Inspection of Older Vehicles	0.045	1.134	0.072	12.6%	16.7%	8.2%	0.000	-0.008	-0.001	0.00%	-0.14%	-0.12%	0.000	-1.889	-0.236	**0**	**-689**	**-86**
VII-12 Remote Sensing used to identify high emitters	0.047	1.163	0.074	13.0%	17.1%	8.4%	-0.001	-0.037	-0.003	-0.46%	-0.65%	-0.37%	-0.342	-8.696	-0.707	**-125**	**-3174**	**-258**
VII- 13 Liquid Leak Check													-0.157	0.000	0.000	**-57**	**0**	**0**
VII-14 Enhanced Evaporative Emission Inspection for Older Vehicles	0.046	1.126	0.071	12.8%	16.6%	8.1%	-0.001	0.000	0.000	-0.30%	0.00%	0.00%	-0.226	0.000	0.000	**-83**	**0**	**0**
VII-16 Annual Inspections for High Mileage Vehicles													0.000	0.000	0.000	**0**	**0**	**0**

* A full description of each option can be found in Appendix D-1. The Roman numeral designation corresponds to the option number in Appendix D-1.
A negative number in the above table indicates more reductions will be obtained compared to the current program (i.e., emissions will decrease).
A positive number in the above table indicates less reductions will be obtained compared to the current program (i.e., emissions will increase).

TABLE 5-3: EMISSIONS IMPACT FOR OPTIONS AND ALTERNATIVES (continued)

	Reduction in g/mi			% Reduction in g/mi			Change in g/mi Compared to Current			% Change in g/mi Compared to Current			Change in tons/day Compared to Current			Change in tons/yr Compared to Current		
Option	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X	Total HC	CO	NO_X
Current Hybrid Program	**0.045**	**1.126**	**0.071**	**12.6%**	**16.6%**	**8.1%**	**0.000**	**0.000**	**0.000**	**0.00%**	**0.00%**	**0.00%**	**0.000**	**0.000**	**0.000**	**0**	**0**	**0**
IX-4 Evaluate Repair Costs (Waiver Limits)													0.000	0.000	0.000	**0**	**0**	**0**
IX-5 Eliminate waivers allowed for OBD II vehicles.	0.046	1.149	0.073	12.9%	16.9%	8.3%	-0.001	-0.023	-0.002	-0.32%	-0.41%	-0.25%	-0.236	-5.430	-0.472	**-86**	**-1982**	**-172**
IX-6 Repair Assistance Program													0.000	0.000	0.000	**0**	**0**	**0**
IX-7 Vehicle Scrappage Program													-0.13991	-1.9977	-0.069	**-51**	**-729**	**-25**
V-18a Provide credit for off-cycle MIT inspections.													-0.13991	-1.9977	-0.069	**-51**	**-729**	**-25**
V-18b Use Remote Sensing Devices (RSD)													-0.27982	-3.9953	-0.948	**-102**	**-1458**	**-346**
V-10 OBD III Motorist Choice Option -- Max Benefit	0.050	1.245	0.081	14.0%	18.4%	9.2%	-0.005	-0.119	-0.010	-1.6%	-2.1%	-1.2%	-1.180	-28.097	-2.358	**-431**	**-10255**	**-861**
V-19 Drop Gas cap test on OBD II vehicles	0.045	1.126	0.071	12.6%	16.6%	8.1%	0.000	0.000	0.000	0.00%	0.00%	0.00%	0.000	0.000	0.000	**0**	**0**	**0**

* A full description of each option can be found in Appendix D-1. The Roman numeral designation corresponds to the option number in Appendix D-1.
A negative number in the above table indicates more reductions will be obtained compared to the current program (i.e., emissions will decrease).
A positive number in the above table indicates less reductions will be obtained compared to the current program (i.e., emissions will increase).

5.1.2 Cost Estimates

The cost methodology used for each option/alternative involved analyzing three separate costs and combining them to summarize the estimated "Overall Operating Cost". The information used to build the cost was from the data sources described above. In general, the three costs of implementation that we analyzed for each option/alternative are:

1. Costs to the State (includes costs billed by the CIF contractor);
2. Costs to the Motorists; and
3. Costs to the PIFs/ERFs.

These three costs were then summed to form the incremental cost that could be expected if the option/alternative were implemented. Not all the options/alternatives have associated costs in all three categories, and in many cases, there are negative costs associated with one or more of the three cost analyses (e.g., reducing the fleet that is subject to emissions inspections saves the State and motorists money, but may cost the PIFs/ERFs). The sums of the positive and negative costs were incorporated in the incremental cost.

The level of detail associated with each incremental cost varies. In some cases, the costs associated with implementation were well known through experiences with the New Jersey I/M program, or I/M programs of other states. In other cases, the incremental cost was estimated, based on the cost of other similar options with scientific/engineering judgments used to complete the costing. Some of the options did not have cost impacts, or the impacts were unquantifiable. In every case, we listed the assumptions and references that led us to our conclusions.

Table 5-4 contains a list of the parameter values that were used for costing the I/M program options. The information used in costing the options includes a wide range of parameters such as cost quotations obtained for necessary equipment or services related to the option as well as many existing program related parameters obtained from NJ MVC and NJ DEP. Appendix D-3 contains the cost analysis data provided by MVC. Estimates of 2007 fleet data, inspection volumes and costs are included whenever possible to provide projected impacts of implementing the options for the new program.

For several options, it was not possible to quantify the costs associated with the option. In those cases, a qualitative assessment of the cost impact was made and is contained in the description of the option in Appendix D-1.

TABLE 5-4. PARAMETER VALUES USED FOR ESTIMATING OPTION COSTS

Option Number	Parameter Description	Value	Source
I-5	PIF Audit Cost	19,564 PIF audits at a per audit cost of $225.10 = $4,403,856 (in 2004)	NJ MVC 10/04/05
I-5	Audit savings if all PIF equipment is obtained from one provider	20%	Estimate
I-5	NJ ASM w/OBD II (complete BAR97 analyzer including OBD and gas cap test)	$35,500 + tax	ESP quotation 10/31/05
I-5	Refurbished NJ ASM w/OBD II (complete BAR97 analyzer including OBD and gas cap test)	~$20,000	ESP quotation 10/31/05
I-5	Annual service contract for NJ ASM equipment	~$3,200	ESP quotation 10/31/05
I-5	Unit cost for installation of NJ ASM	$500 - $800 (volume discounts may reduce this cost)	ESP quotation 10/31/05
I-5	OBD II stand alone system plus gas cap - unit cost	$4,500 (volume discounts may reduce this cost)	Waekon typical cost
I-5	OBD II stand alone system plus gas cap - unit cost	$6,000 (volume discounts may reduce this cost)	SPX typical cost
I-5	OBD II stand alone system	$2,000 per station with volumes < 1,000 stations	Testcom quote 11/16/05
I-5	Annual warranty for OBD II stand alone system	$350	Testcom quote 11/16/05
II-1	Cost of a representative sample of valid remote sensing records	$75,000 to $150,000	Typical ESP cost range
II-2	Perform a one-time BAR97 compliance test (per equipment manufacturer)	$40,000 to $50,000	Typical charge by Sierra or ERG
II-2	Annual I/M program audit	$70,000	Estimate
III-1	NJ Vehicle population 9/02 - 9/05	Various NJ vehicle population data (9/02 - 9/05)	Spreadsheet provided by NJ MVC "Vehicle Population Sheet 9-02 to 9-05.xls"
III-1	Percentage of inspections completed by CIFs	77% (in 2004; estimated to remain the same in 2007)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
III-1	Percentage of inspections completed by PIFs	23% (in 2004, estimated to remain the same in 2007)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
III-1	CIF per inspection cost to NJ	$27.89 (effective 8/01/05)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
III-1	CIF per inspection cost to NJ	$29.42 (in 2007)	Estimate
III-1	VID per inspection cost to PIFs	$1.47	"Estimated Costs to Operate the Enhanced Vehicle Inspection and Maintenance Program & Transition Plan"

TABLE 5-4. PARAMETER VALUES USED FOR ESTIMATING OPTION COSTS (Continued)

Option Number	Parameter Description	Value	Source
III-2	Annual number of CIF inspections in 2004	1,630,612 initial inspections + 584,945 reinspections = 2,215,557 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
III-2	Annual number of CIF inspections in 2007	1,875,390 initial inspections + 672,753 reinspections = 2,548,143 inspections	Estimate
III-2	Annual number of PIF inspections in 2004	428,186 initial inspections + 235,570 reinspections = 663,756 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
III-2	Annual number of PIF inspections in 2007	476,170 initial inspections + 261,969 reinspections = 738,139 inspections	Estimate
III-2	Clean screening rate assumption	10%	Corresponds with emissions modeling assumption
III-2	Percentage of inspections completed by CIFs	77% (in 2004; estimated to remain the same in 2007)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
III-2	Percentage of inspections completed by PIFs	23% (in 2004, estimated to remain the same in 2007)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
III-2	HEP/LEP software package	$100,000 plus 20% annual maintenance	Based on cost of HEP/LEP software and maintenance in CA
III-2	Per vehicle cost for RSD w/ HEP	$24	Cost paid by motorists for this program in MO
III-2	CIF per inspection cost to NJ	$27.89 (effective 8/01/05)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
III-2	CIF per inspection cost to NJ	$29.42 (in 2007)	Estimate
III-2	PIF per inspection cost to motorists	$69.83 (average cost in 2004)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
III-2	PIF per inspection cost to motorists	$72.73 (average cost in 2007)	Estimate
III-3	Motorcycle per inspection (emissions only) @ CIF	$13.95 (based on half the current CIF inspection cost of $27.89)	Estimate
III-3	Motorcycle per inspection (emissions only) @ PIF	$34.92 (based on half the current PIF inspection cost of $69.83)	Estimate
III-3	Percentage of inspections completed by CIFs	77% (in 2004; estimated to remain the same in 2007)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
III-3	Percentage of inspections completed by PIFs	23% (in 2004, estimated to remain the same in 2007)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
III-4	Number of CIFs and CIF lanes in NJ	31 CIFs with 124 lanes	Data provided by NJ MVC for 11/30/05 stakeholder meeting
III-4	Number of CIFs with 4WD dynamometers in NJ	1	Data provided by NJ MVC
III-4	4WD dynamometer installation	$50,000 each	Mustang Dynamometer quotation 10/07/05

TABLE 5-4. PARAMETER VALUES USED FOR ESTIMATING OPTION COSTS (Continued)

Option Number	Parameter Description	Value	Source
III-4	Annual service contract for NJ ASM equipment	~$3,200	ESP quotation 10/31/05
III-6	Number of diesel vehicle safety inspections	12,918 (in 2004)	NJ MVC 11/01/2005
III-6	Percentage of inspections completed by CIFs	77% (in 2004; estimated to remain the same in 2007)	Document provided by NJ MVC 12/06/05 "Handouts for stakeholders 11-17-05.doc"
III-6	Percentage of inspections completed by PIFs	23% (in 2004, estimated to remain the same in 2007)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
IV-3	Current I/M program compliance rate	98%	Corresponds with emissions modeling assumption
IV-3	Annual cost for addition of two fulltime parking lot surveyors plus associated costs	$200,000	Estimate
IV-3	Annual number of CIF inspections in 2004	1,630,612 initial inspections + 584,945 reinspections = 2,215,557 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
IV-3	Annual number of CIF inspections in 2007	1,875,390 initial inspections + 672,753 reinspections = 2,548,143 inspections	Estimate
IV-3	Annual number of PIF inspections in 2004	428,186 initial inspections + 235,570 reinspections = 663,756 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
IV-3	Annual number of PIF inspections in 2007	476,170 initial inspections + 261,969 reinspections = 738,139 inspections	Estimate
IV-3	Parking lot survey assumptions	Survey time for one lot to be surveyed by two surveyors including travel = 3 hrs; Parking lot = 250 spaces	Estimate
V-1	Annual number of CIF inspections in 2004	1,630,612 initial inspections + 584,945 reinspections = 2,215,557 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-1	Annual number of CIF inspections in 2007	1,875,390 initial inspections + 672,753 reinspections = 2,548,143 inspections	Estimate
V-1	Annual number of PIF inspections in 2004	428,186 initial inspections + 235,570 reinspections = 663,756 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-1	Annual number of PIF inspections in 2007	476,170 initial inspections + 261,969 reinspections = 738,139 inspections	Estimate
V-1	Number of CIFs and CIF lanes in NJ	31 CIFs with 124 lanes	Data provided by NJ MVC for 11/30/05 stakeholder meeting

TABLE 5-4. PARAMETER VALUES USED FOR ESTIMATING OPTION COSTS (Continued)

Option Number	Parameter Description	Value	Source
V-1	Cost to outfit new CIF lanes with equipment and complete building retrofits	$75,000 per lane for equipment and $50,000 for building retrofit	Estimate
V-1	CIF per inspection cost to NJ	$27.89 (effective 8/01/05)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-1	CIF per inspection cost to NJ	$29.42 (in 2007)	Estimate
V-1	PIF per inspection cost to motorists	$69.83 (average cost in 2004)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-1	PIF per inspection cost to motorists	$72.73 (average cost in 2007)	Estimate
V-1	NJ ASM w/OBD II (complete BAR97 analyzer including OBD and gas cap test)	$35,500 + tax	ESP quotation 10/31/05
V-1	TSI equipment	$15,000	Estimate
V-1	VID per inspection cost to PIFs	$1.47	"Estimated Costs to Operate the Enhanced Vehicle Inspection and Maintenance Program & Transition Plan"
V-2	Annual number of CIF inspections in 2004	1,630,612 initial inspections + 584,945 reinspections = 2,215,557 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-2	Annual number of CIF inspections in 2007	1,875,390 initial inspections + 672,753 reinspections = 2,548,143 inspections	Estimate
V-2	Annual number of PIF inspections in 2004	428,186 initial inspections + 235,570 reinspections = 663,756 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-2	Annual number of PIF inspections in 2007	476,170 initial inspections + 261,969 reinspections = 738,139 inspections	Estimate
V-2	VID per inspection cost to PIFs	$1.47	"Estimated Costs to Operate the Enhanced Vehicle Inspection and Maintenance Program & Transition Plan"
V-2	Total for CIF and PIF audits	$4,748,271 (in 2004)	NJ DOT 10/04/05
V-2	Estimated audit cost if I/M changes to all-PIF.	$6,200,000	Estimate - See analysis in Section 6.2.1 of this report.
V-2	PIF per inspection cost to motorists	$69.83 (average cost in 2004)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-2	PIF per inspection cost to motorists	$72.73 (average cost in 2007)	Estimate
V-3	Annual number of CIF inspections in 2004	1,630,612 initial inspections + 584,945 reinspections = 2,215,557 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting

TABLE 5-4. PARAMETER VALUES USED FOR ESTIMATING OPTION COSTS (Continued)

Option Number	Parameter Description	Value	Source
V-3	Annual number of CIF inspections in 2007	1,875,390 initial inspections + 672,753 reinspections = 2,548,143 inspections	Estimate
V-3	Annual number of PIF inspections in 2004	428,186 initial inspections + 235,570 reinspections = 663,756 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-3	Annual number of PIF inspections in 2007	476,170 initial inspections + 261,969 reinspections = 738,139 inspections	Estimate
V-3	NJ ASM w/OBD II (complete BAR97 analyzer including OBD and gas cap test)	$35,500 + tax	ESP quotation 10/31/05
V-3	TSI equipment	$15,000	Estimate
V-3	Equipment cost for OBD-only station	$2,500 to $5,000 (with gas cap testing included)	Estimate based on several manufacturer costs - ESP, Waekon, SPX
V-3	VID per inspection cost to PIFs	$1.47	"Estimated Costs to Operate the Enhanced Vehicle Inspection and Maintenance Program & Transition Plan"
V-3	PIF per inspection cost to motorists	$69.83 (average cost in 2004)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-3	PIF per inspection cost to motorists	$72.73 (average cost in 2007)	Estimate
V-5	Annual number of CIF inspections in 2004	1,630,612 initial inspections + 584,945 reinspections = 2,215,557 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-5	Annual number of CIF inspections in 2007	1,875,390 initial inspections + 672,753 reinspections = 2,548,143 inspections	Estimate
V-5	Annual number of PIF inspections in 2004	428,186 initial inspections + 235,570 reinspections = 663,756 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-5	Annual number of PIF inspections in 2007	476,170 initial inspections + 261,969 reinspections = 738,139 inspections	Estimate
V-5	PIF per inspection cost to motorists	$69.83 (average cost in 2004)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-5	PIF per inspection cost to motorists	$72.73 (average cost in 2007)	Estimate
V-7	HEP/LEP software package	$100,000 plus 20% annual maintenance	Based on cost of HEP/LEP software and maintenance in CA
V-7	Annual number of CIF inspections in 2004	1,630,612 initial inspections + 584,945 reinspections = 2,215,557 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting

TABLE 5-4. PARAMETER VALUES USED FOR ESTIMATING OPTION COSTS (Continued)

Option Number	Parameter Description	Value	Source
V-7	Annual number of CIF inspections in 2007	1,875,390 initial inspections + 672,753 reinspections = 2,548,143 inspections	Estimate
V-7	Annual number of PIF inspections in 2004	428,186 initial inspections + 235,570 reinspections = 663,756 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-7	Annual number of PIF inspections in 2007	476,170 initial inspections + 261,969 reinspections = 738,139 inspections	Estimate
V-7	HEP/LEP software HEP vehicle identification rate	0.15	Based on information on CA HEP/LEP program
V-7	PIF per inspection cost to motorists	$69.83 (average cost in 2004)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-7	PIF per inspection cost to motorists	$72.73 (average cost in 2007)	Estimate
V-8	Percentage of inspections completed by CIFs	77% (in 2004; estimated to remain the same in 2007)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-8	Percentage of inspections completed by PIFs	23% (in 2004, estimated to remain the same in 2007)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-9	Cost of initiating OBD II self-test kiosks at three locations in Oregon	$20,000 building retrofit per station + $300,000 software development cost + $5,000 for security cameras	Teleconference with Oregon MVC 10/07/05
V-11	Annual number of CIF inspections in 2004	1,630,612 initial inspections + 584,945 reinspections = 2,215,557 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-11	Annual number of CIF inspections in 2007	1,875,390 initial inspections + 672,753 reinspections = 2,548,143 inspections	Estimate
V-11	Annual number of PIF inspections in 2004	428,186 initial inspections + 235,570 reinspections = 663,756 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-11	Annual number of PIF inspections in 2007	476,170 initial inspections + 261,969 reinspections = 738,139 inspections	Estimate
V-11	Clean screening rate assumption	10%	Corresponds with emissions modeling assumption
V-12	RSD infrastructure and administrative	$8,500,000	Estimate based on information from the Denver, CO program (report date 1/06/2000)
V-12	Number of annual CIF vehicle inspections in 2004	1,630,612 initial inspections + 584,945 reinspections = 2,215,557 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-12	Annual number of CIF inspections in 2007	1,875,390 initial inspections + 672,753 reinspections = 2,548,143 inspections	Estimate

TABLE 5-4. PARAMETER VALUES USED FOR ESTIMATING OPTION COSTS (Continued)

Option Number	Parameter Description	Value	Source
V-12	Increase in the number of annual inspections	0.7% increase in inspections due to high-emitter/clean screen program	Estimate based on information from the Denver, CO program (report date 1/06/2000)
V-12	CIF per inspection cost to NJ	$27.89 (effective 8/01/05)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-12	CIF per inspection cost to NJ	$29.42 (in 2007)	Estimate
V-13	Percentage of inspections completed by CIFs	77% (in 2004; estimated to remain the same in 2007)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-13	Percentage of inspections completed by PIFs	23% (in 2004, estimated to remain the same in 2007)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-13	PIF per inspection cost to motorists	$69.83 (average cost in 2004)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-13	PIF per inspection cost to motorists	$72.73 (average cost in 2007)	Estimate
V-14	Annual number of CIF inspections in 2004	1,630,612 initial inspections + 584,945 reinspections = 2,215,557 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-14	Annual number of CIF inspections in 2007	1,875,390 initial inspections + 672,753 reinspections = 2,548,143 inspections	Estimate
V-14	Annual number of PIF inspections in 2004	428,186 initial inspections + 235,570 reinspections = 663,756 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-14	Annual number of PIF inspections in 2007	476,170 initial inspections + 261,969 reinspections = 738,139 inspections	Estimate
V-14	CIF per inspection cost to NJ	$27.89 (effective 8/01/05)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-14	CIF per inspection cost to NJ	$29.42 (in 2007)	Estimate
V-14	PIF per inspection cost to motorists	$69.83 (average cost in 2004)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-14	PIF per inspection cost to motorists	$72.73 (average cost in 2007)	Estimate
V-14	Number of PIF inspection stations in NJ	1,327	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-14	Number of CIFs and CIF lanes in NJ	31 CIFs with 124 lanes	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-16	Annual number of CIF inspections in 2004	1,630,612 initial inspections + 584,945 reinspections = 2,215,557 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-16	Annual number of CIF inspections in 2007	1,875,390 initial inspections + 672,753 reinspections = 2,548,143 inspections	Estimate
V-16	Annual number of PIF inspections in 2004	428,186 initial inspections + 235,570 reinspections = 663,756 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting

TABLE 5-4. PARAMETER VALUES USED FOR ESTIMATING OPTION COSTS (Continued)

Option Number	Parameter Description	Value	Source
V-16	Annual number of PIF inspections in 2007	476,170 initial inspections + 261,969 reinspections = 738,139 inspections	Estimate
V-16	Percentage of fleet that fail their initial PIF inspection that retest at a CIF	15%	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-16	CIF per inspection cost to NJ	$27.89 (effective 8/01/05)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-16	CIF per inspection cost to NJ	$29.42 (in 2007)	Estimate
V-16	PIF per inspection cost to motorists	$69.83 (average cost in 2004)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
V-16	PIF per inspection cost to motorists	$72.73 (average cost in 2007)	Estimate
V-18	Number of MIT inspected vehicles that are failed per year	2,000 vehicles fail annually (in 2005)	Data from MIT program
V-18	Cost of a manned RSD van	$250,000 per year	Estimate
VI-1	Trigger and artificial intelligence software costs	up to $250,000 plus an unknown annual update fee	Banalogic quote received by NJ DOT December 2005
VI-1	Cost for two record auditors	$125,000	Estimate
VI-2	Cost for video surveillance (per station) at self-test kiosks in Oregon	$5,000	Teleconference with Oregon MVC 10/07/05
VI-2	Number of PIF inspection stations in NJ	1,327	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VI-2	Surveillance video volume estimates	40 hrs of video per week per station requires 1 hour of review by a trained technician at a rate of $15/hr + 33% fringe	Estimate
VII-5	Cost of changing from ASM5015 to BAR31	$40,000 total equipment cost	Estimate based on ESP quotation 10/31/05
VII-5	Number of PIF inspection stations in NJ	1,327	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-5	Number of CIFs and CIF lanes in NJ	31 CIFs with 124 lanes	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-5	Average cost of repairs upon implementation of new USEPA ASM5015 standards	$300 per vehicle	Recent OR survey of repair costs
VII-5	Number of CIF emissions test failures in 2004	176,872 (10.26% failure rate)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-5	Number of PIF emissions test failures in 2004	63,195 (11.19% failure rate)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-5	CIF per inspection cost to NJ	$27.89 (effective 8/01/05)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-5	CIF per inspection cost to NJ	$29.42 (in 2007)	Estimate

TABLE 5-4. PARAMETER VALUES USED FOR ESTIMATING OPTION COSTS (Continued)

Option Number	Parameter Description	Value	Source
VII-5	PIF per inspection cost to motorists	$69.83 (average cost in 2004)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-5	PIF per inspection cost to motorists	$72.73 (average cost in 2007)	Estimate
VII-8	Number of PIF inspection stations in NJ	1,327	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-8	Number of CIFs and CIF lanes in NJ	31 CIFs with 124 lanes	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-8	Cost of updating ASM standards in the analyzers	$200 per analyzer	Between $20K and $40K, based on programs in TX. Assuming 5 analyzer mfrs for 1000 PIFs, total cost is between $100K and $200K. This equates to $100 to $200 per PIF.
VII-8	Average cost of repairs upon implementation of new USEPA ASM5015 standards	$300 per vehicle	Recent OR survey of repair costs
VII-8	Number of CIF emissions test failures in 2004	176,872 (10.26% failure rate)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-8	Number of PIF emissions test failures in 2004	63,195 (11.19% failure rate)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-8	CIF per inspection cost to NJ	$27.89 (effective 8/01/05)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-8	CIF per inspection cost to NJ	$29.42 (in 2007)	Estimate
VII-8	PIF per inspection cost to motorists	$69.83 (average cost in 2004)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-8	PIF per inspection cost to motorists	$72.73 (average cost in 2007)	Estimate
VII-10	Annual number of CIF inspections in 2004	1,630,612 initial inspections + 584,945 reinspections = 2,215,557 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-10	Annual number of CIF inspections in 2007	1,875,390 initial inspections + 672,753 reinspections = 2,548,143 inspections	Estimate
VII-10	Annual number of PIF inspections in 2004	428,186 initial inspections + 235,570 reinspections = 663,756 inspections	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-10	Annual number of PIF inspections in 2007	476,170 initial inspections + 261,969 reinspections = 738,139 inspections	Estimate
VII-10	CIF per inspection cost to NJ	$27.89 (effective 8/01/05)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-10	CIF per inspection cost to NJ	$29.42 (in 2007)	Estimate
VII-10	PIF per inspection cost to motorists	$69.83 (average cost in 2004)	Data provided by NJ MVC for 11/30/05 stakeholder meeting

TABLE 5-4. PARAMETER VALUES USED FOR ESTIMATING OPTION COSTS (Continued)

Option Number	Parameter Description	Value	Source
VII-10	PIF per inspection cost to motorists	$72.73 (average cost in 2007)	Estimate
VII-10	Number of CIF emissions test failures in 2004	176,872 (10.26% failure rate)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-10	Number of PIF emissions test failures in 2004	63,195 (11.19% failure rate)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-14	Enhanced evaporative emissions inspection equipment	$2000, to $3,000 per lane would be required	Based on Quotations for manufacturers in the CA program
VII-14	Number of CIFs and CIF lanes in NJ	31 CIFs with 124 lanes	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-14	Number of PIF inspection stations in NJ	1,327	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-14	Average repair cost for vehicles that fail enhanced evaporative emissions inspection	$165 per vehicle	CARB
VII-14	Number of pre-1996 vehicles registered in New Jersey in September, 2005	1,414,086	Spreadsheet provided by NJ DOT "Vehicle Population Sheet 9-02 to 9-05.xls"
VII-14	Failure rate for enhanced evaporative emissions inspection	10%	Corresponds with emissions modeling assumption
VII-15	Software update - Inspection and repair of aging OBD II vehicles	$20,000	Estimate
VII-16	Percentage of inspections completed by CIFs	77% (in 2004; estimated to remain the same in 2007)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-16	Percentage of inspections completed by PIFs	23% (in 2004, estimated to remain the same in 2007)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-16	CIF per inspection cost to NJ	$27.89 (effective 8/01/05)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-16	CIF per inspection cost to NJ	$29.42 (in 2007)	Estimate
VII-16	PIF per inspection cost to motorists	$69.83 (average cost in 2004)	Data provided by NJ MVC for 11/30/05 stakeholder meeting
VII-16	PIF per inspection cost to motorists	$72.73 (average cost in 2007)	Estimate
VII-17	Cost of Opacity meters	$6,000 per unit	Estimate
VII-17	Number of CIFs and CIF lanes in NJ	31 CIFs with 124 lanes	Data provided by NJ MVC for 11/30/05 stakeholder meeting
IX-4	Number of inspection waivers granted in 2003 in NJ	136 vehicles	Document provided by NJ DEP 10/12/05 "Repair assistance for older cars.doc"
IX-4	Current repair cost ceiling for determining inspection waivers	$450	Document provided by NJ DEP 10/12/05 "Repair assistance for older cars.doc"

TABLE 5-4. PARAMETER VALUES USED FOR ESTIMATING OPTION COSTS (Continued)

Option Number	Parameter Description	Value	Source
IX-4	Number of vehicles that would receive a waiver if the inspection waiver cost ceiling were raised to the proposed $675 inflation adjusted amount	68	Estimate of 50% of current waivers
IX-5	Number of OBD II vehicles granted inspection waivers in 2003 in NJ	75	Parsons Inc.
IX-6	Number of vehicles that would be eligible for low income repair assistance in NJ	5,000	NJ DEP Estimate
IX-6	Cost of low income repair assistance	$500 repair cost + $150 administrative fee	NJ DEP Estimate
IX-6	Number of inspection waivers granted in 2003 in NJ	136 vehicles	Document provided by NJ DEP 10/12/05 "Repair assistance for older cars.doc"
IX-7	Cost of a scrappage program	$1,000 per vehicle + $150 administrative fee	California BAR Estimate
IX-7	Number of vehicles scrapped annually	2% of vehicles that fail inspection = 2,000 vehicles	Corresponds with emissions modeling assumption
IX-8	Catalytic converter replacement cost	$200 to more than $2,000 depending on vehicle type	Estimate
IX-8	Oxygen sensor replacement cost	$200	Estimate
IX-10	Cost to evaluate tracking methods for repair costs by OBD II DTC	$45,000	Estimate
IX-11	Cost to develop I/M inspection "retest pass" tracking report	$3,500	Estimate
IX-17	Cost of ASM dynamometers conversion to drive cycle dynamometers	$3,000	Based on quotations from respondents to the recent RFI

5.1.3 Summary of Options and Alternatives

As discussed previously, we assembled and evaluated over 100 options and alternatives. To summarize these options, we grouped them into five general categories:

- Program Structure
- Program Design and Features
- Technology
- Enforcement/Audit/Oversight
- Training

We completed this grouping based on our assessment of which I/M program category the alternative best fit in terms of how the alternative is defined in Appendix D-1. The following discussions summarize our findings for each of these groups of alternatives. For each group we list the alternative and summarize the information obtained on emission reductions and costs. For several options, it was not possible to quantify the costs or emissions impact associated with the option. In those cases, a qualitative assessment of the cost and emission impact was made and is contained in the description of the option in Appendix D-1. Analysis of all options and alternatives is found in Appendix D-1.

5.1.3.1 Program Structure

MACTEC evaluated options/alternatives involving Program Structure, such as CIF-only networks, PIF-only networks, and various Hybrids (see Table 5-5). Of these options/ alternatives, 71 percent have been demonstrated by other States. Emissions data and cost information were quantified for several options/alternatives. Quantifiable changes in hydrocarbon emission ranged from an increase of 248 tpy to a decrease of 102 tpy. Changes in NO_x emissions ranged from an increase of 333 tpy to a decrease of 66 tpy. CO emission changes ranged from an increase of over 6,000 tpy to a decrease of 1,208 tpy.

While there may be certain benefits to modifying the Program Structure, there are other noncost-related aspects that need to be considered. For example, while converting to a CIF-only program (Option V-1) would reduce emissions and save significant costs to the driving public, the costs to the State would increase because of the number of CIF inspections performed. In addition, PIFs would seriously object if such a program were implemented. Incremental costs indicated in the table represent the cost impact to the State, without consideration of the overall program cost. See Appendix D-1 for complete details on cost impacts to motorists, PIFs, and the State.

5.1.3.2 Program Design and Features

MACTEC evaluated options/alternatives involving I/M program design and features, such as motorcycle inspections, four wheel drive inspections, high emissions profiling, etc. (see Table 5-6). Of these options/alternatives, 80 percent have been demonstrated by other States. Emissions data and cost information were quantified for several of the options/alternatives.

In some cases, implementation of selected options/alternatives would increase emissions, such as increasing model year exemptions, by dropping ASM5015 entirely, or by using low emissions profiling to exempt clean vehicles. These alternatives could save as much as $11.4 million (for increasing model year exemptions from four years to six years), but would increase hydrocarbon, nitrogen oxides, and carbon monoxide emissions by hundreds or thousands of tons. Some options/alternatives (such as motorcycle inspections) would reduce emissions; however, the reductions were not quantified because they are not creditable by the USEPA. Other options/alternatives would reduce emissions, the most notable being high emissions weighting (reductions of 37 tpy for HC, 47 tpy for NO_x, and 840 tpy for CO), and transient loaded mode tailpipe testing (reductions of 237 tpy for HC, 394 tpy for NO_x, and 4,490 tpy for CO).

TABLE 5-5. PROGRAM STRUCTURE OPTIONS/ALTERNATIVES

No.	Title	Description	Proof	Emission Change (tpy) from Current Program			Incremental Costs to State, $/yr
				HC	NOx	CO	
V-1	*Full Test-Only Network*	Convert existing Hybrid network to full test-only network.	Yes	-51	-66	-1,208	CIF only: 19.5M PIF only: ($73M)
V-2	*Full Test-and Repair Network*	Existing CIFs would be closed and all testing would occur at licensed PIFs.	Yes	248	333	6,000	($73M)
V-3	*Limited PIF-Only Network*	Convert Hybrid system to system that has limited number of higher volume PIFs licensed to conduct inspections and also performs repairs.	Yes	-51	-66	-1,208	($73M)
V-4	*Test-Only PIFs*	Individual PIFs licensed as test-only facilities if they choose to only perform vehicle testing and no repairs.	Yes	Inconclusive			NQ
V-5	*CIF-Only Reinspections*	All reinspections must occur at the CIFs.	Yes	-51	-66	-1,208	$7.7M
V-8	*OBD-Only Stations/ Lanes*	Begin to license OBD-only PIFs, but all CIF lanes would be required to retain tailpipe test capability.	Yes*	-25.6	-38.3	-632	Slight reduction
V-16	*PIF-Only Reinspections*	All reinspections must be done at a PIF/ERF.	No	256	329	5,986	($23M)
V-18	*Enhanced Roadside Inspection Program*	Would complement fleet exemptions and provide credit for off-cycle inspection.	Yes	-102	-50	-1,458	$0.25M

A negative number in emission reductions column indicates that emissions will decrease compared to the current program. A negative number in the cost column indicates that costs will be less compared to the current program.

Incremental costs indicated in the table represent the cost impact to the State, without consideration of the overall program cost.

TABLE 5-6. PROGRAM DESIGN AND FEATURES OPTIONS/ALTERNATIVES

No.	Title	Description	Proof	Emission Change (tpy) from Current Program			Incremental Costs to State, $/yr
				HC	NOx	HC	
III-1	*Increased Model Year Exemptions*	Adds up to 2 years to the current new vehicle exemption	Yes	215	387	5,694	-$6.1M
				431	774	11,400	-$11.4M
III-2	*Low Emissions Weighting/ Exemptions*	Use low emissions profiling to exempt expected clean vehicles	Yes	146	183	2,920	-$5.5M
III-4	*Four Wheel Drive Inspections*	Increase 4WD dynamometers to one per CIF	Yes	0	-18	-95	$400K
III-6	*Light Duty Diesel Vehicles Inspections*	Require OBD tests on LDDV for 1997 & older vehicles	Yes	-3	NQ	NQ	$0
V-7	*High Emissions Weighting*	Use high emissions profiling to identify vehicles likely to fail & require special testing	Yes	-37	-47	-840	$2.8M
VII-3	*OBD II- Heavy Duty Gasoline Vehicle Inspection*	Perform OBD II inspections on 2005+ model year HDGV	Yes	Not Quantified (current 4-year exemption)			Minor costs
VII-4	*OBD II Plus Tailpipe Inspections*	Perform OBD II and tailpipe inspections on 1996 & newer vehicles	Yes	Some improvement, but no credit granted by USEPA			NQ, but would increase
VII-5	*Transient Loaded Mode Tailpipe Testing*	Upgrade NJ ASM5015 procedure to similar to BAR31	Yes	-237	-394	-4,490	$9.6M
VII-6	*Back-up Tailpipe Inspections for Special OBD II Cases*	Subject OBD II vehicles to ASM5015 testing under special circumstances	Yes	Not Quantified, USEPA provides no emission credits			NQ
VII-7a	*Replace ASM5015 with Idle Test*	Continue to do OBD and gas cap programs	Yes	0	394	2,130	NQ, but would be lower
VII-7b	*Drop ASM5015 Entirely*	Continue to do OBD and gas cap programs	Yes	412	478	12,800	NQ, but lower
VII-8	*Update ASM Cutpoints*	Implement final ASM5015 cutpoints or an alternate set of cutpoints	Yes	-157	-318	-2,700	NQ
VII-10	*Annual Inspections of Failing Vehicles*	Implement annual inspections of previously-failed vehicles	Yes	0	-88	-690	$6.6M
VII-11	*Annual Inspection of Older Vehicles*	Require annual inspection for all vehicles older than a certain age	Yes	0	-88	-690	$15.2M
VII-13	*Liquid Leak Check*	Perform manual inspection of engine and various fuel component systems for liquid leaks	Yes	-100	0	0	Neg.
VII-14	*Enhanced Evaporative Emission Inspections*	Additional evaporative tests for vehicles 10 years or older	Yes	-441	0	0	$4.4M
VII-17	*Evaluate Smoke Test w/ OBD Vehicles*	Perform functional opacity testing with OBD	No	0	0	0	$192K
IX-4	*Evaluate Repair Costs (Waiver Limits)*	Adjust repair waiver cost of $450 for inflation	Yes	0	0	0	Minimal
IX-7	*Vehicle Scrappage Program*	Non-repairable vehicles scrapped rather than receiving waivers	Yes	-51	-26	-730	$2.3M

A negative number in emission reductions column indicates that emissions will decrease compared to the current program. A negative number in the cost column indicates that costs will be less compared to the current program.

Incremental costs indicated in the table represent the cost impact to the State, without consideration of the overall program cost.

5.1.3.3 Technology

MACTEC evaluated options/alternatives involving updated technology, such as universal inspection software or remote sensing (see Table 5-7). Of these options/alternatives, one-half have been demonstrated by other States. Emissions data and cost information, however, were only quantified for two options/alternatives: Remote Sensing Clean Screening (Option V-11) and Remote Sensing High Emitter Detection (Option V-12). In addition, because these technological advancements are new, there can be technological impediments involved in implementation. For example, implementation of Universal Inspection Software (Option I-6) would be extremely difficult in its present form due to the expressed resistance of emission equipment manufacturers to make their proprietary software code known to any party.

TABLE 5-7. TECHNOLOGY OPTIONS/ALTERNATIVES

No.	Title	Description	Proof	Emission Change (tpy) from Current Program			Incremental Costs to State, $/yr
				HC	NOx	HC	
I-6	*Universal Inspection Software*	Require all certified equipment vendors to install universal software on all BAR97 analyzers	No	Not Quantified			$50K
V-9	*Remote Self-Service OBD II Inspections*	Motorists conduct their own ODBII testing at kiosks	Yes	Not Quantified, but thought to reduce emissions			NQ
V-10	*OBD III Motorist Choice Options*	Remotely communicates OBD II data via wireless communication to a central database	No	Not Quantified, but thought to reduce emissions			Neutral
V-11	*Remote Sensing Clean Screening*	Uses remote sensing devices to identify vehicles not required to have periodic inspections	Yes	126	183	2,920	-$5.5M
V-12	*Remote Sensing High Emitter Detection*	Uses remote sensing devices to identify high-emitting vehicles	Yes	-124	-259	-3,180	$9M

A negative number in emission reductions column indicates that emissions will decrease compared to the current program. A negative number in the cost column indicates that costs will be less compared to the current program.

Incremental costs indicated in the table represent the cost impact to the State, without consideration of the overall program cost.

5.1.3.4 Enforcement/Audit/Oversight

MACTEC evaluated options/alternatives involving enforcement, audits, and oversight, such as CIF/PIF equipment audits, increasing noncompliance penalties, video surveillance, etc. (see Table 5-8). Of these options/alternatives, 63 percent have been demonstrated by other States. For the most part, it was not possible to quantify emission reductions or costs associated with these options/alternatives. Many of these options/alternatives are designed to ensure enforcement of existing statutes or ensure program requirements are being met. While some emission reductions are possible, these options/alternatives are designed primarily to ensure that emissions will not increase, and should be considered preventative. In addition, for some of the options/alternatives, MOBILE6 will not allow any emission reduction credit. Costs for the most part, while not quantified, are thought to be small. Many of these options/alternatives can be implemented practically, with support from stakeholders.

TABLE 5-8. ENFORCEMENT/AUDIT/OVERSIGHT OPTIONS/ALTERNATIVES

No.	Title	Description	Proof	Emission Change (tpy) from Current Program			Incremental Costs to State, $/yr
				HC	NOx	HC	
II-1	*Enhanced Program Evaluation*	Develop & implement a process for ongoing program evaluation	Yes	Not Quantified			100K
IV-2	*Address Disappearing Vehicles*	Quantify magnitude of problem. Determine whether vehicles were scrapped, sold out of state, or driven w/out registration.	Yes	Not Quantified, but could reduce emissions			NQ
IV-3	*Increase Sticker Enforcement*	Increase sticker enforcement through increased detection and enforcement	Yes	Not Quantified, but would reduce emissions			$200K
IV-4	*Increase Non-Compliance Penalties*	Increased penalties would result in higher compliance	Yes	Not Quantified, but reductions thought to be marginal (NJ assumes 98% compliance for MOBILE6)			NQ
VI-1	*Automatic Inspection Trigger Analysis*	Implementation of automatic trigger analysis of inspection results	Yes	-22	-18	-507	$175K
VI-2	*Video Surveillance of Test Stations*	Perform inspections on a network basis or on problem performers	Yes	-22	-33	-511	$2M
IX-10	*Track OBD II Repair Costs by DTC*	Use semi-automated tracking of repair costs by Diagnostic Trouble Code	Yes	Not Quantified			$45K for eval.
IX-11	*Track Retest Pass Rates by DTC*	Periodic reporting of initial retest pass rates using DTCs.	--	Not Quantified			$3.5K
IX-20	*Evaluate Essential Tool Program*	Ensure ERFs possess essential diagnostic tools	Yes	Not Quantified			Minimal

A negative number in emission reductions column indicates that emissions will decrease compared to the current program. A negative number in the cost column indicates that costs will be less compared to the current program.

Incremental costs indicated in the table represent the cost impact to the State, without consideration of the overall program cost.

5.1.3.5 Training

MACTEC evaluated options/alternatives involving training, such as enhanced diagnostic and repair training, streamlined certifications, or development of web-based training (see Table 5-9). Of these options/alternatives, one-half have been demonstrated by other States. Emissions data, cost information, and/or cost effectiveness data were not available. Emission reductions were not quantified because either (a) no credit was allowed by MOBILE6, or (b) no data were available. Similarly, data were not available to quantify the cost. However, the options/alternatives described are not expensive to implement. In every case, the training options/alternatives that are listed could be implemented fairly easily with little or no stakeholder resistance. Overall stakeholder response would be positive, implementation would not be difficult, and motorists would be supportive.

TABLE 5-9. TRAINING OPTIONS/ALTERNATIVES

No.	Title	Description	Proof	Emission Change (tpy) from Current Program			Incremental Costs to State, $/yr
				HC	NOx	HC	
IX-12	*Enhanced OBD II Diagnostic & Repair Training*	Provide advanced training to interested technicians	Yes	Not Quantified, no credit by MOBILE6			NQ
IX-14	*Revise Training Program*	Revise training program for adequacy and completeness with regard to OBD repairs, CAN, etc.	Yes	Not Quantified, no credit by MOBILE6			NQ
IX-15	*Develop Ongoing Training Program Audit System*	Provide training to ERF technicians where deficits are noted	Unk	Not Quantified, but could help reduce emissions			NQ
IX-16	*Develop Web-Based PIF/ERF Training Program*	Use web-based training for PIFs/ERFs	Yes	No Impact			--
IX-17	*Evaluate Drive-Cycle Dyne Conversion*	Allow PIFs to convert ASM dynes to drive-cycle dynes for use in advanced OBD II vehicle fault diagnosis	Yes	No Impact			NQ

A negative number in emission reductions column indicates that emissions will decrease compared to the current program. A negative number in the cost column indicates that costs will be less compared to the current program.

Incremental costs indicated in the table represent the cost impact to the State, without consideration of the overall program cost.

5.2 IDENTIFICATION AND EVALUATION OF PROGRAM SCENARIOS

MACTEC, in consultation with stakeholders, developed program scenarios that incorporate likely program elements for the next generation of the NJMVIS. We developed these scenarios to allow for the comparison of the relative cost and emission changes from the current program that would likely occur if the scenario was implemented. MACTEC structured the scenarios to allow for the evaluation of the three major program design issues: test type, program type, and type of operational support for the centralized inspection facilities. Table 5-10 identifies the program scenarios and provides some explanatory definitions of key terms.

TABLE 5-10: IDENTIFICATION OF PROGRAM SCENARIOS

Scenario	Program Type	CIF Operations	Test Type
Existing	Hybrid	Contractor-run	ASM/OBD
1	Hybrid	Contractor-run	OBD-Only
2	Hybrid	State-run	OBD-Only
3	CIF-only	Contractor-run	OBD-Only
4	CIF-only	State-run	OBD-Only
5	PIF-only	None	OBD-Only
6	Hybrid	Contractor-run	OBD/TSI
7	Hybrid	State-run	OBD/TSI
8	CIF-only	Contractor-run	OBD/TSI
9	CIF-only	State-run	OBD/TSI
10	PIF-only	None	OBD/TSI
Definitions:			
Program Type	Hybrid - program utilizing both centralized test-only sites and decentralized test-and-repair facilities CIF-only – program using facilities owned or leased by the State with inspection lanes available for conducting both safety and emissions inspections PIF-only – program using only privately owned independent shops and companies licensed to perform inspections		
CIF Operations	Contractor-run – CIF operations are provided by a private contractor None – there are no CIF operations under the PIF-only program State-run – CIF operations are provided by employees of the State		
Test Type	ASM/OBD – current test procedure consisting of a dynamometer-based tailpipe test known as the Acceleration Simulation Mode (ASM) test for pre-1996 vehicles and an On-board Diagnostic (OBD) test using the vehicles' computer system for most model year 1996 and newer vehicles OBD-only – test procedure option with OBD testing only for 1996 and newer vehicles; no tailpipe testing required for pre-1996 vehicles OBD/TSI – test procedure options with OBD testing for 1996 and new vehicles; two-speed idle tailpipe test for pre-1996 vehicles		

For each of the scenarios listed in Table 5-10, MACTEC made some necessary assumptions regarding the program elements. These assumptions are discussed in Section 5.2.1. Based on these assumptions, MACTEC evaluated the costs of each program scenario. The details of the cost analysis are presented in Section 5.2.2. We used USEPA's MOBILE6 model to estimate the emissions impact for each scenario and compared the results with the current baseline. The details of the emissions analysis are presented in Section 5.2.3. All cost and emission analyses were completed based on the calendar year 2007. The scenario cost estimates and emission changes were compared against a baseline of the costs and emissions from the current program. Section 5.2.4 summarizes the results of the scenario comparison.

5.2.1 Scenario Assumptions

MACTEC vetted the scenario concept through the stakeholder process, leading to agreement on specific definitions and assumptions for each scenario. Major elements considered in this analysis include the number of inspections and facilities required, responsibilities for conducting audits (MVC audits, DEP audits, and Mobile Inspection Teams), equipment issues, and implementation of the Vehicle Information Database (VID). Definitions of these elements and related assumptions are discussed in the following sections for the three program types: hybrid, CIF-only, and PIF-only. For each of these program scenarios, we assessed costs and emissions for two types of emission tests – a simple OBD-only test scenario and a more complex OBD/two-speed idle/gas cap test scenario.

5.2.1.1 Hybrid Scenario

Under this scenario, motorists can choose to visit either a PIF or a CIF to have their vehicle inspected. This Hybrid scenario is representative of the current New Jersey I/M program.

Based on current use patterns, MACTEC assumed that only 105 lanes (out of a maximum of 124 lanes currently available) would be needed at the CIFs to process the vehicles that need testing and not create wait times beyond the current contractual limits. This assumption is based on current use patterns and the fact that a greater portion of the vehicle fleet will be equipped for OBD testing in 2007. The OBD test is much quicker to perform than any tail pipe test and requires fewer staff to complete.

All failures observed during a safety test currently require repair, and a retest is necessary to verify compliance after repair. Under this Hybrid scenario, we assumed that some safety inspection items at CIFs would be changed to "advisory only." When a failure is detected in an item identified "advisory only,' the vehicle owner would be advised of the failure and the need for repair. No retest would be required to verify repair, thereby reducing the number of retests and resulting in cost savings to the State. This would only affect costs at CIFs, because they currently treat both initial and retests the same (i.e., the contractor is paid the same for initial tests and retests). No cost savings would be realized at PIFs, because they are assumed to charge for initial tests only, with no additional charges for retests.

There are about 1,327 PIFs currently participating in the existing New Jersey Hybrid program. However, for this study we evaluated new testing alternatives, OBD and OBD/TSI, both of which require a much smaller cost of entry to provide testing services. Therefore, it was assumed that the number of PIFs would increase under this new Hybrid scenario. MVC assumed that there would be 3,500 PIFs in the program based upon MVC experience with station participation levels prior to having centralized lanes. For calculation purposes, we assumed each PIF had one bay dedicated to vehicle emission/safety inspections. These assumptions were necessary to evaluate equipment costs associated with this scenario.

With respect to program auditing, we assumed that MVC would continue its audit role for PIFs, which includes overt audits on a quarterly basis at all facilities and 300 covert audits per month. DEP would continue its audit role on the data collected by CIF emission testing equipment. In addition, we assumed that six mobile inspection teams (MITs) would be added to the three existing MITs. These teams would be added to spot check vehicles for safety and emissions problems.

Major assumptions included in the definition of the Hybrid scenario include the following:

- OBD/TSI/Gas Cap and OBD-only scenarios at both CIFs and PIFs
- Bottom-up labor estimates for CIF lane operations
- Cost savings estimated at CIFs for changing some safety items to "advisory"
- Maximum 112 inspection lanes
- 3,500 PIFs
- MVC audits all PIFs quarterly, plus 300 covert audits per month
- MVC audits CIF safety equipment
- DEP conducts data audits and audits CIF emission testing equipment
- Six additional MITs to be instituted (nine total)
- VID contractor and equipment contractor

5.2.1.2 Centralized Inspection Facility (CIF)-Only Scenario

Under the CIF-only scenario, all inspections would take place at centralized inspection facilities and there would be no PIF participation in inspecting vehicles. Emission repairs would continue to be made at shops registered by the MVC to perform emission-related repairs or by vehicle owners.

Because all vehicles would have to go to a CIF for inspection, more tests would be required at CIFs (about 80% of inspections are conducted at CIFs under the current Hybrid program). However, the simplified test procedures will reduce test time, which will counter this increase in test volume. Therefore, we assumed that the existing CIF facilities and lanes have the capacity to absorb this increased volume. No new CIF facilities were assumed; however, all 124 test lanes were assumed to be required to process all vehicles and minimize wait times.

MVC would continue its audit function of CIF safety inspection equipment. MVC would no longer need to audits PIFs. DEP would continue its audit function of CIF emission testing equipment. Six additional mobile inspection teams were assumed as well.

Major assumptions included in the definition of the CIF-only scenario include the following:

- OBD/TSI/Gas Cap and OBD-only scenarios

- Bottom-up labor estimates to run CIF lanes
- Cost savings estimated for changing some safety items to “advisory”
- 124 inspection lanes
- MVC audits CIF safety equipment
- DEP conducts data audits and audits CIF emission testing equipment
- Six additional MITs to be instituted (nine total)
- VID contractor and equipment contractor

5.2.1.3 Private Inspection Facility (PIF)-Only Scenario

Under this scenario, all vehicle emission and safety inspections would be conducted at PIFs. For analysis purposes, we assumed 3,500 PIFs (the same as the number in the hybrid scenario). This assumption was also based upon MVC experience with previous PIF programs.

In addition to facility assumptions, we assumed that MVC would continue its audit role for PIFs, which includes overt audits on a quarterly basis at all facilities and 300 covert audits per month. DEP would continue its audit role on the collected data. In addition, we assumed that six mobile inspection teams would be added to the three existing teams. These teams would be added to spot check vehicles for safety and emissions problems.

Major assumptions included in the definition of the PIF-only scenario include the following:

- 3,500 PIFs in program (1 Bay/PIF)
- PIFs charge a test fee for initial inspection only, re-inspections are no-charge
- Single contract vendor will supply and maintain inspection equipment at the PIFs
- MVC conducts quarterly overt audits, plus 300 covert audits per month
- DEP audit role limited to collected data
- Six additional MITs to be instituted (nine total)
- Contractor to develop and supply new VID

Since there are no CIFs under this scenario, no assumptions regarding the operation of CIFs are needed.

5.2.2 Cost Analysis

Once the scenarios were defined, cost analyses for program elements were completed. The cost elements considered in this analysis include:

- Vehicle Information Database (VID)
- Equipment
- MVC audits
- DEP audits
- Mobile Inspection Teams
- PIF inspections
- CIF inspections (State run)
- CIF inspections (Contractor run)

A discussion of each cost element follows.

5.2.2.1 VID Costs

The cost to operate and maintain the vehicle inspection database provided by the current contractor is included in the total inspection cost per vehicle and is not separately identifiable. Under all scenarios, we considered having a separate VID contractor and contract to allow direct access and communication between New Jersey and the data contractor (not through another prime contractor). This assumption allowed the separation of the VID cost from other vehicle inspection costs to evaluate any potential savings.

To estimate a "VID-only" cost to apply to all scenarios, we evaluated award costs for recent VID-only contracts in other States. Table 5-11 summarizes the costs obtained from Connecticut, California, New York, Nevada, and Texas. The average cost of these VID contract awards is $0.89/vehicle inspected. The most recent awards were in California and Nevada. These two awards average $1.09/vehicle inspected. For purposes of the analysis, we used a cost of $1.00/vehicle inspected, which is the mid point between the average of all contract awards and the average of the most recent awards.

TABLE 5-11: SUMMARY OF VID COSTS

State	All Awards $/Vehicle Inspected	Most Recent Awards $/Vehicle Inspected
CT	$1.00	
CA	$1.50	$1.50
NY	$0.50	
NV	$0.68	$0.68
TX	$0.78	
Average	$0.89	$1.09
For this analysis, we assumed $1.00 per test for VID-only services because this is the mid point between the average of all test fees and the most recent test fees.		

To apply this "per inspection" cost to each scenario, we needed to estimate the number of inspections involved in each scenario. Table 5-12 summarizes fleet estimates for 2007, which include initial tests and retests at both CIFs and PIFs, OBD tests (on 1996 and newer vehicles), and TSI tests for 1995 and older vehicles. These 2007 estimates were projected from actual 2005 data obtained from MVC for all such categories and estimated fleet mix by model year. The data represent fleet distribution for the current Hybrid program in New Jersey extrapolated to 2007.

For the PIF-only scenario, all initial inspections will be conducted at PIFs. MACTEC assumed that the VID cost will apply only to each initial inspection, i.e., there is no cost for re-inspections. This resulted in 2.35 million initial inspections (1.87 million initial inspections projected at CIFs and 0.48 million initial inspections projected at PIFs as shown in Table 5-12). Because we assumed PIFs only charge for initial inspections, we applied VID costs to initial inspections only under this scenario. The VID cost associated with this PIF-only scenario, therefore, is $2.35 million/year ($1.00/inspection x 2.35 million initial inspections per year).

TABLE 5-12: ESTIMATES OF 2007 FLEET POPULATION
(for the Current Hybrid Program in New Jersey extrapolated to 2007)

Parameter	**Projected Value in 2007**
Vehicles Eligible for OBD Inspection[a]	2,347,472
Vehicles Eligible for TSI Inspection [a]	1,150,306
Total Vehicles Eligible for Inspection [a]	3,497,778
Percent of All Inspections that are OBD Inspections	67.11
Percent of All Inspections that are TSI	32.89
CIF Inspections[b]	2,548,143
PIF Inspections[b]	738,139
Total Inspections[b]	3,286,282
Initial CIF Inspections	1,875,390
CIF Re-inspections	672,753
Initial PIF Inspections	476,170
PIF Re-inspections	261,969
Initial CIF Failures Due to Safety	580,809
Initial PIF Failures Due to Safety	58,704
Initial CIF Failures Due to Emissions	225,589
Initial PIF Failures Due to Emissions	51,210
Failures at CIFs (Hybrid Scenario) Due to Safety Advisories Only	132,110
Failures at CIFs (CIF Only Scenario) Due to Safety Advisories Only	170,213

a) not all vehicles that are eligible are inspected with bi-annual inspections
b) includes initial inspections and re-inspections

For the Hybrid scenario, MACTEC assumed that the VID costs apply to both initial inspections and re-inspections at CIFs, but only to initial inspections at PIFs. From Table 5-12, we projected 2.55 million total initial inspections and re-inspections at CIFs and 0.48 million initial inspections at PIFs. This yields total inspections of 3.03 million/year and a total VID cost of $3.03 million per year for this 2007 Hybrid scenario ($1.00/inspection x 3.03 million inspections per year).

For the CIF-only scenario, all inspections will be conducted only at CIFs. MACTEC assumed that CIFs will charge VID costs for both initial and re-inspections. From Table 5-12, we estimated a total of 2.55 million initial inspections and re-inspections at CIFs, and a total of 0.74 million initial and re-inspections at PIFs that would now occur at CIFs. Summing these inspections yields a total of 3.29 million initial and re-inspections performed at CIFs. Applying $1.00/inspection yields $3.29 million/year in VID costs for a CIF-only scenario.

5.2.2.2 Equipment Costs

MACTEC obtained vendor quotes for OBD-only and OBD/TSI scenarios as the basis for equipment costs. Vendors provided estimates on a per lane basis. The average capital cost for OBD/TSI vehicle emissions test equipment was $15,000; the average for OBD-only equipment was $5,000. To develop annual costs, we assumed a five-year capital recovery period and estimated operating and maintenance costs based upon vendor input. A summary of our equipment cost analysis is shown in Table 5-13.

During the stakeholder meetings, some vendors indicated that that deep discounts would be available to New Jersey based on the large number of lanes that would need to be equipped. Vendor experience with recent bids in other States supports this assumption. These stakeholders indicated volume discounts of as much as 50 percent had been realized in other States. The vendors we contacted for the above capital and annual costs did not quote such a large discount even when told the approximate number of units that would be required. As a result, we used the high end of the cost range for determining annual costs. The low end of the range is provided for sensitivity analyses only. The annual cost per lane for OBD-only equipment was $1,400 to $2,200/yr. The annual cost for OBD/TSI equipment was determined to be $4,400 to $6,800/yr.

TABLE 5-13: SUMMARY OF EQUIPMENT COST ANALYSIS

Cost Element	Cost per Lane Low-End	Cost per Lane High-End
OBD-Only Scenario		
Equipment Unit Cost	$2,500	$5,000
Years of Term	5	5
Lease Factor	0.0245	0.0245
Monthly Lease Payment	$61.25	$122.50
Sales Tax (6%)	$3.68	$7.35
Total Monthly Equipment Cost	$64.93	$129.85
Maintenance Cost/Month	$50.00	$50.00
Total Monthly Cost	$114.93	$179.85
Annual Cost	**$1,379.16**	**$2,158.20**
OBD/TSI Scenario		
Equipment Unit Cost	$7,500	$15,000
Years of Term	5	5
Lease Factor	0.0245	0.0245
Monthly Lease Payment	$183.75	$367.50
Sales Tax (6%)	$11.03	$22.05
Total Monthly Equipment Cost	$194.78	$389.55
Maintenance Cost/Month	$175.00	$175.00
Total Monthly Cost	$369.78	$564.55
Annual Cost	**$4,437.36**	**$6,774.60**

To determine total equipment annual costs to apply to scenarios, we applied the per lane costs to the number of lanes assumed in each scenario. The ultimate flexibility from an operations standpoint would be to outfit all lanes with OBD/TSI equipment, allowing any vehicle to be tested in any lane. This is perfectly logical at PIFs where we assumed only one lane per station would be outfitted for testing. However, in 2007 we projected that a significant portion of the fleet (nearly 70%) would be 1996 and newer and would require only an OBD test. Since these OBD vehicles were more than two-thirds of the total vehicles to be tested, we did not believe that all CIF test lanes (CIFs often have multiple lanes) would have to be outfitted with more expensive OBD/TSI equipment. Some lanes could be outfitted with the less expensive OBD-only test equipment and be dedicated to 1996 and newer vehicles.

The existing CIFs vary in the number of lanes per facility (one-, two-, four-, five- and eight-lane stations). MACTEC assumed that OBD/TSI equipment would be installed in all one-lane stations to provide flexibility. We assumed that all stations with even numbered lanes would have half the lanes equipped with OBD/TSI equipment and half the lanes equipped with OBD-only equipment. For five-lane stations we assumed three lanes would be equipped with OBD/TSI equipment, and two lanes would be equipped with OBD-only equipment.

Under the CIF-only OBD/TSI scenario, we assumed a total of 124 operational lanes split into 68 OBD/TSI lanes and 56 OBD-only lanes. Applying the $2,200/lane/year cost for OBD-only equipment and $6,800/lane/per year cost for OBD/TSI equipment yields a total annual equipment cost for the CIF-only scenario of $0.6 million/yr (56 x $2,200 + 68 x $6,800).

For the CIF portion of the Hybrid scenario, we assumed 105 operating lanes would be needed. Applying the above equipment lane assumptions yields 58 OBD/TSI lanes and 47 OBD-only lanes. Using the same annual equipment costs as described above yields an annual equipment cost for the CIF portion of the Hybrid scenario of $0.5 million/year (47 x $2,200 + 58 x $6,800).

For the OBD-only scenarios, the equipment cost assumptions are more straight-forward because all lanes would be outfitted with OBD equipment. For the CIF-only scenario, this yields an annual equipment cost of $0.3 million/year (124 x $ 2,200). For the CIF portion of the Hybrid scenario, the annual equipment costs for OBD-only equipment is $0.2 million/year (112 x $2,200).

Equipment costs at PIFs are discussed later in Section 5.2.2.6 because a different methodology was used to couple equipment and labor costs.

5.2.2.3 MVC Audit Costs

MVC currently fields audit teams that conduct PIF audits and CIF safety equipment audits. Data for 2004 indicate that 21,094 audits were conducted by MVC with a staff of 70 personnel. MVC conducts three types of audits: overt, covert, and covert re-audit. Each of these three types of audits may be conducted at either a PIF or a CIF. Based on discussions with MVC, we assumed that MVC would conduct the same number of audits in 2007 under the current hybrid program as were conducted in 2004.

We estimated the number of MVC audits that would be required in 2007 for the three scenarios for the future program – a hybrid, PIF-only, and CIF-only. Based on MVC experience, we made the following estimates for the number of audits at PIFs in 2007:

- there will be 3,500 PIFs in the PIF-only and Hybrid scenarios
- MVC will conduct quarterly overt audits of all 3,500 PIFs, resulting in 14,000 overt audits per year
- MVC will conduct 300 covert audits per month at PIFs, resulting in 3,600 covert audits per year
- MVC will conduct covert re-audits at a 70% rate, resulting in 2,520 covert re-audits per year.

We assumed the number of CIF audits would stay the same because the number of CIFs used in our scenarios did not change from the current hybrid system. We did add a 10% re-audit rate for CIF covert audits based upon MVC experience.

Table 5-14 summarizes the estimates of the number of MVC audits in 2007 for the current hybrid program and the three future scenarios.

TABLE 5-14: ESTIMATE OF NUMBER OF MVC AUDITS IN 2007

	Actual MVC Audits in 2004/Assumed for 2007	MVC Audits for Future Scenario		
		Hybrid	CIF-only	PIF-only
PIF Overt Audits	17,846	14,000	0	14,000
PIF Covert Audits	1,718	3,600	0	3,600
PIF Covert Re-audits	0	2,520	0	2,520
Total PIF Audits	**19,564**	**20,120**	**0**	**20,120**
CIF Overt Audits	372	372	372	0
CIF Covert Audits	1,158	1,158	1,158	0
CIF Covert Re-audits	0	116	116	0
Total CIF Audits	**1,530**	**1,646**	**1,646**	**0**
Total MVC Audits	**21,094**	**21,766**	**1,646**	**20,120**

The next step was to estimate the cost for conducting the MVC audits. We obtained labor costs from MVC for the audit teams that currently conduct PIF audits and CIF safety equipment audits. Data for 2004 indicate that 21,094 audits were conducted by MVC at PIFs and CIFs with a staff of 70 personnel. MVC provided the number of audit team staff by labor category and salaries for each labor category. For consistency with the other annual cost calculations, we projected these 2004 labor costs to 2007 assuming an escalation rate of 3 percent per year.

For each future scenario, we assumed that the staff necessary to conduct the audits is proportional to the number of audits conducted. For example, to conduct half the audits done in 2004, we assumed half the staff would be needed. We further assumed that the labor category mix remains constant. On that basis, we estimated the MVC staff necessary to conduct audits in 2007 under each scenario.

A fringe rate of 34.75% was applied to the base labor costs (to account for vacation, holiday, sick leave, pension, insurance, etc.), and an overhead rate of 26.21% was applied to base labor (to account for facilities and management costs). The fringe rate was obtained from the New Jersey Office of Management and Budget (NJ OMB) and is applicable through mid-2007. The indirect rate represents the current rate used by DEP to estimate their indirect costs.

The final cost line item is the cost for vehicle equipment to support the MVC audits. MVC provided the base cost for audit support equipment. For consistency with the other annual cost calculations, we escalated these 2004 costs to 2007 assuming an escalation rate of 3 percent per year. We then calculated costs for each scenario based upon the number of staff required for each labor category.

Table 5-15 summarizes our analysis of MVC audit costs. Applying these cost factors to the MVC base salaries yields an MVC audit cost in 2007 for 21,094 audits of $6.2 million/year. Costs for MVC are $6.4 million per year for the future Hybrid scenario, $0.6 million per year for the CIF-only scenario, and $5.9 million/year for a PIF-only scenario. Costs are significantly lower for the CIF-only scenario because there are no PIF audits (3,500 PIF sites) to be conducted.

TABLE 5-15: ESTIMATE OF MVC AUDIT COSTS IN 2007

Labor Category	2004 Annual Salary	2007 Annual Salary	Current Hybrid Program for 2007 21,094 Audits		Future Scenario: Hybrid 21,766 Audits		Future Scenario: CIF-only 1,646 Audits		Future Scenario: PIF-only 20,120 Audits	
			Staff	**Cost**	**Staff**	**Cost**	**Staff**	**Cost**	**Staff**	**Cost**
Supervisor	$67,000	$73,213	4	292,851	4	292,851	1	73,213	4	292,851
Field Monitor 1	$52,000	$56,822	12	681,862	12	681,862	1	56,822	11	625,040
Field Monitor 2	$47,631	$52,048	48	2,498,289	50	2,602,384	4	208,191	46	2,394,193
Mechanic	$38,847	$42,449	6	254,695	6	254,695	1	42,449	6	254,695
Labor Subtotal			70	3,727,696	72	3,831,791	7	380,674	67	3,566,779
Fringe @34.75%				1,295,374		1,331,548		132,284		1,239,456
Indirect Costs @26.21%				977,029		1,004,313		99,775		934,853
Vehicle Equipment Support Costs				179,448		185,164		14,003		171,162
Total Audit Costs				**6,179,547**		**6,352,816**		**626,736**		**5,912,249**

5.2.2.4 DEP Audits

DEP conducts gas audits of the emission test equipment at CIFs and data audits for both the CIFs and the PIFs. We assumed this level of support would continue in the future.

For the DEP gas audits at CIFs, we obtained staffing levels and position types from DEP for conducting gas audits, representative of 2005. Table 5-16 contains a summary of the labor distribution and labor costs required to perform the DEP gas audits. Equipment costs (e.g., vehicles, laptops, etc.) were also estimated. These costs were then escalated to 2007. Total gas audit costs in 2007 for DEP were estimated at $1.0 million. These costs would apply to the Hybrid and CIF-only scenarios, because they both have the same number of CIFs. There are no DEP gas audit costs for the PIF-only scenario, because there are no CIFs.

For the DEP data audits at CIFs and PIFs, DEP estimated that three Principal Environmental Technicians are needed. The 2005 fully-loaded salary rate for this staff level is $80,480. Escalating this cost to 2007 yields a total cost of $0.3 million ($80,480 x 3 x escalation factor of 1.0609) for DEP to conduct the data audits. Data audits apply to all scenarios because data audits must be completed for all vehicle inspections, regardless of where the inspections are performed.

TABLE 5-16: COSTS FOR DEP TO CONDUCT CIF GAS AUDITS

Title	Approximate Current Salary	Fringe (34.75%)	Indirect (26.21%)	Annual Cost to State
LABOR COSTS (2005)				
Auditors (6)				
Principal Environmental Engineer	$62,000	$21,545	$16,250	$99,795
Principal Environmental Engineer	$62,000	$21,545	$16,250	$99,795
Senior Environmental Specialist	$52,000	$18,070	$13,629	$83,699
Supervising Environmental Technician	$55,000	$19,113	$14,416	$88,528
Principal Environmental Technician	$50,000	$17,375	$13,105	$80,480
Principal Environmental Technician	$50,000	$17,375	$13,105	$80,480
Managers and Support Staff (3)				
Senior Environmental Engineer	$60,000	$20,850	$15,726	$96,576
Supervising Environmental Specialist	$80,000	$27,800	$20,968	$128,768
Investigator 1	$70,000	$24,325	$18,347	$112,672
			Total Labor	**$870,794**
EQUIPMENT COSTS (2005)		**Capital Cost**		**Annual Cost**
6 Vehicles @ $25,000 each		$150,000		$30,000
6 Laptops @ $1,000 each		$6,000		$1,200
6 EASE OBD Simulators @ $4,000 each		$24,000		$4,800
Audit Gases and Supplies		$125,000		$25,000
		Total Equipment		**$61,000**
			Total Annual Labor and Operating	**$931,794**
			Escalation Factor to 2007 (at 3% per year for two years)	1.0609
			2007 DEP CIF Audit Costs	**$988,540**

5.2.2.5 Additional Mobile Inspection Teams (MITs)

In each of the scenarios we considered, we assumed that there would be six new mobile inspection teams (MITs) added to the program. From MVC, we obtained the costs to operate the three existing MITs. These costs are representative of 2005 and are summarized in Table 5-17. The 2005 cost for three MITs was $0.8 million. Escalating these costs to 2007 yields a cost of $0.9 million for the three existing MITs.

No new capital costs were assumed for these existing teams in 2007, because equipment had already been in place for some time. For the new MITs, new equipment would have to be purchased. The capital cost to outfit three new MITs was estimated at $321,609. Applying simple 5-year depreciation to this capital cost yields an annual equipment cost of $64,322 in 2007. Adding this equipment cost to the other labor and operating costs for three MITs yields a 2007 cost for three new MITs of $1.0 million. The 2007 cost for six new MITs and the three existing MITs was estimated at $2.8 million.

TABLE 5-17: COSTS FOR ADDITIONAL MOBILE INSPECTION TEAMS (MITs)

Cost Item				Annual Cost First 3 Teams	Annual Cost Next 3 Teams
INITIAL SETUP COSTS					
Mobile Team Van	3 @ $94,378 per unit		$283,134	Equipment	Recoup
Emission Analyzer	3 @ 12,825 per unit		$38,475	Already	Equipment
Equipment	3 @ 3,000 per unit		$9,000	Paid For	Cost in 5 years
Total Setup Cost			$321,609	**$0**	**$64,322**
VEHICLE MAINTENANCE COSTS					
Item	Quantity	Cost per unit			
Vehicle Maintenance	3	$7,200		$21,600	$21,600
Disposal Commodities	3	$2,000		$6,000	$6,000
Miscellaneous Accessories	3	$7,500		$22,500	$22,500
Total Equipment Cost				**$50,100**	**$50,100**
PERSONNEL COSTS					
Title	Number	Salary			
Safety Specialist 1 (I18)	9	39,830		358,470	358,470
Supervisor 3 (R20)	3	44,087		132,261	132,261
	12			**490,731**	**490,731**
Fringe Benefits (Total Salaries @ 34.75%)				170,529	170,529
Indirect Rate (Total Salaries @ 26.21%)				128,621	128,621
Clothing Allowance ($600 per employee)				7,200	7,200
Total Personnel Cost				**$797,081**	**$797,081**
Total Annual Cost (2005)				**$847,181**	**$911,502**
Costs for 3 Existing plus 3 additional MITs in 2007 (Costs Escalated at 3% per Year (from 2007)				**$898,774**	**$967,013**
Costs for 3 Existing plus 6 Additional MITs in 2007			**$2,832,800**		

5.2.2.6 PIF Costs

Under the current program, PIF costs are not controlled nor subsidized by the State. The fees charged by the PIFs are driven by market forces. The average inspection cost per vehicle at the PIFs in 2005 was $68.96, based upon audit data obtained from MVC. However, these costs reflect the ASM test that is required under the current program. The ASM test takes more time to conduct than the TSI test considered under our future scenarios and has more expensive equipment to operate and maintain.

For purposes of our analysis, we developed a procedure to estimate the costs that the PIFs would likely charge the motoring public in 2007 using a TSI test procedure instead of the ASM test. During the stakeholder process and the research phase of our study, an analysis of PIF costs was submitted to the State of New Jersey by a trade association representing the PIF community. That analysis provides a basis for calculating labor costs, equipment costs (both capital recovery and operation and maintenance) and facility costs to conduct the current ASM test. We evaluated the analysis and found it to be reasonable and complete.

The trade association analysis was used to estimate costs in 2007 for PIFs to conduct the TSI test by substituting new labor and equipment costs. As part of this estimate, we evaluated the test charge set to recover labor and equipment costs only (no profit), and the test charge assuming a profit would be generated for the PIFs.

In Table 5-18, we present our analysis of the 2007 PIF test fees for the OBD/TSI tests under a PIF-only scenario. We estimated the costs per bay to equip the facility with emission test equipment.

The table contains two columns that represent the low and high range of capital costs for equipment. The first section of the table identifies the business hours that the PIFs assumed were available for each bay each month.

The second section addresses capital equipment cost to conduct the OBD/TSI tests. The high range of costs is based on the full equipment cost provided in vendor quotes ($15,000 per facility). The low range of costs, provided for sensitivity, estimates the capital costs if discounts of as much as 50 percent are available (as indicated in our stakeholder meeting). This allowed us to bracket the potential PIF charges. Assuming a five-year equipment life, a lease/capital recovery factor was determined to calculate a monthly equipment cost over the five-year period. Additional costs for equipment were assumed based upon vendor data (maintenance - $175/month and consumables (e.g., gases) - $20/month). Total equipment costs, including capital recovery/lease, maintenance and consumables, range from $390/month to $585/month.

The cost of using the bay was also estimated, including utilities, insurance and rent. Labor cost (with benefits) was estimated assuming an ASE certified/New Jersey State trained inspector. All of these costs were provided in the trade association cost analysis, but reviewed by our project team and considered reasonable. Total monthly cost associated with the bay usage totaled $7,208. Dividing the bay usage cost by the billable hours per month for a bay yields an hourly rate of $53.63 for bay usage ($7,208 ÷ 134.4 hours).

TABLE 5-18: 2007 PIF COSTS UNDER PIF-ONLY, OBD/TSI SCENARIO

Parameter	Low Cost Range	High Cost Range
BUSINESS HOURS		
Hours / day	8	8
Days / week	6	6
Hours/week	48	48
Hours/month	192	192
Utilization factor	70%	70%
Billable hours / month	**134.4**	**134.4**
LEASE AND ADDITIONAL EQUIPMENT COSTS		
Equipment cost	$7,500.00	$15,000.00
Years of Term	5	5
Lease factor	0.0245	0.0245
Monthly lease payment	$183.75	$367.50
Sales tax (6%)	$11.03	$22.05
Total Lease Cost	**$194.78**	**$389.55**
Maintenance cost / month	$175.00	$175.00
Consumables / month	$20.00	$20.00
Calibration costs / month	$0.00	$0.00
Total lease/equip. cost/ month	**$389.78**	**$584.55**
AVERAGE OVERHEAD ONE SERVICE BAY/MONTH		
Utilities / insurance	$424.00	$424.00
Rent	$1,484.00	$1,484.00
Labor cost for ASE certified/NJ State trained/ETEP/Licensed inspector, with benefits	$5,300.00	$5,300.00
TOTAL Cost	$7,208.00	$7,208.00
Cost per billable hour	**$53.63**	**$53.63**
TIME PER INSPECTION		
Safety (minutes)	28	28
Emissions (minutes)	9	9
Misc (minutes)	8	8
Total Minutes	45	45
CALCULATIONS		
Overhead Test Cost (0.75 hours)	$40.22	$40.22
Monthly Equipment Costs/Bay	$389.78	$584.55
Number of bays (lanes)	3,500	3,500
Total # 2007 Tests (Initial only)	2,351,560	2,351,560
Cost for All Tests (1 year)	$110,957,852	$119,138,402
# Tests Per Bay (1 year)	672	672
Cost / test (no profit)	**$47.18**	**$50.66**
Cost / test @ 25% Profit Margin on Equipment	**$48.93**	**$53.27**
Gross Annual Profit Per Bay	**$1,169**	**$1,754**
PIF-Only Costs (OBD/TSI)	**$115,050,489**	**$125,276,177**
Inspection Time Sensitivity (Using 30 minutes/test instead of 45 minutes/test)		
Cost / test	$35.52	$39.87
Cost for All Tests	$83,521,389	$93,747,076

The time to conduct a test was estimated by the trade association to be 45 minutes. Therefore, the bay usage cost to conduct an emission and safety test was $40.22/test ($53.63 x 0.75 hours). To estimate total cost that the PIFs would charge without profit, we used the number of PIFs assumed in the program (3,500) and the number of initial tests assumed for a PIF-only program (2,351,560 initial tests). PIF test costs, including both bay usage costs and equipment costs, are calculated as follows:

$$\frac{(\$40.22/\text{test}) \times (2{,}351{,}560\ \text{tests/yr}) + (3{,}500\ \text{PIFs}) \times (\$585/\text{PIF/month}) \times (12\ \text{month/yr})}{2{,}351{,}560\ \text{tests/year}}$$

= $50.66/test to recoup bay and equipment costs for the OBD/TSI PIF-only scenario.

Assuming that a 25 percent profit on the equipment is reasonable, the monthly equipment charge would increase from $585 to $731 in the above equation and the per-test fee (with profit) would be $53.27. Applying this fee to all tests in 2007, the total cost to the motorist for a PIF-only OBD/TSI scenario would be $125.3 million ($53.27/test x 2,351,560 tests).

Sensitivity analyses were performed assuming the lower capital cost for the OBD/TSI equipment ($7,500). This yielded a cost to the motorist of $115.1 million. Therefore, reducing the capital cost of the equipment by 50 percent reduced the motorist cost by only about 8 percent.

We also performed sensitivity analyses on the time required to conduct an OBD/TSI and safety inspection. The previous analysis uses a total inspection time of 45 minutes. This was felt to be reasonable by some but too long by others. Assuming that the OBD/TSI test could be performed in 30 rather than 45 minutes, the cost to the motorist would be reduced from $115.1 to $83.5 million or by 27.5 percent. Therefore, this analysis is much more sensitive to the time assumed to conduct a complete inspection than it is to the cost of the equipment.

Table 5-19 summarizes the same analysis for the PIF-only OBD-only scenario. This assumes the same number of tests as in Table 5-18 but lower capital costs for OBD-only equipment.

Tables 5-20 and 5-21 contain similar analyses for the PIF portion of the Hybrid scenario. The analyses are the same as those presented in Tables 5-18 and 5-19, except that the number of initial tests at PIFs is significantly less (476,170 versus 2,351,560). As expected, this reduction in tests greatly affects the per test cost. Total costs to the motorists associated with PIF charges are less, however, since fewer tests are conducted at PIFs under this scenario.

TABLE 5-19: 2007 PIF COSTS UNDER PIF-ONLY, OBD-ONLY SCENARIO

Parameter	Low Cost Range	High Cost Range
BUSINESS HOURS		
Hours / day	8	8
Days / week	6	6
Hours/week	48	48
Hours/month	192	192
Utilization factor	70%	70%
Billable hours / month	**134.4**	**134.4**
LEASE AND ADDITIONAL EQUIPMENT COSTS		
Equipment cost	$2,500.00	$5,000.00
Years of Term	5	5
Lease factor	0.0245	0.0245
Monthly lease payment	$61.25	$122.50
Sales tax (6%)	$3.68	$7.35
Total Lease Cost	**$64.93**	**$129.85**
Maintenance cost / month	$50.00	$50.00
Consumables / month	$20.00	$20.00
Calibration costs / month	$0.00	$0.00
Total lease/equip. cost/ month	**$134.93**	**$199.85**
AVERAGE OVERHEAD ONE SERVICE BAY/MONTH		
Utilities / insurance	$424.00	$424.00
Rent	$1,484.00	$1,484.00
Labor cost (for ASE certified/NJ State trained/ETEP/Licensed inspector, with benefits	$5,300.00	$5,300.00
TOTAL Cost	$7,208.00	$7,208.00
Cost per billable hour	**$53.63**	**$53.63**
TIME PER INSPECTION		
Safety (minutes)	28	28
Emissions (minutes)	9	9
Misc (minutes)	8	8
Total Minutes	45	45
CALCULATIONS		
Overhead Test Cost (0.75 hours)	$40.22	$40.22
Monthly Equipment Costs/Bay	$134.93	$199.85
Number of bays (lanes)	3,500	3,500
Total # 2007 Tests (Initial only)	2,351,560	2,351,560
Cost for All Tests (1 year)	$100,254,152	$102,981,002
# Tests Per Bay (1 year)	672	672
Cost / test (no profit)	**$42.63**	**$43.79**
Cost / test @ 25% Profit Margin on Equipment	**$43.24**	**$44.68**
Gross Annual Profit Per Bay	**$405**	**$600**
PIF Only Costs (OBD/TSI)	**$101,670,864**	**$105,079,427**
Inspection Time Sensitivity (Using 30 minutes/test instead of 45 minutes/test)		
Cost / test	$29.83	$31.28
Cost for All Tests	$70,141,764	$73,550,326

TABLE 5-20: 2007 PIF COSTS UNDER HYBRID, OBD/TSI SCENARIO

Parameter	Low Cost Range	High Cost Range
BUSINESS HOURS		
Hours / day	8	8
Days / week	6	6
Hours/week	48	48
Hours/month	192	192
Utilization factor	70%	70%
Billable hours / month	**134.4**	**134.4**
LEASE AND ADDITIONAL EQUIPMENT COSTS		
Equipment cost	$7,500.00	$15,000.00
Years of Term	5	5
Lease factor	0.0245	0.0245
Monthly lease payment	$183.75	$367.50
Sales tax (6%)	$11.03	$22.05
Total Lease Cost	**$194.78**	**$389.55**
Maintenance cost / month	$175.00	$175.00
Consumables / month	$20.00	$20.00
Calibration costs / month	$0.00	$0.00
Total lease/equip. cost/ month	**$389.78**	**$584.55**
AVERAGE OVERHEAD ONE SERVICE BAY/MONTH		
Utilities / insurance	$424.00	$424.00
Rent	$1,484.00	$1,484.00
Labor cost (for ASE certified/NJ State trained/ETEP/Licensed inspector, with benefits	$5,300.00	$5,300.00
TOTAL Cost	$7,208.00	$7,208.00
Cost per billable hour	**$53.63**	**$53.63**
TIME PER INSPECTION		
Safety (minutes)	28	28
Emissions (minutes)	9	9
Misc (minutes)	8	8
Total Minutes	45	45
CALCULATIONS		
Overhead Test Cost (0.75 hours)	$40.22	$40.22
Monthly Equipment Costs/Bay	$389.78	$584.55
Number of bays (lanes)	3,500	3,500
Total # 2007 Tests (Initial only)	476,170	476,170
Cost for All Tests (1 year)	$35,523,638	$43,704,188
# Tests Per Bay (1 year)	136	136
Cost / test (no profit)	**$74.60**	**$91.78**
Cost / test @ 25% Profit Margin on Equipment	**$83.20**	**$104.67**
Gross Annual Profit Per Bay	**$1,169**	**$1,754**
PIF Only Costs (OBD/TSI)	**$39,616,275**	**$49,841,963**
Inspection Time Sensitivity (Using 30 minutes/test instead of 45 minutes/test)		
Cost / test	$61.71	$72.45
Cost for All Tests	$29,384,682	$34,497,525

TABLE 5-21: 2007 PIF COSTS UNDER HYBRID, OBD-ONLY SCENARIO

Parameter	Low Cost Range	High Cost Range
BUSINESS HOURS		
Hours / day	8	8
Days / week	6	6
Hours/week	48	48
Hours/month	192	192
Utilization factor	70%	70%
Billable hours / month	**134.4**	**134.4**
LEASE AND ADDITIONAL EQUIPMENT COSTS		
Equipment cost	$2,500.00	$5,000.00
Years of Term	5	5
Lease factor	0.0245	0.0245
Monthly lease payment	$61.25	$122.50
Sales tax (6%)	$3.68	$7.35
Total Lease Cost	**$64.93**	**$129.85**
Maintenance cost / month	$50.00	$50.00
Consumables / month	$20.00	$20.00
Calibration costs / month	$0.00	$0.00
Total lease/equip. cost/ month	**$134.93**	**$199.85**
AVERAGE OVERHEAD ONE SERVICE BAY/MONTH		
Utilities / insurance	$424.00	$424.00
Rent	$1,484.00	$1,484.00
Labor cost (for ASE certified/NJ State trained/ETEP/Licensed inspector, with benefits	$5,300.00	$5,300.00
TOTAL Cost	$7,208.00	$7,208.00
Cost per billable hour	**$53.63**	**$53.63**
TIME PER INSPECTION		
Safety (minutes)	28	28
Emissions (minutes)	9	9
Misc (minutes)	8	8
Total Minutes	45	45
CALCULATIONS		
Overhead Test Cost (0.75 hours)	$40.22	$40.22
Monthly Equipment Costs/Bay	$134.93	$199.85
Number of bays (lanes)	3,500	3,500
Total # 2007 Tests (Initial only)	476,170	476,170
Cost for All Tests (1 year)	$24,819,938	$27,546,788
# Tests Per Bay (1 year)	136	136
Cost / test (no profit)	**$52.12**	**$57.85**
Cost / test @ 25% Profit Margin on Equipment	**$55.10**	**$62.26**
Gross Annual Profit Per Bay	**$405**	**$600**
PIF Only Costs (OBD/TSI)	**$26,236,650**	**$29,645,213**
Inspection Time Sensitivity (Using 30 minutes/test instead of 45 minutes/test)		
Cost / test	$47.66	$51.24
Cost for All Tests	$22,694,869	$24,399,150

5.2.2.7 Contractor-run versus State-Run CIF Lanes

An important aspect of our analysis was to estimate labor costs in 2007 for CIF operations, whether run by State or contractor personnel. The first approach that we considered was to extrapolate a per test fee in 2007 based upon the current contractor fees charged to New Jersey. However, because the tail pipe test procedure to be performed under the new contract will likely be different (TSI vs. ASM), and the simpler less costly OBD test will have a larger impact on the vehicle fleet, this simple extrapolation did not seem reasonable. A more realistic approach is to develop bottom-up labor staff estimates upon which we could apply labor costs. To facilitate comparison, we decided to use the same labor staff estimates for both the State- and contractor-run scenarios, and apply the appropriate labor rates for State versus contractor employees.

To develop this bottom-up estimate of staff requirements, we first started with management staff to operate each facility. Based upon our experience, we assumed one station manager for each of the 31 facilities. If State employees were used, the station manager position would be filled by a Supervisory I employee for large stations (six or eight lanes) and by a Supervisory II employee for smaller stations (one to five lanes).

We also determined that one assistant station manager was needed for each of the smaller stations (the 20 facilities with five inspection lanes or less), and two assistant managers were needed for each of the six and eight lane stations. This results in a total of 42 assistant station managers. If State employees were used, the 42 assistant station manager positions would be filled by Supervisory III employees for all stations.

Next, we estimated the number of inspection technicians needed on a per lane basis. Based upon an audit of CIFs at the end of 2005 and our experience, we estimated that four technicians per lane are required to conduct the current ASM safety/emissions tests. Under any new scenario safety tests would continue to be conducted in all lanes. But staffing could be reduced for the emission tests because the OBD/TSI test requires less manpower (no dynamometer component) and the OBD-only test has no tail-pipe test component.

Based on our experience with states such as Oregon and Delaware that have OBD/TSI test programs, we estimated that only three staff per lane would be required for the OBD/TSI scenario during non-peak periods. Four technicians per lane would be needed for peak periods. To be conservative, we used an average of 3.5 technicians to run an OBD/TSI lane.

For the OBD-only scenario, we estimated only two technicians per lane during non-peak periods would be needed because there is no tail pipe test component. Three technicians per lane would be needed for peak periods. To be conservative, we used an average of 2.5 technicians to run a single OBD-only lane.

As mentioned in previous sections, we used 105 lanes for the Hybrid scenario and 124 lanes for the CIF-only scenario for weekday operations. The total CIF staff assumed for each scenario is summarized in Table 5-22, including assumptions for labor mix between senior lane techs, lane techs, associate lane techs, and part-time staff. Table 5-22 also shows the labor mix by State labor category for the scenario where the CIFs are operated by State employees.

TABLE 5-22: ESTIMATED CIF STAFF FOR WEEKDAY OPERATIONS

Labor Category	Hybrid OBD/TSI Scenario	Hybrid OBD-Only Scenario	CIF-Only OBD/TSI Scenario	CIF-Only OBD-Only Scenario
Number of lanes	105 total 58 OBD/TSI 47 OBD	105 total 0 OBD/TSI 105 OBD	124 total 68 OBD/TSI 56 OBD	124 total 0 OBD/TSI 124 OBD
Contractor Staff:				
Station Manager (one per station)	31	31	31	31
Assistant Manager (two per station for 6 or 8 lane stations)	22	22	22	22
Assistant Manager (one per station for 1-5 lane stations)	20	20	20	20
Senior Lane Tech (1 per lane for OBD/TSI) (1 per lane for OBD-only)	105	105	124	124
Lane Tech (1 per lane for OBD/TSI) (1 per lane for OBD-only)	105	105	124	124
Associate Lane Tech (1.5 per lane for OBD/TSI) (0.5 per lane for OBD-only)	110	53	130	62
Part-Time Tech (1 per station)	31	31	31	31
Total Contractor Staff	**424**	**367**	**482**	**414**
State Employees				
Supervisory I (one per station for 6 or 8 lane station)	11	11	11	11
Supervisory II (one per station for 1-5 lane station)	20	20	20	20
Supervisory III (two per station for 6 or 8 lane station)	22	22	22	22
Supervisory III (one per station for 1-5 lane station)	20	20	20	20
Safety Specialist I (1.5 per lane for OBD/TSI) (1 per lane for OBD-only)	134	105	158	124
Safety Specialist II (2 per lane for OBD/TSI) (1.5 per lane for OBD-only)	186	158	220	186
Part-time Specialist II (1 per station)	31	31	31	31
Total State Employees	**424**	**367**	**482**	**414**

In addition to base hours for weekday operations, we assumed 10 hours per week of overtime for Saturday work for a subset of the total lanes (80 lanes for the Hybrid scenario and 94 lanes for the CIF-only scenario). Time and one-half rates were applied to overtime for lane staff and assistant station managers. Straight time overtime was assumed for the station managers (considered exempt positions).

In addition to staff that manage and operate individual CIFs, we also estimated the staffing requirements for the broader management team necessary to manage overall CIF operations. Based on our experience, we assumed a need for a Program Manager, Deputy Program Manager, Finance Manager, Human Resources Manager and Safety Manager. We assumed three Regional Managers, each responsible for about 10 CIFs. We assumed both a Training Manager and an IT Manager with some support staff, and a call center (Manager and 12 staff) to field calls for appointments, questions, and complaints. This level of management support was assumed to be the same independent of whether the CIFs were run by contractors or State employees.

Once the labor requirements were defined, we developed separate annual wage rates for the contractor-run scenario and the State-run scenario. State employee salaries by labor category were provided by the MVC. To obtain the total loaded labor cost for CIF operations staff, we applied the same State fringe rate (34.75%) and indirect rate (26.21%) as in previous calculations.

For contractor staff, the base rates for station managers and assistant station managers were developed based upon our experience. Base rates for 2004 were escalated to 2007 at 3 percent per year. Base salary rates for the contractor lane technician staff were based upon 2004 collective bargaining agreement rates obtained from MVC. All lane staff rates were escalated per the terms of the existing Collective Bargaining Agreement through 2006 (the end of the current agreement) and then escalated to 2007 at 4 percent per year (same increase as for 2006 in the Collective Bargaining Agreement).

We estimated the contractor mark-up on the base labor costs to estimate fully-loaded labor costs comparable to the costs calculated for the State. Contractor mark-ups typically contain fringe, overhead, general and administrative costs and profit. These rates are proprietary to contractors and it is difficult to obtain actual rates for each of these cost factors. Total mark-up is much easier to estimate. Based upon our experience with pricing jobs similar to this, contractors normally apply lower mark-ups for work performed on the customer’s site, like the lane staff, where office space and staff business needs are supplied by the customer, compared to mark-ups for work performed at the contractor’s office.

On-site mark-ups can range from as low as 1.5 times base labor to 2.4 times base labor. Off-site mark-ups can range from 2.5 to 3.5 times base labor. Variations are due to many factors and can include things like fringe benefits offered by different companies, office space costs, and profit margins. Most of the labor associated with these scenarios is on-site and the bid process, based on recent bids in other States, is expected to be quite competitive. Therefore, we have chosen to use a markup in the lower end of the range. Because off-site labor is a much smaller component of scenario costs, we have chosen to use a mid-range mark-up for off-site labor. For on-site labor we used a 1.75 multiplier to estimate all mark-up costs for on-site activities located at the CIFs and a 3.0 multiplier to apply to off-site activities (management staff).

Total labor costs were then calculated combining the staffing levels for each scenario and the 2007 labor rates. Tables 5-23 through 5-30 presents the details of the cost analysis for the labor needed to run the CIF lanes under each of the eight scenarios analyzed. The bottom-line costs for each of the eight scenarios are as follows:

Labor Cost for CIF Operations (Million $/year)	CIF Operations	Program Type	Test Type
$38.5	Contractor-run	Hybrid	OBD/TSI
$36.6	State-run	Hybrid	OBD/TSI
$43.2	Contractor-run	CIF-only	OBD/TSI
$41.2	State-run	CIF-only	OBD/TSI
$34.3	Contractor-run	Hybrid	OBD-only
$31.8	State-run	Hybrid	OBD-only
$38.3	Contractor-run	CIF-only	OBD-only
$35.7	State-run	CIF-only	OBD-only

5.2.2.8 Salvage Value of CIFs

Under a PIF-only scenario, the State of New Jersey would no longer need the CIFs, so an analysis was made of the "salvage value" or monetary benefit to the State of selling the CIFs. To conduct this analysis, we contacted MVC to determine which of the 31 CIFs they could/would sell. According to MVC, seven of the CIFs are co-located with other MVC activities; therefore, MVC could not dispose of those facilities. Another five facilities are located at sites where MVC already has plans to build/expand other activities; therefore, MVC could not dispose of those facilities. Another 10 sites were identified where MVC or other State agencies had possible future use; therefore, the State could not dispose of those facilities.

Thus, there are only nine existing CIFs that could be sold. The actual real estate value for these nine sites could vary significantly given their location, condition of the property, and any environmental liabilities. A detailed real estate evaluation was outside the scope of this study. For analysis purposes we assumed that each facility could be sold for $1 million, totaling $9 million to the State. Because we were evaluating costs over a five year period, $1.8 million was estimated as the annual impact of disposing of these nine sites.

5.2.2.9 Public Outreach

Public outreach costs were assumed to be one percent of total costs. Thus, the cost estimate for public outreach for each scenario varies depending on the estimated total costs for that scenario.

