

BY THE COMPTROLLER GENERAL
Report To The Chairman, Subcommittee On
Oversight And Investigations
Committee On Energy And Commerce
House Of Representatives
OF THE UNITED STATES

**Vehicle Emissions Inspection And
Maintenance Program Is Behind Schedule**

Under the Clean Air Act, 30 states and the District of Columbia are to implement vehicle emissions inspection and maintenance (I/M) programs to ensure that carbon monoxide and ozone air quality standards will be attained by the end of 1987. The District of Columbia and roughly half of the states met the Environmental Protection Agency's (EPA's) target date for implementing the I/M program--December 31, 1982. As of September 1984, 12 more states had implemented I/M and 4 other states were expected to begin a program between July 1985 and February 1986.

I/M programs are controversial because the benefits are not always clear, and their implementation costs are considerable. In addition, the future need for I/M programs is uncertain because of indications that air quality has improved nationwide generally without I/M programs and with recent advances in vehicle technology for controlling emissions.

The effectiveness of ongoing I/M programs has generally not been evaluated, and at least eight programs have experienced operational problems. GAO believes EPA's scheduled audits should be completed by the close of fiscal year 1986 so that states can benefit from any EPA recommendations before the 1987 deadline. However, EPA has not budgeted adequate resources to complete the scheduled audits. Therefore, GAO recommends that the Administrator, EPA, reassess the priority given to completing scheduled audits of state I/M programs.



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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

B-216009

The Honorable John D. Dingell
Chairman, Subcommittee on
Oversight and Investigations
Committee on Energy and Commerce
House of Representatives

Dear Mr. Chairman:

As requested in your November 16, 1982, letter and our subsequent discussions with your office, this report discusses the Environmental Protection Agency's implementation of vehicle inspection and maintenance programs to ensure attainment of the national ambient air quality standards by 1987. We examined the major factors contributing to delays in starting the required programs.

As arranged with your office, unless you publicly release its contents earlier, we plan no further distribution of this report until 30 days after the issue date. At that time we will send copies to interested parties and make copies available to others upon request.

Sincerely yours,

A handwritten signature in cursive script that reads "Charles A. Bowyer".

Comptroller General
of the United States

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COMPTROLLER GENERAL'S REPORT TO
THE CHAIRMAN, SUBCOMMITTEE ON
OVERSIGHT AND INVESTIGATIONS
COMMITTEE ON ENERGY AND COMMERCE
HOUSE OF REPRESENTATIVES

VEHICLE EMISSIONS INSPECTION
AND MAINTENANCE PROGRAM IS
BEHIND SCHEDULE

D I G E S T

The Clean Air Act amendments of 1970 required the Environmental Protection Agency (EPA) to establish standards to protect public health from air pollution. Amendments to the act passed in 1977 required states to attain national air quality standards for carbon monoxide and ozone--two pollutants caused primarily by automobile emissions--no later than December 31, 1982. EPA granted states an extension to December 31, 1987, if they implemented a vehicle emissions inspection and maintenance (I/M) program to help attain the standards.

An I/M program consists of an inspection to identify high-emitting vehicles and the maintenance or repair actions needed to bring emission levels from polluting vehicles into compliance with applicable emission standards.

Twenty states demonstrated to EPA that they could attain applicable air quality standards by the December 31, 1982, deadline without an I/M program. However, the remaining 30 states and the District of Columbia requested an extension.

According to EPA policy, the requestors had to implement I/M by December 31, 1982, to obtain an extension. EPA established this date to ensure that affected states had the same date for implementation and to provide them time to implement an acceptable program which would help attain air quality standards by the end of 1987.

In response to a request from the Chairman, Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, GAO examined (1) EPA's I/M program policies and practices for states required to have such programs and (2) the costs, benefits, and achievements of these programs.

GAO found that I/M program implementation continues to run behind EPA's schedule largely because states have strongly opposed the program and because EPA, desiring to work with the states, has given states more time to submit an approvable program. In addition, many programs that have been implemented have experienced operational problems in the areas of quality control or enforcement. EPA's scheduled program audits, if conducted, could help identify the overall operational problems and develop a strategy for dealing with them. Finally, several important issues once resolved, could have an impact on the future of I/M programs.

VARIOUS REASONS HAVE CONTRIBUTED TO
DELAYED I/M PROGRAM IMPLEMENTATION

According to EPA, 14 of the 30 affected states and the District implemented acceptable programs by the December 31, 1982, deadline. As of September 1984, 12 more states had implemented I/M and 4 other states were expected to begin a program between July 1985 and February 1986. However, in March 1984, 1 of the initial 14 states (New Mexico) terminated its ongoing I/M program because the state's supreme court ruled that the metropolitan area operating the program had no authority to charge affected motorists an inspection fee. (See pp. 9 to 11.)

A major reason why the I/M program has not been on schedule is that affected states have generally not supported it because they view I/M as being required at a time when state resources were strained. In the latter 1970's, certain states challenged in the courts EPA's authority to require an I/M program; the courts eventually ruled in EPA's favor. However, state legislative bodies have continued to oppose the program at all stages of development, and some have continued their opposition even after program implementation by attempting to discontinue programs. (See pp. 12 to 16.)

In addition, EPA has administratively given states more time to submit acceptable plans and to demonstrate reasonable progress toward program implementation. For example, in

August 1983 EPA formally proposed sanctions¹ against 11 states because they had not implemented their I/M programs in accordance with schedules or commitments agreed to in 1979. However, in November 1983, EPA published a new policy which gave these 11 states a chance to avoid any sanctions if they could convince EPA that they were making reasonable efforts to implement an I/M program. Because of this, program implementation has been stretched out well past EPA's initial December 31, 1982, deadline. (See pp. 16 to 18.)

EFFECTIVENESS OF I/M PROGRAMS
COULD BE IMPROVED

Through its review and approval of state implementation plans, EPA is responsible for ensuring that states design effective I/M programs. The state implementation plan contains the strategy and schedules agreed to by the states and EPA for controlling pollution problems. Once EPA approves a state's plan, it has the force of federal law.

While EPA has reviewed and approved states' plans for I/M implementation, the effectiveness of ongoing programs has generally not been evaluated. This has occurred because they have not operated long enough and because EPA I/M staff have focused their attention primarily on assisting states in getting programs started.

Some I/M programs are
passing too many vehicles

At least eight programs ongoing as of December 31, 1983, were identified by EPA or independent studies as having problems which affected their effectiveness. For example, as of May 1984, about 8,000 vehicles annually were not passing Virginia's I/M test compared with the 80,000 vehicles the program was expected to fail in order to get the emissions reductions needed to attain the applicable standards. Under New York's program,

¹The Clean Air Act Amendments of 1977 granted EPA authority to impose sanctions such as withholding certain types of highway funds against states not making reasonable efforts to bring about the required I/M program on schedule.

about 203,500 failed the I/M test in 1982 compared with the program's estimates of 370,000 vehicles. (See pp. 21 to 24.)

Ineffective I/M enforcement procedures are a problem

Another problem is the ineffective enforcement procedures. For example, of the 600,000 vehicles required to be inspected and tested in Georgia, about half were not being inspected because poorly designed inspection stickers made it difficult to detect noncomplying vehicles and because local law officers had placed low priority on enforcing program requirements. (See p. 24.)

Some states have benefitted from I/M

Despite such problems I/M has helped reduce vehicle emissions in certain instances. For example, New Jersey, which implemented I/M in 1974, reported that its program had substantially reduced carbon monoxide levels. Ninety percent of the cities monitored in New Jersey exceeded health standards for carbon monoxide in 1973 as compared with 40 percent in 1980. The state reported that its I/M program was reducing carbon monoxide by 430,000 tons and hydrocarbons by 29,000 tons annually. (See p. 39.)

EPA IS ADDRESSING I/M PROBLEMS

EPA has begun to address problems in state programs. For example, EPA has developed draft audit guidelines for its personnel to use in overseeing all state I/M programs. As stated in the draft guidelines, the I/M audit objectives will be to allow EPA to collect information needed to

- fulfill its minimum responsibility under the act for ensuring that (1) each state or locality is implementing its state implementation plan for I/M and (2) the plan is adequate to attain the air quality standards and
- improve the effectiveness of each I/M program in reducing emissions and improve its overall cost efficiency.

EPA tested the guidelines on eight programs during the summer of 1984 and expects to have final guidelines ready in fiscal year 1985. I/M programs in the 30 states and the District of Columbia were being targeted for EPA's evaluation by the end of fiscal year 1986.

EPA I/M officials believe that they may not have sufficient resources to completely evaluate these programs by the end of fiscal year 1986. Since other competing programs within EPA have received a higher priority, EPA's initial fiscal year 1986 budget submission did not include the eight new positions the officials requested to support the projected I/M audit workload. According to the I/M program manager at EPA, without the resources requested, it is unlikely that the audits would be finished in time to benefit state programs for the 1987 deadline. (See pp. 24 to 26.)

RESOLUTION OF CERTAIN
ISSUES COULD AFFECT
THE FUTURE OF I/M PROGRAMS

EPA studies show that the nation's air quality has steadily improved. From 1975 through 1981, overall carbon monoxide levels were reduced by 26 percent and ozone levels by 14 percent. How much of the improved air quality was due to reduced emissions from new cars, and whether the trend can be maintained without implementing I/M is uncertain. Preliminary data on new vehicle fleets show that most late-model cars would pass an I/M test when functioning properly, but when they do malfunction, they produce carbon monoxide emissions 20 or more times greater than the standards allow and hydrocarbon emissions 10 times greater. (See pp. 33 to 34.)

Furthermore, EPA has recently reevaluated the data base for its carbon monoxide standards because of questions raised about the quality of some of the key studies upon which EPA has been relying. In a report² to the Chairman, Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, GAO discussed the status of EPA's air quality standards for carbon monoxide. EPA is still making a decision concerning the levels at which the standards should be set. (See pp. 35 to 36.)

²Status of EPA's Air Quality Standards for Carbon Monoxide (GAO/RCED-84-201, Sept. 27, 1984).

In addition, I/M could cost motorists millions of dollars, whereas several state studies have concluded that I/M may not be cost-effective for them compared with the benefits of less costly measures such as controlling motorists' tampering with vehicle emission control components. Independent studies made of two of the older and more established I/M programs in the country have produced divergent views concerning whether these I/M programs have improved the air quality in their respective areas. (See pp. 36 to 43.)

RECOMMENDATION TO THE ADMINISTRATOR, EPA

To date, EPA has focused its attention on getting I/M programs started at the state level. With the approaching 1987 deadline for air quality standards, however, it will be important for EPA to finish auditing state I/M programs by the close of fiscal year 1986 in order to determine (1) the extent of state compliance with I/M implementation plan provisions and (2) whether existing programs need to change to more effectively meet the deadline.

GAO recommends, therefore, that the Administrator, Environmental Protection Agency, reassess the priority given to completing scheduled audits of state I/M programs. If EPA is unable to complete the audits on schedule, it should immediately inform the Congress of the delay, the reasons, and suggested solutions. (See p. 32.)

AGENCY COMMENTS

GAO did not request EPA to officially comment on this report. However, the matters covered in the report were discussed with responsible EPA headquarters officials and their comments were considered in preparing the final report.

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ABBREVIATIONS

EPA	Environmental Protection Agency
GAO	General Accounting Office
HTS	Hamilton Test Systems, Inc.
I/M	inspection and maintenance
NAAQS	national ambient air quality standard
SIP	state implementation plan
VTT	Vehicle Test Technology, Inc.
WDOE	Washington State Department of Ecology

GLOSSARY

Carbon monoxide

A colorless, odorless, tasteless gas, formed as a result of incomplete combustion emitted primarily from automobiles. When inhaled into the lungs, carbon monoxide enters the bloodstream and readily combines with hemoglobin, the substance which carries oxygen to the cells. Oxygen is thus inhibited from being distributed throughout the body, causing dizziness and headaches. Carbon monoxide can weaken heart functioning, impair motor ability, and slow response times. Therefore, carbon monoxide is of special concern to those persons with heart disease.