TABLE 5-23: ESTIMATED COST FOR CIF OPERATIONS CONTRACTOR-RUN, HYBRID, OBD/TSI SCENARIO

CIF LANE STAFF REGULAR HOURS			
Assumptions:	Average Weekday Operating Lanes: 105 total, 58 OBD/TSI, 47 OBD-only		
Labor Category	# of Staff	Annual Wage Rate	Cost
Station Manager	31	$54,600	$1,692,600
Assistant Manager	42	$39,700	$1,667,400
Senior Lane Tech	105	$41,499	$4,357,395
Lane Technician	105	$36,774	$3,861,270
Associate Lane Tech	110	$32,050	$3,528,085
Part-time Tech	31	$13,510	$418,810
	424	Raw Labor Cost:	$15,525,560
		On-site Multiplier (includes raw labor, fringe, overhead, G&A, and fee):	1.75
		Fully Loaded Labor Costs for CIF Lane Staff:	**$27,169,729**
CIF LANE STAFF OVERTIME/SATURDAY			
Assumptions:	Average Saturday Operating Lanes: 80 total, 44 OBD/TSI, 36 OBD-only 520 hours per year (52 Saturdays @ 10 hours/day)		
Labor Category	# of Staff	Annual Wages for Saturday Work	Cost
Station Manager	31	$13,650	$423,150
Assistant Manager	31	$14,888	$461,513
Senior Lane Tech	80	$15,562	$1,244,970
Lane Technician	80	$13,790	$1,103,220
Associate Lane Tech	84	$12,019	$1,008,024
Part-time Tech	0	$5,066	$0
	306	Raw Labor Cost:	$4,240,877
		On-site Multiplier (includes raw labor, fringe, overhead, G&A, and fee):	1.75
		Fully Loaded Labor Costs for CIF Lane Staff:	**$7,421,534**
MANAGEMENT TEAM			
Labor Category	# of Staff		Cost
Program Manager	1		$110,000
Deputy Prog. Mgr.	1		$75,000
Finance Manager	1		$90,000
HR Manager	1		$75,000
Regional Managers	3		$195,000
Training staff	2		$125,000
IT staff	3		$170,000
Safety Manager	1		$50,000
Call Center staff	13		$410,000
		Raw Labor Costs for Management Staff:	$1,300,000
		Off-site Multiplier (includes raw labor, fringe, overhead, G&A, and fee):	3.00
		Fully Loaded Labor Costs for Management Staff:	**$3,900,000**
		Fully Loaded Costs for Regular, Overtime, and Management Staff:	**$38,491,264**

TABLE 5-24: ESTIMATED COST FOR CIF OPERATIONS
STATE-RUN, HYBRID, OBD/TSI SCENARIO

CIF LANE STAFF REGULAR HOURS			
Assumptions:	Average Weekday Operating Lanes: 105 total, 58 OBD/TSI, 47 OBD-only		
Labor Category	# of Staff	Annual Wage Rate	Cost
Supervisor I	11	$58,647	$645,117
Supervisor II	20	$53,773	$1,075,460
Supervisor III	42	$44,809	$1,881,978
Safety Specialist I	134	$42,371	$5,668,830
Safety Specialist II	186	$37,045	$6,901,125
Part Time Spec. II	31	$18,523	$574,198
	424	Raw Labor Cost:	$16,746,707
		Fringe @ 34.75% of Raw Labor:	$5,819,481
		Indirect @ 26.21% of Raw Labor:	$4,389,312
		Fully Loaded Labor Costs for CIF Lane Staff:	**$26,955,500**
CIF LANE STAFF OVERTIME/SATURDAY			
Assumptions:	Average Saturday Operating Lanes: 80 total, 44 OBD/TSI, 36 OBD-only		
	520 hours per year (52 Saturdays @ 10 hours/day)		
Labor Category	# of Staff	Annual Wages for Saturday Work	Cost
Supervisor I	31	$14,662	$161,279
Supervisor II	31	$20,165	$403,298
Supervisor III	80	$16,803	$520,905
Safety Specialist I	80	$15,889	$1,619,666
Safety Specialist II	84	$13,892	$1,971,750
Part Time Spec. II	0	$6,946	$0
	306	Raw Labor Cost:	$4,676,897
		Fringe @ 34.75% of Raw Labor:	$1,625,222
		Indirect @ 26.21% of Raw Labor:	$1,225,815
		Fully Loaded Labor Costs for CIF Lane Staff:	**$7,527,933**
MANAGEMENT TEAM (Additional MVC Staff Needed to Manage State CIF Staff)			
Labor Category	# of Staff		Cost
Program Manager	1		$110,000
Deputy Prog. Mgr.	1		$75,000
Finance Manager	1		$90,000
HR Manager	1		$75,000
Regional Managers	3		$195,000
Training staff	2		$125,000
IT staff	3		$170,000
Safety Manager	1		$50,000
Call Center staff	13		$410,000
		Raw Labor Costs for Management Staff:	$1,300,000
		Fringe @ 34.75% of Raw Labor:	$451,750
		Indirect @ 26.21% of Raw Labor:	$340,730
		Fully Loaded Labor Costs for CIF Lane Staff:	**$2,092,480**
		Fully Loaded Costs for Regular, Overtime, and Management Staff:	**$36,575,913**

TABLE 5-25: ESTIMATED COST FOR CIF OPERATIONS CONTRACTOR-RUN, CIF-ONLY, OBD/TSI SCENARIO

CIF LANE STAFF REGULAR HOURS			
Assumptions:	Average Weekday Operating Lanes: 124 total, 68 OBD/TSI, 56 OBD-only		
Labor Category	# of Staff	Annual Wage Rate	Cost
Station Manager	31	$54,600	$1,692,600
Assistant Manager	42	$39,700	$1,667,400
Senior Lane Tech	124	$41,499	$5,145,876
Lane Technician	124	$36,774	$4,559,976
Associate Lane Tech	130	$32,050	$4,166,500
Part-time Tech	31	$13,510	$418,810
	482	Raw Labor Cost:	$17,651,162
		On-site Multiplier (includes raw labor, fringe, overhead, G&A, and fee):	1.75
		Fully Loaded Labor Costs for CIF Lane Staff:	**$30,889,534**
CIF LANE STAFF OVERTIME/SATURDAY			
Assumptions:	Average Saturday Operating Lanes: 94 total, 52 OBD/TSI, 42 OBD-only 520 hours per year (52 Saturdays @ 10 hours/day)		
Labor Category	# of Staff	Annual Wages for Saturday Work	Cost
Station Manager	31	$13,650	$423,150
Assistant Manager	31	$14,888	$461,513
Senior Lane Tech	94	$15,562	$1,462,840
Lane Technician	94	$13,790	$1,296,284
Associate Lane Tech	99	$12,019	$1,184,428
Part-time Tech	0	$5,066	$0
	349	Raw Labor Cost:	$4,828,214
		On-site Multiplier (includes raw labor, fringe, overhead, G&A, and fee):	1.75
		Fully Loaded Labor Costs for CIF Lane Staff:	**$8,449,375**
MANAGEMENT TEAM			
Labor Category	# of Staff		Cost
Program Manager	1		$110,000
Deputy Prog. Mgr.	1		$75,000
Finance Manager	1		$90,000
HR Manager	1		$75,000
Regional Managers	3		$195,000
Training staff	2		$125,000
IT staff	3		$170,000
Safety Manager	1		$50,000
Call Center staff	13		$410,000
		Raw Labor Costs for Management Staff:	$1,300,000
		Off-site Multiplier (includes raw labor, fringe, overhead, G&A, and fee):	3.00
		Fully Loaded Labor Costs for Management Staff:	**$3,900,000**
		Fully Loaded Costs for Regular, Overtime, and Management Staff:	**$43,238,908**

TABLE 5-26: ESTIMATED COST FOR CIF OPERATIONS STATE-RUN, CIF-ONLY, OBD/TSI SCENARIO

CIF LANE STAFF REGULAR HOURS			
Assumptions:	Average Weekday Operating Lanes: 124 total, 68 OBD/TSI, 56 OBD-only		
Labor Category	# of Staff	Annual Wage Rate	Cost
Supervisor I	11	$58,647	$645,117
Supervisor II	20	$53,773	$1,075,460
Supervisor III	42	$44,809	$1,881,978
Safety Specialist I	158	$42,371	$6,694,618
Safety Specialist II	220	$37,045	$8,149,900
Part Time Spec. II	31	$18,523	$574,198
	482	Raw Labor Cost:	$19,021,271
		Fringe @ 34.75% of Raw Labor:	$6,609,891
		Indirect @ 26.21% of Raw Labor:	$4,985,475
		Fully Loaded Labor Costs for CIF Lane Staff:	**$30,616,637**
CIF LANE STAFF OVERTIME/SATURDAY			
Assumptions:	Average Saturday Operating Lanes: 94 total, 52 OBD/TSI, 42 OBD-only		
	520 hours per year (52 Saturdays @ 10 hours/day)		
Labor Category	# of Staff	Annual Wages for Saturday Work	Cost
Supervisor I	11	$14,662	$161,279
Supervisor II	20	$20,165	$403,298
Supervisor III	31	$16,803	$520,905
Safety Specialist I	120	$15,889	$1,903,107
Safety Specialist II	167	$13,892	$2,316,806
Part Time Spec. II	0	$6,946	$0
	349	Raw Labor Cost:	$5,305,395
		Fringe @ 34.75% of Raw Labor:	$1,843,625
		Indirect @ 26.21% of Raw Labor:	$1,390,544
		Fully Loaded Labor Costs for CIF Lane Staff:	**$8,539,563**
MANAGEMENT TEAM (Additional MVC Staff Needed to Manage State CIF Staff)			
Labor Category	# of Staff		Cost
Program Manager	1		$110,000
Deputy Prog. Mgr.	1		$75,000
Finance Manager	1		$90,000
HR Manager	1		$75,000
Regional Managers	3		$195,000
Training staff	2		$125,000
IT staff	3		$170,000
Safety Manager	1		$50,000
Call Center staff	13		$410,000
		Raw Labor Costs for Management Staff:	$1,300,000
		Fringe @ 34.75% of Raw Labor:	$451,750
		Indirect @ 26.21% of Raw Labor:	$340,730
		Fully Loaded Labor Costs for CIF Lane Staff:	**$2,092,480**
		Fully Loaded Costs for Regular, Overtime, and Management Staff:	**$41,248,680**

TABLE 5-27: ESTIMATED COST FOR CIF OPERATIONS CONTRACTOR-RUN, HYBRID, OBD-ONLY SCENARIO

CIF LANE STAFF REGULAR HOURS			
Assumptions:	Average Weekday Operating Lanes: 105 total, 0 OBD/TSI, 105 OBD-only		
Labor Category	# of Staff	Annual Wage Rate	Cost
Station Manager	31	$54,600	$1,692,600
Assistant Manager	42	$39,700	$1,667,400
Senior Lane Tech	105	$41,499	$4,357,395
Lane Technician	105	$36,774	$3,861,270
Associate Lane Tech	53	$32,050	$1,682,625
Part-time Tech	31	$13,510	$418,810
	367	Raw Labor Cost:	$13,680,100
		On-site Multiplier (includes raw labor, fringe, overhead, G&A, and fee):	1.75
		Fully Loaded Labor Costs for CIF Lane Staff:	**$23,940,175**
CIF LANE STAFF OVERTIME/SATURDAY			
Assumptions:	Average Saturday Operating Lanes: 80 total, 0 OBD/TSI, 80 OBD-only 520 hours per year (52 Saturdays @ 10 hours/day)		
Labor Category	# of Staff	Annual Wages for Saturday Work	Cost
Station Manager	31	$13,650	$423,150
Assistant Manager	31	$14,888	$461,513
Senior Lane Tech	80	$15,562	$1,244,970
Lane Technician	80	$13,790	$1,103,220
Associate Lane Tech	40	$12,019	$480,750
Part-time Tech	0	$5,066	$0
	262	Raw Labor Cost:	$3,713,603
		On-site Multiplier (includes raw labor, fringe, overhead, G&A, and fee):	1.75
		Fully Loaded Labor Costs for CIF Lane Staff:	**$6,498,804**
MANAGEMENT TEAM			
Labor Category	# of Staff		Cost
Program Manager	1		$110,000
Deputy Prog. Mgr.	1		$75,000
Finance Manager	1		$90,000
HR Manager	1		$75,000
Regional Managers	3		$195,000
Training staff	2		$125,000
IT staff	3		$170,000
Safety Manager	1		$50,000
Call Center staff	13		$410,000
		Raw Labor Costs for Management Staff:	$1,300,000
		Off-site Multiplier (includes raw labor, fringe, overhead, G&A, and fee):	3.00
		Fully Loaded Labor Costs for Management Staff:	**$3,900,000**
		Fully Loaded Costs for Regular, Overtime, and Management Staff:	**$34,338,979**

TABLE 5-28: ESTIMATED COST FOR CIF OPERATIONS
STATE-RUN, HYBRID, OBD-ONLY SCENARIO

CIF LANE STAFF REGULAR HOURS			
Assumptions:	Average Weekday Operating Lanes: 105 total, 0 OBD/TSI, 105 OBD-only		
Labor Category	# of Staff	Annual Wage Rate	Cost
Supervisor I	11	$58,647	$645,117
Supervisor II	20	$53,773	$1,075,460
Supervisor III	42	$44,809	$1,881,978
Safety Specialist I	105	$42,371	$4,448,955
Safety Specialist II	158	$37,045	$5,834,588
Part Time Spec. II	31	$18,523	$574,198
	367	Raw Labor Cost:	$14,460,295
		Fringe @ 34.75% of Raw Labor:	$5,024,953
		Indirect @ 26.21% of Raw Labor:	$3,790,043
		Fully Loaded Labor Costs for CIF Lane Staff:	**$23,275,291**
CIF LANE STAFF OVERTIME/SATURDAY			
Assumptions:	Average Saturday Operating Lanes: 80 total, 0 OBD/TSI, 80 OBD-only		
	520 hours per year (52 Saturdays @ 10 hours/day)		
Labor Category	# of Staff	Annual Wages for Saturday Work	Cost
Supervisor I	11	$14,662	$161,279
Supervisor II	20	$20,165	$403,298
Supervisor III	31	$16,803	$520,905
Safety Specialist I	80	$15,889	$1,271,130
Safety Specialist II	120	$13,892	$1,667,025
Part Time Spec. II	0	$6,946	$0
	262	Raw Labor Cost:	$4,023,636
		Fringe @ 34.75% of Raw Labor:	$1,398,214
		Indirect @ 26.21% of Raw Labor:	$1,054,595
		Fully Loaded Labor Costs for CIF Lane Staff:	**$6,476,445**
MANAGEMENT TEAM (Additional MVC Staff Needed to Manage State CIF Staff)			
Labor Category	# of Staff		Cost
Program Manager	1		$110,000
Deputy Prog. Mgr.	1		$75,000
Finance Manager	1		$90,000
HR Manager	1		$75,000
Regional Managers	3		$195,000
Training staff	2		$125,000
IT staff	3		$170,000
Safety Manager	1		$50,000
Call Center staff	13		$410,000
		Raw Labor Costs for Management Staff:	$1,300,000
		Fringe @ 34.75% of Raw Labor:	$451,750
		Indirect @ 26.21% of Raw Labor:	$340,730
		Fully Loaded Labor Costs for CIF Lane Staff:	**$2,092,480**
		Fully Loaded Costs for Regular, Overtime, and Management Staff:	**$31,844,216**

TABLE 5-29: ESTIMATED COST FOR CIF OPERATIONS
CONTRACTOR-RUN, CIF-ONLY, OBD-ONLY SCENARIO

CIF LANE STAFF REGULAR HOURS			
Assumptions:	Average Weekday Operating Lanes: 124 total, 0 OBD/TSI, 124 OBD-only		
Labor Category	# of Staff	Annual Wage Rate	Cost
Station Manager	31	$54,600	$1,692,600
Assistant Manager	42	$39,700	$1,667,400
Senior Lane Tech	124	$41,499	$5,145,876
Lane Technician	124	$36,774	$4,559,976
Associate Lane Tech	62	$32,050	$1,987,100
Part-time Tech	31	$13,510	$418,810
	414	Raw Labor Cost:	$15,471,762
		On-site Multiplier (includes raw labor, fringe, overhead, G&A, and fee):	1.75
		Fully Loaded Labor Costs for CIF Lane Staff:	**$27,075,584**
CIF LANE STAFF OVERTIME/SATURDAY			
Assumptions:	Average Saturday Operating Lanes: 94 total, 0 OBD/TSI, 94 OBD-only 520 hours per year (52 Saturdays @ 10 hours/day)		
Labor Category	# of Staff	Annual Wages for Saturday Work	Cost
Station Manager	31	$13,650	$423,150
Assistant Manager	31	$14,888	$461,513
Senior Lane Tech	94	$15,562	$1,462,840
Lane Technician	94	$13,790	$1,296,284
Associate Lane Tech	47	$12,019	$564,881
Part-time Tech	0	$5,066	$0
	297	Raw Labor Cost:	$4,208,667
		On-site Multiplier (includes raw labor, fringe, overhead, G&A, and fee):	1.75
		Fully Loaded Labor Costs for CIF Lane Staff:	**$7,365,167**
MANAGEMENT TEAM			
Labor Category	# of Staff		Cost
Program Manager	1		$110,000
Deputy Prog. Mgr.	1		$75,000
Finance Manager	1		$90,000
HR Manager	1		$75,000
Regional Managers	3		$195,000
Training staff	2		$125,000
IT staff	3		$170,000
Safety Manager	1		$50,000
Call Center staff	13		$410,000
		Raw Labor Costs for Management Staff:	$1,300,000
		Off-site Multiplier (includes raw labor, fringe, overhead, G&A, and fee):	3.00
		Fully Loaded Labor Costs for Management Staff:	**$3,900,000**
		Fully Loaded Costs for Regular, Overtime, and Management Staff:	**$38,340,751**

TABLE 5-30: ESTIMATED COST FOR CIF OPERATIONS STATE-RUN, CIF-ONLY, OBD-ONLY SCENARIO

CIF LANE STAFF REGULAR HOURS			
Assumptions:	Average Weekday Operating Lanes: 124 total, 0 OBD/TSI, 124 OBD-only		
Labor Category	# of Staff	Annual Wage Rate	Cost
Supervisor I	11	$58,647	$645,117
Supervisor II	20	$53,773	$1,075,460
Supervisor III	42	$44,809	$1,881,978
Safety Specialist I	124	$42,371	$5,254,004
Safety Specialist II	186	$37,045	$6,890,370
Part Time Spec. II	31	$18,523	$574,198
	414	Raw Labor Cost:	$16,321,127
		Fringe @ 34.75% of Raw Labor:	$5,671,591
		Indirect @ 26.21% of Raw Labor:	$4,277,767
		Fully Loaded Labor Costs for CIF Lane Staff:	**$26,270,485**
CIF LANE STAFF OVERTIME/SATURDAY			
Assumptions:	Average Saturday Operating Lanes: 94 total, 0 OBD/TSI, 94 OBD-only 520 hours per year (52 Saturdays @ 10 hours/day)		
Labor Category	# of Staff	Annual Wages for Saturday Work	Cost
Supervisor I	11	$14,662	$161,279
Supervisor II	20	$20,165	$403,298
Supervisor III	31	$16,803	$520,905
Safety Specialist I	94	$15,889	$1,493,578
Safety Specialist II	141	$13,892	$1,958,754
Part Time Spec. II	0	$6,946	$0
	297	Raw Labor Cost:	$4,537,814
		Fringe @ 34.75% of Raw Labor:	$1,576,890
		Indirect @ 26.21% of Raw Labor:	$1,189,361
		Fully Loaded Labor Costs for CIF Lane Staff:	**$7,304,065**
MANAGEMENT TEAM (Additional MVC Staff Needed to Manage State CIF Staff)			
Labor Category	# of Staff		Cost
Program Manager	1		$110,000
Deputy Prog. Mgr.	1		$75,000
Finance Manager	1		$90,000
HR Manager	1		$75,000
Regional Managers	3		$195,000
Training staff	2		$125,000
IT staff	3		$170,000
Safety Manager	1		$50,000
Call Center staff	13		$410,000
		Raw Labor Costs for Management Staff:	$1,300,000
		Fringe @ 34.75% of Raw Labor:	$451,750
		Indirect @ 26.21% of Raw Labor:	$340,730
		Fully Loaded Labor Costs for CIF Lane Staff:	**$2,092,480**
		Fully Loaded Costs for Regular, Overtime, and Management Staff:	**$35,667,030**

5.2.2.10 DEP I/M Related Costs

In addition to audit costs, DEP incurs I/M related costs associated with staff needed to manage the program, facility maintenance costs, contracts, and other costs as follows:

- $1.24 million for staff (includes salaries, fringe, and indirect costs)
- $1.25 million for remote sensing contract for program evaluation
- $0.09 million for other program support contracts
- $0.28 million for apportioned Division of Air Quality assessments
- <u>$0.03</u> million for repairs, snow removal and janitorial and landscaping services
- $2.89 million total for DEP non-audit program costs

These costs apply to all scenarios.

5.2.2.11 MVC Backend Costs

In addition to audit costs, MVC incurs I/M related costs associated with staff needed to manage the program, materials and supplies, outside services, and maintenance/rent. These costs are estimated by MVC to be $12.0 million per year. These costs apply to all scenarios.

5.2.2.12 MVC CIF ODCs

MVC incurs the following annual other direct costs associated with CIF operation:

- $0.18 million for printing and copiers
- $1.30 million for rent, fuel, and utilities
- $0.33 million for three leased sites
- <u>$1.50</u> million for repairs, snow removal and janitorial and landscaping services
- $3.31 million total for MVC CIF other direct costs

These costs apply to all scenarios except the PIF-only scenario.

5.2.3 <u>Emission Change Analysis</u>

MACTEC used USEPA's MOBILE6 model to estimate the emission reductions (on a gram/mile basis) associated with the current Hybrid program in New Jersey. The MOBILE6 emission factor was multiplied by the daily VMT for New Jersey (213,808,924 mi) to calculate the emission benefits (i.e., emission reductions in tpd) from the current program. This model run served as a baseline to compare to the future alternative scenarios for determining the incremental emission changes. The emission reductions associated with the current Hybrid program are 10.7 tpd for HC and 16.7 tpd for NOx.

The emission impacts of each scenario (as compared to the current Hybrid program baseline) are shown in Table 5-31. All scenarios result in less emission benefits than the current system; that is, emissions will increase compared to the current system. Changing from the current ASM/OBD test baseline to an OBD-only scenario will increase HC and NOx emissions by 1.1 to 1.4 tpd. Changing to an OBD/TSI scenario will increase emissions by 0.1 to 0.7 tpd.

TABLE 5-31: EMISSIONS IMPACT OF PROGRAM SCENARIOS

				(HC + NOx, tpd)	
Scenario	**Program Type**	**CIF Operations**	**Test Type**	**Emissions Reduction from Program**	**Increase in Emissions Compared to Baseline**
Baseline (existing)	Hybrid	Contractor-run	ASM/OBD	27.4	0.0
1	Hybrid	Contractor-run	OBD-Only	26.3	1.1
2	Hybrid	State-run	OBD-Only	26.3	1.1
3	CIF-only	Contractor-run	OBD-Only	26.3	1.1
4	CIF-only	State-run	OBD-Only	26.3	1.1
5	PIF-only	None	OBD-Only	26.0	1.4
6	Hybrid	Contractor-run	OBD/TSI	27.2	0.2
7	Hybrid	State-run	OBD/TSI	27.2	0.2
8	CIF-only	Contractor-run	OBD/TSI	27.3	0.1
9	CIF-only	State-run	OBD/TSI	27.3	0.1
10	PIF-only	None	OBD/TSI	26.7	0.7

5.2.4 Summary Comparison of OBD/TSI vs. OBD-Only

Table 5-32 summarizes both the emissions and cost analysis components discussed in this section, presented by scenarios. The top half of Table 5-32 summarizes the costs for OBD/TSI scenarios. These costs range from $61.9 million for the CIF-only State-operated program to $142.7 million for the PIF-only program. Similarly, a comparison of the emissions reduction and program cost data for the OBD-only scenarios is shown in the bottom half of Table 5-32. The cost range for the OBD-only scenarios is from $56.0 million for the CIF-only State-operated program to $122.5 million for the PIF-only program.

5.2.5 Additional Emission Reduction Potential from I/M Options

Because each of the scenarios analyzed results in an emission increase (i.e., a loss in emissions reductions and SIP credits), we evaluated additional emission reductions attributed to I/M control measures beyond those included in the scenarios to make up for the associated loss of SIP credits. Table 5-33 identifies additional measures for the OBD-only test scenario to make up for loss of SIP emission credits. Table 5-34 identifies additional measures for the OBD/TSI test scenario to make up for loss of SIP emission credits. In both tables, estimates of the emissions benefit (reduction), cost, and cost effectiveness are provided for each potential measure.

TABLE 5-32: SCENARIO COMPARISONS

Program Type:	Hybrid	PIF-only	Hybrid	Hybrid	CIF-only	CIF-only
CIF Operator:	**Contractor**	**None**	**State**	**Contractor**	**State**	**Contractor**
Test Type:	**ASM/OBD**	**OBD/TSI**	**OBD/TSI**	**OBD/TSI**	**OBD/TSI**	**OBD/TSI**
Emissions Impact						
Emissions benefit from program (HC + NOx, tons/day)	27.4	26.7	27.2	27.2	27.3	27.3
Increase in emissions compared to ASM/OBD baseline (tons/day)	0.0	0.7	0.2	0.2	0.1	0.1
State Costs						
VID		$2.4	$3.0	$3.0	$3.3	$3.3
Equipment (change from base)	$0.0	$0.0	$0.5	$0.5	$0.6	$0.6
MVC Audits (change from base)	$0.0	-$0.2	$0.2	$0.2	-$4.9	-$4.9
DEP Gas Audits	$1.0	$0.0	$1.0	$1.0	$1.0	$1.0
DEP I/M Related Costs	$2.9	$2.9	$2.9	$2.9	$2.9	$2.9
Additional MITs (6 new teams)	$0.0	$1.9	$1.9	$1.9	$1.9	$1.9
CIF Lane Operations	$66.1	$0.0	$36.6	$38.5	$41.2	$43.2
MVC CIF Support Costs	$3.2	$0.0	$3.2	$3.2	$3.2	$3.2
MVC Backend Costs	$12.0	$12.0	$12.0	$12.0	$12.0	$12.0
Facility Salvage Value	$0.0	-$1.8	$0.0	$0.0	$0.0	$0.0
Public Outreach	$0.0	$0.2	$0.6	$0.6	$0.6	$0.6
Total State Costs	**$85.2**	**$17.4**	**$62.0**	**$63.9**	**$61.9**	**$63.9**
Motorist Costs PIF Inspections	**$36.4**	**$125.3**	**$49.8**	**$49.8**	**$0.0**	**$0.0**
Total Costs	**$121.6**	**$142.7**	**$111.8**	**$113.7**	**$61.9**	**$63.9**
Test Type:	**ASM/OBD**	**OBD-only**	**OBD-only**	**OBD-only**	**OBD-only**	**OBD-only**
Emissions Impact						
Emissions benefit from program (HC + NOx, tons/day)	27.4	26.0	26.3	26.3	26.3	26.3
Increase in emissions compared to ASM/OBD baseline (tons/day)	0.0	1.4	1.1	1.1	1.1	1.1
State Costs						
VID		$2.4	$3.0	$3.0	$3.3	$3.3
Equipment (change from base)	$0.0	$0.0	$0.2	$0.2	$0.3	$0.3
MVC Audits (change from base)	$0.0	-$0.2	$0.2	$0.2	-$4.9	-$4.9
DEP Gas Audits	$1.0	$0.0	$1.0	$1.0	$1.0	$1.0
DEP I/M Related Costs	$2.9	$2.9	$2.9	$2.9	$2.9	$2.9
Additional MITs (6 new teams)	$0.0	$1.9	$1.9	$1.9	$1.9	$1.9
CIF Lane Operations	$66.1	$0.0	$31.8	$34.3	$35.7	$38.3
MVC CIF Support Costs	$3.2	$0.0	$3.2	$3.2	$3.2	$3.2
MVC Backend Costs	$12.0	$12.0	$12.0	$12.0	$12.0	$12.0
Facility Salvage Value	$0.0	-$1.8	$0.0	$0.0	$0.0	$0.0
Public Outreach	$0.0	$0.2	$0.6	$0.6	$0.6	$0.6
Total	**$85.2**	**$17.4**	**$56.8**	**$59.3**	**$56.0**	**$58.7**
Motorist Costs PIF Inspections	**$36.4**	**$105.1**	**$29.7**	**$29.7**	**$0.0**	**$0.0**
Total Costs	**$121.6**	**$122.5**	**$86.5**	**$89.0**	**$56.0**	**$58.7**

TABLE 5-33: ADDITIONAL MEASURES FOR OBD-ONLY SCENARIO

Potential Measures to Offset Loss of SIP Credits	Emissions Benefit HC + NOx (tpd)	Estimate of Cost and Cost Effectiveness	Comments
1. Annual Inspections for Commercial Vehicles	0.42	Cost: $900,241 # of Failures: 3,458 $/failure: $260 $/ton: $5,928	Requires commercial vehicles to be inspected annually.
2. Enhanced Liquid Leak Checks	0.16	Cost: $500,000 # of Failures: 1,000 $/failure: $500 $/ton: $8,741	Train inspectors to better identify vehicles with liquid leaks.
Sub-Total: 1- 2	**0.58**	**Cost: $1,400,241** **# of Failures: 4,458** **$/failure: $314** **$/ton: $6,614**	
3. RSD Enhanced Roadside Inspections -- Using Remote Sensing Devices (RSD) to identify high emitting vehicles for roadside pullovers (increased benefit from RSD)	0.57	Cost: $4,300,000 # of Failures: 6,000 $/failure: $717 $/ton: $20,727	Use RSDs to double fail rate for expanded roadside inspections. This option requires a limited network of retest facilities capable of performing two-speed idle (TSI) and ASM tests.
4. Use RSDs to identify gross polluters for off-cycle inspections	0.53	Cost: $3,529,125 # of Failures: 5,291 $/failure: $667 $/ton: $18,255	Requires gross polluters identified by RSD vans that were not pulled over by MITs to pass off-cycle inspection. This option uses data from the same vans used for enhanced roadside inspections. The incremental cost is for tag editing, plate matching, management and reporting.
Sub-Total: 3 - 4	**1.10**	**Cost: $7,829,125** **# of Failures: 11,291** **$/failure: $693** **$/ton: $19,535**	

TABLE 5-34: ADDITIONAL MEASURES FOR OBD/TSI SCENARIO

Potential Measures to Offset Loss of SIP Credits	Emissions Benefit HC + NOx (tpd)	Estimate of Cost and Cost Effectiveness	Comments
1. Annual Inspections for Commercial Vehicles	0.42	Cost: $900,241 # of Failures: 3,458 $/failure: $260 $/ton: $5,928	Requires commercial vehicles to be inspected annually.
2. Enhanced Liquid Leak Checks	0.16	Cost: $500,000 # of Failures: 1,000 $/failure: $500 $/ton: $8,741	Train inspectors to better identify vehicles with liquid leaks.
Sub-Total: 1- 2	**0.58**	**Cost: $1,400,241** **# of Failures: 4,458** **$/failure: $314** **$/ton: $6,614**	
3. RSD Enhanced Roadside Inspections -- Using Remote Sensing Devices (RSD) to identify high emitting vehicles for roadside pullovers (increased benefit from RSD)	0.98	Cost: $4,300,000 # of Failures: 6,000 $/failure: $717 $/ton: $12,005	Use RSDs to double fail rate for expanded roadside inspections. This option requires a limited network of retest facilities capable of performing two-speed idle (TSI) and ASM tests.
4. Use RSDs to identify gross polluters for off-cycle inspections	0.69	Cost: $3,529,125 # of Failures: 5,291 $/failure: $667 $/ton: $14,029	Requires gross polluters identified by RSD vans that were not pulled over by MITs to pass off-cycle inspection. This option uses data from the same vans used for enhanced roadside inspections. The incremental cost is for tag editing, plate matching, management and reporting.
Sub-Total: 3 - 4	**1.67**	**Cost: $7,829,125** **# of Failures: 11,291** **$/failure: $693** **$/ton: $12,840**	

5.3 EVALUATION OF SEPARATING SAFETY AND EMISSION PROGRAMS

When evaluating the options and alternatives affecting the future I/M program in New Jersey, two issues need to be evaluated concerning the safety portion of the vehicle inspection program. The first issue is the evaluation of impacts associated with separating the safety inspection program from the emission inspection program. The second issue is analyzing the impact of the implementation of "safety advisory" notices. These two issues are discussed in this section.

5.3.1 Separating Safety and Emission Inspection Programs

Several of the options and alternatives analyzed allowed for varying time intervals or implementing innovative approaches to the emission inspection portion of the I/M program. For example, one option/alternative is expanding the four year exemption period to six years. Another option includes evaluation of wireless OBD alternatives that would not require going to an emission inspection station. A third option considers self-service OBD kiosks where the motorist would self inspect for emissions.

We presented data in Section 2 that indicate the positive impact that safety inspection programs have on reducing accidents. To incorporate any of these options in a future I/M program would require consideration of separate schedules for emissions and safety inspections.

Separating, or bifurcating, the safety inspection program from the emissions inspection program would allow for safety inspections to continue at the current biannual interval and for consideration of new alternatives for emission inspections. In fact, bifurcation could also allow for new options to be considered for safety programs, including annual safety inspections or PIF-only safety inspections coupled with wireless OBD or self-serve kiosks.

Discussions were held on separating, or bifurcating, the safety and emissions inspection programs. This concept was discussed within MVC and DEP and at stakeholder meetings with representatives of the inspection stations' owners and operators (PIFs and CIFs), law enforcement, and the motoring public.

Initial concern was that having different schedules for emissions and safety inspections would be too difficult for the State to manage and the public to understand. Other states have successful programs with separate schedules for vehicle emissions and safety inspections. For example, Virginia requires annual safety inspections and biannual emission inspections. A public education program would be necessary to explain the changes to the current program.

Difficulties from the State's point of view would require that the VID and other motor vehicle databases be adapted to accommodate different schedules for emission and safety inspections. Separate notices for safety and emission inspections would be needed, which could double the cost to the State. However, we did not attempt to quantify these costs when analyzing the feasibility of options or alternatives that would involve bifurcation of the safety and emissions inspection programs. We did note, under implementation issues, that these tracking and notification issues would have to be addressed and resolved prior to actual bifurcation of the two vehicle inspection programs.

5.3.2 Safety Advisories

In FY 2007, a program of “safety advisories” is being implemented for the vehicle safety portion of the I/M program. Safety advisories are items that will continue to be inspected at both CIFs and PIFs and failures will continue to be noted. However, safety advisory failure, by itself, will not require the owner to have the vehicle reinspected upon repair, nor keep the vehicle from obtaining its program certification sticker for the I/M program. The vehicle owner will be advised of the safety failure and be given a notice to complete repairs within a specified interval (i.e., 60 days). By not requiring a retest or reinspection for these safety advisories, cost savings in reinspection fees, motorist time, and fuel could be realized.

To determine the magnitude of the cost savings associated with the safety advisory program for the existing and future I/M scenarios, we had to first quantify the number of safety advisories expected. The following were defined as safety advisories during a 2004 MVC pilot program.

- Registration or Plate doesn’t match- If the motorist presents a vehicle registration with an incorrect vehicle identification number or plate number.
- License Plates- a motorist presents a vehicle for inspection and one license plate is missing or both plates are not mounted, or obstructed with a valid vehicle registration that matches the description of the vehicle presented.
- Plate Lights-If license plate light is missing or not illuminating at the time of inspection.
- Odometer- If the odometer is inoperative or replaced. However the motorist cannot apply a low mileage or collector car status.
- Headlights- If the headlights are obstructed or have moisture in them provided that they are operational and visible.
- 3rd Stop Light- If the 3rd stoplight is out, missing or covered with tint, provided that the other two stoplights are operational and visible.
- Turn Signal Lights- If turn signal light is broken, cracked or missing lens, provided that no white light shows to the rear of the motor vehicle. All turn signal light systems and components must be in proper operating condition.
- Specialty Lights or Unapproved Auxiliary Lights- Lights such as auxiliary lights and sequential stoplights, which do not impair the vision of other drivers or pedestrians.
- Excess Rust or Sharp Edges on Body or Bumpers-Excessive rust or sharp edges on a body or bumper that does not pose an immediate threat to property or bodily injury to other vehicles, motorist or pedestrians.
- Car racks or Carriers- Car racks or carriers, which are in excess of legal limits.
- Shift Indicator- Shift indicator is missing, incorrect, or misaligned.
- Horn- If horn is inoperative or is not audible from 200 feet.
- Mirror-Mirror has cracked/broken/sharp edges or not adequate for rear view vision.
- Driver’s Window- If the driver’s window is inoperative and all directional indicators are fully functional.

Table 5-35 contains a list of safety advisories identified at CIFs in 2005 and their frequency of occurrence. Safety advisory failures combined with other failures would not result in cost savings since the vehicle would require retest for the non-safety advisory failures. Therefore, the numbers in Table 5-35 indicate occurrences when the safety advisory was the sole reason for failing the safety inspection. In addition, only safety advisory failures at CIFs were identified, since CIFs charge for reinspections and PIFs typically do not charge for reinspections.

A total of 126,402 reinspections were required in 2005 for these safety advisory failures. Extrapolating this number of retests to our estimated 2007 vehicle fleet would result in 132,116 safety advisory failures expected in 2007. The cost savings to the State associated with avoiding these reinspections can be calculated by using the 2007 CIF inspection fee ($29.42) estimated in our cost analyses of the options and alternatives. The cost savings to the State in 2007 by not requiring reinspections for safety advisories would be $3.9M ($29.42 × 132,116).

Since the data in Table 5-35 represent occurrences under the current Hybrid program in New Jersey, the $3.9M savings to the State should be attributed to future Hybrid scenarios. If the State chose a CIF-only scenario, additional savings would be achieved, since all reinspections (including those currently conducted at PIFs) would have to take place at CIFs where there is a charge for reinspections. The data for 2005 indicate that 77 percent of inspections took place at CIFs. Assuming that the 132,116 safety advisories were associated with 77 percent of the vehicle population, then 171,579 safety advisories would be expected for the entire fleet (132,116 ÷ 0.77). Under a CIF-only scenario, then, cost savings of $5.0M would be attributed to the safety advisory program (171,579 × $29.42).

No cost savings to the motorists would be attributed to avoidance of safety advisory reinspections under a PIF-only scenario, since PIFs do not charge for reinspections. Cost savings for both time and fuel would, however, be realized by the motorists for not having to reinspect their vehicles. To calculate the cost savings associated with the motorists' time spent traveling to/from and waiting during the reinspection, we used the following equation:

Motorist Savings ($) = Hourly Rate ($/Hour) × Hours × Number of Reinspections

An hourly rate for the average motorist was calculated using the average per capita income in New Jersey. The 2005 average per capita income in New Jersey was $43,771. (infoplease.com, 2006) Escalating this rate at three percent per year results in an estimated 2007 annual average per capita income of $46,437. Dividing this by 2,080 hours yields a 2007 average per capita hourly rate in New Jersey of $22.33. MVC estimated that it took, on average, 1.02 hours to travel to an inspection station, complete an inspection, and return home. The number of safety advisory reinspections used in this analysis is the total CIF and PIF reinspections (171,579), since the motorist would avoid reinspection time no matter where the initial inspection took place. Cost savings to motorists for their time would therefore be:

($22.33/Hour) × (1.02 Hours/Inspection) × (171,579 Inspections/Year) = $3.9M

Fuel savings to the motorist can be calculated using average fuel cost, miles traveled to an inspection site and an estimated vehicle fuel economy. We used an average fuel cost of $2.50 per gallon, an average fuel economy of 20 miles/gallon and an average travel distance to an inspection station of 24 miles (from MVC). The fuel cost savings realized by the motorist are:

($2.50/Gallon) ÷ (20 Miles/Gallon) × (24 Miles/Inspection) × (171,579 Inspections/Year) = $0.5M

Total cost savings in 2007 dollars attributed to a safety advisory program are shown in Table 5-36.

TABLE 5-35. 2005 SAFETY ADVISORY FAILURES IDENTIFIED AT CIFS

Item Code	Condition Description	Total
9	Parking brake does not release fully	47
11	Parking brake handle or pedal broken	177
12	Parking brake not holding in park or neutral	331
13	Parking brake assembly is not secure	28
19	Parking brake does not hold vehicle	2,363
34	Registration or plate or VIN do not match	74
38	Registration has minor discrepancies	107
49	Insurance card has wrong serial numbers	264
54	Obstructed license plates	333
57	1 or 2 defaced license plates	59
64	License plates present but not mounted	2,994
65	One(1) license plate missing	1,029
70	Odometer inoperative or replaced	544
72	Headlight not properly mounted	3,149
73	Headlights: improper wiring or switches	216
74	Obstructed headlight	1,102
76	Headlight covers	48
78	Cracked/broken headlight lens	1,945
81	No DOT markings on headlight(s)	41
86	Moisture in headlights	670
90	Unapproved tail lens	89
94	Broken or missing stop light lens	725
96	Broken or missing tail light lens	2,097
97	Stop light not properly mounted	177
99	Tail light not securely mounted	191
102	Unapproved stop light installations	226
104	Sequential stop lights	555
108	3rd Stop Light is out	47,667
114	Center rear stop light covered by tint	615
121	Unapproved stop light lens	53
124	Unapproved type turn/warning signal or lens	47
125	Faulty turn/warning signal or switch	208
126	Turn/warning signal not mounted properly	1,626
129	Obstructed turn/warning signals	60
131	Broken or missing turn/warning signal lens	2,685

TABLE 5-35. 2005 SAFETY ADVISORY FAILURES IDENTIFIED AT CIFS

Item Code	Condition Description	Total
136	License plate light missing	5,639
138	License plate not illuminated	26,837
151	Unapproved auxiliary light	656
152	More than two auxiliary lights	96
153	Auxiliary light improper mounting	72
158	Broken or missing lens/reflector	1,517
159	Unapproved light or lens/reflector	97
160	Improper mounting of lens/reflector	563
166	Defective switching	280
169	Body has excessive rust	183
170	Body has sharp edges	789
172	Bumpers improper mounting	524
173	Bumpers have sharp edges	458
240	Shift indicator misaligned	94
256	Inoperative driver window (no signals)	4,685
258	Horn not audible from 200 feet	1,814
260	No horn button	661
268	Wiper speed inadequate	61
269	Damaged wiper blades	7,758
270	Wiper sweep	128
271	Wiper tension	46
272	Wiper control out of reach of driver	3
274	Mirror has cracked/broken/sharp edges	354
275	Mirror is discolored/tarnished/peeling	95
276	Mirror not securely mounted	289
327	Spinner knob on steering wheel	47
353	Parking brake has insufficient reserve	114
	TOTAL	126,402

TABLE 5-36. TOTAL COST SAVINGS FOR A SAFETY ADVISORY PROGRAM

	Hybrid	**CIF-Only**	**PIF-Only**
Reinspection Fees	$3.9M	$5.0M	0
Motorist Savings	$3.9M	$3.9M	$3.9M
Motorist Fuel	$0.5M	$0.5M	$0.5M
TOTAL	$8.3M	$9.4M	$4.4M

5.4 EVALUATION OF SEPARATE CONTRACTING OF VID AND PROGRAM OPERATION

There was interest on the State's part to consider separation of the VID operation and maintenance from the current contract where the VID contractor is a sub to the prime operations contractor. This would allow the State to have direct control over the VID contractor and better access to the data.

Once a decision is made to separate the VID from the current contract, four different options could be considered:

- Option 1 – In-house VID Component: Separate VID from the Inspection Program; Design, Implement, Operate, and Maintain VID In-House
- Option 2 – Outsource VID Component: Separate VID from the Inspection Program; Outsource through Full and Open Competition
- Option 3 - Hybrid Option for the VID Component: Separate VID from the Inspection Program; Outsource VID Design and Implementation; Operate and Maintain VID In-House
- Option 4 – Outsource the Complete Inspection Program including the VID Component: Retain Current Contract Structure; Outsource VID and All Related Inspection Activities through Full and Open Competition

A complete analysis of each of these options was conducted and can be found in Appendix E. Table 5-37 contains a summary of this analysis. Presented for each option are the estimated staff hours required by New Jersey and VID providers to complete each option.

5.4.1 <u>Analysis of VID Development Options</u>

Table 5-38 contains a summary of the estimated completion date for each option, assuming a start date of January 2007. None of the options identified have a completion date prior to the end of the current contract. Options 2, 3 and 4 include RFP development, issuance, and award in their timeline. Time savings from these efforts could shorten the overall implementation period.

Options 2 and 3 anticipate that the selected vendor would have one or more successful VID implementations to use as the basis for developing a solution for New Jersey. This would allow for a streamlined VID design, development, and implementation process. Quantitatively estimating the expected increase in efficiency and schedule implications is challenging given the degree of uncertainty related to the consistency of the vendor solution with NJ VID requirements, degree of customization needed, compatibility with NJ architecture and development standards, amount of control/access to source code desired by NJ and associated vendor fees, and other factors. The improved level of effort and schedule efficiencies for these options is based on the following assumptions:

TABLE 5-37. SUMMARY OF PRELIMINARY ESTIMATED LEVEL OF EFFORT FOR EACH OPTION

Option	Design and Implementation (total hours)	Operation and Maintenance (hours/year)
1: In-House VID Component	NJ: 14,000 – 29,000 (6.7 – 13.9 FTE)	NJ: 15,590 (7.5 FTE)
2: Outsource VID Component	NJ: 6,120* (2.9 FTE) Vendor: 19,000 (9.1 FTE)	NJ: 4,160 (2 FTE) Vendor: 10,000 (4.8 FTE)
3: Hybrid Option for the VID Component	<u>Design and Implementation</u> NJ: 8,736* (4.2 FTE) Vendor: 19,000 (9.1 FTE) <u>Transition to NJ OIT (estimated 3 months)</u> NJ: 3,600 (7.5 FTE) Vendor: 1,824 (3.8FTE)	NJ: 15,590 (7.5 FTE)
4: Outsource Complete Inspection Program, Including the VID Component	<u>Current vendor selected:</u> -Minimal assuming few changes desired by NJ DEP. <u>New vendor selected (similar to Option 2):</u> NJ: 6,120* (2.9 FTE) Vendor: 19,000 (9.1 FTE)	<u>Current vendor selected:</u> -Expected to be similar to current effort assuming few changes desired by NJ DEP. <u>New vendor selected (similar to Option 2):</u> NJ: 4,160 (2 FTE) Vendor: 10,000 (4.8 FTE)

*Estimates do not include NJ staff effort to support procurement process.
FTE = full-time equivalents at 2,080 hours per FTE per year

TABLE 5-38. SUMMARY OF PRELIMINARY SCHEDULE FOR EACH OPTION

Option	Start Date	Estimated Completion Date (to begin Operation and Maintenance Phase)
1: In-House VID Component	01/02/07	01/18/09
2: Outsource VID Component	01/02/07	02/22/09
3: Hybrid Option for the VID Component	01/02/07	4/25/09
4: Outsource Complete Inspection Program, Including the VID Component (current vendor selected)	01/02/07	Negotiations and revisions expected to be completed before the end of the current contract.
4: Outsource Complete Inspection Program, Including the VID Component (new vendor selected)	01/02/07	02/22/09

- Vendor brings an existing, successful VID as basis for NJ design;
- The proven VID meets NJ architecture standards;
- Minimal changes and customization required by NJ to meet State VID requirements
- PIF /CIF communications protocols are readily available and any required adjustments are negligible and do not require rulemaking or stakeholder input;
- NJ can quickly modify business practices to meet the design requirements and limitations of the proven VID;
- NJ can readily provide staff needed for quick review and turn-around of vendor specifications and design documentation;
- NJ assures that funding is readily available and is not delayed by internal processes (i.e., no work stoppages due to contract work order and funding paperwork processes and approvals); and
- NJ desire to have access to source code and direct control over changes is consistent with vendor standard agreement.

As part of our research, we reviewed recent VID development activities in other States. While a complete description of these activities is included in Appendix E, the following summarizes the range of data we found from the States investigated.

- Number of Inspections: 500,000 - 10,000,000
- VID Design and Implementation Costs: $260,000 - $10,000,000
- VID Component Design and Implementation Labor: 8,300 hours – unknown hours (67,000 hours estimated)
- Note that the low end of this estimate equates to an average labor rate of $31/hr; assuming a maximum average labor rate of $150/hr, the level of effort associated with the high end of this estimate would be equivalent to 67,000 hours
- VID Operation and Maintenance Costs: $680,000 - $5,000,000
- VID Operation and Maintenance Labor: unknown (3,300 – 22,000 hours estimated)
- Assuming the $31/hr to $150/hr labor rate range noted for VID Design and Implementation activities, the annual level of effort associated with these costs ranges from 3,300 - 22,000 hours

The wide range of information available reflects the variability of the inspection program and VID implementation in each State. Because each State develops its own inspection program and VID functionality requirements and the available cost information was fairly limited as most States do not track or did not make available costs at the level of detail required for a comprehensive analysis, these ranges should be considered bounding estimates for the most simple to the most complex VID.

Finally, we also developed a list of advantages and disadvantages associated with each option. Table 5-39 contains a summary of this analysis.

TABLE 5-39. KEY ADVANTAGES AND DISADVANTAGES FOR SELECTED OPTIONS AVAILABLE TO NJ

Option	Key Advantages	Key Disadvantages
1: In-House VID Component	• NJ would have direct access to VID data. • NJ would have increased control over VID operations. • NJ would have greater flexibility in revising and enhancing VID structure, content, reports, functionality, and QA. • If a telecommunications provider is required, re-bidding the telecommunications contract may result in an overall decreased cost per inspection call.	• It is unlikely that a new VID could be designed, developed, implemented, and in production by 2007; the current contract may need to be extended by between one and two years. • NJ would incur significant labor and capital start-up costs to recreate VID and associated infrastructure. • Completing the VID recreation effort according to the schedule would require that NJ dedicate staff that might be assigned to other efforts, and require significant and on-going high-level management support and participation.
2: Outsource VID Component through Full and Open Competition	• NJ could select a contractor experienced with VID design and development and a proven approach that incorporates lessons learned and best practices. • NJ could include contract terms that would allow for more control over VID, direct access to VID data and system, system/software ownership, and greater flexibility. • NJ would not be required to staff up to recreate or maintain VID.	• RFP process required; this would add several months to the schedule. • It is unlikely that a new VID could be designed, developed, implemented, and in production by 2007; the current contract may need to be extended by between one and two years. • If a new contractor is selected, NJ would incur significant labor costs to facilitate recreating the VID. • Based on NJ decisions related to hosting of VID, significant capital costs may be required.
3: Hybrid Option for the VID Component	• NJ could select a contractor experienced with VID design and development and a proven approach that incorporates lessons learned and best practices. • NJ could include contract terms that would allow for more control over VID, direct access to VID data and system, system/software ownership, and greater flexibility. • NJ staff could work hand-in-hand with contractor development team and require training, knowledge transfer, and transition activities as part of the contract.	• RFP process required; this would add several months to the schedule. • It is unlikely that a new VID could be designed, developed, implemented, and in production by 2007; the current contract may need to be extended by between one and two years. • Completing the VID recreation effort according to the schedule would require that NJ dedicate staff that might be assigned to other efforts, and require significant and on-going high-level management support and participation. • If a new contractor is selected, NJ would incur significant labor costs to facilitate recreating the VID. • Based on NJ decisions related to hosting of VID, significant capital costs may be required.

TABLE 5-38. KEY ADVANTAGES AND DISADVANTAGES FOR SELECTED OPTIONS AVAILABLE TO NJ (Continued)

Option	Key Advantages	Key Disadvantages
4: Outsource Complete Inspection Program through Full and Open Competition	• If the selected vendor is the current contractor, the VID and communications infrastructure already exists; NJ would not incur costs to recreate VID, VID infrastructure, data storage, etc. • NJ would not be required to staff up to recreate or maintain VID. • NJ could negotiate contract terms to allow for more control over VID, direct access to VID data and system, system/software ownership, and greater flexibility.	• NJ would not have direct access to VID data and VID operations. • Requests to revise and enhance VID structure, content, reports, functionality, and QA can be costly. • Changes required to address issues and/or upgrade communications with PIFs may have additional cost implications.

5.4.2 Additional Options for VID Hosting and Maintenance

Appendix E describes a variety of options for VID development. These options assume that VID hosting would be completed by the same organization (i.e., the selected vendor or NJ Office of Information Technology {OIT}) as the one selected for VID design and development. Additional discussions with NJ OIT staff indicated that there may be several hosting options for the VID whether vendor staff or NJ OIT lead the design, implementation, operation, and maintenance activities. These hosting options include:

- Vendor hosting and maintenance of the VID. Host and maintain the VID in the vendor environment or a vendor-procured third-party hosting environment. The vendor acquires and maintains the servers, and acquires appropriate licenses for any required software. Vendor staff also maintains the VID.
- NJ OIT hosting and maintenance of the VID. The VID is hosted in the NJ OIT server environment. NJ OIT staff acquires and maintains the servers and acquires the appropriate licenses for any required software. NJ OIT staff also maintains the VID.
- Hybrid VID hosting and maintenance – Option A. The VID is hosted in the NJ OIT server environment. NJ OIT staff acquires and maintains the servers and acquires the appropriate licenses for any required software. Vendor staff maintains the VID on the NJ OIT servers. This would require that vendor staff work on-site at NJ OIT or have appropriate access to the servers via a VPN or other type of direct connection.
- Hybrid VID hosting and maintenance – Option B. The VID is hosted in the NJ OIT server environment. NJ OIT staff acquires and maintains the servers and acquires the appropriate licenses for any required software. The VID is hosted on NJ OIT servers. Vendor staff maintains the servers as well as the VID. This would require that vendor staff work on-site at NJ OIT or have appropriate access to the servers via a VPN or other type of direct connection.

Potential benefits of hosting the VID in the NJ OIT environment include possible savings on software purchase, software maintenance costs, and server hardware. It may be possible to leverage existing NJ OIT software licenses, server equipment, and server support staff that are not currently fully utilized. If new equipment and software licenses are needed, state governments often receive additional discounting that may not be available to all commercial vendors. Note, however, that vendors may be able to negotiate teaming agreements or build partnerships with software and hardware providers to achieve similar discounts.

Potential limitations of hosting the VID in the NJ OIT environment include the impact on staff requirements. It is expected that the VID would include stringent service level agreements (SLAs) that specify required server up-time and availability. Additional discussion with NJ OIT would be required to determine the availability of staff with appropriate skills to meet anticipated SLAs.

Potential benefits of outsourcing VID hosting to a vendor include turn-key hosting of the VID. NJ would not need to acquire, deploy, and maintain additional servers, server hardware, or software licenses. In addition, the need to assess impact on NJ OIT staff levels or skill sets would not be necessary.

Prior to selecting a preferred hosting approach, additional review of expected VID software and hardware requirements, expected service level requirements, NJ OIT software and hardware availability, and NJ OIT software and hardware purchasing discounts should be completed.

The key assumption associated with the hosting options described above is that there are no barriers to implementing any and all required communications and data transfers between the database, equipment at the CIF and PIF inspection stations, and other data exchange requirements whether hosting is done by the vendor, a third-party hosting provider, or NJ OIT.

5.5 IMPLEMENTATION ISSUES

To implement the next generation I/M program in New Jersey, careful consideration must be given to implementation and transition issues. While specific transition issues will be identified once a decision is made on how the State of New Jersey will proceed (e.g., continuation of the Hybrid program or change to a CIF-only or PIF-only program), several major implementation issues can be addressed at this time. These include request for proposal (RFP) development and contract award, outreach/education, system/equipment/workforce transition, and rule changes. The following sub sections contain brief descriptions of some of these issues, followed by timelines that summarize potential schedules for transition to a new program/contract.

5.5.1 RFP Development and Contract Award

Once a decision on the approach to the next generation I/M program is made, work can start immediately on the development of the RFP bid package. Many decisions have to be made on the make-up of the desired new program before actual drafting of the RFP. These decisions include but are not limited to testing/equipment inspection approaches, use of sticker programs or registration denial, contractor evaluation/audit scenarios to track contractor performance, use of existing CIFs, and many more. The need to make these decisions quickly is crucial to having an RFP developed in a timely manner that reflects New Jersey's approach to the new contract.

If New Jersey moves forward with a new VID or adopts new testing scenarios or equipment, a decision would need to be made as to whether the RFP includes detailed VID and equipment specifications or if the specifications are left to the bidder. Providing detailed specifications in the RFP would ensure that the bidders understand the State's needs and provide a response that meets the State's requirements, but such detailed specifications would take time to develop. While more general specifications would allow the RFP to be developed and issued more quickly, additional time might be needed during the proposal evaluation period to ensure that the reviewers understand the approach and have confidence the approach meets the State's needs.

General discussions were held with representatives of New Jersey's Treasury Department, Attorney General's Office, MVC and DEP to discuss the timeframe typically needed for the RFP process in New Jersey. A best case scenario, i.e., no issues arise to stall the process, would result in a draft RFP within four or five months of beginning the process, one month to receive comments from industry on the draft RFP, six to eight weeks to incorporate comments from industry and issue the final RFP, six to eight weeks for the bidder to respond, and six to eight weeks to evaluate proposals and make an award decision. Therefore, in the best case scenario, it would take a year from the beginning of the RFP process to award. Additional time savings could be found if resources are dedicated and materials from previous RFPs can be used. However, we would caution that taking short cuts in the RFP development process could lead to trouble experienced by other states with protests and having to start the RFP process over again.

No matter how much planning there may be, issues do arise that must be addressed thoroughly before proceeding. A more realistic scenario might result in nine months to develop and issue the final RFP (allowing more time for internal review and sign off and more time to address industry comments on the draft RFP) and another six months after the bid responses have been submitted for proposal review, award notification and final award (allowing for more proposal review time and more time to address any concerns between award notification and final award).

5.5.2 Outreach/Education

Once a decision has been made regarding the approach to the next generation I/M program, there would likely be a need for outreach or public education to program stakeholders affected by any changes. For example, if the decision is to go to either a CIF-only or PIF-only program, the motoring public needs to know how this affects them (Where do I go? How much will it cost?, etc).

Any change in equipment or approach that affects the PIFs may require public forums or stakeholder meetings to discuss. Even if the State stays with a Hybrid program, if there are equipment changes, schedule changes, or sticker/registration changes, both the motoring public and the PIFs need to be informed.

This outreach/education program would not affect the schedule for issuance of the RFP or the schedule for an award decision. These outreach/education efforts can begin as soon as a decision is made on the next I/M program. Even for those issues that may be procurement sensitive, sufficient time should be available between issuance of the draft RFP and contract award (six months to one year) to allow time to reach out to the affected stakeholders.

5.5.3 Transition

Transition issues can include workforce transition, development and testing of a new VID, transition to the new VID, and transition to new equipment. Most of these issues must be addressed even if the incumbent contractor is retained.

5.5.3.1 Workforce Transition

Workforce transition issues occur any time there are changes to the existing workforce now implemented by the incumbent contractor. Significant workforce transition issues occur if the incumbent contractor is unsuccessful and the workforce must transition to a new contractor under a CIF-only or Hybrid program that is contractor operated. In these cases, the new contractor has to staff up from new hires or from the current lane staff. This could occur at any time after award and before the new contractor takes over lane operations. However, delays in this process could affect the availability of a workforce already trained to operate the equipment.

If the decision is to have State run CIF lanes under a CIF-only or Hybrid program, the issues are similar to the transition to another contractor. It is assumed that many of the existing lane staff would move to the State workforce. Delays in this transition could again affect the availability of trained staff to operate the State run CIF lanes.

If the decision is to implement a PIF-only program, then CIF lane staff would no longer be needed. It is assumed that these trained staff would be picked up by PIF operators, who would be hiring staff to support the new test volume at the PIFs.

5.5.3.2 Development and Testing of a New VID

If the decision is made to develop a new VID, it is assumed that work would begin immediately after award on this development task. Estimates of time needed to develop a new VID vary widely. Depending on the specifications identified by New Jersey, some vendors that have existing VIDs indicated they could adapt their VID in less than six months. Other estimates have been well over a year just to develop a new VID from scratch. For our analysis, we assumed one year for development and testing.

However, if it takes a year to develop a new VID, the existing VID (and possibly the existing test equipment since it currently communicates to the VID) would have to be maintained until the new VID and equipment could be installed. This increases the need for the availability of staff trained to operate and maintain the existing equipment.

Difficulties transitioning from one vendor’s VID to another’s VID have come up in other States. Our understanding is that most issues have to do with the proprietary nature of some software for communicating from test equipment to the VID. This would be eliminated in New Jersey if the decision is made to have the I/M contractor supply new equipment along with the new VID. This would allow the contractor to work directly with the equipment provider to ensure communication from test equipment to the VID.

5.5.3.3 Implementation of New VID and Test Equipment

If the decision is made to include new emission test equipment at the CIFs and/or the PIFs, time would be needed to install the new equipment and VID. Based on New Jersey's experience, it is estimated that once the new VID is ready, the new VID and new emission test equipment could be rolled out and installed in six to eight months. However, until the new VID and new equipment are installed at all facilities, the State will need to maintain the existing VID to capture tests performed with the old equipment. This could require the maintenance of the existing VID during the entire six to eight month period it takes to install new test equipment.

5.5.4 Rule Changes

Depending on the decisions made or options/alternatives selected for implementation, some rule or statutory changes may be required. This process could take up to a year, depending upon the controversial nature of the change. However, these efforts can occur in parallel with the RFP process and VID development timelines and should not affect the overall transition schedule to a new program.

5.5.5 Timelines

To summarize these transition issues, we developed two timelines, Figures 5-1 and 5-2, to depict the best case and realistic case, respectively. For convenience, we assumed January 2007 as the starting point for each timeline.

Figure 5-1, the best case scenario timeline, shows RFP issuance in eight months and award of a new contract in January 2008. VID development would start immediately after award and be completed in January 2009. VID and equipment installation would be completed by August or September of 2009.

In the more realistic scenario timeline depicted in Figure 5-2, an additional six months is added to the RFP and award process to account for more internal review and preparation of the RFP and for more internal State review between contract award notification and actual contract award/start date. This additional time yields final completion of VID and equipment transition in early 2010.

FIGURE 5-1 BEST CASE TIMELINE TO DEVELOP RFP, AWARD CONTRACT, AND COMPLETE TRANSITION

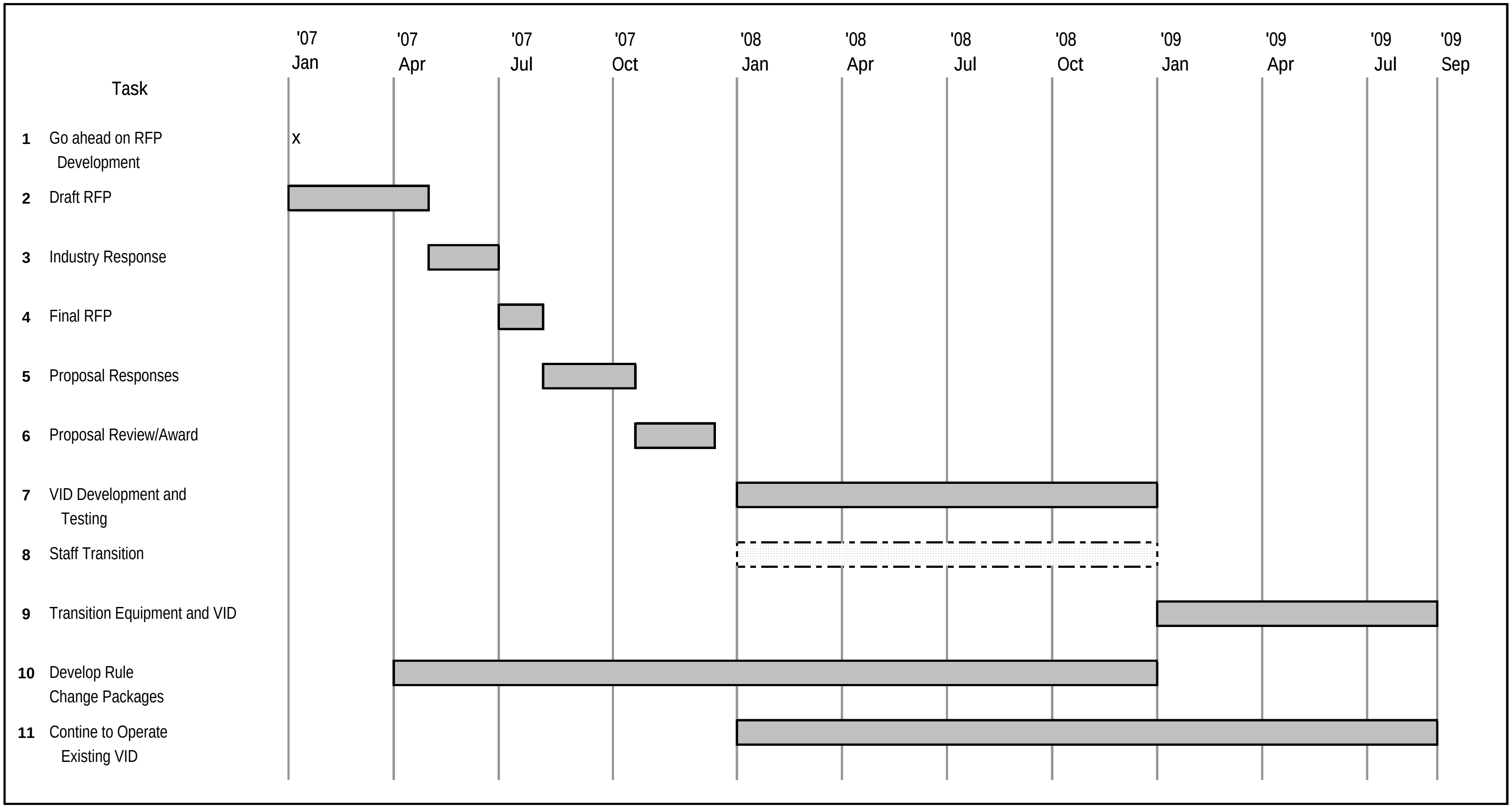
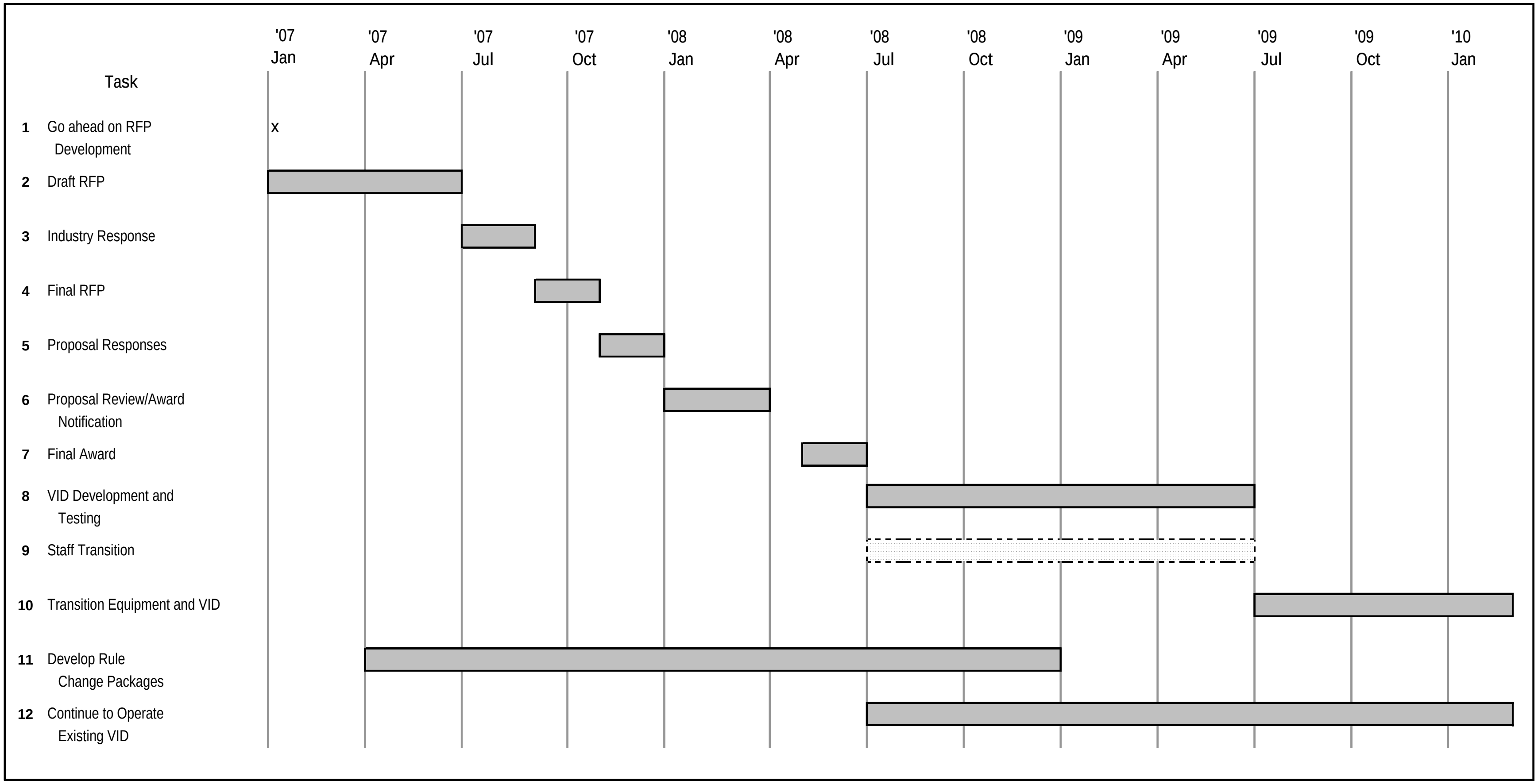


FIGURE 5-2 REALISTIC TIMELINE TO DEVELOP RFP, AWARD CONTRACT, AND COMPLETE TRANSITION



APPENDIX A – REFERENCES

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APPENDIX B-1

FACT SHEETS ON SELECTED I/M PROGRAMS

APPENDIX B-1
FACT SHEETS ON SELECTED I/M PROGRAMS

Fact Sheet on California's I/M Program – Smog Check

Program Element	California's I/M Program
Network Type	Decentralized -- Test Only/ Test & Repair
Coverage	Statewide/1976+ Up to 14000 lbs GVW
Exemptions	First 6 Years
Emissions Test Type	Gasoline Powered Vehicles: ASM or TSI (if not ASM testable) 1996+: OBD II + ASM (or TSI)
Gas Cap Test	All vehicles
Safety Inspection	No
Fuel Types	Gasoline
Enforcement	Registration
Data System	Central VID operated by Contractor (MCI/Testcom)
Test Frequency	Biennial
# Tested	10,000,000/year
# of Test Facilities	10,000+
QA Audits	Performed by BAR
Inspection Fee	Average Inspection Fee: $50 Certificate Fee: $8.25/test (Includes ~ $1.50/test for data system contractor) Newest 6 model year vehicles pay registration fee for Low Income Repair Assistance (LIRAP) and Carl Moyer air quality programs.
Waivers Allowed	Yes -- $450 limit
Website	http://www.smogcheck.ca.gov
Program Contact	David Amlin: 916-255-1376, David_Amlin@dca.ca.gov

Special Features:

Hybrid decentralized system: Several different types of inspection stations, each with different inspection privileges: Test & Repair, Test-Only, Gold Shield, and Referee stations. **Extensive low income repair assistance (LIRAP).**

Directed Vehicles: Likely high emitters must be inspected at Test-Only or Referee stations. High emitters determined with High Emitter Index (HEI) model. Random vehicles also directed to Test-Only (2%)

Gross Polluters: Vehicles that fail their initial tests as Gross Polluters must be retested at Test-Only, Gold Shield, or Referee Stations.

Fact Sheet on California's I/M Program – Smog Check (continued)

ASM/OBD II Clean Screen Study: Currently, 1996+ vehicles receive ASM and OBD II tests. BAR and ARB studied vehicles that fail ASM but pass OBD II inspection to determine if some vehicles could only get OBD II inspections. Study concluded that most vehicles with high tailpipe emissions that pass their OBD II inspection had unset readiness monitors, stored DTCs (with MIL off), or known defects in the OBD II system.

Remote Sensing Device (RSD) Pilot Study: BAR/ARB is completing a pilot RSD program to determine if it has cost-effective uses in Smog Check. Unofficial results indicate that using RSD to identify high emitters is much more expensive than requiring older vehicles to receive annual inspections.

Extensive low income repair assistance (LIRAP): California was one of the first states to set-up LIRAP. The LIRAP program offers qualified motorists two types of assistance:

- $1,000 for scrapping the vehicle.
- Co-pay of $20 to $100 for repairs up to $500 in cost.

In order to qualify for LIRAP, the vehicle must have been designated to be tested at test-only facilities and fail inspection. California requires likely high emitting vehicles to be tested at test-only facilities. Additionally, the motorist must have owned the vehicle for at least two years, and to qualify for the scrappage option, the vehicle must be drivable. About 2,000 vehicles per year are scrapped or repaired as part of LIRAP.

Program evaluation – California does extensive on-road tests to evaluate its I/M program. With assistance from the California Highway Patrol, the Bureau of Automotive Repair (BAR) pulls in-use vehicles over and performs an ASM test. Inspections are conducted by state inspectors, and therefore provide an independent measure of the emission readings and the condition of vehicular smog equipment for California's vehicle fleet. Results of the 1999 and 2001 program evaluation tests found that vehicles certified at Test-Only stations had significantly lower emission rates after their I/M test than those certified at Test-and-Repair facilities.

Fact Sheet on Connecticut's I/M Program

Program Element	Connecticut's I/M Program
Network Type	Decentralized – Limited Network of 300 stations statewide
Coverage	Statewide/1981+ Up to 10000 lbs GVW
Exemptions	First 4 Years
Emissions Test Type	**Gasoline Powered Vehicles:** Pre-1996: ASM or TSI (if not ASM testable) 1996+: OBD II **Diesels:** Pre 1997: Loaded Opacity or Snap Idle 1997+: <8501 GVW: OBD II , >8500 GVW Snap Idle
Gas Cap Test	All vehicles
Safety Inspection	No formal safety inspection; however, road-side spot checks performed by police on behalf of DMV
Fuel Types	All
Enforcement	Registration
Data System	Central VID operated by Contractor (SysTech)
Test Frequency	Biennial
# Tested	1,000,000/year
# of Test Facilities	~300
QA Audits	Performed by DMV and Applus (DMV's equipment contractor)
Inspection Fee	\$20 test (1st reinspection is free) \$12.50 per test to stations \$6.50 per test to Applus (includes equipment cost) \$1 per test to data contractor (+ upfront payment of ~ \$1,000,000)
Waivers Allowed	Yes -- \$660 limit
Website	http://www.ctemissions.com
Program Contact	Greg Kelly: 203-805-6239, Greg.Kelly@dmvct.org

Special Features:

Limited Decentralized System with Equipment and Data Management Contractors: In 2003, Connecticut switched from centralized contractor operated system to a decentralized "contractor assisted" system. Applus provides and maintains equipment and Systech set-up and maintains the vehicle information database (VID). But, the state DMV performs all the oversight activities. Limiting the number of stations to ~300 greatly assists enforcement.

Trigger Reports: On a daily basis, DMV prepares trigger reports to identify fraudulent or inaccurate inspections. The program has very little fraud, and audits now show excellent equipment accuracy.

Fact Sheet on Connecticut's I/M Program (continued)

Video Cameras: Each station has two video cameras, which have been effective in identifying clean scanning and 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.

Fact Sheet on Delaware's I/M Program

Program Element	Delaware's I/M Program
Network Type	Centralized -- Test Only/ State Operated
Coverage	Statewide/1968+ Up to 14000 lbs GVW
Exemptions	First 5 Years
Test Type	Pre 1996 and all >8500 powered by gasoline TSI 1996+, <8500: OBD (1997+ Diesels)
Gas Cap Test	All vehicles without OBD systems. DE also performs functional pressure tests on pre-1996 vehicles.
Safety Inspection	Yes
Fuel Types	Gasoline, Diesels (1997+ only)
Enforcement	Registration
Data System	Central VID operated by State (DMV)
Test Frequency	Biennial
# Tested	~500,000/year
# of Test Facilities	4 facilities (Wilmington, New Castle, Dover, Georgetown)/21 Lanes
QA Audits	Performed by DNREC
Inspection Fee	Part of Registration Fee
Waivers Allowed	Yes -- $675 limit for 1981+ vehicles in Kent and New Castle Counties. Must fail twice.
Website	http://www.dmv.de.gov/services/vehicle_services/faqs/ve_faqs_inspection.shtml
Program Contact	Scott Clapper: 302-744-2533, scott.clapper@state.de.us

Special Features:

State Operated with Equipment Provider: Delaware's I/M is run by DMV. DMV employees inspect vehicles and the State maintains the vehicle inspection database. State employees are not unionized. ESP provides test equipment and Lane Manager (server for inspection data). Both emissions and comprehensive safety checks are performed.

Test Fee: Included in registration fee. State budgets ~$3,000,000/year to test 500,000 vehicles.

Fact Sheet on Georgia's I/M Program

Program Element	Georgia's I/M Program
Network Type	Decentralized Hybrid -- Test Only/ Test & Repair
Coverage	Statewide/1981+ Up to 8500 lbs GVW
Exemptions	First 4 Years
Test Type	Gasoline Powered Vehicles: Pre-1996: ASM or TSI (if not ASM testable) 1996+: OBD II
Gas Cap Test	All vehicles
Safety Inspection	No
Fuel Types	Gasoline
Enforcement	Registration
Data System	Central VID operated by Contractor (MCI)
Test Frequency	Annual
# Tested	2,200,000/year
# of Test Facilities	~300
QA Audits	Overt and covert audits performed by MCI (Parsons is subcontractor). State (EPD) runs extensive trigger reports.
Inspection Fee	$10 to $25/test MCI's fee is ~$5/test, which covers data system, auditing, and training
Waivers Allowed	Yes -- $689 limit
Website	http://www.cleanairforce.com
Program Contact	Steve Leydon, DNR: 404-362-7042, steve_leydon@dnr.state.ga.us

Special Features:

Hybrid Contractor Managed Decentralized System: Contractor (MCI) collects and manages data, trains inspectors, and performs covert and overt audits. RFP for rebid came out in 8/2005. Two basic types of inspection stations: Test & Repair, and Test-Only.

Trigger Reports: On frequent basis, EPD prepares trigger reports to identify fraudulent or inaccurate inspections.

Remote Sensing Program Evaluation: Georgia Tech performs comprehensive a remote program to evaluate the effectiveness of Georgia's I/M program.

Fact Sheet on Illinois' I/M Program

Program Element	Illinois' I/M Program
Network Type	Centralized -- Test Only/ Contractor Operated (ESP), Contract expires 2007
Coverage	Cook, Dupage, and Lake Counties (all zip codes) and Kane, Kendall, McHenry, Will, Madison, Monroe, St. Clair Counties (with zip code exemptions)/1968+ Up to 8,500 lbs GVW
Exemptions	First 4 Years
Emissions Test Type	1981-1995 <8500: IM240 1996+, <8500: OBD 1968-1980: Idle
Gas Cap Test	All vehicles
Safety Inspection	No formal inspection, but vehicles can be rejected if inspector notices bad brakes, as well as visible fluid leaks and worn tires
Fuel Types	Gasoline
Enforcement	Registration
Data System	Central VID operated by Contractor, IEPA has access
Test Frequency	Biennial
# Tested	~3,000,000/year
# of Test Facilities	**North:** 21 (2 stations closed 10/01/05) **South:** 6
QA Audits	Performed by IEPA
Inspection Fee	Part of Registration Fee, ~$15/test
Waivers Allowed	Yes -- $450 limit
Website	http://www.epa.state.il.us/air/vim
Program Contact	James Matheny, IEPA: 217-785-5153, jim.matheny@epa.state.il.us

Special Features:

Centralized Contractor Operated Program: Illinois EPA (IEPA) keeps close tabs on the program.

Planning a Drastically Revised Program: The Illinois legislature passed a bill that calls for drastic changes in Illinois' I/M program, including: testing only 1996+ vehicles, OBD II is primary inspection method (with limited back-up tailpipe tests using idle tests), and allowing inspection facilities to repair vehicles. USEPA Region V has approved these changes. These changes will allow a decentralized inspection network using innovative OBD II inspection methods.

Fact Sheet on Maryland's I/M Program

Program Element	Maryland's I/M Program
Network Type	Centralized -- Test Only/Contractor Operated (ESP), contract expires 2009, fleet self inspect (oversight by MDE)
Coverage	Statewide/1977+ Up to 26,000 lbs GVW
Exemptions	First 2 Years
Emissions Test Type	1981-1995 <8500: IM240 1996+, <8500: OBD Others: Curb Idle
Gas Cap Test	All vehicles, but failing gas-cap test will not fail I/M
Safety Inspection	Heavy-duty only Passenger vehicles are inspected at time of initial registration with another safety inspection conducted upon resale
Fuel Types	Gasoline
Enforcement	Registration
Data System	Central VID operated by Contractor
Test Frequency	Biennial
# Tested	~1,300,000/year
# of Test Facilities	19 facilities/87 lanes (emissions only) – 1,600 facilities that are licensed for safety inspections by the Maryland State Police
QA Audits	Performed by MVA and MDE
Inspection Fee	Part of Registration Fee, $14 cap to contractor
Waivers Allowed	Yes -- $450 limit
Website	http://mva.state.md.us/MVAProg/VEIP/default.htm
Program Contact	David Filbert (MDE): 410-537-4131, dfilbert@mde.state.md.us Fred Loudenslager (MVA): 410-768-7286, floudenslager@mdot.state.md.us Sgt. Rick Klebon (Maryland State Police, Automotive Safety Enforcement Div.): 410-768-7388

Special Features:

Centralized Contractor Operated Program: Motor Vehicle Administration (MVA) and Maryland Department of the Environment (MDE) keep close tabs on the program.

Remote OBD II: MDE is doing a pilot wireless OBD II project.

Fact Sheet on Missouri's I/M Program

Program Element	Missouri's I/M Program
Network Type	Centralized -- Test Only/ Contractor Operated (ESP)
Coverage	St. Louis Area/1980+ Up to 8500 lbs GVW
Exemptions	First 2 Years
Emissions Test Type	1981-1995 <8500: IM240 1996+, <8500: OBD Others: TSI
Gas Cap Test	All vehicles
Safety Inspection	Yes
Fuel Types	Gasoline
Enforcement	Registration
Data System	Central VID operated by State
Test Frequency	Biennial
# Tested	~1,300,000/year
# of Test Facilities	12 facilities and 6 mobile testing locations
QA Audits	Performed by MO DNR
Inspection Fee	$24 (ESP gets $21, State gets $3)
Waivers Allowed	Yes -- $450 limit
Website	www.gatewaycleanair.com www.dnr.mo.gov/alpd/apcp/gcap
Program Contact	Haskins Hobson, P.E.: 573-751-4817, haskin.hobson@dnr.mo.gov Bill Watkins (Missouri State Highway Patrol, Motor Vehicle Inspection Div.): 573-526-6132

Special Features:

Centralized Contractor Operated Program: Centralized program with extensive clean screen tests using remote sensing (see below).

Remote Sensing Device Clean Screen Project: The Gateway Clean Air Program is the first I/M program in the Country to integrate a remote sensing based clean screen program from the outset as a means of improving motorist convenience and reducing the overall number of inspection lanes required. Data from the program help us evaluate how remote sensing can reduce vehicle emissions (report available). 60% of the vehicles clean screened are less than 6 years old, and would be exempt if the first 5 years were exempted.

Fact Sheet on Missouri's I/M Program
(continued)

Remote Sensing Device Clean Screen Project: Missouri's I/M program, termed the Gateway Clean Air Program, is the first in the Country to integrate a remote sensing based clean screen program from the outset as a means of improving motorist convenience and reducing the overall number of inspection lanes required. Data from the program help evaluate how remote sensing can reduce vehicle emissions (Klausmeier, 2005). Of the vehicles clean screened, 60 percent are less than six years old, and would be exempt if the first five years were exempted.

The emissions effectiveness of the RapidScreen program has been calculated using the results of a random two percent audit sample of vehicles identified as having low emissions by the RapidScreen program. Instead of receiving a RapidScreen notice, these vehicles were tested at the inspection stations. The audit sample test results were then used to calculate the air quality impact of exempting the RapidScreen vehicles from a station-based test. The results indicated that the RapidScreen program retained 97% of HC tailpipe reductions, 85% of gas cap related HC reductions, 97% of CO reductions and 97% of NO_X reductions of the Gateway Clean Air Program.

Data from the RapidScreen program helped us evaluate the cost effectiveness of remote sensing. Following are key results concerning cost-effectiveness:

- RSD is estimated to cost $48 per correct I/M test, when results are adjusted for exempting five model years.
- Clean screening has negligible impact on potential emissions reductions.
- Assuming that clean screen costs do not apply to the costs to identify high emitters, the overall cost effectiveness is about $8,600 per ton of HC plus NO_X. This figure is relative to a program without any form of profiling.

Note: Missouri plans to terminate RapidScreen and go to an OBD-only program.

Fact Sheet on New Hampshire's I/M Program

Program Element	New Hampshire's I/M Program
Network Type	Decentralized – Decentralized Test and Repair.
Coverage	All
Exemptions	None
Emissions Test Type	Pre-1996 and all 8501+ GVW: Visual gas cap and tampering inspection 1996+: OBD II
Gas Cap Test	Visual
Safety Inspection	Yes
Fuel Types	Gasoline
Enforcement	Sticker
Data System	Central VID maintained by Contractor (Gordon Darby).
Test Frequency	Annual
# Tested	1,400,000/year
# of Test Facilities	~1,700
QA Audits	Performed by DMV
Inspection Fee	Inspection is Market Driven $3 per test to data and equipment contractor (includes OBD II inspection system cost)
Waivers Allowed	Yes -- $450 limit
Website	http://www.nhostservices.com
Program Contact	Jennifer Jakubauskas: 603-271-8800

Special Features:

Sole Source Data and Equipment Provider: The New Hampshire I/M program uses a single contractor (Gordon Darby), which provides all OBD II test equipment and collects and maintains the vehicle information database (VID). Gordon Darby charges $3 per test, which covers all costs including providing test equipment to stations.

Start-Up Problems: When OBD II was added to the program, many stations objected and much bad press ensued. The State and the contractor did not adequately talk to Stakeholders prior to start-up.

Fact Sheet on New York's I/M Program

Program Element	New York's I/M Program
Network Type	Decentralized – Decentralized Test and Repair
Coverage	Statewide/All vehicles 25 model years old and newer
Exemptions	First 2 Years
Emissions Test Type	**Downstate:** Pre-1996: IM240 or TSI (if not IM240 testable) 1996+ and all 8501+ GVW: OBD II **Upstate:** Pre-1996 and all 8501+ GVW: Visual gas cap and tampering inspection 1996+: OBD II
Gas Cap Test	Functional Downstate, Visual Upstate
Safety Inspection	Yes
Fuel Types	Gasoline
Enforcement	Sticker
Data System	Central VID maintained by State (NYSDMV); Contractor (SGS Testcom) collects and passes data to State
Test Frequency	Annual
# Tested	10,000,000/year
# of Test Facilities	~10,000
QA Audits	Performed by NYSDMV and NYSDEC
Inspection Fee	**Downstate:** $37 test **Upstate:** $21 test (first reinspection is free) $1 per test to data contractor (+ ~$1,700/each Upstate System)
Waivers Allowed	Yes -- $450 limit
Website	http://www.nysdmv.com; www.nyvip.us
Program Contact	James Clyne, NYSDEC: 518-402-8292 Mike Maher, NYSDMV: 518-473-0597

Special Features:

Sole Source Data and Equipment Provider: The Upstate New York I/M program uses a single contractor (Testcom) which provides all OBD II test equipment and collects and passes data to State. Inspection systems cost ~$1,700 and the State pays approximately $0.50 per test for data collection.

Data Triggers: NYSDMV and NYSDEC run extensive trigger reports and shutdown about 400 stations per year.

Fact Sheet on Oregon's I/M Program

Program Element	Oregon's I/M Program
Network Type	Centralized -- Test Only/ State Operated
Coverage	Portland and Medford areas/1975+ Up to 14000 lbs GVW
Exemptions	First 3 Years
Test Type	Pre 1996 and all >8500 powered by gasoline: TSI (phasing-in TSI from BAR31 test that's currently used) 1996+, <8500: OBD (1997+ Diesels)
Gas Cap Test	None
Safety Inspection	No
Fuel Types	Gasoline, Diesels (1997+ only)
Enforcement	Registration
Data System	Central VID operated by State (DEQ)
Test Frequency	Biennial
# Tested	~1,000,000/year (~1,400,000 tests per year).
# of Test Facilities	7 facilities/36 lanes
QA Audits	Performed by DEQ
Inspection Fee	$21/pass collected in lanes by State employees.
Waivers Allowed	No, all vehicles must pass. Some exceptions. Must pass the "basic test", but possible "enhanced test waiver."
Website	http://www.deq.state.or.us/aq/vip
Program Contact	Jerry Coffer or Ted Kostakis: 503-731-3050 COFFER.Jerry@deq.state.or.us

Special Features:

State Operated with Equipment and Computer System Provider: Oregon's I/M is run by DEQ. DEQ employees inspect vehicles and the State maintains the vehicle inspection database. State employees are unionized. SysTech Inc. (STI) provides test equipment and Lane Manager (server for inspection data), along with computers for the vehicle information database (VID).

Innovative OBD II Inspection System: Oregon is implementing self service OBD II inspection kiosks and wireless OBD II inspection systems.

Phase-Out of BAR31 Loaded-Mode test: To simplify lane operations and reduce equipment costs (including maintenance), Oregon is switching back to a TSI (two-speed idle) test for all 1995 and older models.

No waivers: All vehicles must pass I/M tests.

Fact Sheet on Oregon's I/M Program
(continued)

Self Service Lane – The self-service test lane will enable motorists to obtain inspections 24 hours a day, seven days a week. The test bay will consist of a covered test lane with testing equipment on the driver's side. The customer can use a hardwire cable connection to plug into the vehicle's OBD connector or diagnostic link connector (DLC).

The system will attempt to download the vehicle identification number (VIN) from the vehicle's powertrain control module (PCM) to identify the vehicle. If the VIN is not available from the PCM, the system will download the parameter identification (PID) count, PCM module ID, calibration ID (CID), and calibration verification number (CVN). In this case, the customer will be required to enter the vehicle plate. The vehicle inspection program (VIP) database will be searched by plate to obtain vehicle information. If the vehicle plate is found in the VIP database, then the PID Count and PCM Module ID will be compared to a table of possible PID counts and PCM module IDs for that year, make, model and engine. If they match, the VIN in the vehicle database for that plate will be used as the vehicle ID. If there is not a match, the customer will be advised that the vehicle must be inspected at a regular VIP test lane.

Also if the vehicle is not found via plate search within the VIP database, the vehicle will need to be tested in an inspector operated test lane. After hook-up, the OBD inspection will be processed. If the vehicle passes, test fees will be collected via credit/debit card. If desired, the customer will be immediately directed to DMV's website to apply for new tags. A receipt of the transaction will be printed for the customer's records.

Broadcast OBD: The Broadcast OBD system consists of transponders installed in participating vehicles. In one case, transponders will transmit data to access points. In another case, the transponder will be physically delivered to the VIP database to be downloaded. Participating motorists will be able to pass inspection without going to a station, if they meet the OBD pass/fail criteria. The inspection will not include visual malfunction indicator light (MIL) checks.

Fact Sheet on Wisconsin's I/M Program

Program Element	Wisconsin's I/M Program
Network Type	Centralized -- Test Only/ Contractor Operated (Envirotest Wisconsin Inc.)
Coverage	7 Southeastern Counties/1968+ Up to 10,000 lbs GVW
Exemptions	First 2 Years
Emissions Test Type	1981-1995 <8500: IM240 (TSI as back-up) 1996+, <8500: OBD or if GVW >8500 lbs then IM240 Others: Curb Idle
Gas Cap Test	All vehicles (1971 and newer)
Safety Inspection	No
Fuel Types	Gasoline or alternative fuel
Enforcement	Registration
Data System	Central VID operated by State
Test Frequency	Biennial
# Tested	~600,000/year
# of Test Facilities	12 facilities/44 lanes/2 technical assistant centers
QA Audits	Performed by DMV
Inspection Fee	Initial test and first 2 retests are part of Registration Fee, subsequent tests cost $15/test
Waivers Allowed	Yes -- $450 limit
Website	http://www.wivip.com
Program Contact	Chuck Rhodes, DMV: 414-266-1084, vharles.rhodes@dot.state.wi.us

Special Features:

Centralized Contractor Operated Program: DMV keeps close tabs on the program.

Extensive Liaisons with Repair Industry: DMV constantly monitors repair effectiveness and continually upgrades technician certification requirements.

Technician Training in Inspection Lanes: DMV performs technician training seminars in selected I/M lanes.

APPENDIX B-2

SAFETY INSPECTION PROGRAM SUMMARY

TABLE B-1 - SAFETY INSPECTION PROGRAM SUMMARY

State	Model Years	Brake Test	Front End	Tires	Comments
DC	ALL	Test Machine	Test Machine	Tread Gauge/ Visual	Safety Program separate through DMV. Safety inspection every other year. No inspection exemptions. City centralized run inspection facilities. Fee for safety inspection is included within the cost of the registration (Breakdown is $25/2 years). 2nd reinspection is free. 3rd had a $25 reinspection fee. Reinspect for change in ownership. 8-10 minutes to do an average safety inspection. Has no statistical information, "pass/fail" only.
DE	ALL	Test Machine	Test Machine	Tread Gauge/ Visual	Both programs run by DMV. Safety inspection every other year. Four DMV facilities do inspections. New car safety inspection exemption. No fee for inspections. 4-7 minutes to do average safety inspection. They keep some statistical info concerning failure rates but info hard to get.
MA	ALL	Road Test/ Wheel Pull	Lift	Tread Gauge/ Visual	Joint Program by RMV and DEP for oversight and implemented through a Contractor (Applus+ Technologies). Together Safety and emission test take on average 20 minutes to complete. Both safety and emission test cost $29. 1600 licensed inspection stations across state.
NH	ALL	Road Test/ Wheel Pull	Lift	Tread Gauge/ Visual	Both Programs DMV oversight but implemented through Contractor (Gordon-Darby). Annual inspection with requirement to reinspect at change of ownership, otherwise no exemptions. De-centralized system of 2600 licensed safety inspection stations. Each station can set price for inspection. 45 mins on average to inspect. Just started automated program on reporting. Do not have statistics as of this time.
NJ	ALL	Test Machine	Test Machine	Tread Gauge/ Visual	Both Programs run through MVC. State inspection stations and Private inspection stations perform safety tests. Exemptions for new cars four years from the date of purchase and every two years thereafter. Has statistical information on failed components. State inspection is free while each PIF set their inspect costs.

State	Model Years	Brake Test	Front End	Tires	Comments
NY	ALL	Road Test/ Wheel Pull	Lift	Tread Gauge/ Visual	Once year inspection; State run with $10 safety inspection fee. Both programs run through DMV. Inspections done at licensed PIFs. Reinspect for change in ownership. If you become a resident of NYS and register your vehicle in NYS, your out-of-state inspection remains valid. When your out-of-state inspection expires, you must get the vehicle inspected in NYS. No available statistical information.
PA	ALL	Road Test/ Wheel Pull	Lift	Tread Gauge/ Visual	Both Programs run by DMV. Safety inspection done every year and is linked to emissions (no safety test allowed before emissions test completed). Exemptions are antique cars. Inspections done at 17,500 licensed safety PIFs. Do not have to reinspect for change in ownership. ½ hour average time for safety inspection per state law. Each PIF set their inspection costs. Do not keep statistics. Reports still by paper.
TX	ALL	Road Test/ Wheel Pull	Lift	Tread Gauge/ Visual	Both Programs run by Texas Dept. of Safety. No exemptions for safety inspection. New vehicles have a safety inspection after 2 years then every year thereafter. Do not have to reinspect for change in ownership. 32,000 licensed inspection stations (both) with 9900 stations safety only. Average time for safety inspection is 10 minutes. $12.50 for yearly safety inspection. Have some statistical information but all on paper and manually would have to be looked at (not for whole state also).
VA	ALL	Road Test/ Wheel Pull	Lift	Tread Gauge/ Visual	Separate Safety Program through State Highway Patrol. Yearly inspection with new vehicles and antique vehicles, 25 years or older, exempt. Safety inspections through 4500 active licensed PIFs (8000 inactive). PIFS can charge up to $15 for safety inspection. 45 minutes for average safety inspection. Do not have to reinspect for change in ownership. SHP audits PIFs regularly. DMV has some crash statistics but not much. 7 million vehicles inspected last year with 21% failing.
OR	------	-------	-------	-------	Has emissions inspection program but no safety inspection program.

State	Model Years	Brake Test	Front End	Tires	Comments
MD	ALL	Wheel Pull	Lift	Tread Gauge/Visual	Separate Safety inspection through State Highway Patrol (enforcement) and MVA. One time inspection only after selling or reselling of vehicle. No exemptions. Safety inspections through licensed PIFs who charge fee based on hourly rate. Average inspection takes 1-1 ½ hours. Has no statistics available.
GA	--------	--------	------	--------	Has emissions inspection program but no safety inspection program.
IL	-------	--------	-------	--------	Has emissions inspection program but no safety inspection program.
CA	-------	--------	-------	----------	Has emissions inspection program but no safety inspection program.
NC	35 years older exempt	Visual	Visual	Visual	Separate Program specs/program established by DENR and managed through DMV. Yearly inspection with antique vehicles, 35 years or older, exempt. Safety inspections through licensed PIFs. $9.10 fee for safety inspection. 20 minutes for average safety inspection. Do not have to reinspect for change in ownership. No statistical data available.
CT	------	---------	-------	--------	Has emissions inspection program but no safety inspection program.
RI	2yr/24K exempt	Visual	Lift	Visual	Every 2 years; $47 for safety and emission testing. DMV run both programs and implemented through a Contractor (Applus+ Technologies). Safety inspections done at 25 licensed PIFs throughout the state. New cars have 2 year/ 24K miles and antique vehicles, 25 years or older, electric vehicles exempt. 30 to 40 minutes to safety inspect a vehicle. No statistical data available at this time.
MO	2 yr exempt	Wheel Pull	Lift	Visual	Each year at registration or change in ownership. Separate Safety program through MVA.
TN	---------	----------	---------	----------	Has emissions inspection program but no safety inspection program.
KY	----------	----------	---------	----------	Has emissions inspection program but no safety inspection program.
WI	---------	-----------	----------	------------	Has emissions inspection program but no safety inspection program.
OH	----------	----------	---------	-----------	Has emissions inspection program but no safety inspection program.

Twenty-two States (including DC) were investigated, with nine not having any safety inspection program at all. The safety program is run separately from the emissions program in five States and eight States run both programs through the same department.

TABLE B-2 - SAFETY INSPECTION REQUIREMENT LIST

<u>Washington, DC</u>

Vehicle Registration and Documents

1. Missing documents *
2. Mutilated documents *
3. Missing or incorrect tags
4. Incorrect body style
5. Missing or incorrect vehicle identification number
6. Incorrect documentation *

Vehicle Body

1. Damaged or Rusted doors
2. Damaged and/or rusted quarter panel
3. Damaged and/or rusted hood
4. Damaged and/or rusted fenders
5. Damaged and/or missing bumpers
6. Damaged and/or missing bumper guards
7. Incorrect tag mounting*
8. Missing or improper gas cap
9. Damaged body work
10. Damaged or rusted doors, operative and no holes*
11. Minor damaged body work, no jagged edges*
12. Minor dent on vehicle that doesn't affect the vehicles operation*

Vehicle Safety

1. Missing or broken mirror on driver's side
2. Missing or broken mirror on passenger side*
3. Horn must be audible*
4. Missing or damaged seatbelts
5. Missing or broken speedometer
6. Missing or broken gear indicator - gears operational*
7. Missing or broken gear indicator - broken gears
8. Miscellaneous safety item failure

Vehicle Lights

1. Non operational signal lights
2. Non operational backup lights
3. Non operational tail lights
4. One non operational tail light*
5. Non operational stop lights

<u>Washington, DC (continued)</u>

Vehicle Lights (continued)

6. Non operational center stop light*
7. Non operational tag lights*
8. Non operational clearance lights*
9. Non operational marker lights*
10. Non operational fog lights*
11. Incorrect lens color
12. Damaged or Missing side reflectors*
13. Damaged or Missing rear reflectors*
14. Non operational headlights
15. Non operational indicator lights

Vehicle Glass

1. Cracked or damaged windshield
2. Minor cracked or damaged windshield, as long as the crack does not obstruct the driver's vision and is less than three (3) inches in length.*
3. Cracked or damaged side window
4. Cracked or damaged rear window
5. Non operational window controls
6. Unacceptable window tint
7. Missing or non operational wipers
8. Missing or damaged wiper blades

Vehicle Suspension

Damaged or Unacceptable

1. Kingpin
2. Shocks
3. Ball joints
4. Control Arm
5. Rack and Pinion
6. Tie Rod Ends
7. Idler Arm
8. Pitman Arm
9. Sleeve
10. Springs
11. Steering Box
12. Steering Wheel
13. Bearings
14. Steering Linkage
15. Column

Washington, DC (continued)

Vehicle Suspension (continued)

16. Alignment
17. Power Steering
18. Bellows
19. CV Joints

Vehicle Exhaust

1. Leaking exhaust
2. Loose exhaust
3. Flexible piping exhaust
4. Excessive exhaust noise
5. Excessive exhaust smoke

Vehicle Tires

1. Unacceptable or worn tire tread
2. Unacceptable or cut tire
3. Mixed tire types
4. Unacceptable knots and bulges in tires
5. Over or under inflated tires
6. Visible tire cord
7. Tire recap/tread front
8. Missing lug nuts
9. Missing one (1) lug nut on one (1) wheel*

Vehicle Brakes

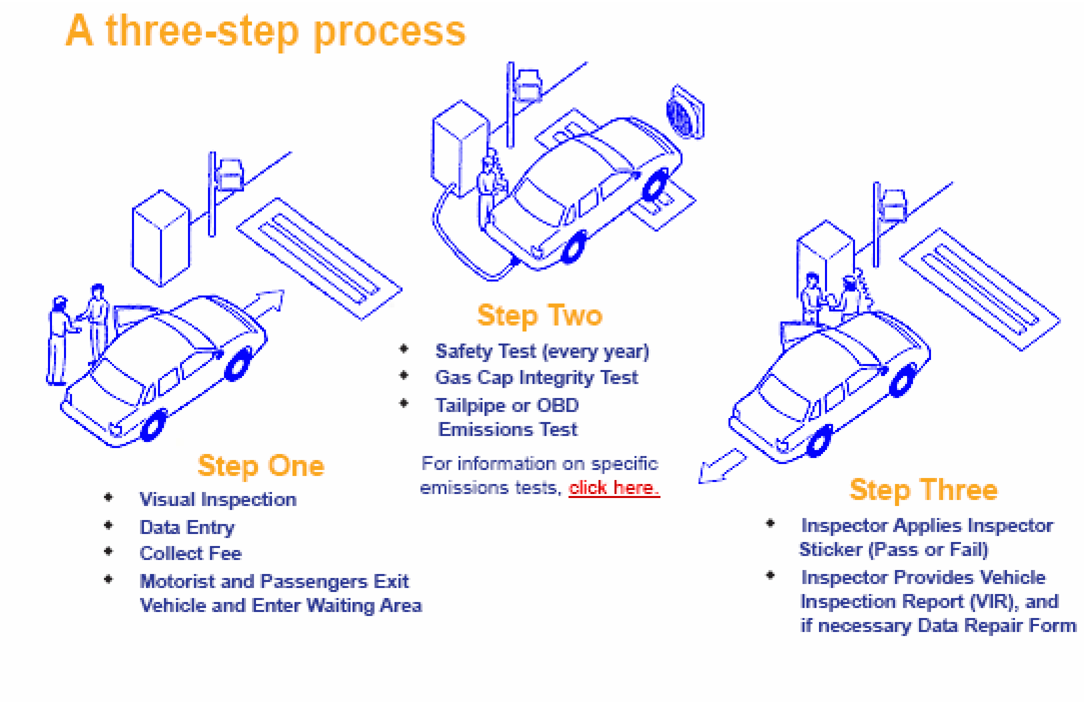
1. Worn or warped rotors
2. Excessive brake noise
3. Leaking or damaged master cylinder
4. Leaking or Damaged wheel cylinder
5. Damaged or Non operational vacuum booster
6. Non operational parking brake

Delaware

Delaware performs a safety inspection of your vehicle to ensure that your vehicle's safety equipment is in working condition. The following is a brief outline of some of the items that will be inspected:

- All lights must be clean, in working order and properly aimed. This includes stoplights, turn signals, license plate lights, parking lights and headlights;
- Brakes must stop the vehicle within required distance;
- Glass in windows must have no holes, breaks or cracks;
- Mirrors must be clean and unbroken;
- Windshield wipers must be fully operative (the rubber blades must be in good condition);
- Hood and trunk latches must hold hood and trunk fully closed;
- Tires must have no bulges, no fabric showing, no bald areas and no cuts. Tread depth must be at least 2/32 inch measured in two adjacent treads;
- Doorknobs or equivalent must be present and in working condition;
- There must be no damaged or dislocated parts projecting from the vehicle that could present a safety hazard;
- Horn must be in operating condition;
- Muffler must effectively reduce sound of engine exhaust. No leaks in exhaust system. Catalytic converter must be installed if originally equipped from manufacturer;
- There must be no gasoline leaks;
- Bumper height on passenger cars must not exceed 22 inches from the ground to the bottom of the bumper;
- No tinting or sun screening device can be applied to the front windshield or to the front side windows;
- No air scoops shall be mounted on a vehicle hood that exceeds 3 inches;
- Windshield must have no cracks that interfere with vision. Any cracks over 5 inches on any window are mandatory failure items. Minimum height of visibility in windshield is 10 inches.

Massachusetts



New Hampshire

New Hampshire follows AAMVA guidelines for inspection criteria.

New Jersey

The current Motor Vehicle Commission Safety Program includes six major components which are credentials, steering & suspension and tires, safety equipment, lights, brakes, exhaust, and miscellaneous safety. Listed below are the six major components broken down into separate specific safety conditions.

- **Credentials**
  - Driver License
  - Registration
  - Insurance Card
- **Steering & Suspension**
  - Wheels
  - Wheel lash
  - Ball joints
  - Tie rod
- **Safety Equipment**
  - Horn
  - Wipers
  - Glazing
  - Visional obstruction
  - Mirrors
  - Wiring
  - Switching
- **Lights**
  - Parking lights
  - Direction signals
  - Marker clearance
  - Identification reflectors
  - Red rear light
  - Plate light
  - Stop lights
  - Headlights
- **Exhaust system**
  - Noise
  - Leaks
  - Tampering- catalytic converter
- **Brakes**
  - Service brake
  - Pedal reserve
  - Brake equalization
- **Miscellaneous**
  - Loose seat
  - Sharp edges on body and bumper
  - Transmission leak
  - Improper hood operation
  - Seat belts

New York

The New York State vehicle safety inspection program helps make sure every vehicle registered in this state meets the minimum standards for safe operation on public streets and highways. In addition, most vehicles are subject to an emissions inspection to help reduce air pollution.

A properly maintained vehicle is safer, performs better, uses fuel more efficiently and saves the owner money. You can help by doing your own equipment safety checks between annual inspections, and by following a program of regular vehicle maintenance as recommended by the manufacturer.

This publication highlights the safety and emissions inspection requirements for cars and light trucks. Other motor vehicles, including motorcycles and trailers, must meet different requirements for annual inspection.

New York State Vehicle Inspection Requirements:

New York State motorists are required by law to keep their motor vehicles in safe operating condition whenever they drive on a public street or roadway.

- Each vehicle must pass inspection every 12 months and whenever there is a change of ownership under which the vehicle is registered in another name.
- Upon receiving a request for inspection, an inspection station must inspect any vehicle it is licensed to inspect or must provide, in writing, an appointment date that is within eight working days of the request. If an appointment is made, the station may require a deposit that cannot exceed the inspection fee.
- An inspection must be done in a licensed inspection station displaying an official sign, and must be performed by a certified motor vehicle inspector.
- If your vehicle fails the safety and/or emissions inspection, the inspection station may not repair it, or attempt to repair it, without your authorization.
- You are not required to have your vehicle repaired or reinspected at the station which performed the inspection.
- It is a misdemeanor for an inspector to knowingly issue, or a motorist to knowingly accept, an inspection sticker unless a full and proper inspection has been performed.

Items Inspected on Cars and Light Trucks

The following safety equipment must be in good condition at all times, and is evaluated when a vehicle is subjected to New York State inspection.

New York (continued)

Seat Belts

Inspect for proper operation and anchorage.

- Model years 1969 and newer - one seat belt is required for each seating position.
- Model years 1967 and 1968 - two front seat belts are required (driver position included), and one seat belt is required for each seating position elsewhere in the vehicle.
- Model years 1965 and 1966 - two front seat belts are required (driver position included).

Brakes

At least one front wheel must be removed to inspect brakes.

- Brake pedal reserve - brake pedal must have 1/3 reserve.
- Brake pedal fade - brake must hold for one minute without fading.
- Power brake unit - check for damage.
- Brake master cylinder - check for leakage and proper fluid level.
- Disc brake pads - check condition.
- Drum brake linings - thickness of linings must be at least 1/16 inch on bonded linings or at least 1/32 inch over rivet head on riveted linings, with no loose or missing rivets or lining.
- Brake drums and/or rotors - check condition.
- Wheel cylinders and/or calipers - check for leakage.
- All brake lines and hoses - check for leaks, cracks, improper support, flattened, etc.
- Parking brake - check for components and function.
- Brake equalization - test vehicle for a straight stop without significant wheel pull.

Steering, Front End, Suspension, Chassis, Frame, Wheel Fasteners

- Front end assembly - check condition.
- Steering wheel play - check for excessive freeplay.
- All steering linkage - check for tightness or binding, excessive wear and/or looseness in parts, including idler arm, center control arm, tie-rod ends, drag link ends, steering and pitman arms gear box, cross shafts, bushings, wheel bearings, steering column or steering wheel shaft mounting.
- Power steering - check operation, condition of belt, and for leakage.
- Shock absorbers - check shock mountings and for broken or missing shock absorbers.

New York (continued)

Steering, Front End, Suspension, Chassis, Frame, Wheel Fasteners (continued)

- Springs and torsion bars - check for sagging or broken springs, or a broken, disconnected, missing or bent torsion or stabilizer bar.
- Chassis/frame - check for breaks, cracks, or severe rust at the suspension attachment points.
- Wheel fasteners - check for missing or broken parts.

Each Tire (Except spare)

- Tread depth - must be at least 2/32 inch when measured in two adjacent major tread grooves showing the most wear.
- Tire condition - check for any fabric break or cut over 1 inch, visible bumps, bulges or knots, and any restricted use designation on the tire.

Lights

All lighting must be of an approved type and inspected for operation, proper mounting, and broken or missing lenses:

- Headlights (low and high beam).
- Tail lamps.
- Stop lamps.
- Directional signals.
- Backup lights (1969 and newer).
- License plate lights.
- Hazard warning/four-way flasher (1966 and newer).
- Directional signal indicator.

Windshield And Other Glass

- Windshield - check for presence and condition.
- All windows - approved safety glass or rigid plastic and condition.

Windshield Wipers And Blades

- Wipers - check for presence and operation.
- Blades - check condition.

Horn

- Check mounting and operation.

New York (continued)

Mirrors

Check mirror location and mounting, and for cracks, breaks, or discoloration:

- Model year 1970 and newer - check adjustable interior and left outside mirror.
- Model year 1968 and 1969 - check interior mirror and one left outside mirror.
- 1967 and older - check interior mirror or left outside mirror.

Note: *Vehicles with a permanent obstruction of the view through the rear window (e.g., pickup cap) must have both left-side and right-side outside mirrors.*

Pennsylvania

Safety inspections for passenger cars and light-duty trucks require that the following items be checked: suspension components, steering, braking systems, tires and wheels, lighting and electrical systems, glazing (glass), mirrors, windshield washer, defroster, wipers, fuel systems, the speedometer, the odometer, the exhaust systems, horns and warning devices, the body, and chassis. For most vehicles in the 42 county, Non-I/M region, this safety inspection will also include a Visual Anti-Tampering Check. The Visual Anti-Tampering Check is an examination of the vehicle to see if the required emissions components have been tampered with or removed. For more information concerning the 42 County Visual Anti-Tampering Check, please visit the PA Code Website. For a complete list of the rejection criteria for passenger cars and light duty trucks, please visit the PA Code Web site, Subchapter E.

Texas

Items of Inspection

Inspect Every Passenger Car For: (Listed in suggested order of inspection)

* Check for evidence of Financial Responsibility

1. Horn
2. Windshield Wipers
3. Mirror
4. Steering
5. Seat Belts
6. Brakes (system) (Parking - beginning with 1960 models)
7. Tires
8. Wheel Assembly
9. Exhaust System
10. Exhaust Emission System (beginning with 1968 models)
11. Beam Indicator (beginning with 1948 models)
12. Tail Lamps (2); (1) if 1959 model or earlier
13. Stop Lamps (2); (1) if 1959 model or earlier
14. License Plate Lamp (1)
15. Rear Red Reflectors (2)
16. Turn Signal Lamps (beginning with 1960 models)
17. Head Lamps (2)
18. Motor, Serial, or Vehicle Identification Number
19. 1988 & newer - inspect for window tinting or coating
20. Gas caps on vehicles 2-24 model years old.

Virginia

The Required Official Inspection Procedure, as approved by the Virginia State Police Superintendent, is as follows:

Required Official Inspection Procedure

Each inspection consists of the following items – for further details consult the "Official Inspection Manual":

1. Remove old inspection sticker.
2. Drive vehicle into inspection lane.
3. Inspect brakes for:
    - Worn, damaged or missing parts.
    - Worn, contaminated or defective linings or drums.
    - Leaks in system, proper fluid level.
    - Worn, contaminated or defective disc pads or discs.
      (NOTE: A minimum of two wheels and drums must be removed from each vehicle at the time of inspection. Consult the official inspection manual for exceptions.)
4. Inspect parking brake for:
    - Broken or missing parts.
    - Proper adjustment.
    - Standard factory equipment or equivalent.
5. Inspect headlights for:
    - Approved type, aim, and output.
    - Condition of lamp, wiring and switch.
    - Beam indicator.
6. Inspect other lights for:
    - Approved type, proper bulbs, condition of lenses, wiring and switch.
    - Aim of fog and driving lamps.
    - Illumination of all lamps, lens color, and condition of lens.
      (NOTE: Every vehicle must have a rear lamp showing a red light to the rear, a white light illuminating the rear license plate; vehicles over 7 feet wide or extending 4 inches or more beyond the front fender extremes must be equipped with approved clearance lamps and reflex reflectors. Count load in measuring.)
7. Inspect signal device for:
    - Approved type, proper bulbs, condition of lenses, wiring and switch.
    - Correct indications and tell-tale (visual or audible).
    - Illumination of all lamps, lens color, and condition of lens.

Virginia (continued)

8. Inspect steering & suspension for: (Jack up front end as shown in Manual)
    - Wear in bushings, kingpins, ball joints, wheel bearings, tie rod ends.
    - Looseness of gear box on frame, condition of drag link and steering arm.
    - Play in steering wheel.
    - Wheel alignment and axle alignment.
    - Broken spring leaves, and worn shackles.
    - Shock absorbers.
    - Broken frame.
    - Broken or missing engine mounts.
    - Lift blocks.
9. Inspect tires, wheels & rims for:
    - Condition of tires including tread depth.
    - Mixing radials and bias ply tires.
    - Wheels that are cracked or damaged so as to affect safe operation.
10. Inspect mirror for:
    - Rigidity of mounting.
    - Condition of reflecting surface.
    - View of road to rear (Truck mirrors must extend at least halfway beyond edge of body) – (Visibility 200 feet to rear).
11. Inspect horn for:
    - Electrical connections, mounting and horn button.
    - Emits sound audible for a minimum of 200 feet.
12. Inspect windshield and other glass for:
    - Approved type safety glass.
    - Cloudiness, distortion or other obstruction to vision.
    - Cracked, scratched or broken glass.
    - Stickers. ALL UNAUTHORIZED STICKERS MUST BE REMOVED.
    - Sunshading material attached to the windshield to ensure it does not extend more than 3 inches downward from the top of windshield, unless authorized by Medical Waiver Certificate.
    - Operation of left front door glass.
13. Inspect windshield wiper/defroster for:
    - Operating condition.
    - Condition of blade.
14. Inspect exhaust system for:
    - Exhaust line-manifold, gaskets, pipes, mufflers, connections, etc.
    - Leakage of gases at any point from motor to point discharged from system.
15. Inspect License tags for:
    - Illumination of rear plate.

Virginia (continued)

16. Inspect hood and area under the hood for:
    - Operating condition of hood latch.
    - Presence of emissions system – Evidence that any essential parts have been removed, rendered inoperative or disconnected.
    - Fluid levels that are below the proper level
        1. Brake fluid.
        2. Power steering fluid.
    - Power steering belt - proper tension, wear, or absence.
17. Inspect air pollution control system (1973 and Subsequent Models) for:
    - Installation.
    - Operation.

      (NOTE: This includes the catalytic converter and the fuel tank filler pipe.)
18. Inspect driver's seat for:
    - Anchorage.
    - Location.
    - Condition.
19. Inspect seat belts for:
    - Approved type.
    - Installation.
20. Inspect doors at the right & left side of the driver's seat for:
    - Handle or opening device which will permit the opening of the door from the outside and inside of the vehicle.
    - Latching system which will hold door in its proper closed position.
21. Inspect fuel system for:
    - Any part that is not securely fastened.
    - Liquid fuel leakage.
    - Fuel tank filler cap for presence.
22. Inspect floor pan for:
    - Holes which allow exhaust gases to enter occupant compartment.
    - Conditions which create a hazard to the occupants.
23. Issue sticker:
    - If approved, place approval sticker on the vehicle, and give pink copy of certificate to operator.
    - All defects must be corrected and the vehicle reinspected within 15 days. The driver may be in jeopardy of receiving a summons for any defect still present any time the vehicle is operated on the highway.

Maryland

Vehicle Parts or Systems to be Inspected

Vehicles - GVWR Equal to or Less Than 10,000 Pounds (form #23-21)	Trailer (form #23-21B)	Motorcycle and 3-Wheel MPV (form #23-21C)	Vehicles - GVWR Over 10,000 Pounds (form #23-21A)
• Steering system • Wheel alignment • Suspension • Brake system • Wheels / tires • Fuel system • Exhaust system • Bumpers • Fenders • Lights • Electrical system • Mirrors • Glazing (windows) • Wipers • Hood / catches • Door handle latches • Floor / trunk pans • Speedometer / odometer • Driver seat • Safety belts • Motor mounts • Gear shift indicator • Universal and CV (constant velocity) joints • Emissions equipment	• Hitches • Suspension • Brake system • Emergency brakes • Wheels / tires • Rear metal frame • Rear wheel flaps • Lights • Electrical system • Fenders	• Steering system • Frame • Brake system • Wheels / tires • Fuel system • Exhaust system • Lights • Electrical system • Mirrors • Windshield • Passenger items (hand hold and foot rest) • Body items (seat, engine mounts, stand, chain and guard, fenders) • Speedometer / odometer	• Steering system • Wheel alignment • Suspension • Brake system • Wheels / tires • Fuel system • Exhaust system • Bumpers / rear frame • Rear wheel flaps • Fenders • Lights • Electrical system • Mirrors • Glazing (windows) • Wipers • Hood / catches • Door handle latches • Floor / trunk pans • Speedometer / odometer

North Carolina

Safety-Emissions Testing checklist includes the following safety items: horn, tires, reflectors, foot brake, emergency brake, steering mechanism, window tinting, windshield wiper, rear view mirror, headlights, parking lights, tail lights, clearance lights, unleaded gas restriction, air injection system, fuel evaporation control, and thermostatic control.

Rhode Island

No safety inspection list available to the public.

Missouri

11 CSR 50-2, SHP-515, and SHP-494 (horn, tires, reflectors, foot brake, emergency brake, steering mechanism, window tinting, windshield wiper, rear view mirror, headlights, parking lights, tail lights, clearance lights, exhaust, bumpers, seat belts, fuel system, and air pollution control devices).

APPENDIX C-1

INITIAL PROJECT STAKEHOLDER LIST

Appendix C-1. PROJECT STAKEHOLDERS

Repair Industry

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Rick Ferber
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Enzo Olivieri
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NJ Gasoline Retailers Association

Labor

Tony Naputano
NJ State Motor Vehicle Employees Union (Local 518)

Alternate/2nd
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President
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Tony Napoli
SEIU

Howie Rofosky
SEIU

Sam Ventola
SEIU

Bob Angelo
SEIU

Rae Roeder (Not likely to attend)
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321 W. State St
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(609) 394-7725
No email
Yes

Alternate/2nd (Not likely to attend)
Pat Stetler
Communication Workers of America

New Car Dealers

Mark McAleer (a stakeholder, but not able to attend; has sent a statement of interests**)**
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Motoring Public

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Alternate/2nd
Stephanie Mensch
AAA South Jersey

Federal

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Vendors

Chris Stock (Not attending)
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Alternate/2nd
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Tom Janhke (not attending)
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Vendors (continued)

Alternate/2nd
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Alternate/2nd
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Ben Rico (not likely to attend)
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Alternate/2nd
Dick Luther (will attend)

James Valerio (may not attend)
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Greg Venet (will attend)

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Vendors (continued)

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Alternate/2nd
Vincent Porcaro (will attend)

Training Providers

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Law Enforcement

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Alternates/2nd
Sgt. Michael Brunson
Branchburg Township Police Department

Law Enforcement (continued)

Lt. Vincent DeRienzo
Bergen County Police Department

Lt. Steve Cozzi
New Jersey State Police

State of New Jersey

Catherine Schafer
NJ Motor Vehicle Commission

Sharon Harrington
NJ Motor Vehicle Commission

Tom Wright
NJ Motor Vehicle Commission

Tom Bednarz
NJ Motor Vehicle Commission

Gary Sondermeyer
NJ Department of Environmental Protection

Rob Schell
NJ Department of Environmental Protection

Bill Wanschura
NJ Department of Environmental Protection

Tom Micai
NJ Department of Environmental Protection

Chris Salmi
NJ Department of Environmental Protection

APPENDIX C-2

NEW JERSEY MOTOR VEHICLE INSPECTION SYSTEM REQUEST FOR INFORMATION (AUGUST 2005)

New Jersey
Motor Vehicle Commission

STATE OF NEW JERSEY

P.O. Box 160
Trenton, New Jersey 08666-0160

Richard J. Codey
Acting Governor

Sharon Harrington
Chief Administrator

REQUEST FOR INFORMATION

New Jersey Motor Vehicle Inspection System
Evaluation, Consultation, and Procurement
August, 2005

Please provide information to help the New Jersey Motor Vehicle Commission (NJMVC) evaluate the Motor Vehicle Inspection System (MVIS).

Background: The NJMVC has initiated a comprehensive study to evaluate all components of the MVIS and determine if the MVIS should continue unchanged or should be modified. This study will focus on vehicle safety inspection, vehicle emission inspection, data management systems, motorist convenience and the public/private partnerships used to deliver vehicle inspection services. The NJMVC has selected MACTEC Federal Programs as the contractor to conceptualize and propose options to modify the overall vehicle inspection system or provide reasons why the existing system should remain unchanged. MACTEC is beginning to research all proposed options to assist the State in selecting an option that is cost effective, is technologically current and will anticipate regulatory and technological trends/changes that impact or will impact motor vehicle inspections in the future.

General Information Requested: MACTEC is requesting general information from all interested parties to identify issues or topics regarding the NJMVIS that respondents believe are important to address during the evaluation. General items of interest include, but are not limited to:

- Other current and “soon-to-be-proven” emission/safety inspection technologies
- Inspection data management systems
- Remote sensing
- Training programs
- Repair/maintenance programs
- Security and anti-fraud programs
- Program costs and benefits
- Air quality considerations

Specific Information Requested: In addition to the general issues/topics listed above, we are requesting more specific information related to On Board Diagnostic (OBD) testing technologies:

- The State currently inspects vehicles using an industry and EPA standard interface. The test requires that the inspection equipment be plugged into the vehicle via a cable. The State is interested in pursuing different options and technologies for conducting OBD inspections. For example, wireless (Wi-Fi) connectivity and/or self service kiosks are emerging technologies for conducting OBD inspections. The State is interested in obtaining further information using these technologies in various operating conditions and use by inspection technicians and the motorists. The State is considering using this information to initiate prototype or pilot testing programs to evaluate the performance, functionality and ease of use of the equipment. Technology demonstrations and presentations to the State are envisioned with plans to conduct pilot demonstration programs and in-use comparisons with the existing OBD test equipment.

All interested parties, including the general public, are strongly encouraged to submit information, comments, or recommendations.

Instructions for Responses: Comments may be submitted by August x in these ways:

By Mail:	By e-mail:	By Telephone:
Attn: NJMVIS Evaluation Team MACTEC Federal Programs, Inc. 560 Herndon Parkway, Suite 200 Herndon, VA 20170-5240	NJMVIScomments@mactec.com	Tom Peters, MACTEC 703.471.8383

Your comments and perspective are very important as New Jersey considers the future of the MVIS. We appreciate your participation in this important undertaking.

Due Date: September, 2005

Contact: Call Tom Peters of MACTEC at 703.471.8383 for more information.

This Request for Information (RFI) is not a solicitation for proposals or for cost information for a system that is specific to New Jersey. This is a preliminary fact finding process for the purpose of obtaining information on new and innovative systems, equipment and/or products available, in order to aid in the development of future procurement opportunities.

APPENDIX C-3

SUMMARY OF INTERNAL STAKEHOLDER INTERVIEWS

Appendix C-3. Summary of Internal Stakeholder Interviews

Purpose: The purpose of Stakeholder Interviews (SHIs) is to identify issues, gather ideas for stakeholder involvement, and build relationships with affected business, trade, civic, and environmental organizations. The stakeholder process team will use the information collected during the SHIs to identify issues and themes, including those that reflect stakeholder perceptions. Attribution of specific points will not be made.

Stakeholders: The attached notes reflect conversations with the following stakeholders:

New Jersey Motor Vehicle Commission
- Facilities Management
- Driver and Vehicle Testing
- Purchase and Property
- Program Management & Systems Development

New Jersey Department of Environmental Protection
- Air Quality Planning
- Transportation Control

Office of Information Technology
- Data Processing
- Information Processing

Treasury Contract Compliance & Administration Unit

I. Program Management

- Both MVC and DEP would like universal software implemented. Universal software- been on the drawing board for years but is resisted by EM's and database vendors.

- DEP sole source equipment for PIFs – dealing with five manufacturers is difficult.

- State operation of CIF Lanes. State should run I/M. Can do cheaper. MVC would own data and could separate out emissions data for DEP. OIT would have to give MVC/DEP ad-hoc query capabilities. Issues include transferring staff back over to the state ad deciding what to pay them.

- Include better and more appropriate contactor performance measures in any new contracts issues by state.

- Next contract contain hours for support/recommendations to improve/correct problems.

- The option of *State Operation of CIF Lanes* was then discussed. [Name Withheld] noted that there would still be some contractor assistance needed. [Name Withheld] stated that maybe the State would staff the operations (handle staffing). DEP thought that the State would do operations and potentially maintenance if this option is considered.

- With regard to *Rebid of CIF Contract*, [Name Withheld] noted that DEP could take better corrective actions with the new contract. The suggestion is that the next contract contain hours for support/recommendations to improve/correct problems. It was also suggested that it might makes sense to break up the new contract into separate pieces based on prior knowledge of the operations.

- With regard to *State Operation of CIF Lanes*, it was noted by DEP that the contractor can deal with inspector and other CIF employee discipline issues better than the state can. It was also noted that the State could not penalize itself for delays. The group discussed that the State could do part of the contract (maintenance or operations) and that there would still be union employees. If the State is operating the CIF lanes, then maybe it shouldn't audit itself. In New Jersey, audits are becoming electronic so it could be audited by a contractor (which might require moving the State auditors to the contractor). It was noted that MVC would like to have a more efficient audit of PIFs. The audit results currently do not go into the VID in New Jersey. However, DEP equipment audits are maintained electronically.

- With regard to *VID Operation*, [Name Withheld] noted that there are four separate components that make up the overall data system and each one need to be addressed. OIT may take over the VID itself, and Bill stressed that he doesn't want a phone-based transfer system.

I. Program Management (continued)

- With regards to *Sole Source Provider for PIF Equipment*, [Name Withheld] noted that dealing with five equipment manufacturers had been a nightmare for the State. The decision to have multiple manufacturers goes back to GRA wanting the freedom to pick from a pre-approved list of manufacturers. DEP would like to have a sole source provider and is looking for options on how to do this. Transaction based inspections came up for discussion.

- The option of *Universal Inspection Software* could be a subset and possible implementation of the previous option. If PIFs are OBD only, then the PIF could buy a bar code reader, a computer, and the OBD equipment and then the State could sole source the software. Sandeep Kishan offered that this software could even reside on OIT or the State's server.

- When asked how to improve contract wording, it was suggested that the contract needs to specify who pays for what. The biggest conflicts have been regarding servicing Parsons' employees (for example lockers). This cost is fuzzy in the current contract. Employee comfort issues involving purchases such as microwaves, water coolers, and other such items have to be negotiated because the items purchased go back to the State when the contract is over. The question is who installs items for employee comfort such as bringing the old buildings up to code (environmental, safety, disability). Prime example is asbestos removal. The State takes no action until a complaint is issued. This issue becomes even bigger at the six consolidated stations (inspection operations conducted by Parsons and MVC office operations conducted by MVC). The locations in question are: Lodi, Eatontown, Rahway, Wayne, Bakers Basin (it was suggested that MACTEC visit), and Newark.

- The employee's health and safety are overseen by Parsons, but MVC pays for the repairs associated with these issues. Workman's compensation is handled by Parsons.

- Another question regarding the program if CIFs remain, who staffs the lanes (lane operation)? Should it be the State (DEP/MVC), which could still involve a contractor, or a contractor like Parsons? With the current contract Parsons is doing a better job than the State did pre-1999. When the State operated the CIFs, there was no enforcement, it was not customer driven, and there was no accountability. MVC would argue the flexibility of staff, but one could argue back that job descriptions have changed and if 100% of the staff was not there then the quality could go down. MVC would also argue that they would be cheaper. There is the economic and efficiency balance. Currently, the public doesn't complain due to the shorter wait times.

- There is the contract issue as a result of mistakes made when DOT/XI Data MgmtV/Treasury/DEP priced and wrote the contract together. The RFP had performance-based requirements to keep it open and Parsons won (only bidder) due to risk. The RFP required that the State only had to have one valid bid that was qualified. MACTEC has been hired due to past investigations into the current contract award. The State did not get the turn key contractor they anticipated (Parsons and the State were both learning). The RFP needs to be more specific (technical and operation requirements, penalties, measurements, and what to do if not meeting measurements). The State also came into the current contract with vague requirements.

I. Program Management (continued)

- The current contract has one single contractor with a Build/Operate/Maintain angle. In 1999, the State tried sending out this contract as separate RFPs (Data Management, Inspection Lane Operation, PIF Assistance, and other minor pieces). Should the State try breaking it up again (should the contract be broken up to handle different aspects)? DEP could handle the equipment (contractor) and MVC could handle operations. If it was decided to break it up, then administration could be a bad thing and the technology could get bidders to do an Operate and Maintain function.

- Parsons should be maintaining buildings or assessed.

- With current contractor there is a lack of control to make changes with the contract (for example, changing advisory).

- The original contract was poorly written. There has been conflict regarding who pays for what ([Name Withheld] assists with these negotiations). There have been 10 amendments to the current contract.

- The biggest problem with the Parsons contract is billing (evaluating all of Parsons' work orders).

- The best thing about the contract is that by using the Build/Operate/Maintain Parsons contract, it is the fastest way to get a job done. It is still cheaper and faster to pay Parsons (even with the add-on fees) than it is to go through Treasury. For example, a roof recently repaired by Parsons at a consolidated station took weeks to complete versus 2 years with the State. It proves that the next contract should have a Build/Operate/Maintain mechanism. This feature is most important for the six consolidated buildings since work can also be done on the Agency side due to the lax wording in the recent contract. This feature would continue to benefit the State since there are plans to construct five new consolidated facilities.

- Parsons is happier as a result of [Name Withheld]'s mediator role and the State has been using them instead of reducing work load (back log has improved).

- MVC spends about $200,000/month on Parsons' facilities.

- To handle some high cost work orders submitted by Parsons (snow plowing), MVC will bid out the work this year to reduce costs.

- High cost work orders submitted by Parson's

- Benefit of contractor running CIFs is customer service, wait times, employee management (e.g., ability to terminate poor performing employees); State would argue that a cost is the inflexibility of staff. I/M is one tenth the cost to get the same benefit of the remediation of one poser plant (numbers from a recent study presented by Bill O'Sullivan). These numbers represent emission measurement cost. With the I/M program, there is just the cost to Parsons (cost effective).

- With regard to PIFs, the biggest headache is multiple equipment manufacturers.

- If MVC says they do not want to operate the CIFs and DEP takes over the operation of the I/M program: (1) DEP does not want to do licensing, registration, or titling; (2) DEP would need funding to ramp up staff to handle the I/M program; and (3) DEP would outsource functions they could not support. Would like to see this option discussed again (killed recently by DEP Commissioner).

- MVC would be open to taking back CIFs or assisting Parsons (or another contractor).

- With regards to current contractor, it was noted that there was a lack of control to make change with the contract (for example changing advisory).

- Conception that Parsons' response is not the best but could be due to contract restraint and could happen with another contractor.

- Parsons built/maintains the specialty sites, but MVC operates these sites. This is currently being debated due to contract interpretation (currently being considered by the Attorney General).

- The conflict between MVC and DEP is due to different cultures. MVC are doers due to the public and DEP takes things into consideration.

- There is no plan in place for CIFs to do by-pass (PIFs have a plan). This is currently in the works, but should have been done earlier in contract (1% for standard communication failure). DEP controls by-passes due to emissions. The process is to go to the CIF. If fail, then go to the PIF to ensure communication (MVC recommendation). If communication issues, then PIF can do by-pass. Then the motorist will go back to MVC and ask for their money back ($77 for PIF) since there was really not a problem. MVC experiences this type of situation about two times per month.

- Need to improve communication between MVC and DEP.

- Need to get enough input from those close to the contract process to help the State write a better RFP in 2007 that includes more detail.

- DEP and MVC have different missions (safety versus emissions) and there is a control issue with regards to the I/M program.
- Key to a new program will be to have a "mediator with clout" (such as the current [Name Withheld] role) to make the contract work. Need a bridge between the State and Parsons.

- If State was to take part of CIF operations back, it was their opinion that the program would get more complex to manage.

- With the current program, multiple equipment vendors and having no bonding have resulted in headaches for DEP and equipment vendors (one so far) going bankrupt.

- In their opinion, would have kept the CIFs in house (operated and maintained by the State). The State pays more to update software if they use a contractor. Some would argue that the contractor does what the State did before without paying benefits, but their opinion is that the State is really paying for the contractor's benefits.

- With a contractor, the State cannot control issues as well and since the State will not give up control they end up paying double. The State is paying Parsons to control but also pays State employees to monitor.

- Prior to the next program, the whole specification of the contract is needed. This includes technology, liability, workers issues, etc. All of this will depend on which test methods the State wants to use.

- The main concern is being able to enforce the contract. Everything needs to be spelled out. The specifications need to be clear, the contractor needs to understand them, and they need to be enforced.

- Another question that should be address by the contractor is who own vendor rights of equipment, software, etc.

- It makes more sense for MVC to take over the I/M program again. When the State ran the program, every vehicle got inspected every year. When the State went to enhanced inspections and the number of inspections was reduced (every 2 years), the program was under contractor operation. The State had an opportunity to prove themselves under the same inspection criteria. MVC has documentation that proves that the State could run the CIFs cheaper than a contractor.

- DEP's stake in the I/M program would make State operated CIFs almost impossible.

- If the State was to take the CIFs back then they would be faced with two issues: (1) would have to transition staff back over and (2) would have to consider if they took back the employees, what to pay them (flex time, benefits, clothing allowances, paid holidays).

- Another question that would have to be answered is with the new program, would the State have to go back to the CAA issues that did not get resolved in the 1999 contract (registration denial and report card for public)? Politically, these two issues did not get resolved. The report card did not happen due to fraud and the cost to generate the actual report. The registration denial has issues due to incorrect VIN data. If the inquiries come back to the State first, the accuracy could be improved. The notification issue would also require additional staff.

- The community and political concerns deal with money allocation. If CIFs go away, then what happens to the money collected through registrations? Other concerns are the wait times and increases in registration costs. Politics and regulations would make a PIF-only system difficult.

- Internal system issues may be slowing speed of system.

- The Union screamed at the Parsons contract and this will happen again during the next contract. In the Union's opinion, outsourcing is not cost effective.

- Since Parsons took over the I/M stations, the stations are running more smoothly. MVC has not received bad press since the wait times are good.

II. Program Oversight

- Integrate QA and data analysis into the CIF program (with MVC getting weekly reports from CIF) MVC stated that there had been QC issues with Parsons and the school bus operators. MVC is being used as QA. Data analysis and QA of the CIF inspection data is minimal. A suggested option was stated that there is a need for QA to be integrated into the program (modify reports so that MVC gets weekly reporting from CIF).

- State should not be auditing CIF lanes if they are also operating them.

- [Name Withheld] also stated that the group should consider the PIF/ERF relationship (an inspector inspecting the repair he just made seems unethical).

- An internal audit uncovered approximately $300,000 off in Parsons' billing. Not sure if these were actual mistakes or if Parsons was padding the books. However, this has improved by MVC doing personal audits and Parsons current work order approval system.

- MVC currently has only one person dedicated to Parsons bill monitoring and it only takes approximately half of his work time.

- It is difficult/almost impossible to analyze Parsons' productivity under the current contract.

- Regarding the evaluation of the I/M program, it was noted that if you do not test almost everyone then how do you get to the retests that are the bad emitters? Maybe you could test by county.

- Contracts receives daily reports from Parsons regarding throughput (wait times). Then Treasury generates monthly reports and accesses liquidated damages based on the wait time exceedances. When new programs are implemented by Parsons, graces are given on liquidated damages.

- The question is how to track liquidated damages and interest. Currently, tracking is computerized by Parsons through MCI.

- Treasury relies on MVC to do audits and they rely on Parsons to be honest with wait times. Would like someone to shadow operations for a day and then confirm Parsons' reports on wait times the next day.

- From a tax payer's opinion, the facilities need to be maintained and Parsons should be doing this. Would like to see Parsons accessed if not maintaining (the State use to do this, but has moved away from). Would also like to ensure that the property value does not go down due to the contractor. A question would be in the case on intentional damage (someone kicks in a window), who should pay for the damages.

II. Program Oversight (continued)

- Parsons is assessed $20,000 to $60,000 per month in liquidated damages. Approximately one to three facilities per month exceed the 15 minute average weighted wait time limit. Typically it is repeat offenders. Some facilities are exempted from this limit. Treasury provided MACTEC with a sample copy of the monthly performance report.

III. Vehicle Coverage

- MVC suggested the option of more automated enforcement be added to the list of options for consideration. They could collect mileage data (currently not available from OBD, but maybe part of testing in 2007).

- Item 9 – MVC was good with getting rid of stickers, but wanted to know what would be the alternative to the stickers. MACTEC suggested that transponders could be built into a sticker that would provide limited data.

- 9. Sticker based system. State would like to replace it. Likely that it will remain for at least 4 to 5 more years.

- The State could bring in more “for hire” vehicles for inspection to be more efficient/cost effective. These vehicles include limousines, taxis, and 13-passenger buses. MVC has a safe taxis program in which their mobile inspection teams go to the municipalities. The rejection rate during these inspections is approximately 90% for safety and a little less for emissions. The State is in the process of changing requirements for the “for hire” fleet by making inspections more frequent.

- Maybe the program should also be changed up from CIFs to random roadside inspections. MVC does not care about emissions data, only the registration. The State had to implement an I/M program to get FHWA money.

- Inspection frequency- high mileage, older vehicles, and taxis. Conceptual program design- CIFs is a tailpipe only program; PIFs are OBD test only.

- With regard to *Four Wheel Drive Vehicle Inspections*, DEP stated that they would like this option removed since the State is moving away from dynamometers.

- With regard to *Registration Denial Enforcement*, DEP really wants to implement this option because it is a requirement of the federal rules.

- With regard to *Quantify/Address Disappearing Vehicles* and *Increase Sticker Enforcement Efforts*, DEP noted that the State has approximately 6% noncompliance with current stickers and approximately 5% noncompliance for inspections. The 1% difference is due to outlaws.

- DEP suggested adding the option *Increase Inspection Compliance* and replace or combine *Quantify/Address Disappearing Vehicles* and *Increase Sticker Enforcement Efforts*.

- With regard to *Motorcycle Inspections*, DEP stated that they have no interest in doing this option with regards to emissions and MVC would concur.

IV. Vehicle Compliance

- Increase the number of roadside mobile inspection teams from 3 to 10.

- Have weekend inspections.

- The motorcycle safety inspection is questionable. Most failures are due to helmets and reflectors. Tires/brakes are the main safety concern.

- Initiate recalls for emissions. MVC started recalls for emissions, but it fell off (willing to try again).

- MVC works with local municipal police for enforcement of current program (looking for obvious violations).

- Would also like to limit/reduce the number of retests (issues with VINs being entered incorrectly by inspectors which cause an "advisory").

- There are also issues when registrations do not match OBD information (same make/model but not the last four digits). It was their opinion that OBD should be considered the most reliable and registration should come in second. Therefore, politically, registration denial is not an option.

- MVC needs to provide the inspectors with a clarification chart on stretch vehicles. These vehicles should be sent to a specialty location for inspection.

- With the safe taxis program, MVC has done approximately 1,000 taxis so far (there are 4,000 taxis in New Jersey). To capture the remaining, MVC could send out more mobile teams or evaluate the capacity of lanes at CIFs and use the extra lanes not being utilized during down months to inspect the taxis more frequently (could use the State or Parsons' inspectors).

- Another issue is sticker fraud. The State needs better enforcement, but how?

- With regards on how to approach which vehicles should be inspected, the "needle in the haystack" analogy was given. Currently the State looks at each stand to find the needle. What the State wants to do is wave a magnet over the top of the stack to pull out all the needles. The question is how to do this without profiling. The perception that being randomly pulled over would be more inconvenient to the public than doing regular inspections.

- With regards to inspection stickers, the State should consider a different design. Only the color is useful, the internal block information is not. Need to consider something that would also prevent fraud.

V. Network Design

- Items 26 and 26b – The group agreed that the focus of the next contract should be on OBD (so more in line to accomplish options for 26a in time frame).

- E-ZPass/transponder technology/kiosk inspections SK:E-ZPass customers ‘volunteer’ to participate, have an established, ongoing customer-client relationship that can be used for some kind of quick OBD check.

- Add “Implement an Appointment System” to the Network Design category.

- [Name Withheld] felt that the State would have to keep a hybrid system (CIF/PIF), but there could be options suggested to MVC about how to split the system.

- Have centralized appointments and a contingency plan so that there would always be no less than 3 lanes in operation.

- Full service versus limited service CIF.

- Decrease the number of cars requiring inspection through kiosks, E-ZPass, mobile inspections, etc.

- [Name Withheld] suggested the option to have different kinds of PIFs (OBD, full service, test-only, test and repair).

- With regard to the category *Network Design*, it was noted that CIF-only, PIF-only, and a hybrid must be addressed.

- With regard to *Gross Polluter Standards*, DEP stated that the State was not going to have specific regulations that would address gross polluters. Anything dealing with tailpipe tests being more stringent is out as far as DEP is concerned.

- With regard to *High Emissions Profiling*, DEP suggested changing the word “profiling” to “weighting.”

- With regard to *Eliminate Inspection Fees*, DEP noted that we needed to work out “CIF/PIF equity.”

- With regard to *Retest-Only Inspection Fees*, [Name Withheld] suggested that this option be removed because it was inequitable to do.

- Many facilities are old (go back to 1938). Many properties are parcel size with no resale value. Several have environmental issues. The recently closed Jersey City location was leased and the State paid $70,000 in remediation costs to the landlord. There is definitely room for consolidation.

V. Network Design (continued)

- Should get rid of old property that is remote and postage size area.

- Recommend reevaluation of CIF properties. Consolidation due to geography is possible. Maintenance of old building should be compared to the cost of new buildings. With regards to the community, consolidation might be easy access (convenience) issue for the older population (which are more vocal).

- With regards to the population issue, the State had a siting study done by Standard and Poors in 2004. A copy is available (ask Cathy Schafer). This study will provide recommendations on consolidation based on cost and priority.

- Politics will be the biggest hurdle for consolidation of facilities. Representatives losing CIFs in their area will oppose the idea (council members complain to senators).

- One of the main issues is the network design. The State should consider the hybrid model (evaluate the current system). DEP advocated CIFs. PIFs are subject to more emissions fraud. The future of OBD reduces cheating, so technology considers certainty of data. More high tech system (open system) could potentially lead to security issues. Industry is slow to move into the high tech area too.

- If CIFs remain, who runs the program? Who handles the data (DEP has interest)? This is a data driven program (dealing with USEPA, dealing with the public and private State, and valuable tech information to refine program available). With regards to the MCI subcontract, should it be contracted to a sub or should the State manage it? There is the question of data integrity.

- Should merge diesel and gasoline vehicle inspection programs.

- It was also noted by [Name Withheld] that there is a Fairness and Affordability Commission that would assess this split. If older vehicles were sent to PIFs and newer vehicles were sent to CIFs, this wouldn’t work or the State would have to provide supplements as the older vehicles, presumably owned by people with lower incomes would have to pay for the inspection while the newer vehicles would not. This would be an Environmental Justice issue. A better split would have older vehicles going to CIFs and the newer vehicles sent to PIFs.

- MVC is looking to conduct the I/M program more cost efficiently by reducing the number of cars inspected (kiosk/E-ZPass/mobile inspections/new technology).

- What do you do if the OBD fails to become ready to read (some vehicles are listed/known to never be ready)? Due to these issues with OBD, there is the potential for the whole program to be slandered if the State went to OBD only. That is a valid reason to have an alternate such as tailpipe testing.

- Some PIFs want whatever CIFs have. With regards to splitting out testing, the CIF cost is approximately $28 per test (money from registration payment goes to General Fund and is allocated to I/M) but PIFs charge approximately $77 per test.

- The State needs to have a clear path during the next process. Some people do not trust OBD. They see it as a "black box" or that the car manufacturers are the "fox in the hen house" (telling the motorist that there is something wrong with their car without looking at it). Some people believe that over time (approximately 10 years) the benefits of tailpipe testing will come back and prove to be more beneficial than OBD. Fear that you have to have some tailpipe testing to judge benefits.

- The PIFs are angry. They do not feel that they got a fair shake last time. MACTEC needs to talk to them individually. Some would rather that the CIFs handle inspections (I) and they cover the maintenance aspect only (M).

- Could use kiosk for emissions and roadside inspections for safety.

- Consider OBD inaccuracies to be potential problem. OBD was never intended to be an inspection tool. Inspectors get false fails with OBD. However the same could be said about ASM test. PIFs had issues with the ASM test due to equipment costs (dynamometers) and because cars were taken away by CIFs.

- Many facilities are old (go back to 1938). Many properties are parcel size with no resale value. Several have environmental issues. The recently closed Jersey City location was leased and the State paid $70,000 in remediation costs to the landlord. There is definitely room for consolidation.

- The landlords of the three stations that the State does not own would be impartial to change at this point in history. They feel that the State has paid them multiple times.

- In their opinion, they did not feel that the State will go back to a State operated CIF system. Some would say during slow periods, if State operated, that the State could use employees to do multi-tasking (prior to 1999 the State employees were trained to do multiple jobs). With the Parsons contract, employees are contract limited regarding what they can do. This would be a benefit to a State operated CIF. The negative would be that customer service would go down, wait times would go up, and the State would have problems managing employees (no means for termination). In addition, the State could not build lanes (would need to contract out) but the State could modify operations quicker (contractor would have to negotiate contract).

- Political risk of letting CIFs go.

- MVC liked the idea of convenience options (E-ZPass transponders and self-test kiosks).

V. Network Design (continued)

- MVC felt that it would be OK to incorporate new technology and pilot programs post August 2007 as long as projection deadlines were rolled in. Various program elements could be phased in over a 3 year period, i.e., 2007 to 2009.

- Item 19 – MVC stated that CIFs should be able to do all testing since they have the ability. This option was not viable to the MVC group and they suggested removing it from the list. MACTEC noted that [Name Withheld]'s idea was to drive business to the PIFs with this option. MVC noted that other stakeholders including DEP, USEPA, and motorists would not be in favor of this option.

- The option of a two-tier inspection program was suggested.

- Decisions regarding facilities are not driven by money, but by public opinion and politics.

- The specialty inspection centers are loaded with union employees (higher ranking employees that did not go to Parsons). These specialty centers handle reconstruction and inspection of PIFs, no regular public testing, and consist of three lanes each. The three specialty centers are Asbury Park, Morristown, and Winslow (it was recommended that MACTEC visit Winslow).

VI. Station Performance

- With regard to *Increase Enforcement Penalties Against Inspectors and Stations*, DEP suggested changing the wording from "Increase" to "Reevaluate" and then not considering it a criminal offense but assessing a monetary penalty (criminal offense considered too harsh).

- With the current accounting system, it takes a lot of manual work to break out the cost per facility. It would be beneficial to have information easily accessible in accounting system. Each facility has a unique identification number so this should be doable. There is currently no breakdown of the budget. Since MVC has a database of work orders, it would be possible to associate the cost of each work order with the location. Currently, can track work load but not total cost per location.

- [Name Withheld] also noted that the State needed to consider tightening up on PIF fraud (was concluded by group that it would be most likely that most false fails were due to safety conditions and most false passes were due to emissions).

VII. Inspection Equipment and Processes

- Eliminate gas cap testing for OBD II equipped vehicles.

- Eliminate tailpipe test or minimize by August 07. (PIFs may have issues with tailpipe testing only being done by the CIFs.)

- Two-speed idle and OBD testing being done at the PIFs (MACTEC suggestion).

- Item 17 – MVC was in favor or the tailpipe testing phase out.

- DEP would like phase in of the new CAN protocol. The group discussed getting the lanes updated to CAN. DEP noted that if a car is purchased from a dealer, the dealer guarantees the vehicle will pass inspection within 30 days of the purchase of the vehicle. (This is a consumer issue). Since PIFs aren't CAN, this should be considered if these cars are sent to PIFs.

- With regard to *OBD II Light-Duty Diesel Inspections*, the group noted that this was a repeat of an earlier option so *Light-Duty Diesel Vehicle Inspections* from *Vehicle Coverage* was removed from the list.

- With regard to *Back-up Tailpipe Inspections for Special Cases with OBD II Vehicles*, DEP wants more discussion (may no longer be an option).

- With regard to *Final or New EPA ASM Standards*, DEP suggested this option to be removed since it was surrounded by too much controversy.

- With regard to *ASM Drive Cycle Change*, DEP wanted this option removed because no further refinements to ASM testing are being considered.

- With regard to *Enhanced Evaporative Emission Inspection for Older Vehicles*, DEP suggested removal of this option due to the history of tank pressure testing. DEP's opinion was that the State would not do tank pressure testing.

- With regard to *Fleet Self Certification Program*, DEP suggested adding the word "Evaluate" to the beginning of the option.

- Another issue is the type of test procedure used. We are OBD bound, but what vehicles get gas cap or tailpipe testing. What infrastructure will be required to support tests? How much resources do we put on finding/fixing older vehicles? What test equipment to invest in to test older vehicles? Gas cap testing currently done on 1970s and newer vehicles. The State is looking to phase out gas cap testing on newer vehicles due to the new technology on these vehicles.

- With regard to test frequency, the State should reevaluate annual inspections versus every 2 years. Should move away from the one rule for all year models approach (specialized would save inspections and also save money for motorists).

VII. Inspection Equipment and Processes (continued)

- The I/M program is a revenue producer (recent changes to fees). There are concerns about how and when money that is generated by the program, the implementation of the program, and changing inspections dates. The politicians might want to change the inspection cycle to every 4 years and take the money while in office, only to leave the next official (if not reelected) with the repercussions. Therefore, the decision to change the inspection dates should be made by legislation to avoid the politics.

- The I/M data proves that cars are better with regards to safety and emissions. There is no reason to change the 4-year inspection cycle on new cars. Inspections are not going to change human behavior. People tend to take better care of their cars these days.

VIII. Equipment Upgrade

- DEP would like to immediately begin the phase out of dynes and gas benches (70% of tests at CIFs are OBD).

- With regard to *PIF Equipment Upgrade* and *CIF Equipment Upgrade*, DEP suggested removal of the options since they were outdated.

- With regard to *Replacing PIF NOx Cells with Analyzer Benches*, DEP stated that this option should be removed since they were not going to make this type of equipment modification this late in the program.

- There is the political problem that the State would have to tell the PIFs that the $50,000 equipment they bought 7 years ago cannot be used. Realistically the equipment is going to become obsolete anyway soon. Therefore, the State must transition the PIFs to a new system.

- Is the emission testing program cost effective in the long run? Dynamometers should go out about 2007. Conflicting information from Parsons regarding cost to transition.

VIIII (IX). Vehicle Repair

- Referee system (as in CA).

- Report cards were problematic – risk of fraud and printing expense.

- Decrease the number of retests (issues with VINs being entered incorrectly by inspectors which cause an 'advisory').

- Consider options outside the normal ETEP testing/training route to get dealership technicians certified.

- With regard to *ERF-Only Repairs*, DEP suggested removal of this option until more information was available.

- [Name Withheld] stated that he would like the group to provide options to have a more customer-service oriented approach in the new program and more public education. The group discussed ways to get the technicians excited and more positive through PSAs and other methods. MACTEC asked DEP and MVC how to get to the technicians since not all of them are registered. [Name Withheld] noted that this would shift the program from "I" to "M" and the group noted that then we could focus on OBD for the "M" side. Vince Mow suggested using the Wisconsin technical assistance center as basis for an option.

- Basically demonstration of benefits. Contribution to air quality. How much are you paying/what is State doing with all the money.

- Need to improve customer service at the CIFs by education/training (reduce customer complaints and bad opinion).

- The public's biggest concern is wait time. Money could also be an issue if the cost goes up.

- People want sticker equity, so 14 days after a title change and registration date the 2-year inspection clock is restarted. On the 15th day, the inspection is just a courtesy only (no sticker equity benefit at this point).

- Cost impact of changes on motorists is a concern.

- When asked about community needs, the question of "What is the cost to motorist?" was asked. The State could help this by reducing lines or by making inspections every 3 or 4 years depending on the vehicle. The State needs to look at the cost impact on behalf of motorists as well as the State (could save motorist approximately $3M by getting rid of ping-pong effect).

X. Safety

- The public expects good change. MVC's plan is to advise and streamline safety inspections. MVC has gotten good press lately, so obviously they do not want to change this.

- Safety tickets are primarily written when police stop motorists for another issue (speeding) and instead of writing the appropriate ticket, the officer writes the ticket for the more minor safety violation. MVC would like to see heavier enforcement of safety issues. This could be accomplished by having more mobile teams.

- Has concern regarding "old school" thinking that there needs to be mandatory safety inspections for people that do not give thought to fixing their problems (drive until the wheels fall off). The State should not remove the safety element from the program. This will also help to keep the small business garages in the loop.

- As a taxpayer would be concerned with safety issues if only had inspections on a new vehicle (currently a new vehicle is tested after 4 years) since new brakes can go out after 2 years.

- Safety inspection method will not change due to timing issues.

XI. Data Management

- It was noted that if VIN information was put in the system using a bar code it would prevent potential data entry errors. There is a big problem that the registration doesn't match the VIN.

- Revamp the way things are billed – e.g., no payment for an inspection if data on VID is missing.

- Simplify data by separating emissions and safety data (MACTEC suggestion).

- Give reports to MVC from DEP regarding problem makes/models.

- [Name Withheld] suggested the group should provide options on what safety and emissions inspections should be given to the vehicle fleet. Options should be provided to modernize the data handling systems in this process.

- Internet-based solutions – give all PIFs a computer (cheaper than the cost of equipment).

- There is missing inspection data in the VID – apparently caused by a problem with Xmitter software. Data entry errors are a major reason for invalid or database tracking errors. MVC noted that there was missing inspection data in the VID. This is an operational issue apparently caused by a problem with Xmitter software. Data entry errors are a major reason for invalid or database tracking errors. Want a more automated enforcement system, relying on bar coded information. Electronic auditing would cost effective. MVC does 270 covert audits per month.

- Big problem with registrations not matching VINs; if VIN information was input using barcodes it would reduce errors.

- MVC not displease with current reports being provided. Accessibility is satisfactory.

- 95% compliance on sticker program presently.

- Revoking of registration without inspection data never implemented due to problems with data being loaded to the VID (delays or missing data).

- Configuration of data may be a problem with the VID.

- The safe taxi program is currently being conducted by MVC (90% rejection on emissions). The option of high mileage annual inspections was suggested. MVC needs a better way to identify vehicles being used to transport seniors (leisure homes and medical centers). They also have problems with stretch limos.

- Target data is the highest priority to MVC.

XI. Data Management (continued)

- Inspection of expiry dates problematic because of data problems. Problems with the sticker information transferred between MCI and PIFs hindered enforcement by MVC.

- Data collection is cumbersome – would like to curtail collection of safety data. There are also anomalies in the data due to inspectors' inconsistent interpretations and data entry selections.

- Data Quality and Accuracy- one of the main concerns. Lack of correlation between VIN/license plate information collected in the field and the OIT database. BAR code scanners have reduced VIN and data input errors.

- CIF communication system- each lane in the 32 facilities is linked directly to the VID. Lanes are not linked and don't communicate to each other. Data quality and missing data is a problem. The data record is a number of fields with a fixed length.

- SK: Ideas for improving repair data collection by using smart cards.

- DEP noted need to modernize data handling systems.

- When asked about the data structure of MVC, it was explained that there is no code that designates if applicable to I/M. There is reluctance to change the system structure. DEP has added pieces to associate data for their emissions needs. MVC is reluctant to release data to DEP. This data is not subject to the Freedom of Disclosure Act.

- Vehicle data is available in the VIN, but predicting if the vehicle needs to be inspected is difficult. There are VIN decoders available (DEP has purchased one) that can be used to get inspection data out of the VIN.

- On MVC side, make and model data is useless. USEPA no longer funds the Vehicle Reference Table (VIIII (IX) Vehicle Repair) updates in the VID so the connection is gone and manual connection (inspector doing a manual lookup association between the vehicle and VIN) is not always accurate.

- Cannot suspend registration for inspection denial. Motorist could not drive suspended vehicle to get it fixed or reinspected. The State recognizes that there will be a lot of false suspensions if this was enforced due to mistakes with registration cards and inspection reports matching. MVC did a study to determine how much man power it would take to resolve the false suspension issue.

- The original enforcement design was to send out notices, but MVC ran out of money. This notification process is suppose to be part of the new data management system MVC is currently developing. The new system is due out in 4 to 5 years.

- Would like to see internet based system to take the data processing side into the new world. However, the PIFs and equipment manufacturers would be against this option.

XI. Data Management (continued)

- An internet setup with an individual screen interface is a "must have." The user would import data from Excel (for example) to .xml. OIRM is doing this type of interface with lab analysis data. This type of service does not cost a lot today and is typically considered part of doing business. This type of system would assist data parsing and determine if data is bad.

- Being able to change the data requested would be advantageous to DEP, the PIFs, and the public. It affords development and to change scheme of data collection. The software would be downloaded at night. Currently the PIFs have to get a service call to get someone to come out and update the software.

- There was an understanding between the State and PIFs that until 2007 there would be no additional costs to the PIFs (to cover the cost of the equipment they had to buy in 1999).

- The cost of a new data system would be less than the cost to maintain the existing data system.

- When asked if the State would want to write specifications needed to support changing the existing system the response was "no, too costly."

- With the new contract, could go to a new system of OBD only or could do tailpipe testing. If continue tailpipe testing, would need to spend approximately $3,000 to $5,000 to upgrade equipment that would communicate with a new system. There would be a transitional period either way.

- Regarding PIFs, the existing equipment would only be able to talk to MCI. The State would have to pay MCI to reformat data for the new data system (costs incurred).

- VIIII (IX) Vehicle Repair data cannot go over phone lines due to the size of the file. Equipment manufacturers will have to deliver VIIII (IX) Vehicle Repair updates to the PIFs on CD if the State keeps the modem system. The State needs to show the PIFs how the new system would bring down costs. This would encourage the PIFs to change.

- It is not clear who is going to manage the data or how/if duties are to be shared. A real question should be "Does anyone use the VID downloads and how?"

- OIT with internet base would be in position to allow registration and inspection connectivity.

- PIFs have served as a "relief valve" for the motorists because they can do more diagnostic and repairs and can get special options. However, costs are higher (administration/oversight and audit enforcement) and even without fraud there have been data quality issues (due to data entry errors). Data entry could be managed with more options. There is also a delay with data submittal since the PIFs are off-line. The PIFs tend to hold data due to confusion regarding MCI charges (charged per inspection transmittal, not by phone call).

- Vehicle data in VIN is insufficient for predicting inspection need.

XI. Data Management (continued)

- Fraud is a concern with a software base and PIFs are subject to more fraud.
- High tech (open) systems increase security risks.
- PIFs hold data due to confusion regarding MCI charges.
- Data collection is cumbersome, would like to curtail (safety) data down. There are anomalies in data (inconsistent due to inspectors' interpretation/data entry selections). Need to make the system more user-friendly for the inspectors and more useful for MVC. Maybe go back to the pass/fail/48 hrs (retest)/advisory level selections (pre 1999 punch card structure layout).
- The data entry issue is definitely a big issue (lane/registration/internal).
- MCI appears to be cooperative to MVC. If the system is goes web based then the response time should be quicker (not real familiar with technology and associated issues).
- Agree that transmittal method needs to be updated but due to security issues, not sure the internet is the way to go. The current system has a three-tiered architecture. The CIFs determine the speed of the transmittal (T1 line) and PIFs are allowed to use modems. To go to the internet, PIFs would have to have a computer (which is cheaper than the inspection equipment). Do not know if State should dictate transfer method. Better to suggest internet and specify DSL or broad band with virtual internet (key fob access architecture would work since a main issue would be security).
- The next contract/program needs to address the concern that a web-based system could introduce new information into a network that already contains motorist personal information (credit card information from MVC centers). This potential overlap with personal information from MVC centers should be evaluated. Need to look at application for exposure to potential identity theft.
- It is critical that DEP/MVC/Treasury work together to address issues prior to the new contract.
- Another issue/concern is management of data coordination internally (within the State).
- What is the State's exposure risk? Low is breaking in to get information from inspection at PIFs. High is information transferred to the State database that allows minor/low data to be linked to credit card "high" personal data already stored.
- The IT architecture for CIFs and PIFs is a main issue.
- Information collected during the inspections is passed from the State to MCI (VID) through a main frame.

XI. Data Management (continued)

- VID summary data is maintained by OIT on a State server (data purged after approximately 5 years). There are no enforcement actions taken on the data. No one uses as far as they were concerned. The reason the State has a summary version of the data (which was going to be used for enforcement) is due to the fact that the Federal Highway Administration (FHWA) would not pay to have detailed data in two locations (MCI and OIT for the State).

- DEP and MVC can see both data sets (MCI and OIT), but OIT cannot. OIT has no problems with this unless they cannot get their job requests done.

- OIT/MVC has access to personal information. MCI has the VIN information but not personal information.

- OIT has certain guidelines for the State's architecture service (to be provided to MACTEC) and MVC would help establish security with a new data system. The new system would have to be encrypted if information is to travel over the Garden State Network (GSN).

- Option for OIT instead of contractor (MCI) to have the VID was discussed. Would OIT want to take it over? Yes, if available funding for MCI was reallocated to OIT.

- MVC is getting ready to restructure the entire MVC data system form ground up (Oracle, data structure, etc.). The VID database would be a small part of this.

- If OIT took over, the modem method would have to go away (OIT is only software).

- Concerns with regard to the data include communications, protocol, and security. OIT is currently not well versed in .xml but could acquire the needed resources.

- With regard to security, the GSN is run by OIT so they run that architecture. The PIFs could use "mynewjersey" as a portal to get into the GSN. They would need an authentication code which would be secure.

- OIT would need resources to take over the VID (people and equipment).

- VID is Oracle and theoretically the State owns so the question was does the State get the database or just the data if it takes the VID back from MCI (what does the contract specify). Relationships are also vital to the VID, but they are not part of the data that OIT currently gets.

- A transfer of VID management would require design work and transition. So the question would be if it was worth the time and money needed to change over from MCI to OIT (which could also be contractor supported).

- To convert, the time frame for implementation would be a concern for OIT if the State wanted OIT to take over the VID. OIT would also want to be included in the planning process (at least with regard to the data). Network and potentially Data Management

XI. Data Management (continued)

Services and Application Infrastructure Services would/might need to be involved also (however OIT would reach out to these parties).

- Only effect the community would have regarding the data would be if the system did not work and they could not get their inspections done. MCI has had essentially zero down time.

- There is a Network Information Exchange element that needs to be considered also.

- MVC needs to answer question of whether inspectors can still do work if the VID is down. Currently, this is allowed but MVC business is moving away from.

- With regard to performance standards, OIT has not put any on response time (no standards).

- The plate number, VIN, overall results (emissions/safety), when and where the inspection was done, mileage, TIN, inspection compliance date and expiration are all collected in MVC's summary report. MVC currently does nothing with this data. Originally, MVC was to validate the date and use it for enforcement. MVC is starting to use the data.

- MCI data is not being updated correctly. There are inspection expiration date issues, incorrect sticker information being transferred between MCI and the PIFs, and registration problems. Because of this, enforcement was a nightmare so MVC stopped enforcement to help the public.

- Due to all the problems, the State took control of the inspection cycles versus letting the software (VID) calculate the date. For example, inspections every 4 years for a new vehicle.

- Ways to improve would be to expand the bar code. This would be a big hassle, so probably would keep. Currently the inspector scans the bar code on the registration. An inquiry is sent to the VIN. If not found in the VIN, then it goes to the State's system. Ideally, the first inquiry would go to the State so the State could make necessary modifications instead of going to the software vendors to make changes. This would allow for more flexibility and less calculation errors.

- Agree with the idea/concept of using an internet (broad band) system. The State is more technologically advanced and is doing this with other field operations.

- In the past, OIT was reluctant to agree to take all the CIF/PIF inquires.

- If MVC ran the I/M program and had ownership of the data, they could separate out DEP's emissions data. Then DEP could assume ownership of that specific data set.

- The data has to be more accessible so that agencies can get to the data in a timely manner and use it for their specific purposes. OIT would have to give MVC/DEP ad-hoc query capabilities to run the data quicker.

XI. Data Management (continued)

- The ideal data model for the new program would have no transfers via modem so OIT could handle it. OIT would oversee data flow and management. DEP and MVC would be able to run queries. MVC could own the vehicle data and DEP could own the emissions data.
- The new system needs to build buckets that allow DEP to get the data needed to demonstrate USEPA compliance.
- Triggers are needed from data to notify MVC of anomalies (alert of potential fraud). Not sure if ever implemented in current system.
- The new I/M program needs the ability to change. The State needs to be in a position to incorporate new systems. If the State wants CIFs and PIFs to relay data it should be a "black box" to them. With the current program, the State cannot change what data they request from the inspections.

XXX. Process

- In the original contract, the State started behind the eight ball and no one went to USEPA for advice. Would not recommend taking this type of action in the future.

- Some stakeholders will not share in a group environment, so private interviews are extremely important. If the State is present at group meetings, then some stakeholders might look to the State for confirmation (influence).

- [Name Withheld] wanted MACTEC to talk to individual PIFs (randomly selected, mix of high/low producers from all over the state) in addition to the group PIF meeting. He will provide a list of recommended PIFs for stakeholder visits. The list will be a composite of stations that participate in the program based on test volume, location, equipment type, etc.

- DEP suggested not having all the PIFs meet together but rather having them represented by one or a few people. [Name Withheld] had ideas regarding who should be included (Dan Dozier is to send the current list of stakeholders to him for review). Rob

- [Name Withheld] was concerned that we needed to separate out the EMs due to procurement issues. The EMs should share new technology only through the RFI process. MACTEC noted that we would be talking to the EMs on an individual basis.

- MACTEC noted that public comments could be obtained through a website or polls at IM stations. DEP and MVC were tasked to come up with ways to make this work with the State system. MACTEC will assist with content and layout and PR.

- [Name Withheld] stated that the group should provide options to address funding some part of PIF operations (the PIFs feel that the State gives money to the CIFs but not to them).

- If I/M taken on road, then you cannot get random testing. Want to get random sampling of in-use fleet (need public and police co-operation). From scientific view, could not get enough vehicles (volume) that were random enough. Therefore, this is useless.

- When asked to outline the driving factors for a change the following was provided: (1) newer technology (faster/cheaper/better) and old technology is not supported and (2) data is better (the State needs to quantify benefits).

- MVC public meetings are the second Tuesday of the month. MACTEC asked that MVC send them transcriptions of these meetings. MACTEC will attend one or more meetings.

- DEP and MVC mentioned need to bring new car dealers into the process. Reason they do not participate in the ERF system may have to do with union issues regarding training of technicians.

- Other internal stakeholders to include are OIT, Purchase and Property, and the Division of Law.

- [Name Withheld] agreed to be POC for the stakeholder list for MVC.

- MVC offered that the Gasoline Retailers Association should be the main outlet for used car dealers (represent 400 of the 1400 PIFs in NJ). In contrast, DEP suggested that GRA should not speak on behalf of the PIFs (GRA has major issues with changes to the IM program – recently walked out of a Repair Excellence Council meeting).

- MVC noted that the Sierra Club, the Public Information Group (PIRG), the Lung Association, and maybe AAA should be included in the stakeholder process.

- The group agreed that new car dealers are missing from the inspection program (since they are not generally registered as ERFs) and they need to be brought into the stakeholder process (NJCAR). [Name Withheld] noted that we should consider training options for the new car dealers. To clarify, we believe that most new car dealers already require fairly stringent training of their technicians. The DEP will consider options outside the normal ETEP testing/training route to get dealership technicians certified.

- DEP noted that the Repair Excellence Council (REC) might come off as frustrated due to repeated meetings with the State.

- [Name Withheld] noted that Ann Arnold should be added to the stakeholder list.

- The group also noted that MACTEC would have to clear the MCI POC (Geri Courington) through Parsons.

- MVC and Parsons meet regularly to discuss problems and proposed repairs. Recently MVC has gone to Parsons for cost estimates on repairs. These repair projects go well (lower costs and good service from Parsons).

YYY. Other

- Where do safety and emissions fit together? DEP does not cross line with no say, not true with MVC. Should be on equal footing or if driven by emissions, managed by DEP. Had no opinion on safety testing.

- In their opinion, the State has done a lousy job of promoting the current I/M program.

- Took "broad brush" approach and showed to USEPA that New Jersey emissions are going down. Reporting is done by model year, so correlations are broken down by technology. Over time, emissions are gradually going down; therefore, violations are resulting in repairs. Over more time due to maintenance, the emission trend will turn. Without more stringent regulations, the emission trend will not continue to decrease.

- The I/M program has instant feedback and DEP is dealing with the entire population of New Jersey. You have to consider the press and misinterpretations due to things being taken out of context.

- MVC cares about day-to-day operations, not predicting future (which is DEP's main concern with emissions).

- The world is changing: (1) equipment manufacturers are going out of business, (2) OBD, and (3) State needs.

- The key aspect of the old program was safety with add-on emissions. Now I/M exists for emissions but is still managed by MVC. So is it a safety or emissions program?

- DEP cares about the public (correct message) in addition to emissions (including data). I/M has problems because New Jersey is coming after the public. Need to take more steps for public outreach. Bad PR could kill a program.

- There is no evaluation to demonstrate that I/M is reducing emissions. Concentration measurement is hard to convert to mass measurement (MEC test) and you have to create a correlation on these test to ASM which is inconsistent).

YYY. Other

APPENDIX C-4

SUMMARY OF EXTERNAL STAKEHOLDER INTERVIEWS

Appendix C-4. Summary of External Key Person Interviews

Purpose: The purpose of Key Person Interviews (KPIs) is to identify issues, gather ideas for stakeholder involvement, and build relationships with affected business, trade, civic, and environmental organizations. The stakeholder process team will use the information collected during the KPIs to identify issues and themes, including those that reflect stakeholder perceptions. Attribution of specific points will not be made.

Stakeholders: The attached notes reflect conversations with the following stakeholders:

Repair Industry

Repair Excellence Council, Rick Ferber,
Alliance of Automotive Service Providers, Bob Everett
New Jersey Automotive Repair Coalition, Enzo Olivieri
New Jersey Gasoline Retailers Association, Bill Dressler
Private Inspection Facility, 640 Passaic
Private Inspection Facility (Sunoco), Passaic (2 blocks south of previous operator)
Private Inspection Facility (Exxon), 11 Boonton Pike

Auto Dealers

New Jersey Coalition of Automotive Retailers, Mark Mcaleer
Greenfield Dodge, Mark Mctamney, Service Manager

Vendors

Snap-On Diagnostics, Tom Jahnke
SPX Corporation, Tom Webster
Environmental Systems Products, Carl Nord, Bo Barbieri, Chris Stock
Dyno-Tech, Craig Rogers

Labor

Service Employees International Union 518, Nick Minutillo, Anthony Naputano

Environment and Public Health

USEPA Region 2, Air Programs Branch, Rema Persaud, Mike Moltzen
NJ Public Interest Group, Dena Mottola
American Lung Association, Laura Quinn

Motorists

AAA, Pam Maiolo, Fam Fisher, and Stephanie Mensch

State Contractors

Parsons Engineering, Jim Nobles
Parsons Engineering, Vincent Porcaro
MCI, Geri Courington

Training Providers

Burlington Institute of Technology, Tom Molnar

I. Program Management

The following information was provided by a vendor:

We have equipment in the PIFs; not the CIFs. By nature, the state would rather have one vendor rather than several for simplicity. Customers, however, would like several options. Our company would prefer that the State continues to use multiple vendors.

The State needs to make sure that whoever they certify is able to support and service the program as well as sell it. A great deal of weight should be placed on the financial position and track record of the bidders in the RFQ and on ongoing performance or service standards.

The three major vendors, ESP, SPX, and Snap On, have been serving the State for years. It is typically the Johnny-come-latelies that want to get in on the program that provide poor or unreliable service. The program looks like a potentially large source of revenue. However, serving the program is quite daunting and the smaller companies are usually not prepared to handle all those requests. (Some states will float a $1 million bond but this ultimately means very little as it will not prevent a firm from going bankrupt.)

NJ does a good job at getting info from various industry groups (e.g., Shop owners).
Better than some at giving manufacturers enough time to comply with equipment updates, i.e., notifying, sharing details, and working with us on time frames.

Every state wants to 'roll their own'; it would be nice if states would request similar things. Problem with NJ is that they have an old analyzer and, if they decide they want to change it dramatically, that will be very complex.

Universal software is more complicated than anything. Each analyzer has different equipment, time settings, and hardware. For example, on an ASM test, gas bench, dyno, and several other tools must all work together. It would be difficult to write software that would accommodate all of the models out there. The hardware interface would make universal software impractical if not impossible.

Having software on the web rather than embedded in the analyzer would be convenient for the manufacturer – updates would be easy - but that would still leave the problem of multiple manufacturers with different programs.

Environmental Interest:

Yes, the hybrid system makes sense, but the vendor that holds the contract for the central fleet must be held accountable to the same standards as PIF fleet. There is a perception that may not be true in the current case. That is, there is a perception that the centralized equipment may be of different (lower) caliber than the PIF equipment.

Vendor:

The State could use a contractor to run the CIFs or manage them themselves. USEPA could regulate through certifications and audits. The State has done a good job to date, but there is room for improvement. Anything going forward will tighten standards and measures of repair effectiveness. Facilities would have to show they are meeting standards that the state set. Audits must be legitimate and replicable.

Our company would like a chance to participate in the program. We have proven equipment. We provide quality that offers the user more value that just a test. Repair effectiveness is important and the other half of our solution is the repair side. Our RFI will include some of that element. We have some novel approaches. Kiosk, remote testing, etc. We are demonstrating something in the early stages in CO at the upcoming conference.

We want to participate. If that means prolonging the life of existing equipment, fine. If it means new equipment, that's fine too, but there has to be a mechanism for reaching older vehicles.

I think it works well with a contractor rather than the State managing the lanes directly; however, the mechanism that is missing there is the flow of info from state to contractor to vendor. But in the end it is really just a matter of preference.

Vendor:

It is important to keep a hybrid system. NJ Residents are used to that. It provides added convenience to those who want to use their own garage. Also, it provides an additional 1000 test points and it would force additional cost if State were to try and take this over.

If we were running the system, we might evaluate the Union element. There are things we do to improve all of our centralized systems that would be easier to do without all the Unions. That is, the current contract provides for unionized staff, which does increase the cost to motorists for the test. A contractor-staffed station would be less expensive to run. However, it's not our desire to jump into the middle of a State-Union issue. There is a State-Union issue that could be addressed differently if State were willing to. That is not to say that we have an opinion.

Yes, we will bid this contract even if the State requires our recognizing the Union. We would still approach the contract as an opportunity we'd like to pursue. There are vendors who are not as experienced or as robust as us at working with unions. The union issue becomes a pricing and contract negotiation question. We'll bid this under any condition except if we were legally prohibited from doing so.

We have been going through a similar exercise with other States with centralized programs. We think it's to the State's advantage to continue with a centralized program and to select a single contractor to run the whole program. Benefit is you have one organization to work with. There are multi-party issues when you have more than one contractor involved.

Within that centralized program, the State should be thinking about the following factors:

- Testing technology is rapidly changing
- USEPA modeling approach is changing
- As to scope of CIF, they should be considering OBD, kiosk, wireless
- Model years that contribute to high pollution. (NJ is in the NE Ozone Transport Region)
- The dyno component should be retained and made available in some way in all lanes.

Vendor:

I'm suggesting that the State consider a comprehensive contract where a single firm covers both public and private networks and all points of service. The contractor would charge a fee for the management component of that contract. The state would pay the contractor based on the number of vehicle tests they are expected to do.

If the State wants to lower costs, there are two things to look at: a) the test or technology and the cost of supporting that technology; and b) the number of participants and points of service.

This might work as follows: The State will pay a fixed fee to the contractor for managing the network (both CIFs and PIFs) – 100% of all tests. There will be a regulatory device or open-market model where the contractor charges a fixed fee for each point of service (CIFs will pay a higher fee). By capturing all vehicle tests and letting the contractor charge the same fee for CIFs and PIFs, the cost to the State will decline. On balance, the PIFs will be paying a little more than they do currently to participate and State will be paying a little less.

A contractor who managed the whole system would be paid on basis of 100% of vehicles tested instead of 60-70% now. This would result in a reduction in the cost to the state for the centralized network. There would be an increase in cost related to the private facilities which could be offset by charging them a management fee. Both private and central facilities would pay the same fee to the State.

The cost to the state would be annual rather than on a per test basis. The contractor would be penalized for lack of availability. Inspectors would be employees of the contractor. The management fee would be guaranteed fee and would be paid on a consistent schedule. The contractor would be liable for penalties for underperformance.

In a hybrid system, there will always be some tension of leverage, volume, revenues. To the extent that a single contractor can better balance that out, the better for the state. The State will be less concerned about competition between PIFs and able to focus only on vehicle volume. The PIFS might be opposed to a single contractor for fear it might steer motorists to its own facilities; if they saw and believed the change was revenue neutral then it would be ok.

The biggest problem any contractor will face is in trying to achieve efficiencies of scale/optimizing the number of PIF or CIF lanes. The union will resist reductions in the central program. Private operators will resist reductions in their lanes. In any scenario, State will have reduced fees. In our case in particular, we have a whole staff of people who look at operational improvement.

New tech – OBD, wireless, OBD kiosk – is eventually going to reduce the need for a network. You won't be able to sell this to the Union, however, as it would take away their jobs. Ask the State who would have greater flexibility to restructure the program – a private contractor or the state government. On the other hand, if the State wants to continue to subsidize an inflexible program, that's fine with us.

The unions may be more accepting of contractor-managed program because they're used to dealing with a single contractor. It may not have much of an effect upon them.

PIF Operator/Representative:

Another problem we've had is with vendors and service contracts. We asked for a performance bond on all these manufacturers of dynos, but the State refused. That has led to problems. If they go to OBD-only, they're going to have to require a performance bond. (There are a lot of problems resulting from this. For example, in New Jersey, you can't fix your own equip. Maxwell sold 70-80 machines. They went bankrupt. Service contracts – even prepaid – were dropped. Kevin Sasso took over. But he went belly up. STS, which made the machines, is now fixing their own machines – that's a conflict of interest.)

We're not sure if we're comfortable with a single vendor.

If you want to keep Parsons or a contractor in the mix, charge them for the facilities they use and so on in order to level the playing field with private inspection facilities.

Labor Interest:

We're not looking for another RFP. We're looking for extensions. We think Parsons is doing a good job. They've got the experience and are doing a good job.

We have a successor clause in our contract but I don't know. We have a lot of people whose jobs are at stake. We have a good relationship with Parsons.

There's going to be a lot of concern if the State puts this out to bid. What do I do? I'm looking to buy a house. Will my job be here in 6 months?

We don't want anybody else. If it is another contractor, we want the clause in the contract regarding the collective bargaining agreement to remain. In 1995, the State gave employees right of first refusal to accept employment with Parsons. We would like that in any new contract.

I don't know, there are a lot of things that would have to be settled [if the State were to take over the program]. If the State takes these guys back, are they subject to civil service exams? What happens to seniority? Is employment guaranteed? It's got to be a union shop.

I. Program Management (continued)

We don't like the idea of the State taking over the program if the reason is to expand our duties. We are hired to inspect cars not to mop floors and clean toilets. But we could live with it.

We have contractors do work when state employees already on the payroll could do it for 1/3rd. For example, our paid electrician is just monitoring the contractor when he could do the work himself.

We don't want anything less than what we have now. Only options that are favorable to us are a state-run program or Parsons. We don't want to deal with a company that is not union-friendly or will not pay a living wage. We need job protection for 500 + employees with comparable wages and benefits. We don't want any other contractor. If it's not Parsons, we want the State.

Motoring Public:

We want to make sure the motorist is getting the best bang for the buck. Parsons has been proactive and responsive to us. They've come out a couple times to speak to AAA and so on. The program is going relatively well now. There would be some risk associated with handing the program back over to the State.

II. Program Oversight

Environmental Interest:

They should also design the program to minimize fraud. Report I received in 2002 showed not as many PIFs were audited as CIFs. CIFs audited 4 times in the year and PIFS only one. Contracting out audits would be fine, I think. Not aware of any USEPA guidance on this. Or maybe contract out the oversight.

Continue evaluating program using same metrics you've always used.

#cars/tested
cars in State
people come in
Failure of people coming back for retesting.

PIF Operator/Representative:

State requires certain vendors and then doesn't give a damn if the vendor provides crappy service (e.g., repairs). I did not buy a service contract. Thank God, I would have gone broke if I also had to pay for a service contract.

III. Vehicle Coverage

Training Interest:

I don’t know what the plan is for hybrids. Maybe hybrids ought to be exempt from the emissions inspection. You don’t hear a lot about vehicles that weigh more than 10,000 pounds (anything above 1 ton). Ought to make sure these vehicles are included in both the safety and emissions programs (especially safety).

In most states there are exemptions for low mileage vehicles. Rather than exempting on model year or mileage, perhaps the State could place a threshold or limit on the amount that must be spent on repairs (or provide State funding if there is financial hardship).

Vendor:

The USEPA modeling approach is changing. They are creating the MOVES model (draft already), which will become official in 2006; it replaces the MOBILE model. The MOVES model will give the state less credit for light duty inspection programs than the MOBILE model. If the state continues to inspect only light–duty, the State will do worse than it does now. By 2007, off–road equipment will be included. Also, there is a federal heavy duty NOx rule that becomes effective. The State will have to look to other areas - they should consider adding a heavy duty diesel testing component to their current roadside testing program.

By 2012, heavy duty OBD will be available. The State might evaluate an advanced roadside high-emitter identification system. The State will also have to look at commuter trains and so on at that point. There is ample opportunity for reducing emissions from these, from ports, and so on.

IV. Vehicle Compliance

Training Interest:

Why don't they consider making vehicle registrations coincide with inspection? I like Maryland's system of denying registrations for people who fail inspections (assuming you have accurate registration data and the program could be done right).

Vendor:

To enhance and appease the Union side and to reduce the number of inspections required on the CIF side/move more inspections to the PIF side is to begin letting CIFs do more basic, simple registrations. The State could also offer the option of processing registrations to the PIFs.

Without a registration-based program, I see additional challenges coming down the road. For example, with wireless OBD and gross emitter checks. The program needs to be registration based for these technologies to be effective.

I'm surprised the State never implemented a registration-based system. The impact on the contractor is that you'll have more people escaping or not registering for the test. Customers ignore their due date and that affects the cash flow and revenue position of the contractor.

Any system that is not registration-based will have some problems, whether the state is doing OBD or not. Although remote sensing is unique in one way – it has the ability to capture non-compliant vehicles.

It's a bit strange to be testing all cars for a minority of vehicles ruining the air.

Vendor:

The more robust the State's database, the more flexibility they will have with enforcement. It would make simple registration renewal and denial possible, for example.

Motoring Public:

Make sure enforcement people understand the changes. We get a lot of complaints about people being pulled over by the police unnecessarily. Law enforcement has not been sufficiently informed.

Glad they get rid of plate stickers. If you are going to use stickers, it is important that you have one, single agency to coordinate all this – not multiple stickers.

V. Network Design

Environmental Interest:

If they're going to run the dual system, they are going to have to make sure that a sufficient volume of business is driven to the private facilities. Even if you keep the current terms the same, you could raise the standards for passing and that would increase business.

We are fully in support of remote-sensing/Blue-Tooth type technologies. We see little benefit from this to new car dealers, however, although maybe it forces people to obey maintenance needs of their cars.

You would have to separate safety and emissions because wireless OBD would not catch info brake pads and so on. Separating the two systems – as in PA – would serve our constituency.

Training Interest:

I don't understand the point of it [the hybrid private and centrally operated system]. Maybe the reason is to make everybody happy. If it were my decision to make, I think it would have a lot do with how much I wanted to keep the equipment owners/customers happy. Some states have strong shop-owner organizations and they don't want to be required to purchase certain types of equipment.

My thoughts on whether you should have a tailpipe test have changed in past year. Most new cars have OBD or CAN capability. A couple of years from now, these low emitting vehicles are going to begin failing tests. However, the cars put out so few emissions and are monitored so closely internally and it is going to cost the customer a lot to fix a sensor that is going to have minimal impact on cleaning the air. My preference might be changing toward a hybrid testing regime: if you fail OBD, you go to a tailpipe test. Or patterned cars go to a tailpipe test. There is no substitute for what is actually coming out of the tailpipe. Requiring car manufacturers to self-certify that their cars meet standards is questionable strategy.

Snap On is not producing equipment for kiosks. Gordon Darby is a big kiosk proponent. Having a proper security system in a kiosk is going to be quite challenging. I haven't seen extensive information on how wireless OBD would work, e.g., how State would implement it. I don't think customers are going to want to plug something in to their car. Customers might be considered about state watching where they go and so on.

Auto Dealer:

I like the hybrid system. Consumers have the opportunity to go to CIF and pay nothing or they can go to a PIF, drop the car off and have it tested and repaired as well.

Training Interest:

My feeling is that if you bought the dyno years ago it is close to being paid for. Somewhere along the line the dyno attracted some business and if it wasn't you would have sold it. However, that doesn't mean people won't make the argument or feel they've been treated inequitably.

Vendor:

That the State is starting the study assuming a blank page is a nice idea but not realistic. We have 1400 service units with viable equipment. These providers are still gaining revenue and depreciating equipment used for that program. That each of those facilities has a dyno is a bonus. Just because the equipment is aged we shouldn't lose the fact that it is installed and viable. Other programs have made such changes and it allows competitors to enter the industry at much lower cost relative to existing providers.

Vendor:

The market is saturated with dynos now. We haven't seen new equipment sales in some time. Opening up the market is a little unfair to those who have made the investment.

Maybe you could give the existing stations the first right of going to OBD only. In Georgia, if you are already a member of the program, you have the right to participate in the next phase of the program. This is important if this develops into a situation for goods and services or for services and goods mandated by state (a state-selected contractor selects equipment or manages vendors that provide equipment, respectively).

Environmental Interest:

OBD and wireless systems should be considered. However, for the PIFs, cost is a big factor for them and they will argue that they haven't run the existing system long enough to see an ROI. Wireless system would not work for them anyway; they don't see the same client base as the CIFs.

A lot of the problems that the NJVIS has had in the past are largely attributed to its unique hybrid nature.

Our view is that the State, to some extent today and certainly 5-6 years ago, was trying to make dyno testing a dominant part of their program even though the technology was moving to OBD. It's no wonder they haven't seen a return on their investment; it is because they waited so long even to implement use of the dynos.

We are concerned about the state spending money in a way that is cost-efficient but also spending it in a way that is effective in reducing emissions.

V. Network Design (continued)

To the extent the State did try to incorporate OBD testing during the last of changes, it was done in a way that undercut its effectiveness and credibility. Specifically, the State would not fail motorists if they failed the OBD test. Rather, they would send the motorist for a second test, this time with the dyno. If the motorist passed the dyno test, they would pass emissions. (The problem here is that OBD is meant in part to be diagnostic – it is meant to prevent future problems, not just detect current ones.) The signal that this approach sends to motorists is that the OBD test was somehow ineffective.

By studying the inspection system and looking at OBD technology, NJ is – in a change from the past – in front of the pack; too often they are at the back of the path.

USEPA is interested in the State doing this for the right reasons. USEPA is interested in having them look at wireless technologies, kiosks, and so forth. Maybe the State deserves to be a national leader for a change. But we want to see it done correctly. We don't want the goals of providing an accurate and effective motor vehicle inspection system and one meets the air quality standards to come at unreasonable cost.

Vendor:

There's no reason to throw out the dyno just because you're moving a portion of the population to OBD. I don't think there is a benefit to do so – more convenience, wider distribution is better. The present system offers convenience. The Infrastructure exists. And stations might raise concerns given their past investment in the equipment. Lowering the barrier to entry into this market – by allowing shops to open only with OBD testing equipment – will anger those who already made the investment in the dyno. Such dilution of market share could only have negative impact on them.

There is nothing to prohibit the use of OBD in centralized or decentralized programs.

Let's consider there are two markets or models – centralized and decentralized. The decentralized model will shrink as the cost of testing goes down (OBD) and the number of vehicles requiring dynamometer tests goes down; there will be natural attrition.

Stated otherwise, let's assume I'm Joe's Garage and I have a maintenance contract for $3000 for my equipment. Down the road, as the number of vehicles I serve declines (either because of OBD testing, new garages, or both), I know that it will cost more per car to maintain this equipment. If all vendors are on the same maintenance contract, there will be some natural attrition as available vehicles declines. (That is, less efficient shops or those shops still paying off their dyno may drop out of the market.)

If you put decentralized and centralized markets under contract and you establish a fixed fee for overseeing all of the stations, this would level the playing field for everyone. The most robust businesses will glide. Those on fringes will drop out.

In fact, in addition to the cost of a maintenance contract, there will be additional cost to the shop because they are now paying a contractor a fee to manage the network. From the contractor's perspective, the only thing that the contract will base their price on is how many tests they get paid for in the scheme of managing that network. Number of stations doesn't matter. The contractor who has the investment and overhead in doing this will still get same amount of money whether there are 1400 or 300 stations. And the cost of participation will rise as some providers drop out.

On the upside, whether wireless or whatever, this development will add convenience in that the test is coming to the customer and the State can still collect the fee.

The fact that State inspections are free is not hurting the PIFs too much now and it won't be much worse by incorporating a voluntary OBD element. And consumers will still need repairs for their vehicles.

Issue you'll face by going to OBD is from existing infrastructure of PIFs. It would remove the barrier to entry. The PIFs will respond, especially in markets where they don't think they're getting enough business. Let the market set the number of PIFs with dynos. Those who are already in the program could go to OBD. Unless you open the OBD option to existing PIFs first and don't let new entrants come until existing PIFs have chosen you'll have problems.

[Going to OBD-only] would open up garage space that you can use for servicing cars.

The transition from dynos to OBD will be very complex and not entirely effective.
There are technical realities that will make it extremely difficult on a widespread basis.

PIF Operator/Representative:

In my opinion, there is only one thing that works for us. The system needs to go all private. We used to have 3000 PIFs when the equipment was $7-10K. There'd be 4000-5000 PIFs if the State hadn't put a moratorium. If go OBD, we'll go back up to 3000 PIFs overnight and 4000-5000 PIFs soon thereafter. I represent shops that do inspections and that don't do inspections. I need to take care of both.

We could support allowing some new entrants on the PIF side doing OBD only but only if the system is entirely PIF run – meaning the PIFs get 100% of the volume.

We won't recommend that the repair community support a hybrid system.

I don't want to do cars that are more than 10 years old. These cars require $500 emissions repairs and people won't pay for it. These old cars are a small part of the fleet anyway. Service contracts on the dyno are $4500/year. As soon as it craps out, I'm buying an OBD.

What we learned from all this is the importance of an individual's perception of whether he is paying or not paying. Even when the cost was $20-$25 we only did 30% of the volume. Even if we double that – and the number of PIFs trebles – the economics don't work for us.

If you go to a PIF-only community, you'll get a lot more participation, and a lot more competition, and prices will fall. If you do your due diligence, you'll see that it is more financially feasible for the State also.

If you went to a PIF only system, the State won't give back the revenue they get from people now. That's politically difficult. It would be easier if they offered to give motorists a voucher to pay for their inspection. Giving a $27 voucher would be popular with the public.

Either its private only or we're out. Look for letter June 14 of 2004 and then again in September. Both of the commissioners know how we feel.

It would be easier for us to get out of this program – what with the audits, the fines, the fees we pay to do inspections, trainings, fingerprints, and so on – than to remain in a hybrid system. Fool me once, shame on you. Fool me twice, shame on me.

If you did a survey of all PIF owner/operators, 90% would say screw the program. What they're doing is milking what investment they've got in there now and that's it. People are just staying in to get a little bit back now that their machines are paid off.

The State can have a voluntary OBD program and even de-couple the safety and emissions programs. Then we can fix the cars rather than fail them. If you go to two inspections as they did in PA – the shop doing the safety inspection is going to fix the car anyway. Forget the emissions inspection.

PIF Operator/Representative:

Another problem we've had is with the number of PIFs allowed to operate. Prior to going enhanced the State said they'd limit the program to 1800-2000 operators. Guys in the know anted up the money right away. And then the State changed the rules. We were meant to believe these were valuable- like liquor license. It's another broken promise.

If the State goes to OBD only, let the current PIFs make the transition first. No big need to have the dynos around beyond next 2-4 years. But the system needs to be PIF only. We need some guarantees in order for us to involve ourselves.

Let Parsons due all the inspections and we'll do all the re-inspections. Re-inspections are less costly. We'll fix it rather send the owner back for another test.

Contractor:

CIFs are growing market share because they are convenient, cheaper, and fairer. Average service time is 12 minutes. At PIFs, you must leave your car and come back.

Labor Interest:

There are several reasons a private-only system won't work:

- PIFs can't handle volume. There are 1400 shops now. You would have to quadruple that number of shops.

- What about the people that can't afford $75. People will perceive it as being taxed twice. That 80% of people use the CIFs shows us that people don't want us to pay.

- Are the PIFs willing to pay those penalties to the State that we pay? You've got to get rid of those penalties by the way. We do 1000's inspections a week. Remove Title 13 and the fines that are imposed on Parsons personnel. And they bring they guys down to Trenton. Parsons will let you go after 2 weeks. We have so many guys going down there and the fines are unbelievable.

- We're free, we do a good job, and we're courteous.

- How many field monitors are we going to have to pay? They get paid more than the inspectors. If all the repair inspections are done privately, you would need 5x the number of stations and 5x the number of monitors. Would go from 50 to 250 monitors. Given that, does it really pay to privatize? Even if they hire our guys as monitors, they'd still have to let go of half of our guys.

- And the private garages don't do proper inspections. I used to monitor a private system. Every morning I used to get a 15 page report every morning of all the private facility transgressions. 60-70% of these private garages cheat. And they might even make more profit from cheating than they pay in fines for cheating. And if they get their licenses permanently suspended they'll just change the name of their business. I see it all the time.

- And we will lose 500 jobs. The State won't come up with 500 jobs for our members. Some people have other career paths they can enjoy. This is largely a young crowd with high school degrees. Some of the guys could go to work for a station.

Regarding the idea of having all new cars owners pay for a private inspection and all owners of older models go to the centrally-operated lanes, the interviewees raised the questions, "Will people be angry that they HAVE to pay for a private inspection if they have a newer car? And won't that shift the business over time to privates?"

For wireless E-ZPass type system, that would be a "thieves' paradise" if you mail registration sticker in the mail. There would be enforcement problems – even at a kiosk.

PIF Operator/Representative:

Smaller, independent shops have been hurt more by the management of the inspection system than we have, especially shops in lower-income areas where people are less willing to pay $70 for an inspection when they could get one for free.

We are more concerned with repairs than testing. Still, a CIF-only system would hurt because we would lose our $70 inspections. We have a lot of regular customers. I suppose we could still do safeties even if state does emissions.

PIF Operator/Representative:

My advice for the state as they evaluate the program is:

- Make up your mind. Do you want to do the program or not? No hybrid. Customer currently thinks, "Why pay $65 when it could be free? You are ripping me off!"

- Do what you say you'll do.

- Keep in mind that several guys haven't paid off their dyno machines yet. (I have high volume and have paid off my machine, thank God.)

I will stay in the program if it remains hybrid because I have this dyno investment.

I'm ok with the CIFs doing all the dyno tests as I'm getting less and less cars requiring a dyno anyway.

PIF Operator/Representative:

Go private only; give people vouchers to pay for the cost of the test.

I don't want to see Bob down the street go get OBD II for 8K. It just doesn't seem fair. I know it's been a couple of years, but it isn't fair. But what am I going to do? I couldn't handle the volume anyway.

Motoring Public:

Whether a PIF-only system would work is really in the details of how it is set up. Need an in-depth analysis of costs and savings. Motorist doesn't understand it all. We are familiar with many of the PIFs. Many of these PIFs are AAA contractors. They tow for us. They are AAA-approved repair facilities. They are unhappy now. They spent a lot of money and are not getting the anticipated amount of market.

VI. Station Performance

Environmental Interest:

Fraud is something that should be evaluated.

PIF Operator/Representative:

Enforcement for real petty things has been stepped up in last 18 months.

We have complaints about how the enforcement program is done. Invariably, fines are always levied against the PIF community. Enforcement against the motorist is negligible. The motorist is the one who solicited! The motorist doesn't get screwed. Do like the hookers.

PIF Operator/Representative:

PIFs are treated unfairly. If we don't catch something or have paperwork errors we are punished heavily. The CIFs are not treated this way.

The paperwork is expansive. We are audited every month. There is an equipment audit every 6 months. We have a mandatory audit once/year.

PIF Operator/Representative:

Audits are a joke – there are too many and they are too picky. For example, I have to go argue a supposed violation tomorrow. A State official came in the other day with a CAN car. The database doesn't catch cars that are OBD/CAN. I have to know the car is CAN or look it up on a printed Bypass List. I didn't look it up on the list – I just tried to do an OBD test – and so I am getting penalized. I could lose my license to operate for 2 weeks.

VII. Inspection Equipment and Processes

PIF Operator/Representative:

What do you think about moving from a loaded mode program to a 2-speed idle program plus OBD? It would be less expensive to running dynos. But I don't know that it takes us any more or less times to update the ASM sequence than the 2-speed idle sequence. If we didn't have to support the dyno, our warranty costs would be much less. Fortunately, in NJ, the MAHA dynos are mostly bulletproof. And there are rebuild kits and so on.

Vendor:

I think the state should maintain the dyno, gas cap and roadside diesel tests. As we look at diesel (light and heavy), there will be several regulatory changes that will impact this and enforcement on I & M side may be a consideration for the State.

Stations can phase out use of the dyno. Let the market determine that rate. PIFs could be a voluntary user of the equipment. However, in this case, the State must mandate and enforce update of the equipment. As a service provider, we have a business model that assumes who will participate in the program; we can't operate with that as an unknown.

Training Interest:

[re: moving to two-speed idle from loaded mode test:] One consideration needs to be cost of this upgrade path – for example, the age of the equipment and the cost of keeping it viable. E-ZPass, wireless technologies are attractive and provide a lot of bang for the buck. That is good but there are elements to that which are unsupported at the moment.

Environmental Interest:

Program planning must address federal regulatory and reporting requirements. Adopting changing technologies may affect the State's performance evaluation and reporting processes. Remember, we're still waiting for their 2003 report! (The delay is reportedly due to new OBD reporting requirements. Reports are normally due in June or July of following year.)

PIF Operator/Representative:

We use the dyno to diagnose a lot of problems. Even though outdated it's still useful.

VIII. Equipment Upgrade

Environmental Interest:

The State during the course of this study must do a good review of technology.

And it needs to consider the cost element. It needs to understand what type of equipment is out there. What it would take to bring it up to today's or tomorrow's standards? (Our current operating system is DOS. We have 300 analyzers operating at 166 MHz.)

Contractor:

Funding for ASM/OBD II/CAN/OBD III is a problem. The industry has progressed as follows:

Phase 1. ASM/OBD II
Phase 2. ASM/OBD II/CAN
Phase 3. ASM/OBD II/CAN/OBD III

The State is stuck in Phase 2 because funding isn't forthcoming. This lack of funding problem never goes away with decentralized system. The CIFs cannot inspect CAN; Parsons is ready to go with CAN technology; the State is not. And the PIFs are not investing in CAN; mom and pop auto shops cannot afford continuing changes in testing technology.

IX. Vehicle Repair/Motorist Assistance

Vendor:

Repair effectiveness should be evaluated. There should be improved audit standards. There should be changes that really qualify those that are in the business to continue and force any new entrants to be of the highest standard.

PIF Operator/Representative:

Another condition/concern is related to certification requirements. We are overwhelmed by the amount of technical training required to be an ERF. Greenfield Dodge has gotten rid of its PIF but it is still a repair facility (ERF) that is open 24 hours a day. We have several technicians certified by the State to fix these vehicles.

The levels of training required by and manufacturers should be sufficient to certify. We had a case recently where none of our certified people were around to sign off even though we had repaired the car. That the dealer or manufacturer signed off on a technician should be enough – even for the Service Manager.

Our guys learn very little new at these programs. We spend $25,000 on training per technician. Most of our guys also have an Associates degree from local community college too. Hard to believe we need to do more.

Training Interest:

I teach the automotive repair courses at the Institute. There were 20 training schools in the 80's and now there are only about 3. Enrollment has dropped a lot. Why? Most of those that needed to be trained are trained. Others decided that state rules governing PIFs were too onerous and chose to work for other facilities.

We do repair technician certifications and inspector certifications. Inspector course is offered once a month with 6-10 students from private facilities. One person a month is someone that had their license taken away for fraudulently offering emissions stickers.

Working with State on course for diesel emission repairs. Being a diesel inspection facility simply requires that you work on trucks and that you have the machine. There should be something more rigorous.

Hybrid technology is something we're interested in. And even hybrids still use gas. So inspections will still be necessary. There are going to be a lot of things that shop techs aren't used to seeing.

Motoring Public:

People would prefer not to have to get inspections. There is anticipation that it will be an arduous process. It has improved. And it stinks.

X. Safety

Auto Dealer:

We have gotten away from safety issues almost entirely with the 4-year new car waiver/sticker program. However, we think having a car out there for 4 years without any inspection is dangerous as brakes and so on go out sooner than this. Used vehicles are being inspected once every 2 years and that also is inadequate.

We would be by all means be glad to participate in a program focused on safety as long as we weren't overwhelmed with expense and licensing systems. We are always looking to take care of customers and improve business. We believe in shortening the 4 year exclusion for new vehicles and in inspecting older cars more often.

No way of keeping track on mileage. Maybe a reduced inspection every year and an extensive test every other year. We have gotten into a habit of doing a safety inspection every time we change the oil. Inspections used to be required every 2 years for new cars and every year for old cars AND an inspection was required every time car changed hands. There was such a backlog at the public inspection stations and there was an outcry from public. We were planning on 30-35% of all inspections to be driven into PIFs. As soon as public lanes backed up, State buckled. Now doing only 8% of inspections at PIFs. This is almost a non-existent line of business for us presently – maybe a give away item for customers. New Jersey car dealer body would be more than happy to participate in a more robust program under the conditions discussed earlier.

Training Interest:

I kind of liked the annual inspection. I don't know that 2 years is often enough for a safety inspection – lights, brakes. Two years may even be too long for emissions – a spark plug can go bad anytime and the driver wouldn't know it.

I think it is an excellent idea to whittle down the list of items that require re-inspection. But how do you monitor whether there is a consequence of taking these items off the list?

They should consult with trainers in reviewing the list of safety items. The State's training manual has a lot of grey areas in it. Also bring some inspectors in. Take a geographical distribution of inspectors. At least give people the opportunity to get involved. I would definitely be involved to clean up some loose ends.

PIF Operator/Representative:

I would increase the number of years that a new car owner can go without an emissions inspection – maybe 3-4 years. But I would still do safety after 2 years and then again after 2 years.

Labor Interest:

They've been trying to eliminate safety items and we've been fighting them on that.

X. Safety (continued)

If the State cuts the safety piece, Parsons will cut 1/3 of employees. Parsons will say, "we're not getting paid for the re-inspection." I have a list of things that the State wanted to cut out of safety last year and that would have put us out of business.

I don't think it should be 4 years for new cars if they are fleet vehicles. Those guys put a lot of mileage on their cars. Maybe the State could go to a mileage standard.

Motoring Public:

Public is more concerned with safety than emissions. They want to get in, pass, and get out.

Number 1 concern is safety.
Number 2 concern is convenience

Don't want to see anything added to the safety list. Taking away is a good idea but we are still concerned about safety.