Hydrocarbons

A class of compounds containing carbon and hydrogen in various combinations. They are found most abundantly in petroleum, natural gas, and coal. Sources include automobiles and the combustion and evaporation of organic compounds.

Nitrogen oxides

In the atmosphere it consists mainly of two substances--nitric oxide and nitrogen dioxide. The first is formed when nitrogen and oxygen react at very high temperatures such as those that exist in automobile engines. Nitric oxide is considered relatively harmless, but it rapidly combines with oxygen, especially in sunlight, to form nitrogen dioxide. The latter can interfere with pulmonary function and decrease resistance to infectious diseases, and it reacts with other pollutants to form components of smog.

Ozone

A pungent gas which is not emitted directly into the air. Ozone is the main constituent of smog and is formed by the chemical reaction of hydrocarbons and nitrogen oxides in the presence of sunlight. Ozone originates mainly from emissions produced by motor vehicles,

combustion of fossil fuels, and industrial processes. Ozone irritates the respiratory tract, interferes with the body's ability to fight disease, deteriorates rubber and other substances, and causes widespread crop damage.

Photochemical oxidants

Pollutants formed by a complex series of chemical reactions initiated when hydrocarbons and nitrogen oxide emissions from automobiles are exposed to sunlight (resulting in photochemical smog). These pollutants irritate the eyes and mucous membranes and aggravate existing respiratory illness. The elderly and very young are particularly affected.

CHAPTER 1

INTRODUCTION

For more than a decade, the Congress has expressed a great deal of concern about the need to improve our nation's air quality. Of particular concern are the health problems caused by excessive and often harmful vehicle emissions. These problems range from irritation of the eyes and mucous membranes to dizziness and headaches, weakened heart functioning, impaired motor ability, and slowed response times. Alternatives for controlling in-use vehicle emissions include transportation-related measures such as exclusive bus lanes, carpooling, and improved mass transit. One of the most controversial alternatives, however, is the requirement that motorists subject their vehicles to mandatory inspection and maintenance (I/M) on a periodic basis.

CLEAN AIR ACT REQUIREMENTS

In the Clean Air Act Amendments of 1970 (Public Law 91-604, 84 Stat. 1676), the Congress directed the Environmental Protection Agency (EPA) to establish standards to protect the public's health from air pollution. EPA has set National Ambient Air Quality Standards (NAAQS) for several pollutants including carbon monoxide and ozone, the two pollutants primarily caused by automobile emissions.

The 1970 amendments required that each state submit to EPA a state implementation plan (SIP) which is the state's detailed program for achieving the NAAQS. Basically, an SIP is developed by assessing emissions in an air quality region and computing by mathematical modeling whether those emissions will result in air quality that violates applicable air quality standards. To the extent that standards would be exceeded, the amendments require that the state impose controls on sources to reduce emissions to meet the standards. Any air quality region, or portions thereof, that would be in violation of the standards is classified as a "non-attainment area." Once approved by EPA, an SIP has the force of federal law.

In the Clean Air Act Amendments of 1977 (Public Law 95-95, 91 Stat. 685), the Congress established December 31, 1982, as the deadline for achieving the NAAQS. In addition, the amendments provided for a possible extension to December 31, 1987, for attaining the carbon monoxide and ozone standards. Before being granted an extension, however, states were required to revise their SIP and include, among other things, a specific schedule for implementing an I/M program if the state or a particular area within the state could not meet the NAAQS deadline for carbon monoxide and/or ozone.

The states and EPA were required by the 1977 amendments to designate, on the basis of existing air quality data, those areas in the states which were in attainment or nonattainment of the

NAAQS. In SIP revisions due to EPA by January 1, 1979, states had to ". . . provide for the implementation of all reasonably available control measures as expeditiously as practicable." Until all reasonably available measures were fully implemented, the SIP revisions were to provide incremental emissions reductions through the required application of reasonably available control technology. In any event, all nonattainment areas so designated by the states were required to be in attainment by December 31, 1982.

In the case of NAAQS for ozone or carbon monoxide, a state could request an extension of the attainment deadline to December 31, 1987, for any of its nonattainment areas but first had to provide in its 1979 SIP revision a demonstration that implementation of all reasonably available control measures was insufficient for the area to reach attainment by December 31, 1982. The extension of the attainment deadline to December 31, 1987, was not automatic; a state had to demonstrate need and had to fulfill the other statutory requirements. Once EPA approved the extension, the extension area had to submit an extra SIP revision by July 1, 1982, which updated all the 1979 requirements, and which included a list of all measures needed for attainment by 1987. The 1982 revised SIP was also required to have all the items to be addressed in the SIP revision in legally enforceable form.

EPA policy issued in February 1978 provided that any SIP revision which demonstrated that attainment of the ozone and carbon monoxide standards was not possible in an area prior to December 31, 1982--despite the implementation of all reasonable emission control measures--also had to include an I/M program or a schedule endorsed by the governor for the development, adoption, and implementation of such a program as soon as possible. EPA policy limited the I/M requirement to urbanized areas with populations of 200,000 or greater. However, EPA has required I/M in several cities with smaller populations because of their inability to demonstrate attainment by 1987 without it. Except for those programs in the cities with populations of under 200,000, the I/M implementation deadline established by EPA was December 31, 1982.

Because of disappointment with the states' performance under earlier clean air legislation, in 1977 the Congress amended the Clean Air Act to give EPA authority to impose economic sanctions against areas which did not comply with the act's provisions. The possible types of sanctions included the following:

- A mandatory funding restriction for a state's failure to at least make a good faith effort to develop complete and proper SIP revisions, including I/M. This sanction cuts

off all clean air planning grants and those highway funds that are not environmentally productive.¹

--The automatic imposition of a moratorium on major stationary source² construction or modification when an SIP revision does not fully comply with all requirements for the SIP.

EPA also has authority under the act to halt federal water pollution control act grants for the construction of new sewage treatment facilities when the SIP is inadequate. Unlike the other sanctions, the decision to halt sewage treatment grants is left to the discretion of the EPA Administrator.³

INSPECTION AND MAINTENANCE PROGRAMS

A vehicle emissions I/M program consists of two major functions: (1) the identification of high-emitting vehicles and (2) the maintenance or repair action necessary to bring emission levels from polluting vehicles into compliance with applicable emission standards.

In the nation's urban areas, almost all of the carbon monoxide, about half of the hydrocarbons, and somewhat less than half of the nitrogen oxides (the latter two helping to form photochemical oxidants or smog) come from mobile sources such as cars and trucks.

An EPA policy issued in July 1978 established the emission reductions standard required of any I/M program. The policy set as the standard a 25-percent reduction in vehicle exhaust emissions of hydrocarbons and a 25-percent reduction in emissions of carbon monoxide by December 31, 1987, compared with what emissions would have been projected to be without the program. EPA determined that a 25-percent reduction in emissions represented reasonably available control technology as required under the act. EPA made this determination on the basis of (1) the performance of the New Jersey program, which was operating at the time the amendments were enacted and (2) an expected program implementation date by

¹The 1977 amendments also provided for a mandatory funding sanction which cuts off clean air planning grants to states which fail to implement any portion of their SIP or SIP revisions.

²"Major stationary source" means any building, structure, facility, or installation which emits or has the potential to emit 100 tons or more per year of any pollutant subject to regulation under the Clean Air Act.

³For GAO's previous discussion of the sanctions added to the Clean Air Act by the 1977 amendments, see letters from the Comptroller General to Representative John Dingell, B-208593, dated Dec. 30, 1982, and B-208593, dated Apr. 21, 1983.

states of December 31, 1982. EPA used the New Jersey program because it had experienced no apparent technical or public acceptance problems. EPA determined that a basic program designed along the lines of the operating program in New Jersey would produce a 25-percent reduction in light-duty vehicle exhaust emissions by 1987.

In a January 1979 report,⁴ we stated that a properly implemented program offered the most direct and effective method of encouraging proper use of emission control systems and bringing cars exceeding emission standards into compliance. We also reported that EPA believed the program would have a comprehensive impact on maintenance problems and other underlying causes of excess emissions from cars in use by providing incentives to (1) car owners to get needed maintenance done, (2) the service industry to do maintenance work more effectively, and (3) the manufacturers to encourage development of cars that are more serviceable.

Additionally, an effective I/M program plays a part in other EPA vehicle emissions enforcement programs. For example, by identifying car models that frequently fail emission inspection tests, the I/M program enables EPA's selective enforcement auditing program (cars leaving the assembly line are tested for compliance with emission standards) and manufacturers' recall programs to better focus on problem car models. Also, the threat of failing an emission inspection would be a serious deterrent to tampering, making I/M a major factor in EPA's antitampering program. I/M programs are also important in enforcing the manufacturers' performance warranty, which makes the manufacturer liable for the cost of repairs to bring a properly operated and maintained car into compliance with emission standards.

PRIMARY AGENCIES INVOLVED IN I/M DEVELOPMENT AND IMPLEMENTATION

State agencies and EPA both have basic responsibilities concerning the development and implementation of I/M programs. Although the Clean Air Act, as amended, required EPA to set NAAQS, it requires states to establish procedures by which the NAAQS will be met and enforced. The United States has been divided by the states and EPA into 247 air quality control regions, and each state is responsible for achieving NAAQS in the regions within its jurisdiction. Each state is primarily responsible for implementing, maintaining, and enforcing program requirements. Since states were responsible for I/M, EPA gave them wide latitude to design and administer their programs.

EPA is primarily responsible for approving and, in some cases, preparing I/M programs. To fulfill its responsibility under the statutes, EPA has issued policy statements prescribing the basic elements of a program and requirements that an SIP must satisfy before it can be approved. In instances where I/M is

⁴Better Enforcement of Car Emission Standards--A Way to Improve Air Quality (Jan. 23, 1979, CED-78-180).

inadequate or missing from an SIP but is otherwise needed, EPA must formulate an adequate program for that state according to EPA's own criteria.

The act, as amended, also envisions an oversight role for EPA. For example, the act provides that EPA shall revise an SIP or portion thereof if the Administrator finds "on the basis of information available to him" that a state's SIP is substantially inadequate to achieve the NAAQS or the requirements of the act. Furthermore, the act provides that whenever SIP violations are so widespread as to indicate that a state has not enforced a plan effectively, EPA may seek injunctive relief against the state.

OBJECTIVES, SCOPE, AND METHODOLOGY

In a November 16, 1982, letter, the Chairman, Subcommittee on Oversight and Investigation, House Committee on Energy and Commerce, asked us to examine EPA's inspection and maintenance policies and practices and the costs, benefits, and achievements of the program, including projected or claimed emission reductions from the programs of the various states.

In our subsequent discussions with his office, it was agreed that the specific objectives of our review would be to examine and report on the following issues:

- The current status of program implementation and the reasons why states had not yet implemented required programs.
- The characteristics of ongoing state programs including whether programs were consistent and comparable.
- The costs being incurred by states to operate programs and the benefits realized.
- EPA's responsibility under the act for approving a program and for ensuring that states design and implement an effective program.
- The Clean Air Act requirements for an acceptable program and whether EPA's I/M policies were being followed.
- The extent to which states used contractors to operate programs and how these contractors were performing.

Each of the above issues is addressed in the main body of this report except for the use of contractors in I/M programs which is discussed in appendix I.