XI. Data Management

Auto Dealer:

Regarding dealer reporting of emissions and repair information to the State: I think that would pose a problem – e.g., the way the dyno and enhanced emission went down, it would be hard to convince the dealer body to come along again. It will be hard to participate. If cost to participate was low, would that make it easier? Are there any blockages other than history and what would it take to undo that history. What could State do to incent dealers to participate? I'm uncomfortable with it personally – not sure if that same discomfort would extend to all of our members.

There is a privacy issue. Data reported as part of an emission inspection or periodic inspection of a vehicle is ok. But dealer reporting info from a generalized repair makes me uncomfortable. Dealer becomes an agent of the state. Motorist can voluntarily sign up for the program. I'm uncomfortable with it. If it isn't voluntary, it raises liability, privacy, agent of state concerns that you expect your customers might have. If voluntary, those concerns might go away but you might still be uncomfortable for other reasons.

Vendor:

And the study should consider how best to manage VID data – should it be communicated through a subcontractor or through some other mechanism? An Internet or broadband connection would require significant upgrade costs. Extending the life of IM equipment will require refurbishing gas bench and shelf, computer, printer, scanner, monitor and also will be costly.

Contractor:

He indicated he would not be comfortable with an Internet system as it is prone to viruses and denial of service attacks (unlike the VID). Any interruption in service could delay operation of the lanes for extended periods.

PIFs misunderstand how they are charged for hooking up to MCI. Similarly, PIFs fear phone lines may be down and prevent them from inspecting. PIFs batch load test information because of these misunderstandings.

An Internet system would be ok so long as you have a completely decentralized system. In fact, he would recommend such a system if starting from the ground up. However, he said "This is not even an option with CIF." He explained that the information is not safe, especially since MVC isn't liked.

Integration of PIF/CIF software is one desired information system improvement. This would enable Parsons to provide uniform releases on performance. There must be a single manager of the program. Having multiple contractors will make enforcement impossible. Registration denial is also impossible without a single manager for the entire inspection system. PIFs are poorly integrated. The same vehicle may fail inspection at multiple times at multiple sites and this happens because the PIFs don't share information. A fully integrated system managed by one contractor would obviate this problem. www.clearnairnj.com is the URL for Parsons public data reports. Even if the program were PIF-only, you would still need a single point of contact, i.e., a single contract manager who manages 2-3 vendors.

PIF Operator/Representative:

I'm ok with an Internet-based system.

PIF Operator/Representative:

The Internet is no problem. It would save me $1.42 a call.

XXX. Process

PIF Operator/Representative:

Meetings with stakeholders – having sat through a number of REC Council meetings. An independent agenda and one that is followed. Problem with REC is that agenda is determined by MVC and we were led to whatever direction they wanted us led to. Fair process where you can express your views. And enough information so that we can react. When I came in to the REC Council I asked for copies of all minutes since inception. I listened to all the minutes. It was always the same issues, same questions, same promises, nothing ever changed.

Vendor:

Interested in timing of any changes that come out of this process. Reiterated that State has been quite good at apprising them of changes in the past.

Auto Dealer:

I'd like to know what's going on from State's perspective and have an opportunity to comment on it. I'm very interested in participating in a stakeholder meeting if it occurs.

Vendor:

When State designs new program it needs to take into account the interests of these PIFs. Changes that current facility providers are forced to make without input will be detrimental.

Vendor:

Neglecting currently installed equipment (dynos) and not understanding concerns of the Association or any group that is organized and supports the testing industry will cause you problems.

Vendor:

I think a good start is consultation with other State program administrators - ones that have been around for the same time period. NY, PA, VA, GA. We just did an upgrade to similar equipment in Virginia. Our customers thought it was handled well by both us and State. VA and GA would be excellent case studies. They went to OBD II with CAN. All decentralized. We operate entirely in programs that are decentralized. MA is probably the gold standard simply because of amount of attention paid to equipment and service performance. (This is a contractor managed program.)

Environmental Interest:

We are in support of the State's recent decision to adopt California's regulations. We've been working with DEP for some time on those plans. The state legislature adopted enacting legislation for state agencies to begin working on how to do this. We want it to be done in way that is as cost-effective as possible.

Put something on MVIS website about the study. There has not been enough outreach to the community in the past; communicate the reasons why it is important to improve the MVIS and to obey OBD dash lights – it reduces air pollution (and maybe costs too).

We've received calls from citizens asking about MVIS. For example, a caller last week asked whether and how a new set of regulations applied to older cars. Maybe you could put something on the website, and develop brochures or mailings to people. When I get calls about the system from citizens, I could send it to them.

DEP is a great agency. I think they would like to do things right. I think the people there are committed and so on. But I think they are trying too hard to satisfy everybody.

Vendor:

Stakeholder meetings involving all parties tend to be bitch sessions with lots of points of view. I would not hold those unless you had a very strong meeting manager and a preset agenda. Independent focus group meetings might work.

Get a mailing list of PIFs from the State. Parsons can set up a VID bulletin out to all of the PIFs to notify them of public meetings and other developments.

PIF Operator/Representative:

Our aim is to protect our guys that are in the program. They paid something but they were told there going to get something.

There are too many groups involved in this process – MVC, DEP, and others. They are not cooperating and they are avoiding the issues.

We learned a long time ago. The people we get to meet with don't make any decisions. They ask us what we think but ultimately decisions are made in the Golden Dome and they're usually made based on dollars and cents. I think they've made some decisions and they're just doing this outreach process because they have to.

They won't even sift through the information they get from us. Reality is they're going to do whatever they want to do. We've lived it since 1999. They do the convenient thing; the easy thing. The goal is to get the $1 billion in highway funds.

PIF Operator/Representative:

Another problem is that the State keeps changing things. We never know if we are coming or going. For example, the State couldn't handle the traffic in the central lanes and asked us to help. Governor Whitman then comes in and decides she's going to privatize everything. When things didn't work, she changed them. All the changes – even if done only on the central side – were ultimately impacting the PIF side. Then Parsons got rid of fees on the central lanes. Then the State realized that if they could get more traffic to the PIFs, they could reduce expenses even more. We put in time, effort, and investment.

Every time we make suggestions they ignore us and do what is politically convenient (and ultimately harmful to us). And we don't have a contract like they do with Parsons. And the inspections are sub par in the central lanes. They use the excuse that they are doing a lot of vehicles – but that is not always true. PIFs cost State nothing.

When you talk to guys who have participated in the program since the beginning you will realize that it won't be hard. Some guys put up houses to buy this equipment. I've done ok and am still not happy. There's a lot of pent up anger.

We only want a PIF only program. And we want a contract. We'll make them pay politically. We've already had a few meetings with state legislators. We are tired of the State's arrogance. If they try something other than a PIF only system they will do so at their peril. Can we rally the troops? Do they really want to find out?

I'm not going to talk to DEP or MVC; I'm just going to talk to legislators. We've gone through this before. We've lived it. No matter what you do or say, you are ignored.

We know what drives decision making now. We thought it was all about clean air and safety. We know now that's not it.

We have ideas, but we have to get past these larger issues [regarding whether the system is all-private, all-public, or hybrid] first. In the past, we've been able to work these things out. We'll have to re-evaluate the other issues depending on how these larger issues go.

We'll bring our case to the public. Everyone is paying attention now. The State is going every 4 years or every 5-6 years and the public is still paying an annual inspection fee. The cost of inspections is going down. But the fee is not.

I'll tell you how bad this program is. We needed new software. The State promised they'd pay for it. They called a last minute meeting on a Friday night at 8 or 9 PM and pleaded, "We need your help." We'll take care of the next one. Then there was a change of administration and the new message we got was "We're not going to recognize the previous admin." Out of the $4 million in support promised, we got about $1 million.

XXX. Process (continued)

Labor Interest:

Hearings are good but they don't advertise and people don't go. Rather than having a public meeting, have a survey. The State can poll people that are coming through the central facilities. Why did you come here: a) free, b) convenient, c) good service, and so on? And ask, "How was the overall inspection?"

PIF Operator/Representative:

The program sucks. I spent a lot of money to get in and now the state is moving to 4 year inspections and Parsons is doing more and more of the inspections

PIF Operator/Representative:

I laid out a lot of money to participate in this program: 55K for my SPX dyno, maintenance, and software updates. We did ok but didn't make much money on it. Parsons shouldn't get any of this business. We lost money when the program requirement was changed to 2 years and now 4 years for new cars. And I see a million mistakes from those guys at Parsons. And I'm the one getting audited every 6 weeks.

Motoring Public:

A lot more work needs to be done communicating with the public. For example, nobody hears about health the health threat of emissions or that it is a federally mandated program. Do things to help motorist understand that what they've done is good for them and the environment. Maybe DEP ought to get out there with message; they could communicate better, e.g., even just a sign at the inspection center.

MVC also needs to communicate better. Most people don't even know what their vehicle is being checked for. MVC should place a notice on the Internet that says what they check for at inspection and what you can be failed on. And hand the motorist a checklist when they arrive for inspection. And if your car fails, the testing facility should hand the motorist something with the relevant regulations along with the reason you failed. There is no marking at the reference station and it is very confusing. There are other examples. There is a lack of knowledge about referee system. For example, what can I go to a referral site for?

We are happy to help by communicating with members. We will do what we can from an informational perspective if MVC gives us things.

The public is concerned about long lines, cost, and customer service.

The fear of failing safety is inconvenience (I have to come back). The fear of failing emissions is cost (I have to pay a lot of money).

Accessibility (Saturday hours) and convenient facility sighting is important.
The facilities need to be clean as well. What you see and so forth is important.

DEP is a difficult agency to work with. Their responsiveness is poor. It is made even worse by the high amount of turnover. Dealing with them is a terrible pain.

It's a breath of fresh air that you are having this interview process.

YYY. Other

Labor Interest:

Well, they are trying to save money. Maybe they could charge companies with large fleets a fee to use central facilities. Or issue fleet licenses for a fee (let them do their own inspections).

These state facilities have no heat in the work area.

PIF Operator/Representative:

Yes, there is a problem when people comes to PIF for a test, fail, and then go to their dealer for repairs. The dealer is not certified for repairs but will do them anyway. But the PIF cannot certify the car because they didn't do the repairs! And then the customer is upset.

YYY. Other

APPENDIX C-5

STAKEHOLDER MEETING OPERATING PROTOCOLS

Appendix C-5. OPERATING PROTOCOLS AND GROUND RULES FOR THE NEW JERSEY STAKEHOLDER CONSULTATION GROUP (SCG)

INTRODUCTION

This document describes the goals and operating structure of the New Jersey enhanced[8] vehicle inspection program stakeholder consultation process. These protocols and ground rules explain how the stakeholder consultation group members (SCG), with the support of the New Jersey Motor Vehicle Commission and other state agencies (the State Project Team), will provide the State Project Team with opinions and views regarding the design of the motor vehicle inspection program.

The SCG is composed of the following invited stakeholders:

Repair Industry:	Bob Everett, Alliance of Automotive Service Providers of NJ Rick Ferber, NJ Repair Excellence Council Enzo Olivieri, NJ Automotive Repair Coalition Bill Dressler, NJ Gasoline Retailers Association
Labor:	Nicholas Minutillo, NJ Motor Vehicle Employees Union Local 518 Rae Roeder, Communication Workers of America Local 1033
New Car Dealers:	Mark McAleer, NJ Coalition of Automotive Retailers (NJCAR)
Motoring Public:	Pam Maiolo, AAA (Mid-Atlantic Region)
Federal:	Mike Moltzen, U.S. EPA Region 2
Environment:	Irwin Zonis, NJ Clean Air Council Marisa Bolognese, American Lung Association of NJ (ALANJ) Roy Jones, NJ Environmental Justice Alliance
Training Providers:	Tom Molnar, Burlington County Institute of Technology Dave Scaler, Mechanics Education Association Bill Kersten, National Institute for Automobile Service Excellence
Law Enforcement:	Chief William Ciccetti, Traffic Officers Association
Vendors:	Chris Stock, Environmental Systems Products (ESP) Tom Janhke, Snap-on Diagnostics Tom Webster, SPX Corporation

[8] The EPA designation for a “severe” and /or “extreme” ozone non-attainment area (over 12.7 ppm) with an urbanized population greater than 200,000. New Jersey is a non-attainment state.

Vendors:	Ben Rico, Worldwide Environmental Products James Valerio, Applus+ Technologies Doug Woolverton, Hunter Engineering Jim Nobles, Parsons

The State Project Team is composed of the following:

NJ MVC	Cathy Schafer
NJ DEP	Gary Sondemeyer

SECTION 1 - BACKGROUND

The agency with overall responsibility for the State of New Jersey motor vehicle inspection program is the New Jersey Motor Vehicle Commission (NJ MVC). The purpose of the stakeholder consultation process is to provide information to assist the NJ MVC to assess how New Jersey should move forward in the future. The current New Jersey Motor Vehicle Inspection System (NJ MVIS) is an emissions and safety program that began, in the current design, in late 1999. The enhanced inspection system was developed and implemented to meet the State Implementation Plan (SIP) requirements of United States Environmental Protection Agency (USEPA or EPA) and National Highway Traffic Safety Administration (NHTSA). It is based on a "hybrid" program design concept that provides motorists in the State with a choice between obtaining an inspection from a Central Inspection Facility (CIF) or a Private Inspection Facility (PIF). CIF inspections are funded through motor vehicle registration fees and PIF inspections fees are market driven. Currently there are 31 CIFs located throughout the State and approximately 1400 PIFs that provide both the safety and emissions inspection service. The PIFs are primarily independent garages, retail outlets and automobile dealerships that own, operate and maintain the facilities and equipment required for inspections. The CIFs are managed and operated by a state contractor, currently Parsons Engineering. The Motor Vehicle Commission and Department of Environmental Protection currently oversee and manage both the CIF and PIF operators.

Testing frequency is biennial for covered vehicles (although new vehicles up to four years old are exempted from testing) and the current test volume per year is approximately 2.5 million vehicles. The CIFs currently conduct approximately 80% of the inspections in the State. The enhanced inspection equipment is a product of USEPA-approved test methodologies and systems certified by the State. For pre-1996 vehicles, an ASM 5015 test is performed.[9] The CIF

[9] This is a steady-state 15 mph mode (5015). The dynamometer (a treadmill-like device that simulates vehicle inertia and road load to derive results under conditions similar to everyday driving) load is set to simulate 50% (5015) of the power required to accelerate the particular vehicle being tested at 3.3 mph/second at 15 mph. The ASM does not include a true speed changing acceleration during emissions measurement, instead the speed is held constant while the dynamometer load is set to simulate the power required to accelerate the car. The 3.3 mph/second acceleration rate is the maximum acceleration rate during the Federal Test Procedure (FTP). The FTP is the transient (accelerations and decelerations) procedure used to certify that vehicles comply with Federal emissions standards, which is required before the manufacturer can offer them for sale. "National I & M Overview." The Equipment and Tool Institute. August 10, 2005.

contractor uses equipment and lane software from one of five certified equipment vendors. For 1996 and newer models, an OBD II[10] test is used instead of the ASM. An ASM test is used when a vehicle cannot be OBD tested or certain failure codes are observed.

Vehicle safety and emissions inspection procedures and requirements for both the CIFs and PIFs include the following:

- Verification of motorist license, registration, and insurance documents
- Safety inspection of brakes, suspension, steering, headlights, horn, wipers, turn signals, etc.
- ASM 5015 test for 1995 and older vehicles
- OBD II test for 1996 and newer vehicles
- 2500 RPM Test
- Curb Idle Test
- Gas Cap integrity test[11]

Passing vehicles receive a 2 year sticker that is affixed to the windshield. Vehicles that fail any part of the safety and/or emission test must be repaired or corrected and re-inspected.

SECTION 2 - STRUCTURE, COMPOSITION AND TASKS OF THE STAKEHOLDERS CONSULTIATION GROUP

The Stakeholders Consultation Group – This group - composed of designated representatives and their alternates from concerned agencies, organizations and stakeholders - will consider and address a full range of policy issues and express views for consideration by the State Project Team. The Stakeholder Consultation Group (SCG) may consider technical analysis and other information provided by the State Project Team. The SCG meeting may also consider public input during their deliberations. Once the SCG membership is established, no new members will be admitted. The meeting of the SCG will be open to the public.

[10] An on-board system comprised of a computer with diagnostic software and sensors. The OBD system monitors the performance of the ignition, fuel metering and emissions systems, including the sensors and the computer itself, while the vehicle is being driven to insure they are working “as designed.” When the OBD system detects a problem, a diagnostic trouble code is stored in the vehicle’s computer. The OBD I/M Check can be performed on most 1996 and newer model-year gasoline powered passenger vehicles, vans and light-duty trucks weighing 8,500 pounds and less, since these vehicles were required by the EPA to be manufactured with OBD systems. Ibid.

[11] A gas cap test is a functional check that tests whether harmful evaporative emissions (fumes) are escaping from a vehicle’s gas tank into the atmosphere. The gas cap is removed and inserted into a device that then applies pressure to the gas cap. The testing unit will verify that the gas cap holds pressure for a period of approximately 45 seconds and a determination will be made as to whether or not fumes are escaping.

SECTION 3 – HOW WE WILL UNDERTAKE OUR RESPONSIBILITIES AND RELATE TO OTHERS

Roles and responsibilities of individual members of the SCG, the State Project Team, and the Facilitators

Individual Members – Members of the SCG are expected to:

1. Prepare for and attend the SCG meeting;
2. Keep the other members, including alternates, of his or her agency, organization or group informed of what is being discussed by the SCG and solicit their input on these issues;
3. Clearly articulate and represent the interests of his/her group;
4. Listen to other points of view and try to understand the interests of others;
5. Openly discuss issues with people who hold diverse views and participate in a cooperative attitude to provide the best information possible to the State Project Team;
6. Agree to support and abide by the points described in this Operating Protocol.

Facilitators - Facilitators from MACTEC, the contractor selected by the state to provide consulting services regarding the NJ MVIS, serve as neutral process designers and facilitators of meetings. In collaboration with the State Project Team and members of the SCG, the Facilitators will design a work session agenda for the SCG meeting. They will remain impartial toward the substance of the issues under discussion. The Facilitators will enforce ground rules approved by the SCG. In addition, the Facilitators will help obtain relevant information and make sure it is available to SCG members in advance of the meeting.

Technical support. SCG members may bring staff from their organizations or agencies or members of their constituency groups to support the problem solving process. SCG members can defer to those individuals when their expertise is required or when requested by the group as a whole. The use of support persons must not disrupt deliberations.

SECTION 4 – HOW TO PROVIDE INPUT TO THE STATE PROJECT TEAM

The SCG is not a decision-making group, but will enable stakeholders to provide effective and informed advice to the State Project Team about the design of the NJ MVIS. SCG discussions will explore all parties' interests. Therefore there will be no voting or other decision making methods used to weight viewpoints.

SECTION 5 – HOW WE WILL COMMUNICATE WITH EACH OTHER

The following guidelines have been adopted to encourage productive deliberations. Members of the SCG will commit to "best efforts" at following them and give the Facilitators the authority to enforce them.

It is crucial that everyone have a chance to be heard and to hear others. Therefore, SCG members will:

- Attend to what is being discussed in the meeting and avoid side conversations;
- Allow people to speak and refrain from interrupting; and
- Be brief and speak to the point.

It is important that all parties feel welcome to express their views and that all stakeholder interests and ideas are identified. Therefore, SCG Members will:

- Avoid judging ideas from other parties
- Look for the need or interest that gives rise to the idea
- Look for ways to improve ideas
- Try to remain open minded

Some disagreements are inevitable, but they should be focused on the issues involved rather than on the people holding a particular view. Therefore, SCG Members will:

- Promote cooperative interactions and avoid competitive behaviors that denigrate other participants
- Promote positive behaviors that promote productive discussions and agreement and avoid behavior that is disruptive to the work of the group
- Address one another in respectful ways

SECTION 6 – HOW WE WILL COMMUNICATE WITH THE PERSONS AND INSTITUTIONS NOT DIRECTLY IN THE PROCESS

Work session notes and other working documents will be available to all SCG Members and, upon request, to members of the public.

Constituents. Informed constituencies will enhance the depth of conversation and better inform the State Project Team on program design issues and insure that the State Project Team is fully aware of stakeholders' interests and the basis for those interests. Members of the SCG who represent agencies or constituencies will inform their constituents and solicit their opinions about the issues under discussion. They will represent the interests of their constituent group and bring their constituents' concerns and ideas to the deliberations. Members of the SCG may elect to hold meetings or otherwise discuss the issues with their constituent group, to provide copies of work session notes to their constituents and request comments, and to communicate informally with them.

Observers. The SCG meeting will be open to the public. However, in order for the SCG to achieve its goals, discussion and deliberation at the work session must be focused and manageable. Participation by non-members of the SCG will be at the discretion of the SCG members as a whole. The SCG meeting may include time for public comment.

Communications with the media. Discussions at the SCG should not be used as opportunities for individual members to posture in order to gain the attention of the media. Stakeholders can refer members of the press to the MACTEC facilitators for questions about the process. Each SCG member is free to speak with the press on behalf of the agency or constituency he or she represents, but must make it clear to the press that his or her comments should not be attributed to the whole stakeholder group. No SCG member will formally speak for or represent the group without express authorization by consensus of the SCG as a whole. No SCG Member will characterize to the press the point of view of other stakeholder representatives.

Communications with elected officials. Each SCG member is free to speak with elected officials on behalf of the agency or constituency he or she represents, but must make it clear that his or her comments should not be attributed to the whole stakeholder group. No SCG member will formally speak for or represent the group without express authorization by consensus of the SCG as a whole. No SCG Member will characterize to elected officials the point of view of other stakeholder representatives.

APPENDIX C-6

MEETING SUMMARY FOR PUBLIC MEETING (OCTOBER 4, 2005)

New Jersey
Motor Vehicle Commission

STATE OF NEW JERSEY

P.O. Box 160
Trenton, New Jersey 08666-0160

Richard J. Codey
Acting Governor

Sharon Harrington
Chief Administrator

Contact:
Gordon Deal, MVC, 609-292-4711
Dan Dozier, Meeting Facilitator, 301-657-4114

PUBLIC INPUT SOUGHT FOR NEW JERSEY MOTOR VEHICLE INSPECTION PROGRAM

(TRENTON) – The contractor selected to research potential changes to New Jersey's Motor Vehicle Inspection System has scheduled a public meeting for October 4th.

MACTEC Inc. will collect input on behalf of the New Jersey Motor Vehicle Commission (MVC) and the New Jersey Department of Environmental Protection (DEP) at MVC's Trenton Regional Service Center, 120 Stockton Street, Trenton on Tuesday, October 4, 2005 from 7:00 p.m. to 9:00 p.m.

The public is invited to provide views and opinions to help the State, MVC and DEP evaluate the Motor Vehicle Inspection System (MVIS).

The State of New Jersey has selected MACTEC as the contractor to conceptualize and research options to modify the overall vehicle inspection system or provide reasons why the existing system should remain unchanged.

The MVC and DEP currently manage vehicle safety, vehicle emission, and data management systems to help provide safer vehicles and fewer exhaust emissions. The MVC and the DEP are requesting public opinions on design of a system that will provide motorist convenience, effective inspections, and the public/private partnerships used to deliver vehicle inspection services.

Those who wish to attend the meeting to speak or make a presentation are encouraged to contact the meeting facilitator, Daniel P. Dozier at 301-657-4114, or at ddozier@mediate.org

Appendix C-6. MEETING NOTES

State of New Jersey
Motor Vehicle Inspection Program
Public Meeting
MVC Regional Service Center
Trenton, New Jersey
October 4, 2005

Welcome and Introductions

A representative from the MACTEC Project Team, Bob Norton, welcomed everyone and briefly described the purpose of the MACTEC study of the New Jersey Motor Vehicle Inspection System. He touched on the following topics:

- Purpose of the study. The study is an unbiased evaluation that will help the state design the next generation of the New Jersey Motor Vehicle Inspection System;
- Research and stakeholder involvement plans;
- The decision making process. Decision making is entirely with the State of New Jersey. However, MACTEC is providing information, including opinion from stakeholders and the public, to better inform the State's decision making process;
- Purpose of this public meeting. This public meeting is one method for the State to consider various views and opinions about the program.

Dan Dozier, meeting facilitator, then described how the meeting would be organized and speakers would be recognized. All who wished to speak had been requested to sign up with Mr. Dozier during the informal coffee and refreshment gathering before the meeting. Those individuals were each given an equal amount of time to speak by taking the number of requests and dividing it by the approximately 90 minutes available for the meeting. Given that 10 people signed up to speak prior to the meeting, each of those individuals would be given a maximum of 9 minutes each to speak. Any other people who wished to speak would be provided the opportunity to do so, however, they were not guaranteed more than about one minute, at the end of the original speakers' presentations.

He then asked the first person on the list of speakers to come to the front of the room to speak.

Presentations from Members of the Public

<u>Bob Everett, Alliance of Auto Service Providers.</u> Mr. Everett presented excerpts from the May 2002 *Report on the State of New Jersey's Enhanced Motor Vehicle Inspection Contract with Parsons Infrastructure and Technology Group,* the March 2002 report of the State Commission on Investigation entitled *New Jersey Enhanced Motor Vehicle Inspection* and the June 8, 2000 *Report to Governor Christine Todd Whitman on Implementation of the Enhanced Motor Vehicle Emissions Inspection and Maintenance Program.* Citing examples from the reports, Mr. Everett concluded that the State could not properly run the emissions program, that a system of private

inspection facilities would be more effective, less costly and in the best interests of the citizens of the State of New Jersey, and that the Alliance would discourage its members from participating in a public-private system. Bob suggested that any economic analysis of a PIF-only program include money that could be gained by selling the facilities/land now occupied by the CIFs.

David Rich, Dave's Automotive**.** Mr. Rich was upset that he had not been contacted for his ideas for improving the motor vehicle inspection program and requested more regular communication by the State with private facilities regarding options under consideration.
David voiced some fear of contacting MVC and of their auditors.

Rick Allen, Rick Allen's Auto Repair. Mr. Allen expressed concern about alleged proposals to eliminate automobile safety inspections. In addition to safety concerns, he noted that this would reduce state income and sales taxes and could raise auto insurance rates.

Mr. Allen also argued that the contractor operating the CIF lanes is not providing adequate inspections or giving adequate reports that private facilities can use to make repairs. He also indicated that the system for registering complaints about CIF inspections were inadequate; calls go directly to the contractor, he said, and they may not have an interest in reporting complaints to the State. In comparison to what he saw as inadequate policing of the contractor's work, Mr. Allen argued that private facilities are "crucified" for even minor oversights.

Mr. Allen proposed an inspection program operated entirely by private facilities. He argued that such a system would result in an increase in the number of private facilities, greater competition, lower prices, better quality inspections, and savings for the State.

Mr. Allen concluded by saying that a four-year inspection regime for safety is not adequate and by suggesting that OBD II will not be as effective as predicted because people will ignore the "MIL On" indicator.

Rick Ferber, PATA, President of Repair Excellence Council (REC). Mr. Ferber expressed support for a "private-only" inspection system and for a contract identifying the obligations of the State and the private facilities. Citing past experience, he indicated that such a contract was necessary to ensure fulfillment of any agreements between the State and private facilities. Mr. Ferber argued that a "private-only" system would offer the best service to motorists. Mr. Ferber also demanded that the State require that vendors providing test equipment issue performance bonds as a warranty on their product and services. And he argued for better enforcement of unlicensed repair facilities and audit triggers for extremely high-volume PIFs.

Enzo Olivieri, REC Council Member and leader of the P.I.F Group. Mr. Olivieri indicated his group's support for a "PIF-only" system and for a question-and-answer or other dialogue opportunity with the State regarding the future of the program. He argued that the State cannot afford to continue paying for centralized lanes and expressed concern that the State had already reached some decisions about the program without consulting with private facility owners and operators. Mr. Olivieri encouraged attendees to contact their local elected officials to express their support for a "PIF-only" system.

He expressed opposition to "OBD-Only" PIFs, saying that there would be too much competition.

Brian Cowen, PATA. Mr. Cowen explained the financial and other commitments that he and other private inspection facility owners and operators had made to participate in the program and expressed frustration with changes that the State made in the program after he and others had made these commitments. Among these investments were equipment in excess of $40,000, service contracts in excess of $1,000 per year, insurance policies, and training and certification programs for inspectors. Among the changes in the program were delays in implementation, relaxation of inspection requirements, and other changes that resulted in a decrease in the number of cars soliciting private inspection facilities. He said that the overall commitment of the State to the PIFs was inadequate. He also spoke in favor of more frequent and more rigorous safety inspections and for an all private network of inspection facilities.

Joseph Oswald, Public. Mr. Oswald indicated that he had been informed about the meeting because of the very small legal notice posted in his newspaper. He urged the state to provide better notice to the motoring public about these types of meetings. Mr. Oswald indicated his disagreement with how the meeting's proceedings were being recorded (that is, by a member of the Project Team) and then spoke adamantly of the need to test and correct for excessive automobile noise pollution.

Roland Bonner, Association of Automobile Service Providers. Mr. Bonner expressed his group's support for a "PIF-only" inspection program and encouraged those in attendance to join an association for private inspection facilities if they hadn't already done so.

Jack Hagopian, Kingsway Auto Service. Mr. Hagopian expressed support for a "PIF-only" program arguing that the State and Parsons have both operated the program poorly. He also expressed concern with what he saw as comparatively lenient enforcement of inspection standards against Parsons. He suggested that the PIF operators be given input into the software design. He compared the State's concern with the safety of cell phone use to the risks involved in reducing the rigor of safety inspections; he concluded that the safety inspection was much more important. He also questions why current regulations allow untrained customers to perform self-repairs on complicated emissions systems. Finally, he expressed hope that the State would "give [private operators] the opportunity to sit down and compromise with [them]."

Pat Fiumara, New Jersey Gasoline Retailers**.** Mr. Fiumara expressed his support for a "PIF only" system noting that such a system was in place to good effect in Pennsylvania. He complained that PIFs have been treated poorly historically resulting in a loss of work and revenue. He expressed support for annual safety inspections and biennial emissions inspection (though he thought that safety inspections on new cars should begin at two years, not four.) He emphasized the need for a contract with the State enumerating the rights and responsibilities of both parties under any future inspection regime (noting what he saw as a historical failure to comply with informal and/or oral agreements in the past).

Mr. Fiumara also spoke regarding the need for greater protection of purchasers of testing equipment. Among the items he spoke of were the need for equipment warranties with terms identical to the number of years the State required use of that equipment, stable pricing over time on service contracts, more responsive service on these contracts (e.g., uninterrupted 24-hour service, not response in 24-hours defined as three 8-hour days), specification up-front of covered and uncovered items on service contracts, and requiring vendors to maintain adequate replacement parts in-hand. Finally, he expressed his group's support for the State selecting one or at most two equipment vendors and for requiring that vendor to issue a performance bond so that they would pay a penalty if they did not perform as required.

Mr. Fiumara said that all inspection facilities should be required to have a dynamometer and that this requirement could be phased out as the percentage of cars made in 1996 and later exceeds a specified threshold (to be determined). This was to protect the investment of the current participants. He expressed the need for greater enforcement action against unlicensed inspection and repair facilities.

Finally, Mr. Fiumara suggested that announcements for future meetings should be broadcast on the VID system and that more notice should be given in advance of any meetings.

Keith Shaw, Quality Auto Centers**.** Mr. Shaw expressed support for a "PIF-only" system and for leaving current inspection requirements for automobile safety unchanged.

Steve Whesthof, PRO-CAT. Mr. Whesthof expressed support for expanding safety standards and expressed specific concern about the inadequacy of the current 4-year inspection requirement. He said that while clean air is important, public safety is more important. High-mileage vehicles are a safety problem given the 2-year inspection cycle. He suggested that people won't have repairs done unless they are required to do so by the safety inspection program.

Sam Clement. Mr. Clement expressed support for a "PIF only" system and for enhancing the current safety inspection requirements. He suggested reinstating the requirement that a car undergo a safety and emissions inspection whenever there is a change in ownership.

James Valero, Applus Technologies. Mr. Valero described his firm's services to central and privately operated lanes and his interest in working with those in attendance.

At this point in the meeting, after all of the individuals who had signed up to speak had spoken, meeting facilitator, Mr. Dozier, asked who in the audience wished to speak. He called in individuals to speak as set out below.

Robert Zapulo, Patrick's Auto. Mr. Zapulo, an inspector and mechanic, suggested that the State solicit the views of himself and other automotive technicians in developing software, testing equipment, and regulations. He emphasized the importance of working only with ASE certified A1-A8 technicians. He explained that old cars will always be on the road and that therefore there would always be a need for dynamometers and for tailpipe tests. He expressed his concern that a "PIF-only" system may result in job losses for those currently working for the CIF contractor. Finally, he expressed hope that the State, the CIF contractor, and private operators would have an opportunity to sit down and develop the next program together.

Keith Krehel. Mr. Krehel expressed support for annual safety inspections similar to what the federal government requires on trucks.

Frank Reston**.** Mr. Reston warned that the State may be liable for damages if there is an accident attributable to inadequate safety inspection requirements or enforcement.

Bob Everett, Alliance of Auto Service Providers. Mr. Everett requested time to speak a second time. He shared findings from a study conducted in the State of Missouri indicating that those states with safety programs experience fewer fatalities than those without such programs. He noted that all such studies understate the benefit because it is only the police officer, who is generally unqualified to make such an assessment in all but the most simple or obvious cases, that makes a determination of whether mechanical failure contributed to the accident. He indicated that reports on this topic had been conducted by NHTSA, GAO, the Government of Australia, and the State of Indiana. He reported that this last study found that mechanical failure contributed to about 25% of accidents investigated.

Dave Scaler, Mechanics Education Association. Mr. Scaler warned that State and private facilities will increasingly be required to conduct inspections on cars with CAN technology and that neither was prepared for such a transition. He advocated that the State provide funding to private operators to make such a transition.

Rich Hoagland, Hoagland Auto Repairs. Mr. Hoagland requested that the State/Project Team contact the PIFs and ERFs individually for input.

Joe Erickson, AAA. Mr. Erickson expressed AAA New Jersey support for automobile safety inspection. He did not agree with the 4-year wait for safety inspections. He also observed that people are not aware that their annual registration fee includes an amount for inspection.

James West. Mr. West emphasized the importance of retaining safety inspections. He warned that some “plug-in” systems for emissions will give people the misimpression that their car is safe to operate and that some of the newer OBD systems (CAN) are not compatible with existing OBD systems. He argued that a “PIF-only” system will save money and suggested that the State refund that money to motorists in the form of lower registration costs.

Jack Reeves, Jack’s Auto. Mr. Reeves emphasized the importance of the safety inspection, arguing that inadequate inspections were substantially more dangerous and should receive much greater attention than that focused on in-car cell phone use. He also expressed frustration with what he understood as the State’s authorization for consumers to fix their own cars for emissions while simultaneously proscribing repair technicians from doing so. Finally, Mr. Reeves asked who he could contact with his concerns about the program. The facilitator, Dan Dozier, provided his contact information to him and the rest of the audience.

Other. Concerns were expressed by more than one person that advertising for tonight’s meeting was inadequate. They argued that greater use should be made of radio ads and that newspaper advertisements should be larger or supplemented by more substantial efforts. There was interest in having press and/or elected officials present at the meetings.

State of New Jersey
Motor Vehicle Inspection Program
Public Meeting
October 4, 2005

Attendance Sheet

1	Rick Ferber	PATA and REC	
2	Brian Cowan	PATA	
3	Joe Castr	PATA	
4	Jim Anderson	PATA,	
5	Andrew Riek	PATA	
6	Dave Rich	Dave’s Automotive	
7	Rich Calabro	Calabro’s Automotive	
8	Robert Zappulla	Patrick’s Auto Repair	
9	Rick Allen	Rick Allen’s Auto Repair	
10	Paul Puleo	Puleo’s Auto Clinic	
11	Enzo Olivieri	REC and PIF Group	
12	Dave Read	Dave’s Friendly Service	
13	Tom Elder (card)	AASP	
14	Rich Hoagland	Hoagland Auto Repairs	
15	Denny Reichard	Reichard Stratford Mobil	
16	Anthony Naputano	SEIU Local 518	
17	Nick Minutillo	SEIU Local 518	
18	Keith Krehel (card)	Krehel Automotive Repair	
19	Charles Bryant (card)	AASP	
20	Ernest Miller	AASP	
21	David Brown	Walter Brown and Son	
22	Bob Wurn	Wurn’s Auto	
23	William Wanschura (card)	DEP	
24	Catherine Schafer	MVC	
25	George Lange	AASP	
26	James West	Autoshop Middlesex	
27	Roland Bonner	AASP	
28	Alex Foschi	AASP	
29	Joseph Oswald	Self	
30	Pete Thomas	SPX	
31	Jack Reeves	Jack’s Auto	
32	Gary Sondermeyer (card)	DEP	
33	Gerald Solarski	J&S Automotive	
34	Jack Hagopian	Kingsway Auto Service	
35	Bo Barbieri	ESP	
36	Krisopher Lewis	Mechanic’s Education Assn	
37	Peter Guddemi	SPX Corporation	
38	Dave Scaler	MEA	
39	William Houston,	Houston’s Auto Repairs	
40	Ken Chew,	Summerdale Auto Repair	

Attendance Sheet (continued)

41	Jim Arose	MVC	
42	Laurie Salbego	MVC	
43	Tom Bednarz	MVC	
44	Henry Darden	NJ Gasoline Retailers	
45	Pat Fiumara	NJ Gasoline Retailers	
46	Fred White	PATA	
47	Joseph Erickson	AAA	
48	Tim White	Self	
49	Dennis Camano	Camano Auto Repairs	
50	Kris Lewis (interest in talking)		onsiteATC@aol.com
51	Jeff Nilon	OTA	Jeffmasel1@aol.com
52	Ketan (Keith) Shah	Quality Auto Centers	Ketan30@yahoo.com
53	Mahesh Shah	Quality Auto Club	
54	Curt Throckmorton	Somerset Transmission	
55	Nicholas Riccioti	R.W. Lakeview	
56	Terry Hayes	Applus Tech	
57	Jack Pierce	Applus Tech	
58	Jim Valerio	Applus Tech	
59	John Mraycak	Jem Service	
60	Frank Resta	Resta’s Auto	
61	Steven J Whesthoff	PRO-CAT	
62	Robert Fraseu	Fraseu’s Auto	
63	Alicia DAquila	Thomas Greco Publishing	
64	Daurz Fuller	European Technicians	
65	Tom Hennessy	Cokesbury Auto and Trans	cokesbury@earthlink.net
66	Sam Clemens		
67	Robert Zapulo	Patrick’s Auto	
68	Frank Reston		

APPENDIX C-7

SUMMARY OF FIRST STAKEHOLDER MEETING (NOVEMBER 30, 2005)

New Jersey
Motor Vehicle Commission

STATE OF NEW JERSEY

P.O. Box 160
Trenton, New Jersey 08666-0160

Richard J. Codey
Acting Governor

Sharon Harrington
Chief Administrator

Contact:
Dan Dozier, Meeting Facilitator, 301-657-4114
Gordon Deal, MVC Communications, 609-292-4711

NEW JERSEY MOTOR VEHICLE INSPECTION PROGRAM STAKEHOLDERS MEETING

(TRENTON) – The contractor selected to research potential changes to New Jersey's Motor Vehicle Inspection System has scheduled a stakeholder meeting for Wednesday, November 30.

Stakeholders are those organizations that have a role in or a particular and identifiable interest in the inspection program. The State is seeking participation and input from all affected stakeholders to obtain information about the impact of changes to the inspection program.

Members of the public are also welcome to attend, but the meeting is designed to hear comments from stakeholders, such as private inspection facilities, car dealers, environmental and public health organizations, training providers, representatives of inspection station employees, contractors, vendors, suppliers, the New Jersey Motor Vehicle Commission (MVC), and the New Jersey Department of Environmental Protection (DEP).

MACTEC Inc. subcontractor Dan Dozier will facilitate discussions. The meeting will be at the Motor Vehicle Commission Headquarters, Room 8 East, 225 East State Street, Trenton, NJ 08666, from 9:30 a.m. to 3:30 p.m. Those who wish to speak or make a presentation need to contact the meeting facilitator, Daniel P. Dozier at 301-657-4114, or at ddozier@mediate.org.

The State of New Jersey has selected MACTEC as the contractor to conceptualize and research options to modify the overall vehicle inspection system or provide reasons why the existing system should remain unchanged. The MVC and DEP currently manage vehicle safety, vehicle emission, and data management systems to help provide safer vehicles and fewer exhaust emissions.

FIRST MEETING OF
THE STAKEHOLDER CONSULTATION GROUP
FOR THE
NEW JERSEY MOTOR VEHICLE INSPECTION PROGRAM

New Jersey Motor Vehicle Commission Headquarters,
Room 8 East, 225 East State Street, Trenton, NJ 08666

November 30, 2005 from 9:30 a.m. to 2:30 p.m.

Agenda

Welcome, Introductions and Agenda Review

- ♦ Welcome by State of New Jersey – Sharon Harrington, Commissioner, NJ Motor Vehicle Commission, and Gary Sondermeyer, Administrator, NJ Department of Environmental Protection
- ♦ Introduction of MACTEC team, meeting participants and observers – Dan Dozier
- ♦ Introduction and explanation of the facilitators' role
- ♦ Description of the convening and representative selection process
- ♦ Agenda review and approval of the agenda for the meeting

An Evaluation of the NJ Motor Vehicle Inspection System (MVIS)

- ♦ Goals and objectives of the MACTEC Contract – Bob Norton, MACTEC
- ♦ Consultation with interested parties and Mandate of the Group – Dan Dozier
- ♦ Commitment of the State of New Jersey to participate in the process

Operating Protocols and Groundrules for the Stakeholder Process (Dan Dozier)

- ♦ Roles and responsibilities of individual members of the Group and the facilitators
- ♦ Representation of interest group views
- ♦ Not a decision making process
- ♦ Constituent responsibilities
- ♦ Technical information
- ♦ Observers
- ♦ Schedule
- ♦ Communication with the broader public and public input processes
- ♦ Attendance at meetings
- ♦ Discussion Guidelines

Break

The NJ Safety and Emissions Inspection Programs (State Representatives)

- Chris Salmi, DEP - Air Quality Impacts of Mobile Sources/ Benefits of IM in NJ
- Tom Wright, MVC - Overview of NJ Enhanced Safety and Emissions Program

Stakeholder Interests Regarding Key Questions (facilitated discussion)

Catherine Schafer started the afternoon discussion by explaining the impetus for the current examination of the MVIS including changes in technology (the development of on-board-diagnostic or OBD technologies) and contractual and policy considerations (direction from the Audit Team and former Governor McGreevy and the August 2007 expiration of the contract for the operation of the Central state inspection lanes – the CIFs). She affirmed that the state safety and emissions programs will continue but explained that the state is interested in reviewing all of the alternatives on how to do this. No decisions other than the continuation of the programs have been made to date. She emphasized that the state is concerned about meeting the needs of motorists and wants stakeholder input. (The aforementioned Audit Report regarding the operation of the CIFs is available on the state's website or by conducting an internet search.)

Gary Sondemeyer, DEP Administrator, welcomed everyone and emphasized the State's interest in obtaining feedback from stakeholders. He also spoke briefly about the importance of the emissions inspection program to air quality in the State of New Jersey.

Sharon Harrington, Commissioner of Motor Vehicles also welcomed everyone and stated how much the State of New Jersey and the Motor Vehicle Commission appreciated people volunteering to provide their views and opinions about this large and important program. She pointed out that New Jersey tests approximately 2.5 million automobiles per year and that the State was looking at how it could address changing technology and policy changes to make the program more cost-effective, customer-friendly and improve both safety and the environment.

Following is a summary of the questions that guided the discussion and the major themes that emerged.

Key Question 1. Program Design – Should the program design be Centralized Inspection Facility (CIF) only, Private Inspection Facility (PIF) only, or the current Hybrid system

- *Several stakeholders observed that the hybrid MVIS is serving motorists well.*

- *Still, there is disagreement regarding the underlying reasons for customer satisfaction with and utilization of different elements of the hybrid system and a suggestion that other criteria, such as PIF operator satisfaction and cost to the state are also important in considering the effectiveness of the system.*

- *PIF representatives contend that the returns to them from the current hybrid system are very different than what was promised and that their continued participation in the program will require significant changes and perhaps decentralization of the inspection system.*

- *Stakeholders disagree on whether an entirely decentralized system or even an entirely centralized system could be as successful in terms of motorist convenience and satisfaction as the current hybrid system.*

Key Question 2. If CIFs continue to be part of the design, should they be State or Contractor operated?

- *With the exception of one of the two individuals representing organized labor, there was a shared sense among the participants that a contractor could operate the CIFs more effectively. The experience a contractor can bring from their work with other programs, operational flexibility, and past experience were among the reasons mentioned.*

Key Question 3. Should safety inspection be separated from the emissions inspections?

- *Responding to concerns, state policy-makers first clarified for participants that there will be a motor vehicle safety inspection program for the foreseeable future.*

- *While it is agreed that mandatory safety inspections encourage vehicle maintenance and repair and that this generally reduces vehicle accidents, injuries, and deaths, the precise reduction in accidents or lives lost from increasing inspection frequency is unclear (and for reasons of technical complexity will continue for the immediate future to remain so).*

- *It was largely agreed that the incidence and timing of safety and emissions-related equipment failures are not necessarily related and that the safety and emissions programs should be able to prove their value independently. Additionally, the two inspection systems could be conducted independently, especially by virtue of technological advances (namely, increasingly prevalence of OBD II technology and the variety of mechanisms for transmitting data). However, it was generally agreed that decoupling the programs operationally at this time would be inconvenient for and therefore unpopular with motorists (to the extent motorists perceive they are required to undergo two separate inspections).*

Key Question 4. Should Vehicle Inspection Database (VID) be separated from the emissions/safety contract? If separated, should the VID be State or contractor operated?

- *There seemed to be little concern about separating the VID in the contract. Stakeholders similarly had little concern or objection if data were required to be reported via the internet.*

Key Question 5. Other Issues?

- *Stakeholders largely agreed that registration denial is an effective mechanism for enforcing compliance with inspection requirements. The accuracy of the state's databases and how to make it happen are the real concerns.*

- *There was broad agreement that despite some good efforts there is a need for new mechanisms for identifying and punishing uncertified repair technicians.*

- *There was broad agreement that the State should identify to motorists whose cars are undergoing inspection what is occurring at each step in the process (as in a car wash), e.g., "here we are determining how your brakes are operating, etc."*

- *There were no major objections to the idea that the State Inspector's Manual would benefit from updating and that this should occur in collaboration with representatives of those training, inspection, and repair facilities that would be using the manual.*

- *There was also broad agreement that motor vehicle manufacturer curriculums were often a suitable replacement for the state of New Jersey's approved curriculum. In fact, during its most recent update to the curriculum, the state offered that it had welcomed car dealers and manufacturers to submit their curriculums for approval by the state but that many dealers had failed to do so.*

- *There was also support from many stakeholders to the suggestion that the State should do a better job publicizing the program, explaining the reasons cars are tested in New Jersey and outlining the benefits of the tests, especially at the stations. The State could provide the CIFs and PIFs with signs and perhaps a brochure to be given to the motorists about the purpose and benefits of both the safety and emissions inspections.*

A more detailed summary of the discussion is included in Attachment 1.

ATTACHMENT 1

Key Question 1: Program Design – Should the program design be Centralized Inspection Facility (CIF) only, Private Inspection Facility (PIF) only, or the current Hybrid system?

Several stakeholders observed that the hybrid MVIS is serving motorists well.

- A representative from the private contractor that operates the centrally run inspection facilities posited that the hybrid system allows people to vote with their feet and that a consistent cadre of people that come to the centralized lanes and a solid and consistent cadre uses the private facilities. He offered further that contractor-administered surveys indicate that 98% of customers are satisfied and perhaps a survey of private facility users would indicated similar levels of satisfaction.

- A representative of the MVC quoted from a joint MVC and Rutgers University survey of customer satisfaction that was conducted in 2003 that on a scale of 0-10 (10 being very satisfied), average satisfaction across the central and privately operated facilities was 7.7. (Of the customers interviewed, 68% had their car inspected in last 2 years. 82% said they go to central lanes, 15% said they go to private lanes. 53% said their last visit was about same as previous and 34% said it was better.)

- A representative of AAA noted that (while its organization was once besieged with complaints when the state first moved to private operation of the state inspection facilities) she can no longer remember the last time she heard a complaint about the inspection program. She emphasized the need to continue to make the program affordable and convenient to motorists.

- A representative of private inspection facilities agreed that the current system is working well – there are no lines and it is convenient for motorists.

Still, there is disagreement regarding the underlying reasons for customer satisfaction with and utilization of different elements of the hybrid system and a suggestion that other criteria, such as PIF operator satisfaction and cost to the state are also important in considering the effectiveness of the system.

- A representative of the private inspection facilities indicated that it is the perception on the part of motorists that the state-run inspection are free that drives motorists to the state run facilities rather than satisfaction and that, if people had to pay for a state inspection, relative utilization of the centralized and decentralized lanes would be different.

- A representative of the environmental community alleged that motorist satisfaction with the inspection system is determined more by whether they pass inspection than by any other factor.

- Another representative of the private inspection facilities suggested that, although the current system is operating well in many regards, aspects of the system related to PIF utilization and other matters are very different than what was promised by the state to the PIF owner/operators.

- Another representative of the private inspection facilities stated that he believed that the PIFs were cheaper (to the state) and as effective as centrally-operated lanes in conducting inspections and that it was therefore not worth running a dual program.

PIF representatives contend that the returns to them from the current hybrid system are very different than what was promised and that their continued participation in the program will require significant changes and perhaps complete decentralization of the inspection system.

- A representative of the PIFs said that his members made substantial investments in new equipment and training with the expectation that they would receive 30% of fleet volume. Actual volume has been around 20% or lower.

- There is agreement that keeping up with new technologies will require a new round of investments and training and that – under the current version of the hybrid system – PIF operators will not receive enough volume to pay for these improvements. He pointed out that there are currently about 1400 PIFs. There is a concern that given the low cost of OBD test systems (under $10,000), if there is open entry by new PIFs utilizing OBD testing only the impact on the current PIFs, who had to invest much more to conduct the tail pipe tests ($50,000 and up). This was felt to be very unfair and would drive many PIFs out of the system.

- PIF representative offered that they would consider the hybrid system to be equitable to PIFs if motorists were charged for using state facilities or if they had a contract with state the same way that CIF operator does.

Stakeholders disagree on whether an entirely decentralized system or even an entirely centralized system could be as successful in terms of motorist convenience and satisfaction as the current hybrid system.

- A representative of AAA questioned whether the PIFs could accommodate the entire New Jersey fleet of 2.2 million cars. Similar concern was raised about whether CIFs could accommodate all vehicles.

- A PIF representative countered that states with similar volumes have shown that private facilities can accommodate the whole fleet and that these facilities are more convenient for motorists because they will check a car and repair it first rather than fail it outright as would occur at a centrally operated facility.

- Without significant countermeasures, PIF customers would likely be dissatisfied with a program that took away their ability to go to private facilities for inspections.

- Without significant countermeasures, CIF customers would likely be dissatisfied with a program that took away what they perceive to be a ‘free’ inspection at state facilities.

- An equipment supplier indicated that advances in technology may make it possible to conduct emissions and safety inspections simultaneously outside of the repair shop. And that brake, suspension, and steering tests are automated at state lanes. Otherwise, the centralized and decentralized lanes are very similar.

- A representative of state employees pointed out that if you live in NJ, everybody is concerned about congestion, safety, and public health – there is overwhelming support for state resource investments in safer roads and cleaner air, and we have been able to do that with this program.

Other comments related to this topic included:

- Stakeholders discussed the cost of equipment necessary to conduct the emissions inspection. To the question about whether there would be an additional cost for doing the safety inspection at the same time, the sense was that most PIFs already have all the necessary equipment but that there are costs associated with training, maintenance, certification, and licensing.

- There was discussion about whether, if the State and PIFs sign a contract that set out the service levels, equipment and so on, such a contract would enable the state to enforce against PIFs that violate the contract and guarantee that those who break the agreement would be subject to serious penalties. Such enforcement is important because otherwise motorists would go to facilities that might make sure the customer is satisfied, even if that might result in an improper inspection. PIFs are in a difficult position because of the desire is to satisfy the customer.

- Some would suggest that if the system is not PIF-only, perhaps it should be CIF–only. Such a system would remove PIFs from having to be the bad guy when a car fails inspection. It takes away the temptation and the pressure from those customers that want PIFs to do the wrong thing. It was pointed out, however, that CIFs are not doing any repairs and that motorists would still have to go to a PIF for repair. Additionally, the PIFs might still need the same testing equipment as they use now to properly diagnose problems and conduct. It is not clear that motorists would appreciate such a system.

- A PIF representative suggested that if the system continues as hybrid, they may well recommend that PIFs not participate in such a system.

- A state representative asked about a system that was designed so that the initial inspection was done only at the CIFs and the PIFs did only repairs and re-inspections. The cost might be lower for the PIFs as the equipment is cheaper without sticker authority – e.g. security-related costs are different. Further, motorists would not be inconvenienced any more than under the current system.

- A representative speaking for the motoring public suggested that such a CIF only inspection system with PIFs performing the re-inspections might work, as people now that go to CIF still then have to go elsewhere for repair and go back to CIF for the re-inspection. Such a change might work.

- A PIF representative said that if the system provided that PIFs performed all re-inspections, but not the initial inspections, it could be something he could support, but only if the re-inspections were at the licensed PIFs. If the motorist could go anywhere for re-inspection, the PIFs would oppose it and it would be a dead issue.

Key Question 2. If CIFs continue to be part of the design, should they be State or Contractor operated?

With the exception of one of the two individuals representing organized labor, there was a shared sense among the participants that a contractor could operate the CIFs more effectively. The experience a contractor can bring from their work with other programs, operational flexibility, and past experience were among the reasons mentioned.

- The local union representing the inspectors, SEIU 518, has worked in this program since its inception. Since 1970s, the union has had a collective bargaining agreement in place. In addition to advocating for safe, quality jobs, the union has also advocated for the benefit of the agency. The union has historically opposed privatization of government jobs. When the contract to operate the CIFs became clear it would be put out to bid, the union decided to look at the labor policies of each bidder, including Parsons. While they had some major concerns about private contractors, the representative said that the union has had a very productive relationship with Parsons. For example, the jobs in the lanes used to be considered crummy jobs due to working conditions. Now, with Parson, the jobs are safe, quality jobs, with lower injury rates. Of course, not everything is perfect. The union would like a better benefits package. However, unusual though it is, the public employee union is urging continuation of the privately run CIF system now.

- A representative of the private equipment suppliers added that the benefit of utilizing a private company to manage the CIFs is that many companies manage many centralized programs in other states and that the states benefit from lessons learned in other programs. Whether the system is centralized, hybrid, or entirely decentralized, a private contractor can manage relationships for the state.

- A contractor suggested that motorists would accept a CIF-only if, and only if the level of service they get is acceptable. People are now satisfied with the system in NJ and that, he argued, is largely because of accountability that the State can hold over the contractor. E.g. Penalties for excessive wait time, etc. If the state were operating the program directly, they would have less power to enforce good service because it is difficult to self-enforce.

- From the view of a union representative, state workers can do the job cheaper because they do not have a profit margin. He questioned whether there is as much accountability if there is a company managing the CIFs compared to the state. He added that the union likes the hybrid system – elderly and younger may find the “free” tests in the CIF lanes to their liking while others, for example, professionals, might be concerned more about time and convenience and use the PIFs.

- A vendor noted that the more elements you add to your program, the more levels of oversight the state would need. He added that the oversight mechanisms in place today do not provide for an "apples-to-apples" comparison. Currently the State enforces against CIFs one way, PIFs another, vendors yet another. The state he argued should make these more consistent.

- A representative of the private inspection facilities noted that the U.S. Environmental Protection Agency doesn't give as much credit to the state toward its federal environmental obligations for a private inspection as it does for a centrally run inspection.

- A representative of the USEPA explained that this gap (in SIP credit) is closing, particularly with the development of OBD technology.

- An environmentalist pointed out that when CIF lanes were run by the state; there was a public uprising by all parties. Since then, the Rutgers study shows significant public satisfaction. So from his perspective that issue is done. Period.

- A person familiar with the state program suggested that that the previous statement was an unfair comparison namely because, at the time of direct state operation, the state was inspecting every car, every year.

Key Question 3. Should safety inspection be separated from the emissions inspections?

As Sharon Harrington and Catherine Schafer pointed out, from the State's perspective, there will be a motor vehicle safety inspection program for the foreseeable future.

- In response to questions, representatives from the state responded that while the design and details of the motor vehicle safety inspection program are being considered, the safety program is a critical element of the MVC mission and that it will continue.

While it is agreed that mandatory safety inspections encourage vehicle maintenance and repair and that this generally reduces vehicle accidents, injuries, and deaths, the precise reduction in accidents or lives lost from increasing inspection frequency is unclear (and for reasons of technical complexity will continue for the immediate future to remain so).

- A PIF representative asserted that the move to two and 4-year inspection cycles is discouraging owner maintenance of vehicles. He added that the separation of registration and safety inspection requirements also discouraged needed testing. An equipment supplier added that car advertisements boasting minimal maintenance requirements for new cars and the increasing move from owning to leasing were also discouraging motorist investment in the upkeep of their vehicles.

- A number of stakeholders pointed out that for safety inspections, mileage between inspections is more important than time, as it is mileage that most significantly leads to wear and tear on vehicles.

- The state has collected data on vehicle mileage and the repair incidence but it has not yet been evaluated. Nevertheless, it would still be unclear what affects the move to two and 4-year inspection cycles had on safety.[12]

- The state police do maintain a Fatal Accident Reporting System for tracking the contribution of vehicle safety failure to accidents. A representative of the private equipment suppliers replied that the system is subjective and reiterated that good data to correlate safety inspection items and accidents is very difficult.

- A stakeholder asked if the state has any comparative data between the New Jersey inspection program an and other state inspection programs,

- A representative from the state pointed out that moving to the 4-year exemption took approximately 32 % of vehicles out of inspection cycle.

- A representative of motorists indicated that the number and types of safety rejections that occur in the first four years for a new car appear to fall within an acceptable range and asked if there were suggested parameters or guidelines for this type of performance. She disagreed that the 741 motor vehicle-related deaths that occurred in 2004 could be reasonably attributed to a lack of safety inspections.

It was largely agreed that the incidence and timing of safety and emissions-related equipment failures are not necessarily related and that the safety and emissions programs should be able to prove their value independently. Additionally, the two inspection systems could be conducted independently, especially by virtue of technological advances (namely, increasingly prevalence of OBD II technology and the variety of mechanisms for transmitting data). However, it was generally agreed that decoupling the programs operationally at this time would be inconvenient for and therefore unpopular with motorists (to the extent motorists perceive they are required to undergo two separate inspections).

- An MVC state representative indicated that roughly 40% of all cars (presenting at both CIFs and PIFs) fail inspection each year.[13] Of these, 90% are for safety and 10% are for emissions. An equipment supplier added that emissions items are more durable than safety items: they are less prone to differences in driving conditions and style.

[12] He noted that the average number of miles placed on a vehicle each year is 11,600 or about 46,000 miles in four years and that no attempt has been made to look at safety data on vehicles that exceeded the average number of miles per year.

[13] Because PIFs often make obvious repairs in advance of conducting a formal inspection, the figures for central and decentralized facilities are not directly comparable. Nevertheless, the figures do give some indication of the relative magnitudes of safety and emissions-related inspection failures.

Key Question 4. Should the Vehicle Inspection Database (VID) be separated from the emissions/safety contract? If separated, should the VID be State or contractor operated?

There seemed to be little concern about separating the VID in the contract. Stakeholders similarly had little concern or objection if data were required to be reported via the internet.

- One PIF representative estimated that currently 60-65% of shops are already hooked to internet, with less than 50% utilizing broadband. More and more the PIFs rely on and could not survive without hi-speed internet. So requiring use of the internet and even broadband will impose no added cost for many PIFs. It does not matter to the PIFs whether it is the State or a contractor that controls the VID. Most recognized that broadband is coming to your shop whether you like it or not. But requiring internet is one thing, we are not sure if the PIFs would be able to participate if the state required broadband. Most PIFs believe that the internet would work but there must be a way to access the internet using modems for phones.

- A state technical representative noted that it is possible to dial into an ISP using telephone access that would be connected to the internet.

- The vehicle inspection database is tied to the state mainframe, as it is from the state that the VID obtains registration data. Further, there are communication links from PIFs to VID and from the CIFs to the VID. One question – do we continue or contract for VID services or does state take it over? What is impact to PIFS of using the Internet for broadband communication to the VID?

- A contractor noted that whatever system the state designs, it must have the high level of reliability that the current system has. The VID is the least problematic element of program.

Key Question 5. Other Issues?

Stakeholders largely agree that registration denial is an effective mechanism for enforcing compliance with inspection requirements. The accuracy of the state's databases and how to make it happen are the real concerns.

- A representative of the equipment supplier industry recommend that the program should utilize a registration-based system to facilitate enforcement and enable other program gains (such as separating safety from emission inspections).

- Registration denial requires an extremely accurate database given the large number of vehicles in the state. It also requires vigilance and careful maintenance. Any significant data entry or other errors can cause major problems.

- A state representative pointed out that currently data for the state Vehicle Information Number (VIN) database must be manually entered into the database. This manual entry causes more errors that would be acceptable if the program utilized registration denial as an enforcement mechanism. Until the state can address that, tracking mileage is problematic. The state databases are getting better but have a long way to go.

- A contractor noted that to make registration denial work, the CIFs and PIFs would need to verification the VIN and currently they cannot do so. Thus, registration denial cannot work until the VIN is fixed or unless the CIFs (and PIFs?) could correct the registration numbers.

- A vendor pointed out that it is possible to correct the VIN and that other states have utilized many different solutions to this problem.

- Registration denial was not implemented because of database issues. The air quality plan assumes it is in place. Law enforcement can still pull you over and ticket you if you do not have up to date tags.

- Another stakeholder pointed out that registration denial does provide the state with another source of revenue – late fees under a registration denial system.

- A PIF representative suggested that New Jersey should learn from other states. Many states do not register any car that has not been inspected. This works. Otherwise, people tend not to pay attention to the expiration.

- Some states use bi-annual registration denial for emissions and annual for safety inspections. In CT, if a motorist is pulled over for a violation, the state can also charge you for a safety item. In a few other states, transponders can detect and enforce.

- One stakeholder raised a note of caution regarding other states as a model for New Jersey, pointing out that NJ has a 70-year history with this program and people seem mostly happy with the program. This program needs to address the unique needs of the state of New Jersey.

- A state representative asked what the reaction would be if the state required equivalent equipment in PIFs and CIFs? This would allow more consistency in inspection and in data, and similar enforcement penalties. The facilitator pointed out that there was no reaction on this point and appears not to be a hot issue.

There was broad agreement that despite some good efforts there is a need for new mechanisms for identifying and punishing uncertified repair technicians.[14]

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[14] A 12 hour course is required to be an inspector. The first 4 hours are state specific – they cover the causes of state requirements for controlling pollution. The other 8 hours cover how to conduct the safety inspection, how to work a dynamometer, how to use OBD II test equipment, and how to conduct a gas cap test. There is a written, 50-question, multiple choice test which must be completed with 80% accuracy to pass.

There are three ways to become a certified repair technician. The first and most difficult path is to pass a 100 question Advanced Placement Instrument Test. This can be provided for $20 by any training provider. There is a 10% success rate. The test covers 4 areas of which the student must get 80% or higher in each. The second path is

- A representative of the training organizations explained that the primary problem with trainer certification program is inadequate enforcement -- there are many mechanics that have not passed the required tests that are out there fixing cars. This discourages future mechanics from seeking certification and leads to less effective and more costly repairs.

- A representative of the PIF community echoed the concern regarding enforcement of certification requirements.

- A representative from a private equipment and services provider suggested that one solution might be to set up a whistleblower mechanism such as a toll free number that anyone can call to report illegal operations.

There was broad agreement that the State should identify to motorists whose cars are undergoing inspection what is occurring at each step in the process (as in a car wash), e.g., "here we are determining how your brakes are operating, etc."

There were no major objections to the idea that the State Inspector's Manual would benefit from updating and that this should occur in collaboration with representatives of those training, inspection, and repair facilities that would be using the manual.

- A representative of the training community that frequently references the Inspector's Manual offered that there are a lot of grey areas and that it requires updating. He said that he has requested updating in the past and the state has indicated contentment with the current manual. He would like to participate in any future development efforts.

- A representative of the PIF community added that he also did not have any formal input into the development of the Inspector's Manual and that he would advise that the state consult with others in developing the manual.

- A state representative explained that the manual is meant to train inspectors on what to look for and not to serve as a repair manual and that perhaps this misperception accounts for some of the dissatisfaction with the manual.

There was also broad agreement that motor vehicle manufacturer curriculums were often a suitable replacement for the state of New Jersey's approved curriculum. In fact, during its most recent update to the curriculum, the state offered that it had welcomed car dealers and manufacturers to submit their curriculums for approval by the state but that many dealers had failed to do so.[15]

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to become ASE Certified. This requires passing the A6 (electrical), A8 (engine performance), and L1 (advanced performance fuel injection) tests. Finally, the third path is to take a 96 hour ETEP course with a certified training provider and pass the required test. (There is now a 28 hour ETEP 2 course as well that covers OBD2 and Lab Scope.) There are computer based versions of all of these tests.

[15] To register as an equipment repair facility, a shop must employ at least 1 certified technician who must sign off on all repairs. The NJDEP has a contract with ASE to oversee issuance of the certificate. Certificates are signed by Director of DEP.

- A representative from NJ Coalition of Automobile Retailers pointed out in a written statement that technicians working at car dealerships were already well trained to work on emissions and that they should not be required to obtain separately state certification.

- A representative of DEP explained that the state has welcomed submission of and has approved many motor vehicle curriculums as these are indeed often more comprehensive for specific makes and models than the official state curriculum. ASE certification is likewise sufficient. He added, however, that the state is going through an update of its curriculum and that many dealers failed to submit curriculums for approval. He reiterated the invitation to submit curriculums. (A representative from ASE added that most automobile manufacturer programs are already ASE certified.)

There was also support from many stakeholders to the suggestion that the State should do a better job publicizing the program, explaining the reasons cars are tested in New Jersey and outlining the benefits of the tests, especially at the stations. The State could provide the CIFs and PIFs with signs and perhaps a brochure to be given to the motorists about the purpose and benefits of both the safety and emissions inspections.

APPENDIX C-8

SUMMARY OF STAKEHOLDER MEETING FEEDBACK (NOVEMBER 30, 2005)

APPENDIX C-8 MEETING EVALUATION

MEETING EVALUATION

New Jersey Motor Vehicle Inspection System
Stakeholder Meeting
November 30, 2005

We take participant feedback seriously in striving to improve our facilitation services.
Please give us your honest input. Thank you for your time.

Your Name ***(optional)*: __**SUMMARY **___________________________**

Did the meeting accomplish the goals set for it? (average = 3.92)

Nothing accomplished				Meeting was very useful
1	2(1)	3 (1,1)	4(1,1,1,1,1,1)	5 (1,1,1)

Which portions of the meeting did you find *most* useful? *Please explain*.

Wide variety of stakeholder backgrounds and the expertise they brought to the table.

The discussions that resulted when questions were asked by the moderator.

The p.m. portion of the meeting was most useful to us because it focused on the main issue on what the state plans on doing with the program. I was surprised to hear that there would be an RFP regardless of what happens with these discussions . Also surprised that there was no talk about the state taking the program back.

Chance to speak on inspection going state run vs. private- state had the system and it went private- union contract calls for evaluation of contracts to show privatization saves money- this most certainly does not meet that criteria.

Inspection system should return to state employees- removes profit motive from budget and public is certain of a fair inspection.

Listening to the positions of those whose interests were not financially motivated.

Hearing how the program currently works and what the participants thought about it

I believe the initial presentations provided everyone with a solid baseline from which to begin suggesting changes and improvements. It is integral that stakeholders understand the various externalities that directly influence the eventual decisions regarding the vehicle inspection program. Therefore, understanding what political, environmental, and statutory requirements exist in New Jersey is essential to the framework of these meetings.

I found both the history of the DMV Inspection System, as well as the charts that were used to explain vehicle failures/failure rates to be extremely useful.

Everyone's input was good.

DEP and MVC Presentations.

Learning about the issues that the other parties are wrestling with

Learned what technology MVC was looking at for the future of OBD and felt that there would be no place four our dealers in the program.

Have a better understanding of how MVC looks at safety program

Which portions of the meeting did you find l*east* helpful? *Please explain*.

My perception that there was some distrust of MVC motives which infiltrated some discussions.

On a few occasions (not many), participants were "speechifying' to make (or belabor) a certain point.

The a.m. part.

PIF Associations trying to claim whole job- they are more concerned with their profit statement than public service. A dual system is needed so the consumer has a choice of who they trust and can afford. Young drivers 17 to 25, senior citizens on a fixed income, lower income families (unfortunately this includes many state workers) simply can not afford $75 to $100 for inspection or the lost time from work.

Most of the meeting was excellent, I did however find the in–depth charting of the history of particulate pollutants rather uninteresting.

For ASE, discussion was limiting until we talked about training and certification.

Personally, I did not see any negative or unproductive portions of the meeting.

There was nothing about the meeting that I found to be "least helpful". In fact, it was probably one of the most insightful meetings that I've ever attended….for any subject

I realize that jobs are at stake, but I'm upset that the unions were such a large say in what the state does about Clean Air and Safety.

Some folks talking repeatedly.

I wonder if the meeting might have been a bit more candid if the State was not there. I know I kept some observations to myself because we ultimately want to win the business there

Some Stakeholders held back to see what positions others would take and defeated the purpose of the meeting.

4. How would you rate the facilitation services at this meeting? The facilitator was: (Average = 4.25)

Not helpful				Very helpful
1(1)	2	3	4 (1,1,1,1,1)	5 (1,1,1,1,1,1)

5. Additional Suppositions of Comments on this meeting.

If there is more meeting planned to focus on that four questions.

Check about the contract evaluation. It does not make sense to recommend privatization if it violates a legal document the state has signed.

There is also a SCI report about the previous contract issuance which should be reviewed. Possibly the report may be obtained thru NJMVC Commissioners Office.

Would like to have seen better advertising in order to enable the public to attend and be able to voice their concerns, since any agreed to changes as a result of these findings has the greatest impact on them.

The expectations, needs, and desires of the various industry groups were very unclear. Recognizing that there are multiple organizations, I believe those organizations represent the needs of the 1275+ private inspection facilities and hundreds of repair-only facilities. Given this representation, it would be more compelling if the common requests were coordinated and prioritized

I can't think of any suggestions, as this was a class-act meeting.

I learned a lot!

The meeting was much more useful then I expected it to be. The question is did it help the State?

Have more formal agenda made up of topics learned from past meetings

Try to get Stakeholders to give their opinions on each topic and details of how they would like to see new program run.

What is your overall evaluation of the meeting *(Circle one)* Average = 4.2

Poor	*Below Average*	*Average*	*Good*	*Excellent*
1	**2**	**3(1,1)**	**4 (1,1,1,1,1)**	**5 (1,1,1,1,1)**

APPENDIX C-9

SUMMARY OF SECOND STAKEHOLDER MEETING (JANUARY 30, 2006)

New Jersey
Motor Vehicle Commission

P.O. Box 160
Trenton, New Jersey 08666-0160

STATE OF NEW JERSEY

Jon S. Corzine
Governor

Sharon A. Harrington
Chief Administrator

***** ADVISORY *****

Contact
Dan Dozier, Meeting Facilitator, (301) 657 4114
David Weinstein, NJ MVC, (609) 777 3791

NEW JERSEY MOTOR VEHICLE INSPECTION PROGRAM STAKEHOLDER MEETING

(TRENTON) – The contractor selected to research potential changes to New Jersey's Motor Vehicle Inspection System has scheduled a second stakeholder meeting for Monday, January 30, 2006. The first stakeholder meeting was held on November 30, 2005. Approximately 40 stakeholders attended.

Stakeholders organizations that have a role in or an identifiable interest in the inspection program. The State is seeking participation and input from all affected stakeholders to obtain information about the impact of changes to the inspection program.

Members of the public are also welcome to attend, but the meeting is designed to hear comments from stakeholders, such as private inspection facilities, car dealers, environmental and public health organizations, training providers, representatives of inspection station employees, contractors, vendors, suppliers, the New Jersey Motor Vehicle Commission (MVC), and the New Jersey Department of Environmental Protection (DEP).

The meeting will be at MVC Headquarters, 225 East State Street, 8 East Conference Room, Trenton, NJ 08666, from 10 a.m. to 4 p.m. Those who wish to speak or make a presentation need to contact the meeting facilitator, Daniel P. Dozier at 301-657-4114, or at ddozier@mediate.org.

The State of New Jersey has selected MACTEC as the contractor to conceptualize and research options to modify the overall vehicle inspection system or provide reasons why the existing system should remain unchanged. The MVC and DEP currently manage vehicle safety, vehicle emission, and data management systems to help provide safer vehicles and fewer exhaust emissions.

FINAL SUMMARY

SECOND MEETING
THE STAKEHOLDER CONSULTATION GROUP
FOR THE
NEW JERSEY MOTOR VEHICLE INSPECTION PROGRAM

New Jersey Motor Vehicle Commission Headquarters,
Room 8 East, 225 East State Street, Trenton, NJ 08666

January 30, 2006 from 10:00 a.m. to 4:00 p.m.

Agenda

Welcome, Introductions and Agenda Review

- ♦ Welcome by State of New Jersey – Sharon Harrington, Commissioner, NJ Motor Vehicle Commission (MVC)
- ♦ Introduction of meeting participants and observers – Dan Dozier, meeting facilitator
- ♦ Introduction and explanation of the facilitator's role
- ♦ Review of the meeting groundrules
- ♦ Agenda review and approval of the agenda for the meeting

Scenarios for the NJ Safety and Emissions Inspection Programs and Facilitated Discussion Regarding Stakeholder Interests

- ♦ Assumptions Regarding Program Design Options – Catherine Schafer, NJ MVC
- ♦ Hybrid System – Contractor or State Run
- ♦ PIF Only Network
- ♦ CIF Only Network
- ♦ Separated Safety and Emissions Inspection System

Next Steps and Adjourn

Executive Summary

Scenario 1 - Hybrid System (Contractor or State Run)

- *There seemed to be agreement that the program could use a single vendor for CIF, PIF, and VID equipment and services. Possible benefits include lower costs through economies of scale, greater system efficiencies and ease of coordination (for example, in designing and implementing software updates), and greater accountability for overall system performance. PIF representatives are open to the idea but would like continued involvement in the discussion about this approach. In any case, PIF representatives believe that the State should invite PIF involvement in writing the specifications for new equipment and services.*

- *Participants disagreed on the need for retaining a gas cap test should OBD be implemented and on whether PIFs should continue to test pre-1996 vehicles under this scenario. The State will check with USEPA on the emissions credit that the State would receive for continued gas cap testing if it were to implement OBD.*

- *There is concern about reducing the number of safety items that must be operational for a vehicle to pass inspection. The group agreed that any such review would require a broad consultation process and that, even if there were no changes, a public education campaign about safety requirements would be a good idea.*

- *There was disagreement about whether the central lanes should be operated by the state or a private contractor.*

Scenario 2 – Private Inspection Facility Only Network

- *Participants seemed to agree that capping the labor hours for PIF-conducted inspections (but not specifically the price of the inspection or the labor unit cost) could work in a PIF-only network. PIFs expressed opposition to capping such costs under the hybrid scenario, however, unless motorists are able to credit the relevant portion of their vehicle registration fees toward the cost of a private inspection.*

- *There was uncertainty about the reaction of motorists to an all PIF program. Among the concerns expressed were the impact of any added cost to the motorist, familiarity and seeming satisfaction with the current system, and possible transition problems (for example, at least in the short term, accommodating all the motorists requiring tests).*

- *Participants agreed that, despite the cost gas cap and tailpipe testing would be necessary for at least the 2007 through 2010 period. (Advances in technology such as Partial Zero Emission Vehicles, low sulfur fuels, and so on and their widespread use are still too far off to allow eliminating these tests.)*

- *Among the alternatives discussed for making testing equipment more affordable was a transaction-based pricing system.*

- *The use of centrally based computers and the internet could reduce the cost to private shops of the OBD component of emissions testing.*

- *An additional drawback of an all PIF system is that it would require laying off 500 union employees. Transition assistance and alternative employment options were not discussed at length.*

- *Participants would like to see an estimate of the costs to the State of transitioning to an all PIF system (as well as the other scenarios).*

Scenario 3 – Central Inspection Facility Only Network

- *While the central inspection facilities may have sufficient capacity for all New Jersey motorists (they currently test about 80% of the vehicles), participants seem to agree that reducing the total number of testing facilities available would represent a significant reduction in motorist choice and convenience. (There are currently about 1300 public and private testing facilities of which 31 are CIFs.)*

- *Most participants seemed to agree that a move toward more centralized facilities was contrary to the larger trend of decentralization that is occurring nationwide, in part because of technology changes.*

- *Some PIFs might prefer this option rather than the current hybrid system (though not as much as an all private system).*

Scenario 4 – Separated Safety and Emission Inspections

- *Participants seemed to agree that while providing motorists with separate for safety and emissions inspections (and therefore separate enforcement mechanisms); it is not necessary to separate the locations where the tests are administered and doing so, depending on expiration dates and other issues could be a significant and unwelcome inconvenience.*

- *Participants seemed to agree that while advances in technology would facilitate decoupling emissions and safety tests in the future, the reverse is not true; that is, separating the administration of emissions and safety tests would not foster or ease the transition to the use of new testing technologies. At any rate, the question of decoupling, it was largely agreed, is a different issue than whether the inspection program is hybrid, private, or centralized.*

Meeting Notes

Welcome, Introductions and Agenda Review

Commissioner Harrington opened the meeting by welcoming the participants and thanking them for working with the State to improve the maintenance and inspection program. She explained that the first meeting of the stakeholder group was successful and, as at that meeting, the State is looking for frank input on proposed changes to the program. Other ways for providing input include submitting comments through the Motor Vehicle Commission website, www.state.nj.us/mvc/index.shtml, or by sending an email to the meeting facilitator (ddozier@mediate.org).

The meeting facilitator, Dan Dozier, thanked the participants for attending and asked each individual to introduce him or herself. Mr. Dozier then explained that his role would be to make sure that all participants have an opportunity to have their views heard. He summarized the meeting groundrules and, after soliciting comments on the draft agenda, introduced Catherine Schafer, the Director of the MVC.

Scenarios for the NJ Safety and Emissions Inspection Programs and Facilitated Discussion Regarding Stakeholder Interests

Ms. Shafer welcomed the participants and thanked them for their continued involvement. She explained the roles of the MVC and the New Jersey Department of Environmental Protection in managing vehicle safety, vehicle emissions, and data systems for providing safer vehicles and fewer exhaust emissions. The State, she added, has selected MACTEC as the contractor to conceptualize and research options to modify the overall vehicle inspection system or provide reasons why the existing system should remain unchanged. She explained that the purpose of the stakeholder process was to get input from stakeholders and the public, that the State had not yet any decisions on how to proceed with the maintenance and inspection program, and that she wanted comment from the variety of interests assembled about the pros and cons of several possible scenarios.

Before introducing possible models for the program, Ms. Shafer introduced some preliminary assumptions to set the parameters for the discussion and asked for comment.

<u>Preliminary Assumptions Regarding Program Design:</u>

- Both Safety inspections and Emissions inspections will be retained in some form.
- Based on USEPA modeling and vehicle population distribution, dynamometer and tailpipe testing will eventually be eliminated. New Private Inspection Facility (PIF) equipment may at some point not require a dynamometer component.
- Existing PIF and Centralized Inspection Facility (CIF) equipment will eventually become obsolete.
- At different stages in the program, different facilities may conduct different emissions tests (OBD, dyne, and tailpipe).

- Current Emission Repair Facility (ERF) and repair technician programs will remain the same for the short term but be evaluated for improvement.
- All inspector and repair technician training will be evaluated for improvement and automation.
- Emissions repair data capture will be improved.
- The new VID/software infrastructure will be flexible and scalable to allow for additional components in the future.

In response to a question, a representative of DEP explained that preliminary modeling indicated the State could eliminate tailpipe testing in the 2012-2014 timeframe. This however, can change, as USEPA has not finalized the new model.

A representative of the private inspection facility (PIF) community asked whether the DEP was being pressured by USEPA to move from tailpipe to on-board diagnostic (OBD), and CAN testing programs, as this shift would have a significant impact on private testing stations. A DEP representative pointed out that, USEPA aside, the industry was moving to OBD and CAN testing. He further pointed out that the OBD and CAN testing protocols are more accurate than tailpipe tests, a fact recognized in the models.

A vendor expressed an interest in the state identifying specific items related to vehicle safety in the new program and it was agreed that while capturing this data would be a priority in the new program, it was premature to identify specific items at this time.

The Director then introduced the first of the four inspection program scenarios set out by the state for discussion today.

Scenario One – Hybrid Inspection Program (Contractor or State Run). Under this scenario, the State would keep the same system of both State Central Inspection Facilities (CIFs) and Private Inspection Facilities (PIFs). Characteristics of this scenario include:

- Motorist choice continues.
- CIF Equipment, PIF Equipment, and VID would be provided by one contractor.
- CIF test would include OBD, Gas Cap and tailpipe testing.
- CIF lanes could be operated by the State or by a contractor.
- PIF test could be OBD and gas cap.
- PIF Equipment could be paid for by sale or by transaction
- PIF inspection fee could be capped or market driven.
- Safety Advisories could reduce retest inspections.
- State audits would be reviewed.

Themes from this discussion and supporting conversations are set out below.

- *There seemed to be broad agreement from those who spoke on the desirability and feasibility of having a single vendor for CIF, PIF, and VID equipment and services.*

Possible benefits include lower costs through economies of scale, greater system efficiencies and ease of coordination (for example, in designing and implementing software updates), and greater accountability for overall system performance. PIF representatives are open to the idea but would like continued involvement in the discussion, as obviously they would be affected by the nature and details of the vendor arrangements. PIF representatives strongly suggested the best way to address their interests would be to allow PIF input into the specifications for new equipment and services.

A representative of the PIF community indicated that his constituency would like some say in how many and which contractors are selected to furnish equipment for the program. He indicated that, on the one hand, PIF have run into problems with different manufacturers (e.g. getting equipment ready for software updates) and might be open to having a single contractor. On the other hand, the PIFS enjoy having some freedom of choice when selecting equipment. His opinion was that the larger, well-established equipment vendors have better networks in place for servicing equipment.

Another PIF representative indicated that the terms of the contract were just as important as which or how many contractors were involved. Contracts should have service and performance standards including mutually agreed time frames and prices for repairs.

A vendor representative indicated that significant cost savings were possible with the economies of scale that would be achieved with a single contractor. As an example, he noted the large range in costs for comparable equipment in the states of New York (single contractor) and Pennsylvania (more than one contractor): $1400-$7,000).

A union representative asked if this or any of the other scenarios described below required legislative approval. Cathy Shafer responded that the State Treasurer may determine whether the central lanes are run by the state or a contractor; therefore, on that point, no legislation is needed. An all PIF operated inspection program, on the other hand, could require legislation and she would look into it.

One vendor representative indicated that some firms likely would bid for the right to provide equipment for the CIFs, PIFs, the VID, and so on, if given the opportunity. Subcontractors would be used for those goods and services that are not otherwise available from a given vendor. Several vendor representatives indicated agreement with this remark.

Another vendor representative concurred with the argument that there was a cost advantage of going with a single contractor and estimated the advantage at as much as 2:1. He also indicated that a single-contractor system would be much more efficient and gave the example of implementing a software update. By his estimation, defining and deploying a software update could take 1-2 weeks in such a system. In contrast, the same update could take 1-2 years in a program that has multiple vendors.

A representative of the current State contractor for the central lanes added that there is significantly more accountability when there is only a single contractor. He added that is much easier for the State to hold a single contractor accountable than it was for the State to hold itself accountable. Concurring, a PIF representative said that if a software provider is also answering help line calls, there is much more incentive to improve the software than if the help line service were contacted out to another operator.

A PIF representative expressed the importance of procuring effective equipment – equipment that has a record of performing well and of being serviceable and not just inexpensive – and asked that PIFs have an opportunity to provide input to the State on criteria and specifications. Cathy Shafer indicated an interest in doing this and suggested that trials for new equipment possibly could be conducted in a small number of shops.

- *Participants disagreed on the need for retaining a gas cap test should OBD be implemented and on whether PIFS should continue to test pre-1996 vehicles under this scenario. The State agreed to check with USEPA on the emissions credit that the State would receive for continued gas cap testing if it were to implement OBD.*

A vendor representative noted that gas cap testing can handicap OBD systems and encouraged the DEP to evaluate how much emission credit the State gets for gas cap testing if it also has OBD testing. A representative of DEP indicated that the modeling is ambiguous at this point and that most states have decided against using both.

Another representative of DEP noted that the State is under significant pressure for non-attainment and even small amounts of credit are meaningful; any emissions reductions that are not covered by inspection and maintenance program will get pushed on to another sector. Another indicated that the failure rate for gas caps in the State is currently about 2% all model years inclusive.

A couple of participants pointed out that requiring motorists with pre-96 vehicles to use the CIFs (PIFs would only provide OBD testing and pre-96 cars are not compatible with this technology) might create some confusion as to where to go for testing and some inconvenience or displeasure at being forced to use a specific testing facility.

A participant argued that the system should be designed so that retests can be done at PIFs. Most PIFs, he noted, are also repair facilities and therefore most of them already have the equipment to continue dynamometer testing. Others pointed out that the cost of keeping dynamometers certified is costly and that the retest market may be too small to support it. Another PIF representative suggested that all tests should continue to be performed at PIFs.

A PIF representative explained that, if PIFs and CIFs are testing identical model years, the ease or difficulty of passing the test must be comparable. He suggested that public perception used to be that PIFs were providing harder tests and this may have reduced the PIFs share of the market relative to CIFs.

- *Participants seemed to agree on capping the labor hours that could be attributed by PIFs to inspections (but not on the price of the inspection or the labor unit cost). PIFs are opposed to a hybrid scenario, however, unless motorists are able to credit the relevant* *portion of their vehicle registration fees toward the cost of a private inspection. That this fee is credited only toward the cost of a CIF inspection creates an unfair price advantage for CIFs.*

In response to the State's explaining that it was considering capping the fees that PIFs charge, A PIF representative noted that different private inspectors had different cost factors and that any cap should consequently be placed on the amount of time that can be charged for an inspection and not on the total cost per inspection. In this scenario, the market would still operate to keep prices down.

A PIF representative noted that his constituency's support for a hybrid system was conditional on the State creating "a level playing field" whereby registration fees can be credited toward the cost of using either a CIF or PIF. He suggested a voucher for all motorists in an amount equal to the current cost of a state inspection.

- *There is keen concern about reducing the number of safety items that must be operational for a vehicle to pass inspection. The group agreed that any review required a broad consultation process and that, even if there are no changes, a public education campaign about safety requirements would be a good idea.*

The State reiterated that safety inspections will continue at both CIFs and PIFs.

The MVC Director pointed out that motorists are unduly inconvenienced when they are required to undertake a re-inspection when their vehicle fails for something as easy to repair as a non-operational windshield wiper.

A PIF representative explained that advisories are a waste of time as motorists will only comply with mandatory repairs. Other participants voiced agreement. One added that there is an estimated $8 billion in unperformed car maintenance in the country. A representative of the motoring community acknowledged that safety was her biggest concern but suggested that there was an opportunity for enforcement by police if people do not follow advisories.

Another participant suggested it was not advisable or feasible to have an increasing amount of police time spent on enforcing these items. For example, inspection records indicate that the biggest failure item at inspection is a non-operational 3rd stoplight. This is easy for law enforcement to see (much more than other safety items). Even in this case, however, it is unrealistic to expect officers to set other more pressing responsibilities aside and detain every driver that has non-functioning 3rd stoplight.

A representative of the Traffic Officers Association indicated that he would likely oppose any change that would allow motorists whose vehicle do not meet current safety standards to pass inspection with a mere advisory to have un-operational items repaired. He did not offer any items to add to the safety inspection at this time.

A representative of the contractor operating the CIF lanes added that it is important that the list of advisory items, whatever they may be, are fixed for the duration of the next iteration of the safety program (e.g. the length of any contract with the State). He would minimally expect an opportunity for his organization and the public to comment on any changes.

A representative of the motoring community expressed interest in a review of the list and in the need for educating motorists about safety requirements. How old is the list of safety items? How important are they? What does the consumer know? What items do people most commonly fail for and how often? She noted that the only complaint her organization received in 2005 was from a motorist who failed inspection for a small crack in his windshield. Nobody could show him where in the regulation it required failing his vehicle for this. She added that broad consultation on items to be included is important. Other participants also expressed support for the need for broad consultation.

In response to a concern on the part of a union representative about changing safety items to advisory status, the State clarified that any changes would have to go through the regulatory review process. As such, any proposals would be published well in advance and that stakeholders and the public would be given an opportunity to comment.

The participants then discussed options other than keeping the system the same or making some repairs advisory. A representative of the training industry suggested sending motorists a checklist at the same time they receive notice to get their vehicle re-inspected. The motorist could then get these items checked out by a mechanic before going to inspection. A union representative replied that this had been tried before and was ineffective. A vendor also questioned the effectiveness of this approach. He noted that a study of Arizona motorists indicated that 12% of motorists presented for inspection even though they had a "Check Engine Light" on. A representative of the DEP added that some states have introduced "Repair-to-Pass" programs and that the State was looking at whether and how to introduce this element in New Jersey.

- *There was disagreement about whether the central lanes should be operated by the state or a private contractor.*

A union representative argued in favor of the current arrangement of having central lanes operated by a (single) contractor and remarked that the system was working well. A representative of another union disagreed, arguing that the central lines should be folded back in to State operations.

A representative of the current contractor argued that the State is better able to hold a contractor accountable than itself. He added that a private contractor's interest in profitability is precisely the reason that contractor-operated outfits are more cost-effective than state-run operations.

A vendor noted that the introduction of new technologies and the resulting decline in more labor intensive testing methods would mean a shift in the role that inspectors employed by the State would play and not necessarily their elimination. He noted that while introducing E-ZPass reduced the need for toll operators it created a need for professional administrative staff.

- *Audits*

A PIF owner expressed concern about the adequate enforcement of licensing requirements for Emission Repair Facilities (ERFs). He believes there has not been adequate enforcement and that, in fact, licensed facilities are monitored more closely even than potential unlicensed facilities if for no other reason because the State their contact information.

A PIF representative indicated that increasing the amount of time between audits may not be good idea because it is easier to find information that you are missing. The system keeps operators up to date on paperwork.

The PIF representative also expressed interest in a more automated or electronic system of data capture. A vendor offered that new equipment increasingly provides for electronic data capture and that the potential time savings are significant.

A representative of the environmental community inquired as to whether auditing frequency impacts the State's emission credits. A representative of DEP replied that it could. He added that, as the State transitions to OBD, however, the Clean Air Act allows for these audits to be conducted less often.

Scenario 2 – Private Inspection Facility Only Network. Assumes only PIFs are permitted to provide inspection services.

- No motorist choice.
- Equipment and VID provided by one contractor.
- Equipment may be paid for by sale or by transaction.
- Emissions test to include OBD, Gas Cap and tailpipe testing.
- Inspection fee may be capped.
- Safety Advisories may reduce retest inspections.
- State audits will be reviewed.

Themes from this discussion and supporting conversations include:

- *There was no agreement about whether motorists would on balance favor an all private inspection program. Among the concerns expressed were the added cost to the motorist, familiarity and seeming satisfaction with the current system, and possible transition problems (for example, at least in the short term, accommodating all the motorists requiring tests).*

A representative of car dealers indicated that this scenario provides the ultimate in consumer choice. A representative of the motoring public agreed that it provided the ultimate in choice and convenience. However, she added that more than three times as many motorists elect to go the CIF under the current hybrid system must be considered. A representative from the public indicated that it removes the option of those who would elect to pay no additional fees for testing and added that there are a number of low income and retired persons on fixed or small budgets for whom this may be important. A union representative concurred with this. He added that the level of acceptance by the motoring public of the current system is such that they would not like a change of this magnitude. Indeed, this would involve a change in the practice of 80% of motorists. A motorist representative indicated that MVC would have to do a lot of advertising and public education to ease any transition of this nature.

A vendor representative explained that if you are going to change people's habits and charge them additional fees they are going to want to know where the value is in this.

There was additional concern about whether an all private market had sufficient capacity or flexibility to accommodate the roughly 80% of motorists that currently have their tests conducted at CIFs. A PIF representative indicated that about 3500 shops (there are about 1300 now) would be needed to service the entire New Jersey fleet and that the price cap (which he argued needs to be based on hourly rates) would determine how many would open shops or begin providing inspections. Some shops, he added, might devote entire lanes just to inspections. He then explained that the total number of handlings – inspections plus re-inspections – under a PIF only system would be lower than the amount under the current system because repairs would be done in the moment (thereby eliminating the need for a re-inspection). Finally, he added that several other states had gone all private and did not have these problems.

- *Participants agreed that, despite the cost, gas cap and tailpipe testing would be necessary for at least the 2007 through 2010 period. (Advances in technology such as Partial Zero Emission Vehicles, low sulfur fuels, and so on and their widespread use are still too far off to allow eliminating these tests.)*

A vendor pointed out that the evolution of Partial Zero Emission Vehicles, low sulfur fuels, cleaner engines, and so forth will eventually eliminate the need for tailpipe and gas cap tests. Another vendor noted that Oregon is already implementing a voluntary remote OBD testing program and estimated that by 2012 about 90% of all new cars will be PZE.
Participants agreed that these advances, while meriting continued attention, will not reach a sufficient percentage of vehicles until the 2010 to 2015 period to allow elimination of tailpipe testing (or possible even gas cap testing). Participants acknowledged that there is no experience yet with the voluntary OBD program in Oregon.[16] Another vendor representative also indicated that there might be political obstacles to large scale adoption of remote sensing technologies (namely, concerns about privacy). At this time, only a small number of engine manufacturers are producing PZE engines.

Similar advancements in remote sensing technologies could someday assist in remote testing of vehicle safety features as well. A DEP representative noted that General Motors is using telematics (the On Star system) to alert motorists (and dealers) about repair needs.[17] Original

[16] A DEP representative added that Oregon has unique status and flexibility regarding its motor vehicle emissions program as it is currently meeting EPA emission requirements.

[17] A representative of the automobile publishing industry shared that roughly 25% of new GM cars feature this service and added that GM expects to include this as a standard feature by 2007. Testing of short wave communication technologies is due to end in 2008 and it is possible that this technology could come into production

equipment manufacturers and the Federal Highway Administration are currently investigating the use of short wave communications to alert drivers of non-operational safety features (called Vehicle Infrastructure Integration). Changing technology may eliminate the need for ever having centralized tests. Now may be the right time to make the transition, especially if the state gave motorists the portion of the registration fee (now estimated to be about $25) back to ease the transition. Overall, however, the large-scale roll-out of remote sensing technologies for safety-related items is even further off than those for emissions testing.

- *If they continue to be required, the cost to private shops of providing tailpipe tests must be addressed under an all-private system.*

A vendor explained that the cost of tailpipe testing is increasingly disproportion to the number of cars requiring this test and that this could make an all private system unviable. (All cars made after 1996 can be tested with on-board diagnostics and a gas cap test.) A PIF representative responded that most private repair shops already have the necessary equipment for tailpipe testing because they use it for repairs. A vendor replied that this equipment cannot be used for state inspection unless it is certified. He estimated the cost of certified gas analyzers at about $10,000. A representative from DEP added that integrating certified equipment with other equipment adds to this cost. The PIF representative seemed to concur and added that the annual cost of maintaining certified equipment is far too high (his said that his service contact is $4500 a year) and that this is in fact one of the issues he would like the group to address.

- *Among the alternatives discussed for making testing equipment more affordable was a transaction-based pricing system.*

A vendor suggested that a program whereby shop owners pay for testing equipment on a per use basis would make the program more affordable for them. Under this system, a single vendor would have a contract with each PIF. The contract would cover all costs and services – the equipment, service and maintenance, and so on. Each PIF would reserve space in their shop for the testing equipment and would pay a fee each time they used the equipment. A precondition of this type of pricing scheme is that the State would have to cap the number of stations allowed to participate in the program so that participants can be assured that they will receive enough volume to accept the equipment into their bays.

Another vendor pointed out that setting a limit on the number of people that can provide inspection services is difficult politically. Nobody wants to be excluded from providing a service that they wish to provide. A second difficulty, he added, is that the high volume shops end up subsidizing the low volume shops. Another vendor argued that, in the absence of charging a cost to participate, a transaction based pricing system creates the possibility that some shops will underutilize their equipment. Exacerbating this, some large shops with multiple bays will argue that they need analyzers for each of their bays.

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in 2010. (The service, he said, will be provided free to the customer along with the first year of service. The price for additional years of service will be $199 to $399 a year depending.) BMW and Mercedes have similar systems on their high line vehicles and are considering it for all of them.

He suggested an alternative, such as in New York, where participants pay a fee to participate (up to the cost of the equipment). Depending on the specification, the cost of the equipment (analyzers) would likely be in the $10,000-$15,000 range. A third vendor replied that the cost of the equipment could be a lot lower if there is a sole provider.

Another vendor replied that, so long as there is a single contractor, a scoring system could be used to determine which shops would do the most volume. Additionally, there could be volume discounts such that shops are encouraged to test a large number of cars. There could also be exit clauses to allow low volume shops to withdraw from the program.

A PIF representative said he would be interested in learning more about this type of system. He is concerned about capping the number of providers. He added that $7,000 - $8,000 for an analyzer is not unreasonable, especially given that the service contract on his existing equipment is a$4,500. Overall, he concluded, it would be easy to make a transition to new equipment given the cost and lack of reliability of the old.

A vendor in the current program pointed out that existing equipment still has considerable value. For example, his firm's equipment has some elements for OBD and gas bench and that upgrades are possible.

- *The use of centrally-based computers and the internet could reduce the cost to PIFs of the OBD component of emissions testing.*

A vendor proposed that an internet-based system with centrally located computer hardware could further reduce the cost of OBD testing. Under this scenario, PIFS would provide their own shop computers and purchase high speed internet service. All the data from their emissions tests would be sent to a central computer that is owned and operated by the contractor. All software updates would be managed through that single computer; shops would not even need to download software. The program would require users to pay each time they use the software on the central computer. Connecticut apparently runs a program like this. According to another vendor, there is also a system like this in place in New York, and the cost to shops for making a call is about $.03 per call. A test usually requires two calls. According to the vendor, the cost of the call represents all costs to the shop – equipment, maintenance, the VID, training, the website, and so on (but this type of program cannot provide tailpipe tests).

A representative of DEP indicated that the State was looking at this and one concern they had is the fact that, if an internet connection goes down, it keeps a shop from operating.

A PIF representative replied that he relies heavily on the internet (ordering parts, renting U-Haul's, etc) and that access reliability does not seem to be a problem. Internet use is increasingly widespread. As a reference point, another vendor described the system in New Hampshire where there are 1500 stations connected to a central computer. According to the vendor, one-third of the stations representing about 50% of the test volume pay for broadband service. The rest of the stations use traditional dial-up service.
Another vendor noted that USEPA's new emissions model almost requires shops to have wireless broad brand in the near future and that its use in shops would definitely increase.

MVC agreed to try to identify those shops that already have dial-up and/or broadband access when they conduct their monthly audits.

- *The State would receive somewhat lower emission credits under this scenario in the short term. The medium and long term outcomes are not clear.*

A representative of DEP indicated that, based on current modeling, the State would get less emission reduction credit under this scenario. Currently, a private inspection gets 80% of the credits that a state inspection receives. With OBD, he thinks this can be increased. He offered that the State could look at other states that have moved to all private systems and, if indicated, further adjust the compliance rates that they are currently assuming in their emissions model. Similarly, if the State could show that this change resulted in better maintained cars that emitted less, the State would also get more credits. In response to questions about the model, he explained that USEPA's emissions model gives credit for the longevity of an inspection program, the number of people who try to comply and how many ultimately pass, among other things. The number of failures is not considered.

- *An additional drawback of an all private system is that it would require laying off 500 union employees. Transition assistance and alternative employment options were not discussed at length.*

- *Participants would like to see an estimate of the costs to the State of transitioning to an all private system (as well as the other scenarios).*

A PIF representative indicated that the State's financial condition is such that the cost of the program to the state is a significant consideration. He requested that the State obtain cost estimates for the most likely scenarios for the inspection program and the information be shared with participants.

A contractor indicated that previous references to an all private system saving the state money assume that the state would not refund to motorists the $25 charge that is currently included for inspection costs in their registration fee.

The MVC Director indicated that the audit system will be reviewed under all scenarios and that it is likely in the case of an all private system that the number of personnel responsible for auditing private shops would increase.

In response to an earlier suggestion that an estimate of the cost of a private system include estimated proceeds for selling state inspection facilities, Ms. Schafer noted that these facilities must first be offered to other state agencies before they can be sold publicly and that the proceeds, if any, may be insignificant.