We performed our review during January to December 1983. However, we updated some of our information concerning program status on the basis of comments received from EPA officials in May and September 1984. I/M is a dynamic program, however, and some

areas may have since implemented an I/M program while others may have slipped their projected target dates from those shown in this report. During our review, we did our work at the following principal locations:

- EPA headquarters, Washington, D.C.; EPA Region V, Chicago, Illinois; and EPA's Mobile Source Air Pollution Control Laboratory, Ann Arbor, Michigan.
- The Arizona Department of Health Services, Division of Environmental Health Services, Bureau of Vehicular Emissions Inspection, Phoenix, Arizona.
- The Oregon Department of Environmental Quality, Air Quality Division, Motor Vehicle Inspection Program, Portland, Oregon.
- The Rhode Island Department of Transportation, Motor Vehicle Safety and Emission Control Division, Cranston, Rhode Island.
- The New Jersey Department of Environmental Protection, Division of Environmental Quality, Bureau of Mobile Source Control and Enforcement Data Management, Trenton, New Jersey.

We reviewed in detail the programs of four states--Arizona, New Jersey, Oregon, and Rhode Island. We selected the four programs because they were already operating, represented a variety of approaches to I/M control, and had different types of administrative organizations and legislative or administrative authority. In addition, these four programs were the oldest ongoing programs in the country and had available data on program operations and costs. We also obtained information from I/M program officials in 25 other states and the District of Columbia because these areas were required to implement I/M programs.

We interviewed representatives of various special interest groups such as the American Automobile Association, the Motor Vehicle Manufacturers Association, and several motor vehicle manufacturers, namely, General Motors Corporation, Ford Motor Company, and Volkswagon of America, Inc.

We made an extensive literature and legislative search to identify major federal, state, and local agencies and laws and regulations affecting I/M programs. This search included reviews of the Federal Register. We also researched our prior reports dealing with air quality issues and with problems EPA has experienced in meeting legislated objectives for transportation-related air pollution.

To ascertain the status of program implementation in the states, we interviewed I/M program officials in 30 states and the District of Columbia. We obtained information on a variety of I/M

characteristics, such as program type, geographic area covered, inspection frequency, vehicle failure rate, inspection fee, repair cost waivers, vehicle coverage, capitalization and operating costs, enforcement, calibration of test analyzers, and quality control procedures. In many instances, state officials provided copies of studies evaluating the need for and benefits of the program. We did not verify the accuracy of the cost or program data used in the evaluations nor did we evaluate the soundness of the study methodology.

For the four programs reviewed in detail, we interviewed state officials responsible for program implementation to obtain information on how the programs were designed to work and what officials believed was actually being accomplished. We reviewed monthly state program activity reports; records showing the number of vehicles inspected, tested, and reinspected; organization charts; I/M staffing levels and budget projections; state statutes authorizing an I/M program and any implementing rules and regulations; state implementation plans submitted to EPA; contracts with private firms for vehicle inspection and testing; and public information brochures and pamphlets. When available, we also reviewed internal and external evaluations of program performance and effectiveness and any records showing program accomplishments and costs.

During our state visits, we accompanied state inspectors or I/M personnel on their visits to inspection and testing facilities in order to (1) gain insight into how exhaust emission analyzers used to test vehicles and record test results were being calibrated, (2) become acquainted with the facility used for testing and the procedures followed in testing vehicles, and (3) review onsite documents such as the forms and records used by station personnel.

To determine the extent of EPA's efforts to fulfill its responsibilities under the act for I/M programs, we obtained information from EPA headquarters officials who establish EPA policy directives and develop guidelines to be followed by areas when designing an I/M program. We analyzed policies and implementing directives, internal memorandums discussing the policy implications of various EPA actions, correspondence with congressional sources related to inquiries about EPA's I/M efforts and progress, national I/M status reports prepared since March 1982, internal reports and evaluations made by EPA contractors, proposed actions and public comments on the I/M portion of state implementation plans, and various letters and other correspondence with state governors and I/M program officials.

To determine the extent that states were using private contractors to operate the program, we relied on data obtained from EPA's I/M staff at headquarters. However, we verified and supplemented EPA's data as necessary during our contacts with state I/M officials. We obtained from the states additional data on

such matters as contractor payments, performance, and problems to the extent that these could be readily identified. We also obtained a copy of the formal contract between the state and the private firm involved and analyzed contract provisions for consistency and completeness.

As requested by the Chairman, we did not obtain official agency comments on the report. We did, however, discuss matters contained in the report with EPA headquarters officials in the Office of Mobile Sources responsible for the I/M program. Their comments have been incorporated in the report where appropriate. Except as noted above, our review was performed in accordance with generally accepted government auditing standards.

CHAPTER 2

STATUS OF VEHICLE I/M PROGRAMS

A total of 30 states and the District of Columbia were required by EPA to implement an I/M program either statewide or in selected areas by December 31, 1982. Although efforts to implement I/M programs are moving forward in many states, progress overall has been behind schedule. Eleven states had a program operating by the end of 1982. Five additional states and one of two urban areas in another state implemented I/M in 1983. Eleven states established a target date for implementing an I/M program sometime in 1984, but program slippages in the past make it unlikely that all of these states will meet their new schedule. As of May 1984, it was still uncertain in three states if and when a program will be implemented.

For years, I/M programs have met strong opposition at the state level. Opponents say that I/M programs are not needed to attain air quality, are not cost beneficial, result in inequitable treatment of motorists, and come at a time when state resource problems are acute.

STATUS OF I/M IMPLEMENTATION

Of the 50 states and the District of Columbia, a total of 30 states and the District were required to have an I/M program because they requested and received an extension from December 31, 1982, to December 31, 1987. The remaining 20 states were able to convince EPA that they could attain applicable air quality standards by December 31, 1982, and thus were not required by law to implement vehicle I/M. According to EPA policy, to be granted an extension, the 30 states and the District had to agree to implement I/M by December 31, 1982.

According to EPA I/M officials, the December 31, 1982, deadline was important for a variety of reasons. For one thing, a common target date was supposed to ensure equity in that all I/M areas had to implement a program by the same date. In addition, implementing a program on or before that date was supposed to provide nonattainment areas the time necessary to gradually introduce a program to the public and to get state officials and/or private garages acquainted with the operations of the program. Furthermore, implementation by December 31, 1982, provided areas with sufficient time to build up to the required 25-percent emissions reduction needed by December 31, 1987. EPA officials told us that the longer after December 31, 1982, that an area delays implementing an I/M program, the more stringent the program will have to be in order to achieve the necessary emissions reductions by the 1987 deadline.

Shown below is the implementation status as of December 31, 1983, for the areas required to implement an I/M program by December 31, 1982. The subtotals at the end of each column add to

32 because the two areas (Memphis and Nashville) in Tennessee required to have an I/M program were in different stages of implementation as of December 31, 1983.

Table 1
I/M Implementation Status as of
December 31, 1983

<u>States with operating programs</u>	<u>Date effective</u>	<u>States with programs under development</u>	<u>Scheduled start date</u>	<u>States with program status uncertain</u>
New Jersey	2/1/74	Kentucky	1/84	Alaska
Oregon	7/1/75	Missouri	1/84	Illinois
Arizona	1/1/77	Maryland	2/84	Michigan
Rhode Island	1/1/79	California	3/84	Ohio
Colorado	1/1/82	Texas	4/84	(4)
New York	1/1/82	Wisconsin	4/84	
Virginia	1/1/82	Utah	5/84	
Washington	1/2/82	Indiana	6/84	
Georgia	4/1/82	Pennsylvania	6/84	
North Carolina	12/1/82	Tennessee		
Connecticut	12/31/82	(Nashville)	7/84	
Delaware	1/3/83	Idaho	8/84	
New Mexico	1/3/83	(11) ^a		
District of Columbia	1/12/83			
Massachusetts	4/1/83			
Tennessee (Memphis)	8/1/83			
Nevada	10/1/83			
(17)				

^aAs of September 1984, ten of these states had implemented I/M programs. (See p. 11.)

Eleven states implemented an I/M program by the December 31, 1982, deadline. EPA also considered that Delaware, New Mexico, Massachusetts, and the District of Columbia met the deadline even though these I/M programs did not begin until early 1983. Three states--New Jersey, Oregon, and Arizona--implemented a program before it became a federal requirement. Although Rhode Island began an I/M program in 1979, the state successfully demonstrated to EPA that it had attained the NAAQS by December 31, 1982, and that an I/M program was no longer required. Nevertheless, the state is planning to continue the present program.

The above table does not include those areas of the country which initially expected to attain the applicable NAAQS by the end of 1982 but did not, and did not request an extension of the deadline to 1987. As EPA identifies such non-extension nonattainment areas, EPA could require them to implement an I/M program to help attain the applicable NAAQS. For example, Indianapolis, Indiana, a non-extension nonattainment area for carbon monoxide and ozone, could eventually be required by EPA to implement I/M if other control strategies prove unsuccessful in bringing the area into NAAQS attainment.

In a September 1984 meeting with the I/M staff at EPA to discuss our findings, we were advised that a number of programs had been implemented since December 31, 1983, and were advised of other changes in I/M status. We were told of the following program implementations in 1984: Kentucky (Louisville) and Missouri programs in January, the Maryland program in February, the California program in March, the Utah and Wisconsin programs in April, the Indiana and Pennsylvania programs in June, the Texas program in July, and the Idaho program in August. The Tennessee (Nashville) program was slipped from July 1984 to January 1985. Further, we were told that the states having an uncertain status as of December 31, 1983, were no longer uncertain. Alaska has projected a July 1985 program start date, Michigan is projecting August 1985, Illinois October 1985, and Ohio is expected to begin a program about February 1986. For details on the status of I/M as of May 1984 in the latter three states see appendix II.

In an apparent setback to I/M implementation, we were also told that the New Mexico program ceased to operate on March 28, 1984, because the State Supreme Court ruled that the city of Albuquerque had no authority to charge inspection fees. On March 29, 1984, EPA was drafting a rulemaking action to propose highway funding limitations against New Mexico for terminating its I/M operations.

Our major field work in the states was completed as of December 31, 1983. We did not verify the information on the above changes in status but mention them to demonstrate the transitory and changing nature of the I/M program and the difficulty of reporting on its status at any given point in time.

VARIOUS REASONS HAVE CONTRIBUTED TO DELAYED I/M PROGRAM IMPLEMENTATION

Implementation of I/M programs was to be a cooperative effort between the states and EPA. However, this has not always happened. Some state legislative bodies have opposed I/M programs at all stages of development, and some have continued their opposition even after program implementation. These states have resisted I/M primarily because they perceived that I/M was a forced federal requirement coming at a time when state resources were strained. Other reasons presented by the states were that the programs were not cost-beneficial, resulted in inequitable treatment of motorists, and were unnecessary since overall air quality was improving without the programs.

In addition, EPA has administratively decided to give states missing EPA or statutory deadlines more time to submit an approvable program and to satisfy various I/M requirements. This has stretched out I/M implementation past EPA's deadline of implementation of all programs by December 31, 1982. And some states delayed work on implementation, thinking that the Congress would

revise I/M requirements. During 1982 congressional sessions, several proposals were introduced which ranged from repealing I/M to extending the deadline for its implementation.

Legislative opposition to I/M

We reported in 1977 and again in 1979 that I/M programs had met strong opposition for years. In a February 1977 report,¹ we stated that widely differing court decisions questioned EPA's authority to require states to establish I/M programs. In that report, EPA stated that these decisions further delayed I/M and made it virtually impossible to implement I/M programs already developed. In the January 1979 report,² we stated that I/M programs had not been operational because states had resisted their implementation. At that time, four states were in the courts challenging EPA's authority to require I/M programs. According to the Chief, Technical Support Staff, EPA's Emission Control Technology Division, the 1977 amendments to the act resolved the issue by clarifying the conditions under which states were required to have I/M programs. Both of the reports cited above predated the statutory requirement that states provide for an I/M program in their 1979 revised SIP submittal.

An example of the legislative delays experienced by states can be seen in Nevada, where the legislature repeatedly postponed I/M program implementation for the Las Vegas and Reno areas. The I/M authority originally adopted by the state legislature required mandatory startup on July 1, 1979. However, in the 1979 state legislative session, the date was postponed to July 1, 1981. During the 1981 session (the legislature convenes every 2 years), the startup date was again delayed until July 1, 1983. And, in the 1983 session, a bill was introduced to delay I/M until July 1985, but it was amended to show an October 1983 start. The program started on schedule on October 1, 1983. A state I/M official said the program was unpopular based on past experience. The official said that a change of ownership program (emissions inspection at time of change) went into effect in 1974 but did not last because of a concern over rip-offs and overcharges for emission repairs by garage owners. Also, the official said Clark County (Las Vegas) attempted to implement a program in 1980 but had to rescind it after about 4 months because of a great public outcry against it.

California is an example of long standing opposition to I/M. Six major urban areas of California were required to implement

¹Pollution From Cars on the Road--Problems in Monitoring Emission Controls (Feb. 4, 1977, CED-77-25).

²Better Enforcement of Car Emission Standards--A Way to Improve Air Quality (Jan. 23, 1979, CED-78-180).

the program. However, EPA had to impose federal funding restrictions against the six areas in December 1980 because the state failed to have an approved 1979 SIP (no required I/M legislation). EPA removed the restrictions in October 1982 soon after California passed legislation which authorized implementation of I/M if and when the affected areas requested program implementation from the state. A state I/M official said the primary reason for legislative opposition was that I/M was a states' rights issue, that is, the federal government was forcing the state to do something it did not want to do. Furthermore, several issues had to be resolved which led to delays. These issues included a dispute over a centralized versus decentralized program and the inclusion/exclusion in the program of rural areas with clean air.

Pennsylvania is another example of long-standing opposition. Since August 1978, the state has been under a consent decree requiring the implementation of I/M. On January 22, 1982, a U.S. District Court held the state in civil contempt for violating the consent decree and imposed an injunction against the release of \$419 million in fiscal year 1982 federal transportation funds for the Philadelphia and Pittsburgh areas. The state appealed the District Court's order and injunction, but on May 21, 1982, the Appeals Court upheld the District Court's ruling. In May 1982, the legislature voted to restore I/M funding in the Philadelphia, Pittsburgh, and Allentown/Bethlehem/Easton areas. In October 1982, however, the state legislature passed a bill prohibiting the use of state funds to begin a program. Subsequently, the state agreed to start an I/M program on June 1, 1984--25 months after the initial proposed program start date of May 1982. On May 6, 1983, federal transportation funds were released to the state. A state I/M official said the state legislature opposed I/M because the forced imposition of the program was seen as violating states' rights and unnecessary since the air was improving without the program, and garage owners contended that a \$5 inspection fee would not recover their costs for an I/M test.

Several of the current operating programs have also faced efforts by state legislatures to repeal them. For example, Washington adopted a program only after considerable debate in the legislature. In January 1981, bills to repeal I/M were introduced in both the House and Senate. Backers of the bills cited inconclusive results from other states as reasons to dismantle the program. Although the effort to repeal was unsuccessful in 1981, repeal bills were reintroduced in the 1982 legislature but were again unsuccessful. Other states affected by similar attempts to repeal program authority include Arizona, Connecticut, Idaho, Maryland, Michigan, New York, and Oregon.

Besides attempting to stop I/M development altogether, some state legislatures have also impeded program progress and caused slipped program implementation dates. Reasons for the slippages include states not adopting the necessary rules and regulations to implement the program or enacting the legislation needed. The

following are examples of some of the problems that were experienced and continue to be experienced in the I/M implementation process which resulted in program delays.

- Missouri's emissions testing program was to be combined with the safety inspection program for the St. Louis area. The program was originally scheduled to begin by December 1981 but was rescheduled for January 1984. Problems encountered were delays in preparing final rules and regulations and in setting the inspection fee. For example, the state senate did not enact a bill to set the emissions inspection fee which was needed to provide adequate funds to operate the I/M program. Although a committee in the state house did pass such a bill, it was assigned low priority on the house mark-up list. The program began in January 1984, the reschedule date.
- Maryland's program was delayed from its December 1982 planned start date because the legislature was undecided over the type of program to adopt for the Baltimore area and Maryland's Washington, D.C., suburbs. The legislature considered several bills, varying from cutting off funding to repealing the program before it decided to delay the program for 6 months. However, in March 1983, the state senate enacted a bill to require emission tests every 2 years instead of annually as had been considered. The expected start date was February 1984 and the state met this date.
- Instead of an I/M program, Texas implemented a parameter inspection program (inspection of emission control devices). This program does not include a tail-pipe test of exhaust emissions, which EPA requires for an I/M program. The Texas program places emphasis on the reduction of excess emissions caused by tampering, misfueling, and improper maintenance of vehicle emission control systems. EPA has estimated that the Texas parameter program will reduce emissions by 6 to 13 percent, which is well below the 25-percent reduction required of an I/M program by EPA. The state's Department of Public Safety is attempting to collect more data on the parameter inspection program to more accurately determine the effect of such inspections. Meanwhile, to supplement the parameter inspection program, Texas, beginning in April 1984, was planning to inspect 1980 and later vehicles to check for tampering and lead deposits in the tailpipe. Texas implemented an EPA approved program in July 1984.
- Wisconsin had signed an agreement with a contractor to implement a program for the Milwaukee area by April 1984--15 months after the December 31, 1982, deadline. In December 1983, the contractor was moving into the final stages of construction at the 10 testing sites and the state had begun acceptance testing of the equipment and the

facilities. In a May 28, 1982, letter replying to EPA on the state's progress in implementing I/M, the governor wrote that obtaining authorizing legislation and a commitment of resources at the state level took longer than originally anticipated. The contractor met the April 1984 start date.

- Indiana was due to begin its program in December 1982, but it was rescheduled for startup in January 1984. The state house passed a bill giving I/M testing responsibility to the Indiana Vocational Technical College, but the state senate did not fund the program. The program began in June 1984.
- In Idaho, the city of Boise remains in favor of an I/M program, although Ada County commissioners were attempting to pass a county ordinance which would repeal the program. EPA reported in its July 1983 I/M status report that the commissioners have used the current controversy over the validity of the carbon monoxide standard as their latest reason for delaying the I/M program. (See pp. 35 to 36 for discussion of carbon monoxide controversy.) EPA further reported that Idaho needs an I/M program to attain the carbon monoxide standard by 1987. In its December 31, 1983, I/M status report, EPA stated that both the city and county had decided to begin an I/M program in August 1984, but that EPA will need to keep pressure on the state or else the planned implementation date will slip. The state began a program in August 1984.

State governors oppose I/M

From May through July 1982, officials of 12 states wrote to EPA explaining why they were opposing I/M. The states were responding to letters from EPA in which the agency was proposing to find that the applicable states were no longer meeting their SIP commitment for the program, and that EPA may be required to impose sanctions against the states. In their reply to EPA, seven states opposed I/M because, after studying the program's feasibility, they concluded that it either was not necessary to achieve air quality standards for ozone and carbon monoxide or that it was not of sufficient effectiveness or of reasonable cost to be considered a reasonably available control measure for all areas. Following are two examples from the state letters.

- In June 1982, the governor of North Carolina wrote that it was unclear whether a program in Charlotte would make a significant contribution to reaching the state's clean air goals. The letter also stated that air quality in the Charlotte area was expected to continue its past improvement without the benefit of an I/M program.

--In May 1982, the governor of Tennessee wrote that the cost of about \$2 million to start a program was difficult to justify since projections showed that the state could attain air quality standards by 1987 without it.

In February 1982 hearings before the Subcommittee on Health and the Environment, House Committee on Energy and Commerce, the EPA Administrator testified that states were resisting the I/M requirement primarily because it was being forced on them and because the law required sanctions against noncomplying areas. We found that the threat of sanctions was the direct cause for some states deciding to implement an I/M program in spite of their opposition to it. As discussed on p. 12, California began a program only after federal funding restrictions were actually imposed by EPA. Further, the states of Indiana and North Carolina told EPA in 1982 that they would implement a program if only to avoid the sanctions which EPA was proposing against those states. Finally, as of September 1984, states like Illinois and Michigan which had long resisted I/M implementation were seriously taking the steps necessary to begin a program rather than lose federal money.

The acting I/M project manager for EPA told us in May 1984 that he believed the primary reasons why states had delayed implementing a program were because of a lack of state resources, because I/M was a controversial political issue, because states have had a difficult time determining the type of program to implement, and because EPA's policies under different administrations have confused some states.

EPA's flexible policies have contributed to I/M program delays

EPA has contributed to program implementation delays by giving states missing EPA or statutory deadlines more time to satisfy I/M requirements. Instead of immediately proposing the use of sanctions in every instance, EPA has pursued flexible policies and practices which have given nonattainment areas additional time to correct SIP deficiencies and demonstrate that they were making reasonable progress toward implementing the program required.

For example, the District of Columbia and 30 states which asked for extensions from 1982 to 1987 in meeting standards for ozone and carbon monoxide had to submit to EPA an SIP revision by July 1, 1982. In the SIP revision, states had to satisfy the elements for an I/M program outlined in EPA's final policy on the Criteria for Approval of the 1982 Plan Revisions, published January 22, 1981. The policy provided that by July 1, 1982, states had to submit rules and regulations for a program as well as documentation of 10 other critical program elements. In addition, all the items addressed in the July 1982 SIP revision were to be in legally enforceable form on the submittal date. For

the states, the potential consequences of not submitting an SIP revision by the due date and in a form approvable by EPA were sanctions provided for under the 1977 amendments.

However, in a May 1982 letter to state governors--less than 2 months before final SIP revisions were due--EPA outlined its intent to be as "flexible" as the law will allow in evaluating the 1982 SIP revisions. The letter stated that, in some cases, if a state submitted sufficient enforceable measures to provide for "reasonable further progress" toward attaining the standards during the first few years of the extension period, EPA would accept schedules for adopting the additional enforceable measures required to maintain progress in the remaining years (conditional approval) in lieu of proposing the imposition of a construction ban and the withholding of federal highway funds. The letter also stated that the EPA Administrator was actively working for amendments to the act to permit further attainment date extensions and to provide greater flexibility and authority to the states.

According to the former EPA Assistant Administrator for Air and Radiation, a strict EPA interpretation of the act's requirements could have resulted in disapproved plans for most states and triggered a ban on the construction of new or modified major stationary sources of air pollution. This EPA official also said that states which did not make a "reasonable effort" to submit the required plan revisions would also have been subject to loss of federal funds for highways and perhaps wastewater treatment facilities, as well as grants for air pollution control.

An example of EPA's flexible approach can be seen in Idaho. Idaho submitted its SIP revision on November 8, 1982--over 4 months after the date required by EPA and the statute. On February 3, 1983, EPA proposed to conditionally approve this SIP although the state was proposing to start its I/M program a year after the December 31, 1982, deadline. Furthermore, EPA was flexible by agreeing to accept the state's proposed schedules for submitting to EPA data on enforcement procedures, program operation, and program rules and regulations, all of which were supposed to have been submitted in final form by July 1, 1982.

On August 9, 1982, the Chairman, Subcommittee on Oversight and Investigation, House Committee on Energy and Commerce, asked us to render an opinion concerning EPA's legal basis for being flexible in reviewing and approving SIP revisions. Responding to our August 27, 1982, request for information about the basis for its "appropriately flexible" policy, EPA stated that its actions were authorized by the act but did not explain why or how.