- *Audits*

In response to a question, a DEP representative indicated that the State is considering privatizing the auditing function. In 1998, the last time this was done privately, the State paid $450,000 for 1400 audits.

Scenario 3 – Central Inspection Facility Only Network. Assume no private facilities and only State facilities provide initial and re-inspection services.

- No motorist choice.
- Equipment and VID provided by one contractor.
- Some lanes will be OBD-only and some will include tailpipe testing.
- Gas Cap testing will be included.
- Same hours of operation.
- Lanes may be operated by State or by contractor.
- Safety Advisories may reduce retest inspections.
- State audits will be reviewed.

Themes from this discussion and supporting conversations include:

- *While the central inspection facilities may have sufficient capacity for all New Jersey motorists (they currently administer about 80% of the vehicles), participants seem to agree that reducing the total number of testing facilities available would represent a significant reduction in motorist choice and convenience. (There are currently about 1300 public and private testing facilities of which 31 are CIFs.)*

A representative of the contractor that currently administers the central lanes indicated that all New Jersey motorists could be accommodated in the existing central lanes with some new equipment, possible additional hours, and increased staff. The additional volume would translate into an increase in costs for the State unless they are able to reduce the cost per inspection.

A member of the public noted that handicapped and elderly drivers might not be able to drive the entire distance to one of the 31 existing central facilities. This option, to him, provided insufficient choice and convenience. Several others concurred.

- *Most participants seemed to agree that a move toward more centralized facilities was contrary to the larger trend of decentralization that is occurring nationwide, in part due to new technologies.*

A vendor noted that the majority of states are private only. When states have made significant changes in their programs, they have tended to more toward private systems. Connecticut is the latest example. This trend away from central inspections is because of the evolution of OBD. In fact, with the evolution of new ways of delivering OBD, there is a trend even away from private facilities and toward kiosks. A PIF representative question why the State would seriously consider centralizing testing given these advances in technology.

The group framed the question as, “The trick is how do you get from 2007 to 2015?” and “Do you develop a whole new program or continue with what you have?” or “Can you continue in a way that you think will accommodate new technologies?” Participants noted that the cost of any new equipment has to be in line with the likely life span of the program. The participants acknowledged that OBD and other technologies would not be widespread enough until as late as 2015 to allow entirely remote testing vehicles. A vendor indicated that political concerns might also slow the spread of new technologies, pointing out that consumers may reject technologies that are seen as impinging too much on their privacy (e.g. that would show their speed from point A to point B or that that they were at either location).

- *Some PIFs might prefer this option rather than the current hybrid system (though not as much as an all private system).*

A representative of the PIF community said that many of his constituents would rather see a CIF-only program than an extension of the current hybrid system. The hybrid program creates a conflict interest whereby private shop operators feel pressured by motorists to pass vehicles. He equated the hybrid program with further ‘dumbing down’ of safety requirements (e.g. making some items advisory or increasing the allowable time between inspections). His contention is that since many shops are not making money off the current program and they find the requirements for participating to be burdensome. Under a CIF-only program, private shops would still perform all the repairs. He asked if the State had considered having people pay for inspection at the CIF. (According to a representative from MVC, this was the practice from 1937-1956 and that they found it was easier administratively to collect the fee when registering a vehicle.)

Scenario 4 – Separated Safety and Emission Inspection. The program would involve safety inspections being done all at Private Inspection Facilities (PIFs) and all emissions inspections done at the State Central Inspection Facilities (CIFs).

- Motorist must go to two places for inspection.
- Equipment and VID provided by one contractor and system provides for the capability of utilizing new technology for future inspections.
- Equipment may be paid for by sale or by transaction.
- Emissions test to include OBD, Gas Cap and tailpipe testing.
- Safety or Emission Inspection fee may be capped or market driven
- Safety Advisories to reduce retest inspections.
- Creates easier system to implement program changes for the future.
- State audits will be reviewed.

Themes from this discussion and supporting conversations include:

- *Participants seemed to agree that while providing motorists with separate stickers for safety and emissions inspections, separating the locations where these tests are administered would be a significant and unwelcome inconvenience.*

A representative of the automobile publishing industry advised asking New Jersey motorists if they would like this option. According to him, convenience is a major factor in the success and acceptance of inspection programs and making them go to two locations for these tests was asking a lot. Others agreed.

- *Participants seemed to agree that while advances in technology would facilitate decoupling emissions and safety tests in the future, the reverse is not true; that is, separating the administration of emissions and safety tests would not foster or ease the transition to the use of new testing technologies. At any rate, the question of decoupling, it was largely agreed, is a different issue than whether the inspection program is hybrid, private, or centralized.*

A representative of the State offered that decoupling the two tests allows them to incorporate new and developing technologies such as OBD into the program with fewer disruptions. For example, if a motorist goes to one inspection location for a safety test, he may be more likely to elect participating in a remote testing program for emissions rather than now visiting a central inspection lane for an emissions test. A representative from DEP added that greater adoption of OBD would result in lower overall emissions (constant monitoring) and greater emissions credits. Another DEP representative added that, under this scenario, the PIFs would not have to maintain any emissions testing equipment – just a means of recording and communicating information to the State on safety inspections.

A contractor replied that these advances in technology and their adoption would happen anyway and was not convinced that changing the program in the way would really facilitate that advance. Moreover, he added, you could accomplish the same ends merely by changing the rules of the current program. A representative of the PIF community responded with great concern to the idea of continuously incorporating new technologies and other changes in the inspection program once the elements of a new program are decided. These types of changes are precisely what have hurt the profitability of private shop owners since implementation of the enhanced inspection program. He added that private shops are already providing emissions inspections to a higher percentage of older cars than the CIF lanes. As such, they will have the tailpipe equipment and will want to continue providing emissions inspections. (PIFs also need this testing equipment anyway to diagnose and repair cars that have failed emissions.)

<u>Overall Comments and Questions</u>

A representative of the PIF community reiterated that, no matter the design of the program, it was imperative that the State keep it unchanged for the entire length of any contract. In his words, "Don't changing the rules in the middle of the game. We [the PIF community] can't allow that to happen again.

A representative of the motoring public repeated her earlier position that the State should consider public education about the program no matter what the program looks like. A vendor noted that, in New York, his firm was given $2 million to spend on public education. According to the Director of MVC, the State still has $1 million that was set aside for this purpose on the current program.

A vendor suggested that a properly defined public opinion survey could be a valuable decision making tool for policymakers.

A PIF owner asked if there was a timeline for State decision making. The Project Manager for MACTEC, the firm that is conducting the current evaluation of the NJMVIS, said that his firm will deliver a final report on options and costs in the spring and that the report will be public. The Director of MVC said that the State would make a decision shortly after receiving that report and that the August 2007 expiration of the existing CIF contract was driving the timing. The state, she added, is also writing RFPs for a VID. She was unable to indicate at this time when and in what format the group would meet again but promised to stay in contact.

At the conclusion of the meeting, State representatives thanked everyone for volunteering their time. The facilitator then passed out meeting evaluation forms and requested that all participants complete the forms to provide him and the State with feedback about the meeting and the utility of this type of meeting.

APPENDIX D-1

OPTIONS AND ALTERNATIVES

The options and alternatives were organized by the following themes:

- I Program Management/Operations
- II Program Oversight
- III Vehicle Coverage
- IV Vehicle Compliance
- V Network Design
- VI Station Performance
- VII Inspection Equipment and Procedures
- VIII Equipment Upgrades
- XI Vehicle Repair/Motorist Assistance
- X Safety Inspection
- XI Data Management/Network Maintenance

PROGRAM MANAGEMENT/OPERATIONS
REBID OF CIF CONTRACT

MEASURE IDENTIFICATION CODE: I-1

DESCRIPTION

Rebid current contract for CIF and VID operations. Thorough procurement process will be required prior to end of current and rebid of CIF program contract.

This option is discussed in detail in Section 5.2 of this report.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Programs in Maryland, Illinois, Indiana, Colorado, and British Columbia.

AIR QUALITY IMPACT

- Air quality impacts are subject to changes resulting in program changes associated with rebid and restructure of the I/M program. Other options in this program analysis present air quality impacts that would result from specific program changes.

OVERALL OPERATING COST

- See Section 5.2 of this report for a complete analysis of costs associated with program changes.

EMISSION COST/BENEFIT QUOTIENT

- The cost benefit of this option is subject to specific program elements. Other options in this program analysis present air quality impacts that would result from specific program changes.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Not applicable.

EASE OF IMPLEMENTATION

- Decisions regarding desired program elements and program elements to be discontinued, revised or replaced will determine the complexity of the RFP for rebid of the I/M program.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- There is union concern about CBA and member benefits, union recognition.
- There is a major PIF concern as they are campaigning for a PIF-only system.

STATE IMPACTS

- Impact could vary depending on outcome of bid process (e.g., new contractor will require transition)
- Additional workload could be experienced if additional contractor metrics are added to new contract.

- Potential program savings could result from program changes.
- Rebid of the program affords an opportunity to design a more efficient program consistent with safety and emission objectives.
- Decisions on equipment specs will be necessary, and costs will be influenced by these decisions.
- The State could design future I/M contracts to have flexibility to use the contract for ancillary services (IT services, Program Management)
- Planning and rebid will result in a more accurate measurement of AQ impact, and the cost/benefit quotient of program changes.

SAFETY IMPROVEMENT FACTOR

- There are potential savings to program costs if the program changes.
- A rebid of the I/M contract creates an opportunity to design a more efficient program consistent with safety and emission objectives.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- This option is affected by all options relating to changes in program design. Particular relationship to I-2, I-3, and V-2. For Option I-3, the possibility of a single contractor managing both PIFs and CIFs would be considered.

MEASURE IDENTIFICATION CODE: I-2

DESCRIPTION

The State would take over the operation of the CIF lanes.

This option is discussed in detail in Section 5.2 of this report.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Other states including Delaware, Oregon, and the District of Columbia use this approach.

AIR QUALITY IMPACT

- Air quality impacts associated with this option are subject to changes in the inspection program.

OVERALL OPERATING COST

- See Section 5.2 for a complete analysis of this option.

EMISSION COST/BENEFIT QUOTIENT

- The cost benefit of this option is subject to specific program elements. Other options in this program analysis present air quality impacts that would result from specific program changes.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Not applicable.

EASE OF IMPLEMENTATION

- There will be transition issues from contractor to State; quantifiable under evaluation.
- Transition would include challenges of conversion to state employee work force, acquisition or duplication of warehousing and repair center, retaining or acquiring key personnel with specialized knowledge, etc.
- If undertaken simultaneous with IT improvements and VID redevelopment, potential for problems associated with delays and human resource shortages are compounded.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Given historic human resource challenges and substantial turnover of inspection personnel, can the State maintain the same level of performance with the prevailing restrictions on discipline and dismissal?
- Potentially lower cost; equipment maintenance costs could offset some savings.
- A state run program is susceptible to funding issues.
- The State does not have the same ability to fire, hire.
- The State may allow flexibility of employees to conduct multiple tasks.
- Past experience has resulted in motorist inconvenience and increased wait times.

- There would be a motorist expectation that availability and throughput would improve or at least not deteriorate.
- This option is very undesirable to the PIFs
- The Union would have concern about member benefits, CBA details.

STATE IMPACTS

- Union relationships are a concern to the State.
- Handling Transition impacts would be a factor associated with this option.
- There would be concerns with funding and maintaining a workforce sufficient to handle inspection volume.

SAFETY IMPROVEMENT FACTOR

- There is no relative advantage associated with this option.
- This option is subject to final program design elements.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-1 and I-3.

PROGRAM MANAGEMENT/OPERATIONS
CONTRACTOR OVERSIGHT OF PIFS

MEASURE IDENTIFICATION CODE: I-3

DESCRIPTION

Change oversight of PIFs from State to contractor.

This option is discussed in detail in Section 5.2 of this report.

PROOF/DEMONSTRATION OF ALTERNATIVE

- State oversight examples include New Jersey, Colorado, California, Maine, and Connecticut.
- Contractor oversight examples include Georgia, Pennsylvania, and Maine.

AIR QUALITY IMPACT

- There are no air quality impacts associated with option.

OVERALL OPERATING COST – Depends on all aspects of complete program

- See Section 5.2 for a complete analysis of this option.
- Total estimated cost of PIF audits in NJ in 2004 was $4,403,856.
- Georgia utilizes a contractor to conduct the PIF audits. The total annual estimated cost of PIF audits in Georgia is approximately $350,000.
- The total potential savings to NJ by utilizing a contractor to conduct audits of the PIFs could be approximately $4,050,000 when compared to the similar, but contractor-run audit program in Georgia.

EMISSION COST/BENEFIT QUOTIENT

- Not applicable.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Not applicable.

EASE OF IMPLEMENTATION

- Ease of implementation is subject to other program changes.
- If state oversight is discontinued, some upfront burden would be associated with RFP and contract development.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Costs and cost effectiveness of a contractor run audit program are of concern.
- State does not have the ability to hold manufacturers/vendors accountable.
- Relationship between PIF and State has been difficult to improve.

STATE IMPACTS

- This option presents minimal changes from the existing design.
- There would be difficulty controlling equipment manufacturers.
- A contractor can hold equipment manufacturers accountable for equipment reliability.
- In a contractor run model:
  - Contractor would have to ensure that the equipment meets the requirements of the State,
  - State only manages contractor instead of each PIF, with substantially more leverage,
  - Possible delays if stakeholders resist new contractual obligations, and
  - State may have to mediate disagreements between contractor and PIFs.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- The alternative of contractor managed program could be evaluated using Pennsylvania, New York, and Maine as good examples.
- Closely related to I5 (Sole Source Provider for PIF Equipment).

PROGRAM MANAGEMENT/OPERATIONS
VID OPERATION

MEASURE IDENTIFICATION CODE: I-4

DESCRIPTION

Under this option, the VID would be separated from the overall program management contract and either offered for public bid developed, operated, and maintained by a contractor or developed, implemented, and operated directly by the State. The VID is currently operated and maintained by the centralized lane (CIF) contractor.

A detailed analysis of VID operation has been provided in the OIT VID Assessment document.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Nevada, Texas, California, and Virginia separate out the VID (contractor run).
- Delaware, the District of Columbia, and Oregon run their own VID (centralized).

AIR QUALITY IMPACT

- There is no impact associated with this option.

OVERALL OPERATING COST – Using $1 per test, 2007 VID costs are estimated to be $2,400,000 for a PIF-only program, $3,000,000 in a Hybrid program, and $3,300,000 in a CIF-only program

- The current average VID cost per test is $0.89. California and Nevada are the most recent awards, and average $1.09 per test. Existing costs in other States are provided as a reference point only, and actual costs associated with the future New Jersey I/M program are discussed in the OIT VID Assessment document.
- Impact on State if operate (need to develop VID and infrastructure).
- Data handling costs are likely to be lower than current system.
- California, Nevada, Virginia program costs to be analyzed.
- Revenue neutral based upon transaction fees from users.

EMISSION COST/BENEFIT QUOTIENT

- Minimal or not applicable due to the air quality impact.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Not much of a difference from present program design in which VID is sub-contracted instead of being operated by a prime contractor that reports directly to the State. Practicality of State run VID is being evaluated based upon necessary resources, personnel and infrastructure.

EASE OF IMPLEMENTATION

- Option implementation will require development, testing, and running concurrently.
- Transition time would be 1 year minimum.

- Due to these factors, the contract would have to be bid, evaluated, and awarded by August 2006.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- PIFs would be concerned about cost, availability, uptime, and reliability.
- The option creates an opportunity to use better technology to communicate.
- Most stakeholders (users) only care about VID availability, reliability, and accuracy.
- Major issues could arise if motorist or inspection industry inconvenience develops.

STATE IMPACTS

- If State operated, the cost to develop infrastructure, database, and maintenance would be factors.
- There is a cost to develop reporting and auditing function.
- The State would own the VID source code.
- If contractor operated, there is the burden to manage more contracts.
- The State could become arbitrator if any conflict arises between operation and VID contractor.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to XI-1, XI-8, and XI-9.

PROGRAM MANAGEMENT/OPERATIONS
SOLE PROVIDER FOR PIF EQUIPMENT

MEASURE IDENTIFICATION CODE: I-5

DESCRIPTION

Under this option, the State would select a single vendor of emissions measurement equipment through a competitive procurement process to supply emissions analyzers and OBD II units located at PIFs. There are currently five equipment suppliers that provide equipment to the PIF network.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Alaska, Massachusetts, New York, Nevada, Rhode Island, and Connecticut have a contractor who selects one or two exclusive vendors of emissions measurement equipment.
- The Nevada vendor directly reports to the DMV.
- The contractor provides management and equipment in Connecticut and New York.

AIR QUALITY IMPACT

- There should be no emissions impact associated with implementation of this option.

OVERALL OPERATING COST – $4,400-$6,800/yr per unit for OBD/TSI. $1,400-$2,200/yr per unit for OBD-only. Reduction in equipment costs – see quotes below.

- Based on average vendor costs for OBD-only and OBD/TSI equipment with “deep” discounts suggested by equipment vendors at a Stakeholder meeting, the annual cost per lane would vary from $4,400-$6,800/yr for OBD/TSI lanes, and $1,400-$2,200/yr for OBD-only. These estimates assume monthly payments over a 5-year period and include operating and maintenance costs.
- By having better control of the life cycle costs of the equipment, there may be cost benefits to the PIFs.
- Use of a single equipment supplier could reduce audit costs since personnel who conduct audits would be able to make a quicker and more thorough assessment of test equipment at each PIF. This would reduce the audit time, thereby reducing the cost of the audit.
- Parts, maintenance, and equipment upgrades are uniform and greatly simplified with better economies of scale. Software update costs would be further reduced due to Acceptance Test Protocols (ATP) only being performed on one type of software/equipment platform.
- There would be cost reductions associated with training MVC audit staff on only one type of equipment.
- The total estimated cost of PIF audits in NJ in 2004 was $4,403,856 (NJ DOT 10/04/05). Assuming simplification of the audit process leads to a 20% reduction in audit costs, the State would save approximately $881,000 per year.
- Under a contractor-managed PIF program model, the State may have the option of minimizing the equipment purchase and/or maintenance expense to PIFs by an appropriate increase in the transaction fee that PIFs would be assessed by the contractor.
- Based on a quote from ESP, the price for a certified NJ ASM with OBD II (complete BAR97 analyzer including OBD and gas cap test) would be $35,500 plus tax. ESP also

has refurbished systems set up the same as new with a one year warranty for $20,000 plus tax. Service contracts are in the range of $3,200 per year. If the air, 220VAC electrical and pit requirements are met, the installation cost would be $500 per unit. If it is above ground, the installation cost would be $800 per unit (extra $300 for the ramps). These are unit costs; volume discounts would decrease the overall cost.
- For an OBD II stand alone system plus gas cap, the cost ranges from $4,500 (Waekon quote based on the PA model) to $6,000 (SPX quote) without an annual maintenance cost. These are unit costs and would likely decrease for a volume purchase.
- Based on information provided by Testcom, an approximate total package price cost for NJ would not likely exceed $2,000 per station (even with volumes under 1,000). However, other variations based on NJ MVIS specification could affect the package price. In New York, each station pays a total package price of $1,700 for the OBD II system and a couple of years of maintenance by an IBM partner with a national service force (based on a 10,000 unit discount and New York program specifications). The discounted price to New York is approximately 15%. Other than the included warranty, annual warranty expense is about $350, although Testcom's presentation stated that there was no warranty cost for seven years. New York's package does not currently include a gas cap tester.

EMISSION COST/BENEFIT QUOTIENT

- Reducing costs will improve cost effectiveness for the State and for PIFs. The State is likely to save through simplification of the audit process and the PIFs will benefit from discounts applied to equipment purchases and maintenance.
- Emissions reductions will not change.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Use of a single equipment vendor would improve consistency of test results between test lanes.
- A single equipment vendor would simplify communication between the PIF and the VID, thereby reducing data communication errors that exist with the present multi-vendor system.
- This option improves the effectiveness and feasibility of universal software since testing equipment would only have to be compatible with one data system, and the data system would not be required to communicate with many types of equipment.

EASE OF IMPLEMENTATION

- Implementation of this option requires the State to develop a RFP and bid process.
- The audit and enforcement processes would be simplified immediately upon implementation of this option.
- Certification of emissions testing equipment and anti-tampering provisions is greatly simplified.
- The burden of implementation may be placed more fully with the vendor than with State.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- The current business model will not work.

- Private inspection industry stakeholders have expressed concerns that a single contractor or equipment vendor may be in a position to exert undue influence contrary to the interests of a small business person.
- Programs such as Massachusetts and Rhode Island have elected to certify two equipment vendors to maintain an on-going competitive basis. The choice between two competing platforms may remain important to PIFs as service and performance issues emerge after equipment is purchased.
- The PIFs have concerns over limited options and choice, although the State could exert much more control over a single vendor to enforce compliance with equipment/software upgrades and warranty/service provisions.
- The EMs would likely oppose this option.

STATE IMPACTS

- Implementation of this option greatly simplifies equipment audits, training, and operational procedures.
- Use of a single vendor may provide an increased measure of vendor accountability.
- Use of a single vendor may provide a basis for more uniform performance metrics.
- This option requires a decision from NJ DEP.

SAFETY IMPROVEMENT FACTOR

- There are no safety related impacts associated with this option.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- This option is closely related to Options I-3 and I-6.
- Variations of this option include use of the same provider for CIF and PIF, contractor managed model, who performs audits, and certifications.

MEASURE IDENTIFICATION CODE: I-6

DESCRIPTION

California has considered requiring all certified equipment vendors of emissions analyzers to install so-called universal software on all BAR97 analyzers. Under this option, the State would have non-exclusive rights to the source code for inspection applications that are interchangeable across all platforms certified for use in the MVIS. Such software would be provided by equipment vendors or third party software developers to comply strictly with specifications accepted for use with NJ MVIS.

PROOF/DEMONSTRATION OF ALTERNATIVE

- California has tried unsuccessfully for 7 years to develop a universal software program. No other state is trying. States and equipment manufacturers consider this an unfeasible option.

AIR QUALITY IMPACT

- This air quality impact on converting to universal software is not quantifiable.

OVERALL OPERATING COST – Assuming $50,000 for development, $25 per copy of the software.

- The cost per copy would be minimized by larger economies of scale than those typically available to any one of the five suppliers of equipment and software to the NJ MVIS. For example, $50,000 development cost at 2,000 licensed copies yields a cost per copy of only $25 per copy.
- Similar to the example above the process of providing updates to universal software could avoid much of the time consuming and costly logistics of independent software development by several different firms each of which must later be validated and corrections often applied prior to final acceptance.
- Initial development costs to the State may be mitigated by licensing fees charged back to emission equipment manufacturers although such costs must ultimately be passed along, either directly or indirectly, to purchasers of equipment.

EMISSION COST/BENEFIT QUOTIENT

- Not applicable.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- There are severe technical impediments where multiple platforms and diverse hardware interfaces are concerned.
- It is not very practical with the present program design of proprietary software and hardware interfaces.
- Practicality improves if new program design unites the benefits of universal software with only one or two different brands of equipment being used throughout the program.

EASE OF IMPLEMENTATION

- Implementation of this option would be extremely difficult in its present program context for both technical and ownership standpoints due to the expressed resistance of emission equipment manufacturers to make their proprietary code known to any other party. Even if a third party were to develop a universal application, proprietary elements of any emissions platform for which the software is to be applied must be made available.
- The impediments involved with gaining access to the proprietary elements of several platforms can be largely overcome if the use of a universal software package were specified in a new RFP, especially if a multiplicity of platforms and technologies could be thus avoided.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Manufacturers would strongly resist this option under present program scenario.
- Universal software would likely be challenged by EM's and equipment vendors.
- If this requirement is integral with specifications for a new program, the origins and universality of the software package should be transparent to most stakeholders.
- Ease of service and support should improve as the difference between platforms is minimized since technicians and support personnel need only be familiar with a single version of software.
- PIFs may be concerned if purchase price of new equipment reflects too large an increment of software cost, although in theory such costs should be minimized by favorable economies of scale as mentioned above.

STATE IMPACTS

- Software vendor qualifications, performance standards, bonding, and penalties are critical since potential bugs and required support effect every participant in the program.
- The burden of technical development for the State is primarily during the design/specification phase.
- Ongoing program management, certification, updates and modifications would be greatly simplified.

SAFETY IMPROVEMENT FACTOR

- Non-quantifiable except as existing problems may be solved with new software design/specifications.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Closely related to I-3 and I-5.

PROGRAM OVERSIGHT
ENHANCED PROGRAM EVALUATION

MEASURE IDENTIFICATION CODE: II-1

DESCRIPTION

The Clean Air Act and EPA I/M rules require biennial program effectiveness evaluations. The basic purpose of such program evaluation is to confirm that the difference between baseline (no I/M program) emissions and emission reductions attributable to the current program are equal in magnitude to those reductions claimed in the State Implementation Plan.

Program evaluation elements recognized by EPA generally include: 1) analysis of program data, 2) modeling, 3) remote sensing, and 4) road-side pullovers. EPA Guidance on the use of these elements to conduct program evaluations is available but limited in scope and detail. The local EPA Regional office may provide approval for variations in program evaluation design.

The current program evaluation process has been complicated by logistical and management issues. In addition, when OBD II testing is fully implemented, there will be limited data available on the tailpipe emissions of vehicles in the State. This option would involve developing and implementing a semi-automatic process for ongoing program evaluation (i.e., software and data analysis models). One such approach would be program evaluation-related remote sensing and/or tailpipe testing of a random sample of all vehicles undergoing their official emissions inspections.

Any substantial changes contemplated in the future for the NJ MVIS are likely to influence program evaluation design. It may therefore be desirable to incorporate specific evaluation method and technology requirements in any RFP prepared for a new program.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Program evaluation elements recognized by EPA generally include 1) analysis of program data, 2) modeling, 3) Remote Sensing, and 4) road-side pullovers. EPA Guidance on the use of these elements to conduct program evaluations is available but limited in scope and detail. The local EPA Regional office may provide approval for variations in program evaluation design.
- Pennsylvania, Georgia, and Virginia follow EPA guidance and use remote sensing to demonstrate program effectiveness.
- California uses road side pullovers and audits to evaluate their Smog Check program.

AIR QUALITY IMPACT

- The air quality impact of enhanced program evaluation has not been quantified, but would have a positive impact on air quality.

OVERALL OPERATING COST - $75,000 - $150,000

- Slight increase - Typically costs range from $75,000 to $150,000 (ESP) for a representative sample size of valid remote sensing records. The actual cost depends upon the size of the program and the number of vehicles sampled per EPA guidance.

EMISSION COST/BENEFIT QUOTIENT

- Unquantifiable - increased cost is offset by increased emissions reductions. Since the emissions reductions have not been quantified, the cost/benefit quotient is unquantifiable.
- The cost/benefit quotient could be quantified if a pilot RSD network is used to determine the emission reduction coefficients.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Not applicable.

EASE OF IMPLEMENTATION

- This option would make use of existing data to a great extent.
- The program could easily build on current roadside checks.
- Other options that include installation of remote sensing devices could assist in the development of this option.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- There has not been a consistent approach developed or proposed by EPA.
- The PIFs are concerned that additional data requirements will ultimately cost them money.

STATE IMPACTS

- The state would need to design a program and then obtain EPA approval.
- There are costs to develop ongoing program evaluation.

SAFETY IMPROVEMENT FACTOR

- Safety would likely be improved due to the reduction in inspection fraud that accompanies enhanced program evaluation.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- This option is related largely to RFP development.

PROGRAM OVERSIGHT
PROGRAM AUDIT

MEASURE IDENTIFICATION CODE: II-2

DESCRIPTION

Depending upon the extent to which existing equipment, technology and procedures are to remain in place after program changes in 2007, a thorough evaluation of the operational condition, reliability and general adequacy of these components would become the basis to determine needs for additional maintenance or modifications consistent with new program design objectives. Key audit elements should include:

- a detailed review and identification of all applicable Federal and State statutory and regulatory requirements, including all relevant provisions of 40 CFR Part 51;
- a pre-audit request for and review of all relevant I/M program documentation and test results;
- an on-site audit visit that includes individual audit sessions with staff from the State agency or contractor responsible for the I/M program;
- observation of overt and covert audits, inspector license testing, and I/M office referee actions;
- motorist compliance evaluations involving analysis of parking lot survey results, I/M test data and state vehicle registration records;
- comprehensive audit of all PIF test systems performance relative to more recent BAR97 certification procedures for hardware and software performance;
- comprehensive audit of CIF test system performance to document the compliance status of the equipment relative to original NJ equipment specifications; and
- completion of a lengthy audit report containing an evaluation of the programs' performance relative to each Federal and State requirement, explicit identification of all audit deficiencies, a qualitative assessment of the impact of each deficiency on I/M program effectiveness, and detailed recommendations for addressing the deficiencies and improving the effectiveness of the program. An audit including these elements could be performed to give the State a thorough understanding of the program's strengths and weaknesses, and areas of possible or needed improvement.

Options II-3, II-4, and VI-5 are incorporated with this option.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Connecticut and Alaska conduct annual program audits.
- California BAR conducts routine program audits.
- The Georgia and Pennsylvania programs and system audits are conducted by the management contractor.

AIR QUALITY IMPACT

- A slight improvement is expected if problems are identified and corrected.

OVERALL OPERATING COST - $40,000 - $50,000 per equipment manufacturer

- The cost to perform a one-time BAR97 compliance test is $40,000 to $50,000 per equipment manufacturer. This cost is based on the amounts typically charged by Sierra and ERG.
- There are additional costs of approximately $70,000 per year for program audits.

EMISSION COST/BENEFIT QUOTIENT

- There would be a positive impact on air quality to the extent that program defects are identified, but since the purpose of an audit is to discover deficiencies that are not yet known the benefit cannot be quantified prior to performing the audit.
- This option may not be cost effective or required if new equipment is procured.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Not applicable.

EASE OF IMPLEMENTATION

- Some program audits are currently in place at the CIFS and PIFs. Additional audits could make use of existing data.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Manufacturers may object to additional auditing methods especially if modifications to equipment are necessary to satisfy additional requirements.
- If existing equipment is not compatible with new auditing procedures the equipment may be obsolete or have negligible salvage value.
- PIFs are likely to object to additional audits, especially if cost and/or equipment availability is impacted.

STATE IMPACTS

- There would be an increased program cost to the State to conduct the audit.

SAFETY IMPROVEMENT FACTOR

- Additional audits would reduce fraud and increase effectiveness.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Incorporates Options II-3, II-4, VI-4, and VI-5.

PROGRAM OVERSIGHT
CIF EQUIPMENT AUDIT

MEASURE IDENTIFICATION CODE: II-3

DESCRIPTION

This option has been incorporated into Option II-2 (Program Audits). Therefore, only a description has been provided for technical review. Additional information regarding option analysis can be found in the summary for Option II-2.

In order to achieve on-time startup of the New Jersey enhanced I/M program in December 1999, the State allowed the contractor to defer compliance with a number of CIF test system acceptance testing criteria. Efforts to improve CIF test lane performance after the rocky startup in December 1999 focused primarily on improving the ease of use of the lane software and increasing vehicle throughput. These efforts were successful in reducing vehicle wait times and improving CIF test lane performance to a level acceptable to the public. However, certain test system performance issues related to the accuracy and proper performance of emissions testing may have never been fully tested and verified to meet the State's requirements and specifications. The acceptance testing procedures needed to fully test the equipment are more comprehensive than the audit procedures currently being performed by the State.

If there is a transition to a new contractor or State-run program, this option would involve a comprehensive audit of CIF test system performance to document the current status of the equipment and aid the State in getting the current CIF contractor to address any identified deficiencies. State staff could work closely with an audit contractor and the CIF personnel so that they would be capable of performing similar periodic audits in the future.

PROGRAM OVERSIGHT
PIF EQUIPMENT AUDIT

MEASURE IDENTIFICATION CODE: II-4

DESCRIPTION

This option has been incorporated into Option II-2 (Program Audits). Therefore, only a description has been provided for technical review. Additional information regarding option analysis can be found in the summary for Option II-2.

Comprehensive audit of all PIF test systems performance would be performed to document the current status of each test system and to aid the State in getting the vendors to address any identified deficiencies. There have been several changes/updates by the California Bureau of Automotive Repair (BAR) to the BAR97 hardware certifications. It is unclear to what extent the PIF vendors have upgraded their test systems in compliance with current BAR97 requirements. In addition, changes to the software associated with the updates may have also created unknown system performance or accuracy programs; therefore, the hardware functionality evaluated in the initial acceptance testing should be rechecked.

VEHICLE COVERAGE
INCREASED MODEL YEAR EXEMPTIONS

MEASURE IDENTIFICATION CODE: III-1

DESCRIPTION

This option would increase the existing new car model year exemptions in New Jersey for greater than the existing four years. Provisions for rolling exemptions of vehicles 25 years and older could also be applied under this option for other than historic, collector or low-mileage vehicles exempted under current program guidelines. This option would add up to two additional years to the current new vehicle exemption of the first four model years.

PROOF/DEMONSTRATION OF ALTERNATIVE

- California - Estimated loss in emissions benefits of approximately 4 tons per day of HC and NO_X and revenue loss to the private inspection network of about $11 million annually (CA Inspection and Maintenance Review Committee - Review of the Smog Check Program 2004).
- Delaware – Exempt vehicles from inspections for the first 5 years.

AIR QUALITY IMPACT

- There is a total loss of emissions benefits of 34.5 tons per day for exempting the 6 newest model years instead of the 4 newest model years. MOBILE6 model run results indicate that exempting the 6 newest model years instead of the 4 newest model years will increase HC emissions by 1.59%, NO_X emissions by 1.12%, and CO emissions by 2.34% (1.18 additional tons/day of HC, 2.12 additional tons/day of NO_X, 31.2 additional tons/day CO).
- There is a total loss of emissions benefits of 17.2 tons per day for exempting the 5 newest model years instead of the 4 newest model years. Assuming that increasing new car model year exemptions from 4 years to 5 years would cause half the increase attributed to the increase of new car model year exemptions to 6 years, HC emissions would increase by 0.80 %, NO_X emissions would increase by 0.56%,, and CO emissions by 1.17% (0.59 additional tons/day of HC, 1.06 additional tons/day of NO_X, 15.6 additional tons/day CO).

OVERALL OPERATING COST – Based on projected impact on the current hybrid program, there would be a total cost reduction of $9,050,000 annually for a five year exemption, and $16,827,000 annually for a six year exemption. Using a 3% per year escalation factor and assuming a hybrid program, projected cost reduction in 2007 would be $9,600,000 for a five year exemption and 17,850,000 for a six year exemption.

- Based on information from NJ DOT, New Jersey's vehicle population grew from 5,466,520 vehicles in 9/02 to 5,556,618 vehicles in 9/05. The average total number of vehicles during this time period was approximately 5,507,900 vehicles (based on NJ DOT spreadsheet, "Vehicle Population Sheet 9-02 to 9-05.xls").
- By keeping the exemption for new car model years at the current level of 4 years, the number of vehicles requiring inspections is 3,409,158 vehicles. The percentage of vehicles exempted is approximately 38% (Based on NJ DOT spreadsheet: "Vehicle Population Sheet 9-02 to 9-05.xls").

- If the exemption is extended to 5 years, the number of vehicles requiring inspections drops to 3,003,520 vehicles. The percentage of vehicles that would be exempted increased to approximately 45%. This level of exemption would result in a decrease of inspections in relation to the current demand by approximately 12%, or 405,638 vehicles compared to current inspection volume. Taking biennial inspections into account this equals to 202,819 fewer vehicles per year requiring inspections. Currently the CIFs inspect 77% of the vehicles and the PIFs inspect 23%, therefore the CIFs would lose 156,171 vehicle inspections and the PIFs would lose 46,648 vehicle inspections annually. Since there is approximately one CIF reinspection for every three initial CIF inspections, the actual reduction in CIF inspections would be approximately 207,700. At a CIF inspection cost to the State of $27.89 (based on the amount billed to NJ by Parsons for each inspection), the State would save $5,793,000 annually. The PIFs only charge for initial inspections. At an average PIF inspection cost of $69.83, the PIFs would lose $3,257,000 annually (minus $1.47 per inspection paid to MCI for VID). The reduction in the number of inspections at the CIFs and PIFs results in an overall program cost reduction and a savings for the State and motorists.
- If the exemption is extended to 6 years, the number of vehicles requiring inspections drops to 2,654,950, or 52% of the total. This level of exemption would result in a decrease of inspections by 22%, or 754,208 vehicles compared to current inspection volume. Taking biennial inspections into account, 377,104 fewer vehicles per year would be required to be inspected. Currently the CIFs inspect 77% of the vehicles and the PIFs inspect 23%. Therefore, the CIFs would lose 290,370 inspections and the PIFs would lose 86,734 inspections annually. Since there is approximately one CIF reinspection for every three initial CIF inspections, the actual reduction in CIF inspections would be approximately 386,200. At a CIF inspection cost to the State of $27.89 (based on the amount billed to NJ by Parsons for each inspection), the State would save $10,770,000 annually. The PIFs only charge for initial inspections. At an average PIF inspection cost of $69.83, the PIFs would lose $6,057,000 in annual revenue (minus $1.47 per inspection paid to MCI for VID). The reduction in the number of inspections at the CIFs and PIFs results in an overall program cost reduction and a savings for the State and motorists.

EMISSION COST/BENEFIT QUOTIENT

- The 5 model year exemption results in annual savings of approximately $5,793,000 to the State (lost revenue to the CIF contractor), but an increase in emissions of approximately 17 tons per day.
- The 6 model year exemption results in annual savings of approximately $10,770,000 to the State (lost revenue to the CIF contractor), but an increase in emissions of approximately 34 tons per day.
- Lost revenue to the PIFs for a 5 year exemption would be $3,257,000/yr, and $6,057,000/yr for a 6 year exemption. The lost PIF revenue also represents a savings to motorists.
- The overall reduction in program costs (CIF + PIF) would be approximately $9,050,000 annually for a five year exemption, and $16,827,000 annually for a 6 year exemption. The lost PIF revenue also represents a savings to motorists.
- Using a 3% per year escalation factor and assuming a hybrid program, projected cost reduction in 2007 would be $9,600,000 for a five year exemption and $17,850,000 for a six year exemption.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- This measure has been adopted in California and Delaware. Examples from programs such as California and Delaware indicate that exemptions can be effectively applied.
- When more convenient and less costly testing for the newer fleet is available, such as with automated OBD inspection, the loss of 17 to 34 tons per day of emissions becomes hard to justify on the basis of cost or convenience.

EASE OF IMPLEMENTATION

- A potential rule change may be required.
- Since the I/M program already exempts some vehicles, implementation issues should be minimal.
- Some public and stakeholder processes may complicate the process, especially as legislative initiatives are likely to be required.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- The repair community is generally critical if vehicles are exempted from inspections throughout their entire factory warranty period, since motorists may not discover defects until warranty expires.
- May be misconceptions by some factions that while emissions dis-benefit is minimal, sufficient vehicle wear occurs within 5 or 6 model years to make safety inspection advisable. PIFs and AAA may therefore be interested in opposing further model year exclusions.
- Inspection industry is critical of removing any proportion of vehicles from the testable pool due to perceived inequities in the proportion of vehicles subject to CIF testing.
- Economic justice issues have arisen in other jurisdictions like California, with concern that exemption privileges are only available to economically advantaged motorists.
- There is a negative economic impact on the PIFs and ERFs, but a positive economic benefit to motorists.
- Motorists may be concerned that they are paying fees with no tests. However, they may be pleased they do not have to take their car in for testing.

STATE IMPACTS

- These would be a measurable loss of SIP emissions benefits.
- Some economic justice issues may arise based on perception that the economically disadvantaged do not have equal access to the privileges of exemption.
- Other means of bringing high mileage vehicles back into the program may be desirable since it is well understood that the higher mileage fraction of exempted vehicles represent the majority of potential losses in emissions and safety benefit.

SAFETY IMPROVEMENT FACTOR

- If safety inspections are bifurcated from emissions, separate criteria for determining safety exemption could be developed

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Closely related to V-8, V-9, V-10, V-11 V-12, V-18, X-12, XI-1, XI-2, XI-4, VII-12, VII-16, and VII-20.

VEHICLE COVERAGE
LOW EMISSIONS WEIGHTING/EXEMPTION

MEASURE IDENTIFICATION CODE: III-2

DESCRIPTION

Some states use low emissions profiling (LEP) or low emissions weighting (LEW) of the inspection record database to identify and exempt expected clean vehicles from inspection. Weighting methodologies take into account such factors as vehicle age, the failure rates of a particular type (make, model, etc.) of vehicle, and even the maintenance history of vehicles if such database inputs were available. This option can either augment clean screen records from remote sensing or be applied independent of direct emission measurements to exempt expected clean vehicles from inspection.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Missouri residents volunteer for their Rapid Screen program and agree to a fee of $24.
- Massachusetts was using LEP, but stopped a few years ago. The State had several political changes and with the transition to OBD they decided to use model exemptions instead. Massachusetts exempts the first two model years from testing.

AIR QUALITY IMPACT

- There is a potential increase in emissions due to clean screening vehicles that would fail an actual inspection. Clean screening or exempting 10% of vehicles from inspection is estimated to increase HC by 0.6% (0.4 tons/day), NO_X by 0.3% (0.5 tons/day), and CO by 0.6% (8.0 tons/day). This would result in a total annual emissions impact (increase) of 146 tons per year of HC, 183 tons per year of NO_X, and 2,920 tons of CO.
- Some vehicles with Malfunction Indicator Lights (MILs) on will get exempted.

OVERALL OPERATING COST – Program savings of $8,980,000 due to reduced inspections would be slightly offset by initial program costs of around $100,000 and maintenance of around $20,000 annually.

- Based on 2007 projected fleet information and assuming a hybrid I/M program similar to the existing program, the total number of initial annual inspections of approximately 1,875,390 CIFs plus 476,170 PIFs, a 10% reduction would reduce the total number of annual inspections by 187,539 at the CIFs plus 47,617 at the PIFs. At a projected CIF inspection cost to the State of $29.42, the State would save $5,517,000 annually. At a projected PIF inspection cost of $72.73, the PIFs would lose $3,463,000.
- Based on information obtained from the California program, it is estimated that the High Emitter Profile/Low Emitter Profile (HEP/LEP) software package would cost about $100,000.
- Maintenance cost for the software runs about 20% of the initial software license fee annually and is required to update the model for new vehicles joining the fleet.
- The cost of using Remote Sensing Device (RSD) technology (with the HEP) in Missouri is covered by motorists who opt in the program and agree to a $24 fee, so there is no cost to the State.
- If the State implements Clean Screen based on RSD and the HEP model, then it is likely that the overall I/M program costs will decrease. This is based on estimated CIF savings

of $5,517,000 annually + motorist savings of $3,463,000 resulting from decreased PIF inspections = $8,980,000. The cost of implementing and running the RSD and HEP program would likely be less than $8,980,000 based on information from other State programs.

EMISSION COST/BENEFIT QUOTIENT

- For HEP-only Clean Screen, the potential cost savings to the State of $5,517,000 per year and savings of $3,463,000 by motorists would be offset by an increase in emissions of 329 tons per year (146 tons per year for HC and 183 tons per year for NO_X).
- Net emissions loss can be mitigated by roadside testing off-cycle inspections, high mileage inspections, and other measures to identify dirty vehicles.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- This option would have diminished returns if the model year exemption is increased since the majority of vehicles that would be exempted by clean screening are the newer models.
- The cost reduction to the State may be offset by a significant increase in emissions.

EASE OF IMPLEMENTATION

- This issue can be hard to explain to motorists, especially without the RSD component.
- There are reasonably complex network requirements to compile, report, and effect low emissions exemption from the fleet.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- There may be some big brother sentiment from motorists.
- The inspection industry tends to resent loss of testable fleet.
- Safety could be compromised, according to PIFs and AAA.

STATE IMPACTS

- This option diminishes the size of the fleet subject to testing at inspection facilities.
- May increase the need for verification of appropriate passes.

SAFETY IMPROVEMENT FACTOR

- Since vehicles are being screened for emissions only, potential net loss of safety benefits may result unless safety testing is bifurcated and vehicles are recruited for safety inspection using different criteria than clean screening.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Closely related to V-11, V-12, V-18, and X-4.

VEHICLE COVERAGE
MOTORCYCLE INSPECTIONS

MEASURE IDENTIFICATION CODE: III-3

DESCRIPTION

Some states subject motorcycles to emissions inspections in addition to safety inspections. Subject to low annual mileage accumulation, motorcycles generally do not exhibit significant deterioration of emissions controls from lack of routine maintenance and component defects. However, motorcycles are subject to extraordinarily high rates of exhaust system tampering. Based on surveys by the Motorcycle Industry Council, 34% of on-road motorcycles have been retrofitted with aftermarket exhausts, virtually all of which eliminate the catalytic converter on catalyst-equipped motorcycles and all of which emit excessive noise levels. The high rates of tampering will become increasingly significant from an emissions control perspective as more motorcycles are factory-equipped with catalytic converters to meet more stringent emissions standards that have been adopted by California for model years 2004 and 2008. Some 2003 models equipped with 3-way catalysts were certified to meet the upcoming 2008 model year standards. This option considers adding motorcycles to the current biennial emissions and safety inspection program.

Note that motorcycles sold in California are equipped with emissions controls not found on motorcycles sold in New Jersey.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Arizona: The State inspects any motorcycles greater than 90 cc engine displacement using an idle test. The gas cap test is also completed as part of the emissions test. The emissions tests are conducted using the same analyzers as those used on LDGVs. The only program addition necessary to conduct the test is the software upgrades that contain the appropriate data concerning motorcycle emissions standards. EPA does not issue credits for conducting motorcycle emissions tests, but Arizona is currently obligated to continue the inspections since they were included as part of a SIP.
- California: This issue was thoroughly explored during a CARB rulemaking, with California electing to impose stringent manufacturing standards on motorcycles produced after 1978, but not requiring periodic emission inspections. Existing standards in place before 1999 regulated exhaust and evaporative emissions of hydrocarbons beginning with the 1978 model year. Hydrocarbon emissions standards ranged between 5.0 and 14.0 grams per km. Additional regulations in place in 1999 established a standard of 1.4 g/km HC + NO_X for model years beginning 2004. Additionally, beginning in model year 2008, the amended standard of 0.8 g/km HC + NO_X becomes effective. Manufacturers are allowed to meet the standards on a corporate average basis as long as no engine emits more than 2.5 g/km HC + NO_X. Regulations are slightly less stringent for small manufacturers of motorcycles.

AIR QUALITY IMPACT

- EPA does not issue emissions credits for motorcycle emissions inspections.
- Some emissions from motorcycles would be reduced if motorcycles were included as part of the emissions inspections program, but since the EPA does not issue emissions credits,

calculation methodologies have not been developed extensively. In order to approximate emissions reductions from motorcycle emissions testing, Arizona assumed the reduction for motorcycles to be the same as that from the same number of LDGVs for the purpose of determining the benefit.

- As a frame of reference for considering the total impact of motorcycle emissions, it should be noted that the entire population of motorcycles in NJ (138,000 motorcycles which was provided by NJ MVC on 10/24/05) equates to approximately 2% of the vehicle population of 5,556,618 vehicles noted by NJ DOT in 9/05. In fact, the number of vehicles representing growth of the 2004 NJ fleet is greater than the total motorcycle population for all previous model years.
- Other factors mitigating the total impact of this fraction of the NJ fleet are the seasonal use characteristics and the low total Vehicle Miles Traveled (VMT) per year, and higher mpg which yields a lower gram per mile emissions factor for total emissions. The average motorcycle in NJ travels 1,974 miles annually based on a random survey of 5,112 motorcycles (information provided by NJ MVC on 11/18/05). Assuming a 10,000 mile average VMT per year for a LDGV, a motorcycle travels about 1/5 of the miles that a typical vehicle would during a year.
- Since most motorcycles do not have traditional emissions control devices (e.g. catalytic converters), expected HC and CO reductions are small, based on the assumptions outlined previously.

OVERALL OPERATING COST – $0 annual cost for emissions inspections of motorcycles in addition to existing safety inspection. Unknown cost to make changes to the VID.

- There would be a cost associated with making changes to the VID to include standards for motorcycles. The only other State that has implemented motorcycle testing is Arizona and they were unable to quantify the cost associated with incorporating changes to their vehicle database.
- The on-going costs of conducting emissions tests on motorcycles should be minimal since the same emissions testing equipment can be used on motorcycles as is used on cars. It is not clear how well sticker enforcement would work or whether registration denial would be necessary.
- There is no additional CIF cost for emissions inspection since Parsons charges the same amount for each inspection regardless of its content. (DOT comments 12/06/05)
- There is no additional PIF cost for emissions inspection since the same fee is charged for any type of initial inspection. (DOT comments 12/06/05)

EMISSION COST/BENEFIT QUOTIENT

- The air quality benefit of implementation of motorcycle inspections is minimal based on the diminutive proportion to the fleet of both vehicles and VMT. No cost/benefit quotient could be quantified for this option based on available data.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Methods of reducing the emissions from motorcycles include enforcement concerning exhaust tampering or otherwise disabling any control device in place on the motorcycle from the factory. In theory, exhaust tampering and disabled control devices are easily identified, but in reality, enforcement is difficult because many motorcycles on the roads

today have already been modified extensively and the public would be adamant against enforcement.
- Some modification of the fuel-mix ratio can be performed easily by a technician or by the motorcycle owner to create a leaner fuel mix, which would reduce NO_X and HC, but these modifications are just as easy to reverse and any related enforcement would be difficult.

EASE OF IMPLEMENTATION
- Implementation of this option will require several program design considerations such as testing protocol development, inspector training and safety issues, etc.

STAKEHOLDER IMPACTS AND PERCEPTIONS
- The general impression is that there is a very small benefit for the amount of effort required to inspect and repair motorcycles.

STATE IMPACTS
- Implementation would likely result in some measurable improvement in air quality; however, EPA does not allow SIP credits.
- Instituting a system to recruit, identify, and repair this class of vehicles has extensive initial impact on planning and administrative resources.
- There is concern over a possible push-back from special interests related to this option.
- Implementation of this option would require development of new test procedures, standards, and emissions cut-points.

SAFETY IMPROVEMENT FACTOR
- Any safety related improvements would be subject to the program design.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO
- Not applicable.

VEHICLE COVERAGE
FOUR WHEEL DRIVE VEHICLE INSPECTIONS

MEASURE IDENTIFICATION CODE: III-4

DESCRIPTION

Under this option, New Jersey would increase the number of 4WD dynamometers to one unit per CIF. The current test equipment required to conduct an ASM inspection cannot be used for an emissions test of 4WD vehicles. Throughout the rest of the network, 4WD vehicles are getting a 2500 RPM test in lieu of an ASM test and therefore have no direct measurement of potential excess NO_X emissions. This option would add 29 4WD dynamometers. The increasing fleet penetration of two-wheel drive vehicles with advanced traction control technologies may cause much larger proportions of the fleet to be dependent upon 4WD dynamometer testing if they are to receive an ASM test that does not damage vehicle components.

PROOF/DEMONSTRATION OF ALTERNATIVE

- The Wisconsin centralized program has one 4WD dynamometer at each of its CIFs.
- Missouri features a 4WD/AWD dynamometer in each of the ten facilities within its centralized enhanced program.

AIR QUALITY IMPACT

- It is expected that there would be a minimal air quality impact by installing a 4WD dynamometer at each CIF. There would be no reduction in HC, a 0.03% reduction in NO_X, and a 0.02% reduction in CO (0.05 tons/day NO_X, and 0.26 tons/day CO). The total daily emissions reduction is 0.31 tons/day.
- The proportion of the vehicle fleet that is 4WD or AWD and is not OBD II compatible is decreasing. Vehicles produced before 1996 are not OBD II compatible, so emissions testing using a dynamometer is the best way to determine whether the engine controls are working properly; however, these vehicles must be tested on a 4WD/AWD dynamometer, which only exists at a few inspection facilities in NJ. Each year, some of these pre-1996 vehicles are removed from service while new vehicles are added to the fleet. As we go into the future, the pre-1996 vehicles that are 4WD or AWD will comprise a decreasing number and decreasing percentage of the total vehicle fleet. As a result of this decreasing fleet, the emissions associated with this part of the fleet will also decrease.
- The new MOVES model that will be the standard by 2007 does not distinguish between loaded-mode and non-loaded mode testing, so the calculated SIP credits for a 4WD dynamometer test will be zero. (Comment from NJ DEP 11/17/05)

OVERALL OPERATING COST - $400,000 per year

- The 4WD dynamometers have higher maintenance and investment than 2WD dynamometers due to the necessity of two dynamometer rollers instead of one with twice the number of parts wear such as bearings and couplings.
- There are 32 CIFs in New Jersey. Three of the CIFs already have 4WD dynamometers. Twenty-nine additional 4WD dynamometers need to be installed to implement this option. The cost of each 4WD dynamometer would be approximately $50,000 installed

(approximate cost provided by Mustang). The total cost of installing a 4WD dynamometer at all CIFs would be approximately $1,450,000 (installation costs based on Mustang dynamometer). Power and site preparation costs are estimated to be $500 per CIF, or $14,500. Amortizing this cost over a 5-year period yields an annual cost of approximately $293,000 per year. No quote for maintenance was given, but service contracts for BAR 97 ASM systems have been quoted at $3,200 per unit per year by ESP. Using the $3,200 estimate as a rough maximum cost of maintenance on the 4WD dynamometers, the annual cost would be $92,800 per year. The total cost of adding 29 4WD dynamometers is approximately $400,000 per year.

EMISSION COST/BENEFIT QUOTIENT

- Based on information obtained from NJ MVC, in August 2005 there were 87,933 ASM-eligible vehicles tested, of which only 3,819 (4.3%) required 4WD dynamometer testing.
- At an annual cost per year of $400,000 and an emission reduction of 18 tons per year the cost/benefit quotient is approximately $21,900 per ton of NO_X reduction and $4,200 per ton of CO reduction. (The reduction in HC is approximately zero.) The emission quotient will increase with time since the cost would remain the same as emission reduction potential decreased as older non-OBD II vehicles phased out.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- If OBD testing were used as the only alternative to 4WD/AWD ASM testing a quantifiable loss of benefits would accrue from at least the fraction of the vehicle fleet which is 4WD/AWD and not OBD capable.
- Loss of measurable benefits could be somewhat mitigated by the use of two-speed idle testing on pre-OBD 4WD/AWD vehicles.

EASE OF IMPLEMENTATION

- There would be a high investment cost and possible disruption of facilities during installation.
- Some public and technician education would be required to advise motorists and other stakeholder of the program change.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Owners of vehicles that have previously been exempt are likely to resist.
- PIFs may object since they’ll have to reject 4WD/AWD vehicles that need to be ASM tested.
- The inspection and repair industry are likely to be supportive.
- Motor vehicle manufacturers, such as Subaru, who have demonstrated resistance to their AWD vehicle being subject to ASM may offer continued resistance to AWD/4WD dynamometer testing primarily over drive train damage and warranty impact concerns.

STATE IMPACTS

- There would be some stakeholder push back as illustrated above.
- There would be quantifiable emission benefits for NO_X lost if idle testing were only option especially for the pre-OBD vehicle that are known to contribute the highest proportion of gross emissions.

- There is a possibility of increased liability for damage claims based upon various drive train issues which are common to this class of vehicles in general, but could be blamed by vehicle owners on the loaded mode test.

SAFETY IMPROVEMENT FACTOR

- Subject to other program design options such as a requirement to perform safety testing on AWD/4WD vehicles that may otherwise be exempt from emissions tests.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Not applicable.

VEHICLE COVERAGE
PROBLEM VEHICLE LIST

MEASURE IDENTIFICATION CODE: III-5

DESCRIPTION

1996 and newer vehicles of various makes and models that exhibit problems that prevent OBD II inspection may have a serious detrimental effect on inspection efficiency and data integrity. This option would improve the present system to list problem vehicles for use in OBD II emission inspections. Improvements may include faster turn-around time for new problem vehicles, better matching of registration data with problem vehicle database, and integration of problem vehicle database with Vehicle Reference Table (VRT).

Due to bad matching between scanned registration data and vehicle database listings, excessive manual entry by inspectors is contributing to loss of data integrity that takes extraordinary effort for the State to correct after-the-fact. This is related to the problem that exists due to the VRTs not having been updated past the 2002 model year. Over 75,000 model year 2003 or later vehicles were inspected this year by CIFs alone. The manual entry required for these vehicles is a major contributing factor to poor VID data integrity.

The problem vehicle list would also be used to identify special test procedures for vehicles that have problems but pass the I/M test. For example, 1996 Dodge trucks have bad catalysts and defective catalyst monitors for their OBD system. Therefore, they often pass the OBD II inspection because the catalyst monitor does not identify the worn-out catalyst. These vehicles receive tailpipe tests instead of OBD II inspections.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Most states have developed a system for listing problem vehicles in a timely manner. Vehicles that are reported by inspectors as either failing to communicate or with monitor readiness issues are integrated with the existing VRTs.

AIR QUALITY IMPACT

- The air quality impact of this option is unknown. MOBILE6 modeling is not precise enough to detect the improvement from this measure.

OVERALL OPERATING COST

- The operating cost of this option is minimal if the system uses data developed from existing test records and/or trigger reports.

EMISSION COST/BENEFIT QUOTIENT

- The air quality impact of developing this system for use by DEP and MVC is unknown; therefore, the cost/benefit quotient is unknown.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Implementation of this option would improve test efficiency through identification of problem vehicles.

- PIFs would have less discretion over bypassing OBD II inspection for a tailpipe test to improve consistency of test type throughout the program.
- Use of existing data makes this option easy to implement.

EASE OF IMPLEMENTATION

- States with problem vehicle lists have experienced improved test convenience through identification of problem vehicles.
- Some VRT and problem vehicle database improvements may be necessary to develop a useful problem vehicle list.
- VRTs and/or problem vehicle list must be revised to more accurately reflect scanned registration data so that manual entry of data is not necessary and rate of data errors is improved.
- Proper development, dissemination, and use of the problem vehicle list is the key to successful implementation of this option.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- There would be a positive perception by motorists since implementation could improve test convenience.
- Manufacturers would appreciate that OBD vehicles are not being bypassed to tailpipe testing.
- Inspectors would prefer knowing which vehicles should not be inspected and greatly appreciate better automation of data entry.

STATE IMPACTS

- Implementation of this option could reduce complaints from motorists concerning inspection problems experienced at CIFs or PIFs since fewer OBD vehicles would be bypassed and inspection time decreased with improved data entry.
- This option would result in improvement to inspection efficiency.

SAFETY IMPROVEMENT FACTOR

- There are no impacts on safety resulting from this option.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IX-4, IX-6, and IX-7.

VEHICLE COVERAGE
LIGHT-DUTY DIESEL VEHICLE INSPECTIONS

MEASURE IDENTIFICATION CODE: III-6

DESCRIPTION

For an older diesel vehicle fleet the only practical inspection measures available in a state program were opacity and possibly NO_X testing. With the advent of more sophisticated on-board emission control technologies, special maintenance issues have also emerged. Since the Light Duty Diesel (LDDV) fleet now features advanced emission controls like Exhaust Gas Recirculation to actively control NO_X and sophisticated Particle Traps to prevent emissions of fine particulate, 1997 model year and later LDDVs are required to be OBD II-compliant. This option would require OBD II tests to be conducted on LDDVs consistent with programs being successfully conducted in other states.

PROOF/DEMONSTRATION OF ALTERNATIVE

- LDDV inspections are currently performed in Connecticut, Vermont, Nevada and Oregon.
- Nevada currently includes dynamometer and opacity testing of 1998 or newer light-duty diesel powered vehicles under 10,000 lbs GVWR.
- The Massachusetts program is planning to include light-duty diesel testing.
- Tennessee's Memphis program includes OBD inspection of "all" 2002 and newer diesels.
- LDDV inspection is under consideration in TX.

AIR QUALITY IMPACT

- Based on a study in Texas, HC and PM emissions from LDDVs with OBD II systems are estimated to be reduced by 4%. NO_X emissions are estimated to be reduced by 0.6%. Using the g/mi benefit from the Texas study, the total annual benefit to NJ is estimated to be 3 tons/yr HC + NO_X.

OVERALL OPERATING COST - $0

- According to NJ MVC, the VID indicates that 12,920 diesel vehicles were given a safety inspection in 2004. We assume that this is approximately the same number of vehicles that would require an OBD II test in the future based on the four model year exemption. Assuming a 77/23 CIF/PIF split in tests, the CIFs would conduct an additional 9,948 emissions tests annually and the PIFs would conduct an additional 2,972 emissions tests annually. The increase in cost would be small and related only to the additional time and expense required to run the OBD II test. Based on the accounting structure of the current CIF and PIF inspections, there would be no costs passed on to the State or motorists. There would not be any additional costs associated with the VID, since LDDVs are already included in the VID.
- There is no additional CIF cost since Parsons charges the same amount for each inspection regardless of its content. (DOT comments 12/06/05)
- There is no additional PIF cost since the same fee is charged for any type of initial inspection. (DOT comments 12/06/05)

EMISSION COST/BENEFIT QUOTIENT

- The benefit of requiring 1997 and later ODBII-compliant vehicles to pass the OBD II test would be approximately 3 tons of HC + NO_X emissions per year. There are no costs to the State or motorists resulting from implementation of this option.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- OBD II analysis for determination of compliance is practical based on existing technology.
- New Jersey does not currently test any diesel vehicles for NO_X. New Jersey does have a heavy duty diesel vehicle inspection program which measures opacity.

EASE OF IMPLEMENTATION

- Implementation of this option is easy to add, no additional equipment is required by the inspection stations.
- Inspection protocols must be developed prior to implementation.
- Some motorist awareness and technician training is involved with this option.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- This option is well-perceived by motorists, especially those motorists that currently drive gasoline vehicles. The perception is that LDDVs are just as likely to pollute as LDGVs, and should not be exempt from vehicle testing.
- There is some potential for resistance from special interests.

STATE IMPACTS

- There are some emissions reductions of HC, NO_X, CO, and fine particulate.

SAFETY IMPROVEMENT FACTOR

- Since diesel powered vehicles tend to have higher VMT over their lifecycles, there may be a more dramatic safety benefit due to accelerated vehicle aging.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Not applicable.

VEHICLE COMPLIANCE
REGISTRATION DENIAL ENFORCEMENT

MEASURE IDENTIFICATION CODE: IV-1

DESCRIPTION

This measure involves switching from sticker enforcement systems to denial of vehicle registration.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Used in most states (DE, CA, NV, VA). CT is one of the latest states to drop stickers.

AIR QUALITY IMPACT

- Marginal to moderate based on improvements in enforcement and avoidance detection. Since present sticker based system exhibits measured effectiveness of 96%, care should be taken to ensure that enforcement mechanisms are sufficiently in place during transition to registration denial.

OVERALL OPERATING COST

- Should be revenue neutral based upon registration fees. Loss of sticker income could be offset by additional fees for license plate stickers.

EMISSION COST/BENEFIT QUOTIENT

- Dependent upon transition plan and availability of current registration data to State and local law enforcement.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Already a feature of several programs.
- May be difficult to transition from sticker enforcement until registration data-record becomes available to all state and local law enforcement. License plate stickers may be necessary to supplement data availability to law enforcement.

EASE OF IMPLEMENTATION

- Moderate to difficult depending outreach to motorists and data-base access by enforcement personnel.
- Necessitates very close control over the quality of data entered, particularly title and VIN.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Older vehicle owners may fear permanent loss of registration privileges.
- Some economic justice concerns (may be mitigated by integration of low-income repair assistance and vehicle scrappage programs).
- PIFs may resist losing control of sticker-based inspection results.

STATE IMPACTS

- Brings program into better compliance with Federal guidelines.

- Would virtually eliminate sticker fraud and permit inspection fraud to be assessed by trigger reports and audits only.
- Would require some serious procedural changes with the confusion and training burden that generally ensues.
- May involve a lengthy transition during which time inspection stickers continue to be used until either license plate stickers are issued and/or law enforcement has sufficient access to data.

SAFETY IMPROVEMENT FACTOR

- Could be dramatic improvement in inspections of older non-complying vehicles but only if enforcement mechanisms are at least equally effective.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Closely related to VI-2, VI-3, VI-4, VI-5, IX-4, IX-6, IX-7, XI-2, XI-4, XI-5, XI-7, XI-8, and XI-9.

MEASURE IDENTIFICATION CODE: IV-2

DESCRIPTION

Analyses in other programs (e.g., Arizona and Alaska as per Sierra report) have found that roughly 20% of vehicles failing their initial inspection "disappear" (i.e., they never return for a passing test). Both legitimate (e.g., scrapped or sold out of area) and illegitimate (e.g., driven without being registered) scenarios can account for such disappearances. Under this option, an evaluation would be performed to quantify the magnitude of the problem, attempt to identify underlying reasons, and develop suggested methods for addressing disappearing vehicles.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Data on improvements in identification of vehicles avoiding inspection may be available from states (such as California) that have instituted Repair Assistance and Vehicle Scrappage programs.

AIR QUALITY IMPACT

- Vehicles avoiding inspection are likely to consist of a higher proportion of gross emitters than the standard fleet distribution.
- Emissions reductions per vehicle identified may therefore be greater than the average vehicle in the fleet.
- There is a marginal modeled impact based on current enforcement levels (NJ DEP assumes approximately 98% compliance when doing mobile modeling).

OVERALL OPERATING COST

- The cost of addressing disappearing vehicles depends upon whether vehicles are identified through data sources or enhanced on-the-road means. Identification of the vehicles through data sources would likely cost less and could potentially be more effective through implementation of a registration denial program.
- Addressing the problem of disappearing vehicles includes increasing sticker enforcement efforts and increasing non-compliance penalties (Options IV-3 and IV-4 respectively).

EMISSION COST/BENEFIT QUOTIENT

- The emissions benefit of addressing disappearing vehicles depends on the level of effort devoted to identifying these vehicles and taking action.
- As with emissions, the cost of addressing disappearing vehicles depends on the level of effort devoted to identifying these vehicles and taking action.
- Options IV-3, IV-4, and IV-5 address specific methods of approaching the disappearing vehicle problem, and provide cost/benefit analysis based on the respective action.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- There is a point of diminishing returns because the cost of increased enforcement efforts related to the yield of vehicles located decreases with increasing effort applied. Any improvements in the use of data manipulation to identify these vehicles are likely to be the most cost effective.

EASE OF IMPLEMENTATION

- This option involves increased enforcement, which is dependent on the amount of funds available.
- It is difficult to estimate how easy or difficult implementation of this option would be until investigation of various methods to meet the objective is concluded.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Most stakeholders would not object to a system that is applied fairly to all motorists.
- The inspection/repair industry is likely to be supportive of a measure that generally increases the testable fleet.
- There may be some Environmental Justice concerns if the vehicles identified have a low value, or are simply old.

STATE IMPACTS

- Implementation of this option presents an opportunity to improve even-handed enforcement efforts.
- There is a good chance of measurable air quality improvements.

SAFETY IMPROVEMENT FACTOR

- Vehicles avoiding inspection are the most likely to have safety problems, as well as emissions defects.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IX-6 and IX-7.

VEHICLE COMPLIANCE
INCREASE STICKER ENFORCEMENT EFFORTS

MEASURE IDENTIFICATION CODE: IV-3

DESCRIPTION

This option would increase the sticker enforcement program through increased detection and enforcement of non-compliant stickers. An inherent limitation of emissions sticker-based systems has to do with limited options for adequate enforcement. The NJ MVIS presently relies primarily upon visual identification of the correct sticker being present on the windshield of a vehicle to determine the adequacy of that vehicle's compliance. In the absence of registration denial, improvements to the sticker enforcement rate can come from either improved means for physical observation, optical scanning of vehicles such as in toll lanes, or refinements in inspection record data analysis. However, only the comparison of sticker observation to record analysis may fully address the presence of counterfeit and stolen stickers.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Pennsylvania has a specific sticker enforcement program related to identifying vehicles that have avoided inspection. Approximately 130 parking lots are surveyed per year, and 11,000 non-compliant vehicles are identified according to expired or non-existent stickers.
- North Carolina recently increased fees for late/skipped vehicle inspections.

AIR QUALITY IMPACT

- There is a marginal impact based on current enforcement levels (NJ DEP assumes approximately 98% compliance when doing MOBILE modeling).
- Based on 2007 fleet numbers, the number of initial inspections increases to 2,351,560 per year, including 1,875,390 CIF and 476,170 PIF inspection. Assuming 98% compliance, this equates to 2,304,529 compliant vehicles and 47,031 non-compliant vehicles. Assuming that a parking lot survey conducted by two people including travel time, surveillance, and documentation would take about 3 hours, then two people could conduct approximately 650 surveys annually. It is also assumed that each parking lot had approximately 250 spaces. Multiplying 650 parking lot surveys times 250 cars each at a non-compliance rate of 2% equates to approximately 3,300 non-compliant vehicles located annually. In theory, this scenario still fails to locate 43,731 non-compliant vehicles, and the overall compliance rate would only increase from 98.0% to 98.2%. However, publication of this enforcement activity would further increase the compliance rate.

OVERALL OPERATING COST - $200,000/year per inspection team would be cost neutral if penalties are $61

- Increasing compliance from the current rate of 98% to 100% is not possible. Compliance would be improved by adding two full-time employees (at a minimum) for parking lot surveys plus additional reporting and administrative costs. Two full-time employees at the rate of $75,000 each (including benefits) plus management, overhead, and other costs at a rate of $50,000 per year would equate to a total cost of approximately $200,000.

These costs may be neutral since the penalties imposed for non-compliance could pay for the program. Assuming a cost of $200,000 to identify 3,300 vehicles, the penalty would be $61.00 per vehicle.

- Devoting significant resources to parking lot surveys would reach a point of diminishing returns since less and less vehicles would be out of compliance as this effort is increased.

EMISSION COST/BENEFIT QUOTIENT

- There is a marginal cost/benefit which is dependent on the effort applied. Additionally, increased efforts would quickly meet with diminishing returns.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Increased enforcement by conventional means such as law enforcement scrutiny of on-the-road vehicles is a known quantity. More novel methods that involve technical solutions such as stickers subject to optical or remote wireless identification may be more experimental.

EASE OF IMPLEMENTATION

- There are no technical impediments to implementation of parking lot surveys. Other methods of sticker enforcement such as optical scanning of vehicles in toll lanes would require investment in new equipment, and personnel to take action based on the new data collected.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- It the enforcement effort is perceived as fare by the motorists, it could reduce public opposition about increase enforcement penalties.
- Implementation of this option is likely to generate positive reactions from inspection/repair industry due to increases in the testable fleet.
- Police and enforcement personnel may have questions about the effectiveness and efficiency of program, removing resources from “real” problems.

STATE IMPACTS

- This option is one of several that offers the opportunity to eliminate more of the dirtiest and most unsafe vehicles while increasing the repair rate and inspection revenues.

SAFETY IMPROVEMENT FACTOR

- Implementation of this option is likely to capture some of the least safe cars on the road.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IV-1, IV-2, IV-4, IV-5 and V-18.

VEHICLE COMPLIANCE
INCREASE NON-COMPLIANCE PENALTIES

MEASURE IDENTIFICATION CODE: IV-4

DESCRIPTION

Non-compliance issues range from driving for a short period after safety/emissions sticker expiration to fraudulently maintaining an out-of-state registration to avoid New Jersey inspection indefinitely. In order to determine the potential for improvements in the rate of compliance based solely upon increases in penalties, the current deterrent influence of existing penalties must be evaluated relative to public awareness of them. Proposed increases should then be weighed against potential improvements in public awareness of consequences for avoidance or falsification as well as other compliance improvement options included here.

PROOF/DEMONSTRATION OF ALTERNATIVE

- New York and Texas impose non-compliance penalties in their programs. However, neither State has increased the amount of these penalties; therefore, it has not been demonstrated that increasing non-compliance penalties will increase compliance.
- New Jersey's current penalty for failure to inspect is $121.

AIR QUALITY IMPACT

- There is a marginal impact based on current enforcement levels (NJ DEP assumes 98% compliance when doing MOBILE modeling). The effect of additional compliance penalties is difficult to quantify and since no other states have increased their penalties in order to increase compliance and study the effect, there is no basis for determining how a given percentage increase in the penalty would effect compliance.

OVERALL OPERATING COST

- The operating cost of implementation of this option would probably be neutral since the additional penalties would likely result in a higher compliance. Less penalties would be assessed, but at a higher amount. No increased effort would be needed to enforce higher penalties versus current penalties as long as the higher penalties consisted only of raising existing monetary fines.

EMISSION COST/BENEFIT QUOTIENT

- The emission reduction associated with implementation of increased compliance penalties cannot be quantified and the cost is assumed to be neutral since the threat of additional penalties would likely increase compliance. This results in a scenario that reduces emissions at no additional cost to the State.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Not applicable.

EASE OF IMPLEMENTATION

- The ease of implementation of this option depends upon whether current enforcement efforts are tightened or novel methods are introduced.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- The public is not likely to react favorably to increases in penalties associated with compliance. The level of discontent is expected to be proportional to the amount of the increase.
- There is likely to be positive reaction from the inspection/repair industry regarding increases in the testable fleet.

STATE IMPACTS

- The State may elect to increase enforcement to give credibility to the increased penalties, so some additional personnel may be necessary to give the increase credibility.
- Implementation of this option would increase the testable fleet with possible emphasis on dirtiest vehicles, so the result of implementation would be positive for the State.

SAFETY IMPROVEMENT FACTOR

- Implementation of this option would increase the testable fleet with possible emphasis on vehicles with the highest defect rate.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IV-1, IV-2, IV-3, V-18, IX-6, and IX-7.

VEHICLE COMPLIANCE
INCREASE INSPECTION COMPLIANCE

MEASURE IDENTIFICATION CODE: IV-5

DESCRIPTION

This option is a duplication of Option IV-4 (Increase Non-Compliance Penalties). See Option IV-4 for analysis.

NETWORK DESIGN
FULL TEST-ONLY NETWORK

MEASURE IDENTIFICATION CODE: V-1

DESCRIPTION

Under this option, the existing Hybrid network would be converted to full Test-Only network. There are three possible conversion scenarios to evaluate this option.

1) CIF-Only - This would involve requiring all I/M tests to be conducted at the CIFs, with only ERFs and possibly do-it-yourselfers allowed to perform diagnostic and repair work on the vehicles only. All subsequent retests would be done at the CIFs.
2) CIF plus PIF Test-Only - In addition to the CIFs, PIFs at their option would convert to Test-Only stations. These stations could only perform I/M tests and would not be allowed to perform vehicle repairs. It is expected that very few of the current PIFs would elect to participate as Test-Only stations unless the current fee structure (free at CIFs/pay at PIFs) is also changed.
3) PIF-Only - This would involve requiring all I/M tests to be conducted at Test-Only PIFs. Repairs would be required to be performed by ERFs or the motorist. No repairs would be done at the PIFs.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Other states are Test-Only, e.g. Delaware, District of Columbia, Maryland, Illinois, Indiana, British Columbia, Colorado, Arizona, and California. With the California Gold-Shield Program, the State identifies vehicles (through HEP) and notifies the motorists to come in for an inspection. Additionally, some motorists elect to come in voluntarily for an inspection.

AIR QUALITY IMPACT

- There would be a marginal improvement based upon a recent study by the California I/M Review Committee on differences in the environmental benefit between Test-Only and Test-and-Repair. Any differences in benefits are likely to be reduced with OBD II phase-in due to the diminished influence of technicians on test results.
- Based on MOBILE6 modeling and observed enforcement levels in PIFs, changing to a full Test-Only network is estimated to reduce HC by 0.19% (0.14 tons/day), NO_X by 0.09% (0.18 tons/day), and CO by 0.25% (3.31 tons/day), for a total emissions reduction of 3.63 tons per day.
- Any potential improvement is dependent on fraction of fleet subject to testing, i.e., Older Fleet versus OBD only and subject to the fraction of vehicles receiving appropriate repairs keeping pace with any improvements in the failure identification rate.

OVERALL OPERATING COST – Depends on the variation of this option. See detail below.

- **CIF-Only**: With the current exemption of the newest four model years, the CIF lanes have been conducting approximately 2,215,537 tests annually (NJ MVC – total 2004 inspections). The PIFs have been conducting approximately 663,756 tests annually (NJ MVC – total 2004 inspections). If NJ converts to a CIF-only program, additional facilities may need to be procured to meet the approximately 30% increase in inspections. NJ currently has 32 CIF inspection stations with 124 operational lanes. A 30% increase would result in 9 new inspection stations and/or 34 new inspection lanes. If tailpipe testing is required it would cost $75,000 per lane for equipment ($2,550,000 total lane equipment cost) and $50,000 to retrofit each building ($1,600,000 total building retrofit cost). This does not include costs for new CIF construction.

- It has been suggested by NJ MVC that the current CIFs could absorb any increase resulting from eliminating the PIFs without additional facilities. It seems feasible that the CIFs could absorb a 30% increase in inspections without expanding, but wait times would increase.
- Without considering additional facilities that may be required if NJ switches to a CIF-Only program, the cost of the additional inspections to the State would be $27.89 (cost billed by Parsons) times 663,756 additional tests, or $18,500,000. Estimated CIF fee in 2007 is projected to be $29.42, which translates into a 2007 cost of $19,530,000.
- A CIF-only I/M program would not result in any increased cost to NJ motorists, in fact, NJ motorists would experience a net savings if the I/M program were changed to CIF only. This is based on the current average cost of $69.83 for a PIF inspection. Since the PIFs only charge for initial inspections, the cost is calculated based on PIF initial inspections only. If the 428,186 initial PIF tests annually conducted at the PIFs were conducted at the CIFs, the public would save approximately $30,000,000.
- **CIF plus PIF**: There would be some decrease in operating costs since CIFs and PIFs must charge the same for inspection. The number of people going to PIFs may increase if the fees are equal. This is difficult to quantify.
- The PIFs would lose revenue associated with vehicle repair. This cannot be quantified.
- **PIF-Only**: More PIFs would have to enter market to service 100% of the fleet.
- Since the CIFs currently conduct approximately 2,215,557 tests and the PIFs conduct approximately 663,756 tests annually, the PIF facilities would be forced to handle an additional 2,215,557 tests annually, or an increase in volume to 430% of the current PIF volume. The current PIFs are test and repair facilities. These facilities would have to convert to test-only facilities. New facilities would have to purchase equipment to do either the combination of OBD II and dynamometer testing (~$35,000) or possibly TSI at about $15,000. Alternately the equipment cost for an OBD-only station would be from $2,500 to $5,000 with gas cap testing included.
- Operating costs to the State would be significantly reduced. The only costs to the State would pertain to obtaining data from the VID, implementation of an increased audit effort, and other general oversight. Estimates of VID cost to the State would be around $2,400,000 per year. Audit effort would be around $6,200,000 per year. Total cost to the State would be reduced from existing program cost of $83,200,000 to around $9,700,000.
- If the cost of a PIF inspection remains at an average of around $69.83, then the cost to the NJ motorists would be that cost times the number of initial inspections that are currently conducted at the CIFs (1,630,612 initial CIF inspections in 2004), or $114,000,000 per year. Based on the 2007 fleet, there are 1,875,390 initial CIF inspections expected. This means that the expected motorist cost in 2007 would increase to $131,000,000.
- The PIFs would lose revenue associated with vehicle repair. This cannot be quantified.

EMISSION COST/BENEFIT QUOTIENT

- **CIF-Only**: Additional cost of $19,530,000 in 2007 (which does not include the costs to build new lanes or CIFs) divided by emissions reductions in tons of emissions per year equals an approximate cost of $382,000 per ton of HC, $298,000 per ton of NO_X, and $12,300 per ton of CO to the State. The public would save approximately $30,000,000 annually.

- **CIF plus PIF**: Some unquantifiable decrease in cost to the State would be realized since the CIF volume decreases in this scenario. Cost/benefit cannot be quantified.
- **PIF-Only**: I/M program cost to the State would be reduced from $83,200,000 (current estimated cost) to around $9,700,000. This scenario would cost the public an estimated $131,000,000 annually in inspection fees based on the projected 2007 fleet.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Not applicable.

EASE OF IMPLEMENTATION

- Requiring the present test and repair industry to abandon the service dimension of their enterprise in order to remain in the inspection side of the program is likely to foment significant push back. Push back would be even more severe in a CIF-only model.
- A transition to test-only may need to account for adequate numbers of ERFs coming into the program to replace PIFs that would no longer offer repair services in order to maintain practical levels of service for motorists required to seek repairs before re-inspection.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- If the I/M program is changed to a CIF-only program,, then the convenience of PIF inspections would be lost to 20% of motorist that opt to use these facilities. Likewise, if the I/M program is changed to a PIF-only program, then the majority of motorists that currently use the CIF facilities would lose the convenience of obtaining their inspection at the CIF.
- Converting from the present hybrid program to a PIF-only program would be perceived as an extra expense to motorists accustomed to using the CIFs, since the inspection is perceived as being “free” at the CIFs. This would result in a push back from motorists.
- There would be major battles with PIFs and their supporters if a CIF-only system was implemented.

STATE IMPACTS

- If the number of PIFs significantly decrease as the result of restrictions on repair services or elimination of inspection business altogether, increased CIF capacity would be required. Load leveling at CIFs may become more critical with influx of many motorists accustomed to PIF convenience.
- If a significant number of higher volume PIFs join the program, CIF capacity requirements may diminish.
- There is some risk of increasing the non-compliance rate of the highest emitting (older and higher mileage) vehicles with owners preferring repair services to be available at the point of inspection.

SAFETY IMPROVEMENT FACTOR

- There is the potential for improvement if appropriate repairs keep pace with increases in safety failure identification rate, assuming that false passes will decrease with the CIF-only scenario.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to V-2, V-3, V-4, V-5, V-8, V-9, V-10, V-16, VII-2, and IX-3.

NETWORK DESIGN
FULL TEST-AND REPAIR NETWORK (ALL-PIF NETWORK)

MEASURE IDENTIFICATION CODE: V-2

DESCRIPTION

Under this option, the existing Hybrid network would be converted to a Full Test-and-Repair network (decentralized inspection network). Existing CIFs would be closed and used for other purposes by the State, and all testing would occur at licensed PIFs.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Connecticut, Virginia, Massachusetts, New York, Georgia, and Pennsylvania are examples of states that only use licensed PIFs.
- Connecticut just switched from Test-Only to Test-and-Repair network.

AIR QUALITY IMPACT

- Based on MOBILE6 modeling and observed enforcement levels in PIFs, changing to a full test and repair network is estimated to increase HC by 0.92% (0.68 tons/day), NO_X by 0.48% (0.92 tons/day), and CO by 1.23% (16.4 tons/day) for a total annual emissions increase of 6,580 tons.

OVERALL OPERATING COST.

- More PIFs would have to enter market to service 100% of the fleet.
- Since the CIFs currently conduct approximately 2,215,557 inspections (NJ MVC – 2004 inspections) annually and the PIFs conduct approximately 663,756 inspections (NJ MVC – 2004 inspections) annually, PIFs would be forced to increase their volume to 430% of their current volume. Based upon current ASM requirements new facilities would have to purchase equipment to perform OBD II and dynamometer testing (~$35,000 each). If the mix of new facilities being added to the program includes an OBD only option, capital equipment costs for facilities opting to inspect only post 1995 vehicles would be significantly less.
- Operating cost to the State would be significantly reduced. The only costs to the State would pertain to obtaining data from the VID, implementation of an increased audit effort, and other general oversight. Estimates of VID cost to the State would be around $2,400,000 per year. The current audit cost associated with the PIFs is $4,748,000. New PIF audit costs associated with this option are approximately $6,200,000 (Estimated cost of PIF audit in this program structure). Total costs would be reduced from the existing program cost of $83,200,000 per year to approximately $9,700,000 per year.
- If the cost of a PIF inspection remains at an average of around $69.83, then the cost to the NJ motorists would be that cost times the number of initial inspections that are currently conducted at the CIFs (1,630,612 initial CIF inspections in 2004), or $114,000,000 per year. Based on the 2007 fleet, there are 1,875,390 initial CIF inspections expected. This means that the expected motorist cost in 2007 would increase to $131,000,000.

EMISSION COST/BENEFIT QUOTIENT

- There would be a net cost increase to New Jersey motorists due to the higher cost of PIF inspections.
- I/M program cost to the State would be reduced from $69,000,000 (current estimated cost from NJ MVC) to around $14,430,000. This scenario would cost the public an estimated $196,350,000 annually in inspection fees, while annual emissions would increase by 248 tons of HC, 333 tons of NO_X, and 6,000 tons of CO.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- This option is technically most practical with OBD-only tests. Costs can be excessive with ASM's dependence upon loaded-mode (dynamometer) testing.

EASE OF IMPLEMENTATION

- Substantial infrastructure changes would be required making the implementation lengthy and difficult.
- Fraud detection efforts would have to be enhanced.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- PIFs would be strongly in favor – their official position at present.
- Centralized contractors would strongly oppose.
- Federal stakeholders and/or special interests would have questions and have to see air quality benefits offset.
- General public would resist, having to pay additional inspection fees. Potential political ramifications and environmental justice (poor impacted to a greater extent).

STATE IMPACTS

- There would be a reduction in SIP credits.
- There would be an increase in oversight requirements and costs, unless the number of stations is limited, like in Connecticut.
- There would be a substantial increase in oversight by either the State or contractor (if privately managed) like New York and Massachusetts.

SAFETY IMPROVEMENT FACTOR

- The fraud rate may increase unless there is substantial improvement in fraud detection.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-3, I-5, I-6, V-1, V-3, V-4, V-8, V-9, V-10, V-16, VI-1, VI-2, VI-3, VI4, VII-21, IX-3, IX-9, IX-18, and IX-19.

MEASURE IDENTIFICATION CODE: V-3

DESCRIPTION

Under this option, the existing hybrid system in New Jersey would be converted to a system that has a limited number of higher volume PIFs licensed to conduct inspections and also performs repairs. Connecticut implemented this type of system, in which 300 private garages inspect roughly 1.1 million vehicles per year. Connecticut has also hired a program management contractor to oversee and provide test equipment to the private garages. A separate contractor developed and operates the VID. The New Jersey CIFs would cease operation if this option is implemented.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Connecticut implemented this type of system after eliminating a centralized program design.

AIR QUALITY IMPACT

- The emissions reductions expected with implementation of a limited PIF network are expected to be similar to the reductions associated with a full test-only network. Implementation of this option is estimated to reduce HC by 0.19% (0.14 tons/day), NO_X by 0.09% (0.18 tons/day), and CO by 0.25% (3.31 tons/day), for a total emissions reduction of 3.63 tons per day.
- Because fewer stations would receive better oversight, there would be a positive impact on air quality.
- Any differences in benefits are likely to be reduced over time with OBD II phase-in due to the diminished influence of technicians on test results.

OVERALL OPERATING COST

- Since the CIFs currently conduct approximately 2,215,557 inspections (NJ MVC – total 2004 inspections) and the PIFs conduct approximately 663,756 inspections (NJ MVC – total 2004 inspections) annually, the PIF facilities would be forced to handle an additional 2,215,557 tests annually, or an increase in volume to 430% of the current PIF volume. The current PIFs are test and repair facilities. These facilities would have to convert to test-only facilities. New facilities would have to purchase equipment to do either the combination of OBD II and dynamometer testing (~$35,000) or possibly TSI at about $15,000. Alternately the equipment cost for an OBD-only station would be from $2,500 to $5,000 with gas cap testing included.
- Operating costs to the State would be significantly reduced. The only costs to the State would pertain to obtaining data from the VID, implementation of an increased audit effort, and other general oversight. Estimates of VID cost to the State would be around $2,400,000 per year. Audit effort would be around $6,200,000 per year. Total cost would be reduced from existing program cost of $83,200,000 to around $9,700,000.
- If the cost of a PIF inspection remains at an average of around $69.83, then the cost to the NJ motorists would be that cost times the number of initial inspections that are currently conducted at the CIFs (1,630,612 initial CIF inspections in 2004), or $114,000,000 per

year. Based on the 2007 fleet, there are 1,875,390 initial CIF inspections expected. This means that the expected motorist cost in 2007 would increase to $131,000,000.

EMISSION COST/BENEFIT QUOTIENT

- The cost to the motorist would likely increase in a limited PIF network, but the cost of the program to the state would decrease from the current estimate of $83,200,000 to around $9,700,000. The overall program cost would likely increase depending on the average PIF inspection cost.
- Implementation of this option is estimated to reduce HC by 0.19% (0.14 tons/day), NO_X by 0.09% (0.18 tons/day), and CO by 0.25% (3.31 tons/day), for a total emissions reduction of 3.63 tons per day.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Not applicable.

EASE OF IMPLEMENTATION

- Implementation of this option involves substantial network redesign and means of facilitating fair competition for limited PIFs.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Centralized contractors would oppose implementation of a limited PIF network unless the network is contractor managed.
- Smaller PIFs are likely to oppose implementation of this option since they would be less able to absorb an increase in test volume.
- Larger PIFs interested in expanding may be in favor of this option.
- Motorists might object if local and convenient PIFs and CIFs are removed from program.

STATE IMPACTS

- This option reduces the cost of oversight since the PIFs are limited and the CIFs are not used.
- There is the additional potential for use of a single equipment provider as with the Connecticut program.

SAFETY IMPROVEMENT FACTOR

- With better oversight of the program, a positive impact on safety can be expected.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-3, I-5, I-6, V-1, V-2, V-4, V-5, V-8, V-14, V-16, and IX-3.

NETWORK DESIGN
TEST-ONLY PIFS

MEASURE IDENTIFICATION CODE: V-4

DESCRIPTION

Individual PIFs could be licensed as test-only facilities if they choose to only perform vehicle testing and no repairs. Unlike the test-only option described in Option V-1, test-and-repair PIFs would also be allowed to continue under this option. California is licensing test-only private garages as a way to improve program performance and increase resulting emissions reductions. Multiple analyses of the California program have shown the test-only stations to be achieving on average larger emissions reductions than test-and-repair stations.

A recent report to the California Inspection & Maintenance Review Committee confirmed a higher fail rate for the same vehicles at Test-Only stations than at test-and-repair stations. The report was not conclusive in that it is difficult to factor in the influence of pre-tests and "repairs before inspection" that take place at test-and-repair stations which would not be performed at test-only stations.

It may be prudent to assess the extent of repairs that occur on vehicles prior to inspection which may be creditable toward SIP claims, whether or not such data supports the adoption of a test-only PIF alternative.

PROOF/DEMONSTRATION OF ALTERNATIVE

- California is licensing test-only private garages as a way to improve program performance and increase resulting emissions reductions. Multiple analyses of the California program have shown the test-only stations to be achieving on average larger emissions reductions than test-and-repair stations.

AIR QUALITY IMPACT

- Test-only PIFs are generally regarded as achieving higher emissions reductions than test and repair stations due to a higher fail rate at the test-only station. It is possible that test-only facilities have a better failure identification rate, but the repair rate must coincide. Previous attempts to quantify the benefit of test-only PIFs have been inconclusive.

OVERALL OPERATING COST

- Test-only shops are more efficient at inspections than test and repair shops but it is not clear how that would affect market driven inspection fees.
- Any overall changes in the total I/M program cost would be dependent on the PIF inspection fee and how the program change affects the distribution of inspections between PIFs and CIFs.

EMISSION COST/BENEFIT QUOTIENT

- The cost/benefit quotient cannot be quantified since the air quality impact of test-only PIFs is unknown, and the operating cost would be market driven.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- California currently licenses test-only PIFs.

EASE OF IMPLEMENTATION

- This option depends on how many PIFs opt in, but implementation is not likely to be very difficult since changes in equipment and/or technology are not associated with this option.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- There could be a significant negative impact from test and repair PIFs and the CIF contractor.
- Motorists would object to the potential loss of some convenient PIF "drop off, test, and fix" services.

STATE IMPACTS

- There could potentially be some increased complexity by handling a new category of PIF, but fewer PIFs overall that are subject to the higher level of oversight associated with test-and-repair facilities.

SAFETY IMPROVEMENT FACTOR

- There would likely be an improvement in accurate identification of safety failures, but repairs must coincide with the identification for an overall benefit to accrue.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-3.

NETWORK DESIGN
CIF-ONLY REINSPECTIONS

MEASURE IDENTIFICATION CODE: V-5

DESCRIPTION

Under this option, all reinspections of vehicles that fail initial inspections must occur at the CIFs. Currently, the vehicle maybe reinspected at either a CIF or PIF.

PROOF/DEMONSTRATION OF ALTERNATIVE

- California requires gross polluters to be retested at Gold Shield, Test-Only or Referee stations (Test-Only).

AIR QUALITY IMPACT

- There is a positive influence with respect to air quality since fraudulent repairs are reduced. There is less impact with implementation of this option than with changing to a full test-only network. Changing to a full test-only network is estimated to reduce HC by 0.19% (0.14 tons/day), NO_X by 0.09% (0.18 tons/day), and CO by 0.25% (3.3 tons/day). If it is estimated that these emissions reductions represent the maximum amount that could be saved by implementing this option, then it is possible to calculate the best case scenario for cost/benefit.

OVERALL OPERATING COST - $7,700,000 additional annual cost to the State

- The operating cost is not large unless it contributes to excessive loading of CIFs that would require additional facilities. NJ MVC claims that there is currently some additional capacity available at the CIF facilities.
- According to NJ MVC, the number of vehicles that fail their initial emissions inspection is approximately 176,872 vehicles at the CIFs and approximately 63,195 vehicles at the PIFs. This information is based on 2004 inspections.
- PIFs currently conduct approximately 428,186 initial inspections annually, of which 63,195 fail the emissions portion of the inspection and would have to go to the CIF for reinspection. Additionally, 15% of the current CIF failures go to the PIF for reinspection (26,531 vehicles). If these vehicles are added to the existing volume at the CIFs, the increase in volume at the CIF would bring the total CIF inspections from 2,215,557 per year to 2,305,283. This represents an inspection volume increase of approximately 4% annually at the CIFs.
- The cost to the State of 89,726 additional tests at the CIF would be approximately $2,500,000 (assuming $27.89 per test which is charged by Parsons to the State).
- Based on the 2007 fleet, with 2,351,560 initial CIF inspections, and 476,170 initial PIF inspections, the total number of reinspections are estimated to be 934,722. This includes the 261,969 PIF reinspections. At an estimated CIF inspection cost of $29.42 the added cost to the State would be the number of PIF reinspections at the rate of $29.42. The total cost increase to the State in 2007 would be $7,700,000.

EMISSION COST/BENEFIT QUOTIENT

- At an estimated cost to the State of $7,700,000 and a corresponding emission reduction of 51 tons per year of HC, and 65 tons per year NO_X, and 1,210 tons per year of CO, the approximate cost/benefit to the State for implementation of this option is $151,000 per ton of HC reduced, $144,400 per ton of NO_X reduced, and $8000 per ton of CO reduced.
- It is difficult to quantify all aspects of this option since PIF reinspections are free to the motorist.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Implementation of this option would require significant restructuring of the current program.

EASE OF IMPLEMENTATION

- Implementation of this option would require legislation.
- Some motoring community outreach would be required and program design changes would be necessary.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Motorists and PIFs would oppose implementation of this option since “ping ponging” of the motorist between PIFs and CIFs would increase.

STATE IMPACTS

- This option would increase the effective repair rate and may contribute slightly to increased program costs at CIFs

SAFETY IMPROVEMENT FACTOR

- There may be some increase in safety if the CIFs conducted the re-inspections, since fraudulent passing of non-compliant vehicles is less prevalent at the CIFs.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-2, V-8, V-9, V-10, V-13, V-14, V-15, and V-16.

NETWORK DESIGN
GROSS POLLUTER STANDARDS/TESTING REQUIREMENTS

MEASURE IDENTIFICATION CODE: V-6

DESCRIPTION

In the California program, vehicles that fail so-called gross polluter standards (i.e., which are higher than the normal pass/fail standards) must go to test-only or other specially licensed stations for verification that their emissions have been reduced to passing levels following repair. This was implemented to ensure that gross emitters cannot avoid repair by going to test-and-repair stations that are willing to conduct fraudulent tests. In New Jersey, such gross polluters could be required to obtain retests at the CIFs.

PROOF/DEMONSTRATION OF ALTERNATIVE

- California requires gross polluters to be retested at Gold Shield, Test-Only or Referee stations.

AIR QUALITY IMPACT

- Since 50% of emissions are from a subset of emitters known as "gross polluters," sending these vehicles to the CIFs for retests could reduce emissions. With Option V-5, a maximum emissions reduction of HC by 0.19% (0.14 tons/day), NO_X by 0.09% (0.18 tons/day), and CO by 0.25% (3.3 tons/day) is possible with implementation of a program change requiring all vehicle retests to be conducted at CIFs.
- Documentation from "AAA" California suggests that 50% of emissions are produced by 10% of vehicles. The 10% of vehicles represent gross polluters, and this option assumes that these vehicles will therefore be required to be retested at the CIFs.

OVERALL OPERATING COST - $173,000 additional annual cost to the State

- Based on the 2007 fleet, the projected number of vehicles that will fail their initial emissions inspection is approximately 276,799. Of these failures, 225,589 are CIF failures and 58,704 are PIF failures.
- If it is assumed that 10% of these vehicles would be considered gross polluters, then 27,680 vehicles would be required to go to a CIF for reinspection. 5,870 of these gross polluters are from PIFs and must be reinspected at CIF facilities. At a 2007 projected rate of $29.42 per inspection at CIFs, the estimated cost of this option is $173,000 annually.

EMISSION COST/BENEFIT QUOTIENT

- At an estimated cost to the State of $173,000 and a corresponding emission reduction of 26 tons HC, 33 tons of NO_X, and 605 tons of CO per year, the approximate cost/benefit for implementation of this option is $6,640 per ton of HC reduction, 5,200 per ton of NO_X reduction, and $290 per ton of CO reduction annually.
- It is difficult to quantify all aspects of this option since PIF reinspections are free to the motorist.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Not applicable

EASE OF IMPLEMENTATION

- Implementation of this option would require legislation.
- There are extensive program design and outreach implications.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Motorists and PIFs may oppose implementation because it would limit motorists' freedom to choose PIF or CIF.

STATE IMPACTS

- This option would add complexity to the I/M program.
- There are associated cost, public relations, and oversight requirements with this option.

SAFETY IMPROVEMENT FACTOR

- Some positive impact on safety is possible.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Other related options are: III-5, V-5, V-7, V-12, V-16, VII-10, VII-11, VII-12, and VII-16.

MEASURE IDENTIFICATION CODE: V-7

DESCRIPTION

Some states use high emissions profiling (HEP) or high emissions weighting (HEW) to identify vehicles that are likely to fail and then require special testing (e.g., in California vehicles identified by HEP are directed to test-only stations). Using the vehicle inspection database weighting methodologies take into account such factors as vehicle age, the failure rates of a particular type (make, model, engine, etc.) of vehicle, and potentially remote sensing readings (see subsequent option).

PROOF/DEMONSTRATION OF ALTERNATIVE

- California: The state requires vehicles that are predicted to be high emitters to be tested at Test-Only or Referee stations. Identification of the predicted high-emitters is done using a high-emitter identification model.

AIR QUALITY IMPACT

- Estimates of the air quality impact based on MOBILE 6 show that using high emissions weighting to assist in pinpointing potential high-emitters will reduce HC emissions by 0.13% (0.10 tons/day), NO_X emissions by 0.07% (0.13 tons/day), and CO emissions by 0.17% (2.3 tons/day). This would result in a total emissions reduction of 36 tons per year of HC, 46 tons per year of NO_X, and 847 tons of CO.
- There would be an increased benefit if this program were included in an annual instead of biennial cycle of inspections.

OVERALL OPERATING COST – Additional State cost increase of $2,751,000 annually. Motorist savings of $4,480,000 annually. Overall program cost savings of $1,729,000.

- Based on information obtained from California, it is estimated that the High Emitter Profile/Low Emitter Profile (HEP/LEP software package would cost about $100,000). It is estimated that this cost would not be impacted by purchasing the software for New Jersey versus the version of the software used in California. It is assumed that some software changes would be necessary for each State using the software program, and that this cost is included in the purchase price of $100,000.
- Maintenance cost for the software runs about 20% of the initial software license fee annually and is required to update the model for new vehicles joining the fleet. The maintenance fee is estimated to be approximately $20,000 annually.
- For this option it is assumed that 15% of all vehicles are identified as potential high emitters by the HEP/LEP software. The vehicles that would be going to the CIFs regardless would not directly impact any costs. The vehicles that would have gone to the PIFs were they not required to go to a CIF for inspection would impact the cost of the inspection program. Currently the PIFs inspect 428,186 vehicles annually (initial inspections in 2004). If 15% of those vehicles are identified as potential high emitters and directed to the CIFs, then CIF inspections would increase by 64,227. This would

result in a program cost increase to the State of 64,227 X $27.89 (the amount charged to the state by Parsons) = $1,791,000. The PIFs would lose $4,480,000 in revenue due to the loss of 64,227 inspections. This revenue loss represents a motorist savings.