On December 30, 1982, we issued a legal opinion³ concerning EPA's policy and concluded that an enforceable I/M program is an

³Letter from the Comptroller General to Representative John Dingell, B-208593, dated Dec. 30, 1982.

absolute requirement of all 1982 nonattainment SIP revisions, and conditional approval of SIP revisions where sanctions apply or additional rulemaking by the state is required could put I/M on indefinite hold.

In the February 3, 1983, Federal Register, EPA reported that only seven states submitted a final revised SIP by the July 1, 1982, deadline. The rest of the states either submitted a draft plan or submitted a final plan at a later date. Further, EPA found that for all the SIP revisions over half were incomplete as to some of the required elements. EPA proposed to disapprove the 1982 SIP revisions for 17 of the states. The implications of final EPA disapproval of 1982 SIP revisions would be sanctions.

On November 2, 1983, EPA published a new policy as a final rulemaking action in the Federal Register on EPA's use of sanctions. The new policy, focusing on cooperative planning between EPA and the states, provides states an opportunity to correct deficiencies in their implementation plan which could result in a stretchout of potential sanctions by EPA. For example, the new sanctions policy allows states not implementing I/M provisions set out in the 1979 SIP revisions to avoid sanctions if they could convince EPA that they were making reasonable efforts to implement a program. In the August 3, 1983, Federal Register, EPA had formally proposed a construction ban and funding restrictions against 11 states--Illinois, Indiana, Kentucky, Maryland, Michigan, Missouri, Nevada, Pennsylvania, Tennessee, Texas, and Wisconsin. The reason EPA cited for the proposed sanctions was that these states had not implemented their I/M schedules or commitments in their 1979 SIP revision. EPA stated that the extent to which funds would be withheld would depend on which level of government--state or local--was responsible for operating the I/M program and the size of the urban area in which the program was required. The construction ban would also have applied to specific cities and counties or portions of counties in the 11 states. Under EPA's new policy, however, the 11 states have a chance to avoid the sanctions EPA was proposing to initiate.

Proposed clean air act revisions affected I/M implementation

Because some states believed that the Congress was going to substantially revise I/M requirements in its reauthorization of the Clean Air Act, these states delayed actions that they were planning to take toward implementing a program.

For example, in February 1982, the House Committee on Energy and Commerce held a series of hearings on a bill (H.R. 5252) to amend the Clean Air Act. Proposals in this bill would have altered the I/M requirement by providing that only the most severe nonattainment areas for ozone and carbon monoxide would have to implement such programs. Furthermore, it provided that in light of this new requirement, states which had already implemented a program could review and modify it. And, for those areas unable to attain air quality standards by 1987, although having

implemented an I/M program, the bill would have allowed an additional extension of up to 6 years under certain conditions.

In addition, at least seven other bills were introduced in the House and Senate between February 1980 and June 1983. In each case, the purpose of the bill was to repeal the Clean Air Act requirement for periodic inspection and testing of motor vehicles.

In July 1981, during consideration of the 1982 HUD-Independent Agencies appropriations bill, an amendment was introduced in the House calling for a 1-year moratorium on EPA spending funds to enforce or compel states to adopt mandatory I/M in their respective jurisdictions. The amendment was defeated. In September 1982, a similar amendment was introduced to prohibit the use of any funds appropriated by the HUD-Independent Agencies Appropriations Act of 1983 for enforcing sanctions under the Clean Air Act on any state not adopting, implementing, conducting, or enforcing a vehicle I/M program. This time the amendment passed the House. The Senate, however, did not agree to the amendment and the provision was deleted at conference.

Following are examples where states delayed I/M progress while anticipating congressional changes in I/M requirements:

- In a May 28, 1982, letter to EPA, the governor stated that Indiana had delayed requesting proposals from contractors to construct necessary inspection stations and to operate the I/M program in the hope that the Congress would expeditiously resolve controversial provisions in the act. According to the governor, the state believed that there was a good possibility that the mandatory requirement for a program would be dropped.
- In a May 27, 1982, letter to EPA, the governor of Tennessee requested that EPA withhold any further action on the issue of I/M for the state until the Congress had completed its revisions to the act. Because he believed that the Congress was very likely to revise the I/M requirement, the governor could see no reason to actively pursue it. Also, state data showed that Tennessee would attain the ozone standard by the end of 1982 and the carbon monoxide standard by 1987 without I/M.
- A May 21, 1982, letter to EPA from the Illinois Environmental Protection Agency stated that the governor of Illinois had recently spoken with key members of both the House Energy and Commerce Committee and the Senate Environment and Public Works Committee and had received encouraging responses from both sides concerning the prospects that the Congress would modify the I/M language in the act to clarify requirements for states such as Illinois where the program was not essential for meeting air quality goals. Illinois had concluded that a program in the state could not be justified.

CONCLUSIONS

For various reasons, some states have strongly opposed I/M and have delayed implementation of such programs. EPA has contributed to this situation by developing policies to encourage states' implementation of I/M rather than impose sanctions. As a result, I/M program implementation continues to run behind the schedule initially established by EPA. If the 30 states and the District of Columbia are to attain the applicable national ambient air quality standards by the end of 1987 as required by law, those states still without an I/M program will need to implement those programs quickly. And, late programs once implemented will probably need to be much more stringent than earlier programs had to be, in order to achieve the necessary emissions reductions by the 1987 deadline.

CHAPTER 3

EFFECTIVENESS OF I/M PROGRAMS COULD BE IMPROVED

The Clean Air Act made the states primarily responsible for I/M program design, implementation, and enforcement. EPA's role was to ensure that states designed and implemented effective I/M programs. Within this framework, most of the 17 programs implemented as of December 31, 1983, have had a difficult time achieving good program quality control and enforcement. Until programs begin to achieve quality control goals and until I/M requirements are adequately enforced, the contribution of I/M programs to improving air quality by 1987 will not be maximized. In addition, EPA has given states wide latitude in tailoring the design of their programs to local conditions. The different practices resulting from this approach has in some instances detracted from a program's effectiveness.

STATES EXPERIENCING PROBLEMS IN I/M PROGRAM QUALITY CONTROL AND ENFORCEMENT

Of the 17 programs operating on or about December 31, 1983, 8 have been identified by either EPA or independent studies as having serious problems. The eight programs are in Arizona, Colorado, Georgia, Nevada, New Mexico, New York, Rhode Island, and Virginia. For the remaining 9 programs, it was uncertain what difficulties they may be encountering until EPA completes its evaluation of these programs' effectiveness. EPA is planning to audit all I/M programs in the 30 states and the District of Columbia by the end of 1986 in order to fulfill its minimum responsibility under the act for ensuring that each state or locality is implementing its SIP for I/M and that the plan is adequate to attain the air quality standards.

Quality control lacking for some state I/M programs

According to a study prepared for EPA, it is important that accurate tests be performed at all inspection stations for a program to operate effectively and equitably. Therefore, the quality control of the inspection procedures and equipment plays a major role in the overall success of an I/M program. One important feature of quality control is the periodic visit of the inspection station by the administrating agency. By randomly visiting inspection stations, state quality control personnel can help assure that each station is performing in accordance with the state's licensing requirements.

Two purposes can be served by periodically visiting inspection stations. One is to check for the presence of the required equipment and supplies (analyzer, tachometer, spare parts, inspection forms, stickers, guidance manuals, etc.) and to check the performance of the emissions analyzers and related equipment. The

other purpose is to check the inspectors' performance in making inspections, calibrating and maintaining the equipment, and keeping records.

Studies in Arizona and Rhode Island--two of the older and established programs in the country--identified quality control inadequacies in these programs. Arizona has had a mandatory program since January 1977, and Rhode Island since January 1979.

Arizona's I/M program difficulties

In a February 1983 report to the Arizona legislature on the state's I/M program, the auditor general of Arizona concluded that the program had not been routinely monitored and evaluated at any time during operation. One of the items reported was the need for additional controls to assure accurate and reliable emissions testing. Following are some of the auditor general's findings:

- State program officials made only 56 percent of the field audits required by state regulations during fiscal year 1982.
- The contractor conducting the audits also did not conduct all field audits required by internal company policies during this same period because the specific procedures to be used were uncertain since the administrating agency had not supplied all the information it needed to perform the audits.
- State officials had not established a formal management reporting system to inform top management of field audit performance. Consequently, state I/M officials did not know whether all required field audits had been completed or the nature and extent of test lane equipment failures.

Rhode Island's I/M program difficulties

In 1981, the Rhode Island attorney general's office conducted an unmarked vehicles test program by submitting a preconditioned vehicle for inspection at various private garages participating in the state's I/M program. These garages were supposed to perform both a safety inspection and emissions test. The investigators drove the test vehicles to the various garages without an inspection sticker; periodically, the license plates were changed to prevent detection.

The undercover team visited 211 private garages and reported the following findings:

- One hundred and twenty (57 percent) of the stations did not perform the emissions test but issued inspection stickers anyway.

--Fifty seven (63 percent) of the 91 stations that performed the test (which involved warming up the analyzer properly, inserting the probe correctly, etc.) did it incorrectly.

In January 1983, we visited Rhode Island to obtain an overview of program operations. We also accompanied a state inspector on inspection visits to two private garages. On these visits, the inspector observed the calibration of the exhaust analyzer and reviewed inspection records completed for each safety inspection and emissions test. At one location we visited, the mechanic had to adjust the emissions analyzer to conform to the correct settings. We also found that emissions readings were not recorded on 5 of the 30 inspection forms the inspector reviewed.

Another quality control problem experienced by some states is that not enough vehicles fail the I/M test and get repaired. EPA believes that failure rates of about 20-percent normally should be sufficient to achieve the 25-percent emissions reduction desired by 1987. At the same time, areas implementing a program can choose to initially operate it with a lower failure rate in order to gain public support, but then the program eventually must achieve whatever failure rate is necessary to reduce emissions by 25-percent by the end of 1987.

EPA's acting I/M project manager said that the states of Virginia, New York, and Nevada were experiencing serious failure rate problems as of May 1984. According to the project manager, North Carolina previously experienced serious problems also but had taken steps to correct them. The project manager said the vehicle failure rates being reported to EPA by Virginia and New York were so low that these two states may have to take drastic action such as setting more stringent I/M test standards and passing fewer vehicles so that needed emissions reductions would be realized.

In Virginia, about 8,000 vehicles do not pass the initial emissions test annually compared with the 80,000 vehicles the program was designed to fail--a 20-percent design failure rate. State I/M program officials believe the actual failure rate is higher than the reported rate of 3 percent because inspectors do not record all initial failures. According to EPA's acting I/M project manager, Virginia's state air board was expected to meet in early June 1984 to consider tightening emission standards so that a greater number of vehicles will fail the I/M test.

In New York, the overall 1982 failure rate was at 5.5 percent, which equates to 203,500 failures of the estimated annual inspection of 3.7 million vehicles. The I/M program was designed to achieve a 10-percent failure rate, or 370,000 vehicles for 1982, its first year of operation. Beginning in January 1985, the New York program is scheduled to attain a 30-percent failure rate for pre-1980 vehicles and 5 to 10 percent for newer vehicles. EPA I/M officials stated that the New York program is having problems

partly because the New York program's low emission standards result in too many cars passing the I/M test and not enough emissions reductions being achieved.

Enforcement problems limit I/M program effectiveness

In addition to quality control problems, programs in some cases were experiencing difficulty in enforcing program requirements. According to EPA, Georgia was experiencing the most serious enforcement problem of any state. EPA's acting I/M project manager stated that, as of May 1984, about half of the approximately 600,000 vehicles in the metropolitan Atlanta area were not being inspected and tested as required, and that the problem had continued to worsen. The EPA official said that Georgia's problems include a poorly designed inspection sticker which makes it difficult to detect noncomplying vehicles, and the low priority local law officers have given to enforcing program requirements.

Colorado and New Mexico are examples of other states with enforcement problems. In July 1983, EPA reported that in Colorado, anywhere from 210,000 to 420,000 vehicles were not tested for emissions. State Department of Health and Department of Revenue surveys of parking lots around Denver found many vehicles without an emission inspection compliance sticker. As of August 1983, a formal survey by state personnel found a 30-percent noncompliance rate. State officials contend the reason for the high noncompliance includes the low priority that law officers give to program enforcement and the difficulty law officers have identifying violators because of the enforcement stickers' poor design.

According to EPA, about 40 percent of the motorists are evading inspections in the New Mexico program, and this high non-compliance rate reduces program effectiveness and causes financial problems. A state I/M program official stated that the primary enforcement problem is the difficulty experienced in identifying vehicles registered within the program area. According to an EPA I/M official, the enforcement problem in New Mexico must be overcome if the state expects to meet 1987 air quality objectives.

EPA efforts to address state problems

According to the EPA I/M project manager, EPA I/M staff have focused most of their attention initially on assisting states in implementing their program. At the same time, however, EPA has been concerned that ongoing programs be operated with proper quality control and enforcement measures and recently has begun to deal with problems at the state level.

In June 1983, EPA contracted with the Radian Corporation to study quality assurance procedures followed in 13 ongoing I/M programs. The contractor was to directly contact state program officials and gather data on quality control procedures; the quality assurance system, including data collection, enforcement waiver

procedures and rates, warranty regulations, and experience; and any other matters pertinent to program effectiveness and efficiency. The contractor was to then use these data in developing a workshop on quality assurance for state and local program managers. At the first workshop, held in November 1983, attendees discussed program effectiveness and quality assurance along with such other topics as data collection and analysis, waivers, and calibration of testing equipment. EPA is planning additional workshops of this type.

EPA was also developing national audit program guidelines for use by EPA regional offices. The national audit guidelines were being developed in response to a requirement by EPA's Office of Air and Radiation that I/M program audits be required.

EPA is working closely with the Radian Corporation to develop the national audit guidelines for evaluating I/M programs. From May to July 1984, EPA and Radian audited programs in eight states to test the draft guidelines. The I/M project manager for EPA said that the eight programs to be initially selected provided a cross-section of program types and had been operational for at least 1 year. The pilot audits were expected to take about 2 to 3 days to complete compared to the over 11 weeks EPA estimates will be required to do a comprehensive audit of each program once the guidelines have been completed.

Based on the preliminary audit results, the draft guidelines will be modified and sent to the 10 EPA regional offices, selected EPA headquarters offices, and a group of state and local agencies for their review and comment. Final guidelines were expected to be ready for fiscal year 1985 program audits. EPA's I/M headquarters' and regional offices' staff will jointly use the final audit program to evaluate a state's program for the purposes of

- fulfilling EPA's minimum responsibility under the act to ensure that each state or locality implements its SIP for I/M and that the plan is adequate to attain the air quality standards and
- improving the effectiveness of each program in reducing emissions and improving its overall cost efficiency.

According to EPA's I/M project manager, eight more program audits were planned for fiscal year 1985 in addition to doing a follow-up audit at the eight state programs included in the initial guideline testing phase. EPA is planning to accomplish this goal by using three positions (currently authorized for the I/M staff but unfilled as of September 1984) to support audit work. According to a document entitled Implementation Support for State and Local Inspection and Maintenance and Tampering/Fuel Switching Programs, prepared by EPA's Office of Mobile Sources in June 1984, virtually all I/M programs in the 30 states and the District of Columbia also were being programmed for an audit in fiscal year 1986. To accomplish this goal the EPA I/M staff in June 1984

requested an increase from 3 to 11 positions to support the audit workload. The I/M project manager was concerned that without any additional resources it was unlikely the audits could be started and completed by the end of fiscal year 1986.

In November 1984, the acting director of the Program Management Office, Office of Mobile Sources, advised us that the I/M staff's request for eight additional positions had been excluded from EPA's final fiscal year 1986 budget request forwarded to the Office of Management and Budget on September 15, 1984. The acting director said that the budget process within EPA was on hold until the agency hears from the Office of Management and Budget which will probably be in December. This official said the request for the additional audit positions was denied in favor of providing resources to programs considered within EPA to warrant a higher priority. Examples of programs with high priority within the Office of Mobile Sources, according to this official, include those dealing with tampering and fuel-switching, automotive recall, and the phasedown of lead used in gasoline.

In addition to getting the audits done in a timely manner, EPA may face a problem in getting the states to correct any deficiencies identified through the audit work. In a January 17, 1984, memorandum on Strategy for Achieving Fraud- and Error-free I/M Programs, the I/M project manager for EPA noted that states will be reluctant to change their program for various reasons, such as the need to obtain changes in legal authority; the problems involved in changing regulations or procedures; and the expense involved with developing better analyzer specifications, improving the design of forms, or making other changes. EPA recognized in the above memorandum that if states do not voluntarily correct serious program deficiencies, then options available to EPA included applying sanctions, calling for another SIP revision whenever the audit information shows that the plan is inadequate to achieve the air quality standards or to comply with the requirements of the act, or bringing a civil action against a state.

WIDE VARIETY EXISTS AMONG I/M PROGRAMS

EPA was supposed to ensure through the SIP review and approval process that states designed and implemented an effective program. To meet this responsibility, EPA established a policy requiring a 25-percent emissions reduction by 1987 because EPA believed that any program using reasonably available control technology should be able to attain this goal at a minimum. At the same time, EPA gave the states maximum flexibility to design a program to meet the 1987 objective. We are concerned, however, that the use of certain practices among I/M programs in the different states are making programs less effective than they otherwise could be. And, we are concerned that these practices have been allowed to be developed and continued at a time when many states were experiencing serious operational problems as

discussed in the preceding section. According to EPA I/M officials, certain changes could be made to existing programs which could improve their effectiveness.

Types of I/M programs

Three basic types of I/M programs exist--centralized government-operated, centralized contractor-operated, and decentralized government-operated programs. Of the 17 programs already in operation at December 31, 1983, 9 are centralized while 8 are decentralized. Four of the centralized programs are run by contractors. In a centralized program, emission tests are made at centrally located inspection facilities while decentralized programs rely on licensed private garages to make inspections and emissions tests.

According to EPA, the type of organizational structure selected has inherent advantages and disadvantages to motorists in terms of consumer convenience, protection, and cost. A centralized program offers motorists the greatest protection in that it provides for more effective control on the quality and propriety of the testing being performed. A decentralized program, on the other hand, is the most convenient to motorists because of better access to the inspection/test site and because of shorter waiting lines. Also, the motorist is already in a facility which can make any necessary repairs. In terms of cost, centralized programs result in economies of scale but require large capital outlays to start the program. A decentralized program can reduce the financial burden of state-capital investments, but such a program does not make the most efficient use of equipment and also results in additional recurring costs for monitoring licensed stations. Appendix III provides a more comprehensive list of the advantages and disadvantages for each program type.

In addition to the basic differences in program types, programs differ in other characteristics as well. These differences include the frequency of inspections, the way that inspections are made, the fees charged for inspection and testing, the classes of vehicles covered by a program, and the cost motorists are expected to incur for vehicle repair. The last two areas are discussed below because they demonstrate how different practices can reduce a program's effectiveness. Appendix IV provides a comparative listing of selected characteristics of programs operating as of December 31, 1983.

Vehicles covered by I/M programs

The age and size of vehicles tested in the 17 operating programs cover a wide range of requirements. Some programs base coverage on vehicle age, others on weight only, and still others on a combination of the two.

Four states base program coverage on age. Oregon includes all models from 1942 to the present, Arizona and North Carolina include vehicles for the last 13 model years, and Washington includes vehicles less than 14 years old.

Four states--New Jersey, New York, Rhode Island, and Tennessee (Memphis)--test vehicles according to weight. These programs include all vehicles up to a certain weight--New Jersey and Tennessee (Memphis) test vehicles up to 6,000 pounds, New York up to 8,500 pounds, and Rhode Island to 8,000 pounds.

The remaining programs use the following combination of both age and weight in determining which vehicles to test.

<u>State</u>	<u>Limit on age of vehicles tested</u>	<u>Limit on weight(lbs.) of vehicles tested</u>
Colorado	1968 to present	8,500
Connecticut	1968 to present	10,000
Delaware	18 years old	8,500
Georgia	10 years old	6,000
Massachusetts	15 years old	8,000
Nevada	1965 to present	5,000
New Mexico	1968 to present	8,000
Virginia	8 years old	6,000
Washington, D.C.	25 years old	6,000

Generally, diesel-powered vehicles and motorcycles were exempt from the emissions test. Also, most new vehicles were exempt from testing the first year and, in some cases, for the first 2 years.

Pre-1968 vehicles were not subject to federal emission standards and thus have less sophisticated emission controls. Although these vehicles have substantial emissions reduction potential, some states were excluding them from their I/M program. In Arizona, for example, the state legislature changed its program requirements, effective January 1, 1981, to include only vehicles up to 13 years of age versus the 15-year age requirement previously in effect. According to the state I/M program manager, the new requirements will result in over 100,000 vehicles being exempted from the program. The state official also said that the state could not attain the air quality standards by 1987 without including these vehicles. In February 1983, the Arizona auditor general reported that expanding the program to include older vehicles would result in a projected drop in emissions.

In June 1982, Connecticut provided EPA a draft document describing various I/M strategies which the state could pursue. The draft stated that one source of popular dissatisfaction in Connecticut with the I/M program was that some pre-1968 vehicles exempt from program requirements will continue to emit heavy and offensive visible exhaust. In addition, exempting such vehicles

will cause owners of vehicles requiring expensive repairs to question the fairness of the program, particularly if their vehicles initially had no obvious exhaust problem.

An EPA technical report issued August 1981 recommended that states include all gasoline light-duty vehicles weighing less than 8,500 pounds gross as these vehicles have the largest potential for emissions reduction. The technical report also stated that exempting older vehicles from I/M testing requirements reduces a program's effectiveness because older cars have less sophisticated emissions controls and have a substantial per-vehicle potential for emissions reductions. At the same time, however, the report stated that older vehicles can represent a small fraction of the total vehicle miles traveled in an area because few of these cars are on the road, and they are driven less as they get older. If an area decides to exempt older vehicles from I/M testing, EPA recommended that all pre-1968 vehicles and cars over 15 years old be exempted because EPA has determined that this approach preserves much of an I/M program's effectiveness. However, as the preceding discussion shows, state practices vary widely and do not conform to EPA's advice.

Vehicle repair cost waivers

The cost to motorists of repairing vehicles which do not pass I/M inspection and passing a retest can be substantial. Consequently, many states have established price ceilings on repair costs which exempt any vehicle from having repair work done which exceeds the ceiling. The amount and use of waivers varies from program to program and can result in some of the higher polluting vehicles being excluded from program requirements.

The following table shows the differences in repair cost waivers among state programs:

Table 2

Annual Repair Cost Waiver Criteria
for Operating I/M Programs as of
December 31, 1983

<u>State</u>	<u>Waiver criteria</u>
Arizona	\$ 75.00 or 10 percent of vehicle value (whichever is lower)
Colorado	15.00 (1968-80 vehicles) 100.00 (1981 and newer vehicles)
Connecticut	40.00
Delaware	75.00
District of Columbia	Cost of repairs must exceed vehicle worth
Georgia	50.00
Massachusetts	100.00 or 10 percent of vehicle value (whichever is lower)
Nevada	1965 to 1981 models required to have tuneups for a fee of up to \$18; \$100 limit for 1981 and newer vehicles
New Jersey	No dollar limit--waiver only granted in extreme circumstances
New Mexico	75.00
New York	Waiver granted if vehicle is unable to pass retest after undergoing prescribed set of checks/repairs
North Carolina	50.00
Oregon	Waivers not granted
Rhode Island	No dollar limit--waiver only granted in extreme circumstances
Tennessee (Memphis)	50.00
Virginia	75.00 ^a
Washington	50.00

^aIf owner spends at least \$75 on related repairs or has a low emission tune-up and fails a retest, owner receives a permanent test waiver until the vehicle is sold or transferred.