- The cost of implementing this option assumes that vehicles would be directed to a CIF for testing. Thus, the total cost of the implementation would be from the software and maintenance cost plus the cost of additional vehicles going to the CIFs. There would also be some cost of notifying motorists that they are required to go to a CIF for inspection.
- If the software cost is amortized over a 5 year period, the annual cost the software purchase alone would be $20,000 per year. Adding the maintenance cost of $20,000 per year after the first year, the amortized cost of the software over 5 years would be $36,000 per year. The total cost increase to the state for implementation of the HEP/LEP program would be approximately $2,751,000 per year including additional inspections and software costs.
- The increase in cost to the State would be more than completely offset by the reduction in cost to the motorist. Lost PIF revenue equates to motorist savings, although since motorists go to PIFs by choice, the savings of $69.83 per PIF inspection would cost the motorist the convenience of going to the PIF.
- The overall cost of the inspection program decreases with implementation of this option. The overall program cost is the State program cost increase ($2,751,000) minus the savings to motorists ($4,480,000) = a net program savings of $1,729,000.

EMISSION COST/BENEFIT QUOTIENT

- The overall cost of the program decreases because the reduction in PIF inspections more than offsets the cost of the program to the state.
- Implementation of the HEP/LEP program would result in a total emissions reduction of 36 tons per year of HC, 46 tons per year of NO_X, and 847 tons of CO.
- Since adoption of this measure would improve both the overall program cost as well as the level of emissions benefit, emissions cost/benefit is not calculated.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- The software used to determine vehicles that may require testing has been developed, and is in use in other States. There are no technological obstacles associated with implementation of this option that would need to be overcome. Since California emissions standards are different than other states, some changes would need to be made to the program; however, these changes are assumed to be covered in the estimated software cost of $100,000.

EASE OF IMPLEMENTATION

- Implementation of this option may be difficult to explain to motorists, and would require public education to avoid a push back from the public.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Motorists would not like this option because of the negative connotation associated with vehicle profiling.
- PIFs may initially be against this option since it would reduce their inspection load. However, the impact to the PIFs may not be very significant since vehicles needing to be repaired would still end up at the PIF for repair. Since PIFs do not charge motorists for

vehicle reinspection as long as repairs are completed at the PIF, there would be no significant reduction in PIF revenue.

STATE IMPACTS

- Implementation of this option adds some cost to the state and complexity to the present program.
- Implementation of this option may cause economic justice concerns.

SAFETY IMPROVEMENT FACTOR

- The impact to safety associated with this option is negligible unless high emissions vehicles have a higher incidence of safety failures.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Closely related to VII-10, VII-11, VII-12, VII-15, and VII-16.

NETWORK DESIGN
OBD-ONLY STATIONS/LANES

MEASURE IDENTIFICATION CODE: V-8

DESCRIPTION

Some programs are either designing entire networks or licensing selected stations as OBD-only. These stations are not required to have tailpipe test capability and can only conduct tests on 1996+ OBD II vehicles. As the percentage of OBD II compliant in-use vehicles continues to grow, it is expected that there will be increasing interest from agencies and the PIF testing industry in supporting OBD only test stations.

Under this option, the State would begin to license OBD-only PIFs, but all CIF lanes would be required to retain tailpipe test capability to ensure adequate capacity to handle both tailpipe testing of pre-OBD II vehicles and backup tailpipe testing of 1996+ OBD II vehicles. This does not preclude the possibility of individual CIF test lanes being dedicated to OBD-only testing.

PROOF/DEMONSTRATION OF ALTERNATIVE

- OBD II-only has been demonstrated in several other programs, but none currently have centralized tailpipe test facilities for older vehicles. Oregon is planning to do this. Other states are likely to follow.
- Pennsylvania will begin authorizing OBD II-only PIFs while maintaining tailpipe testing in the Metro regions, January 2006.

AIR QUALITY IMPACT

- Maintaining tailpipe capabilities insures no loss of benefits from the older pre-OBD II fleet.
- Assuming that 77% of OBD tests are conducted at CIFs and 23% of OBD tests conducted at PIFs (2004 and 2007 percentage of CIF and PIF tests), and also assuming that the CIFs conduct all the tailpipe tests, the implementation of this option is estimated to reduce HC by 0.09% (0.07 tons/day), NO_X by 0.06% (0.11 tons/day), and CO by 0.13% (1.73 tons/day), for a total emissions reduction of 1.91 tons per day.

OVERALL OPERATING COST $0

- The overall operating cost of the program is expected to go down slightly, since it is expected that OBD-only PIF stations would be forced to reduce their inspection fee to be competitive with PIFs and CIFs that offer OBD and tailpipe tests. The cost reduction would depend on the reduction in inspection cost.
- This option would not affect the cost of the CIF program, therefore no change in program cost to the State is expected.

EMISSION COST/BENEFIT QUOTIENT

- The overall cost/benefit quotient for implementation of this option cannot be quantified, but the overall cost is expected to go down slightly, and implementation of this option is estimated to reduce HC by 0.09% (0.07 tons/day), NO_X by 0.03% (0.05 tons/day), and CO by 0.11% (1.46 tons/day), for a total emissions reduction of 1.58 tons per day.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- There are no technology-related issues influencing implementation of this option. Since the OBD II fleet is increasing both as a percentage of the overall fleet and in number of vehicles, this option seems almost unavoidable as time progresses. As the number and percentage of vehicles requiring tailpipe tests decreases, it will become less profitable for the PIFs to purchase and maintain the test equipment, and therefore PIFs will be less likely to stay in the inspection program.

EASE OF IMPLEMENTATION

- This option would be easier than upgrading tailpipe test equipment in all the PIFs.
- Existing dynes can be used to run "readiness drive cycles".
- Some minor program design changes would be required, since the OBD-only stations would require less oversight and audit than the traditional PIFs.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Some motorists with older automobiles will be inconvenienced when they arrive at an OBD-only station and realize that they must go to a PIF station that offers the tailpipe test or a CIF for testing.
- Motorists with OBD II systems (newer cars) may be pleased with the change since an OBD II-only station may be quicker than a station that offers OBD II and tailpipe testing.
- PIFs that have already purchased the BAR 97 equipment to do tailpipe and OBD tests may resent this program change.
- The motorist will need some way to identify which facilities will continue to be OBD and tailpipe versus OBD only.

STATE IMPACTS

- There would be some reduction in oversight since OBD-only testing does not require as much oversight.
- OBD II enforcement can be done remotely if data is accessible.
- Implementation of this option should improve the overall program efficiency and increase test throughput for OBD II vehicles.
- At some point in the new program an outreach to the new car dealer network to entice their participation is necessary. Complicated electronic monitoring of on-board systems is becoming the norm on cars and increasing each year. The new car dealers are currently performing warranty repairs but have elected to not participate on a large scale in the ERF program. Lower cost of equipment to become an OBD PIF could result in a greater demand to participate. In order to avoid stretching auditing resources, an electronic audit protocol will need to be one component of the program.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Relates to I-3, VII-2, VII-4, and VII-6.

NETWORK DESIGN
REMOTE SELF-SERVICE-OBD II INSPECTIONS

MEASURE IDENTIFICATION CODE: V-9

DESCRIPTION

Oregon has adopted regulations that would allow “self-service” OBD II testing of vehicles. Part of this network change would allow motorists to conduct their own OBD II inspections at test kiosks designed for such self-service tests. Several contractors have developed prototype self-service kiosks to conduct OBD II inspections performed by either inspectors or the motorists themselves. In concept, such self-service OBD II inspections could be performed almost anywhere, (e.g., at gasoline stations and mini-marts), where adequate security and supervision is available. Under this option, private businesses (including both these types of examples as well as typical PIFs) would be licensed to establish such self-service testing kiosks. As an alternative, the State could build its own system of kiosks; however, utilizing existing facilities where motorists typically go on a regular basis (e.g., gas stations and grocery stores) may still be a valid option. Either the State or a contractor would remotely observe the inspections to ensure they are being properly performed.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Oregon: A self-service OBD II kiosk system is currently under development with three pilot locations in place.

AIR QUALITY IMPACT

- Implementation of this option can have a positive impact on air quality by encouraging off-cycle/more frequent inspections; however, there are no quantitative estimates of air quality impacts available. The Oregon program has not progressed beyond the current pilot status; therefore, air quality benefits have not been assessed.
- Any improvement in air quality is dependent on the success of kiosks with respect to fraud control and effective and timely repairs to vehicles that use the kiosks.
- There is a potential for abuse/fraud that can be minimized with cameras and data collection.

OVERALL OPERATING COST – Startup costs: $300,000 for software development, $20,000 for building retrofit, and $5,000 for security cameras. Overall cost could be revenue neutral.

- Since attendants are not necessary for the kiosk program, there would likely be a lower cost per test, provided maintenance costs do not exceed their expected low levels. This option could potentially be revenue neutral.
- The cost associated with implementation of this option is variable since it depends on the number of stations to be installed.
- Oregon has implemented three self-test 24-hour lanes. Existing buildings were reconfigured and set up with OBD II testing equipment for $20,000 each. Additional cost included $300,000 in software development for the overall system and $5,000 in cameras for security and audit purposes.
- Oregon currently does not charge users for use of the OBD II self-test. The only charge users incur is for the inspection sticker.

EMISSION COST/BENEFIT QUOTIENT

- Implementing an OBD II self-test kiosk network would have a positive impact on air quality, but the magnitude of the impact cannot be quantified at this time based on existing data. The cost of the program would depend on the size of the program. Emissions cost/benefit cannot be assessed.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Implementation of this option is practical with existing OBD II technology, but in order to test vehicles that are not OBD II compliant, the State must continue to provide tailpipe test equipment and infrastructure.
- This option is considered an addition to the program and therefore would not result in removal of OBD II test machines from the CIFs and PIFs.
- Several vendors have demonstration hardware and technology.
- This option would probably be dependent upon a transition from sticker based enforcement to registration denial.

EASE OF IMPLEMENTATION

- The State would likely need to grant licenses for self-service kiosks.
- Implementation of this option lends itself to a fully contractor-managed program. This option could be rolled out without interruption of current operations.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- With public outreach, motorists should appreciate the convenience of 24-hr self-service kiosks, but some concerns about privacy may be present due to cameras being present in the kiosks for the purposes of security and fraud control.
- The PIFs strongly opposed implementation of this option because they predict further reductions in business.

STATE IMPACTS

- State costs could be reduced with implementation of this option.
- Implementation of this option would provide the motorist with convenience, but puts a greater burden on fraud control oversight. Testing can either be free to the motorist or charged as part of registration fees for OBD II vehicles.

SAFETY IMPROVEMENT FACTOR

- Would require issues of safety/emission test cycle bifurcation to be settled before implementation.
- It would be necessary for the State to determine how old a vehicle can be before it must receive a safety inspection. Vehicle safety concerns would have to be addressed as part of implementation of a self-test kiosk network. The implication is that if a vehicle is allowed to self-test, safety concerns could be overlooked.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IV-1, VII-2, VII-3, VII-4, VII-20, X-1, X-3, and X-4.

NETWORK DESIGN
OBD III "WIRELESS" MOTORIST CHOICE OPTION

MEASURE IDENTIFICATION CODE: V-10

DESCRIPTION

California has pioneered the concept of OBD III, in which data from vehicle OBD II systems would be remotely communicated to a central database via a wireless communications system. CARB and the Bureau of Automotive Repair (BAR) and other states are currently conducting studies on commercial (taxicabs) and privately owned vehicles. Oregon is also incorporating what they call broadcast OBD as part of the regulations being adopted to allow on-road clean screening and "self-service" testing of vehicles. This type of network design is feasible but there are concerns regarding public acceptance of what might be viewed as a potentially intrusive monitoring system. Under this network design, motorists would be given the option of having their vehicle equipped with a transponder connected to the OBD II system in their vehicle and monitored remotely during either normal in-use operation (as envisioned in the California design and one option in the Oregon design) or during a drive-by of a monitoring station (the other option in the Oregon design). Motorists that do not choose this option would be required to report for normal periodic inspection at an established test station. Vehicles that are not repaired within some period of time after failing a remotely monitored OBD II test would also be required to come in for testing.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Several states are currently doing pilot/concept demonstration studies (California, Maryland, and New Jersey).
- Remote OBD III transponder technology is being examined by Oregon as a possibility for the near future.
- The idea of equipping vehicles with transponders to relay OBD information is consistent with emerging on-board technology. The technology is available to roll out a remote transponder OBD III program, but the concept has not been proven on the large scale.

AIR QUALITY IMPACT

- A remote OBD III transponder network creates a mechanism for frequent and directed OBD inspection and response to failure detection. Since vehicles would be required to obtain necessary repairs soon after vehicle problems occur, there would be off-cycle air quality benefits. In the current inspection system, a vehicle that experiences a problem with the emissions system soon after inspection would not be required to seek repair until the next time an inspection is required, which could be up to 2 years.
- There is some potential for tampering to provide false OBD pass results. In a program where vehicles equipped with transponders are only required to obtain inspections when a problem is reported remotely, some vehicles may not obtain necessary repairs, and therefore emit excess emissions over an extended period of time.
- Since no states have implemented a remote transponder OBD III program, there are no estimates of the air quality impact available, but assuming that tampering is controlled, the program has the potential to reduce emissions.
- Potential for abuse that can be minimized with data collection and restrictions on eligible vehicles.

OVERALL OPERATING COST – Possible reduction in overall program operating cost

- There are substantial upfront costs associated with building a monitoring network and providing transponders.
- The ongoing costs are expected to be lower than physical inspection.
- Since the ongoing costs are lower than the current program, the State could offer transponder installation at no cost for eligible vehicles, which would mean that the motorist would have no cost increase associated with this program, and the state would still save money in ongoing costs.
- Oregon has obtained approval from the legislature to begin to develop OBD III technology and $600,000 has been allotted for research and program initiation. Oregon has taken into consideration the use of continuous transponders and data storage devices to be installed in vehicles. The legislature has given approval only to continue research of the data storage devices. Oregon expects approval on the continuous transponder by the end of summer 2006. The new car dealer association has requested information about the program and wants to know if the can plan to sell the equipment pre-installed in new cars.

EMISSION COST/BENEFIT QUOTIENT

- There are substantial upfront costs associated with this option, as well as a positive air quality benefit. Ongoing costs are expected to be lower than the cost of the current program though. After the initial capital expenditure necessary to implement this network, it is expected that this program would save some money and reduce emissions.
- Any improvement could be offset by fraud if tampering exerts a substantial influence.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Implementation of this option is practical with OBD II.
- The state still must provide safety tests and tailpipe tests at conventional facilities.
- Technology is just reaching the development stage as far as state inspection networks are concerned.
- A remote OBD III program is not likely to be the primary means of inspection for several years. Adequacy of repairs and emissions of the older fleet that cannot be equipped with the transponders will determine overall fleet-wide emission inventory.
- This option would probably be dependent upon a transition from sticker based enforcement to registration denial.

EASE OF IMPLEMENTATION

- There would likely be a need to license OBD III contractors.
- This program would require substantial network design, data management infrastructure, oversight, and network development.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- The PIFs may be concerned about potential loss of business associated with inspections. Repair revenue should not change.
- Motorists should not object if the program voluntary in nature.

- Some motorists, PIFs, and AAA could have concerns about safety if not decoupled from safety inspections.

STATE IMPACTS

- State costs could be reduced in the long term, although an upfront capital expenditure would be required to create the network.
- There are considerable contract and network developing requirements associated with this option.
- For the foreseeable future this option will add to the complexity of the program since a significant extent of tailpipe, functional tests, and conventional OBD inspection will be needed to produce adequate emission reductions for the fleet.

SAFETY IMPROVEMENT FACTOR

- There is a need to determine how old a vehicle can be before it must receive a safety inspection.
- Once the safety test is bifurcated from the overall inspection then exemptions and inspection cycles must be determined.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- One implementation option would be to roll this measure out as an optional advisory-only test with only vehicles that are currently exempted from testing. This would eliminate any potential negative impact from bugs during the implementation phase and would not encroach on the existing inspection volume for PIFs.
- Related to IV-1 and VII-12.

NETWORK DESIGN
REMOTE SENSING CLEAN SCREENING

MEASURE IDENTIFICATION CODE: V-11

DESCRIPTION

Several states have used or are considering the use of remote sensing devices (RSD) for clean screen purposes (i.e., identifying vehicles that do not need to come in for their regularly scheduled periodic inspection). Oregon is also incorporating a remote sensing element as part of the regulations being adopted to allow on-road clean screening and "self-service" testing of vehicles. Under the Oregon design, vehicles would simply drive thru a designated RSD installation to have their emissions remotely measured and recorded. Other states have typically hired contractors to locate portable RSD systems alongside suitable roadways; however, California has recently contracted for the purchase of several unmanned remote sensing units from an RSD supplier. All of these options would be possible as part of a remote sensing clean screening network element in the New Jersey program. Remote sensing results could also be used in combination with low emissions weighting (LEW).

PROOF/DEMONSTRATION OF ALTERNATIVE

- Missouri residents volunteer for their "Rapid Screen" program for a fee of $24.
- California is in the process of contracting for the purchase of several unmanned remote sensing units from an RSD supplier.
- Oregon is in the design phase of a program to put installations in place to have emissions remotely measured and recorded.

AIR QUALITY IMPACT

- There is a negative effect on air quality since some vehicles that would normally fail an emissions test will be exempted (false pass). There will also be some vehicles that would normally pass an emissions test that would not be clean screened, but this would have no impact on air quality (false fail).
- Estimates of the air quality impact based on MOBILE 6 show that using remote sensing clean screening to exempt approximately 10% of vehicles from inspection will increase HC by 0.6% (0.4 tons/day), NO_X by 0.3% (0.5 tons/day), and CO by 0.6% (8.0 tons/day). This would result in a total annual emissions impact (increase) of 156 tons per year of HC, 183 tons per year of NO_X, and 2,903 tons of CO.
- Many vehicles with Malfunction Indicator Lights (MILs) on will get exempted through RSD technology.

OVERALL OPERATING COST - $6,921,000 annual program cost reduction due to reduced number of inspections, to be partially offset by implementation costs of the program.

- Based on a total annual number of initial inspections of approximately 1,630,612 CIFs plus 428,186 PIFs (2,058,798 initial inspections total based on 2004 inspection volume), a 10% reduction would reduce total number of annual inspections by 205,880. Since the CIFs conduct approximately 77% of the inspections, and the PIFs conduct approximately 23% of inspections, the CIF volume will decrease by approximately 158,528, and the PIF volume will decrease by 47,352. At a CIF inspection cost to the State of $27.89 (based on the average per inspection billed to NJ by Parsons), the State would save $4,421,000 annually. At the current PIF inspection cost of $69.83, the PIFs would lose $3,307,000 in revenue (minus $1.47 per inspection paid to MCI for VID).

- Based on projected fleet and costs in 2007, the number of initial inspections is 1,875,390 CIF and 476,170 PIF for a total of 2,351,560 annual inspections. A 10% reduction would reduce the total number of inspections by 187,539 CIF and 47,617 PIF inspections. At a CIF inspection cost to the State of $29.42, the State would save $5,520,000. At a projected cost of $72.73 per test at the PIFs, the PIFs would lose $1,401,000 in inspection revenue.
- In practice, the cost will be a function of the number of replicate tests required to exempt a vehicle. The cost of RSD may be about the same cost as a physical inspection.
- The cost of using RSD technology for clean screening in Missouri is estimated at $24 per vehicle. This expense is paid entirely by motorists who opt in the program and agree to the $24 fee. The State receives $3 of the $24 fee.
- If the State implements Clean Screen using RSD, then it is likely that the overall I/M program costs will decrease. This is based on estimation of total program cost reductions by adding the CIF savings of $5,520,000 annually to the state and motorist savings of $1,401,000 resulting from decreased PIF inspections for total program cost reductions of $6,921,000. The cost of implementing and running the RSD program would likely be much less than $6,921,000 based on information from other State programs.

EMISSION COST/BENEFIT QUOTIENT

- The cost/benefit quotient cannot be quantified since implementation of the option results in total annual emissions impact (increase) of 156 tons per year of HC, 183 tons per year of NO_X, and 2,903 tons of CO. Reduced inspections at the CIFs and PIFs would reduce the cost of the inspection program, but some capital expenditures would be necessary to establish a network for RSD. Also, motorists may be charged a fee for using the RSD to offset the cost to the state, in exchange for the convenience of clean screening. PIFs would lose some inspection revenue, but repair revenues would not change.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- The technology is in demonstration phase, and has not been entirely proven as practical within a state program context.
- Model year exemptions are one alternative to the use of RSDs. New Jersey currently exempts the newest four model years from obtaining inspections.

EASE OF IMPLEMENTATION

- This option can be difficult to explain to motorists.
- RSD is very equipment intensive. Sites must be carefully selected to insure that a sufficient quantity of vehicles are in the acceptable modes of operation while the test is being performed. Installations are sensitive to atmospheric influence, accidents and vandalism. Substantial data handling issues and timely record transmittal requirements must be included with program design.
- The number of inspections may not be reduced if safety inspections are still required.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Motorists may not easily grasp the state's intent in removing selected vehicles from emissions inspection requirements, especially if they must appear for safety inspections regardless.
- The inspection industry is likely to object to the loss in the physically testable fleet volume.
- There are concerns about effectiveness from all groups except the equipment vendor.

STATE IMPACTS

- Implementation of this option can be complicated.
- There is a substantial initial investment, network design, stakeholder education and program design requirements.
- There is a possible political backlash from the repair industry and environmental interest groups.
- One ancillary benefit may be to monitor license plate numbers of vehicles that are not currently registered.

SAFETY IMPROVEMENT FACTOR

- As with similar options, there are potential problems associated with vehicle safety if this option is implemented without first bifurcating the safety and emissions test programs.
- This option would require issues of safety/emission test cycle bifurcation to be settled before implementation.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Relates to III-2, IV-1, IV-2, IV-5, V-12, X-1, X-4, and XI-2.

MEASURE IDENTIFICATION CODE: V-12

DESCRIPTION

Remote sensing (RSD) technology can be used to identify dirty, high emitting vehicles. Under this option, vehicles identified as high emitters could be subjected to several alternative requirements such as: (a) special notices could be sent requiring them to report for off-cycle testing at designated test only stations; (b) they could be required to go to test-only stations for their normally scheduled tests; or (c) the remote sensing measurements could be considered as part of the High Emissions Weighting identification described in Option V-7. An RSD installation used for this purpose could also provide Clean Screening capabilities as described in Option V-11.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Texas has a program in place to identify dirty vehicles using RSD.
- A program to identify dirty vehicles using RSD is planned for implementation in Virginia.

AIR QUALITY IMPACT

- Emissions benefits would increase proportionate to the increased rate of identification of dirty vehicles. Off-cycle inspections of identified high emitting vehicles would result in additional repairs and emission reductions.
- Estimates of the air quality impact based on MOBILE6 show that using remote sensing to assist in pinpointing potential high-emitters will reduce HC emissions by 0.46% (0.34 tons/day), NO_X emissions by 0.37% (0.71 tons/day), and CO emissions by 0.65% (8.7 tons/day). This would result in a total emissions reduction of 124 tons per year of HC, 259 tons per year of NO_X, and 3,176 tons of CO. This estimate assumes that continuous OBD II monitoring (OBD III Motorist Choice Option) is not done.

OVERALL OPERATING COST - $8,984,000 annual program cost

- There are substantial upfront costs associated with this program since the RSD equipment would be required for implementation.
- A study was conducted in the Denver Metropolitan Area by the Regional Air Quality Council. In their report dated January 6, 2000, they determined that the testing and administrative costs of implementing a stand-alone high emitter program with confirmatory testing of vehicles that fail the remote test would cost approximately $13,600,000 per year. This estimate is based upon the remote sensing infrastructure necessary to evaluate 80% of the total fleet. The number of vehicles in the total fleet is not included in the report, but the number of vehicles required to get an additional emissions test would be around 7000, of which approximately 3,300 of these vehicles are expected to fail the physical emissions inspection. The total estimate includes $6.5 million dollars for the remote sensing infrastructure, $2 million for remote sensing administrative costs, $3.2 million for confirmatory testing, and $1.9 million for confirmatory testing administrative costs. For the purposes of estimating the cost to New Jersey, we ignored Denver’s estimates of the cost of conducting confirmatory testing and

associated administration, and then figure the cost of the additional tests separately. Therefore, the cost of the infrastructure and remote sensing administrative total approximately $8.5 million.

- According to the Denver area estimate, a high emitter element added to the clean screen program would result in an additional 7,000 physical inspections annually, with 3,300 of these vehicles failing the test. According to the "Air Care Colorado" program, approximately 1,000,000 vehicles are tested annually, so the increase of 7,000 inspections represents a 0.7% increase. If the same percentage increase is applied to the 2007 CIF + PIF projected initial inspection volume of 2,351,560 annual inspections, the increase in vehicle inspections would be approximately 16,461 annually. At a projected 2007 program cost of $29.42 per inspection at the CIFs the program cost increase would be approximately $484,000 annually to the State.
- The cost of implementing this option assumes that vehicles would be directed to a CIF for testing. Thus, the total cost of conducting the RSD program plus the cost of additional vehicles going to the CIFs for additional emissions inspection. This total cost is approximately $8,500,000 + $484,000 = $8,984,000 annually. Much of the costing of this option is based on information from other State's experience. Adjustments for various program options and inflation add uncertainty to this estimate.
- The Denver report estimated that infrastructure costs could be reduced from $6.5 million to $5.9 million if clean screening is used in combination with the identification of dirty vehicles. The reason for this is that motorists would be more likely to seek out a RSD station to be clean screened; therefore, the network could consist of slightly fewer stations.
- The financial impact to PIFs is considered to be small, since many of the vehicles screened for high emissions will end up at the PIFs for repairs, therefore the loss in revenue to the PIFs should be small.

EMISSION COST/BENEFIT QUOTIENT

- At an approximate cost of $8,984,000 per year, and emissions reductions of 124 tons per year of HC, 259 tons per year of NO_X, and 3,176 tons of CO, the cost/benefit quotient for this option is $72,000 per ton of HC, $35,000 per ton of NO_X, and $2,800 per ton of CO.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- A certain number of false fails are inherent with the RSD system.

EASE OF IMPLEMENTATION

- RSD is very equipment intensive. Sites must be carefully selected to insure that sufficient quantities of vehicles are in the acceptable modes of operation while the test is being performed. Installations are sensitive to atmospheric influence, accidents and vandalism. Substantial data handling issues and timely record transmittal requirements must be included with program design.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Implementation of this option may evoke harsh criticism if false failures are reported to the media by motorists.
- With sufficient outreach, the inspection/repair industry may be supportive as long as failing vehicles are directed to have a physical inspection to confirm failure.

- PIFs might be concerned about a reduction in their testing business, but there would be no impact on their repair revenue.
- Many stakeholders would be concerned about the effectiveness/accuracy of the equipment to be used.

STATE IMPACTS

- Implementation of this option adds to the cost and complexity of the existing program. Substantial initial investment, network design, stakeholder education and program design requirements would all be necessary. One ancillary benefit may be to monitor license plate numbers of vehicles that are not currently registered.
- Dealing with motorists that experience false fails would be a challenge, especially if they were widespread.

SAFETY IMPROVEMENT FACTOR

- There may be slight improvement if older or higher mileage vehicles previously avoiding inspections are identified, especially if dirty vehicles are subject to a mandatory safety inspection.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IV-2, IV-5, V-6, V-7, V-11, VII-10, VII-11, VII-12, VII-15, VII-16, and VII-17.

NETWORK DESIGN
EQUALIZE INSPECTION FEES

MEASURE IDENTIFICATION CODE: V-13

DESCRIPTION

An ongoing source of contention with the PIFs in New Jersey is the higher than expected fraction of vehicles going to the CIFs for inspections. A key reason for this is the disparity in inspection fees between the two networks (tests are free to the motorist at the CIFs and must be paid for at the PIFs). One approach to resolve this issue, as previously discussed under Option V-16, is to guarantee a certain level of PIF test volumes rather than change the existing fee structure. Another approach is to regulate the PIF test fee and directly reimburse PIFs up to that maximum amount. A third approach is to credit PIFs the same amount as a CIF inspection with the issuance of an inspection voucher, based on credit for registration fees charged for this specific purpose that could be used at either CIFs or PIFs. In any case the current registration fee structure as it applies to inspections would be reevaluated.

Under this option, inspection fees would be either discounted or eliminated at the PIFs by having the State reimburse the PIFs equivalent with the CIF cost per inspection.

PROOF/DEMONSTRATION OF ALTERNATIVE

- There is no known precedent in a private inspection program.
- This option is only done in centralized programs.

AIR QUALITY IMPACT

- Any impacts on air quality are considered to be small, but non-quantifiable.

OVERALL OPERATING COST – State cost would increase by $23,978,000 at $50 PIF reimbursement

- The scenario of increasing PIF test volumes by requiring all reinspections at PIFs is discussed in Option V-16.
- If fees were regulated and directly reimbursed to PIFs, this option would decrease costs to motorists but would increase costs to the State. In this scenario, the State would be paying for all inspections instead of the ~77% (Reference: NJ MVC 12/06/05) going to CIFs currently. Since it would be impractical to reimburse PIFs with no limit in inspection fees, it must be assumed that if PIFs are to be reimbursed for the full cost of the test, the test fee must be limited to a reasonable level.
- In a third scenario of issuing vouchers based on existing registration revenues, fees may be set to make the program revenue neutral. Motorists' costs are reduced while PIFs benefit from increased volumes. CIFs would lose some amount of revenue that is proportionate to the increased rate of PIF tests.
- By reducing PIF fees to motorists, the number of PIF inspections would increase.

- In the regulated fee reimbursement scenario, at a reimbursement level of $50 per test for example, and an increased PIF inspection volume of 12% (.12 X 428,186 = 51,382 additional inspections), the increase in program cost to the State would be the number of PIF inspections X $50. In 2004, there were 428,186 initial PIF inspections. Addition of 51,382 inspections brings the total PIF inspections to 479,568. The cost of these inspections to the State would be $23,978,000.
- An additional benefit of this measure would be the load leveling influence such as with an appointment system that has the potential to minimize the need for additional inspection facilities or even allow existing facilities to be closed.
- The impact of this option would depend on the fee structure agreed on between the State and the PIFs. There would be no reason to adjust the current fee structure at the CIFs; however the CIF contractor may be unsatisfied with any negotiations between the State and the PIFs, especially if the negotiated PIF rate ends up being higher than the CIF inspection rate. A scenario where the PIF inspection ends up being set at a higher cost than CIF inspection is likely. In addition to this potential problem, the PIFs are likely to be unsatisfied with having to negotiate their rate and end up being paid a significantly lower rate than they charge currently.
- If the amount reimbursed by the State to the PIF is less than the amount currently charged by the PIFs, an average initial inspection cost of $69.83, then the overall program cost will decrease (although the State cost will still increase).

EMISSION COST/BENEFIT QUOTIENT

- If PIFs received a given market share regardless of test outcome there may be less potential for fraud, therefore improving emissions benefits. The overall program cost is likely to decrease with implementation of this plan, although cost to the State would increase.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Not applicable.

EASE OF IMPLEMENTATION

- Setting up an efficient payment mechanism could be difficult.
- The primary burden of implementation of this option would be on finance.
- Other concerns would be outreach to motorists, enforcement at PIFs, and record keeping.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- PIFs will resist standardization of fees but will support payments from state funds and the increase in business that will result from eliminating the fee to motorists.
- CIF contractors may strongly oppose.
- Motorists that prefer PIF inspection will be strongly supportive because of the elimination of direct costs to them.
- Motorists that prefer CIF inspections are likely to be neutral, and possibly supportive since it will result in load leveling that would reduce their wait times.

STATE IMPACTS

- At least one version of this option would increase costs to the State, but likely reduce overall program costs.

- Standardization of the fee structure for PIFs will be a difficult undertaking.
- Implementation would entail more complex record keeping and auditing practices.

SAFETY IMPROVEMENT FACTOR

- Any impacts to safety are not quantifiable until implemented, but assumed to be small.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- One variation that may greatly improve the chance of acceptance by PIFs is that the state supplement PIF fees rather than regulate the final fee to motorists. If market forces prevail motorists will automatically choose PIFs that accept the state supplement with the least additional cost to motorists.
- Related to V-1, V-2, V-3, V-4, V-14, V-15, V-16, and X-4.

NETWORK DESIGN
IMPOSE CIF INSPECTION FEES

MEASURE IDENTIFICATION CODE: V-14

DESCRIPTION

Under this option, inspection fees equal to the current average PIF fee of $77 per inspection would be imposed at the CIFs to address current PIF concerns regarding the relatively high fraction of vehicles that are going to the CIFs for inspections. A variation of this option may include the issuance of an inspection voucher, based on credit for registration fees charged for this specific purpose that could be used at either CIFs or PIFs. In any case the current registration fee structure as it applies to inspections would be reevaluated.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Most centralized programs with the exception of Illinois currently assess fees for inspection.

AIR QUALITY IMPACT

- The air quality impact may be negative (i.e. an increase in emissions), if more motorists avoid inspections due to cost, but the estimate is unquantifiable.

OVERALL OPERATING COST - $137,000,000 program cost at $72.73 fee.

- Currently, the CIFs conduct 2,215,557 tests annually, and the PIFs conduct 663,756 tests annually. The CIF tests are available at no direct cost to the motorist other than fees assessed for vehicle registration for this purpose. The PIFs charge an initial inspection fee of around $69.83 per vehicle. Determination of CIF fees would have a direct impact on motorists' election of CIF or PIF testing. CIF fees would probably not have to be equal to average PIF fees in order for some redirection of vehicles from CIFs to PIFs to take place. Since there are 1,327 PIFs in New Jersey, and 31 CIFs, it is likely that significantly more motorists will go to the PIFs instead of the CIFs if test costs are equal. The testing volume would shift possibly from 2,215,557 CIF tests to 2,215,557 PIF tests, and the remaining 663,756 tests completed at the CIFs. It is expected that many motorists would continue to prefer CIFs if that is what they are accustomed to or if they have concerns for PIF accuracy or integrity.
- The cost to the motorist would be the new charge that would be incurred by the 2,215,557 inspections that were previously free. The PIFs would generate additional revenue depending on how many additional emissions inspections were conducting. Assuming that they increase from the current 428,186 initial annual inspections to 1,630,612 annual inspections (only count initial inspections with PIFs since they do not charge for reinspections) annually their revenue increase would total the 1,202,426 additional inspections, or $84,000,000 if the current inspection fee of $69.83 per initial inspection. The actual inspection cost would depend on competitive market influences. At a CIF inspection fee of $69.83, the cost to the motorist at CIFs would be $69.83 X 663,756 = $46,000,000. Total program cost would be $130,000,000. If this amount is adjusted for inflation from 2005 to 2007 using 1.027 annual adjustment factor, the total program cost will be approximately $137,000,000.

- The cost of the program would depend on the fee. Since the I/M program is shifting towards OBD tests, the program costs are likely to go down, which means that fees can likely be adjusted downward.
- One additional variation would be to set the CIF fee at a lower level than the current average PIF fee and let competitive open market forces prevail without attempting to regulate PIF fees. This would likely result in an overall lowering of PIF fees by shops who wish to be competitive with CIFs.
- The program cost to the State would be subject to re-allocation of state funds currently collected for CIF operation.

EMISSION COST/BENEFIT QUOTIENT

- The emission impact is unquantifiable but would most likely be negative because a higher number of motorists would avoid inspections. Fines could be increased to encourage motorists to get their vehicles inspected, but this would be an additional action that would be perceived poorly by the public.
- The cost to the motorist would increase greatly with implementation of this option.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- There is plenty of precedent in other state programs. The main difficulty would be motorist reaction based on the long historical precedent in NJ.

EASE OF IMPLEMENTATION

- Collection and handling of payments at CIFs would require changes to the CIF contract, infrastructure, financial auditing, training, and personnel.
- There is significant transition planning including public outreach to prepare motorists.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- The CIF contractor may not be amenable with appropriate contractual agreements since this change would significantly reduce the number of CIF inspections and contractor profit.
- The PIFs would be highly supportive of the improved competitive basis depending on what price the state sets for the inspection.
- The inspection cost set by the state would greatly determine whether the PIFs would be satisfied with the change, as well as whether the motorists would perceive the program change as negative or positive.
- The motorists may be strongly opposed unless the costs are rebated by the state from registration/titling fees.
- There is a greater impact to the poor than the wealthy with implementation of this option.

STATE IMPACTS

- Implementation of this option would require significant modifications to re-distribution of funds, cost-accounting, auditing, public outreach, etc.
- The long term impact may be favorable by leveling the flow of vehicles during peak periods between PIFs and CIF since cost penalties for using PIFs is reduced or eliminated.
- The state would have greater influence over average PIF fees whether directly regulated or subject to improved competitive market forces with CIFs.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IV-5, V-5, V-13, and V-15.

MEASURE IDENTIFICATION CODE: V-15

DESCRIPTION

Under this option, inspection fees would only be charged for retests at PIFs. The objective of this approach would be to equalize PIF and CIF inspection fees for all but the small fraction of failing vehicles, thereby seeking to address current PIF concerns regarding the relatively high fraction of vehicles that are going to the CIFs for inspections. Another alternative would be to also charge for retests at the CIFs.

PROOF/DEMONSTRATION OF ALTERNATIVE

- None.

AIR QUALITY IMPACT

- Not quantifiable. There could possibly be a negative influence (i.e., higher emissions) if re-inspection costs become an additional reason for motorist to avoid re-inspection.
- There may be a greater incentive for fraud during the initial tests to avoid paying the reinspection fee for failures. An increase in fraud would decrease air quality benefits.

OVERALL OPERATING COST

- Subject to other program design features such as whether or not a portion of registration fees will continue to contribute to MVIS funding.

EMISSION COST/BENEFIT QUOTIENT

- If cost for retest contributes to motorist avoidance of repairs and retest after initial failure, emission cost/benefit ratio would deteriorate proportionately.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Not an emissions reduction technology.

EASE OF IMPLEMENTATION

- Some additional program complexity would be introduced if retests are not permitted at CIFs because shops may be incentivized to fail vehicles in order to receive a retest fee. The same shop that may falsely fail a vehicle could easily pretend the repairs were effective when vehicle passes the retest. Puts a much greater burden on fraud detection and repair proficiency auditing if independent CIF re-inspection is no longer an option.
- On the other hand, if CIFs must begin charging for re-inspection, handling cash at CIF facilities is unprecedented and would create new infrastructure, training and public awareness challenges.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- This option may increase the potential for false fails, so motorists may object.
- PIFs may object to giving free inspections if the same customer does not return to their shop for re-inspection unless the State was to supplement that cost.

- Motorist may support this if it means they get a free inspection as long as they do not fail.
- Organizations representing low income and disadvantaged persons may protest their constituencies being subject to financing a disproportionate share of the program since their older vehicles are known to represent a much higher proportion of total initial failures and subsequent retest costs.

STATE IMPACTS

- More difficult to manage if fees must be accepted by CIFs and additional financial controls and adjustments to registration fees must be developed and communicated to the public.
- There may be an issue with shops falsely failing vehicles to capture additional re-inspection fees.
- Significant training, accounting, auditing and public awareness efforts would be required.
- Issues and concerns may arise regarding likely adverse reaction from special interest groups representing economic justice for certain classes of motorists.

SAFETY IMPROVEMENT FACTOR

- There would be a greater incentive for PIFs to fail vehicles may cause slight improvement.
- There could be a possible slightly negative influence if re-inspection costs become an additional reason for motorist to avoid re-inspection.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IV-4, IV-5, V-1, V-3, V-4, V-5, V-13, V-14, V-16, IX-11, and X-4.

NETWORK DESIGN
PIF-ONLY REINSPECTIONS

MEASURE IDENTIFICATION CODE: V-16

DESCRIPTION

All reinspections must be done at a PIF/ERF. Currently the motorist has the option of using a PIF or a CIF for reinspections. There is no charge to the motorist at the CIF, and currently PIFs are not supplied with any pricing guidelines. Generally, PIFs in New Jersey do not charge for reinspections, provided they perform the repair work.

PROOF/DEMONSTRATION OF ALTERNATIVE

- This option is not done in any other I/M program. California requires gross polluters to be retested at private Gold Shield, Test-Only or State-run Referee stations, but the majority of failures can be retested anywhere.

AIR QUALITY IMPACT

- Implementation of this option may increase tendency for PIFs to falsely pass a vehicle they have repaired. This would contribute to a negative air quality impact compared to more impartial reinspection.
- Based on MOBILE6 modeling and observed enforcement levels in PIFs, requiring all inspections to occur at PIFs is estimated to increase HC by 0.9% (0.7 tons/day), NO_X by 0.5% (0.9 tons/day) and CO by 1.2% (16.4 tons/day). The total emissions impact (increase) is approximately 256 tons of HC, 329 tons of NO_X, and 5,990 tons of CO.

OVERALL OPERATING COST – $23,000,000 reduction in State costs annually. Variable increase in motorists cost depending on PIF inspection cost. Program costs would probably increase.

- Implementation of this option could lower the state's CIF inspection costs but increase the overall costs to motorists depending upon allocation of state funds already designated for CIF inspection.
- According to NJ MVC, in 2004, 176,872 vehicles failed the emissions inspection at the CIFs and 63,195 vehicles failed their emissions inspection at the PIFs.
- The CIFs currently conduct approximately 2,215,557 tests annually which includes a re-test volume of 584,945 retests resulting from CIF failures. The PIF volume would increase from 663,756 tests in 2004 to 1,248,701 tests annually, while CIF volume would drop correspondingly by 663,756.
- In the current program, approximately 15% of the vehicles that fail at the PIF are retested at the CIF. This means that 35,335 retests that would normally have gone to the CIF will now get their retest done at a PIF.
- If 699,091 vehicles are reinspected by PIFs, the State would save approximately $19,500,000.
- The increase in PIF revenue would be approximately $48,800,000 based on PIF inspection cost of $69.83 per vehicle from comments received by NJ MVC on 11/08/05. This assumes that there would be a charge for each test (initial and reinspection), since the PIFs could not be expected to complete the test for free.

- The overall increase in the motorist inspection cost would be $48,800,000. Some of this increase could be offset if the $19,500,000 in State savings were used to provide some benefit for vehicles subject to inspection, such as low income repair assistance.
- Based on the 2007 fleet with an overall increase in inspections of 14.1% over 2004, and projected inspection cost of $29.42, the State would save approximately $23,000,000.
- Based on the 2007 fleet with an overall increase in inspections of 14.1% over 2004, and projected inspection cost of $72.73 per inspection, the increase in motorist inspection cost would be $58,000,000 at the PIFs.

EMISSION COST/BENEFIT QUOTIENT

- The potential $23,000,000 cost savings to the State would be offset by an increase in emissions of 256 tons of HC, 329 tons of NO_X, and 5,990 tons per year of CO.
- Although requiring reinspections at the PIFs would save the State an additional $23,000,000, there could be a net program cost increase.
- It is difficult to quantify all aspects of this option since PIF inspections are often free to the motorist as long as repairs are completed at the PIF.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Implementation of this option requires that PIFs have tailpipe and OBD test capability.

EASE OF IMPLEMENTATION

- Implementation of this option would be complicated because it creates a new inspection facility class.
- This option would be extremely burdensome if PIFs were required to purchase additional equipment to maintain parity with original CIF inspection procedures.
- The PIFs would be rewarded for obtaining the new equipment with increased inspection volume and repair revenues.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- The ERFs may object to implementation of this option.
- Environmental groups may object due to the negative emissions impact.
- Motorist may object over fears of false fails by PIFs trying to increase repair work.
- PIFs are likely to be supportive.
- Objections and impacts to low income and disadvantaged motorists are likely.

STATE IMPACTS

- Implementation of this option increases the enforcement and auditing burden.
- Substantial public awareness and a technician training initiative would be required for successful implementation.
- Implementation of this option would increase oversight costs to the State.

SAFETY IMPROVEMENT FACTOR

- Any potential impacts to safety are non-quantifiable based on existing data.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-3, IV-5, V-1, V-2, V-3, V-4, V-5, V-8, and V-15.

NETWORK DESIGN
EVALUATE AND OPTIMIZE PRESENT CIF APPOINTMENT SYSTEM

MEASURE IDENTIFICATION CODE: V-17

DESCRIPTION

CIF utilization issues need to be addressed as the size and characteristics of the fleet evolve. Consistent with good management practices peak demand periods must be accommodated without causing unacceptable wait times, while avoiding excessive infrastructure costs at facilities with only modest average yearly volumes. The current CIF contractor has indicated that the present appointment system is serving to shave peak loads while enhancing motorist convenience at some CIFs. Potential improvements include incentives to encourage people to book appointments and more flexible ways to book appointments (e.g. allow last minute appointments on a capacity available basis). Improving the CIF appointment system could reduce overall system cost because less excess capacity will be needed to handle peak loads.

As the NJ fleet grows, such load optimization may have the potential to ultimately avoid construction of new facilities while still providing at least the same level of service to motorists. This option involves consideration of whether the present appointment-based system at CIFs is adequate or should be expanded as a means of improving overall CIF utilization and avoiding unnecessary future infrastructure expense.

PROOF/DEMONSTRATION OF ALTERNATIVE

- The Wisconsin centralized program includes a provision for their contractor, ESP, to operate Technical Assistance Centers on an appointment basis as discussed in Option IX-18.

AIR QUALITY IMPACT

- If motorist convenience is improved, inspection avoidance may be reduced for a slight improvement in emissions benefit.

OVERALL OPERATING COST

- This option could lower some costs through better facility utilization, but is unlikely to change State costs under the current CIF contract.

EMISSION COST/BENEFIT QUOTIENT

- No measurable impact is expected.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- This is an existing program element that could be increased to provide additional load-leveling at the CIFs and motorist convenience.

EASE OF IMPLEMENTATION

- A pilot study to investigate potential improvements could be initiated by obtaining feedback from the CIF contractor and motorists as well as examining station records to evaluate improvements in lane utilization.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- The CIF would be highly supportive and cooperative, since increases in efficiency would help to reduce costs to the CIF contractor.
- Motorists are supportive of the current program, and would be in support of any measures that would increase convenience without increasing costs.
- Any improvements that make the CIFs more attractive to the motorist is likely to reduce PIF inspection volume, so the PIFs would likely oppose any increases in CIF convenience.

STATE IMPACTS

- Increasing efforts to make the CIFs more efficient would increase facilities utilization, and therefore lower costs, but is unlikely to change State costs under the current CIF contract.
- There are no known negative impacts to the State.

SAFETY IMPROVEMENT FACTOR

- There would be little impact, if any, on safety.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to: I-1, I-2, III-5, IV-5, and X-4

MEASURE IDENTIFICATION CODE: V-18

DESCRIPTION

This option involves review of the adequacy of the current roadside inspection program to meet overall compliance objectives for EPA-mandated program evaluation and mitigate any deficits created by future program changes such as increased exemption for the newest or oldest vehicles.

The present program design calls for sticker removal upon failure and immediate reinspection at a PIF or CIF before a new sticker can be issued. One possible variation would be for the roadside team to issue a failure sticker to better insure the vehicle is presented for repairs rather than other means of circumventing the inspection process. If registration denial is implemented the same effect could be achieved without any sticker handling at all.

The State may wish to consider means by which they would take SIP credit for identifying high polluting vehicles in roadside inspections. MACTEC considered two options for doing this: (1) claim credit for vehicles failing current roadside tests and (2) use Remote Sensing Devices (RSD) to allow New Jersey to select vehicles that are likely high emitters.

PROOF/DEMONSTRATION OF ALTERNATIVE

- New Jersey currently performs extensive roadside inspections including tailpipe tests using trailer mounted mobile test systems, so they have already dealt with logistics.
- The California BAR performs extensive roadside inspections, with and without using RSD to identify vehicles. BAR finds that over 80% of the vehicles with high RSD emission levels fail the roadside inspection that immediately follows.

AIR QUALITY IMPACT

- Expansion of roadside inspections would have a positive impact on air quality based upon the increased identification of “missing” vehicles, especially gross polluters, and vehicles with fraudulent stickers. Expansion of the current program could also help mitigate losses from vehicles otherwise exempted from inspections and to validate a small percentage of remote sensing results and emission profiling results.
- The State currently fails approximately 2,000 vehicles per year through Mobile Inspection Team (MIT) inspections (2005 data from MIT). Based on this information from MIT and assuming that the 2,000 vehicles are repaired, estimated potential SIP credit for the existing program that is not being taken is 51 tons HC, 25 tons NO_X, and 729 tons CO per year. This calculation is based on 2,000 failed vehicles with an average annual 12,000 miles per vehicle. Repairing the vehicles is assumed to reduce HC by 1.93 g/mi, NO_X by 0.95 g/mi, and CO by 27.59g/mi based on New Jersey ASM data converted to g/mi.
- The emission reductions from roadside inspections could more than double if RSD vans were set-up just before the MITs. Assuming emission reductions double, this option is estimated to reduce emissions by 102 tons HC, 50 tons NO_X, and 1,458 tons CO per year.

OVERALL OPERATING COST - $250,000 per year for an additional manned RSD van.

- Existing MIT program cost is unknown.
- A manned RSD van will cost approximately $250,000 per year. It is likely that the RSD van will be used for other purposes.

EMISSION COST/BENEFIT QUOTIENT

- The cost/benefit quotient may be neutral or favorable based on the proportion of gross polluting vehicles identified.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- The roadside check program has already proven in California and New Jersey.

EASE OF IMPLEMENTATION

- Expanding this program would be fairly easy. If additional funds are available, the only requirements would be to hire qualified technicians to conduct the inspections and provide them with the necessary equipment.
- Additional human resource and training requirements may be necessary to ensure that data is correctly conveyed to the VID in a timely manner so that vehicles appearing for inspection after repairs are handled efficiently.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Expanding the roadside inspection program would have little impact on PIFs and CIFs.
- The PIF/ERFs may notice a slight increase in vehicles showing up to obtain needed repairs.
- Motorists may object to the increased number of roadside pullovers.

STATE IMPACTS

- An increase human resources would be necessary for attendant oversight and training costs.
- Some data handling improvement is advisable so that vehicles appearing for inspection after repairs are handled efficiently.

SAFETY IMPROVEMENT FACTOR

- There would be some increases in safety since expansion of roadside inspections would identify vehicles that had previously avoiding inspections.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to III-1, III-2, IV-1, IV-2, IV-3, IV-5, V-11, V-12, and VII-12.

STATION PERFORMANCE
AUTOMATIC INSPECTION TRIGGER ANALYSIS

MEASURE IDENTIFICATION CODE: VI-1

DESCRIPTION

Under this option, the State would implement automatic trigger analysis of inspection results that is designed to prevent and/or detect improper testing. Specific trigger elements could include:

a. Onboard diagnostic (OBD) triggers (i.e., on the test systems) can be designed to totally prevent certain types of test fraud. An example of this type of trigger is to reject any inspection record for which key parameters are inconsistent with more complex OBD II system characteristics, such as protocol type and PID count that can be determined in advance by decoding the Vehicle Identification Number.

b. Post-test triggers that are periodically run (e.g., each month) either on the VID or a separate database that is populated from the VID. These triggers would be designed to identify and flag stations that appear to be conducting fraudulent tests for further enforcement action or covert auditing.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Automatic inspection trigger analysis has been demonstrated in many I/M programs including California, Connecticut, Louisiana, and Georgia.

AIR QUALITY IMPACT

- The air quality impact is positive, especially with respect to PIFs.
- Modeling of the implementation of automatic inspection trigger analysis assumes that OBD effectiveness at PIFs is increased from 96% to 99%. This is estimated to reduce HC by 0.07% (0.06 tons/day), NO_X by 0.05% (0.09 tons/day), and CO by 0.10% (1.39 tons/day), for a total emissions reduction of 1.54 tons per day.

OVERALL OPERATING COST - $250,000 for software plus $125,000 for personnel

- Trigger and artificial intelligence software costs are as much as $250,000 plus an annual data update fee (Banalogic quote obtained by NJ DOT December, 2005). One to two additional record auditors may be needed. The additional cost for two additional record auditors is $125,000 per year.

EMISSION COST/BENEFIT QUOTIENT

- The air quality impact (reduction of emissions) of the inspection trigger analysis is 22 tons/year HC, 33 tons/year NO_X, and 507 tons/year CO. Based on an annual cost of $375,000 per year, the cost benefit quotient is $17,000/ton of HC reduction $11,300/ton of NO_X reduction, and $740/ton of CO reduction.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Automatic inspection trigger analysis is compatible with OBD II.

EASE OF IMPLEMENTATION

- Implementation of this option involves the installation of a software package to conduct analysis of data that is already being collected.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Environmental groups will like this analysis if the function of the software is explained.
- The PIFs may have some concerns, but since the function of the software is to detect fraud, there should be no reason for objection from PIFs that are operating properly.

STATE IMPACTS

- Software development or purchase costs plus support costs would impact the state.
- There may be a slight increase in staff requirements necessary to analyze data and initiate responses to potential fraud that is picked up by the software.

SAFETY IMPROVEMENT FACTOR

- There would be a slight improvement in safety, associated with the increased perception of oversight. Even though safety would not be included as part of an automatic trigger analysis, the increased oversight would have an effect on fraud and testing quality.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Not applicable.

MEASURE IDENTIFICATION CODE: VI-2

DESCRIPTION

Under this option, video surveillance systems would be installed on either a network-wide basis or at selected inspection stations that were previously identified as problem performers. Inspections performed at the stations would be either monitored online, or recorded and reviewed after inspections.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Video surveillance of inspection stations has been moderately effective in Connecticut. Data triggers are easier and almost as effective for OBD II tests.
- Mexico City (Federal District of Mexico), makes extensive use of video surveillance in its ESP centralized program for fraud prevention. Recordings are transported at the end of each day to Federal offices.

AIR QUALITY IMPACT

- For modeling purposes it was assumed that automatic inspection triggers and video surveillance raise the OBD effectiveness in PIFs from 96% to 99%. The modeling results represent an upper limit for what could be expected from video surveillance. The estimated emissions impact for this option based on modeling is a 0.07% reduction in HC (0.06 tons/day), a 0.05% reduction in NO_X (0.09 tons/day), and a 0.10% reduction in CO (1.4 tons/day).
- The extent that fraud can be deterred is subject to adequate monitoring and enforcement of the results obtained through inspection triggers and video surveillance.

OVERALL OPERATING COST – Total estimated cost of $2,043,000 per year

- There would be a cost increase for video equipment and personnel to monitor the video equipment.
- Oregon estimated that video surveillance equipment for their self-service OBD II inspection stations would cost approximately $5,000 per station. This was based on equipping approximately 1-10 inspection stations with cameras. Under this option, it is expected that New Jersey would be installing cameras at many more than 10 inspection stations. There would likely be some discounts on the surveillance equipment if purchased in large quantities. In addition, self-service OBD II inspection stations would have more cameras installed for the purpose of protection from vandalism. There would be no need to install these additional cameras as part of this option. Therefore the cost to install cameras for fraud coverage only would be less than $5,000 per station in New Jersey.
- Assuming installation of video surveillance equipment at 1,327 PIFs at an average cost of $2,500 per station (assumed based on volume discount and differences in New Jersey program as discussed earlier), the initial capital cost of this option would be approximately $3,300,000. Amortizing the cost over a five year period yields an annual cost of the video equipment of $660,000 per year.

- The ongoing cost of personnel to review video would be dependent on how much video needs to be reviewed, which is proportional to the number of stations equipped with monitoring equipment. There are 1,327 PIFs in New Jersey (Reference: NJ MVC 12/06/05). The initial and ongoing costs resulting from this option are dependent on the number of stations equipped with video cameras. Assuming that each PIF is open to business at least 40 hours per week, 40 hours of video would be available for review. Even with fast-forwarding, a thorough review of the video would be labor intensive. Assuming that each station records 40 hours of video per week and the 40 hour video requires 1 hour of review and follow-up by a trained inspection technician at an estimated hourly rate of $15 per hour (hourly rate based on the NJ MVC estimate that lane technician salary is $30,501 (from "Estimated Costs to Operate the Enhanced Vehicle Inspection Program and Transition Plan"), the annual cost of reviewing all the video would be approximately $1,040,000 plus 33% for fringe = $1,383,000
- The total cost of this option including equipment and personnel would be approximately $2,043,000 per year.

EMISSION COST/BENEFIT QUOTIENT

- Using the assumptions stated as part of the air quality impact analysis, HC emissions would be reduced by 20 tons/year, NO_X would be reduced by 34 tons per year, and CO would be reduced by 508 tons per year. This estimate is assumed to be the maximum benefit of installing automatic inspection triggers and video surveillance equipment. The cost of this option is dependent on how many cameras are installed and monitored, but based on assumptions included in the cost analysis this option would cost approximately $2,043,000 per year. The cost/benefit quotient of this option is approximately $102,000 per ton of HC reduced, $60,000 per ton of NO_X reduced, and $4,000 per ton of CO reduced.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Implementation of this option may be overkill with OBD II, since the data triggers are effective in identifying inspection problems. Video surveillance would be necessary at self-service inspection stations to minimize fraud and prevent vandalism.
- Effectiveness as a fraud deterrent may decrease with time as stations become familiar with and learn to circumvent the system.

EASE OF IMPLEMENTATION

- Implementation requires hardware installation at the stations and a data network capable of handling video.
- This option requires a substantial investment in equipment, data network and support structure. In addition, implementation may require policy development as well as legal and legislative review.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- There is likely to be resistance from the PIFs.
- Motorists and PIFs may feel like "Big Brother" is watching.

STATE IMPACTS

- Additional staff would be required to monitor/review the video images. Connecticut has 3-5 full time video auditors.
- Implementation may improve ongoing station auditing and deter clean piping for both tailpipe and OBD tests, assuming that stations are not able to circumvent surveillance.
- This option could replace some physical auditing functions to offset substantial costs of implementation and operations.

SAFETY IMPROVEMENT FACTOR

- There would be some improvements in safety if the inspections were monitored due to reduction in intentional false passes.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IV-1 and IV-3.

MEASURE IDENTIFICATION CODE: VI-3

DESCRIPTION

This option would involve a comprehensive review of enforcement procedures and policies relating to violations of acceptable practice by inspectors and stations.

Procedures currently in place at MVC allow for expedient disciplinary action to be taken with offending stations (as fast as 24-hr shut downs that include proper documentation). Unless contrary information comes to light there is no particular alternative to the present procedures that require further analysis other than some of the other options relating to audits and trigger reports already mentioned.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Current MVC procedures allow for enforcement and disciplinary action up to closure of a station within 24 hours.

STATION PERFORMANCE
REEVALUATE ENFORCEMENT PENALTIES AGAINST INSPECTORS AND STATIONS

MEASURE IDENTIFICATION CODE: VI-4

DESCRIPTION

This option has been incorporated into Option II-2. Therefore, only a description has been provided for technical review. Additional information regarding option analysis can be found in the summary for Option II-2.

Based on discussions with State personnel the present structure for enforcement procedures and penalties has been accepted by the regional EPA Air Division as being in compliance with federal I/M regulations (40 CFR 51.364, *Enforcement Against Contractors, Stations and Inspectors*). If new issues emerge from execution of the General Program Audit referred to in Option II-2, enforcement practices and penalties could be revised according to those findings.

STATION PERFORMANCE
ENHANCED EQUIPMENT AUDIT ENFORCEMENT

MEASURE IDENTIFICATION CODE: VI-5

DESCRIPTION

This option has been incorporated into Option II-2. Therefore, only a description has been provided for technical review. Additional information regarding option analysis can be found in the summary for Option II-2.

This option was intended to address audit practices that vary between CIFs and PIFs. Although there are differences in audit enforcement practices between PIFs and CIFs that reflect the more critical nature of CIF throughput requirements, there is no indication that current practices are compromising general test integrity. If such issues emerged from execution of the General Program Audit referred to in Option II-2, enforcement practices and penalties could be revised according to those findings.

STATION PERFORMANCE
EQUIPMENT TRIGGERS

MEASURE IDENTIFICATION CODE: VI-6

DESCRIPTION

Equipment triggers have been developed to analyze calibration data and aid in determining when test systems are encountering problems. Under this option, the State would implement an automated equipment-related triggers analysis system either on the VID or a separate data warehouse that would be designed to identify problem test systems. While they may not be failing calibrations or audits, these are systems that are clearly in need of service. The State would share these results with the CIF contractor, the PIF vendors and the PIF stations, and work with them to establish an effective repair and preventative maintenance system.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Equipment trigger systems for identifying "out-of-calibration" and/or potential equipment malfunctions are used extensively in California and Connecticut.

AIR QUALITY IMPACT

- Implementation of equipment triggers to detect problems with calibration can generally be expected to result in some improvements in air quality impact. In the case of equipment faults that cause false failures below normal cutpoints, however, air quality benefits could actually improve even though the operating condition of the equipment is unacceptable. Because equipment failures can result in either increased emissions or reductions in emissions, the overall air quality impact is probably negligible.

OVERALL OPERATING COST

- There may be costs associated with upgrades to the VID and/or other software.
- Overall program costs could be reduced by focusing equipment audits.
- Equipment triggers would be a relatively low cost alternative to the frequency of audits that would be necessary to provide the same "early warning" system.

EMISSION COST/BENEFIT QUOTIENT

- There is very little impact on emissions, but the cost of the system will be low. Overall operating costs could drop because of the reasons mentioned above.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Equipment trigger analysis is compatible with OBD II and tailpipe test equipment.
- Equipment trigger analysis is used extensively in California and Connecticut.

EASE OF IMPLEMENTATION

- Some upgrades to the VID and other software may be necessary.
- Writing reports for existing data should be a routine undertaking with assistance from those experienced in this area.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- PIFs and testing contractors may oppose this option because it may result in additional maintenance expenses.

STATE IMPACTS

- There would be very little impact on program costs associated with this option.
- Implementation of this option could actually provide cost savings by better directing equipment audits.

SAFETY IMPROVEMENT FACTOR

- It is not likely that safety would be impacted upon implementation of this option.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to II-4, VI-5, VIII-1, and VIII-2.

INSPECTION EQUIPMENT AND PROCEDURES
OBD II CAN COMMUNICATIONS FUNCTIONALITY

MEASURE IDENTIFICATION CODE: VII-1

DESCRIPTION

The OBD II Controller Area Network (CAN) communications protocol is incorporated for generic I/M communications on some model year 2003 vehicles. From 2008 going forward, CAN will be the mandatory default OBD II protocol for all vehicle makes and models sold in the United States. CAN communications functionality must eventually be added to the CIF and PIF OBD II test systems in order to prevent the exclusion of increasing proportions of the fleet otherwise subject to emission testing, and for NJ MVIS to be fully in compliance with EPA rules. CAN was implemented at the New Jersey CIFs as of mid October 2006. Although CAN protocol capability has not yet been integrated with the existing PIF inspection analyzers, the PIFs are currently using portable CAN capable scan tools to conduct stand-alone OBD II inspections.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Pennsylvania and several other OBD programs have incorporated CAN.

AIR QUALITY IMPACT

- At the rate of current model year exemptions CAN should be implemented in NJ well before 2007 to assure no significant loss of OBD II benefits.
- Based on data gathered during a 10 day period in October of 2005 at NJ CIF lanes, current proportion of CAN in the population of vehicles presented for centralized OBD inspection is about 0.75% or 1 out of every 130 vehicles subject to OBD II inspection. This rate is subject to large incremental increases as each subsequent model year with greater CAN proportions becomes eligible for NJ MVIS inspection.
- If the 284 CAN vehicles reported (per Parsons based on data collected from 10/1/2005 through 10/12/2005 in NJ CIF lanes) were considered a representative average, as many as 10,366 vehicles that appeared at a CIF for inspection in 2005 were unable to receive an OBD test. If PIF inspections add 22% to the untestable fraction of the fleet, there were approximately 12,646 total CAN vehicles in the 2005 NJ fleet subject to OBD testing.

OVERALL OPERATING COST

- Other than initial software or other minor component updates, there should be no on-going costs associated with this option.

EMISSION COST/BENEFIT QUOTIENT

- A very small improvement should be anticipated until the CAN portion of the fleet (2008 and later models) becomes more dominant.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- It is more practical to implement CAN before the next contract than waiting until a later date. The program is faced with awkward alternatives such as back-up tailpipe testing or trying to explain to motorists why it is fine for some OBD vehicle to be tested while others do not matter if the State waits.

EASE OF IMPLEMENTATION

- Implementation of CAN becomes routine if it is done at a time when equipment and software is subject to other upgrades.
- It is unlikely that CAN will be implemented in the PIF equipment prior to the implementation of the new program. If PIFs do not implement CAN when the CIFs do, some vehicles will receive a different emissions test upon reinspection.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Impacts from stakeholders should be neutral if the update is performed before CAN vehicles must be exempted in large numbers.
- PIFs may object to the fact that the CIFs can do a CAN OBD inspection while the PIFs cannot.

STATE IMPACTS

- By implementing CAN, NJ will be in compliance with Federal standards and avoid negative reactions from stakeholders.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-5, III-6, V-9, V-10, and VIII-1.

MEASURE IDENTIFICATION CODE: VII-2

DESCRIPTION

This option is a duplication of Option III-6 (Light-Duty Diesel Vehicle Inspection). See Option III-6 for analysis.

INSPECTION EQUIPMENT AND PROCEDURES
OBD II HEAVY-DUTY GASOLINE VEHICLE INSPECTIONS

MEASURE IDENTIFICATION CODE: VII-3

DESCRIPTION

Beginning with the 2005 model year, heavy duty gasoline vehicles (HDGVs) up to 14,000 lbs GVWR must be OBD II compliant. By definition, HDGVs are any gasoline-powered vehicles over 8,500 lbs GVWR. However, some states are successfully performing OBD II tests on many existing HDGVs (e.g., Oregon is successfully testing roughly 80% of all 1996 and newer HDGVs). Under this option, OBD II testing would be initiated in the New Jersey program on 1996 or newer HDGVs. Vehicles that cannot be OBD II tested would still receive a curb idle test, which is how they are currently being tested.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Oregon conducts OBD II testing on roughly 80% of all 1996 and newer HDGVs.
- Other states may begin to conduct OBD II inspections once they have an opportunity to change the inspection requirements to include these vehicles. With model year exemptions in place in many states, it is expected that the newer HDGVs that are required to be OBD II compliant may not require inspections immediately. 2005 is the first model year in which OBD II is required for HDGVs, and EPA only issues emissions credits based on the 2005 model year and later.

AIR QUALITY IMPACT

- The EPA only allows emissions credits on 2005 model year or newer vehicles. No immediate emission reductions are estimated (with 4 year exemptions).
- Conducting OBD II inspections of 1996 and newer vehicles may reduce emissions, but since HDGVs were not required to be OBD II compliant until 2005, the improvement would be small.

OVERALL OPERATING COST

- There is a minimal increase in the program cost if HDGVs are required to get OBD II tests.
- The cost increase would be negligible if the software and OBD interface is updated with other scheduled improvements at the same time.
- Inspection costs could increase slightly if the I/M program includes OBD II testing of 1996 and newer vehicles, because some time would be wasted attempting to conduct OBD II testing, and then having to conduct a tailpipe test on the HDGVs with OBD II systems that were not compliant.

EMISSION COST/BENEFIT QUOTIENT

- The impact would be minimal initially, until the OBD II compliant fleet becomes a larger percentage of the total fleet.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- There would be very little cost for this benefit that increases as more OBD II equipped HDGVs enter the fleet. Inspecting 2005 and later model years is the most practical version of this option, since EPA does not issue credits for conducting OBD II inspections of pre-2005 models, and attempt OBD II inspections of pre-1995 models could increase program costs.

EASE OF IMPLEMENTATION

- Implementation would be easy since the only requirement would be to update the OBD II test equipment with the appropriate cut-offs for this new vehicle class and some inspector and auditor training specific to HD connector location.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- There are no significant stakeholder impacts or perceptions anticipated.

STATE IMPACTS

- There is the potential for significant benefits over time with minimal investment.

SAFETY IMPROVEMENT FACTOR

- Any impacts to safety are subject to program design with regard to the relation between safety and emission inspection cycles.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Not applicable.

MEASURE IDENTIFICATION CODE: VII-4

DESCRIPTION

Some states are considering whether to perform both OBD II and tailpipe tests on 1996 and newer vehicles due to their view that the combination of the two tests may identify more failing vehicles than an OBD II-only test. Under this option, New Jersey would also subject OBD II vehicles to the ASM5015 tailpipe test. Vehicles receiving both tests would include a large proportion of 1996 and 1997 model year vehicles with some indication of OBD identified problems, e.g. one or two monitors not ready or stored DTCs (with MIL-off) or vehicles with known deficiencies in their OBD II systems.

PROOF/DEMONSTRATION OF ALTERNATIVE

- California currently tests OBD II vehicles using both ASM (5015/2525) and OBD II. California finds that most vehicles that only fail ASM have either stored DTCs (without MIL-on), unset readiness monitors, or defective or improperly designed OBD II systems.
- Colorado conducted duplicate inspections, but has discontinued the practice.
- Federal guidelines generally discourage performance of tailpipe tests on OBD II vehicles.

AIR QUALITY IMPACT

- There is some possible improvement, but EPA will not grant additional I/M credits over the OBD II test alone. As a result, the MOBILE6 model can not estimate the air quality impact of this option.

OVERALL OPERATING COST – Costs would increase

- This option would result in a cost increase over conducting the OBD II test only. The increase in cost is dependent on the number of vehicles that are to undergo the dual test.
- The increased cost at the CIF would need to be negotiated as part of the CIF contract.
- The increased cost at the PIF would be passed on to the motorist.

EMISSION COST/BENEFIT QUOTIENT

- There would be some cost increases, but also some benefit, so the cost/benefit quotient would be positive. If both tests are conducted on all OBD II vehicles, the increased cost would erode the cost/benefit quotient. Currently, the EPA will not grant any additional credits.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- This option may be practical for use on vehicles that qualify for waivers due to excessive repair costs, gross polluters that have very high mileage, or have known OBD II system problems (e.g. Dodge Trucks with known defective catalyst monitors).
- This option would be much more practical as a back-up strategy for vehicles that are exempted from OBD II inspection.
- A remote sensing program could mitigate OBD II errors of omission.

EASE OF IMPLEMENTATION

- Implementation could be difficult for the next phase of the I/M program, since this option would require that all inspection facilities maintain analyzers and dynes in all lanes. This option depends on whether the new program design maintains the present level of tailpipe test equipment.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Motorists and auto makers are likely to object due to increased cost (at the PIFs), and the additional time required to conduct the test.
- Motorists may consider dual testing inconvenient due to unnecessary decreases in lane throughput at the CIFs and PIFs (i.e. increased wait times).
- Motorists and other stakeholders may draw the conclusion that either OBD or tailpipe testing are not reliable individually and therefore should not be used at all.

STATE IMPACTS

- There would be a cost increase for administrative and audit functions.
- Implementation of this option negates the cost benefit of throughput improvements with OBD II.
- There would be negative impressions by stakeholders if neither tailpipe nor OBD II are considered reliable as stand-alone measures.

SAFETY IMPROVEMENT FACTOR

- There is no impact on safety associated with this option.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to III-6, V-8, V-9, V-10, V-12, VII-6, VII-12, VII-15, and VII-16.

INSPECTION EQUIPMENT AND PROCEDURES
TRANSIENT LOADED MODE TAILPIPE TESTING

MEASURE IDENTIFICATION CODE: VII-5

DESCRIPTION

Gordon-Darby has developed a methodology for determining exhaust volumes during transient tests (e.g., IM240, IM147, BAR31, etc.) without having to actually measure exhaust flows. Under this option, New Jersey's current ASM5015 procedure would be upgraded to a transient tailpipe test procedure (e.g., the BAR31).

PROOF/DEMONSTRATION OF ALTERNATIVE

- IM240 has been used by several programs in the past, but now many programs plan to drop it because a majority of vehicles get OBD II tests.
- Oregon has dropped the BAR31 test and replaced it with an idle test.

AIR QUALITY IMPACT

- Modeling the impact of using IM240 with the final cut-points instead of ASM with the phase-in cut-points yields an emissions reduction of 0.87% HC, 0.57% NO_X, and 0.93% CO. The corresponding daily reduction is 0.65 tons HC, 1.08 tons NO_X, and 12.3 tons CO. The additional benefits of an ASM program at final cutpoints (Option VII-8) are much lower.

OVERALL OPERATING COST - $5,000 per lane for a total CIF plus PIF network equipment cost of $7,255,000 plus $2,470,000 CIF reinspection cost plus motorist cost of $36,000,000 = $45,725,000

- Changing from the ASM5015 to a transient tailpipe test procedure such as BAR31 would add $5,000 per lane to the price of the ASM equipment. The total equipment cost per lane would increase to $40,000.
- There are 124 CIF lanes and 1,327 PIF lanes in New Jersey. The total cost of adding the transient tailpipe test equipment in all the existing lanes would be $7,255,000.
- The primary cost would be increased retest volume and repair costs at around $300/repair (A recent survey in OR found that average repair costs were $300.) According to NJ MVC. The number of vehicles in New Jersey that failed the emissions portion of the inspection in 2004 was 176,872 CIF failures and 63,195 PIF failures. Upon implementation of IM240 with final standards, it is estimated that repair volume will increase by 50%. This corresponds with an additional 88,436 CIF and 31,598 PIF retests after repairs. The reinspection cost to the State would be $2,470,000 at a CIF inspection rate of $27.89. The PIFs do not charge for reinspections, so there are no additional PIF retest costs. Cost to the motorist would be for the additional repairs necessary to comply with the more stringent standards. The cost to motorists for additional repairs at $300 per repair would be approximately $36,000,000.

EMISSION COST/BENEFIT QUOTIENT

- Based on a total hybrid network cost of $45,725,000 including reinspections and repairs, the cost would result in a benefit of approximately $39,000 per ton of HC, $58,000 per ton NO_X, and $2,000 per ton CO by amortizing the costs over a 5-year period. However, it is likely that the equipment could degrade and therefore would not provide consistent reductions during the 5-year span; therefore, increasing the cost per benefit.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Converting the necessary equipment at this time is not practical with the emerging OBD fleet.

EASE OF IMPLEMENTATION

- Installing new equipment at the test stations is a large financial and labor intensive undertaking.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- The PIFs will object to this option because it will require them to install additional equipment that will be perceived as unnecessary.
- The cost of the equipment is likely to cause PIF test costs to increase, which would displease motorists.
- The CIF contractor may object to installing new equipment.

STATE IMPACTS

- This option would require increased investment and maintenance.
- There would be negative impacts on throughput, inspector training, inspection liability and audit requirements with minor measurable benefits.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Not applicable.

INSPECTION EQUIPMENT AND PROCEDURES
BACK-UP TAILPIPE INSPECTIONS FOR SPECIAL CASES WITH OBD II VEHICLES

MEASURE IDENTIFICATION CODE: VII-6

DESCRIPTION

With this option, OBD II vehicles would be subject to ASM5015 tailpipe test for special cases (e.g., retests of previous failures with catalyst DTCs, if CAT monitor is not ready), as is currently done in New Jersey. This option could include performing ASM5015 tests on vehicles with known readiness issues (e.g., 1996 Subaru and many other 1996 and 1997 model year vehicles that often reset monitors to not ready).

PROOF/DEMONSTRATION OF ALTERNATIVE

- This is currently done in New Jersey and soon to be done in Connecticut.
- California conducts tailpipe tests on all OBD vehicles.

AIR QUALITY IMPACT

- EPA does not provide any emissions credits for conducting tailpipe tests on OBD vehicles, even for cases where the OBD system has deficiencies. EPA recommends that states require CAT monitors to be ready on retests if the vehicle fails with CAT DTCs. States do back-up tailpipe tests as an alternative to requiring the CAT monitor to be ready. EPA does not enforce compliance with this recommendation.
- In the future, the number of vehicles with OBD II issues that might be candidates for back-up tailpipe tests will be small.

OVERALL OPERATING COST – $10,000 - $30,000 per PIF for additional equipment plus additional test related labor costs

- There would be a significant cost impact at PIFs in the future compared to OBD II-only at the PIFs. The primary expense is the need to have tailpipe test equipment ($10,000 – idle test, $30,000 – ASM test). For about 10% of the vehicles, additional time (5-10 minutes) will be required to perform the test.

EMISSION COST/BENEFIT QUOTIENT

- There is no EPA credit; therefore, zero cost benefit for this option.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Some vehicles have "hard-to-set" CAT monitors, so this provision helps avoid customer relation problems.
- In the absence of other functional test stratagems this is the only practical means of handling a variety of special cases including problem vehicles, aging OBD vehicles, retest of CAT vehicles, vehicles with more than two monitors not ready, etc.

EASE OF IMPLEMENTATION

- Implementation would be difficult at the PIFs, but easier to implement at CIFs (not much difficulty with present base of tailpipe testing equipment).

STAKEHOLDER IMPACTS AND PERCEPTIONS

- There are no major stakeholder impacts associated with this option.
- Not having to exempt too many vehicles or trying to use OBD II for vehicles with problems may generally be perceived as the better alternative.

STATE IMPACTS

- Reducing customer complaints will reduce State resources required for the I/M program.
- This option avoids loss of benefits and fills in program gaps for OBD II vehicles that would otherwise avoid inspection and repair.
- There is a minimal cost impact with the existing equipment base.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to III-6, V-4, V-8, V-9, V-10, V-12, VII-4, VII-15, VII-21, VIII-1, VIII-2, IX-5, and IX-18.

INSPECTION EQUIPMENT AND PROCEDURES
TAILPIPE TEST PROCEDURE CHANGES

MEASURE IDENTIFICATION CODE: VII-7a/VII-7b

DESCRIPTION

Under this option, the current ASM5015 test procedure would be changed to an idle test (VII-7a) or dropped entirely (VII-7b). 1996 and newer light-duty vehicles will continue to receive OBD II inspections. Another change would be to perform gas cap tests only on 1995 and older models.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Oregon is in the process of dropping loaded dynamometer test (BAR31) in favor of two-speed idle (TSI).
- Illinois plans to drop tailpipe tests entirely and rely on OBD II tests alone.

AIR QUALITY IMPACT

- If the current test is only changed to replace the ASM test with the idle test (e.g. continue to do OBD and gas cap test consistent with the current program), then HC would not change, NO_X would increase by 0.57% (1.08 tons/day), and CO would increase by 0.44% (5.84 tons/day), for a total emissions increase of 6.92 tons per day. These numbers would decrease as older vehicles are retired.
- If tailpipe tests are eliminated entirely (i.e., continue to do OBD on 1996 and newer vehicles and gas cap tests on 1995 and older vehicles), then HC would increase by 1.5% (1.13 tons/day), NO_X would increase by 0.69% (1.31 tons/day), and CO would increase by 2.6% (35 tons/day), for a total emissions increase of 37.4 tons per day.
- Emissions increases from either VII-7a or VII-7b could be mitigated by the addition of certain visual and functional component tests for 1995 and older vehicles such as, Evaporative Pressure test, EGR test, Liquid Leak test, Catalyst Efficiency test, etc. (see Option VII-21).

OVERALL OPERATING COST

- There would be improved (lower) maintenance costs and up time at PIFs and CIFs with an idle tailpipe test.
- The elimination of dynamometers (and analyzers with VII-7b) would reduce maintenance cost.
- If the State elects to do a simple idle test, inspection costs would be reduced because an idle test can be done faster than an ASM test. If the State elects to do a TSI test, maintenance cost reductions at CIFs could be offset by increased operating costs because TSI test can take longer to perform than ASM tests.

EMISSION COST/BENEFIT QUOTIENT

- Emissions for this scenario are expected to increase with either option (VII-7a or VII-7b), but cost effectiveness may improve slightly because operating and capital costs will drop.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- An idle test will capture equivalent HC and CO emissions, as well as identify gross polluting vehicles. An idle test only improves the practicality and implementation of applying universal software to the program.
- By 2010, the elimination of gas cap tests on 1996 and newer models will have insignificant impact on evaporative emissions.
- In the future, most NO_X benefits will come from OBD II (1996+) vehicles, so both VII-7a and VII-7b will provide almost the same benefits as the current program.

EASE OF IMPLEMENTATION

- This option could be easily done at start of new program. It may require physical removal of dynamometers, conversion of dynamometers to OBD diagnostic use in PIFs, and update to software.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- PIFs may object to loss of dyne investment but may enjoy lower costs of maintenance. PIF complaints could be mitigated by low cost conversion of dynamometers to diagnostic or utility use. Due to low costs of equipment, new PIFs may have a cost advantage compared to those PIFs with dynamometers.

STATE IMPACTS

- If the State runs the CIFs, then it could slightly increase labor requirement but will greatly simplify lane operation since none will need dynamometers.
- This option would promote program streamlining and improvements in equipment reliability, audit overhead, equipment maintenance costs, etc.
- As an alternative to an OBD II only program, this option would prevent the loss of significant older fleet benefits even when the older fleet accounts for less than 20% of fleet-wide VMT.
- The state costs may not increase due to the opportunity to align similar functions and benefit from combining certain workforces and similar functions. These include allowing some school buses needing reinspection to present the bus at a CIF rather than sending a team of Safety Specialists to the school bus terminal. Additional efficiencies can be realized by cross training inspection and driver testing personnel. Scheduling road tests around the end of the month will result in more personnel available for traditionally busier inspection periods.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-1, I-2, I-3, I-5, I-6, II-3, II-4, V-4, VII-4, VII-5, VII-6, VII-8, VII-9, VII-15, VII-20, VII-21, VIII-1, VIII-2, VIII-4, and IX-17.

INSPECTION EQUIPMENT AND PROCEDURES
FINAL OR NEW EPA ASM STANDARDS

MEASURE IDENTIFICATION CODE: VII-8

DESCRIPTION

New Jersey is currently using startup ASM standards (cutpoints) for its enhanced tailpipe test. Under this option, the State would implement final EPA ASM5015 standards that consist of either (a) the original vehicle weight-based final cutpoints released by EPA or (b) an alternative set of engine displacement-based final ASM cutpoints that EPA developed and released in August 2002 to more strongly target true failures and avoid false failures.

PROOF/DEMONSTRATION OF ALTERNATIVE

- This option has been implemented in some programs, e.g. Connecticut (ASM2525). NO_X standards are less stringent than the phase-in for LDGTs, but EPA still gives more I/M credit.

AIR QUALITY IMPACT

- If the State moves to implement final EPA ASM5015 standards instead of the current startup ASM standards, the State will get more EPA I/M credit. The additional emissions reduction (EPA credit) would be 0.58% HC (0.43 tons/day), 0.46% NO_X (0.87 tons/day), and 0.55% CO (7.4 tons/day).
- This option provides questionable real world benefits, since NO_X failure rate actually is lower, based on data from Connecticut.

OVERALL OPERATING COST – $200,000 software upgrade cost, plus $36,000,000 motorist repair cost, plus $2,470,000 reinspection cost = $38,670,000

- This option would require a software update. This type of software modification costs between $20,000 and $40,000 based on programs in TX. Assuming 5 analyzer manufacturers, the total cost is between $100,000 and $200,000. There are 124 CIF lanes and 1,327 PIF lanes in New Jersey. If the total software upgrade costs $200,000, then the cost per analyzer would be approximately $140.
- The primary cost would be increased retest volume and repair costs at around $300/repair (A recent survey in OR found that average repair costs were $300.) The current number of vehicles in New Jersey that failed the emissions portion of the inspection in 2004 was 176,872 CIF failures and 63,195 PIF failures. Upon implementation of the final EPA ASM5015 standards it is estimated that repair volume will increase by 50%. This corresponds with an additional 88,436 CIF and 31,598 PIF retests after repairs. The reinspection cost to the State would be $2,470,000 at a CIF inspection rate of $27.89. The PIFs do not charge for reinspections, so there are no additional PIF retest costs. Cost to the motorist would be for the additional repairs necessary to comply with the more stringent standards. The cost to motorists for additional repairs at $300 per repair would be approximately $36,000,000.

EMISSION COST/BENEFIT QUOTIENT

- There is questionable real world benefit associated with this option, but the EPA credit for emissions reduction after amortizing all costs over 5 years would be $50,000 per ton of HC reduction, $25,000 per ton of NO_X reduction, and $2,800 per ton of CO reduction assuming a total cost of $38,670,000.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- ASM cutpoints are not well defined for LDGT3/4 categories.

EASE OF IMPLEMENTATION

- This would require an easy software change.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- The potential for false fails increases, thereby impacting motorists.

STATE IMPACTS

- There are costs associated with implementation of this option, which provides questionable real world benefit.
- There is significant EPA credit for implementation of this option.

SAFETY IMPROVEMENT FACTOR

- There are no impacts on safety associated with this option.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Not applicable.

INSPECTION EQUIPMENT AND PROCEDURES
ASM DRIVE CYCLE CHANGE

MEASURE IDENTIFICATION CODE: VII-9

DESCRIPTION

Based on previous research conducted for EPA, it is estimated that 1-2% of all vehicles (roughly 10% of all failures based on the Sierra report) undergoing ASM testing in New Jersey might be falsely failed due to lack of preconditioning and/or how the vehicle's engine operates during the ASM5015 driving mode. In its work for EPA, Sierra developed a relatively simple change that could be implemented to address this issue. This change involves introducing a brief change in speed during the ASM5015 test. It is referred to as the "speed wiggle." This change was previously considered prior to the 1999 startup of the enhanced test, but was deferred at that time due to the State's primary focus on attempting to ensure a smooth startup and was subsequently never implemented. Under this option, the existing ASM5015 drive cycle would be modified by implementing the change developed by Sierra for EPA. Note that currently no states use the speed wiggle in their I/M programs.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Currently no state has incorporated the speed wiggle change in their I/M program.

AIR QUALITY IMPACT

- EPA does not give additional reductions for this measure.

OVERALL OPERATING COST

- There would be a software change on the order of changing standards.
- There would be a cost to retain all inspectors on the new test.
- This option could increase the test abort rate.

EMISSION COST/BENEFIT QUOTIENT

- There is no EPA credit; therefore, zero cost benefit for this option.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Unknown and not demonstrated.

EASE OF IMPLEMENTATION

- This option would require the inspectors to be retrained.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- No impact anticipated.

STATE IMPACTS

- This option could increase the test abort rate.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Not applicable.

INSPECTION EQUIPMENT AND PROCEDURES
ANNUAL INSPECTIONS OF FAILING VEHICLES

MEASURE IDENTIFICATION CODE: VII-10

DESCRIPTION

Previous analyses have shown vehicles that fail their tailpipe test and are then repaired are more likely to fail during their next biennial inspection. California is currently considering whether to require vehicles that are more likely to fail to be subject to annual inspections as a way to increase overall I/M program benefits. Under this option, New Jersey would implement annual inspections of previously failing vehicles.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Annual inspection for only failed vehicles is not required in any current programs.
- California is contemplating annual inspections for older models based on studies showing that it's cost-effective and increases emissions benefits.
- Texas and Georgia currently inspect vehicles annually.
- Many studies show that previous failed vehicles have the highest fail rates at their next inspection.

AIR QUALITY IMPACT

- The maximum benefit of implementing this option is assumed to equal the benefit of performing annual inspections on all 1995 and older vehicles. This is estimated to reduce NO_X by 0.12% (0.24 tons/day), CO by 0.14% (1.89 tons/day), with no impact on HC, for a total emissions reduction of 2.13 tons per day.

OVERALL OPERATING COST – State cost of $6,640,000 plus motorist cost of $3,720,000 = $10,360,000 annually

- According to NJ MVC, the number of vehicles that failed their 2004 emissions inspection in New Jersey is 176,872 at the CIFs and 63,195 at the PIFs.
- The cost to the State of 176,872 additional tests at the CIF would equal $4,930,000 (assuming $27.89 per test which is charged by Parsons to the State), and the motorist would be charged an additional $4,410,000 (assuming $69.83 average PIF inspection cost provided by NJ MVC). These costs assume that those motorists getting inspected at the CIFs will continue to use CIFs, and those motorists getting inspections at PIFs will continue to use PIFs.
- The total cost of implementation of this option is estimated to be $9,340,000. If vehicles failing safety inspections are also required to obtain an inspection annually, the amount would be significantly more.
- Based on 2007 fleet estimates, it is estimated that there will be 225,589 CIF failures and 51,210 PIF failures due to emissions in 2007. The 2007 cost impact for these additional inspections, based on estimated CIF inspection cost of $29.42 and PIF inspection cost of $72.73 would be $6,640,000 increase to the State and $3,720,000 to the motorists at the PIFs.
- There would be no additional direct cost to the motorist for testing if failing vehicles were directed to the CIFs, but this would impact the State's cost and PIF revenue.

EMISSION COST/BENEFIT QUOTIENT

- At a cost of $10,360,000, a NO_X reduction of 86 tons/year, and a CO reduction of 689 tons/year, the cost benefit quotient is $120,000 per ton of NO_X, and $15,000 per ton of CO.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- There are no technical impediments to implementation although economic justice issues may arise.
- There is some redundancy with other options, e.g. Remote Sensing, Annual Inspection of Older Vehicles, Off-Cycle Inspections and Roadside Inspection.

EASE OF IMPLEMENTATION

- This option would be difficult to implement since some vehicles would be required to get inspections every year, and others only every two years.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- This option possibly targets low income owners, since older vehicles are most likely to fall into this category.
- Motorists are likely to object.
- Some resistance could be expected from car clubs and owners of older vehicles. Objections could be mitigated with low income repair assistance, scrappage, and waivers.
- PIFs are likely to be strongly supportive, since this option would significantly increase their inspection and repair revenue.

STATE IMPACTS

- Implementation of this option would likely increase complaints and State oversight requirement.
- Provides a relatively simple means to prevent the most likely gross emitters from going as long as two years at a time without appropriate repairs.
- Stakeholder objections can be mitigated by combining this program with other similar measures, e.g. Remote Sensing, Annual Inspection of Older Vehicles, Off-Cycle Inspections and Roadside Inspection.

SAFETY IMPROVEMENT FACTOR

- There would be no impact unless this option also applies to safety failures.
- Safety implications are subject to program design. Including safety inspections with off-cycle emission inspections could result in some safety improvements.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IV-5, V-6, V-7, V-12, V-18, VII-11, VII-12, VII-16, IX-6, and IX-7.

INSPECTION EQUIPMENT AND PROCEDURES
ANNUAL INSPECTIONS OF OLDER VEHICLES

MEASURE IDENTIFICATION CODE: VII-11

DESCRIPTION

Another option that has been considered by some programs is requiring all vehicles past a certain age to return for annual inspections. This is an indirect approach to the same issue as described under Option VII-10, the higher probability of a failing vehicle exhibiting emissions deterioration well before its next biennial inspection. Older vehicles accumulate more defects and are therefore more likely to fail, so requiring them to be inspected annually would allow for additional off-cycle inspection benefits beyond the current biennial emissions inspection system. Under this option, New Jersey would implement annual inspections of older vehicles.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Texas and Georgia currently inspect vehicles annually regardless of age.
- California is contemplating annual inspections for older models based on studies showing that it is cost-effective and increases emissions benefits.

AIR QUALITY IMPACT

- The maximum benefit of implementing this option is assumed to equal the benefit of performing annual inspections on all 1995 and older vehicles. This assumption is based on the current population of pre-1996 vehicles. As time goes on, the model year of vehicles required to obtain annual inspections will change. This is estimated to reduce NO_X by 0.12% (0.24 tons/day), CO by 0.14% (1.89 tons/day), with no impact on HC, for a total emissions reduction of 2.13 tons per day. Although some reduction in HC is expected, MOBILE6 showed no benefit at the 0.001 g/mi level.

OVERALL OPERATING COST – State cost of $15,200,000 plus motorist cost of $11,400,000 = Total program cost increase of $26,600,000 annually.

- If this option is implemented to test pre-1996 vehicles annually and remaining vehicles biennially, there will be a program cost increase proportional to the increase in tests.
- By keeping the exemption for new car model years at the current level of 4 years, the number of vehicles currently requiring inspections is 3,409,158 vehicles. The percentage of vehicles exempted is approximately 38% (based on NJ DOT spreadsheet: "Vehicle Population Sheet 9-02 to 9-05.xls"). There are currently 2,058,798 CIF inspections and 663,756 PIF inspections annually for a total inspection volume of 2,722,554.
- The number of pre-1996 vehicles in the NJ fleet is 1,414,086 as of 9/05. This number is decreasing, and has changed from 2,351,882 in September 2002 (based on NJ DOT spreadsheet: "Vehicle Population Sheet 9-02 to 9-05.xls"). Based on the number of pre-1996 vehicles registered in 9/05, it can be assumed that half of those vehicles (707,043 vehicles) require inspections in any given year with the biennial inspection program. If pre-1996 vehicles are required to be inspected annually, it would add 707,043 vehicles to the current inspection volume.
- The addition of 707,043 vehicles to the current inspection volume would increase the program cost. Since 77% of vehicles get CIF inspections and 23% of vehicles get PIF

inspections, the split would be approximately 544,423 CIF and 162,620 PIF inspections. At a rate of $27.89 per CIF inspection, the additional inspections would cost the State a minimum of $15,200,000 (there would be a certain number of failures that would result in re-inspections). Additionally, at an average PIF inspection cost of $69.83, the additional 162,620 PIF inspections would cost the motorist approximately $11,400,000. The PIFs do not charge for inspections when repairs are completed, so the cost of PIF inspections may actually be lower than this estimate.

EMISSION COST/BENEFIT QUOTIENT

- The total program cost increase is estimated to be $26,600,000 annually. The NO_X reduction of 86 tons annually yields a cost benefit of $300,000 per ton of NO_X reduced. The CO reduction of 689 tons annually yields a cost benefit of $39,000 per ton of CO reduced.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- There is no technical impediment to implementation although economic justice issues may arise. There is some possible redundancy with other programs (e.g. Remote Sensing, Annual Inspection of Failing Vehicles, Off-Cycle Inspections and Roadside Inspection).

EASE OF IMPLEMENTATION

- It would not be difficult to implement this option. Primarily, a tracking and motorist notification function would need to be added.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Motorists of older vehicles are likely to object.
- Some resistance could be expected from car clubs and owners of older vehicles. Objections could be mitigated with low income repair assistance, scrappage, and waivers.
- PIFs are likely to be strongly supportive.

STATE IMPACTS

- This option would likely increase complaints and State oversight requirements.
- This option provides a relatively simple means to prevent most likely gross emitters from going as long as 2 years at a time without appropriate repairs. Stakeholder objections can be mitigated by combining this option with other measures.
- The State must be careful to not appear to penalize drivers who drive older cars. The perception that wealthier drivers enjoy a benefit of not having to inspect as frequently has the potential to become a point of contention for the program.

SAFETY IMPROVEMENT FACTOR

- There should be no impact unless requirement also applies to safety failures.
- Subject to program design for including safety with off-cycle emission inspection, some improvement could be expected.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IV-5, V-6, V-7, V-12, V-18, VII-10, VII-12, VII-16, IX-6, and IX-7.

INSPECTION EQUIPMENT AND PROCEDURES
OFF-CYCLE INSPECTIONS

MEASURE IDENTIFICATION CODE: VII-12

DESCRIPTION

Under this option, suspected dirty vehicles would be identified through some means (e.g., HEP, remote sensing, additional roadside inspections, etc.) and required to report for an off-cycle testing and repair if needed to pass the applicable I/M standards.

Please refer to the following options for a more complete analysis of Off-Cycle Inspection methods that may be eligible for SIP credit.

- Option V-7, High Emissions Weighting
- Option V-10, OBD II Motorist Choice Option
- Option V-12, Remote Sensing High Emitter Detection
- Option V-18, Enhanced Roadside Inspection Program
- Option VII-10, Annual Inspections of Failing Vehicles
- Option VII-11, Annual Inspection of Older Vehicles
- Option VII-15, Inspection and Repair of Aging OBD II Vehicles
- Option VII-16, Annual Inspections for High Mileage Vehicles
- Option IX-7, Vehicle Scrappage Program

INSPECTION EQUIPMENT AND PROCEDURES
LIQUID LEAK CHECK

MEASURE IDENTIFICATION CODE: VII-13

DESCRIPTION

Previous studies have shown that a substantial portion of motor vehicle hydrocarbon (HC) emissions is due to evaporative control system defects, with a key source being so-called liquid leaks. In recognition of this issue, California has implemented and currently requires a liquid leak check to be conducted on vehicles undergoing I/M testing in that program. This involves a manual inspection of the engine and various fuel system components to identify any visible leaks. Under this option, a similar liquid leak procedure would be implemented in the New Jersey program.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Liquid leak checking is part of the California visual inspection (and to some extent other states with visual inspection). No functional tests are performed.

AIR QUALITY IMPACT

- The air quality impact is based on the California Bureau of Automotive Repair (BAR) study of the percentage of vehicles with liquid leaks, and the g/mi impact of leaks. The only pollutant that would be reduced by conducting a leak check and fixing liquid leaks is HC, since the emissions from liquid leaks are not combustion emissions, but simply HCs which evaporate directly into the air.
- Based on information from the California BAR, New Jersey could expect a reduction in HCs of approximately 6.75% (5.0 tons/day). This calculation is based on a VOC impact of 4.26 g/mi, 1.00% of the vehicle fleet having a liquid leak, and 50% inspection and repair effectiveness. It should be noted that there is a high degree of uncertainty associated with this potential reduction. The effectiveness of this program has not been proven, although the potential reduction is large.

OVERALL OPERATING COST

- California BAR stated that the leak check already exists as part of the existing safety and equipment check, and would therefore not add any more time to the inspection.
- There are no additional costs for labor or equipment associated with completing a leak check of automobiles during inspection.
- Failure of an inspection due to detection of a fuel leak could result in additional re-inspections, however since New Jersey is already looking for liquid leaks as part of the safety inspection then there would be no additional cost implications for the motorist, State, or PIF.

EMISSION COST/BENEFIT QUOTIENT

- Negligible costs are associated with addition of a leak check as part of the emissions inspection.
- New Jersey could expect a reduction in hydrocarbons of 6.75% (5.0 tons/day), although this estimate is subject to a high degree of uncertainty.

- There is a very favorable benefit for the small fraction of the fleet with liquid leaks; however, since there are no costs associated with addition of this option, no cost/benefit quotient has been calculated.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- California's BAR study revealed that most liquid leaks are present in vehicles older than the 1990 model year. The study results were discussed by the California BAR in 2001, so their study could be interpreted to say that most leaks occur in vehicles older than 10 years.
- Because of the variable definition of a liquid leak, the leak check is a somewhat subjective test that is difficult to audit and enforce. Since a single leaking vehicle can have HC emissions order of magnitudes greater than the average vapor leak, when combined with other health and safety considerations any reasonable effort may be justified.

EASE OF IMPLEMENTATION

- Implementation of this option would not be difficult, other than modification of visual inspection procedures and associated inspector training.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Addition of this option is expected to be mostly neutral.
- The repair industry will be in favor of implementation of this option.
- With appropriate PR the impact could be quite positive, especially with regards to known health and safety issues in addition to atmospheric impacts.

STATE IMPACTS

- There could be a slight/negligible cost increase due to training and enforcement.
- The HC emissions reduction could be very large.

SAFETY IMPROVEMENT FACTOR

- There are considerable health and safety impacts from known concentrations of air toxics in occupant compartment of vehicles with liquid leaks, as well as hazards of fire and explosion when vehicles with liquid leaks experience collisions. The health and safety benefits of increased emphasis on eliminating liquid leaks would be significant.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to VII-11 and VII-14.

MEASURE IDENTIFICATION CODE: VII-14

DESCRIPTION

Due to the importance of evaporative-related defects as a primary source of HC emissions, the California Air Resources Board (ARB) has recently recommended implementation of an enhanced evaporative emissions inspection for vehicles 1995 and older. Although existing CIF equipment contains an early model Evaporative Pressure Test system, this basic technology has been vastly improved to meet current California specifications. The improved equipment was recently the subject of an ARB study[1] that indicated there were no false failures in about 30 vehicles recruited from roadside pullovers. The same study demonstrated that correcting the evaporative emissions from older vehicles improved emission reductions more than anticipated and were more cost-effective than earlier assumptions using less sophisticated test methods.

[1]"Environmental Impacts of Implementing a Low Pressure Evaporative Test in the California Smog Check Program". California Air Resources Board – 11/29/2005 (Available on the MACTEC DART system)

PROOF/DEMONSTRATION OF ALTERNATIVE

- Tank pressure tests are performed in Delaware, and Arizona.
- This test is to be added to the California I/M test.
- Data are available from recent studies by the California Air Resources Board.

AIR QUALITY IMPACT

- The estimated MOBILE6 HC reduction from implementation of this option is 0.3% (0.23 tons per day). The estimated reduction is based on the current program plus a tank pressure test for pre-1995 LDGVs.
- The emissions reduction calculated by CARB and presented in the document: "Environmental Impacts of Implementing a Low Pressure Evaporative Test in the California Smog Check Program," is 14 tons per day of HC. Based on the CARB calculation, the emission impact in New Jersey may be proportional to the number of vehicles subject to the enhanced inspection. The number of vehicles subject to the enhanced emissions test in California (pre-1996 fleet) is estimated to be 5,783,020. The number of vehicles in New Jersey that would be subject to the enhanced test is 1,414,086 (pre-1996 fleet) (Based on NJ DOT spreadsheet: "Vehicle Population Sheet 9-02 to 9-05.xls"). Based on the ratio of the pre-1996 fleets in the two States and applying the ratio to California's estimated 14 tons per day reduction, New Jersey's estimated HC reduction would be 3.4 tons per day. Refer to the CARB document for complete details on the calculated HC reduction in California.