For equity reasons, Oregon requires all motorists to pay whatever it costs to get a vehicle in the condition necessary to pass the emissions test. The manager of the Oregon I/M program told us that the program is easier to administer without a waiver ceiling and is viewed by the public as being more equitable since no exceptions are made. However, this same official said an advantage to having a repair cost limit would be to provide some consumer protection. For example, a motorist could pay to have a vehicle repaired and then fail a retest because of poor repair work. Without a repair cost ceiling, Oregon motorists must take the initiative to go to the same or another repair facility and pay for additional repairs until the vehicle passes the I/M test.

Among other programs having a strict waiver policy are New Jersey's and Rhode Island's. Although the above table shows these states have no dollar-limit waiver criteria, motorists in these two states will be given a waiver under extreme circumstances. In New Jersey, a motorist can obtain a waiver only if the motorist can document that after taking all reasonable steps to repair the vehicle, it still could not pass the I/M emissions test. New Jersey grants about 10 waivers per year. Rhode Island has a policy similar to New Jersey's but also requires a motorist to demonstrate that all emission control devices are connected and have not been tampered with. In 1981, about 50 Rhode Island motorists requested a waiver; in all but two cases, state officials denied the request.

To receive a waiver in the Virginia program, the owner must provide written proof, which is verified by an inspector, that at least \$75 was spent on vehicle repair since the initial inspection was made. The waiver granted is permanent in that the vehicle would no longer be subjected to an emissions test unless ownership of the vehicle changed. Out of 325,000 vehicles tested in 1982, 742 received a permanent waiver. In a fact sheet on I/M attached to an August 1982 letter to various congressmen, the American Automobile Association's director of legislative affairs stated that Virginia's waiver policy ". . .clearly frustrates the emissions-reduction potential of the program."

Other states have different types of waiver policies. For example, Massachusetts' repair cost ceiling is \$100 or 10 percent of the value of the vehicle, whichever is lower. Colorado motorists owning 1968 to 1980 models that do not pass the emissions test are required to make emissions control equipment adjustments costing up to \$15. Owners of 1981 and newer vehicles have to spend up to \$100 in emission-related repairs. Repairs are required until the vehicle passes the test or \$100 has been spent.

Washington, D.C., motorists can obtain a waiver by meeting certain conditions. Each waiver request is considered on a case-by-case basis and can be given only if one of three conditions exist--(1) the vehicle has a built-in design problem, (2) the vehicle is used rarely, or (3) the cost of repair would exceed the vehicle's worth.

According to EPA I/M officials, because specific guidance from EPA was not forthcoming, states have set their own dollar limits on repair cost waivers usually subject to political considerations. The officials said that there is no reason why repair cost waivers should be handled differently among states. The officials said that waivers should have been addressed in EPA's minimum I/M requirements but were overlooked. Furthermore, these officials said that allowing low cost or permanent waiver practices in those states which were experiencing serious operational or performance problems was counter-productive to attaining the air quality standards by the 1987 deadline.

CONCLUSIONS

States have been given wide latitude in designing an I/M program to satisfy EPA's performance requirement. The result has been the development and use of certain practices which tend to make a program less effective than it otherwise could be.

A number of I/M programs already implemented are not achieving the emissions reductions expected because of state control and enforcement problems. However, without completing its scheduled evaluation of I/M programs in fiscal years 1985 and 1986, EPA is not in the best position to know whether states are implementing or fully complying with their SIP for I/M and how ongoing programs will need to change to more effectively contribute to 1987 attainment. To the extent that EPA finds SIP nonimplementation or noncompliance as a result of the evaluations, EPA will need as much time as possible before 1987 to work with the states in remedying any I/M program deficiencies or inadequacies.

RECOMMENDATION TO THE ADMINISTRATOR, EPA

We recommend that the Administrator, EPA, reassess the priority given to completing scheduled audits of state I/M programs. We believe the audits should be completed by the close of fiscal year 1986 so that states can benefit from any EPA recommendations before the 1987 deadline. The audits are necessary for EPA to determine the extent of state compliance with implementation plan provisions for I/M and whether existing programs need to change in any way to more effectively meet the 1987 goal for attainment. If EPA is unable to complete the audits on schedule, it should immediately inform the Congress of the delay, the reasons, and suggested solutions.

CHAPTER 4

THE RESOLUTION OF CERTAIN ISSUES

COULD AFFECT THE FUTURE OF I/M PROGRAMS

Several important issues which could affect the future of I/M programs are unresolved:

- A March 1983 EPA study showed that between 1975 and 1981 (a period when few vehicle I/M programs were operating), carbon monoxide and ozone levels throughout the country had steadily improved.
- An EPA panel of experts recently disclosed evidence questioning the validity of the data used to support the health-based air quality standards for carbon monoxide. The question to be resolved is whether the standards are either too high or too low.
- The cost of I/M programs is expected to be substantial, but the benefits from such programs are at best inconclusive and at worst may not justify the costs of program implementation.

The resolution of these issues could have an impact on I/M programs in certain areas of the country. For example, a relaxed carbon monoxide standard coupled with gradually improving air quality may bring areas of the country into compliance with national clean air standards without having to implement an I/M program.

NATION'S AIR QUALITY HAS IMPROVED WITHOUT IMPLEMENTATION OF I/M PROGRAMS

EPA statistics show the nation's air quality is gradually improving. The question to many states is whether I/M programs are still needed in light of the apparent trend toward cleaner air.

In its National Air Quality and Emission Trends Report, covering the period from 1975 through 1981, EPA reported that overall carbon monoxide levels were reduced by 26 percent and ozone levels by 14 percent. EPA concluded that the carbon monoxide reduction taking place was due to reduced emissions from new technology vehicles resulting from more stringent federal standards for vehicle emissions. EPA further concluded that the more recent improvement in ozone levels may be due in part to reduced industrial activity in 1981. Implementation of I/M programs could not have been a major factor in either case because only four programs were operating prior to 1981. (See table on p. 10.) The acting I/M project manager at EPA stated that, although air quality was gradually improving, he believed the improvement generally was not enough to get nonattainment areas into attainment by 1987 without an I/M program.

As discussed below, knowing how much of the improvement in air quality can be traced to new car technology and whether the trend can be maintained without I/M is uncertain. Starting in 1981 (1980 in California), vehicle manufacturers equipped most new vehicles with an engine control system which functioned off a computer control unit, in order to meet more stringent federal and state emission standards in conjunction with optimizing fuel economy. The computer was to receive signals from a variety of sensors which monitored key engine variables including the air/fuel ratio. In those circumstances, when the air/fuel ratio is not at the proper mixture, the computer could initiate action to bring vehicle performance into proper balance and thus minimize the emission of harmful exhaust pollutants.

In a technical paper entitled In-Use Emissions of 1980 and 1981 Passenger Cars: Results of EPA Testing, published by the Society of Automotive Engineers in 1982, EPA I/M and test and evaluation staff reported on EPA's evaluation of 1,328 vehicles as part of its Emission Factor Testing Program. As a result of its testing, EPA concluded that most 1980 to 1982 model vehicles were capable of passing an I/M test and maintaining a low failure rate. Of the 1,328 vehicles given an I/M test, EPA found a failure rate of zero to 14.6 percent, depending on the vehicle make and model year. According to the paper, the failure rate found was low when compared with the failure rate of 39 to 46 percent, which EPA found existed for a sample of 1975-77 models in its Portland, Oregon, study.

EPA also found that newer vehicles contribute to air pollution. A technical report issued by EPA in September 1982, based on a study of 22 vehicles, found that 1981 and later model-year vehicles, when they do malfunction produced carbon monoxide emissions 20 or more times greater than the standards allow and hydrocarbon emissions 10 times greater. The technical report concluded that only a small percentage of these malfunctioning vehicles could greatly increase fleet average emission levels.

In our review of programs in two states we visited, we obtained limited data on tests of 1980 and newer model year vehicles. The data gathered confirmed EPA's finding that the newer models are more likely than older models to pass an initial I/M test. For example, in Arizona over the last 7 months of 1981, only 5.8 percent of the 50,701 1980-model vehicles given an initial I/M test failed, and only 4.2 percent of the 14,493 1981-model vehicles failed their initial test. Only 81 tests were given to 1982 models and of these, 2.5 percent failed. In New Jersey, the Department of Environmental Protection, in December 1981, reported that out of a sample of 9,431 emission tests given to vehicles in calendar year 1980 the failure rate for carbon monoxide was 1.9 percent, or 3 out of every 157 vehicles tested.

As vehicle manufacturers design and sell tamper-resistant vehicles and these vehicles are added to the inuse fleet, one of the functions of I/M programs--to keep tune-up parameters properly adjusted--will be diminished.

CONTROVERSY SURROUNDS SCIENTIFIC BASIS
OF CARBON MONOXIDE STANDARDS

As part of its responsibility under the Clean Air Act, in 1971, EPA established national ambient air quality standards for carbon monoxide. The standards were set at a level of 9 parts per million, 8-hour average, and 35 parts per million, 1-hour average. EPA proposed several revisions to the standards in August 1980. These revisions included changes tightening the 1-hour standard from 35 to 25 parts per million and changes in the methods for determining compliance for the 8-hour standard.¹

Two recent developments, however, have delayed EPA's decisionmaking process for determining what the final standards for carbon monoxide should be. One development occurred in March 1983 when EPA learned that the Food and Drug Administration had questions regarding the technical adequacy of several studies conducted on experimental drugs by Dr. Wilbert S. Aronow.² The second development was EPA's decision that an independent assessment of Dr. Aronow's work was advisable prior to a final decision on the carbon monoxide standards. EPA had given major consideration to seven studies by Dr. Aronow on the adverse health effects of carbon monoxide exposure prior to its August 1980 proposed revisions to the carbon monoxide standards.

In April 1983, EPA convened a special peer review committee comprised of four experts to meet with Dr. Aronow and examine available data and records from his carbon monoxide research. The committee released its report on May 25, 1983, and on the basis of limited information available, concluded that there is considerable concern about the validity of the results reported. The committee concluded that raw data were lost or discarded, adequate records were not maintained, available data were of poor quality (i.e., had been collected on bits of paper or looseleaf notepaper), quality control was nonexistent or inadequate, and finally there appeared to be some differences of opinion as to patient diagnosis between Dr. Aronow and other physicians who examined the patients that participated in the research.

After receiving the report of the peer review panel, EPA re-evaluated its carbon monoxide data base and submitted its revised documentation for review to EPA's Clean Air Science Advisory Committee.³ The Committee reviewed the revised documentation and

¹Under another request from the Chairman, we issued a report entitled Status of EPA's Air Quality Standards for Carbon Monoxide (GAO/RCED-84-201, Sept. 27, 1984).

²A former Veterans Administration cardiologist who conducted several carbon monoxide exposure studies.

³This is a standing committee of scientists and engineers external to the federal government, established under Section 109 of the Clean Air Act, to advise the EPA Administrator on the scientific bases for air quality standards.

in a May 17, 1984, letter to the EPA Administrator concluded that, even without the use of the Aronow studies, there remained a sufficient and scientifically adequate basis on which to finalize the carbon monoxide standards.

On August 9, 1984, EPA published a notice in the Federal Register that summarized what has occurred since the August 1980 proposed carbon monoxide revisions, reviewed the basis for EPA's proposal to revise the standards, and solicited additional public comment. The notice stated that, based on the available information, including the letter from the Clean Air Science Advisory Committee, EPA is inclined to issue the standards proposed in 1980. The notice also stated that, because of the changes in the interpretation of the scientific evidence since proposal and the significance of the decision, EPA believes it important to encourage public participation and obtain further comment before making a final decision.