OVERALL OPERATING COST – $4,353,000 equipment cost incurred by the State and PIFs. $23,400,000 repair costs incurred by the motorists.

- Initial capital investment in the range of $2,000 to $3,000 per lane would be required for the necessary equipment based upon quotations for manufacturers in the California program.
- There are 124 CIF lanes and 1,327 PIF lanes in New Jersey (NJ MVC 11/30/05). The total cost of adding tank pressure test equipment in all the existing lanes would be $4,353,000 at a per lane cost of $3,000.
- There would be no measurable increase in operating cost since the test could be conducted while other tests are being conducted. Use of pressurized nitrogen would be the safest method for testing the tanks if this option is implemented. (Note that Delaware has not had problems using compressed air.) There would be additional costs associated with using nitrogen.
- September 2005 New Jersey vehicle registrations show that there are 1,414,086 pre-1996 vehicles registered in New Jersey. Assuming a 10% failure rate for this portion of the fleet there would be 141,409 failures. California Air Resources Board reports an average repair cost of $165. Assuming this cost would be similar in New Jersey, the repair cost associated with this option is approximately $23,400,000.

EMISSION COST/BENEFIT QUOTIENT

- Due to the uncertainty of the air quality impact of implementation of this option and the emissions credit that would be taken by New Jersey, the cost/benefit quotient for this option cannot be quantified.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- This option applies to pre-1996 vehicles. Most 1996+ vehicles have OBD II systems that effectively check vehicle evaporative systems.
- This large proportion of total mobile emissions cannot be identified by any other means in the pre-OBD II fleet. The conclusion of the recent California Air Resources Board study indicates that the latest technology is ready for deployment with nearly 0% errors of omission.

EASE OF IMPLEMENTATION

- This option requires equipment and training. However, minimal technician training would be required with use of graphical look-up tables already prepared for California.
- Previous NJ studies indicate an increased test time of two to three minutes, although it is now believed that the test can be conducted simultaneously with other test and not result in test time increases.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- PIFs may object to increased inspection time, although PIF/ERFs would benefit from the increased revenues from repairs.
- There may be some PIF resistance to purchasing equipment unless it is part of a new equipment package.
- A possible slight increase in test time may cause initial concern from motorists.
- Increased repair costs will be perceived negatively by motorists.
- With appropriate PR, fuel savings benefits may outweigh other concerns.

STATE IMPACTS

- There are increased costs associated with implementation of this option.
- Implementation may be an ideal means to supplement testing of the pre-OBD II fleet, thereby containing almost 100% of gross HC emitters. With the HC benefit nearly equivalent to the tailpipe test, implementation of this option may help justify elimination of tailpipe testing in future, especially with addition of other functional tests like gas cap, catalyst, and EGR.

SAFETY IMPROVEMENT FACTOR

- Vapor and liquid leaks identified with this test can help prevent direct exposure of vehicle occupants to air toxics and explosion hazards in crashes.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to VII-10, VI-11, VII-13, VII-15, VII-21, and VIII-2.

MEASURE IDENTIFICATION CODE: VII-15

DESCRIPTION

There has been concern that as OBD II vehicles age and deteriorate, an increasing fraction of vehicles are going to fail which could be well beyond the failure rates previously seen in New Jersey and other I/M programs. These vehicles should illuminate their Malfunction Indicator Lights (MILs) whenever their on-board systems determine they are likely to have emissions more than 1.5 times their original certification standards. They should also illuminate MILs whenever one or more of their monitoring sensors fail, regardless of their emissions levels. This means there may be little or no direct emissions benefit associated with repairing a fraction of these failures. This is the reason for including the *OBD II Model Year Retest* field in SYSTEM.DAT in the New Jersey OBD II specifications; the State can use this field in the future to allow vehicles that initially fail the OBD II test to only pass a tailpipe test upon their return after repair. There are, however, a number of related issues that need to be tracked and decided upon as OBD II vehicles continue to age and accumulate mileage; they include:

a. The level and type of OBD II failures that are occurring.
b. The cost to repair OBD II vehicles and whether existing repair cost ceilings should be adjusted for these vehicles.
c. The level of emissions reductions being achieved from OBD II vehicles. This issue cannot be determined by looking just at the normal inspection results (since emissions are not typically measured during an OBD II test), but will need to be tracked through independent testing and evaluation either in New Jersey or elsewhere.

Because we are looking into the future, it is impossible to predict at present exactly how these and other related issues will manifest themselves. Nonetheless, the issue of aging OBD II vehicles could be one of the most important technical and programmatic issues to face I/M programs over the next 5 to 10 years. Under this option, New Jersey will continue to devote resources to tracking and evaluating this issue over the next 5 years.

PROOF/DEMONSTRATION OF ALTERNATIVE

- New Jersey has the capability to implement this option, but has not done it. Currently, no other states do this directly, but they do provide an out through the waiver process.

AIR QUALITY IMPACT

- No air quality benefit is expected.

OVERALL OPERATING COST – Development cost of $20,000

- This option would require a software update. The cost to develop this update is estimated at $20,000.
- To simply add a switch to the software that allows special handling of these vehicles would have a minimal cost if done as part of other upgrades.

EMISSION COST/BENEFIT QUOTIENT

- This option would have little impact on the cost/benefit quotient.
- Once the SYSTEM.DAT file is modified, the State may choose at any point in the future program that the emission cost/benefit is favorable enough to begin bringing these vehicles in for off-cycle testing.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- EPA's High Mileage Study shows that repairs to some OBD II failures are expensive and provide minimal benefits.

EASE OF IMPLEMENTATION

- A software change would be required to implement this option plus the State will need to continue to have tailpipe testing capabilities in PIFs if they want to test these vehicles.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- There probably would be no reaction to the software change.
- If the State chooses to subject these vehicles to more frequent inspections, a minority of motorists may feel inconvenienced.
- The inspection/repair industry is likely to be supportive of this option.

STATE IMPACTS

- The State will have to explain retest complexity to the motorists.
- The option provides an appropriate means of dealing with a fraction of the fleet that may become problem vehicles without incurring the cost and embarrassment of modifying software after the new program is implemented.

SAFETY IMPROVEMENT FACTOR

- If aging high mileage vehicles receive more frequent inspections, additional safety benefits are likely to accrue.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to VII-11, VII-12, and VII-16.

INSPECTION EQUIPMENT AND PROCEDURES
ANNUAL INSPECTIONS FOR HIGH MILEAGE VEHICLES

MEASURE IDENTIFICATION CODE: VII-16

DESCRIPTION

Since increased deterioration rates for high mileage vehicles subject to I/M inspection significantly increase the incidence of failure within 1 year after their most recent inspection, this off-cycle inspection option provides a means of recapturing SIP creditable emissions that would otherwise be lost. With this option, vehicles that are driven much more than the average vehicle (e.g., taxis) would be given annual emissions tests. High mileage vehicles are defined as greater than 20,000 miles/year.

PROOF/DEMONSTRATION OF ALTERNATIVE

- There are no known programs that allow mileage to influence the I/M inspection cycle.

AIR QUALITY IMPACT

- Implementation of this option would provide a positive impact on air quality, but the air quality impact is unquantifiable.
- Although it may be possible to implement this option and reduce emissions, the reductions are difficult to prove to the EPA for credit.

OVERALL OPERATING COST

- Cost increases would result from compiling sufficient vehicle mileage information to determine who would be subject to annual inspections. It is not known whether sufficient information exists to determine applicability.
- There would be program cost increases due to increased volume of inspections at the CIFs and PIFs. The increased program cost would be the number of additional vehicles that would require an emissions test. It can be assumed that the CIFs would conduct 77% of the additional inspections at a program cost of $27.89 per inspection (estimated 2007 CIF cost would be $29.42). The PIFs would conduct 23% of the additional inspections at a cost to the motorist of $69.83 per inspection (estimated 2007 cost would be $72.73).

EMISSION COST/BENEFIT QUOTIENT

- The cost/benefit quotient cannot be quantified, but there would be some emissions benefit in return for the additional operating cost required.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- It would be difficult to determine all vehicles that drive more than 20,000 miles per year.
- Assumptions could be used to assemble lists of likely vehicles that surpass 20,000 miles per year, such as taxis or other known high mileage fleet vehicles, but it would be difficult to determine the applicability to vehicles driven by motorists in the general public.

EASE OF IMPLEMENTATION

- Implementation of this option does not require any new technological assistance, but it may be difficult to enforce.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- High use vehicle operators (e.g., taxi fleet owners) are likely to complain.
- Motorists would likely complain about being targeted, since many high-mileage vehicles are well maintained, and pose no additional threat.
- A large percentage of high-mileage vehicles are part of the new car fleet, which would be less likely to have emissions related problems.
- Environmentalists may be supportive of this option.

STATE IMPACTS

- There would be additional costs associated with this option.
- Enforcement of this option may be difficult.
- Many motorists would be against this option, so dealing with resistance from the motoring public could prove to be costly and labor intensive.

SAFETY IMPROVEMENT FACTOR

- There would be an improvement in safety associated with the increased frequency of inspections.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to VII-12.

INSPECTION EQUIPMENT AND PROCEDURES
EVALUATE SMOKE TEST WITH OBD VEHICLES

MEASURE IDENTIFICATION CODE: VII-17

DESCRIPTION

This option should only apply if there is strong reason to believe that OBD systems are failing to indicate malfunctions that can cause excessive smoke. A functional opacity test would be used to identify OBD vehicles with excessive smoke that do not have Malfunction Indicator Lights illuminated. Even if this option could identify some unknown fraction of smoking vehicles with unresponsive OBD systems, it would still not provide additional HC, CO, or NO_X credit.

PROOF/DEMONSTRATION OF ALTERNATIVE

- There is no known precedent for this option.

AIR QUALITY IMPACT

- This option would have no impact because it is unlikely that a significant portion of the fleet would have smoke problems that did not result in an OBD failure indication.

OVERALL OPERATING COST – Opacity meter costs of $6,000 per unit

- This option would require the use of an opacity meter and increase the labor cost of a test. Opacity meters cost approximately $6,000 per unit. Assuming one unit per CIF (31CIFs per NJ MVC 11/30/2005) equals a capital expense of $186,000.

EMISSION COST/BENEFIT QUOTIENT

- The cost/benefit quotient is not very favorable if the cost per test for all vehicles is increased while only a few are identified outside of OBD failure indications.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Opacity testing is a feature of several state programs for heavy duty diesel testing and is known to be effective for gasoline powered smokers as well.

EASE OF IMPLEMENTATION

- Implementation of this option involves deployment of new equipment and training in test and calibration procedures. Equipment and procedures would also be subject to new audit procedures.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- This option may be perceived by stakeholders as unnecessary or redundant with existing tests.
- If there is a cost to PIFs, then they might object.

STATE IMPACTS

- Could add program cost and complexity without significant emissions benefits.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to V-7, V-12, V-18, VII-10, VII-11, VII-12, VII-15, and VII-16.

INSPECTION EQUIPMENT AND PROCEDURES
AUDIT FLEET SELF CERTIFICATION PROGRAM EFFECTIVENESS

MEASURE IDENTIFICATION CODE: VII-18

DESCRIPTION

This option would evaluate self certification program for commercial and government fleets. There are currently about 70 Private Fleet Inspection Facilities (PFFs) which include Verizon, Car Rental companies and other private and public fleets that compose the NJ MVIS Class II fleet program. These PFFs are already subject to the same equipment audits and monthly record audits as PIFs.

No further evaluation of this program is needed other than that covered by Option II-2, Program Audit.

INSPECTION EQUIPMENT AND PROCEDURES
EVALUATE GAS CAP TESTING ON OBD VEHICLES

MEASURE IDENTIFICATION CODE: VII-19

DESCRIPTION

The gas cap check requirement would be dropped on OBD II vehicles, since the OBD system identifies many vehicles with bad gas caps. Several states currently have dropped the gas check requirement, while most other states have continued with combined OBD/gas cap checks. A recent report by an emissions equipment manufacturer using Maryland centralized data indicates that without a functional gas cap test for OBD II vehicles up to 75% of leaks that exceed the EPA leak criteria would go undetected. However, the current MOBILE6 model does not seem to support the extent of reductions indicated by the empirical data attributable to a functional cap test on OBD II vehicles.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Connecticut, Delaware, and Oregon no longer perform gas cap tests on OBD II equipped vehicles.
- Arizona, California, Colorado, Georgia, Massachusetts, Maryland, Ohio, Pennsylvania, Rhode Island, Texas, Washington, and Wisconsin have combined OBD/gas cap checks.

AIR QUALITY IMPACT

- Based upon a recent report, *Analysis of EPA Gas Cap Test Versus OBD II On-Board EVAP Monitors Effect on Hydrocarbon Emissions comparing OBD II Threshold Failures to the Functional Gas Cap Test*, significant HC losses would be anticipated (see Emission Cost/Benefit Quotient section).
- Implementation of this option would not result in as significant a loss of SIP credits based on MOBILE6 modeling. However, it may be reasonable, based upon more recent emissions reduction data, to request more SIP credit for combined testing than was otherwise allowed in the current MOBILE6 model.
- Federal guidance still requires functional gas cap test with an OBD II inspection for full MOBILE model credit.

OVERALL OPERATING COST

- By eliminating the gas cap check, only the approximately 2-minute time period it takes to conduct an inspection could possibly result in cost savings. However, since the gas cap test can be conducted simultaneous with the OBD II inspection, there may be no quantifiable reduction in test time.
- No additional equipment costs can be anticipated since existing equipment would be utilized.
- Since CIFs were originally required to use nitrogen as a pressure source for the combined evaporative pressure and gas cap test, if the evaporative pressure test continues to go unimplemented, some cost reductions could accrue if CIFs used air instead of nitrogen for gas cap testing.

EMISSION COST/BENEFIT QUOTIENT

- In order to estimate the actual cost/benefit ratio, the New Jersey fleet would have to be modeled similar to the study performed in Maryland for the report referenced above. The report based on Maryland data only quantified the percentage of failing caps that would be omitted by OBD only testing. Further quantification of the total emissions loss from those caps should also be developed.
- While operational costs may be slightly reduced by elimination of this test, the short test time, low cost of equipment and favorable cost/benefit ratio should also be considered.
- A functional gas cap test is traditionally considered most favorable regarding benefits, given that the cost of testing and repair is very low compared to the HC benefit. Benefits in the range of $650/ton HC have been reported by other states.
- Based upon the Hickok/ESP report, reliance upon OBD II only for detection of excess emissions from gas caps would result in failure to identify about 75% of the vehicles currently failing the functional gas cap test under current EPA criteria.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Most 1996+ vehicles have OBD II systems that effectively identify the grosser leaks in vehicle evaporative systems and gas caps but cannot approach the 60 cc/min flow rate standard the EPA guidance prescribes for the functional gas cap test.
- Standard practice for most state programs is to include the functional gas cap check with OBD II inspections.

EASE OF IMPLEMENTATION

- OBD II inspections are already being done in New Jersey.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Federal and environmental stakeholders may resist abandonment of functional gas cap test.
- Motorists may be somewhat supportive or neutral to this option unless they are aware of the additional fuel savings and occupant health benefits that may result from the more restrictive functional gas cap test.

STATE IMPACTS

- Potential for some slight cost savings and test volume improvement with reasonably large HC benefit losses.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to V-8, V-9, and VII-21.

MEASURE IDENTIFICATION CODE: VII-20

DESCRIPTION

This option would evaluate pre-OBD fleet emissions consequence relative to what is known of 1998 and newer fleet performance. An essential element of program planning, and decision support for several of the options contained in these analyses, is to determine the extent of excess emissions attributable to the "older" fleet. An abundance of current studies have indicated that the OBD II fleet, especially after the 1997 model year, contributes a small fraction of excess emissions to the air inventory compared to earlier model vehicles, on a mile per mile basis.

Analysis of the California fleet has led the California Air Resources Board to conclude that the majority of excess emissions will come from the older fleet for the next 10 to 15 years. Any decisions made by the State to abandon or curtail the identification of excess emissions in the older fleet should be based on a comprehensive analysis of older fleet versus newer fleet emissions consequence.

PROOF/DEMONSTRATION OF ALTERNATIVE

- California and other states are evaluating consequences to varying extents.

AIR QUALITY IMPACT

- There would be a potential positive impact if more targeted approach to identification of high emitters and quantification of total emissions in older fleet is understood for 2007 program year.

OVERALL OPERATING COST

- Since this option is only a modeling exercise, there would be no significant cost.

EMISSION COST/BENEFIT QUOTIENT

- This option is intended to support decision making for other options such as moving from an ASM to a two-speed idle test. No cost/benefit applies directly to this option.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Evaluation could be performed using existing data.

EASE OF IMPLEMENTATION

- This analysis would involve several MOBILE6.2 modeling runs.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- None expected.

STATE IMPACTS

- May significantly improve decision to support streamlining of program if all appropriate criteria are taken into account (see related options).

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-1, II-1, II-2, V-18, VII-7, VII-8, VII-9, VII-11, VII-12, VII-14, VII-16, IX-4, and IX-9.

MEASURE IDENTIFICATION CODE: VII-21

DESCRIPTION

This option would examine the combination of functional tests that may replace tailpipe testing and provide OBD surrogate for older vehicles. For example, functional EGR, O_2 sensor, EVAP, Liquid Leak, Catalyst, and other tests could be done instead of tailpipe tests on pre-1996 vehicles. One or more of these functional tests could be used to offset the loss of emission benefits from reduction or elimination of ASM 5015 inspection.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Texas studied this for EGR system and concluded that while significant NO_X benefits were possible, further technology refinements would be necessary to reduce potential fraud.
- California currently performs an EGR inspection, (snap throttle test), by very manual and subjective means. Improved inspection technologies are available.
- Various research and demonstrations of EVAP, GAS CAP, EGR, CAT, O_2 Sensor and OPACITY test technology are available.

AIR QUALITY IMPACT

- Air quality impact could be potentially significant if considered alternative to no tailpipe test of older fleet.

OVERALL OPERATING COST

- Combined tests would cost less than tailpipe testing for similar benefit. The primary unknown is the skill and time needed to perform an effective functional test.

EMISSION COST/BENEFIT QUOTIENT

- Combined tests would have similar benefit to tailpipe test.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Within this mix of options are proven technologies as well as products in various stages of development.
- Because functional test results reveal specific component defects, diagnostic errors are reduced and likelihood of effective repairs increased.

EASE OF IMPLEMENTATION

- There would be a significant transition from tailpipe to functional component tests including major changes in equipment, software, training, and auditing.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Motorist and industry reactions may very. Functional component tests are much more focused than tailpipe tests and generally yield useful diagnostic data for the older fleet similar to OBD II.

- May reduce motorist avoidance of repairs since defects are limited in scope. Example: A motorist would replace a gas cap that is identified as defective without much resistance, whereas an evaporative system leak diagnosis that did not identify the gas cap specifically, could lead a motorist to fear the potential cost of diagnosis and repair.

STATE IMPACTS

- May provide a cost-effective alternative to tailpipe/loaded mode testing that preserves substantial older fleet emission benefits. It would bring older fleet tests more directly into parity with OBD II.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-1, I-6, V-18, VII-4, VII-5, VII-6, VII-7, VII-8, VII-9, VII-14, VII-15, VII-17, VIII-1, VIII- 2, VIII-4, IX-8, IX-17, and IX-20.

EQUIPMENT UPGRADES
PIF EQUIPMENT UPGRADE

MEASURE IDENTIFICATION CODE: VIII-1

DESCRIPTION

Emissions test systems have typically been considered to have 5-to-7-year lifetimes before they begin to wear out, replacement components (e.g., CPUs) are no longer available, etc. The New Jersey PIF specifications indicate that the test systems must have a minimum useful life of 7 years from the data of original installation, which for most of the current PIF platforms is early-to mid- 1999. This means the end of their useful life would be in 2006. Under this option, the State would require the PIFs to purchase new test systems beginning in early 2006.

When the New Jersey PIFs agreed to enter the 1999 program, there was an understanding that they would purchase the required equipment and depreciate it over 5 years. Therefore, the PIFs should be expected to upgrade their equipment at the end of this period.

This option was included in the earlier Sierra research (2003) and prior to the current plan for a program change in 2007. In light of new program planning, it becomes obvious that PIFs could not be expected to invest in new equipment other than as a function of the new program design.

This option cannot, therefore, be analyzed separately but can be included with the new program RFP once it is in development.

EQUIPMENT UPGRADES
CIF EQUIPMENT UPGRADE

MEASURE IDENTIFICATION CODE: VIII-2

DESCRIPTION

Another equipment issue that needs to be considered as part of the CIF rebid (or any further contract extension if the State decides to instead pursue this route) is replacement and upgrade of the CIF test systems. The same equipment issues described under the previous option also apply to the existing CIF test systems. In addition, the CIF equipment also is subject to the following factors:

d. It is subject to much higher inspection volumes and is thus expected to wear out considerably faster (particularly in the highest volume lanes) than the typical PIF test unit.

e. The current test systems are generally less rugged and more poorly engineered than the equipment used in other test-only networks. (This is not meant to criticize Parsons, but is a simple statement of fact.) These test systems are generally adaptations of decentralized test equipment that is not designed for the type of high-volume operation that occurs on a regular basis in the New Jersey CIF lanes. Conversely, high volume test systems in other programs are expressly designed for this purpose, which means they are more capable of standing up to the wear and tear, and maintaining high levels of uptime and accuracy.

It is anticipated that the CIF test systems will be fully worn out by the August 2007 completion date of the current contract at which time the State will require this equipment to be completely replaced as part of either the rebid or in the event of a further extension of the current contract.

This option was included in the earlier Sierra research (2003) and prior to the current plan for a program change in 2007. In light of new program planning it becomes obvious that CIF equipment would not be replaced other than as a function of the new program design.

This option cannot, therefore, be analyzed separately but can be included with the new program RFP once it is in development.

EQUIPMENT UPGRADES
AUTOMATED VRT UPDATES

MEASURE IDENTIFICATION CODE: VIII-3

DESCRIPTION

The New Jersey Vehicle Reference Table (VRT) and OBDVRT are used in the inspection software to ensure proper and consistent ASM and OBD II testing of all applicable vehicles. New model years must be added to the VRT on a continual basis, which requires the State to obtain an updated table and then get the equipment vendors and Parsons to distribute it to all the CIF and PIF test systems (the capability to download these data to the PIF analyzers through the VID has never been functional). At California BAR's request, Sierra is currently developing a proposed approach to address this issue in the California program through an annual automated process that requires minimal effort on the part of BAR and does not need to be linked to a software update. Sierra contacted the individual equipment vendors and developed a conceptual approach that met BAR's objectives at a reasonable cost. Under this option, a similar approach would be incorporated into the New Jersey program.

Automated VRT updates should be part of any inspection program if VRT is used, since it is impossible to make use of VRT without maintaining the latest updates. No further analysis of this option is necessary.

EQUIPMENT UPGRADES
REPLACING PIF NO_X CELLS WITH ANALYZER BENCHES

MEASURE IDENTIFICATION CODE: VIII-4

DESCRIPTION

The current PIF tailpipe test systems utilize electrochemical cells for measurement of NO_X. These cells have short lifetimes (on the order of three to six months according to the manufacturer). Due to their relatively high replacement cost, the NO_X cells do not get replaced as often as needed, which can lead to inaccurate test results. The California Bureau of Automobile Repair (BAR) recently certified NO_X analyzer benches submitted by two separate manufacturers, both of which have significantly longer lifetimes, to be used as replacements for the NO_X cells in the California program. BAR is requiring: (1) new test systems sold in the state to be equipped with the new NO_X analyzers, and (2) in-use test systems to be retrofitted with the NO_X analyzers within one year. If the suggested improvement to change to a transient test is implemented, this change to the NO_X analyzers would be required because the response time of the NO_X electrochemical cells is too slow for transient testing.

Unless ASM dynamometer type testing is retained as a permanent feature of the program, the cost and complexity of NO_X cell upgrades would be difficult to justify.

Based upon available data, no further analysis of this option seems indicated at this time.

VEHICLE REPAIR/MOTORIST ASSISTANCE
STATION REPORT CARDS

MEASURE IDENTIFICATION CODE: IX-1

DESCRIPTION

Under this option, the State would prepare monthly "report cards" of station performance and provide this information to all owners of failing vehicles at the time of initial failure. This is a Federal I/M requirement (40 CFR 51.369, *Improving Repair Effectiveness*); however, the New Jersey program currently does not include this option.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Station report cards are only an effective tool in centralized programs, since repair facilities in decentralized programs often repair vehicles before they are inspected. Station report cards can be difficult to implement in centralized programs because repair facilities often turn away vehicles that may fail inspection in an effort to maintain favorable numbers. The resulting reports are therefore unreliable and can be misleading to the motorist.
- British Columbia and Illinois have centralized programs and have had achieved good results with Repair Effectiveness Index (REI) reports. (Illinois is currently moving toward a hybrid system).
- Colorado has a centralized program and has attempted to use REI reports effectively, but has not achieved good results.

AIR QUALITY IMPACT

- Station report cards have only been an effective means of improving air quality in centralized I/M programs. New Jersey's hybrid program may encounter problems with attempting to implement station report cards.
- There would be a slight improvement if stations that falsely pass vehicles have their test volume reduced.

OVERALL OPERATING COST

- There would be minimal operating costs if automated reports were generated and posted to a website (eliminate mass mail outs).

EMISSION COST/BENEFIT QUOTIENT

- This option is non-quantifiable until after implementation.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Since New Jersey operates a hybrid inspection program, implementation of station report cards may have a negative effect on the program operation.
- There are no impediments to use of existing data from regular audit results, motorist complaints, questionnaires at CIFs and MVC customer service calls.

EASE OF IMPLEMENTATION

- There would be some data processing and public awareness issues to deal with during implementation.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Motorists would be supportive since it would help them decide which stations would be most likely to complete necessary repairs successfully. As stated earlier, positive results have only been achieved in centralized inspection systems.
- Stations would be divided in support based on their grade (high and low performers).

STATE IMPACTS

- This option could generate some positive PR value and discourage practices that are adverse to program goals.

SAFETY IMPROVEMENT FACTOR

- There would be a slight improvement in safety if stations that falsely pass vehicles have their test volume reduced.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-3, VI-1, VI-2, VI-3, VI-4, IX-2, IX-11, IX-12, IX-14, IX-19, and XI-3.

VEHICLE REPAIR/MOTORIST ASSISTANCE
ENHANCED ENFORCEMENT OF ERF REQUIREMENTS

MEASURE IDENTIFICATION CODE: IX-2

DESCRIPTION

Emission repair facilities (ERFs) are private garages certified under the I/M program to repair emission-related failures. If motorists do not perform emissions repairs on their own vehicles, they are supposed to have them repaired by an ERF. ERFs are licensed by the State and must have certified emissions repair technicians on staff. Currently, however, the State is not fully enforcing the repair requirements and is allowing vehicle repairs to be made by non-ERF shops. Motorists frequently report that their repairs are "self performed" to avoid having to provide any repair receipts, especially if the repairs were performed by a non-ERF. The motorists know that the cost of repairs performed by a non-ERF do not count toward a repair waiver if required. Under this option, the State would fully enforce the ERF requirements.

PROOF/DEMONSTRATION OF ALTERNATIVE

- California is one example of a State with very strict authorized repair enforcement. Shops that are not part of the Smog Check program are routinely disciplined for performing emission repairs.

AIR QUALITY IMPACT

- Impact should be proportionate to improved repair effectiveness, but MOBILE6 (EPA) does not grant additional credit. The State currently assumes that 97+5 of the failed vehicles meet standards after repairs, so there is no room for improvement.

OVERALL OPERATING COST

- Not applicable.

EMISSION COST/BENEFIT QUOTIENT

- There is no EPA credit; therefore, zero cost benefit for this option.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- This is not an emission reduction technology but may have the potential to reduce ineffective repairs.

EASE OF IMPLEMENTATION

- Review of present enforcement effectiveness must be conducted to identify the nature of inadequacies before the difficulty of providing improvements can be assessed.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Legitimate PIFs are likely to be supportive.

STATE IMPACTS

- This is to be determined based upon a thorough review of inadequacies. If problem is policy or procedural in nature, impact should be minimal.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Not applicable.

VEHICLE REPAIR/MOTORIST ASSISTANCE
ERF-ONLY REPAIRS

MEASURE IDENTIFICATION CODE: IX-3

DESCRIPTION

Under this option, the existing repair requirements would be expanded to require that all emissions repairs be performed by the ERFs (i.e., owner self-repairs would not be allowed). For a no tolerance policy such as this to be practically enforced it may be best complemented by program elements such as the Repair Assistance Program as described in Option IX-6. Customers would be provided with financial assistance in order to ensure that clean vehicles are on the roads. An evaluation of the extent to which uncertified technicians are currently performing emission repairs may reveal areas for possible improvement whether or not vehicle owner repairs are also restricted.

PROOF/DEMONSTRATION OF ALTERNATIVE

- There is no known precedent for this option.

AIR QUALITY IMPACT

- To the extent that more effective and durable repairs may be carried out by certified professionals on the small proportion of the fleet currently receiving owner repairs, some air quality benefits may accrue. Since any ERF-only requirement should not restrict normal vehicle owner maintenance items like gas cap replacement, air filter, fuel filter, etc., not all categories of current owner repairs would be affected.

OVERALL OPERATING COST

- The only costs that can be quantified for this option are covered under Option IX-6, Repair Assistance Program.
- There would be a dramatic increase in cost to motorists that presently perform their own repairs.
- To ensure that the option is being enforced, the State would have to increase money spent on enforcement.
- It could potentially decrease CIF inspection loading since owners are presently required to bring self-repaired vehicles to CIFs for retests.

EMISSION COST/BENEFIT QUOTIENT

- A slight improvement in emissions might be possible if “professional” repairs are more effective.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- This option would be very difficult to enforce. For example if a motorist that fails for high CO wants to replace his own spark plugs, it is not clear that the State should have the authority to prevent it. Another example would involve the State having to decide if a gas cap replacement is considered a self-repair. Items such as these would have to be considered and guidance provided to enforcement agents.

EASE OF IMPLEMENTATION

- There potentially could be political and possibly legal impediments including economic justice issues if the option was implemented.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- PIFs and ERFs would be strongly supportive.
- Many motorists and special interest groups would be strongly opposed.

STATE IMPACTS

- The State would likely face a firestorm of protest.
- The option may have an adverse affect on overall inspection compliance.

SAFETY IMPROVEMENT FACTOR

- There could be a slight improvement in safety if certain “professional” repairs are more effective.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to V-5, V-15, IX-6, IX- 7, IX-8, and IX-9.

VEHICLE REPAIR/MOTORIST ASSISTANCE
EVALUATE REPAIR COSTS (WAIVER LIMITS)

MEASURE IDENTIFICATION CODE: IX-4

DESCRIPTION

Currently, the I/M program has a repair cost ceiling of $450, with repairs made by certified emissions repair technicians or vehicle owners counting toward the ceiling. Federal I/M regulations (40 CFR 51.360) specify a repair cost ceiling of $450 for all enhanced programs beginning in January 1998, which is to be adjusted annually by the change in the Consumer Price Index (CPI) from a baseline of 1989 to keep pace with inflation. Under this option, the repair cost ceiling would be raised to $675 to match the increase in the CPI since that date.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Most states (including CA) use EPA $450 limit, although only about half correct if for inflation.
- Oregon does not allow waivers.

AIR QUALITY IMPACT

- There is no additional benefit calculated since it will be difficult to justify a waiver rate lower than the current rate.

OVERALL OPERATING COST – Minimum cost to the motorist of $15,000. No additional cost to the State.

- Numbers available from NJ show that only 136 vehicles were granted a waiver in 2003 with the $450 repair cost ceiling. This is due largely to the fact that it is not widely known that vehicles may be eligible for waivers after spending $450 on repairs. Additionally, some vehicles are falsely passed by the PIF/ERFs after unsuccessful completion of repairs. This demonstrates that the current waiver program is under-utilized by the public.
- Implementation of this option would reduce waiver eligibility. There would be an increase in repair costs for some fraction of motorists that seek waivers. If it is assumed that half of the 136 vehicles granted waivers in 2003 would have qualified for a waiver at the higher amount of $675, the cost of implementation of this option would be the additional amount paid for repairs by the 68 vehicles that did not qualify for the waiver. If we assume that repairs on those 68 vehicles totaled $674, then the cost of raising the waiver limit from $450 to $675 is $15,232. In reality, $15,232 represents the minimum impact on motorists, since there are many more vehicles that would qualify for this waiver than actually pursue it.
- There may be a small increase in revenues for ERFs upon implementation of this option that corresponds exactly with the $15,232 cost to motorists.

EMISSION COST/BENEFIT QUOTIENT

- Since there is no measurable impact on air quality, no cost/benefit quotient can be calculated.

- Since the increase cost is applied directly to emission related repairs for vehicles that have already failed inspection the most likely effect on cost / benefit would be favorable.
- A California study indicates a significant loss in program benefits due to the current cost of effective repairs.
- If the waiver amount is not adjusted for inflation, it is likely to be abused by the public in future years, since an increasing number of repairs will cost in excess of the $450 waiver.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Adjusting the waiver for inflation has been demonstrated in other states.
- There are no technical impediments to adjusting the repair cost ceiling.

EASE OF IMPLEMENTATION

- This option should be easy to implement.
- Implementation may require a rule change.
- Implementation would require slight procedural changes and public awareness efforts.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- A negative impact from motorists is possible if the increase in waiver costs is publicized. Currently most motorists are not aware of waiver limits.
- A repair assist program could reduce impacts on low income owners.
- PIF/ERFs would tend to be supportive of this option.

STATE IMPACTS

- This measure would potentially capture an increased proportion of those vehicles most likely to be gross emitters as well as bringing the program closer to compliance with Federal guidelines.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IX-5, IX-6, and IX-7.

VEHICLE REPAIR/MOTORIST ASSISTANCE
NO WAIVERS FOR OBD II VEHICLES

MEASURE IDENTIFICATION CODE: IX-5

DESCRIPTION

EPA OBD-I/M guidance recommends that states not allow waivers for OBD II vehicles, to avoid allowing any of these vehicles to complete their inspection cycle with their MIL still illuminated. Waivers are currently allowed for OBD II vehicles in the New Jersey program; however, under this option they would be eliminated. Indications thus far are that the actual waiver rate for OBD vehicles approaches 0%. Therefore it is unlikely that adoption of a no tolerance policy such as this would have much effect on the program other than to bring it into better compliance with EPA guidelines. An additional option to mitigate any perceived hardship that may be cause by adopting this option is the Repair Assistance Program as described in Option IX-6.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Most states use the EPA $450 limit on repairs to govern the waiver policy. Once the motorist spends $450 in an effort to bring the vehicle into compliance if the vehicle will still not pass inspection, a waiver may be applied for and granted. Only about half the states that use this limit correct it for inflation.
- Oregon does not allow waivers.

AIR QUALITY IMPACT

- Parsons reported that in New Jersey of 1,000,000 vehicles inspected, only 75 waivers were granted to OBD II vehicles. This corresponds to a vehicle waiver rate of 0.0075%. There is no additional information available with which to calculate the air quality impact of denying waivers.

OVERALL OPERATING COST

- Since the current OBD waiver rate approaches 0%, there is no basis from which to calculate operating costs for this option at this time.
- Given the statistically insignificant waiver rate there is no quantifiable cost impact to the State if waivers were denied. Since the vehicles currently granted waivers undergo inspections, then attempt to obtain repairs before finally obtaining a waiver, there would be little impact on inspection volume if the waivers were not issued.
- If the State decides to require inspections for 100% of OBD II vehicles, the State may also decide to assist motorists with necessary repairs if the costs are excessive. If the State decides to implement such a program, these costs would add to the cost of this option.

EMISSION COST/BENEFIT QUOTIENT

- There would be some emissions benefit to requiring 100% of OBD II vehicles to pass inspection, but since the current waiver rate is only 0.0075%, the benefit would be small.
- Requiring 100% of OBD II vehicles to pass inspection would not cost the state, unless a program was employed to assist motorists with excessive repair costs.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- According to EPA recommendations there is no acceptable reason why appropriate repairs should not allow a MIL to be turned off, other than factory defects. Factory defects should be repaired under warranty. OBD waivers permit a vehicle to operate with the OBD warning system disabled which can result in increasing liability for the vehicle operator if more serious problems develop.

EASE OF IMPLEMENTATION

- Implementation of this option would require a change in inspection procedures, waiver procedures, and public outreach.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Some fraction of motorists may resist this option.
- ERFs would likely support this option since it could result in slightly increased revenues.

STATE IMPACTS

- By ensuring that the most defective fraction of the OBD II fleet receives appropriate repairs, overall program integrity is preserved. The state should work with dealer associations on issues of OBD II lemons.

SAFETY IMPROVEMENT FACTOR

- There may be some slight improvement for safety related DTCs.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IX-4, IX-6, and IX-7.

VEHICLE REPAIR/MOTORIST ASSISTANCE
REPAIR ASSISTANCE PROGRAM

MEASURE IDENTIFICATION CODE: IX-6

DESCRIPTION

Other states (e.g., California) have significant repair assistance programs to aid the owners of failing vehicles in getting them repaired. All motorists are eligible for repair assistance in California, with documented low-income vehicle owners being required to contribute a lesser co-pay amount. The California program is also linked to a vehicle scrappage program that includes incentive payments to vehicle owners who choose to have their vehicle scrapped rather than repaired. Under this option, the State would implement a repair assistance program in New Jersey. Currently, the worse emitters in New Jersey can receive a waiver and continue to operate. This option to the program would get these vehicles repaired.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Used in California and Texas. Texas collects $8 on each OBD II test to fund LIRAP. Money often is left over in the Texas program.

AIR QUALITY IMPACT

- No additional benefit is calculated since it will be difficult to justify a waiver rate lower than the current rate.

OVERALL OPERATING COST - $3,250,000

- Based on low income repair assistance for 5,000 vehicles at a cost of $500 per vehicle plus $150 administrative fee per vehicle, the cost of this program would be around $3,250,000. The estimate of eligible vehicles and cost of the repair assistance program was obtained from NJ DEP.

EMISSION COST/BENEFIT QUOTIENT

- No air quality impact is calculated based on existing modeling assumptions; therefore, no cost/benefit can be calculated.
- The cost/benefit quotient is estimated to be favorable ratio based upon the analysis done by California.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- There are no known technical impediments to implementation of this option.

EASE OF IMPLEMENTATION

- Implementation requires that a new program be created from scratch which would likely include a vehicle scrappage component as well. There would be some additional burden for public outreach and documentation of eligibility of repair category and individuals' income category.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Motorists, ERFs, and environmental groups are likely to be supportive of this option.

STATE IMPACTS

- There would be an increase in the financial and administrative burden to prevent dirty vehicles that are currently operating under waivers from using this option.

SAFETY IMPROVEMENT FACTOR

- There would be little impact on safety unless funds were allocated to assist motorists with safety related issues. Some repairs do qualify as safety and emissions related improvements, such as repair of liquid leaks.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IX-4, IX-5, and IX-7.

VEHICLE REPAIR/MOTORIST ASSISTANCE
VEHICLE SCRAPPAGE PROGRAM

MEASURE IDENTIFICATION CODE: IX-7

DESCRIPTION

Under this option, a vehicle scrappage program can be implemented either separately or in combination with a repair assistance program. The scrappage program would be linked to the I/M program (i.e., owners of failing vehicles would be given the option of either repairing or scrapping the vehicles). A benefit which is exclusive to scrappage is that eligible vehicles are permanently prevented from contributing pollution to the air inventory, as opposed to typical inspection/repair methods that may suffer from limited effectiveness such that vehicles begin contributing excess emissions before 2 years elapse for their next inspection.

PROOF/DEMONSTRATION OF ALTERNATIVE

- California has a scrappage program as part of LIRAP program.

AIR QUALITY IMPACT

- There would be improvement in air quality since even after repairs older vehicles operate at higher emission rates than vehicles with more robust emission control technology. It is estimated that scrapping 2% of failed vehicles or 2,000 vehicles would reduce HC by 0.14 tons per day, NO_X by 0.07 tons per day, and CO by 2.0 tons per day assuming that the scrapped vehicles would otherwise be driven 12,000 miles per year.

OVERALL OPERATING COST - $2,300,000

- According to information from the California Bureau of Automobile Repair, the cost of the scrappage program costs approximately $1,000 per vehicle plus an additional administrative fee per vehicle of $150. Assuming a 2% scrappage rate of 2,000 vehicles per year, the program cost would be approximately $2,300,000.

EMISSION COST/BENEFIT QUOTIENT

- At a program cost of $2,300,000 and an estimated annual HC reduction of 51 tons, NO_X reduction of 25 tons, and CO reduction of 729 tons, the cost benefit quotient would be $45,000 per ton of HC, $92,000 per ton of NO_X, and $3,200 per ton of CO.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- There are no technical impediments to implementation of this option.

EASE OF IMPLEMENTATION

- The new program must be created from scratch, which would likely include a low-income repair assistance component as well. (See Option IX-6) Some additional burden for public outreach and documentation of eligibility of repair category and individuals' income category.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Motorists and environmental groups are likely to be supportive of this option.

- PIF/ERFs may be somewhat opposed because it reduces the number of vehicles that would otherwise need repairs.
- There are potential environmental justice issues associated with this option.

STATE IMPACTS

- Implementation of this option would increase the financial and administrative burden to prevent dirty vehicles that are currently operating under waivers.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to VII-12, IX-4, IX-5, and IX-6.

VEHICLE REPAIR/MOTORIST ASSISTANCE
OXYGEN SENSOR AND/OR CATALYST REPLACEMENT PROGRAM

MEASURE IDENTIFICATION CODE: IX-8

DESCRIPTION

Oxygen sensors are one of the most common types of emissions-related defects, particularly on aging vehicles. Catalysts also degrade over time and are often dead on older vehicles (i.e., those greater than 10 years old). Alaska implemented an oxygen sensor replacement pilot program in Fairbanks as a CO control strategy. While both mandatory and voluntary replacement programs have been investigated, current implementation efforts focus on a voluntary program aimed at replacing oxygen sensors on marginal emitters (those that barely pass their I/M test). Under this option, a similar voluntary program would be implemented in New Jersey.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Alaska found that this option had positive results early, but minimal effectiveness would be expected after 2010 when the older vehicles with replaced oxygen sensors are scrapped. There is no explanation as to why continuing to replace oxygen sensors in older vehicles would not provide continued emissions reductions. [Reference report found on State website under http://www.co.fairbanks.ak.us/Transportation/FnsbAqPlan/FULL_REPORT.pdf]

AIR QUALITY IMPACT

- Some improvement would be expected if this option is applied to older fleet marginal emitters which are likely to fail before the next inspection cycle.
- The Alaska report which is dated December 2003 projected that the maximum emissions reduction would come from including model years 1983 – 1993. This can be interpreted as including vehicles from 10-20 years old. There is no explanation of why vehicles in excess of 20 years old are not included. It is assumed that those vehicles would benefit from oxygen sensor replacement as well, however the number of vehicles older than 20 years would be small and it is likely that those vehicles would be driven fewer miles per year than newer cars.

OVERALL OPERATING COST - Program costs up to $100,000 per year. Catalytic converter replacement plus oxygen sensor range from $400 to over $2,200 per vehicle.

- Program costs would stem from the State paying for or assisting the motorist with the cost of replacing the oxygen sensor and/or catalyst.
- Catalytic converter replacement costs range from $200 to over $2,000 depending upon the make, model and year of the vehicle. Oxygen sensors generally cost much less than catalytic converters, at around $200 or less.
- Program costs would be up to $100,000, based on one person’s salary for management of the replacement program.

EMISSION COST/BENEFIT QUOTIENT

- The cost/benefit quotient would be favorable since vehicles are targeted that are most likely to be high emitters. Both the program cost and benefit could be significant.
- Alaska estimates that the oxygen sensor replacement program will cost the State between $1,350 and $2,400 per ton of CO reduced depending on the vehicles that are targeted for replacement. Although NO_X and HC emissions are expected to be impacted by the oxygen sensor replacement program, the cost benefit of these pollutants are not reported.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- The technology associated with implementation of this option is straightforward. It has been shown that replacement of emissions control devices will yield emissions reductions. The key to implementation is selecting the appropriate vehicles from the fleet in order to gain the most benefit from this option.
- The Fairbanks Alaska study reported for 1985 - 1992 vehicle models included in the pilot study and having initial CO tailpipe concentrations in the range of 0.40 - 1.0%, sensor replacement yielded an average CO emissions reduction of about 21% for typical winter day driving.

EASE OF IMPLEMENTATION

- As a voluntary program, implementation consists primarily of outreach and funding.
- Research would be necessary to establish program eligibility based on alignment of program cost with available funding.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Motorists, ERFs, and environmental groups would likely be supportive of this option.

STATE IMPACTS

- There are costs associated with the effort to capture emissions from vehicles that are likely to be high emitters for the period between inspection cycles.
- There is for potential emissions reductions early, but minimal effectiveness after 2010. Therefore, early implementation would be most beneficial if this program goes forward.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IX-4, IX-6, IX-7, IX-9, VII-11, VII-20, and VII-21.

VEHICLE REPAIR/MOTORIST ASSISTANCE
MORE STRINGENT REPAIR CUTPOINTS

MEASURE IDENTIFICATION CODE: IX-9

DESCRIPTION

I/M cutpoints are designed to identify vehicles with significant emissions-related defects. Defect-free vehicles have emissions levels that are well below these standards. Once a vehicle containing emissions-related defects has been identified, it is reasonable to expect it to be repaired to an emissions level representative of defect-free vehicles; however, studies have shown that failing vehicles are often repaired to just pass the applicable cutpoints. Under a program enhancement that California considered, more stringent repair cutpoints would have been applied to the after-repair test in order to reduce emissions to passing vehicle levels. A similar change would be implemented in the New Jersey program under this option. It should be noted that California did not implement this option.

The most straightforward application of this program change would be to apply the more stringent standards to vehicles that receive a tailpipe test, where it would be possible to apply standards based on concentration measurements. Application of this program change to the OBD fleet would be possible, but a tailpipe test would have to be added.

PROOF/DEMONSTRATION OF ALTERNATIVE

- This option is not done anywhere else.
- Since California has not elected to proceed with this measure there are no other known examples of successful implementation.

AIR QUALITY IMPACT

- It is difficult to quantify this option without determining cutpoints.

OVERALL OPERATING COST

- Any increase in repair cost for motorists would be based upon the cutpoints ultimately imposed.
- Since there is no present benchmark for this measure, the State would have to decide upon actual cutpoints for any quantification to be possible.

EMISSION COST/BENEFIT QUOTIENT

- It is difficult to quantify this option without determining cutpoints.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Since such a strategy would require changes to re-inspection methods, it is not clear if this is a workable alternative.

EASE OF IMPLEMENTATION

- If this option was implemented, there would be substantial test procedure, repair procedure, training and auditing burdens to overcome.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- The option would likely be opposed by motorists, but supported by ERFs.

STATE IMPACTS

- Substantial program design burdens with unclear benefits.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to V-7, VII-7, VII-10, VII-11, VII-12, VII-20, IX-6, IX-7, and IX-8.

VEHICLE REPAIR/MOTORIST ASSISTANCE
TRACK OBD II REPAIR COSTS BY DTC

MEASURE IDENTIFICATION CODE: IX-10

DESCRIPTION

The only means available for tracking emission repair costs in New Jersey at present is a paper-based system that requires extraordinary effort to process. This option would allow for evaluation of improved methods of data collection that could include semi-automated tracking of repair costs by Diagnostic Trouble Code (DTC) for the OBD II fleet, and improved procedures for entry of repair data by repair technicians. NJ DEP has been involved in some initial evaluation of such improvements that may be expanded upon for this purpose.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Delaware enters repair from based data into a large database for post processing that can be used to derive a variety of repair cost effectiveness factors.

AIR QUALITY IMPACT

- There is no direct air quality benefit. However, such data may be used to identify deficits in training or enforcement that can eventually improve repair proficiency and related emissions benefits.

OVERALL OPERATING COST – $45,000 to perform evaluation

- Since this option only refers to evaluation of tracking methods, the evaluation may be performed internally. This cost was estimated to be $45,000 based on similar evaluations.
- Costs would be directly related to the data processing function.

EMISSION COST/BENEFIT QUOTIENT

- Not applicable.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- A convenient source of this information may come from waiver reports that require the type and cost of repairs to be entered. In order for the reports to be most useful, they should be entered electronically for file upload to a database. The greatest impediment to gathering useful information in this manner is the mixing of various service items, on the same work order/invoice, including those not emissions related. The report must be formatted so that the repair shops itemize repair parts and labor per DTC.

EASE OF IMPLEMENTATION

- This option is primarily a data management function with some technician training required.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Some resistance from repair shops could be anticipated due to extra work involved with data entry.

STATE IMPACTS

- By improving the accuracy of repair cost estimates, a better determination of inspection cost/benefit and program effectiveness can be developed.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IX-1, IX-4, IX-6, IX-7, and IX-11.

VEHICLE REPAIR/MOTORIST ASSISTANCE
TRACK RETEST PASS RATES BY DTC

MEASURE IDENTIFICATION CODE: IX-11

DESCRIPTION

This option would provide for periodic reporting on the initial retest pass rate of vehicles that fail an initial OBD II inspection according to the Diagnostic Trouble Codes (DTCs) that were present at the time of initial inspection. This simple data management and reporting function can generate extremely valuable data for program evaluation especially as it reveals the adequacy of training, repair effectiveness, re-inspection procedures, and procedures for repair verification. Tracking this type of OBD II inspection data would essentially be a function of generating a VIID report based on DTC retest criteria. No analyzer software changes are required. However, if future data records were formatted to provide for a means of distinguishing initial retests from subsequent retests, other than the test date, it may simplify future analysis. Parsons/MCI are fully capable of this type of reporting from the shadow VIID in the absence of State resources appropriate to this task.

Implementation of this option would support the repair training objectives referred to in Options IX-12 (Enhanced OBD II Diagnosis and Repair Training) and IX-14 (Revise Training Program). Please refer to those options for further perspective regarding this option.

PROOF/DEMONSTRATION OF ALTERNATIVE

- This is just a standard database reporting function. No special skills or technology is required.

AIR QUALITY IMPACT

- No impact can be assessed until the effect of implementation on repair proficiency can be evaluated after-the-fact.

OVERALL OPERATING COST - $3,500

- Estimated contractor cost to develop the database reporting function is estimated to be $3,500.

EMISSION COST/BENEFIT QUOTIENT

- No impact can be assessed until the effect of implementation on repair proficiency can be evaluated after-the-fact.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- A simple database reporting function with the potential to identify deficits in repair proficiency.

EASE OF IMPLEMENTATION

- After initial report development, data would have to be reviewed periodically and made available to management responsible for technician training as a decision support tool.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- There are no stakeholder impacts anticipated regarding this option.

STATE IMPACTS

- This would provide evidence of deficits in repair proficiency that may otherwise be obscure.

SAFETY IMPROVEMENT FACTOR

- No impact can be assessed until the effect of implementation on repair proficiency can be evaluated after-the-fact.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IX-10, IX-12 and IX-14.

VEHICLE REPAIR/MOTORIST ASSISTANCE
ENHANCED OBD II DIAGNOSIS AND REPAIR TRAINING

MEASURE IDENTIFICATION CODE: IX-12

DESCRIPTION

Under this option, enhanced training in OBD II diagnosis and repair would be provided to interested repair technicians.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Alaska provides this option.

AIR QUALITY IMPACT

- Impact should be proportionate to improved repair effectiveness, but MOBILE6 (EPA) does not grant additional credit. The State currently assumes that 97+5 of the failed vehicles meet standards after repairs, so there is no room for improvement.

OVERALL OPERATING COST

- The cost of a train-the-trainer classes and/or web-based resources and/or technician clinics should be considered. The cost will vary depending on which class format the State chooses and if they contract the work out.

EMISSION COST/BENEFIT QUOTIENT

- There is no EPA credit; therefore, zero cost benefit for this option.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Would use well known training delivery channels with possibility of more innovative web-based training resources.

EASE OF IMPLEMENTATION

- The development of this option would be supported by Option IX-10 which facilitates the identification of OBD II defects that are not being effectively repaired prior to the first reinspection.
- Curriculums are available from various qualified sources. Mission would involve contract development with some State management and resource staff.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Response should be very positive from ERFs, environmental groups, and motorists.

STATE IMPACTS

- May be a cost effective means of insuring long term success of OBD program. State staff connected with the repair side of the program could benefit from this option as well.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to II2-, IX-1, IX-2, IX-3, IX-4, IX-10, and IX-11.

VEHICLE REPAIR/MOTORIST ASSISTANCE
STREAMLINE ERF CERTIFICATION FOR OE SHOPS

MEASURE IDENTIFICATION CODE: IX-13

DESCRIPTION

More factory service facilities may be encouraged to become ERFs if certain State training and certification requirements that are considered redundant with factory training were relaxed. One alternative would be for a service manager with ERF training, who is available during periods when emission repairs are performed, to designate factory-trained service techs to perform repairs based on the service manager's certification alone. Another alternative would be to offer factory trained technicians the option of completing web-based training to satisfy ERF requirements on a much more flexible schedule than classroom training. The second option may serve to soften much of the resistance to training activities that stems from techs having to lose time on the job.

PROOF/DEMONSTRATION OF ALTERNATIVE

- There is no known proof/demonstration of this option.

AIR QUALITY IMPACT

- Not applicable.

OVERALL OPERATING COST

- The operating cost would be neutral since option only requires a review of the factory training programs and a policy change.
- There could potentially be overhead costs if the State decides to develop web training resources.

EMISSION COST/BENEFIT QUOTIENT

- Not applicable.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Not applicable.

EASE OF IMPLEMENTATION

- Implementation would require a review of the OE training to determine if it is sufficient. A policy change would also be required.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- OE's are likely to be supportive of an option that permits technicians with expert level OE training to perform emission repairs in shops where the service manager has an ERF certificate.
- Other private repair ERFs may object if all of their technicians are already trained (loss of business).
- Motorists would probably be neutral.

STATE IMPACTS

- This option would reduce contention with new car dealers over ERF requirements and increase the repair technician base for the program as a whole. There is a possible need for an independent review of dealer training relative to current New Jersey ERF requirements.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-3, IX-2, IX-3, IX-10, IX-11, and IX-12.

VEHICLE REPAIR/MOTORIST ASSISTANCE
REVISE TRAINING PROGRAM

MEASURE IDENTIFICATION CODE: IX-14

DESCRIPTION

Revise training program for adequacy and completeness as regards OBD repairs, CAN, etc. With the rapidly increasing pace of technological change in both automotive design and diagnostic technologies, current resources provided to ERF technicians should be supplemented in areas where deficits have either been noted or can be reasonably anticipated. Certain categories of OBD II diagnosis and repair are known to present unusual challenges to techs with current training. Some of these areas include OBD II EVAP diagnosis and MODE 6 data for analysis of OBD monitor performance that may be manufacturer specific. With the advent of the CAN, (Controller Area Network), OBD II protocol, technicians will have to be prepared to face whole new categories of diagnostics and assess the capabilities of the diagnostic equipment they already own to provide adequate communications with these vehicles.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Most I/M states with training programs review them periodically.

AIR QUALITY IMPACT

- Impact should be proportionate to improved repair effectiveness, but MOBILE6 (EPA) does not grant additional credit. The State currently assumes that 97%+5% of the failed vehicles meet standards after repairs, so there is no room for improvement.

OVERALL OPERATING COST

- The cost of a train-the-trainer classes and/or web-based resources and/or technician clinics should be considered. The cost will vary depending on which class format the State chooses and if they contract the work out.

EMISSION COST/BENEFIT QUOTIENT

- There is no EPA credit; therefore, zero cost benefit for this option.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Based upon data available from Option IX-10 (Track OBD II Repair Costs) and periodic review of emerging automotive technologies, training staff should be able to determine areas of need.

EASE OF IMPLEMENTATION

- Implementation does not require any staff or level effort beyond existing practices.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Motorists and repair technicians are likely to be supportive of this option.

STATE IMPACTS

- May be an opportunity to apply corrections before serious problems can develop with certain types of repairs.

SAFETY IMPROVEMENT FACTOR

- Importance of repair proficiency applies equally to emissions or safety.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to IX-10, IX-11, IX-12, IX-15, and IX-16.

VEHICLE REPAIR/MOTORIST ASSISTANCE
DEVELOP ONGOING TRAINING PROGRAM AUDIT SYSTEM

MEASURE IDENTIFICATION CODE: IX-15

DESCRIPTION

With the rapidly increasing pace of technological change in both automotive design and diagnostic technologies, current resources provided to ERF technicians should be supplemented in areas where deficits have either been noted or can be reasonably anticipated.

One means of assessing the deficits in current technician training required for ERF certification would be to develop trigger reports based on the incidence of post inspection/repair/retest failures (ping-pong effect) that could provide a semi-automated audit method.

PROOF/DEMONSTRATION OF ALTERNATIVE

- There are no states using correlations of retest failures per ERF technician to direct training.

AIR QUALITY IMPACT

- Implementation of this option would help to reduce emissions through more effective repairs of vehicles that fail emissions inspections.

OVERALL OPERATING COST

- The cost of this option would be dependent on the development cost of the necessary trigger reports and the cost of additional training for ERF technicians. These costs have not been established.
- Motorists may save money if this option is implemented, since it will help to eliminate unnecessary or improper initial repairs.

EMISSION COST/BENEFIT QUOTIENT

- The emission cost/benefit quotient cannot be quantified for this option.
- The cost/benefit quotient would be proportionate to the increase in the rate of effective repairs.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- There should be a straightforward periodic inter-agency review that considers factors such as subsequent failures after initial inspection and emerging technical challenges such as CAN, Hybrid Vehicles, Higher Voltage Auto Electric Systems, etc. for in-time development and delivery of technical resources for repair and diagnostics.

EASE OF IMPLEMENTATION

- The State could assume an umbrella role in coordinating the efforts of existing technical training and academic institutions.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- It is expected that there would be a generally positive perception of this option by motorists and ERFs.
- Training organizations would want/need to be involved in program development.

STATE IMPACTS

- Taking a proactive role in avoiding technical training deficiencies would bring dividends in the appropriate repair rate and progress towards attainment of air quality goals.
- There are undetermined costs associated with the development of this option.

SAFETY IMPROVEMENT FACTOR

- There may be some benefits to safety. Any safety improvements would be subject to the training program design.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to II-2, IX-1, IX-2, IX-3, IX-4, IX-10, IX-11, IX-12, IX-14, and IX-16.

VEHICLE REPAIR/MOTORIST ASSISTANCE
DEVELOP WEB-BASED PIF/ERF TRAINING PROGRAM

MEASURE IDENTIFICATION CODE: IX-16

DESCRIPTION

The availability of economical high-speed internet services, both at home and in PIF/ERF repair shop environments makes it possible for a great deal of the content currently provided in a classroom environment to be made available to technicians through more convenient and cost-efficient channels such as the world wide web. Some of the training providers who are past or current stakeholders have already developed and are capable of customizing such resources to meet MVIS requirements. This would be an ideal method of delivering updates and just in time training to meet emerging technical challenges on a timelier basis.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Some of the training providers who are past or current stakeholders have developed and are capable of customizing a web-based PIF/ERF training program.

AIR QUALITY IMPACT

- There are no impacts on air quality associated with this option.

OVERALL OPERATING COST

- The cost of development of this program is not known. The details of development, timeframe for roll-out, and cost can only be determined through a formal request for bids, since there are no other programs known that use this option.
- Additional cost considerations would consist of proper computer hardware and internet connectivity for those in need of training. Some trainees could possibly train from home as long as sufficient audits were conducted to assure training goals are achieved.

EMISSION COST/BENEFIT QUOTIENT

- There are no anticipated emissions impacts; therefore, the cost/benefit quotient cannot be calculated.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- Not applicable.

EASE OF IMPLEMENTATION

- This option is technically feasible, but there are no precedents within I/M programs with which to base the ease of implementation.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- The stakeholder impact is unknown.

STATE IMPACTS

- Impacts to the State include cost considerations associated with program development, whether the training would be as effective as traditional classroom training, and potential cost savings over the long term. Expected long term cost savings result from the program relying less on training personnel with an internet based training course.

SAFETY IMPROVEMENT FACTOR

- There no safety related impacts anticipated with this option.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Not applicable.

VEHICLE REPAIR/MOTORIST ASSISTANCE
EVALUATE DRIVE-CYCLE DYNE CONVERSION

MEASURE IDENTIFICATION CODE: IX-17

DESCRIPTION

There is some cause for concern that PIFs may be particularly resistant to any State proposal for phasing out the ASM portion of the program based upon loss of their significant investment in ASM dynamometers. If loaded-mode testing is thus obsolesced, PIFs could be provided the option to convert their current ASM dynamometers to drive-cycle dynes for use in advanced OBD II vehicle fault diagnosis and drive-cycle performance. Such conversions may be available from respondents to the recent RFI published by NJ MVC and MACTEC for under $3,000 thus making the conversion cost effective and mitigating the perception of lost investment by PIFs to some extent.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Proposals have been developed by dyne manufacturers to implement the necessary conversions for approximately $3,000 per conversion.
- The conversion was exhibited at 21st Clean Air Conference and a demonstration was offered to New Jersey by Mustang Dynamometer in response to the RFI.

AIR QUALITY IMPACT

- There is no estimated impact on air quality.

OVERALL OPERATING COST - $3,000 or less per ERF for a total implementation cost of approximately $4,000,000

- All costs would be borne by ERFs. Conversion cost quotes are for $3,000 or less using existing inspection grade dynamometers. There are 1,327 PIFs in New Jersey. If the dynamometer conversion is performed at all the PIFs, the total cost of implementation would be approximately $4,000,000.

EMISSION COST/BENEFIT QUOTIENT

- There are no anticipated air quality impacts, so no cost/benefit quotient has been calculated.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- This option provides a mechanism for continued use of existing dynamometers if stations are switched to OBD II-only.
- This option is just out of the development stage and beginning the demonstration stage of development. The fundamental technology has been proven in millions of ASM drive cycles for inspection use.

EASE OF IMPLEMENTATION

- There are no technical impediments in conjunction with the program change that eliminates loaded mode testing.

- Installation of the conversion kits on existing dynamometers could be problematic for PIFs since they have revenue-based incentives to be operational as much as possible. Shutting down a dynamometer to complete the conversion would take the test lane out of service. Completing the installations across a large number of PIFs could take time. The conversion is considered as something that would be optional to the PIFs.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Motorists and ERFs should be neutral or supportive of this option.
- PIFs may object to loss of the dynamometer investment if loaded mode testing is abandoned and they do not select this option.

STATE IMPACTS

- This option presents a viable alternative to mitigate concerns over lost PIF investment in dynamometers. Implementation could contribute substantially to improve effective repairs for OBD vehicles.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to VII-4, VII-5, VII-6, VII-7, VII-8, VII-9, VII-21, VIII-4, IX-10, IX-11, IX-12, IX-14, and IX-20.

VEHICLE REPAIR/MOTORIST ASSISTANCE
CONVERT OBSOLETE CIF(S) TO TECHNICAL ASSISTANCE CENTER(S)

MEASURE IDENTIFICATION CODE: IX-18

DESCRIPTION

Dependent upon other program design considerations it may be desirable to remove some of the single lane CIFs from service. Single lane CIFs are somewhat inflexible in responding to inspection load variations and are much more sensitive to downtime due to their lack of redundant lanes and equipment.

The State of Wisconsin has included a feature with their Centralized Inspection Program known as Technical Assistance Centers (TACs). The TACs are essentially single lane inspection facilities that handle referee services, problem vehicles, the development of technical refinements for inspection and repair as well as playing host to emission repair technicians for after-hours seminars and workshops around a lane environment. Based upon the Wisconsin model, conversion of somewhat obsolete single lane CIFs to TACs could handle problem vehicles on an appointment basis that otherwise burden the MVIS while improving PIF industry relations by enhancing technical support to PIFs.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Wisconsin has implemented Technical Assistance Centers to handle referee services, problem vehicles, the development of technical refinements for inspection and repair as well as playing host to emission repair technicians for after-hours seminars and workshops around a lane environment.

AIR QUALITY IMPACT

- Air quality impacts would be proportionate to increased rates of inspection and repair for problem vehicles.

OVERALL OPERATING COST

- There would be little impact on program cost if existing facilities are converted to an appointment basis. TAC strategy relies on better trained but fewer technicians.

EMISSION COST/BENEFIT QUOTIENT

- The air quality impact has not been estimated, therefore the cost/benefit quotient has not been quantified.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- This option has proven to be a great benefit in the Wisconsin centralized program. TACs can function as technical training centers and also be a resource to evaluate potential changes to inspection procedures.

EASE OF IMPLEMENTATION

- There may be some associated network design and human resource challenges, such as implementing teams to run the TACs efficiently and communicating the proposed CIF changes to motorists so that they understand the purpose and locations of the TAC facilities.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- This option has historically received a positive response from motorists with problem vehicles and ERFs that seek assistance.
- The PIFs may have minor concerns, since suggested improvements to the CIF system threatens the PIFs.
- Some PR problems could arise without proper notification of the facility designation change to a TAC, as motorists would continue to arrive for unscheduled inspections as they are used to with traditional CIFs.

STATE IMPACTS

- Implementation provides better utilization of select single lane CIFs that should be obsolesced due to facility limitations. In emission repair as with general automotive service, a small percentage of the vehicles cause the majority of problems. The Technical Assistance Center approach can operate as a referee, trouble shooting, and technician resource base to perform more expert and in depth analysis on vehicles that cannot pass emission re-tests. Where pattern failures are concerned solutions can then be communicated to the entire repair network.

SAFETY IMPROVEMENT FACTOR

- Safety related implications are subject to the program design.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-1, II-1, II-2, III-6, V-17, VII-10, VII-11, VII-12, VII-15, VII-16, VII-21, IX-6, IX-10, IX-11, and IX-12.

VEHICLE REPAIR/MOTORIST ASSISTANCE
DEVELOP INCENTIVE BASED SYSTEM FOR HIGH PERFORMING SHOPS

MEASURE IDENTIFICATION CODE: IX-19

DESCRIPTION

This option is similar to the California Gold Shield model. Test and Repair Stations that meet high performing criteria can apply and be accepted. Once accepted, listings of Gold Shield shops are provided to consumers and may be included in the facility's advertising. For perspective on this option, refer to Option V-4 (Test-Only PIFs).

PROOF/DEMONSTRATION OF ALTERNATIVE

- This option has had limited success in California.

AIR QUALITY IMPACT

- California reports a slight improvement for qualifying test and repair facilities.

OVERALL OPERATING COST

- Revenue would be neutral since application fees can be used to cover certification costs.

EMISSION COST/BENEFIT QUOTIENT

- Not applicable.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- California reports a slight improvement for qualifying test and repair facilities.

EASE OF IMPLEMENTATION

- This option is not difficult to implement. Essentially it just requires a certification program for select PIFs.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Motorists tent to support some means of determining higher quality facilities for inspection.

STATE IMPACTS

- This option can help raise the industry bar among PIFs and create constructive competition.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-3, II-1, II-2, V-4, VI-1, VI-2, VI-3, VI-4, IX-1, IX-2, IX-3, IX-14, IX-20, XI-3, and XI-5.

VEHICLE REPAIR/MOTORIST ASSISTANCE
EVALUATE ESSENTIAL TOOL PROGRAM

MEASURE IDENTIFICATION CODE: IX-20

DESCRIPTION

There is presently no specific requirement or approval process for ERFs to possess essential diagnostic tools. Some States such as California require ERFs to possess certain basic tools to demonstrate their ability to adequately perform emission repairs. An example would be a tool as simple as a vacuum pump that allows certain components, such as EGR valves on older models, to be exercised in the diagnostic process. Another example would be an OBD scan tool that is capable of interfacing with any 1996 or newer vehicle the shop elects to perform emission repairs on. At minimum a suggested list of such tools could be developed to assist ERFs in being properly equipped to protect motorists from ineffective repairs. The current audit staff could be used to advise PIFs that it is a basic requirement of the MVIS for non-owner emission repairs to be carried out only by professional technicians who are certified, trained and properly equipped with a list of suggested diagnostic tools or equivalents.

PROOF/DEMONSTRATION OF ALTERNATIVE

- California requires ERFs to possess certain basic tools to demonstrate their ability to adequately perform emission repairs.

AIR QUALITY IMPACT

- It is expected that increasing audits on ERFs to ensure that the proper equipment and repair technician certifications are in place would result in a positive impact on air quality.

OVERALL OPERATING COST

- This option could be incorporated into the existing audit program with minimal effort and/or cost.

EMISSION COST/BENEFIT QUOTIENT

- The emission cost/benefit quotient cannot be quantified.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- This option requires the personnel providing oversight to be knowledgeable in advanced automotive diagnostic systems. Best Available Technology must be reviewed periodically and shops either encouraged or required to obtain tools considered essential to appropriate diagnostics, repairs, and repair verification.

EASE OF IMPLEMENTATION

- There would be some professional staff and audit changes necessary for implementation of this option.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Less professional ERFs may resist implementation of this option.
- Expert and high volume shops are more likely to cooperate.
- Positive audit responses could possibly be used for advertising to increase business.
- All ERFs actually benefit since evolving vehicle technologies have promoted a bewildering assortment of specialty diagnostics for which the average shop may be ill-equipped to judge the value.

STATE IMPACTS

- There is little adverse impact if such a program is introduced on a voluntary basis where certain basic diagnostics are recommended and shops that meet minimum criteria receive special status and possibly web promotion.

SAFETY IMPROVEMENT FACTOR

- Any impacts on safety are subject to program design

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-3, II-1, VII-14, VII-17, VII-21, VIII-1, VIII-2, IX-1, IX-3, IX-11, IX-12, IX-14, IX-16, IX-17, and IX-19.

SAFETY INSPECTION
SAFETY FAILURE PROFILING

MEASURE IDENTIFICATION CODE: X-1

DESCRIPTION

This option reviews the possibility of applying a safety failure profile to determine if certain vehicles can be exempted from specific safety inspection requirements.

PROOF/DEMONSTRATION OF ALTERNATIVE

- There are no known precedents related to this option that have been implemented in any other I/M programs. Safety research specific to the New Jersey fleet would be needed.
- Preliminary analysis by MACTEC found that the failure rate for brakes and suspension were low for vehicles up to 10 years old, indicating that model year exemptions could be expanded for these items but more analysis is needed.

AIR QUALITY IMPACT

- There are no air quality related implications associated with this option.

OVERALL OPERATING COST

- There is some potential cost reduction associated with reducing the per vehicle inspection time; however, the safety inspection is already completed quickly. Creating a profile for the purpose of exempting certain vehicles from specific safety inspection requirements may just add complexity to the safety inspection without significantly reducing inspection time.

EMISSION COST/BENEFIT QUOTIENT

- There are no air quality related implications associated with this option.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- This change may be needed if the State wants full advantage of Self-Service OBD II or OBD III options.
- There are no technical impediments to implementation of this option.

EASE OF IMPLEMENTATION

- Traffic safety research and program re-design are required as well as measured safety ratings of vehicles and individual safety components of all vehicles. It may be possible to exempt more vehicles from specific safety inspection requirements if the vehicle safety database is extensive.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- PIFs and ERFs may resist somewhat, due to the implications of reducing their inspection/repair volume.
- Motorists would likely be supportive of this option. If this option is implemented together with the self-service OBD II option or other similar program change exemption

from the safety test would mean that the motorist could save the hassle of having their vehicle inspected at a CIF or PIF.

STATE IMPACTS

- This option has the potential to reduce costs.
- It is not clear whether this option would simplify inspections or complicate them. Currently all vehicles undergo the same safety inspection. Gathering data to exempt some vehicles from some safety inspection items may add a significant burden to the State in terms of data collection and communication to the PIFs and CIFs.

SAFETY IMPROVEMENT FACTOR

- This option could cause a reduction in safety test effectiveness. This could be countered by increasing the number of roadside tests.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to III-1, III-2, III-3, III-4, V-8, V-9, V-10, V-18, VII-10, VII-11, VII-12, VII-15, VII-16, VII-18, IX-7, X-2, X-3, X-4, and X-5.

SAFETY INSPECTION
CHANGE OF OWNERSHIP (COO) INSPECTION

MEASURE IDENTIFICATION CODE: X-2

DESCRIPTION

This option considers the implications of requiring a safety inspection upon any vehicle change of ownership except for the purchase of a new vehicle.

PROOF/DEMONSTRATION OF ALTERNATIVE

- California requires a safety inspection upon vehicle change of ownership.

AIR QUALITY IMPACT

- There are no benefits to air quality unless a full inspection (including emissions inspection) of the vehicle is required.

OVERALL OPERATING COST

- The cost of this option has not been quantified.

EMISSION COST/BENEFIT QUOTIENT

- There are no benefits to air quality unless a full inspection (including emissions inspection) of the vehicle is required.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- This option is not relevant except to the extent that it assists with program elements of the Self-Service OBD II or OBD III options.
- This option is primarily a data management and network design function. It is probably easier to implement in conjunction with registration denial.

EASE OF IMPLEMENTATION

- This option is primarily a data management and network design function. It is probably easier to implement in conjunction with registration denial.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Some motorists and used car dealers may resist as the need for inspection would add to the time needed to complete a sale/purchase.
- Some motorists may appreciate the inspection requirement, and use it as a condition for purchasing the vehicle.
- CIFs, PIFs, and ERFs would be likely to support this option since there is some potential for additional inspection and repair revenues.

STATE IMPACTS

- This option would increase registration paperwork and manpower required.

SAFETY IMPROVEMENT FACTOR

- This option could produce some safety improvements.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to III-1, IV-1, IV-5, VII-10, VII-11, VII-12, VII-15, VII-16, X-1, X-4, and XI-2.

SAFETY INSPECTION
REVISION OF SAFETY INSPECTION PROGRAM REQUIREMENTS

MEASURE IDENTIFICATION CODE: X-3

DESCRIPTION

Procedures need to be reviewed and optimized for cost effectiveness and performance. Change normal maintenance items to advisory only.

A complete safety inspection analysis has been included as part of the New Jersey I/M program review and is presented elsewhere in this report.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Research specific to New Jersey fleet would be indicated.

AIR QUALITY IMPACT

- Not applicable.

OVERALL OPERATING COST

- Possible reductions in cost could be achieved if the requirements of the inspection are reduced.

EMISSION COST/BENEFIT QUOTIENT

- Not applicable.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- This change may be needed if the State wants full advantage of Self-Service OBD II or OBD III options.
- There are no technical impediments to implementation of this option.

EASE OF IMPLEMENTATION

- Traffic safety research and program re-design are required as well as measured safety ratings of vehicles and individual safety components of all vehicles. It may be possible to exempt more vehicles from specific safety inspection requirements if the vehicle safety database is extensive.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- PIFs and ERFs may resist somewhat, due to the implications of reducing their inspection/repair volume.
- ERFs will want to know exact impact on their operations.

STATE IMPACTS

- Possible reductions in cost could be achieved if the requirements of the inspection are reduced.

- This option could potentially simplify the existing system allowing better allocation of resources.

SAFETY IMPROVEMENT FACTOR

- This option could cause a reduction in safety test effectiveness. This could be countered by increasing the number of roadside tests.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to III-3, III-4, III-5, VII-18, X-2, X-2, X-4, X-5, and XI-6.

SAFETY INSPECTION
DE-COUPLE OBD VEHICLE EMISSION INSPECTION FROM SAFETY INSPECTION CYCLE

MEASURE IDENTIFICATION CODE: X-4

DESCRIPTION

This option would involve a program design change to make emissions and safety inspections independent of each other. Several other options, such as the various automated forms of OBD II inspection, may be dependent upon separating the safety test from inspections.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Pennsylvania and other states have de-coupled inspection programs.

AIR QUALITY IMPACT

- The air quality impact associated with this option would depend on other program elements and how the overall program is designed.

OVERALL OPERATING COST

- The operating costs associated with this option would depend on other program elements and how the overall program is designed. This option may be revenue neutral if fees for automated OBD II inspection exceed the inspection costs.

EMISSION COST/BENEFIT QUOTIENT

- Not applicable.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- No technical impediments would be involved with this program change.

EASE OF IMPLEMENTATION

- Implementation of this option would require substantial program redesign, inspection procedure changes, data network changes, training, and public outreach.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Overall opinion of this type of program may be generally supportive due to the improved flexibility.
- Motorists may object to having two tests although both tests for many vehicles may still be conducted at the same time.
- PIFs may support due to the additional business.

STATE IMPACTS

- Option may be essential to support several other options such as automated OBD II inspection.

SAFETY IMPROVEMENT FACTOR

- The safety factor associated with this option would be subject to other program elements and how the overall program is designed.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to III-1, III-2, III-3, III-4, III-5, IV-5, V-8, V-9, V-10, V-11, V-12, V-18, VII-2, VII-3, VII-10, VII-11, VII-12, VII-15, VII-16, VII-18, X-1, X-2, X-3, X-5, XI-2, and XI-6.

SAFETY INSPECTION
QA/QC SERVICES TO CIF, FLEETS, ETC.

MEASURE IDENTIFICATION CODE: X-5

DESCRIPTION

QA/QC services to CIF, fleets, etc. should become more integral with program design. Presently NJ MVC has been providing advisory inspections for school buses, for example, to supplement fleet self-certification requirements. This option would increase the amount of QA/QC integrated into the new program so that both the State and the Fleets have a better idea of what is expected. For example, QA/QC reporting could be increased so that NJ MVC receives weekly reports from the CIFs regarding fleets. One variation of this option may include assessing charges to fleets who fail to adequately perform their own QA/QC.

QA/QC and other data related concerns should be addressed as a part of any program change and will not be fully analyzed here as a stand alone option.

PROOF/DEMONSTRATION OF ALTERNATIVE

- There are no known precedents for this option.

AIR QUALITY IMPACT

- Not applicable.

OVERALL OPERATING COST

- There is opportunity to improve cost basis for existing State services by charging fleets for extraordinary services currently provided at no cost.

EMISSION COST/BENEFIT QUOTIENT

- Not applicable.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- The State is already providing services. Accounting for lapses of fleets to perform their own QA/QC should just be a policy change.

EASE OF IMPLEMENTATION

- If penalty system is put in place where fleets who do not meet the standards for self-inspection must reimburse the State for services, only minor program design and accounting changes should be required.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Fleets may be somewhat resistance but most probably recognize whether or not they are meeting a reasonable standard.

STATE IMPACTS

- There could be some improvement in human resource allocation if fleets are encouraged to do their own QA.

SAFETY IMPROVEMENT FACTOR

- There would be no significant difference unless fleets do a better job than State enforcement is already doing.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to I-2, IX-18, X-1, X-3, and X-4.

DATA MANAGEMENT/NETWORK MAINTENANCE
VID/NETWORK UPGRADE

MEASURE IDENTIFICATION CODE: XI-1

DESCRIPTION

Upgrade to current technology including TCP/IP transfers and industry standard communications protocols.

This option has been addressed as part of the OIT VID Assessment document. Once the OIT VID Assessment document is finalized, the option summary sheet will be completed.

DATA MANAGEMENT/NETWORK MAINTENANCE
SEPARATE SAFETY RECORD FROM EMISSIONS

MEASURE IDENTIFICATION CODE: XI-2

DESCRIPTION

If OBD Inspection and Safety Inspection cycles are de-coupled, inspection records must be also be separated. This option to separate the safety and emission records has been consolidated with Option X-4 (De-Couple OBD Vehicle Emission Inspection from Safety Inspection Cycle). Therefore, no further analysis has been performed.

DATA MANAGEMENT/NETWORK MAINTENANCE
ACCESS TO PIF/ERF REPAIR DATA

MEASURE IDENTIFICATION CODE: XI-3

DESCRIPTION

This option addresses whether or not to access PIF/ERF repair and maintenance data to promote effective maintenance and use of clean screen triggers.

It is unclear whether or not this information is compiled by any PIF/ERFs, or the extent to which the data is maintained. Further information is necessary to analyze this option.

MEASURE IDENTIFICATION CODE: XI-4

DESCRIPTION

This option suggests more automation in rejecting bad entries to help minimize on-site audits. The mechanisms for improving data entry and record validation are analyzed as part of Option XI-7 (Barcodes), and Option VI-1 (Trigger Analysis).

DATA MANAGEMENT/NETWORK MAINTENANCE
FINANCIAL CONSEQUENCE FOR BAD DATA ENTRY

MEASURE IDENTIFICATION CODE: XI-5

DESCRIPTION

This option would apply financial consequences for bad data entry at the CIFs and PIFs. Basically, the CIFs and PIFs would only get paid by the State for good records imported to the VID.

PROOF/DEMONSTRATION OF ALTERNATIVE

- There are no known precedents for this option.

AIR QUALITY IMPACT

- Not applicable.

OVERALL OPERATING COST

- This option may be revenue neutral based on the cost of software upgrades and the money saved from payment for erroneous data.

EMISSION COST/BENEFIT QUOTIENT

- Not applicable.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- This option would depend on data management, reporting, and billing functions.

EASE OF IMPLEMENTATION

- Shops must receive an adequate notice of change in policy and the opportunity for public comment.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- PIFs will likely resist this option due to the monetary penalty.

STATE IMPACTS

- Any additional costs of enforcement may be offset by penalties. Improvements to data record integrity would benefit the overall program.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to VI-3, VI-4, IX-1, IX-19, and XI-7.

DATA MANAGEMENT/NETWORK MAINTENANCE
EVALUATE POTENTIAL TO STREAMLINE (SCRUB) DATA RECORDS

MEASURE IDENTIFICATION CODE: XI-6

DESCRIPTION

The NJ MVIS VID's present data record format has not been updated for some time and contains certain obsolete data that could be removed. Similarly, once the new program design is in place, it is likely that the data record may be insufficient to accommodate new data. This option would evaluate the potential to streamline (scrub) data records.

This option would be complemented by a review of the client software (PIF/CIF Analyzer software) to determine similar improvements to facilitate better handling of records.

This option would only be implemented as part of the specifications for the new program design, so no further analysis will be done here.

DATA MANAGEMENT/NETWORK MAINTENANCE
EVALUATE USE OF BARCODES

MEASURE IDENTIFICATION CODE: XI-7

DESCRIPTION

This option would evaluate the use of barcodes on vehicle documents for more automated and failsafe entry of vehicle data. For example, some programs use 2-D barcodes to store information on test results for failing vehicles, so it can be easily retrieved on retests without a VIC call.

PROOF/DEMONSTRATION OF ALTERNATIVE

- Many states (e.g., Texas and Connecticut) use 2-D barcodes to read information on registration documents and Vehicle Inspection Reports (VIRs).

AIR QUALITY IMPACT

- Not applicable.

OVERALL OPERATING COST

- This option could potentially save costs, over a period, by reducing data input time.

EMISSION COST/BENEFIT QUOTIENT

- Not applicable.

PRACTICALITY OF EMISSIONS REDUCTION TECHNOLOGY

- The barcode sticker with validated vehicle info could be supplied upon registration renewal and applied to passenger corner of windshield.

EASE OF IMPLEMENTATION

- Evaluation could be performed internally, based on available information from technology suppliers and other agencies. The evaluation would determine equipment, software, and man power needed to implement the use of bar codes in New Jersey.

STAKEHOLDER IMPACTS AND PERCEPTIONS

- Not applicable.

STATE IMPACTS

- If implemented, would have dramatic improvement in data record integrity and possibly assist with fraud detection.

SAFETY IMPROVEMENT FACTOR

- Not applicable.

OTHER POTENTIAL PROGRAM MODIFICATIONS RELATE TO

- Related to V-9, V-10, VI-3, and XI-4.

DATA MANAGEMENT/NETWORK MAINTENANCE
MIGRATE OIT VEHICLE DATABASE FROM MAINFRAME TO WEB-BASED TRANSACTIONS

MEASURE IDENTIFICATION CODE: XI-8

DESCRIPTION

This option evaluates whether to migrate the OIT vehicle database from a mainframe to web-based transactions.

This option has been addressed as part of the OIT VID Assessment document. Once the OIT VID Assessment document is finalized, the option summary sheet will be completed.

DATA MANAGEMENT/NETWORK MAINTENANCE
EVALUATE BIFURCATION OF VID

MEASURE IDENTIFICATION CODE: XI-9

DESCRIPTION

Evaluate bifurcation of VID between NJ MVC and DEP for State managed VID option.

This option has been addressed as part of the OIT VID Assessment document. Once the OIT VID Assessment document is finalized, the option summary sheet will be completed.

APPENDIX D-2

TRIGGER ANALYSIS OF NEW JERSEY I/M PROGRAM

APPENDIX D-2
TRIGGER ANALYSIS OF NEW JERSEY'S I/M PROGRAM

MACTEC developed and applied reports to identify facilities performing questionable inspections. The goal of this analysis was to assess how PIFs compare with CIFs in terms of compliance with I/M procedures. These reports are termed "triggers", since they're intended to trigger investigations of stations that may be performing fraudulent or inaccurate inspections.

High Probability Clean-Piping/Clean Scanning Triggers

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. Following are triggers that identify specific cases of Clean Piping and Clean Scanning:

Suspected Clean Scanning

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

- Mismatch between entered VIN and OBD VIN
- 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 entered VIN with VIN provided by vehicle's OBD II system. Following are percentages of tests with OBD II VIN mismatches (May 2005 data):

- All tests with OBD II VINs: 0.33%
- Tests done at PIFs: 1.17%
- Tests done at CIFs: 0.17%

Following are percentages of stations with >10% of the tests with OBD II VIN mismatches:

- PIFs: 2.48%
- CIFs: 0%

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

The readiness monitors supported by the vehicle's OBD II system provide a rough signature for the vehicle. MACTEC identified pairs of final pass/previous fail combinations and looked for mismatches in monitors supported (May 2005 data). Following are percentages of retests with readiness monitors that do not match initial tests:

- All retests: 1.37%
- Retests done at PIFs: 2.43%
- Retests done at CIFs: 0.08%

Previous Test Station	CIF	PIF
CIF	0.08%	2.80%
PIF	0.00%	2.15%
All	0.08%	2.43%

Repeat Emissions Trigger Analysis

Sierra Research identified possible cases of clean piping using its "repeat emissions trigger". Following are the percent of stations that were flagged by this trigger:

- PIFs: 6.2%
- CIFs: 0%

Failure Rate Analysis

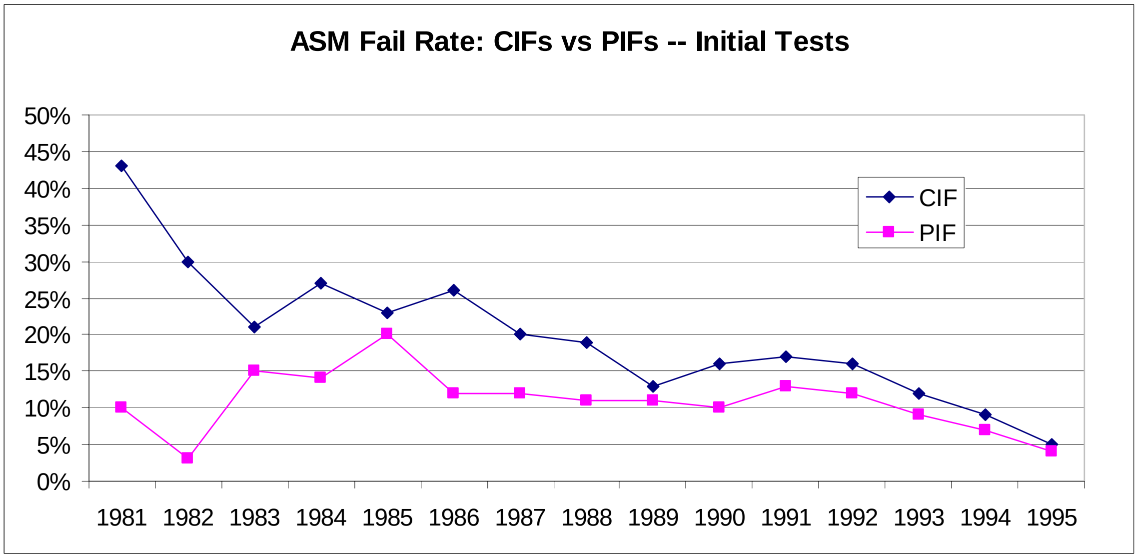
MACTEC calculated failure rates for different inspection facilities for initial tests and retests. Following are key conclusions:

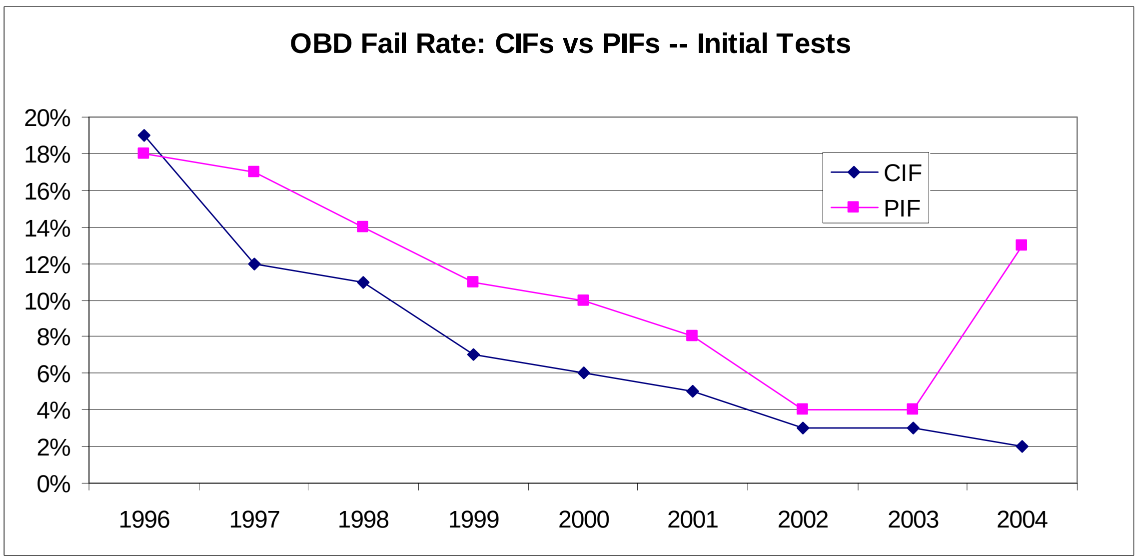
- Failure rates for the OBD II test are similar in PIFs and CIFs.
- Failure rates for ASM tests in PIFs are about ½ of failure rates in CIFs.
- Failure rates for safety inspections in PIFs are about 1/3 of failure rates in CIFs.

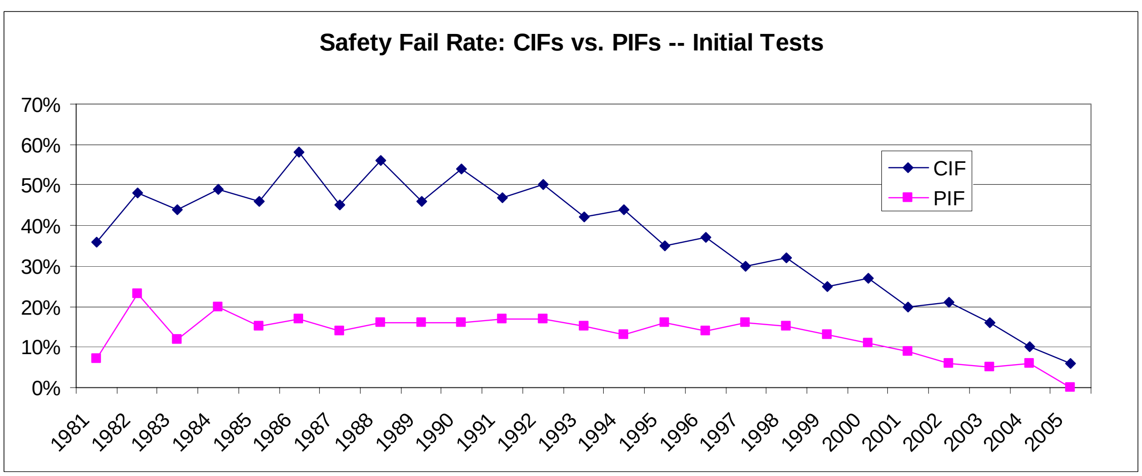
Conclusions

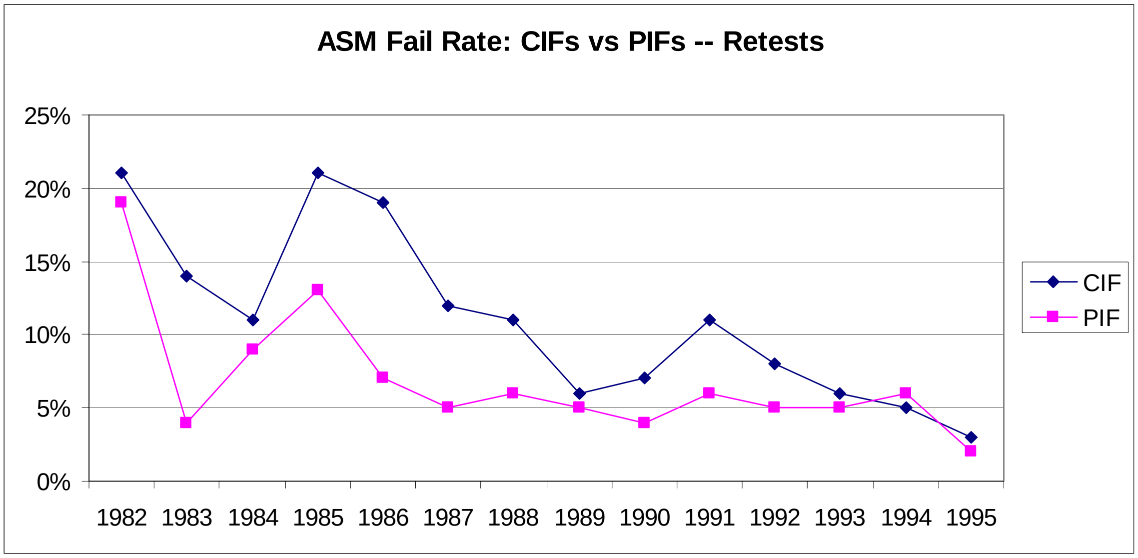
Following are the key conclusions of this analysis:

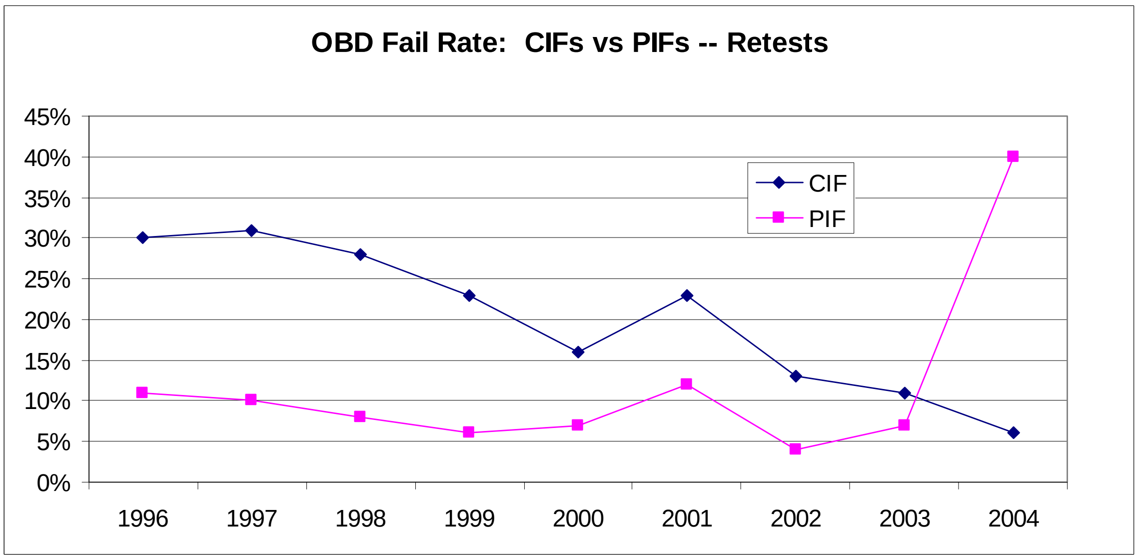
- There's little fraud in OBD II inspections conducted in PIFs and CIFs. Based on the two triggers analyzed above, MACTEC believes that the effectiveness of OBD II inspections in PIFs is 96% of the effectiveness for CIFs. This figure was derived by subtracting the percent of OBD VIN mismatches (1.17%) and retest monitor mismatches (2.43%) from 100%. 96% compares to 80%, which is the effectiveness assumed in New Jersey's SIP.
- There appears to be more fraud in tailpipe tests conducted in PIFs than in OBD II tests. New Jersey's current assumption that PIFs achieve 80% of the tailpipe test effectiveness of CIFs appears reasonable.

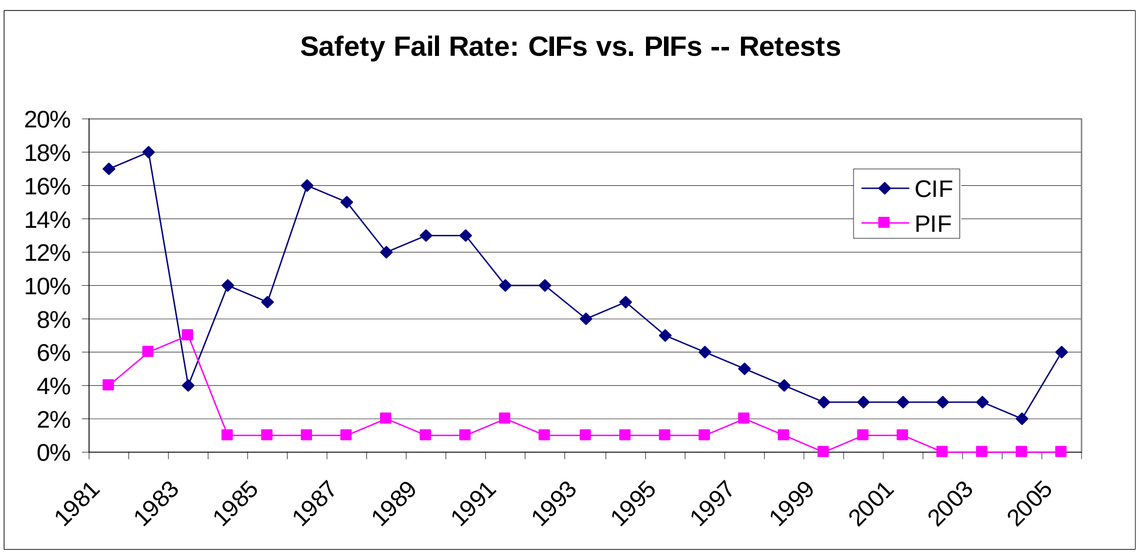

ASM Fail Rate: CIFs vs PIFs -- Initial Tests
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
CIF
PIF


OBD Fail Rate: CIFs vs PIFs -- Initial Tests
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
1996
1997
1998
1999
2000
2001
2002
2003
2004
CIF
PIF


Safety Fail Rate: CIFs vs. PIFs -- Initial Tests
70%
60%
50%
40%
30%
20%
10%
0%
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
CIF
PIF


ASM Fail Rate: CIFs vs PIFs -- Retests
25%
20%
15%
10%
5%
0%
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
CIF
PIF


OBD Fail Rate: CIFs vs PIFs -- Retests
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1996
1997
1998
1999
2000
2001
2002
2003
2004
CIF
PIF


Safety Fail Rate: CIFs vs. PIFs -- Retests
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
CIF
PIF

APPENDIX D-3

COST ANALYSIS DATA FROM MVC

APPENDIX D-3
COST ANALYSIS

Current Inspection System: the New Jersey Enhanced Inspection and Maintenance System (NJEIMS) consists of 31 centralized inspection facilities (CIFs) with 124 lanes operated by Parsons, and 1,327 private inspection facilities (PIFs). The total number of vehicles inspected by both CIFs and PIFs for 2004 was 2,879,313. Of the 1,327 private inspection facilities there are 1,251 Class One (1) and 76 Class Two (2) Facilities. Class One (1) Facilities are private garages that conduct vehicle inspection for the general public, while the Class Two (2) Facilities are fleet owners authorized by the state to inspect their own vehicles.

During 2004, CIFs performed 2,215,557 vehicle inspections or 77 % of all vehicle inspections. Of those inspections 1,630,612 were initial inspections and 584,945 were re-inspections. In 2004 Parsons was paid $ 55,164,374 to operate the CIFs. The current per vehicle inspection rate is $ 27.89 which was effective August 1, 2005.

In 2004, the PIFs performed 663,756 vehicle inspections or 23 % of all vehicle inspections at an average initial inspection cost of $69.83 per vehicle. During 2004, the PIFs conducted 428,186 initial inspections and 235,570 re-inspections. Their initial inspection rate is based on market forces and is determined by the PIFs. Re-inspection rate is based on a portion of the initial inspection rate. If the PIF repairs the rejected item the motorist is not charged a re-inspection fee.

All vehicle inspections are conducted by licensed motor vehicle inspectors. There are currently 4,140 inspectors licensed to conduct vehicle inspection in the state. According to state regulation, to perform emission related repairs, a repair facility must be registered with the state. There are 2,025 emission repair facilities (ERFs) registered with the state to perform emission related repairs.

Emission Testing: Currently the NJEIMS uses four (4) emission tests at the CIFs and PIFs. They are Curbing Idle Test, 2500 RPM test, Acceleration Simulation Mode 5015 (ASM5015), and On Board Diagnostics Two (OBD II).

Curb Idle Test is performed upon a stationary vehicle with its transmission in neutral or park, with the engine being operated at curb idle speed. This test is applicable for all vehicle model years 1980 and older and all heavy duty gasoline vehicles (regardless of model year).

A **2500 RPM Test** is also performed upon a stationary vehicle with its transmission in neutral or park and the engine operating at an approximate speed of 2500 revolutions per minute (rpm) for no longer than 30 seconds. This test is performed on all vehicles of model year 1981 and newer which are exempt or excluded from OBD II or ASM 5015 Testing.

ASM 5015 Test is conducted by sampling a vehicle’s exhaust emission at an operating speed of 15 miles per hour by driving the test vehicle on a treadmill or dynamometer. This is administered to most vehicles 1981 through 1996. This test is not given to all wheel drive vehicles.

OBD II Testing is conducted by using a vehicle’s on board computer network to query its emission components to see if they are working within standards set by United States Department of Environmental Protection. Model year vehicles 1996 and newer are subject to this test.

The chart below shows a comparison of emission test results for Calendar Year 2004 between CIFs and PIFs.

CIF					PIF			
Pass	**Pass Rate**	Fail	**Failure Rate**	**Emission Test**	Pass	**Pass Rate**	Fail	**Failure Rate**
1,012,044	92.52%	81,798	7.48%	**OBD II**	190,501	88.40%	25,005	11.60%
467,618	84.52%	85,652	15.48%	**ASM 5015**	255,123	89.04%	31,410	10.96%
23,673	86.23%	3,779	13.77%	**2500 RPM**	16,080	86.00%	2,617	14.00%
43,002	88.40%	5,643	11.60%	**Curb Idle**	39,741	90.52%	4,163	9.48%
1,546,337	89.74%	176,872	10.26%	**Total Emission Test**	501,445	88.81%	63,195	11.19%

The chart below shows a comparison between the number of emission tests conducted for Calendar Year 2004 by CIFs and PIFs.

CIF			PIF	
Total Test Conducted	Percentage of Total Emission Test	**Emission Test**	Total Test Conducted	Percentage of Total Emission Test
1,093,842	63.48%	**OBD II**	215,506	38.17%
553,270	32.11%	**ASM 5015**	286,533	50.75%
27,452	1.59%	**2500 RPM**	18,697	3.31%
48,645	2.82%	**Curb Idle**	43,904	7.78%
1,723,209	100.00%	**Total Emission Test**	564,640	100.00%

Safety Inspection Components: the current Motor Vehicle Commission Safety Program includes six major components which are credentials, steering & suspension and tires, safety equipment, lights, brakes, exhaust, and miscellaneous safety. Listed below are the six major components broken down into separate specific safety conditions.

Safety Inspections:

- **Credentials**
  - Driver License
  - Registration
  - Insurance Card
- **Steering & Suspension**
  - Wheels
  - Wheel lash
  - Ball joints
  - Tie rod
- **Safety Equipment**
  - Horn
  - Wipers
  - Glazing
  - Visional obstruction
  - Mirrors
  - Wiring
  - Switching
- **Lights**
  - Parking lights
  - Direction signals
  - Marker clearance
  - Identification reflectors
  - Red rear light
  - Plate light
  - Stop lights
  - Headlights
- **Exhaust system**
  - Noise
  - Leaks
  - Tampering- catalytic converter
- **Brakes**
  - Service brake
  - Pedal reserve
  - Brake equalization
- **Miscellaneous**
  - Loose seat
  - Sharp edges on body and bumper
  - Transmission leak
  - Improper hood operation
  - Seat belts

The chart below shows a comparison of safety rejection results for Calendar Year 2004 between the CIFs and the PIFs.

CIF/ PIF Initial Rejection Rate for Safety Items-Calendar Year 2004

CIFs			PIFs	
Rejections	**Rate**	**Safety Condition**	**Rejections**	**Rate**
53,799	3.40%	**Credentials**	5441	1.30%
29,878	1.90%	**Steering & Suspension and Tires**	8,443	2.10%
197,844	12.70%	**Safety Equipment**	21,627	5.30%
301,015	19.30%	**Lights**	32,860	8.10%
76,662	4.90%	**Brakes**	9,921	2.40%
37,733	2.40%	**Exhaust**	6,708	1.60%
56,395	3.60%	**Misc. Safety**	4507	1.10%
555,743	35.60%	**Overall Safety Inspection**	59,527	14.60%

APPENDIX E

ANALYSIS OF VID IMPLEMENTATION OPTIONS

Addendum to Appendix E

1. California and Georgia VID Projects Updates

Appendix E discusses two related VID applications: one being developed by the State of California and one planned for development by the State of Georgia. Updates on the progress of these applications are as follows:

- California: California awarded a contract for development of a new VID and other related applications in October of 2004; the new applications were scheduled to go on-line in September of 2005. The VID component of the application was released to production and is currently being used. Note that the release was approximately one year behind schedule.

- Georgia: Georgia had awarded in early 2006 a contract to update their VID application. The award was successfully protested. Georgia released a new RFP for the project in December 2006.

Appendix E. Analysis of VID Implementation Options

1.0 Introduction

The current State of New Jersey motor vehicle inspection program includes the following components and stakeholders:

- Vehicle registration program and database – operated by the NJ Motor Vehicle Commission.
- Centralized inspection Facilities (CIFs) – operated by Parsons under contract to NJ.
- Private Inspection Facilities (PIFs) – privately owned and operated, typically by small businesses.
- Communications network – transfers data between the vehicle inspection database (VID) and NJ registration databases, CIFs, and PIFs – operated by MCI under contract to Parsons.
- VID – includes both a real-time database and reporting database – operated by Parsons and MCI.

New Jersey's current dedicates significant monetary and labor resources to its current vehicle inspection program, and is investigating the following four options for implementing a more efficient program:

- Option 1 – In-house VID Component: Separate VID from Other Related Inspection Activities; Design, Implement, Operate, and Maintain VID In-House
- Option 2 – Outsource VID Component: Separate VID from Other Related Inspection Activities and Outsource through Full and Open Competition
- Option 3 - Hybrid Option for the VID Component: Separate VID from Other Related Inspection Activities; Outsource VID Design and Implementation; Operate and Maintain VID In-House
- Option 4 – Outsource Entire Inspection Program, Including the VID Component: Retain Current Contract Structure - Outsource VID and All Related Inspection Activities through Full and Open Competition

This assessment provides for each of these options a summary, a listing of associated advantages and disadvantages, and preliminary level of effort estimates, as well as a detailed assessment of NJ OIT's capabilities in the areas of design, implementation, operation, and maintenance of the VID component of the inspection program.

2.0 Summary of NJ Inspection Program and VID Component Parameters

A summary of the key NJ inspection program and VID component information considered in this assessment is presented in Table 2-1.

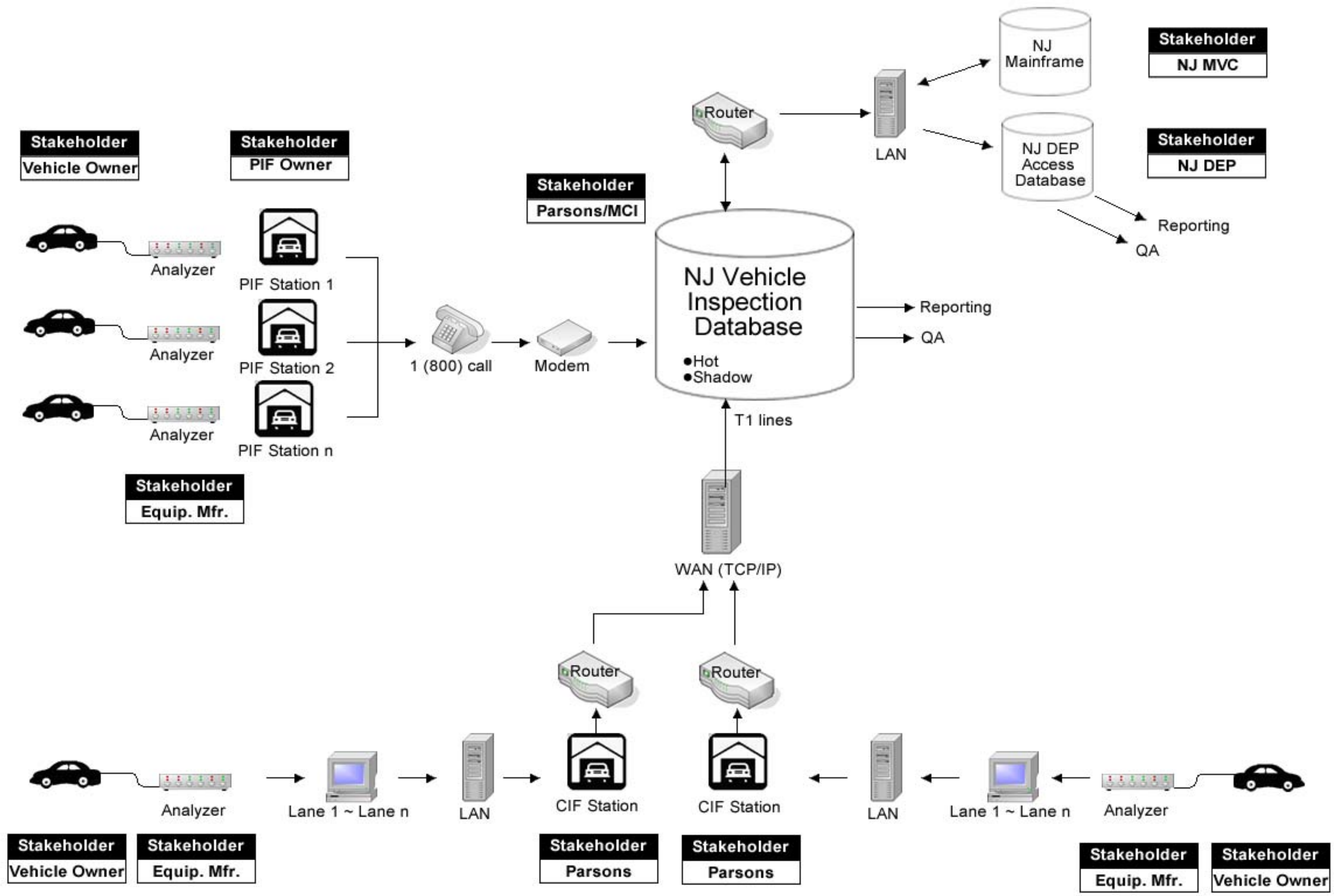
Table 2-1: Summary of NJ Inspection Program and VID Component Parameters

Information Element	CIF	PIF	Data Source/Notes
Number of Facilities	31	1,400	August 2005 Draft Research Report - MACTEC
Number of Lanes	124	1,400	Assume one lane per PIF
Number of Inspections per year	2,550,000	724,000	"Comparison of New Jersey OBD II I/M Results to Other States" prepared by Sierra Research for New Jersey Motor Vehicle Services - April 20, 2005. Note: decentralized may include PIF, mobile inspection team tests, etc.
Fee per inspection	None to vehicle owner, part of registration fee.	$1.47	September 22, 2005 meeting notes. NJ pays Parsons $27.89/CIF inspection (12/8/05 comments received from NJ on draft report).

3.0 VID Infrastructure

A summary of the current VID infrastructure is described in this section. Figure 3-1 presents a conceptual view of the VID infrastructure, communications interfaces, and stakeholders.

Figure 3-1. Conceptual Diagram of NJ VID Infrastructure, Communications Interfaces, and Stakeholders



3.1 Servers

Parsons and MCI currently operate:

- Real-time inspection databases/servers, referred to as the Hot VID. These databases/servers manage the individual inspection transactions in real-time.
- Reporting databases/servers, or Shadow VID. Data from the Hot VID are copied to the Shadow VID, typically within a few seconds to minutes and support most reporting and QA activities.
- CIF application server.
- Miscellaneous peripherals such as hubs, routers, etc.

Parsons/MCI indicated that the databases are in Oracle format, and the reporting and QA applications were written using VisualBasic.

3.2 Communications Network

MCI currently operates the following:

- WAN TCP/IP segments for direct communications with CIFs (including communications with inspection devices).
- Dial-up connections for PIF communications
- Communications with NJ mainframe to retrieve vehicle registration information and transfer inspection summary information.

Note: the transactional load for the VID communications network is between 8,000 and 10,000 transactions per day.

3.3 Server uptime

Parsons/MCI server uptime record for the VID is excellent, and reported at greater than 99.5% for the period of August 2004 through June 2005.

4.0 Preliminary Summary of VID Options

A preliminary listing of the options available to NJ for VID design, development, operations and maintenance include the following:

- Option 1 In-house VID Component: Separate VID from the Inspection Program; Design, Implement, Operate, and Maintain VID In-House
  Description: Separate VID from all other inspection activities. Move all VID design, development, enhancement, operation, and maintenance activities in-house. NJ OIT would manage the VID in partnership with NJ DEP. Note: NJ does not own or have access to the existing VID code base or software; these are considered proprietary by the current VID contractor team of Parsons/MCI. This option would require that NJ recreate any existing useful VID functionality.

- Option 2 – Outsource VID Component: Separate VID from the Inspection Program; and Outsource through Full and Open Competition
  Description: Separate VID from all other inspection activities. Prepare a request for proposal to outsource VID design, development, enhancement, operation, and maintenance activities.

- Option 3 - Hybrid Option for the VID Component: Separate VID from the Inspection Program; Outsource VID Design and Implementation; Operate and Maintain VID In-House
  Description: Separate VID from all other inspection activities. Prepare a request for proposal to outsource VID design, and development activities. After full deployment, transition VID operations and maintenance to NJ OIT staff.

- Option 4 – Outsource the Complete Inspection Program; including the VID Component: Retain Current Contract Structure - Outsource VID and All Related Inspection Activities through Full and Open Competition
  Description: Keep VID and other related inspection activities together. Prepare a request for proposal to outsource VID design, development, enhancement, operation, and maintenance activities, as well as operation of all related inspection activities, such as CIF and PIF operations.

Preliminary summaries of the advantages and disadvantages of each of these options are presented Tables 4-1 through Tables 4-4.

TABLE 4-1. Preliminary Summary of Advantages and Disadvantages Option 1: In-House VID Component	
Advantages	**Disadvantages**
• NJ would have direct access to VID data. • NJ would have increased control over VID operations. • NJ would have greater flexibility in revising and enhancing VID structure, content, reports, functionality, and QA. • NJ would have direct access to detailed information about resource requirements and expenditures associated with development, operation, and maintenance of VID. • If a telecommunications provider is required, re-bidding the telecommunications contract may result in an overall decreased cost per inspection call. • Potential for significant cost savings or significant cost increases to be determined.	• It is unlikely that a new VID could be designed, developed, implemented, and in production by 2007; an extension of the current contract extension for a period of between one and two years may be required. • NJ would incur significant labor and capital start-up costs to recreate VID and associated infrastructure. • Completing the VID recreation effort according to the schedule shown in Table 6-4 would require that NJ dedicate staff that might be assigned to other efforts, as well as require significant and on-going high-level management support and participation. • NJ OIT would likely be required to add significant storage capacity for VID data. Given that the VID is approximately 4 GB in a flat file, it is likely that at a minimum an Oracle server with 60 GB storage capacity would be required. • NJ OIT would need to re-assign and train/ hire staff that are highly skilled in the required technologies. • NJ OIT would need to modify its infrastructure to allow for communications via dial up connections from PIFs or contract out. • NJ may need to work with a telecommunications provider whether the VID is operated and maintained in-house or contracted out. • Potential for significant cost savings or significant cost increases to be determined.

TABLE 4-2. Preliminary Summary of Advantages and Disadvantages Option 2: Outsource VID Component (Full and Open Competition)	
Advantages	**Disadvantages**
• NJ could select a contractor experienced with VID design and development and a proven approach that incorporates lessons learned and best practices. • NJ could include contract terms that would allow for more control over VID, direct access to VID data and system, system/software ownership, and greater flexibility. • NJ will not be required to staff up as much as needed under Option 1 to recreate or maintain VID. • Potential for significant cost savings or significant cost increases to be determined.	• RFP Process required; this will add several months to the schedule. • It is unlikely that a new VID could be designed, developed, implemented, and in production by 2007; an extension of the current contract extension for a period of between one and two years may be required. • Timely completion of the VID recreation effort would require that NJ dedicate staff to work with the vendor that might be assigned to other efforts to provide direction to the vendor, review vendor design and other deliverables, etc. In addition, significant and on-going high-level management support and participation would be required. • If NJ wanted to move VID data in-house, OIT would likely be required to add significant storage capacity for VID data. Given that the VID is approximately 4 GB in a flat file, it is likely that at a minimum an Oracle server with 60 GB storage capacity would be required. • NJ would not have direct access to detailed information about resource requirements and expenditures associated with development, operation, and maintenance of VID. • Changes required to address issues and/or upgrade communications with PIFs may have additional cost implications. • Potential for significant cost savings or significant cost increases to be determined.

TABLE 4-3. Preliminary Summary of Advantages and Disadvantages Option 3: Hybrid Option for the VID Component - Outsource VID Design and Implementation, In-House Operation and Maintenance	
Advantages	**Disadvantages**
• NJ could select a contractor experienced with VID design and development and a proven approach that incorporates lessons learned and best practices. • NJ could include contract terms that would allow for more control over VID, direct access to VID data and system, system/software ownership, and greater flexibility. • NJ will not be required to staff up as much as needed under Option 1 to recreate the VID. • NJ staff could work hand-in-hand with Contractor development team and require training, knowledge transfer, and transition activities as part of the contract. • Potential for significant cost savings or significant cost increases to be determined.	• RFP Process required; this will add several months to the schedule. • It is unlikely that a new VID could be designed, developed, implemented, and in production by 2007; an extension of the current contract extension for a period of between one and two years would be required. • Timely completion of the VID recreation effort by the schedule shown in Table 6-6 would require that NJ dedicate staff to work with the vendor that might be assigned to other efforts to provide direction to the vendor, review vendor design and other deliverables, etc. In addition, significant and on-going high-level management support and participation would be required. • If NJ wanted to move VID data in-house, OIT would likely be required to add significant storage capacity for VID data. Given that the VID is approximately 4 GB in a flat file, it is likely that at a minimum an Oracle server with 60 GB storage capacity would be required. • NJ OIT would need to re-assign and train/ hire staff that are highly skilled in the required technologies (although fewer than with Option 1). • NJ would not have direct access to detailed information about resource requirements and expenditures associated with development of VID. • Potential for significant cost savings or significant cost increases to be determined.

TABLE 4-4. Preliminary Summary of Advantages and Disadvantages Option 4: Outsource the Complete Inspection Program; including the VID Component	
Advantages	**Disadvantages**
• NJ could maintain the current approach to its inspection program and VID operations • NJ could select a contractor experienced with all inspection program activities, including VID design and development, as well as a proven approach that incorporates lessons learned and best practices. • NJ could include contract terms that would allow for more control over inspections, equipment manufacturers and standards, VID, direct access to VID data and system, system/software ownership, and greater flexibility. • NJ will not be required to staff up as much as needed under Option 1 to recreate or maintain VID. • If the current vendor is selected, the VID and communications infrastructure already exists; NJ would not incur costs to recreate VID, VID infrastructure, data storage, etc. • Potential for significant cost savings or significant cost increases to be determined.	• RFP Process required; this will add several months to the schedule. • If a new contractor is selected, the transition period required for CIF operations could be significant given the variety of professional and trades staff needed. • It is unlikely that a new VID could be designed, developed, implemented, and in production by 2007; an extension of the current contract extension for a period of between one and two years may be required. • Timely completion of the VID recreation effort would require that NJ dedicate staff to work with the vendor that might be assigned to other efforts to provide direction to the vendor, review vendor design and other deliverables, etc. In addition, significant and on-going high-level management support and participation would be required. • If NJ wanted to move VID data in-house, OIT would likely be required to add significant storage capacity for VID data. Given that the VID is approximately 4 GB in a flat file, it is likely that at a minimum an Oracle server with 60 GB storage capacity would be required. • NJ would not have direct access to detailed information about resource requirements and expenditures associated with development, operation, and maintenance of VID. • Changes required to address issues and/or upgrade communications with PIFs may have additional cost implications. • If current contractor is selected and contract terms not negotiated, NJ may not have direct access to VID data and VID operations. • Requests to revise and enhance VID structure, content, reports, functionality, and QA can be costly. • Potential for significant cost savings or significant cost increases to be determined.

5.0 Preliminary Detailed Analysis of Option 1: In-house VID Component

A detailed analysis of the infrastructure and staff skill requirements associated with the VID and NJ OIT capabilities is provided in this section.

5.1 VID Design and Implementation

Currently, Parsons/MCI owns all infrastructure, software, and program code associated with the VID. If NJ OIT were to take over the VID component of the inspection program, the associated infrastructure, communications protocols and network, and VID, NJ OIT would need to integrate the full complement of infrastructure needs into the OIT infrastructure, and acquire new hardware and software as appropriate. OIT would also need to recreate the VID, reporting, and QA components. It is anticipated that OIT would follow the full software development life cycle and related steps for this effort, including:

- Existing system and functionality and interfaces review;
- Requirements Analysis (note: the following key functionality groups are expected to be required: Security, Reports and Queries (over 50 reports in current VID), Quality Assurance, Data and Report Export, Interfaces with other NJ Systems, Administration and Maintenance, and Performance Standards such as system uptime requirements);
- System and Database Design;
- Communications Network and Data Transfer Design;
- Data Migration;
- Implementation/Development;
- Testing;
- Deployment and Training;
- System Operation;
- System Maintenance and Improvement;
- Project Planning and Management.

To complete these activities, OIT would require staff with significant availability that are skilled in the following:

- Project Manager: lead and oversee all aspects of the project.
- Business Analyst(s): conduct requirements analysis and joint application design sessions, define and document VID-related business processes.
- Technical Architect(s): assess requirements, design, communications, and NJ standards to develop an overall architecture for the VID and related components.
- Network/Communications Engineer(s): review PIF/CIF/NJ communications needs, available protocols, and provide options for implementation.
- Data Modeler/Database Designer(s)/Database Administrator(s): Design transactional database to support data storage, transfer, and functional requirements.

- Data Warehouse Developer(s): Design and create VID-related data marts, integrate with existing NJ data marts.
- Software/Web Designer(s): Develop specification for software interfaces to meet VID requirements.
- Software/Web Developer(s): Implement software specifications.
- Report Designers: Develop specifications for VID reports.
- Report Developer(s): Implement report specifications.
- Software and Report Tester(s): Test implemented software specifications against documented requirements.
- Extract/Transform/Load (ETL) Coders: Design, implement, and support testing of ETL processes that will copy data from the transactional VID to the data warehouse.
- Technical Writer(s): Support various document preparation activities.
- Graphic Designer(s): Support graphics development, design interface look-and-feel options, and prepare other graphics as needed.

5.2 VID Operation and Maintenance

After the VID has been designed, implemented, tested, and deployed successfully, OIT efforts would turn towards system maintenance and operation. To complete these activities, OIT would require a team that includes staff with the following expertise:

- Project Manager: lead and oversee all aspects of the project.
- Technical Architect(s): assess impact of maintenance issues, change requests, and enhancements on the overall architecture for the VID and related components.
- Business Analyst(s): conduct requirements analysis and joint application design sessions to address VID change requests and enhancements, or new/revised reporting and data collection requirements.
- Network/Communications Engineer(s): troubleshoot issues with VID interfaces, including CIF/PIF communication and data transfer network, as well as communications and data transfer with other NJ databases.
- Data Modeler/Database Designer(s)/Database Administrator(s): assess impact of and implement database revisions on the transactional database.
- Data Warehouse Developer(s): assess impact of and implement VID-related data mart changes to reflect new or revised reporting and data collection requirements.
- Software/Web Designer(s): Develop specification for software interfaces that address VID change requests and enhancements.
- Software/Web Developer(s): Implement software specifications that address VID change requests and enhancements.
- Report Designers: Develop specifications for VID reports to reflect new or revised reporting requirements, change requests and enhancements.
- Report Developer(s): Implement report specifications that reflect new or revised reporting requirements, change requests and enhancements.
- Software and Report Tester(s): Test implemented software specifications against documented requirements.

- Extract/Transform/Load (ETL) Coders: Design, implement, and support testing of ETL processes that will copy data from the transactional VID to the data warehouse to reflect new or revised reporting and data collection requirements.
- Technical Writer(s): Revise project documentation as needed to reflect VID change requests and enhancements, or new/revised reporting and data collection requirements.

Note that as the VID would be in production, several of these staff could likely be shared across multiple projects.

5.3 Comparison of VID Design, Operation, and Maintenance Requirements with NJ OIT Capabilities

According to the NJ OIT web site (see http://www.nj.gov/it/oit/over/index.html) and the State of New Jersey Shared IT Architecture (http://www.nj.gov/it/swit/ps/it_architecture.pdf), OIT employs over 900 information technology professionals and oversees the mainframes, servers, networks, and databases that make up the state's technical infrastructure. OIT core responsibilities include application development and maintenance, data center operations, and telecommunications, Internet development, GIS, and data management services. OIT supports over 450 mission critical applications and operates 2 data centers with 24/7 support. During meetings with OIT staff, it was estimated that OIT manages approximately 12 million transactions per year, 1 million transaction per month, or 33,000 transactions per day.

NJ OIT's standard or target architecture, according the State of New Jersey's Shared IT Architecture (http://www.nj.gov/it/swit/ps/it_architecture.pdf):

- Database: NJ OIT currently operates over 50 Oracle servers and is moving to Oracle as a standard. OIT has Oracle Enterprise licenses. OIT supports IBM DB2 and MS SQL Server, and maintains several mainframe legacy databases in IMS, Datacom, Adabase, Bull DM4, as well as a variety of flat and Focus files.
- Web application development: primarily Java Servlet and JSP, support for ColdFusion and PHP.
- Other Software Development Languages: Cobol, Java, SQL, Visual Basic
- NJ maintains an Enterprise Data Warehouse and associated data marts; Business Objects is the standard data warehousing tool.
- Business Intelligence Tools: BusinessObjects Enterprise and BusinessObjects Crystal Reports
- Extract, Transform, and Load (ETL) Tools: Ascentials DataStage
- Data Modeling: Oracle Designer

A preliminary summary of NJ OIT capabilities is provided in table 5-1.

TABLE 5-1. Preliminary Summary of NJ OIT Capabilities	
VID Requirement	**NJ OIT Status**
Technology Requirements	
Oracle Databases	NJ OIT operates approximately 50 Oracle servers and has a number of Oracle database administrators on staff.
Data Warehousing	NJ OIT has a team of approximately 10 staff that lead all BusinessObjects-related data warehousing work. This team contracts with consultants to meet increased demands when needed.
Web Application Programming	NJ OIT staff is gaining expertise in Java and JSP, however the learning curve required for a productive developer is approximately 2 years. NJ OIT does not have a large number of skilled Java/JSP developers on staff.
Networking/Communications	NJ OIT staff operates and maintain a few hundred servers and the communications infrastructure for over 450 applications.
Expertise Requirements	
Project Managers	NJ OIT staff is responsible for over 450 applications that are managed by OIT Project Managers.
Business Analysts - Requirements Analysis	NJ OIT staff commonly complete preliminary requirements analysis activities. NJ contracts with consultants to meet increased demands when needed. NJ does not have a formal requirements traceability standard or process.
Business Analysts - Joint Application Design (JAD) Session Facilitators	NJ OIT typically contracts work that requires facilitation and JAD sessions.
Report Developers	NJ OIT has a team of approximately 10 staff that lead all BusinessObjects-related data warehousing work, including business Objects Reporting tasks. This team contracts with consultants to meet increased demands when needed.
Extract/Transform/Load (ETL) Designers and Developers	NJ OIT staff has limited ETL expertise. NJ OIT typically contracts ETL tasks.
Software Testers	It is assumed that NJ OIT has software testers available and that consultants are contracted to meet increased demands when needed.
Technical Writers	It is assumed that NJ OIT has technical writers available and that consultants are contracted to meet increased demands when needed.

TABLE 5-1. Preliminary Summary of NJ OIT Capabilities	
VID Requirement	**NJ OIT Status**
Graphic Designers	It is assumed that NJ OIT has graphic designers available and that consultants are contracted to meet increased demands when needed.

Additional NJ OIT Notes of interest:

- OIT has significant Oracle expertise; however the majority of the applications and databases are still mainframe-centric.
- Although NJ is moving towards Oracle and Java-based development, much of the work done is in the mainframe environment with Cobol programming.
- OIT staff are beginning to come up to speed on non-mainframe technologies such as Java, .Net, and XML; however OIT estimates that up to two years are required to become proficient in these platforms.
- Competing project priorities, such as MATRIX, could make staffing challenging. The goal of the MATRIX project is to rewrite all NJ MVC mainframe and Escala applications using Oracle and Java. MATRIX will likely ramp up in the summer or fall of 2006.
- The OIT application development group that leads all NJ MVC work includes approximately 35 staff members.
- Management support would be required to purchase additional hardware to support the project.
- OIT does not have the infrastructure to support PIF dial up communications. A new communications method would need to be developed and implemented. Costs impacts to the PIFs could be significant and would need further evaluation.

6.0 Preliminary Estimated Level of Effort and Schedule by Option

Preliminary estimates of the level of effort and the required schedule associated with each VID option are provided in this section. Note that cost information is provided where available.

As an input into the analysis of level of effort estimates, VID design, development, implementation, operating, and maintenance information available from other states was collected. These data are summarized in Table 6-1. The wide range of information available reflects the following:

- Variability of inspection programs: For example, some state inspection programs require OBD only, while other states have complicated safety inspection requirements in addition to OBD.
- Variability of VID requirements: For example, some states track inspection data only in their VID, other states have complicated VID communications networks, and other states have complicated interfaces and information exchanges between their VID and related financial, billing, and other systems.
- Variability of available cost information: The availability of detailed cost information was fairly limited as most states do not track or did not make available costs at the level of detail required for a comprehensive analysis.

Because each state develops its own inspection program requirements and VID functionality requirements, the ranges provided in Table 6-1 should be considered bounding estimates for the most simple to the most complex VID.

TABLE 6-1. Comparative VID Level of Effort or Costing Information Available for Other States Preliminary Draft: Work in Progress								
State	**Level of Effort (hours)/year**	**Cost ($)/year**	**Cost Includes**	**Total Inspections/ year**	**Network Type (number facilities/lanes)**	**Inspection Types**	**VID Operator**	**Notes**
NJ	---	$3,800,000 - $5,200,000	VID operation and maintenance, communications network.	3,274,000	Centralized (124 lanes), Decentralized (1,400)	ASM, OBD, TSI (limited)	Parsons/ MCI	Calculated based on NJ information. The low value is based on MCI charge to PIFs of $1.47/inspection, high value is based on Parsons yearly data/communications management cost in proposal.
DE	---	$3,000,000	VID operation and maintenance, communications network, inspection station operation, staff, and other related activities.	500,000	Centralized (21 lanes)	TSI, OBD	State	
---	---	$1,000,000 to $10,000,000	VID design and implementation.	not applicable	not applicable	not applicable	not applicable	Anecdotal information.

TABLE 6-1. Comparative VID Level of Effort or Costing Information Available for Other States Preliminary Draft: Work in Progress								
State	**Level of Effort (hours)/year**	**Cost ($)/year**	**Cost Includes**	**Total Inspections/ year**	**Network Type (number facilities/lanes)**	**Inspection Types**	**VID Operator**	**Notes**
CA	80,000 (note: LOE includes both one-time design and development effort as well as on-going maintenance)	---	VID design, implementation, operation, and maintenance; communications network, complex business rules, billing component, interfaces to other agencies CA DMV and possibly CALTRANS.	10,000,000	Decentralized (over 10,000)	ASM, TSI, OBD	Testcomm	Estimate based on anecdotal information that the contractor team working on the CA VID effort consists of approximately 40 people working on design, development, and implementation.
CA	---	$15,000,000 (note: Cost includes both one-time design and development cost as well as on-going maintenance)	VID design, implementation, operation, and maintenance; communications network, complex business rules, billing component, interfaces to other agencies CA DMV and possibly CALTRANS.	10,000,000	Decentralized (over 10,000)	ASM, TSI, OBD	Testcomm	Estimate based on CA data indicating that approximately $1.50/inspection is paid to the VID contractor.
CT		$1,000,000	VID operation and maintenance, communications network.	1,000,000	Decentralized (300)	ASM, TSI, OBD, loaded opacity, snap idle	SysTech	Estimate based on CT data indicating that $1/inspection to is paid to the data contractor, plus an upfront cost of $1,000,000.

TABLE 6-1. Comparative VID Level of Effort or Costing Information Available for Other States Preliminary Draft: Work in Progress								
State	**Level of Effort (hours)/year**	**Cost ($)/year**	**Cost Includes**	**Total Inspections/ year**	**Network Type (number facilities/lanes)**	**Inspection Types**	**VID Operator**	**Notes**
NV	---	$680,000	VID operation and maintenance, communications network.	1,000,000	Decentralized	OBD II, TSI, ASM (diesel)	Systech	Estimate based on NV information indicating that approximately $0.68/inspection is paid to VID contractors.
NV	8,300 (note: one time effort)	$260,700 (note: one time cost)	VID design and implementation.	1,000,000	Decentralized	OBD II, TSI, ASM (diesel)	not applicable	NV: January 2004 Feasibility Report. This estimate is equivalent to 4 FTEs at $31.41/hr, which is not likely representative of labor rates in NJ.
TX	---	$5,000,000	VID operation and maintenance, communications network	6,500,000	Decentralized	ASM, OBD II, TSI	MCI	Estimate based on TX data indicating that $0.78/inspection to is paid to the VID contractor.

6.1 Option 1: In-House VID Design

As described previously, NJ does not own or have rights to the existing VID code base, database design, or hardware. Therefore, transitioning to an in-house VID would require that NJ first design, develop, and implement the VID, and then move to operating and maintaining the VID.

6.1.1 Option 1: In-House VID Design, Development, and Implementation – Preliminary Level of Effort Estimate

Several techniques were used to estimate costs that would be required to design, develop, and implement the VID, including a bottom-up estimate, top-down estimate, and comparison to other state or anecdotal VID costing information. The details of these approaches are presented in Appendix A and Appendix B. Table 6-2 summarizes the level of effort estimates for the bottom-up and top-down approach. Note that the data are provided as level of effort estimates rather than costs. Additional information on labor costs associated with the staff that would perform the work would be required for a more detailed cost analysis. In addition, capital expenditures for required software, licensing, server, and communications equipment are not addressed in these estimates.

TABLE 6-2. Option 1: Top Down and Bottom Up Level of Effort Estimates*

Level of Effort (hours)	
Low	***High***
Bottom-Up Estimate	
16,000	29,000
Top-Down Estimate	
14,000	22,000

*Detailed summaries of the level of effort for Top-down and bottom-up estimates of key VID design, development, testing, and implementation tasks are provided in Appendix A and Appendix B.

Additional detail for the primary tasks and level of effort estimates associated with the bottom-up estimate are provided in Table 6-3.

TABLE 6-3. Option 1: Additional Detail for Bottom Up Level of Effort Estimates

	Level of Effort (hours)	
Primary Task	**Low**	**High**
Management	4,150	8,300
Project Planning and Life Cycle Deliverables	250	500
Assessment of As-Is VID	1,200	2,300
Requirements Analysis	1,000	2,000
System and Database Design	3,600	6,000
Data migration	200	300

TABLE 6-3. Option 1: Additional Detail for Bottom Up Level of Effort Estimates		
	Level of Effort (hours)	
Primary Task	**Low**	**High**
NJ Environment/Infrastructure Set-up	300	500
Implementation	2,600	4,500
Testing	2,000	3,400
User materials	500	800
Deployment	200	400
Total	16,000	29,000

6.1.2 Option 1: In-House VID Operation and Maintenance Preliminary Level of Effort Estimate

To operate and maintain the VID, NJ OIT would need to provide staff that could monitor the VID communications network, QA VID operations and data, evaluate performance metrics such as up-time, and other related activities. Table 6-4 summarizes the type of staff and estimated level of effort requirements for VID operation and maintenance.

Table 6-4. Option 1: Preliminary Estimate of VID Operation and Maintenance Level of Effort				
Staff	**Responsibilities**	**Full-time Equivalents (FTE) (per year)**	**Shifts with FTE need (per day)**	**Labor Hours (per year)**
Project Manager	Oversee project, coordinate project team, track performance, deliverables, schedules, budget, issue identification and resolution, reporting, and other management responsibilities.	1	1	2,080
Business/System(s) Analyst with Subject Matter Expertise	Perform QA, summarize issues, review change and enhancement requests, and assist with system monitoring. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	1.5	1	3,120
Reporting Database Administrator	Back-up and performance tune reporting database, assure database up-time, monitor ETL logs, complete data modeling and database modifications to address approved change requests, revised data tracking or reporting needs, and enhancements	0.25	2	1,040
Transactional Database Administrator	Back-up and performance tune transactional database, assure database up-time, complete data modeling and database modifications to address approved change requests, revised data tracking or reporting needs, and enhancements	0.25	3	1,560

Table 6-4. Option 1: Preliminary Estimate of VID Operation and Maintenance Level of Effort				
Staff	**Responsibilities**	**Full-time Equivalents (FTE) (per year)**	**Shifts with FTE need (per day)**	**Labor Hours (per year)**
Network/ Communications Engineer	Monitor performance of communications network or communications contractor, assure communications network up-time, troubleshoot and resolve issues	0.5	2	2,080
Software Designer	Work with Business Analysts to create detailed specifications to address approved change requests, revised data tracking or reporting needs, and enhancements. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.5	1	1,040
Software Developer	Implement VID reporting changes based on detailed specifications. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.5	1	1,040
Report Designer	Work with Business Analysts to create detailed specifications to address report revisions.	0.25	1	520
Report Developer	Work with Business Analysts to create detailed specifications to address report revisions.	0.25	1	520
Software Testers	Test revised VID interfaces and code. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.5	1	1,040
Extract, Transform, Load Process Developer	Revise the extract/transform/load processes to address changes in transactional and reporting databases.	0.25	1	520
Technical Writer	Maintain project documentation, prepare new documentation as needed.	0.25	1	520
Additional NJ Staff	Support design, review, and approval activities, respond to questions, and provide additional information that may be needed by the vendor. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.25	1	520
Total Estimated Hours				15,590
Total Estimated FTEs (assuming 2,080 hours per FTE)				7.5

6.1.3 Option 1: In-House VID Schedule

Table 6-5 presents a preliminary schedule for key tasks that would be associated with VID design, development, and implementation for Option 1: In-house VID. ***Note that***

this preliminary schedule assumes a start date of January 4, 2007; any delay in start date would result in an equivalent delay in the completion date. It is anticipated that operation and maintenance activities would begin shortly after training is completed.

Table 6-5. Preliminary Schedule for Option 1: In-House VID Design and Implementation*

Task	Duration	Start Date	End Date
Project Planning	35 days	01/04/07	02/21/07
Existing system, functionality, and interfaces review	45 days	01/25/07	03/28/07
Requirements Analysis	105 days	03/08/07	08/01/07
System and Database Design	150 days	08/02/07	02/27/08
Communications Network and Data Transfer Design	90 days	08/02/07	12/05/07
NJ Environment Set-up	180 days	03/08/07	11/14/07
Data Migration	50 days	12/27/07	03/05/08
Implementation/Development	285 days	08/23/07	09/24/08
Testing	285 days	09/20/07	10/22/08
Deployment	290 days	10/11/07	11/19/08
Training	45 days	11/20/08	01/21/09
SUMMARY		01/04/07	01/21/09

* A detailed Microsoft Project Plan for Option 1 is provided in Appendix C. Note that this schedule includes transition from current vendor to NJ staff as part of the Project Planning; Existing system, functionality, and interfaces review; and Requirements Analysis tasks.

6.2 Option 2: Outsource VID (Full and Open Competition)

Outsourcing the VID design, development, implementation, operation, and maintenance would allow NJ to continue the current turn-key VID approach, reducing NJ staff requirements and continuing strict up-time requirements. Outsourcing through a full and open competition would allow NJ to compare VID approaches used by multiple successful vendors in the marketplace. It is anticipated that vendors responding to the procurement would have one or more successful VID implementations that would be used as the basis for developing a solution for NJ. This would allow NJ to evaluate and take advantage of best practices in VID design and operations in the marketplace, and assess competitive price offers.

Note, however, that a full and open competition would require additional time for NJ to develop and internally review the procurement, complete legal and contractual review, release the procurement to interested vendors, allow time for vendors to respond, evaluate responses, and make an award. It is anticipated that the procurement process would add between four and six months to the timetable required to design, develop, implement, and fully deploy the VID.

6.2.1 Option 2: Outsource VID (Full and Open Competition) Design, Development, and Implementation - Preliminary Level of Effort Estimate

Outsourcing VID design, development, and implementation would require vendor as well as NJ support.

Preliminary Vendor Level of Effort

It is anticipated that the selected vendor would have one or more successful VID implementations to use as the basis for developing a solution for NJ. This would allow for a streamlined VID design, development, and implementation process. Quantitatively estimating the expected increase in efficiency is challenging given the degree of uncertainty related to the consistency of the vendor solution with NJ VID requirements, degree of customization needed, compatibility with NJ architecture and development standards, amount of control/access to source code desired by NJ and associated vendor fees, and other factors. Table 6-6 provides a preliminary level of effort estimate for VID design, development, and implementation by a vendor with a proven solution based on the following assumptions:

- Vendor brings an existing, successful VID as basis for NJ design;
- The proven VID meets NJ architecture standards;
- Minimal changes and customization required by NJ to meet State VID requirements
- PIF /CIF communications protocols are readily available, any required adjustments are negligible and do not require rulemaking or stakeholder input;
- NJ can quickly modify business practices to meet the design requirements and limitations of the proven VID;
- NJ can readily provide staff needed for quick review and turn-around of vendor specifications and design documentation;

- NJ assures that funding is readily available and is not delayed by internal processes (i.e., no work stoppages due to contract work order and funding paperwork processes and approvals); and
- NJ desire to have access to source code and direct control over changes is consistent with vendor standard agreement.

Table 6-6. Preliminary Vendor Level of Effort Estimate for Option 2: Outsource VID (Full and Open Competition) Design, Development, and Implementation *

Primary Task	Option 1 NJ Staff Level of Effort Estimate (hours) Low	Option 1 NJ Staff Level of Effort Estimate (hours) High	Proven Vendor Level of Effort Estimate (hours)	Notes
Management	4,150	8,300	6,200	Assumed average of Option 1 range
Project Planning and Life Cycle Deliverables	250	500	400	Assumed average of Option 1 range
Assessment of As-Is VID	1,200	2,300	1,750	Assumed average of Option 1 range
Requirements Analysis	1,000	2,000	1,500	Assumed average of Option 1 range
System and Database Design	3,600	6,000	3,600	Assumed low end of Option 1 range
Data migration	200	300	250	Assumed average of Option 1 range
NJ Environment/ Infrastructure Set-up	300	500	0	Not required, assume vendor hosts VID
Implementation	2,600	4,500	2,600	Assumed low end of Option 1 range
Testing	2,000	3,400	2,000	Assumed low end of Option 1 range
User materials	500	800	500	Assumed low end of Option 1 range
Deployment	200	400	200	Assumed low end of Option 1 range
Total			19,000 hours 9.1 FTE*	Estimated increased efficiency over Option 1: (29,000 - 19,000)/29,000*100 = 34%

*Assume 2,080 hours per year per FTE.

The notes provided in Table 6-6 reflect the expectation that a vendor with proven VID experience could complete project planning, existing VID analysis, assessment, and requirements analysis activities somewhat more efficiently, and that the greatest gain in efficiency would be in the design, implementation, and training activities.

Preliminary NJ Level of Effort Estimate

Prior to beginning work with a vendor, NJ staff would be needed to support and manage the procurement process. Information about the typical or expected level of effort associated with a VID procurement is unknown at this time.

After selecting and contracting with a vendor, NJ would need to maintain in-house project management and technical project staff. The type and level of involvement desired by NJ would need to be fully assessed to better determine effort required. At a minimum, it is anticipated that NJ would provide the same staff that would be required to oversee VID operations and maintenance, with additional subject matter experts to respond to vendor questions. These staff would be expected to fill the following roles: contract manager, project manager, and business/systems analysts with subject matter expertise, NJ communications/security standards experts, database administrator, software testers, and other NJ staff to support design, review, and approval activities. Table 6-7 summarizes the preliminary estimate of NJ level of effort for VID design, development, and implementation for Option 2.

Table 6-7. Option 2: Preliminary Estimate of NJ Level of Effort Requirement – VID Design, Development, and Implementation

Staff	Responsibilities	Full-time Equivalents (FTE) (per year)	Labor Hours (per year)
Procurement Staff	Develop and internally review the procurement, complete legal and contractual review, release the procurement to interested vendors, allow time for vendors to respond, evaluate responses, and make an award.	Unknown	Unknown
Project Manager	Oversee project and vendor, coordinate project team, track performance, deliverables, schedules, budget, issue identification and resolution, reporting, and invoice approval processing, other management responsibilities.	0.5	1,040
Business/ Systems Analyst(s) with Subject Matter Expertise	Participate in requirements gathering and design sessions. Review documentation, perform QA, prepare test cases and test. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.75	1,560
NJ Communications/ Security Standards Experts	Participate in development of and review CIF/PIF and other interfaces communications plan, assure compliance with NJ standards.	0.10	200
Database Administrator	Database review, assure compliance with NJ standards.	0.10	200
Software Testers	Develop test data sets, test cases, perform testing. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.5	1,040

Table 6-7. Option 2: Preliminary Estimate of NJ Level of Effort Requirement – VID Design, Development, and Implementation			
Staff	**Responsibilities**	**Full-time Equivalents (FTE) (per year)**	**Labor Hours (per year)**
Additional NJ staff	Support design, review, and approval activities, respond to questions, and provide additional information that may be needed by the vendor. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	1	2,080
Total Estimated Hours*			6,120
Total Estimated FTE*			2.9

*Estimates do not include NJ staff effort required for procurement process.

6.2.2 Option 2: Outsource VID (Full and Open Competition) Operation and Maintenance - Preliminary Level of Effort Estimate

Outsourcing VID operation and maintenance would require two labor components – NJ staff and vendor/contractor staff. NJ would need to maintain in-house project management and technical project staff. The type and level of involvement desired by NJ would need to be fully assessed to better determine effort required for NJ. At a minimum, it is anticipated that NJ would provide staff to fill the following roles: contract manager, project manager, business/systems analysts with subject matter expertise, and other NJ staff to support operation and maintenance activities. Table 6-8 summarizes the preliminary estimate of NJ level of effort for VID operation and maintenance.

Table 6-8. Option 2: Preliminary Estimate of NJ Level of Effort Requirement – VID Operation and Maintenance			
Staff	**Responsibilities**	**Full-time Equivalents (FTE) (per year)**	**Labor Hours (per year)**
Project Manager	Oversee project and vendor, coordinate project team, track performance, deliverables, schedules, budget, manage change and enhancement requests, issue identification and resolution, reporting, invoice approval processing, and other management responsibilities.	0.5	1,040
Business/ Systems Analysts with Subject Matter Expertise	Assist project manager, troubleshooting, bug testing, participate in change request requirements gathering and design sessions. Review documentation, perform QA, prepare test cases and test. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.5	1,040
Additional NJ staff	Support operations and maintenance, change request design, review, and approval activities, respond to questions, and provide additional information that may be needed by the vendor. Note: it is anticipated	1	2,080

Table 6-8. Option 2: Preliminary Estimate of NJ Level of Effort Requirement – VID Operation and Maintenance			
Staff	**Responsibilities**	**Full-time Equivalents (FTE) (per year)**	**Labor Hours (per year)**
	that this FTE requirement would be comprised of efforts from multiple staff members.		
Total Estimated Hours			4,160
Total Estimated FTE			2

It is expected that a vendor with a proven track record in VID operations and maintenance would work more efficiently than in-house NJ staff with limited VID operations and maintenance experience. The degree of increased efficiency is unknown; therefore it is assumed that the percent efficiency increase for maintenance would be similar to the estimated efficiency increase for VID design, development, and implementation provided in Table 6-6, or 34% more efficient. Table 6-9 summarizes the anticipated vendor effort requirement for VID operation and maintenance; assuming a 34% increased efficiency.

Table 6-9. Option 2: Maximum Anticipated Vendor Effort Requirement – VID Operation and Maintenance				
Staff	**Responsibilities**	**Full-time Equivalents (FTE) (per year)**	**Shifts with FTE need (per day)**	**Labor Hours (per year)**
See Table 6-3 for additional detail on staff roles, responsibilities, and FTE requirements.				
Total Estimated Hours (15,080*(1-0.34) = 9,952 hours)				10,000
Total Estimated FTEs (assuming 2,080 hours per FTE)				4.8

6.2.3 Option 2: Outsource VID (Full and Open Competition) Schedule

Table 6-10 presents a preliminary schedule for key tasks that would be associated with Option 2: Outsource VID Design, Development, Implementation, Operation, and Maintenance (Full and Open Competition). ***Note that this preliminary schedule assumes a start date of January 4, 2007; any delay in start date would result in an equivalent delay in the completion date.*** In addition, if NJ can provide information regarding the typical time period required for RFP Preparation, Procurement and Award, the timetable can be adjusted. It is anticipated that operation and maintenance activities would begin shortly after training is completed.

It is expected that a vendor with proven VID experience could complete project planning, existing VID analysis, assessment, and requirements analysis activities somewhat more efficiently, and that the greatest gain in efficiency would be in the design, implementation, and training activities. Table 6-10 presents a best case schedule assuming the following:

- Vendor brings an existing, successful VID as basis for NJ design;
- The proven VID meets NJ architecture standards;

- Minimal changes and customization required by NJ to meet State VID requirements
- PIF /CIF communications protocols are readily available, any required adjustments are negligible and do not require rulemaking or stakeholder input;
- NJ can quickly modify business practices to meet the design requirements and limitations of the proven VID;
- NJ can readily provide staff needed for quick review and turn-around of vendor specifications and design documentation;
- NJ assures that funding is readily available and is not delayed by internal processes (i.e., no work stoppages due to contract work order and funding paperwork processes and approvals); and
- NJ desire to have access to source code and direct control over changes is consistent with vendor standard agreement.

Table 6-10. Preliminary 'Best Case' Schedule for Option 2: Outsource VID Design, Development, Implementation, Operation, and Maintenance (Full and Open Competition)*			
Task	**Duration**	**Start**	**Finish**
RFP Process	155 days	01/04/07	08/08/07
Project Planning	35 days	08/09/07	09/26/07
Existing system and functionality and interfaces review	45 days	08/30/07	10/31/07
Requirements Analysis	105 days	10/11/07	03/05/08
System and Database Design	105 days	03/06/08	07/30/08
Communications Network and Data Transfer Design	90 days	03/06/08	07/09/08
Data Migration	50 days	06/19/08	08/27/08
Implementation/Development	170 days	03/20/08	11/12/08
Testing	175 days	04/03/08	12/03/08
Deployment	223 days	04/21/08	02/25/09
Training	45 days	12/25/08	02/25/09
SUMMARY		01/04/07	02/25/09

* A detailed Microsoft Project Plan for Option 1 is provided in Appendix D. Note that this schedule includes transition from current vendor to NJ staff as part of the Project Planning; Existing system, functionality, and interfaces review; and Requirements Analysis tasks.

6.3 Option 3: Hybrid - Outsource VID Design, Development, and Implementation, In-house VID Operation and Maintenance

Outsourcing the VID design, development, and implementation would allow NJ to take advantage of proven vendors in the VID marketplace, increase staff skill sets, and have more control over the VID. This hybrid approach would require the selected vendor to train NJ staff by fully partnering on project activities and completing a series of knowledge transfer sessions. For this approach to be successful, NJ would need to commit a project team to work hand-in-hand with the selected vendor throughout the process. It is expected that NJ would essentially form the VID Operations and Maintenance team at the start of the VID design, development, and implementation effort.

Outsourcing design, development, and implementation through a full and open competition would allow NJ to compare VID approaches used by multiple successful vendors in the marketplace. It is anticipated that vendors responding to the procurement would have one or more successful VID implementations that would be used as the basis for developing a solution for NJ. This would allow NJ to evaluate and take advantage of best practices in VID design and operations in the marketplace, and assess competitive price offers.

Note, however, that a full and open competition would require additional time for NJ develop and internally review the procurement, complete legal and contractual review, release the procurement to interested vendors, allow time for vendors to respond, evaluate responses, and make and award. It is anticipated that the procurement process would add between four and six months to the timetable required to design, develop, implement, and fully deploy the VID. In addition, vendor effort for a transition from implementation to operations and maintenance would also be required.

6.3.1 Option 3: Hybrid – Outsource VID Design, Development, and Implementation - Preliminary Level of Effort Estimate

Outsourcing VID design, development, and implementation would require vendor as well as NJ support. Prior to beginning work with a vendor, NJ staff would be needed to support and manage the procurement process. Information about the typical or expected level of effort associated with a VID procurement is unknown at this time.

Preliminary Vendor Level of Effort

It is anticipated that the Option 3 vendor level of effort required for VID design, development, and implementation is the same as that estimated for Option 2. The vendor selected vendor is expected to have one or more successful VID implementations to use as the basis for developing a solution for NJ. This would allow for a streamlined VID design, development, and implementation process. Quantitatively estimating the expected increase in efficiency is challenging given the degree of uncertainty related to the consistency of the vendor solution with NJ VID requirements, degree of customization needed, compatibility with NJ architecture and development standards, amount of control/access to source code desired by NJ and associated vendor fees, and other factors. Table 6-11 provides a preliminary level of effort estimate for VID design, development, and implementation by a vendor with a proven solution based on the following assumptions:

- Vendor brings an existing, successful VID as basis for NJ design;
- The proven VID meets NJ architecture standards;
- Minimal changes and customization required by NJ to meet State VID requirements
- PIF /CIF communications protocols are readily available, any required adjustments are negligible and do not require rulemaking or stakeholder input;
- NJ can quickly modify business practices to meet the design requirements and limitations of the proven VID;
- NJ can readily provide staff needed for quick review and turn-around of vendor specifications and design documentation;
- NJ assures that funding is readily available and is not delayed by internal processes (i.e., no work stoppages due to contract work order and funding paperwork processes and approvals); and
- NJ desire to have access to source code and direct control over changes is consistent with vendor standard agreement.

Table 6-11. Preliminary Vendor Level of Effort Estimate for Option 3: Hybrid - Outsource VID (Full and Open Competition) Design, Development, and Implementation, In-house VID Maintenance *				
Primary Task	**Option 1 Level of Effort Estimate (hours)**		**Proven Vendor Level of Effort Estimate (hours)**	**Notes**
	Low	**High**		
Management	4,150	8,300	6,200	Assumed average of Option 1 range
Project Planning and Life Cycle Deliverables	250	500	400	Assumed average of Option 1 range
Assessment of As-Is VID	1,200	2,300	1,750	Assumed average of Option 1 range
Requirements Analysis	1,000	2,000	1,500	Assumed average of Option 1 range
System and Database Design	3,600	6,000	3,600	Assumed low end of Option 1 range
Data migration	200	300	250	Assumed average of Option 1 range
NJ Environment/ Infrastructure Set-up	300	500	0	Not required, assume vendor hosts VID
Implementation	2,600	4,500	2,600	Assumed low end of Option 1 range
Testing	2,000	3,400	2,000	Assumed low end of Option 1 range
User materials	500	800	500	Assumed low end of Option 1 range
Deployment	200	400	200	Assumed low end of Option 1 range
		Total	19,000	Estimated increased efficiency over Option 1: (29,000 - 19,000)/29,000*100 = 34%

The notes provided in Table 6-11 reflect the expectation that a vendor with proven VID experience could complete project planning, existing VID analysis, assessment, and requirements analysis activities somewhat more efficiently, and that the greatest gain in efficiency would be in the design, implementation

Preliminary NJ Level of Effort Estimate

After selecting and contracting with a vendor, NJ would need to maintain in-house project management and technical project staff. It is assumed that these same staff would perform VID operations and maintenance activities. The type and level of involvement desired by NJ would need to be fully assessed to better determine effort required for NJ. It is expected that because NJ would not only be supporting contractor activities to design and develop the VID, but also preparing for taking over VID operations and maintenance, that NJ would essentially put in place the project the VID Operations and Maintenance team to closely partner with vendor staff from the start of the project. This will allow for more significant knowledge transfer opportunities and assure a smooth transition in that the lead NJ staff from all disciplines and levels would have had opportunity for input and comment on the VID development process. The anticipated NJ labor effort for Option 3 is assumed to be similar to the Option 1 operations and maintenance level of effort, with the exception that staff are not expected to be required for multiple shifts. Table 6-12 summarizes the preliminary estimate of NJ level of effort for VID design, development, and implementation for Option 3.

Table 6-12. Preliminary Estimate of NJ Level of Effort Requirement – Option 3: Hybrid - Outsource VID (Full and Open Competition) Design, Development, and Implementation, In-house VID Maintenance *

Staff	Responsibilities	Full-time Equivalents (FTE) (per year)	Labor Hours (per year)
Procurement Staff	Develop and internally review the procurement, complete legal and contractual review, release the procurement to interested vendors, allow time for vendors to respond, evaluate responses, and make an award.	Unknown	Unknown
Project Manager	Oversee project, coordinate project team, track performance, deliverables, schedules, budget, issue identification and resolution, reporting, assure staff preparation for transition and monitor knowledge transfer activities, and other management responsibilities	0.75	1,560
Business/Systems Analyst(s) with Subject Matter Expertise	Participate in requirements gathering and design sessions. Review documentation, perform QA, prepare test cases and test. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.75	1,560
Reporting Database Administrator	Participate in data modeling, complete database design review, assure compliance with NJ standards, prepare for system transition.	0.25	520
Transactional Database Administrator	Participate in data modeling, complete database design review, assure compliance with NJ standards, prepare for system transition.	0.25	520
Network/ Communications Engineer	Monitor performance of communications network or communications contractor, assure communications network up-time, troubleshoot and resolve issues	0.5	1,040
Software Designer	Participate in development of and review CIF/PIF and other interfaces communications plan, assure compliance with NJ standards. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.25	520
Software Developer	Work with vendor software developers, review vendor code and documentation, assure compliance with NJ standards. Note: it is anticipated that this FTE requirement would be comprised of efforts from	0.25	520

Table 6-12. Preliminary Estimate of NJ Level of Effort Requirement – Option 3: Hybrid - Outsource VID (Full and Open Competition) Design, Development, and Implementation, In-house VID Maintenance *			
Staff	**Responsibilities**	**Full-time Equivalents (FTE) (per year)**	**Labor Hours (per year)**
	multiple staff members.		
Report Designer	Work with vendor report designers, review vendor code and documentation, assure compliance with NJ standards.	0.25	520
Report Developer	Work with vendor report developers, review vendor code and documentation, assure compliance with NJ standards.	0.25	520
Software Testers	Develop test data sets, test cases, perform testing. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.25	520
Extract, Transform, Load Process Developer	Work with vendor ETL developers, review vendor code and documentation, assure compliance with NJ standards.	0.10	208
Technical Writer	Maintain project documentation, prepare new documentation as needed.	0.10	208
Additional NJ Staff	Support design, review, and approval activities, respond to questions, and provide additional information that may be needed by the vendor. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.25	520
Total Estimated Hours			8,736
Total Estimated FTEs (assuming 2,080 hours per FTE)			4.2

*Estimates do not include NJ staff effort required for procurement process.

6.3.2 Option 3: Hybrid In-house VID - Transition - Preliminary Level of Effort Estimate

Following VID design, development, and implementation and prior to NJ fully taking on operation and maintenance of the VID, it is expected that a formal transition period of approximately 90 days would be needed. During this time, the full NJ operation and maintenance team would be needed, as well as a subset of the selected vendor development team. Table 6-12 presents the Option 3: VID Transition Period - Estimate of NJ Level of Effort. Table 6-13 presents the Option 3: VID Transition Period - Estimate of Vendor Level of Effort.

Table 6-13. Option 3: Option 3: Hybrid VID Transition Period - Estimate of NJ Level of Effort				
Staff	**Responsibilities**	**Full-time Equivalents (FTE) (per 3 months)**	**Shifts with FTE need (per day)**	**Labor Hours (per year)**
Project Manager	Oversee transition, coordinate project team, track performance, deliverables, schedules, budget, issue identification and resolution, reporting, and other management responsibilities.	1	1	480
Business/System (s) Analyst with Subject Matter Expertise	Perform QA, summarize issues, review change and enhancement requests, assist with system monitoring. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	1.5	1	720
Reporting Database Administrator	Back-up and performance tune reporting database, assure database up-time, monitor ETL logs, complete data modeling and database modifications to address approved change requests, revised data tracking or reporting needs, and enhancements	0.25	2	240
Transactional Database Administrator	Back-up and performance tune transactional database, assure database up-time, complete data modeling and database modifications to address approved change requests, revised data tracking or reporting needs, and enhancements	0.25	3	360
Network/ Communications Engineer	Monitor performance of communications network or communications contractor, assure communications network up-time, troubleshoot and resolve issues	0.5	2	480
Software Designer	Work with Business Analysts to create detailed specifications to address approved change requests, revised data tracking or reporting needs, and enhancements. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.5	1	240
Software Developer	Implement VID reporting changes based on detailed specifications. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.5	1	240
Report Designer	Work with Business Analysts to create detailed specifications to address report revisions.	0.25	1	120
Report Developer	Work with Business Analysts to create detailed specifications to address report revisions.	0.25	1	120

Table 6-13. Option 3: Option 3: Hybrid VID Transition Period - Estimate of NJ Level of Effort				
Staff	**Responsibilities**	**Full-time Equivalents (FTE) (per 3 months)**	**Shifts with FTE need (per day)**	**Labor Hours (per year)**
Software Testers	Test revised VID interfaces and code. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.5	1	240
Extract, Transform, Load Process Developer	Revise the extract/transform/load processes to address changes in transactional and reporting databases.	0.25	1	120
Technical Writer	Maintain project documentation, prepare new documentation as needed.	0.25	1	120
Additional NJ Staff	Support design, review, and approval activities, respond to questions, and provide additional information that may be needed by the vendor. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.25	1	120
Total Estimated Hours				3,600
Total Estimated FTEs (assuming 480 hours per FTE during the 3 month transition period)				7.5

Table 6-14. Option 3: VID Transition Period - Estimate of Vendor Level of Effort				
Staff	**Responsibilities**	**Full-time Equivalents (FTE) (per 3 months)**	**Shifts with FTE need (per day)**	**Labor Hours (per year)**
Project Manager	Oversee transition, coordinate project team, track performance, deliverables, schedules, budget, issue identification and resolution, reporting, and other management responsibilities.	0.5	1	240
Business/System (s) Analyst with Subject Matter Expertise	Perform QA, summarize issues, review change and enhancement requests, assist with system monitoring. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.5	1	240
Reporting Database Administrator	Back-up and performance tune reporting database, assure database up-time, monitor ETL logs, complete data modeling and database modifications to address approved change requests, revised data tracking or reporting needs, and enhancements	0.10	2	96

Table 6-14. Option 3: VID Transition Period - Estimate of Vendor Level of Effort				
Staff	**Responsibilities**	**Full-time Equivalents (FTE) (per 3 months)**	**Shifts with FTE need (per day)**	**Labor Hours (per year)**
Transactional Database Administrator	Back-up and performance tune transactional database, assure database up-time, complete data modeling and database modifications to address approved change requests, revised data tracking or reporting needs, and enhancements	0.10	3	144
Network/ Communications Engineer	Monitor performance of communications network or communications contractor, assure communications network up-time, troubleshoot and resolve issues	0.25	2	240
Software Designer	Work with Business Analysts to create detailed specifications to address approved change requests, revised data tracking or reporting needs, and enhancements. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.10	1	48
Software Developer	Implement VID reporting changes based on detailed specifications. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.10	1	48
Report Developer	Work with Business Analysts to create detailed specifications to address report revisions.	0.10	1	48
Software Testers	Test revised VID interfaces and code. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.25	1	120
Extract, Transform, Load Process Developer	Revise the extract/transform/load processes to address changes in transactional and reporting databases.	0.10	1	480
Technical Writer	Maintain project documentation, prepare new documentation as needed.	0.25	1	120
Total Estimated Hours				1,824
Total Estimated FTEs (assuming 480 hours per FTE during the 3 month transition period)				3.8

6.3.3 Option 3: Hybrid In-house VID Operation and Maintenance - Preliminary Level of Effort Estimate

Following the transition period, NJ OIT would need to provide staff to monitor the VID communications network, QA VID operations and data, evaluate performance metrics such as up-time, and other related activities to operate and maintain the VID. Table 6-15 summarizes the type of staff and estimated level of effort requirements for VID operation and maintenance.

Table 6-15. Option 3: Hybrid - Preliminary Estimate of VID Operation and Maintenance Level of Effort

Staff	Responsibilities	Full-time Equivalents (FTE) (per year)	Shifts with FTE need (per day)	Labor Hours (per year)
Project Manager	Oversee project, coordinate project team, track performance, deliverables, schedules, budget, issue identification and resolution, reporting, and other management responsibilities.	1	1	2,080
Business/system (s) Analyst with Subject Matter Expertise	Perform QA, summarize issues, review change and enhancement requests, assist with system monitoring. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	1.5	1	3,120
Reporting Database Administrator	Back-up and performance tune reporting database, assure database up-time, monitor ETL logs, complete data modeling and database modifications to address approved change requests, revised data tracking or reporting needs, and enhancements	0.25	2	1,040
Transactional Database Administrator	Back-up and performance tune transactional database, assure database up-time, complete data modeling and database modifications to address approved change requests, revised data tracking or reporting needs, and enhancements	0.25	3	1,560
Network/ Communications Engineer	Monitor performance of communications network or communications contractor, assure communications network up-time, troubleshoot and resolve issues	0.5	2	2,080
Software Designer	Work with Business Analysts to create detailed specifications to address approved change requests, revised data tracking or reporting needs, and enhancements. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.5	1	1,040
Software Developer	Implement VID reporting changes based on detailed specifications. Note: it is anticipated	0.5	1	1,040

Table 6-15. Option 3: Hybrid - Preliminary Estimate of VID Operation and Maintenance Level of Effort				
Staff	**Responsibilities**	**Full-time Equivalents (FTE) (per year)**	**Shifts with FTE need (per day)**	**Labor Hours (per year)**
	that this FTE requirement would be comprised of efforts from multiple staff members.			
Report Designer	Work with Business Analysts to create detailed specifications to address report revisions.	0.25	1	520
Report Developer	Work with Business Analysts to create detailed specifications to address report revisions.	0.25	1	520
Software Testers	Test revised VID interfaces and code. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.5	1	1,040
Extract, Transform, Load Process Developer	Revise the extract/transform/load processes to address changes in transactional and reporting databases.	0.25	1	520
Technical Writer	Maintain project documentation, prepare new documentation as needed.	0.25	1	520
Additional NJ Staff	Support design, review, and approval activities, respond to questions, and provide additional information that may be needed by the vendor. Note: it is anticipated that this FTE requirement would be comprised of efforts from multiple staff members.	0.25	1	520
Total Estimated Hours				15,590
Total Estimated FTEs (assuming 2,080 hours per FTE)				7.5

6.3.4 Option 3: Hybrid VID Schedule

Table 6-16 presents a preliminary schedule for key tasks that would be associated with Option 3: Hybrid: Outsource VID Design, Development, Implementation, Operation (Full and Open Competition; In-House Maintenance. ***Note that this preliminary schedule assumes a start date of January 4, 2007; any delay in start date would result in an equivalent delay in the completion date.*** In addition, if NJ can provide information regarding the typical time period required for RFP Preparation, Procurement and Award, the timetable can be adjusted. It is anticipated that operation and maintenance activities would begin shortly after training is completed.

It is expected that a vendor with proven VID experience could complete project planning, existing VID analysis, assessment, and requirements analysis activities somewhat more efficiently, and that the greatest gain in efficiency would be in the design, implementation, and training activities. Table 6-16 presents a best case schedule assuming the following:

- Vendor brings an existing, successful VID as basis for NJ design;
- The proven VID meets NJ architecture standards;
- Minimal changes and customization required by NJ to meet State VID requirements
- PIF /CIF communications protocols are readily available, any required adjustments are negligible and do not require rulemaking or stakeholder input;
- NJ can quickly modify business practices to meet the design requirements and limitations of the proven VID;
- NJ can readily provide staff needed for quick review and turn-around of vendor specifications and design documentation;
- NJ assures that funding is readily available and is not delayed by internal processes (i.e., no work stoppages due to contract work order and funding paperwork processes and approvals); and
- NJ desire to have access to source code and direct control over changes is consistent with vendor standard agreement.

Table 6-16. Preliminary 'Best Case' Schedule for Option 3: Hybrid: Outsource VID Design, Development, Implementation (Full and Open Competition); In-House Maintenance

Task	Duration	Start	Finish
RFP Process	155 days	01/04/07	08/08/07
Project Planning	35 days	08/09/07	09/26/07
Existing system and functionality and interfaces review	45 days	08/30/07	10/31/07
Requirements Analysis	105 days	10/11/07	03/05/08
System and Database Design	105 days	03/06/08	07/30/08
Communications Network and Data Transfer Design	195 days	10/11/07	07/09/08
NJ Environment Set-Up	180 days	10/11/07	06/18/08
Data Migration	50 days	06/19/08	08/27/08
Implementation/Development	170 days	03/20/08	11/12/08
Testing	175 days	04/03/08	12/03/08
Deployment	223 days	04/21/08	02/25/09
Training	45 days	12/25/08	02/25/09
Transition to NJ OIT	90 days	12/25/08	04/29/09
	SUMMARY	01/04/07	04/29/09

* A detailed Microsoft Project Plan for Option 1 is provided in Appendix E. Note that this schedule includes transition from current vendor to NJ staff as part of the Project Planning; Existing system, functionality, and interfaces review; and Requirements Analysis tasks.

6.4 Outsource the Complete Inspection Program (Full and Open Competition), including the VID Component; Retain Current Contract Structure

Outsourcing the complete inspection program through a full and open competition, including the VID Component as well as CIF/PIF activities would allow NJ to continue the current turn-key approach, reducing NJ staff requirements and continuing strict up-time requirements. This report focuses on the VID component of this option only. If the current vendor were selected, NJ would not be required to perform any actions, incur re-or re-implementation costs, or allocate additional staff resources unless changes to the existing VID are desired or the terms of the contract are modified significantly to allow for more flexibility and control of VID functionality. If a new vendor is selected, the VID component level of effort estimates provided in Option 2 would be applicable.

6.4.1 Option 4: Outsource VID (Current Contractor) Design, Development, and Implementation - Preliminary Level of Effort Estimate

If current vendor is selected: Design, development, and implementation costs are expected to be minimal unless NJ requires changes to the existing VID or the terms of the contract are modified significantly to allow for more flexibility and control of VID functionality.

If a new vendor is selected: the VID design, development, and implementation estimates provided for Option 2 are applicable.

6.4.2 Option 4: Outsource VID (Current Contractor) Operation and Maintenance - Preliminary Level of Effort Estimate

If current vendor is selected: Operation and maintenance costs are expected to be approximately the same as NJ currently spends, unless NJ changes requirements or the terms of the contract are modified significantly to allow for more flexibility and control of VID functionality.

If a new vendor is selected: the VID operation and maintenance estimates provided for Option 2 are applicable.

6.4.3 Option 4: Outsource VID (Current Contractor) Schedule

If the current VID contractor is selected: schedule items would include only those tasks related to preparing the procurement package and awarding the contract. It is anticipated the NJ could complete these activities prior to the end of the current contract unless NJ requires changes to the existing VID or the terms of the contract are modified significantly to allow for more flexibility and control of VID functionality

If a new vendor is selected: the VID scheduled provide for Option 2 is applicable.

Acronyms

CIF: Commercial Inspection Facility
EM: Inspection Equipment Manufacturer
NJ: New Jersey
NJDEP: New Jersey Department of Environmental Protection
NJMVC: New Jersey Motor Vehicle Commission
NJMVIS: New Jersey Motor Vehicle Inspection System
NJOIT: New Jersey Office of Information Technology
PIF: Private Inspection Facility
VID: Vehicle Inspection Database
VIN: Vehicle Identification Number
VIR: Vehicle Inspection Report

Appendix A

Option 1: Detailed Top-Down Level of Effort Estimate

Appendix A: NJ VID - Option 1 - Design, Development, and Implementation Costing: Top-Down Estimate			
		Order of Magnitude Estimate (hours)	
Primary Task	**Subtask**	**Low**	**High**
Management	Managements, Budget Tracking, Meetings, Various Project Reports	2,000	4,000
Assessment of As-Is VID	Current Database, Reports, QA	500	800
	Current Architecture	200	300
	Current Interfaces/Connections (CIFs, PIFs, mainframe, desktop)	200	300
Requirements Analysis:	Stakeholders meetings/JAD sessions (10 groups)	400	800
	Requirements Report, Requirements Prioritization	150	300
	Requirements Traceability Entries	80	160
	To-Be VID report	100	200
System and Database Design	Transactional Database	150	250
	Data Warehouse/Data Mart	300	400
	Data Transfer/Communications	200	300
	Extract/Transform/Load Process Design	200	300
	Report Need Analysis Documentation/Report (currently approximately 52 reports, 7 groups, assume 15 new reports)	200	300
	QA Needs Analysis Report	100	200
	Site Map	40	80
	Security/users/user management/roles/etc. (Joint application Design (JAD), Wireframe (WF), Prototype (PT), Design Document (DD))	100	200
	Admin/Maintenance (JAD, WF, PT, DD)	150	300
	Queries (JAD, WF, PT, DD)	200	300
	Reports (JAD, WF, PT, DD)	250	400
	QA (JAD, WF, PT, DD)	150	300
	Export (JAD, WF, PT, DD)	100	150
	TBD Functional Group 1 (JAD, WF, PT, DD)	150	250
	TBD Functional Group 2 (JAD, WF, PT, DD)	150	250
	TBD Functional Group 3 (JAD, WF, PT, DD)	150	250
Data migration	Data Mapping	100	160
	Data Transfer Scripts	100	160
	Handling of Missing/Incomplete Data	100	200
	Data Migration Testing/Verification	80	120

Appendix A: NJ VID - Option 1 - Design, Development, and Implementation Costing: Top-Down Estimate			
		Order of Magnitude Estimate (hours)	
Primary Task	**Subtask**	**low**	**high**
NJ Environment/Infrastructure Set-up	Development Environment	80	120
	Test Environment	60	100
	Production Environment	60	100
Implementation	Database		
	Transactional Database	100	200
	Data Warehousing/Data Mart Database	200	300
	Security	400	600
	Admin/Maintenance	500	600
	Queries	600	800
	Reports	1,000	1,200
	QA	600	800
	Export	200	400
	TBD Functional Group 1	400	600
	TBD Functional Group 2	400	600
	TBD Functional Group 3	400	600
Testing	Overall Testing Approach	100	200
	Security (test case and data development, testing, bug reporting, revisions)	100	200
	Admin/Maintenance (test case and data development, testing, bug reporting, revisions)	150	250
	Queries (test case and data development, testing, bug reporting, revisions)	200	300
	Reports (test case and data development, testing, bug reporting, revisions)	300	400
	QA (test case and data development, testing, bug reporting, revisions)	150	250
	Export (test case and data development, testing, bug reporting, revisions)	80	120
	TBD Functional Group 1 (test case and data development, testing, bug reporting, revisions)	150	250
	TBD Functional Group 2 (test case and data development, testing, bug reporting, revisions)	150	250
	TBD Functional Group 3 (test case and data development, testing, bug reporting, revisions)	150	250

Appendix A: NJ VID - Option 1 - Design, Development, and Implementation Costing: Top-Down Estimate			
		Order of Magnitude Estimate (hours)	
Primary Task	**Subtask**	**low**	**high**
User Materials	Help, User's Guide, Training Materials, Training	400	600
Deployment	Final Deployment to Production	200	400
Total Estimated LOE		***13,730***	***22,220***

Appendix B

Option 1: Detailed Bottom-Up Level of Effort Estimate

Appendix B: NJ VID - Option 1 - Design, Development, and Implementation Costing: Bottom-Up Estimate				
			Order of Magnitude Estimate (hours)	
Primary Task	**Subtask**	**Assumptions/ Costing notes**	**low**	**high**
Management	Management (includes weekly status meetings, weekly status reports, monthly summary of activities and costs, WBS Development and Maintenance)	PM and DPM - assume 1 FTE each, full time, for project duration	4,160	8,320
Project Planning and Life Cycle Deliverables	Project Plan and Schedule Software Development Plan		254	508
	Communications Plan			
	Change Management Plan			
	Risk Analysis Plan			
	Assessment of NJ Software Development Life Cycle Requirements and Applicability to Project			
	Document Storage and Organization			
	Project Website			
	Project Dashboard			
	High-level Management Briefing Materials			
	Testing Approach			
	Bug Tracking Approach			
Assessment of As-Is VID	Document current system and Architecture		1,194	2,298
	-Database			
	-Reports			
	-QA			
	Document current architecture			
	Document current interfaces/connections			
Requirements Analysis	Stakeholders meetings/JAD sessions -NJDEP	Meeting preparation, Conduct Meeting, Meeting Notes, Wrap up 5-10 meetings	1,038	2,038
	-Parsons	5-10 meetings		
	-MCI	5-10 meetings		
	-Inspection Equipment Manufacturers	5-10 meetings		
	-PIF Owners/operators	2-4 meetings		
	-Vehicle Owners	2-4 meetings		
	-NJ MVC	5-10 meetings		
	-TBD Stakeholder Group 1	2-4 meetings		

Appendix B: NJ VID - Option 1 - Design, Development, and Implementation Costing: Bottom-Up Estimate				
			Order of Magnitude Estimate (hours)	
Primary Task	**Subtask**	**Assumptions/ Costing notes**	**low**	**high**
	-TBD Stakeholder Group 2	2-4 meetings		
	-TBD Stakeholder Group 3	2-4 meetings		
	Requirements Collation and Report	Potential Requirements Groupings: data elements, reports, QA, uptime, communications protocols, platform, business rules, inspection equipment		
	To-Be VID report			
System and Database Design	Database Data Transfer/Communications		3,568	5,930
	Extract, Transform, Load from transactional database to Data Warehouse/Data Mart			
	Reports			
	QA			
	VID Application Interface Design			
	Security	Users, user management, roles, etc.		
	--Security JADs (assume 3)			
	-Security wireframing (assume 2)			
	-Security prototyping and review (assume 2 sessions)			
	--Security Design Document/Specification			
	--Plan describing integration with NJ security protocols and standards			
	--Application and database security			
	Admin/Maintenance	Detailed subtask listing similar to Security detailed task listing.		
	Queries	Detailed subtask listing similar to Security detailed task listing.		

Appendix B: NJ VID - Option 1 - Design, Development, and Implementation Costing: Bottom-Up Estimate				
			Order of Magnitude Estimate (hours)	
Primary Task	**Subtask**	**Assumptions/ Costing notes**	**low**	**high**
	Reports	Detailed subtask listing similar to Security detailed task listing.		
	QA	Detailed subtask listing similar to Security detailed task listing.		
	Export	Detailed subtask listing similar to Security detailed task listing.		
	TBD Functional Group 1	Detailed subtask listing similar to Security detailed task listing.		
	TBD Functional Group 2	Detailed subtask listing similar to Security detailed task listing.		
	TBD Functional Group 3	Detailed subtask listing similar to Security detailed task listing.		
Data migration	Data mapping		190	280
NJ Environment/Infrastructure Set-up	Development Environment		300	450
	-Development Server(s) Design/Configuration			
	-Procure Development Equipment if Needed			
	-Install OS, Software, etc. and Configure Development			
	Test Environment	Detailed subtask listing similar to Development Environment detailed task listing.		
	Production Environment	Detailed subtask listing similar to Development Environment detailed task listing.		
Implementation	Transactional Database		2,592	4,532

Appendix B: NJ VID - Option 1 - Design, Development, and Implementation Costing: Bottom-Up Estimate				
			Order of Magnitude Estimate (hours)	
Primary Task	**Subtask**	**Assumptions/ Costing notes**	**low**	**high**
	Data Warehouse/Data Mart			
	Security			
	Admin/Maintenance	Detailed subtask listing similar to Security detailed task listing.		
	Queries	Detailed subtask listing similar to Security detailed task listing.		
	Reports	Detailed subtask listing similar to Security detailed task listing.		
	QA	Detailed subtask listing similar to Security detailed task listing.		
	Export	Detailed subtask listing similar to Security detailed task listing.		
	TBD Functional Group 1	Detailed subtask listing similar to Security detailed task listing.		
	TBD Functional Group 2	Detailed subtask listing similar to Security detailed task listing.		
	TBD Functional Group 3	Detailed subtask listing similar to Security detailed task listing.		
Testing	Overall Testing Approach Security		1,998	3,386
	-Security Test Case Development			
	-Security Test Data Development			
	-Security Test Data Population in Database (as appropriate)			
	-Security Testing in Test Environment			

-Security Bug Reporting/Tracking for Test

Appendix B: NJ VID - Option 1 - Design, Development, and Implementation Costing: Bottom-Up Estimate				
			Order of Magnitude Estimate (hours)	
Primary Task	**Subtask**	**Assumptions/ Costing notes**	**low**	**high**
	Environment			
	-Security Testing Discussions with Developers - Test Environment			
	-Security Testing Revisions for Test Environment			
	-Security Retesting in Test Environment			
	-Security Testing in Production Environment			
	-Security Bug Reporting/Tracking for Production Environment			
	-Security Testing Discussions with Developers - Production Environment			
	-Security Testing Revisions for Production Environment			
	-Security Final Verification Testing in Production Environment			
	Admin/Maintenance	Detailed subtask listing similar to Security detailed task listing.		
	Queries	Detailed subtask listing similar to Security detailed task listing.		
	Reports	Detailed subtask listing similar to Security detailed task listing.		
	QA	Detailed subtask listing similar to Security detailed task listing.		
	Export	Detailed subtask listing similar to Security detailed task listing.		
	TBD Functional Group 1	Detailed subtask listing similar to Security detailed task listing.		

Appendix B: NJ VID - Option 1 - Design, Development, and Implementation Costing: Bottom-Up Estimate				
			Order of Magnitude Estimate (hours)	
Primary Task	**Subtask**	**Assumptions/ Costing notes**	**low**	**high**
	TBD Functional Group 2	Detailed subtask listing similar to Security detailed task listing.		
	TBD Functional Group 3	Detailed subtask listing similar to Security detailed task listing.		
User materials	User materials -Help System		536	840
	-User's Guide			
	-Training Materials			
	-Training			
Deployment	Final Testing in Production Final Revisions		200	360
Total Estimated LOE			***16,030***	***28,942***

Appendix C

Option 1: Microsoft Project Schedule

Appendix C: NJ VID - Option 1 – Estimated Project Schedule					
ID	**Name**	**Duration**	**Start**	**Finish**	**Predecessors**
1	***Project Planning***	***35 days***	***01/04/07***	***02/21/07***	
2	Project Planning and Schedule	15 days	01/04/07	01/24/07	
3	WBS Development and Maintenance	10 days	01/25/07	02/07/07	2
4	Communications Plan	10 days	02/08/07	02/21/07	3
5	Change Management Plan	10 days	01/25/07	02/07/07	2
6	Risk Analysis Plan	10 days	01/25/07	02/07/07	2
7	Testing and Bug Tracking Approach	10 days	01/25/07	02/07/07	2
8	***Existing system and functionality and interfaces review***	***45 days***	***01/25/07***	***03/28/07***	
9	Database	15 days	01/25/07	02/14/07	2
10	Reports	20 days	02/15/07	03/14/07	9
11	QA	15 days	02/15/07	03/07/07	9
12	Architecture (database, servers, communications)	15 days	02/15/07	03/07/07	9
13	Interfaces to other systems	15 days	02/15/07	03/07/07	9
14	Report	15 days	03/08/07	03/28/07	13
15	***Requirements Analysis***	***105 days***	***03/08/07***	***08/01/07***	
16	Stakeholder meetings (NJ DEP, NJ MVC, NJ OIT, Parsons, PIF, Inspection Equipment Manufacturers, Vehicle Owners)	90 days	03/08/07	07/11/07	13
17	Requirements Report	15 days	07/12/07	08/01/07	16
18	***System and Database Design***	***150 days***	***08/02/07***	***02/27/08***	
19	Database - Transactional	60 days	08/02/07	10/24/07	17
20	Database - Reporting	45 days	10/25/07	12/26/07	19
21	Data transfers	15 days	08/02/07	08/22/07	17
22	ETL	30 days	12/27/07	02/06/08	20
23	Application Interface	45 days	10/25/07	12/26/07	19
24	Security	30 days	10/25/07	12/05/07	19
25	Reports	60 days	12/06/07	02/27/08	24
26	QA	45 days	12/06/07	02/06/08	24
27	Administration/Maintenance	30 days	12/06/07	01/16/08	24
28	Export	30 days	12/06/07	01/16/08	24
29	***Communications Network and Data Transfer Design***	***90 days***	***08/02/07***	***12/05/07***	
30	Communications/Data Transfer	90 days	08/02/07	12/05/07	17
31	NJ Environment Set-up	180 days	03/08/07	11/14/07	
32	Development	60 days	03/08/07	05/30/07	13
33	Testing	60 days	05/31/07	08/22/07	32
34	Production	60 days	08/23/07	11/14/07	33
35	***Data Migration***	***50 days***	***12/27/07***	***03/05/08***	
36	Map data, missing/invalid data handling	30 days	12/27/07	02/06/08	20
37	Transfer data	10 days	02/07/08	02/20/08	36
38	QA migrated data	10 days	02/21/08	03/05/08	37
39	***Implementation/Development***	***285 days***	***08/23/07***	***09/24/08***	
40	Database - Transactional	45 days	10/25/07	12/26/07	19
41	Database - Reporting	60 days	12/27/07	03/19/08	20
42	Data transfers	20 days	08/23/07	09/19/07	21
43	ETL	45 days	02/07/08	04/09/08	22
44	Application Interface	45 days	12/27/07	02/27/08	23

Appendix C: NJ VID - Option 1 – Estimated Project Schedule					
ID	**Name**	**Duration**	**Start**	**Finish**	**Predecessors**
45	Security	45 days	12/06/07	02/06/08	24
46	Reports	90 days	02/28/08	07/02/08	25
47	QA	60 days	07/03/08	09/24/08	46
48	Administration/Maintenance	45 days	01/17/08	03/19/08	27
49	Export	30 days	01/17/08	02/27/08	28
50	Communications Network	60 days	12/06/07	02/27/08	30
51	***Testing***	***285 days***	***09/20/07***	***10/22/08***	
52	Database - Transactional	20 days	12/27/07	01/23/08	40
53	Database - Reporting	20 days	03/20/08	04/16/08	41
54	Data transfers	15 days	09/20/07	10/10/07	42
55	ETL	15 days	04/10/08	04/30/08	43
56	Application Interface	45 days	02/28/08	04/30/08	44
57	Security	45 days	02/07/08	04/09/08	45
58	Reports	30 days	07/03/08	08/13/08	46
59	QA	20 days	09/25/08	10/22/08	47
60	Administration/Maintenance	15 days	03/20/08	04/09/08	48
61	Export	15 days	02/28/08	03/19/08	49
62	Communications Network	15 days	02/28/08	03/19/08	50
63	***Deployment***	***290 days***	***10/11/07***	***11/19/08***	
64	Develop training materials	145 days	05/01/08	11/19/08	56
65	Database - Transactional	15 days	01/24/08	02/13/08	52
66	Database - Reporting	15 days	04/17/08	05/07/08	53
67	Data transfers	15 days	10/11/07	10/31/07	54
68	ETL	15 days	05/01/08	05/21/08	55
69	Application Interface	15 days	05/01/08	05/21/08	56
70	Security	15 days	04/10/08	04/30/08	57
71	Reports	25 days	08/14/08	09/17/08	58
72	QA	20 days	10/23/08	11/19/08	59
73	Administration/Maintenance	15 days	04/10/08	04/30/08	60
74	Export	15 days	03/20/08	04/09/08	61
75	Communications Network	15 days	03/20/08	04/09/08	62
76	***Training***	***45 days***	***11/20/08***	***01/21/09***	
77	Training	45 days	11/20/08	01/21/09	72

Appendix D

Option 2: Microsoft Project Schedule

Appendix D: NJ VID - Option 2 – Estimated Project Schedule					
ID	**Name**	**Duration**	**Start**	**Finish**	**Predecessors**
1	***RFP Process***	***155 days***	***01/04/07***	***08/08/07***	
2	NJ develop RFP specs and package	30 days	01/04/07	02/14/07	
3	legal review	20 days	02/15/07	03/14/07	2
4	send out for bid	10 days	03/15/07	03/28/07	3
5	receive responses	45 days	03/29/07	05/30/07	4
6	award	45 days	05/31/07	08/01/07	5
7	start work	5 days	08/02/07	08/08/07	6
8	***Project Planning***	***35 days***	***08/09/07***	***09/26/07***	
9	Project Plan and Schedule	15 days	08/09/07	08/29/07	7
10	WBS Development and Maintenance	10 days	08/30/07	09/12/07	9
11	Communications Plan	10 days	09/13/07	09/26/07	10
12	Change Management Plan	10 days	08/30/07	09/12/07	9
13	Risk Analysis Plan	10 days	08/30/07	09/12/07	9
14	Testing and Bug Tracking Approach	10 days	08/30/07	09/12/07	9
15	***Existing system and functionality and interfaces review***	***45 days***	***08/30/07***	***10/31/07***	
16	Database	15 days	08/30/07	09/19/07	9
17	Reports	20 days	09/20/07	10/17/07	16
18	QA	15 days	09/20/07	10/10/07	16
19	Architecture (database, servers, communications)	15 days	09/20/07	10/10/07	16
20	Interfaces to other systems	15 days	09/20/07	10/10/07	16
21	Report	15 days	10/11/07	10/31/07	20
22	***Requirements Analysis***	***105 days***	***10/11/07***	***03/05/08***	
23	Stakeholder meetings (NJ DEP, NJ MVC, NJ OIT, Parsons, PIF, Inspection Equipment Manufacturers, Vehicle Owners)	90 days	10/11/07	02/13/08	20
24	Requirements Report	15 days	02/14/08	03/05/08	23
25	***System and Database Design***	***105 days***	***03/06/08***	***07/30/08***	
26	Database - Transactional	45 days	03/06/08	05/07/08	24
27	Database - Reporting	30 days	05/08/08	06/18/08	26
28	Data transfers	10 days	03/06/08	03/19/08	24
29	ETL	20 days	06/19/08	07/16/08	27
30	Application Interface	30 days	05/08/08	06/18/08	26
31	Security	20 days	05/08/08	06/04/08	26
32	Reports	40 days	06/05/08	07/30/08	31
33	QA	30 days	06/05/08	07/16/08	31
34	Administration/Maintenance	20 days	06/05/08	07/02/08	31
35	Export	20 days	06/05/08	07/02/08	31
36	***Communications Network and Data Transfer Design***	***90 days***	***03/06/08***	***07/09/08***	
37	Communications/Data Transfer	90 days	03/06/08	07/09/08	24
38	***Data Migration***	***50 days***	***06/19/08***	***08/27/08***	
39	Map data, missing/invalid data handling	30 days	06/19/08	07/30/08	27
40	Transfer data	10 days	07/31/08	08/13/08	39
41	QA migrated data	10 days	08/14/08	08/27/08	40
42	***Implementation/Development***	***170 days***	***03/20/08***	***11/12/08***	
43	Database - Transactional	23 days	05/08/08	06/09/08	26

Appendix D: NJ VID - Option 2 – Estimated Project Schedule					
ID	**Name**	**Duration**	**Start**	**Finish**	**Predecessors**
44	Database - Reporting	30 days	06/19/08	07/30/08	27
45	Data transfers	10 days	03/20/08	04/02/08	28
46	ETL	23 days	07/17/08	08/18/08	29
47	Application Interface	23 days	06/19/08	07/21/08	30
48	Security	23 days	06/05/08	07/07/08	31
49	Reports	45 days	07/31/08	10/01/08	32
50	QA	30 days	10/02/08	11/12/08	49
51	Administration/Maintenance	23 days	07/03/08	08/04/08	34
52	Export	15 days	07/03/08	07/23/08	35
53	Communications Network	30 days	07/10/08	08/20/08	37
54	***Testing***	***175 days***	***04/03/08***	***12/03/08***	
55	Database - Transactional	15 days	06/10/08	06/30/08	43
56	Database - Reporting	15 days	07/31/08	08/20/08	44
57	Data transfers	12 days	04/03/08	04/18/08	45
58	ETL	12 days	08/19/08	09/03/08	46
59	Application Interface	12 days	07/22/08	08/06/08	47
60	Security	12 days	07/08/08	07/23/08	48
61	Reports	8 days	10/02/08	10/13/08	49
62	QA	15 days	11/13/08	12/03/08	50
63	Administration/Maintenance	12 days	08/05/08	08/20/08	51
64	Export	12 days	07/24/08	08/08/08	52
65	Communications Network	12 days	08/21/08	09/05/08	53
66	***Deployment***	***223 days***	***04/21/08***	***02/25/09***	
67	Develop Training Materials	145 days	08/07/08	02/25/09	59
68	Database - Transactional	10 days	07/01/08	07/14/08	55
69	Database - Reporting	10 days	08/21/08	09/03/08	56
70	Data transfers	10 days	04/21/08	05/02/08	57
71	ETL	10 days	09/04/08	09/17/08	58
72	Application Interface	10 days	08/07/08	08/20/08	59
73	Security	10 days	07/24/08	08/06/08	60
74	Reports	20 days	10/14/08	11/10/08	61
75	QA	15 days	12/04/08	12/24/08	62
76	Administration/Maintenance	10 days	08/21/08	09/03/08	63
77	Export	10 days	08/11/08	08/22/08	64
78	Communications Network	10 days	09/08/08	09/19/08	65
79	***Training***	***45 days***	***12/25/08***	***02/25/09***	
80	Training	45 days	12/25/08	02/25/09	75

Appendix E

Option 3: Microsoft Project Schedule

Appendix E: NJ VID - Option 3 – Estimated Project Schedule					
ID	**Name**	**Duration**	**Start**	**Finish**	**Predecessors**
1	***RFP Process***	***155 days***	***01/04/07***	***08/08/07***	
2	NJ develop RFP specs and package	30 days	01/04/07	02/14/07	
3	legal review	20 days	02/15/07	03/14/07	2
4	send out for bid	10 days	03/15/07	03/28/07	3
5	receive responses	45 days	03/29/07	05/30/07	4
6	award	45 days	05/31/07	08/01/07	5
7	start work	5 days	08/02/07	08/08/07	6
8	***Project Planning***	***35 days***	***08/09/07***	***09/26/07***	
9	Project Plan and Schedule	15 days	08/09/07	08/29/07	7
10	WBS Development and Maintenance	10 days	08/30/07	09/12/07	9
11	Communications Plan	10 days	09/13/07	09/26/07	10
12	Change Management Plan	10 days	08/30/07	09/12/07	9
13	Risk Analysis Plan	10 days	08/30/07	09/12/07	9
14	Testing and Bug Tracking Approach	10 days	08/30/07	09/12/07	9
15	***Existing system and functionality and interfaces review***	***45 days***	***08/30/07***	***10/31/07***	
16	Database	15 days	08/30/07	09/19/07	9
17	Reports	20 days	09/20/07	10/17/07	16
18	QA	15 days	09/20/07	10/10/07	16
19	Architecture (database, servers, communications)	15 days	09/20/07	10/10/07	16
20	Interfaces to other systems	15 days	09/20/07	10/10/07	16
21	Report	15 days	10/11/07	10/31/07	20
22	***Requirements Analysis***	***105 days***	***10/11/07***	***03/05/08***	
23	Stakeholder meetings (NJ DEP, NJ MVC, NJ OIT, Parsons, PIF, Inspection Equipment Manufacturers, Vehicle Owners)	90 days	10/11/07	02/13/08	20
24	Requirements Report	15 days	02/14/08	03/05/08	23
25	***System and Database Design***	***105 days***	***03/06/08***	***07/30/08***	
26	Database - Transactional	45 days	03/06/08	05/07/08	24
27	Database - Reporting	30 days	05/08/08	06/18/08	26
28	Data transfers	10 days	03/06/08	03/19/08	24
29	ETL	20 days	06/19/08	07/16/08	27
30	Application Interface	30 days	05/08/08	06/18/08	26
31	Security	20 days	05/08/08	06/04/08	26
32	Reports	40 days	06/05/08	07/30/08	31
33	QA	30 days	06/05/08	07/16/08	31
34	Administration/Maintenance	20 days	06/05/08	07/02/08	31
35	Export	20 days	06/05/08	07/02/08	31
36	***Communications Network and Data Transfer Design***	***195 days***	***10/11/07***	***07/09/08***	
37	Communications/Data Transfer	90 days	03/06/08	07/09/08	24
38	***NJ Environment Set-up***	***180 days***	***10/11/07***	***06/18/08***	
39	Development	60 days	10/11/07	01/02/08	20
40	Testing	60 days	01/03/08	03/26/08	39
41	Production	60 days	03/27/08	06/18/08	40
42	***Data Migration***	***50 days***	***06/19/08***	***08/27/08***	
43	Map data, missing/invalid data handling	30 days	06/19/08	07/30/08	27
44	Transfer data	10 days	07/31/08	08/13/08	43

Appendix E: NJ VID - Option 3 – Estimated Project Schedule					
ID	**Name**	**Duration**	**Start**	**Finish**	**Predecessors**
45	QA migrated data	10 days	08/14/08	08/27/08	44
46	***Implementation/Development***	***170 days***	***03/20/08***	***11/12/08***	
47	Database - Transactional	23 days	05/08/08	06/09/08	26
48	Database - Reporting	30 days	06/19/08	07/30/08	27
49	Data transfers	10 days	03/20/08	04/02/08	28
50	ETL	23 days	07/17/08	08/18/08	29
51	Application Interface	23 days	06/19/08	07/21/08	30
52	Security	23 days	06/05/08	07/07/08	31
53	Reports	45 days	07/31/08	10/01/08	32
54	QA	30 days	10/02/08	11/12/08	53
55	Administration/Maintenance	23 days	07/03/08	08/04/08	34
56	Export	15 days	07/03/08	07/23/08	35
57	Communications Network	30 days	07/10/08	08/20/08	37
58	***Testing***	***175 days***	***04/03/08***	***12/03/08***	
59	Database - Transactional	15 days	06/10/08	06/30/08	47
60	Database - Reporting	15 days	07/31/08	08/20/08	48
61	Data transfers	12 days	04/03/08	04/18/08	49
62	ETL	12 days	08/19/08	09/03/08	50
63	Application Interface	12 days	07/22/08	08/06/08	51
64	Security	12 days	07/08/08	07/23/08	52
65	Reports	8 days	10/02/08	10/13/08	53
66	QA	15 days	11/13/08	12/03/08	54
67	Administration/Maintenance	12 days	08/05/08	08/20/08	55
68	Export	12 days	07/24/08	08/08/08	56
69	Communications Network	12 days	08/21/08	09/05/08	57
70	***Deployment***	***223 days***	***04/21/08***	***02/25/09***	
71	Develop Training Materials	145 days	08/07/08	02/25/09	63
72	Database - Transactional	10 days	07/01/08	07/14/08	59
73	Database - Reporting	10 days	08/21/08	09/03/08	60
74	Data transfers	10 days	04/21/08	05/02/08	61
75	ETL	10 days	09/04/08	09/17/08	62
76	Application Interface	10 days	08/07/08	08/20/08	63
77	Security	10 days	07/24/08	08/06/08	64
78	Reports	20 days	10/14/08	11/10/08	65
79	QA	15 days	12/04/08	12/24/08	66
80	Administration/Maintenance	10 days	08/21/08	09/03/08	67
81	Export	10 days	08/11/08	08/22/08	68
82	Communications Network	10 days	09/08/08	09/19/08	69
83	***Training***	***45 days***	***12/25/08***	***02/25/09***	
84	Training	45 days	12/25/08	02/25/09	79
85	***Transition***	***90 days***	***12/25/08***	***04/29/09***	
86	Transition	90 days	12/25/08	04/29/09	