Because of the concern with the research supporting the carbon monoxide standards, EPA will decide whether to issue the revised standards as proposed in 1980, propose new revised standards or wait until the results of ongoing research is completed before issuing revised standards. Should EPA decide to tighten the standard--a primary determinant of the need for an I/M program--then more areas might be required to implement a program. Conversely, a relaxed standard could bring some nonattainment areas into compliance, thus obviating the need for a program in those areas.

I/M PROGRAMS PRODUCE SOME BENEFIT BUT WILL BE COSTLY

The total cost of all state I/M programs could be millions of dollars. Meanwhile, although programs in some cases have reduced tailpipe emissions, some studies show that the benefits of an I/M program may not be worth the costs that some areas would incur for such a program. In addition, two independent studies did not agree on the impact of I/M on ambient air quality.

Cost of I/M implementation could be considerable

I/M program costs consist of such items as personnel costs for quality assurance and program enforcement; administrative costs for public relations and education; program monitoring and evaluation costs; equipment and supplies used to administer the program and perform testing; the initial cost of facilities and land, if any, needed to start the program; and the cost to affected parties such as mechanics who must be trained in testing methods and who must pay for special equipment. For the most part, these costs are transferred to motorists in the form of inspection fees and vehicle repair costs. Motorists also incur indirect costs such as wasted time, loss of wages, and inconvenience.

An I/M program is more costly to some motorists than others depending on where the motorist lives and the type of program adopted for that area. The direct cost to motorists to get their vehicles tested for emissions varied from no charge in Delaware to a charge of \$10 in some states as shown in the following table.

Table 3
Emissions Testing Fees
for the 17 States Operating I/M Programs
as of December 31, 1983

<u>Centralized program</u>		<u>Decentralized program</u>	
<u>State</u>	<u>Fee</u>	<u>State</u>	<u>Fee</u>
Delaware	\$ 0.00	Georgia	\$ 3.00
Tennessee		Virginia	3.85
(Memphis)	.00	Rhode Island	4.00 ^a
New Jersey	.50	North Carolina	4.25
District of		New York	6.50
Columbia	5.00 ^a	Nevada	8.00
Arizona	5.44	Colorado	10.00
Oregon	7.00	Massachusetts	10.00 ^a
New Mexico	9.25		
Connecticut	10.00		
Washington	10.00		

^aThe fee charged is for combined emissions testing and vehicle safety inspection. State data do not provide the fee for emissions testing only.

Data obtained from the 17 ongoing programs indicate that these states spend about \$17 million annually to operate them. These costs vary considerably among states, because of such things as wide differences in the types of programs implemented (i.e., centralized versus decentralized and state-operated versus contractor-operated), the number of vehicles subject to inspection, and the severity of the pollution problem to be controlled.

Operating costs for some of the programs not yet implemented could be considerably higher than for the current programs. For example, the state of Wisconsin plans to pay a contractor about \$9.2 million annually to operate its program. The state will not charge a fee to its motorists, choosing instead to pay the entire cost from state funds. According to the I/M program manager in California, the annual cost to operate the program in the state will be about \$8 million, mostly for staff salaries and maintenance expense.

In addition to operating costs, states also incur a one-time capitalization cost to start their programs. The 17 states with programs estimated that their total cost was about \$15.3 million for facilities and equipment to implement their programs. This estimate may not be indicative of the total cost of

capitalization, however, because 9 of the 17 states combined the I/M program with their ongoing vehicle safety inspection programs. Therefore, the facilities were already in existence for these programs.

We also obtained estimates of capitalization costs for some of the programs that had not yet been implemented. Both Kentucky and Maryland expected to spend about \$2 million each to capitalize, while California planned to spend about \$2.5 million. And two of the states where I/M implementation was uncertain--Alaska and Michigan--estimated capitalization costs of \$8 million to \$9 million and \$4.5 million, respectively, to begin their required programs.

Individual motorists bear the brunt of I/M costs. In addition to repair costs, motorists incur additional costs such as the costs of performing inspections and reinspections and gasoline costs to access the inspection site and the repair facility. A July 1981 study, published by the Automobile Club of Southern California, projected that the direct cost to motorists resulting from an annual program in the South Coast Air Basin of California alone would be almost \$211 million annually. The costs included in the projection were in 1981 dollars, unadjusted for inflation, and were based on 7.3 million inspections annually. The following is a breakdown of the estimate which did not include indirect costs such as wasted time, loss of wages, and inconvenience of the tests.

Estimated Annual Costs to Motorists
for I/M in California's South
Coast Air Basin

	<u>Million</u>
Initial inspection fees (\$11)	\$ 80.3
Repair costs for failed vehicles (\$29 average repair cost for 46% of the vehicles)	97.4
Reinspection fees for failed vehicles (\$7 for 46% of vehicles)	23.5
Gasoline costs (10-mile round trip for initial inspection and reinspections)	9.5 -
Total	<u>\$210.7</u>

Many states have elected to combine their emissions testing program with their safety inspection program. When this has been done, the direct cost to motorists for emissions testing is usually lower. Programs in the nine following jurisdictions have combined emissions testing with safety inspections--Delaware, District of Columbia, Massachusetts, North Carolina, New Jersey, New York, Rhode Island, Tennessee (Memphis), and Virginia. The emissions inspection fee for nine combined safety and emissions

testing programs averages \$2.73⁴ while the average fee for the eight programs testing only for emissions is \$7.84. A motorist in Virginia, for example, pays a safety inspection fee of \$7.00 in addition to a \$3.85 fee for an emissions test. In New York, the safety test fee is \$6.00 with a \$6.50 emissions fee added on, while North Carolina has a safety fee of \$4.25 added to a \$4.25 emissions fee.

I/M program benefits are inconclusive

Some states with programs have reported that tailpipe emissions have been reduced. After studying the I/M program requirement, other states have concluded that any benefit in terms of improved air quality is not worth the costs. Several of these studies also show that other control programs may produce air quality improvements at the same or lower costs than those to implement an I/M program. Finally, two independent studies of established I/M programs arrived at sharply different conclusions regarding whether or not these programs actually were resulting in improved air quality.

I/M programs have reduced tailpipe emissions

Several states reported that their I/M programs have reduced vehicle emissions. The following are some examples.

--The first annual report issued in January 1983 on Washington's program--begun in January 1982--reported that it had been effective in reducing vehicle emissions. On the basis of over 550,000 vehicle tests made from January through December 1982, the report showed that carbon monoxide emissions were reduced by 78,860 tons in 1982 and hydrocarbon emissions by 1,782 tons.

--Rhode Island's 1981 annual I/M report stated that a comparison of the emissions for 1975 through 1978 model vehicles indicated these vehicles were emitting 26.1 percent less carbon monoxide and 13.5 percent less hydrocarbons in 1981 than they did in 1978. These conclusions were based on data collected from random roadside tests.

--The New Jersey Department of Environmental Protection reported in September 1982 that carbon monoxide levels had improved dramatically since the state had implemented its program in 1974. In 1973, the worst carbon monoxide year, 90 percent of the cities monitored exceeded health standards as compared with 40 percent in 1980. The department reported that annual inspections were reducing carbon monoxide by 430,000 tons and hydrocarbons by 29,000 tons.

⁴Average, based on assumption that half of the combined fees for safety and emissions testing was for emissions testing in the three programs where state data did not provide the fee for emission testing only.

--On December 1, 1982, the Air Quality Control Commission of Colorado reported to the governor and general assembly on the results of the I/M program that began January 1, 1982. Data from the first 477,905 vehicles tested indicated an average reduction of 56 percent in idle tailpipe carbon monoxide concentration for retested vehicles. This represents about 151 tons of carbon monoxide each day. The reduction for hydrocarbons averaged 42 percent.

EPA also has assessed the effectiveness of a few programs. One such effort was an evaluation of data on the Portland, Oregon, I/M program for the period June 1979 through April 1982. EPA found that the I/M test in Portland identified 55 percent of all vehicles emitting above the federal carbon monoxide or hydrocarbon standards; this 55 percent figure accounted for 80 percent of the emissions exceeding federal standards. EPA further found that, after repair of 1975 to 1977 models that did not initially pass the I/M test, carbon monoxide emissions were reduced by 47 percent and hydrocarbon emissions by 42 percent.

The Portland program may not be representative of other state programs. This I/M program, one of the oldest ongoing programs in the country, has several characteristics that most programs lack. For example, Portland does not waive vehicle repair for any motorist not passing the test regardless of the cost of repair. The Portland program also has a required check to ensure the vehicle has not been tampered with. Consequently, more vehicles should fail an I/M test and greater emission reductions should be achieved once such vehicles are repaired to meet the standards.

Some studies show I/M programs are not worthwhile

Some states have studied the feasibility of establishing an I/M program and have concluded that the benefits are not worth the costs that would have to be incurred for such a program. The following synthesizes several of these studies.

In a June 1981 statement before the Senate Committee on Environment and Public Works, the Manager, Division of Air Pollution Control for the Illinois Environmental Protection Agency, referred to an analysis it had made of I/M costs and benefits and a cost-effectiveness comparison of I/M with other types of emission controls. Referring to the study his agency had completed early in 1981, this official concluded that implementing a program in the state could not be justified. Below are selected conclusions from that study:

--Illinois motorists will spend about \$500 million in inspection fees and repair costs over a 5-year period. The \$500-million figure was based on a cost analysis conducted by a consulting firm for the Illinois EPA. This cost analysis revealed that an annual inspection fee of \$13 for each of the 3.5 million vehicles to be tested would be needed to

recover the \$249 million in capitalization, start-up, and operating costs to run an I/M program for the 5-year period. Using an average repair cost of \$35, which was based on average repair costs being reported by existing I/M programs, the consultant estimated that the annual costs to motorists for repairing the 1 million plus vehicles that would fail the emissions test each year would total \$259.7 million over the 5-year period.

- The cost per ton of hydrocarbon emissions reduction produced by I/M is more than four times as great as the weighted average cost per ton of stationary hydrocarbon source controls adopted by Illinois in 1979.
- Over the 5-year period from 1983 to 1987, I/M will only reduce the number of days the ozone standard will be violated in the Chicago area by about 6 days. Furthermore, I/M will only advance attainment of the ozone standard in both Chicago and East St. Louis by about 1 year.
- Without a program, the number of potential carbon monoxide violation sites in the Chicago area will be reduced from about 3,600 in 1982 to about 333 in 1987, for a reduction of about 90 percent. In the opinion of Illinois EPA, the remaining potential violation sites do not warrant a program since the number of citizens likely to remain exposed to elevated carbon monoxide levels continuously over an 8-hour period is considered very small.

The Ohio legislature created an I/M Study Board to report to the general assembly by July 1981. The Board's mandate was to determine the most feasible program for controlling motor vehicle emissions in the state. The Board concluded that an I/M program would produce a relatively small improvement in Ohio's air quality at a relatively high cost. Assuming an optimistic 40-percent reduction in vehicle emissions, the Board found that a program would only lower total hydrocarbon emissions by 3 to 4 percent and total carbon monoxide emissions by 8 to 13 percent from 1975 levels. The Board also found that the cost to achieve these results would be high and that the public would suffer considerable inconvenience. The Board recommended that the state consider several related programs which may achieve improved air quality at a lesser cost-per-ton of emission reduction than would result from an I/M program. The other control programs recommended included a program to reduce tampering by individual vehicle owners, a program to expand public awareness regarding how regular engine tune-ups improved gas mileage and reduced pollution, and a program to collect and return gasoline fumes that normally escape during vehicle fueling.

In 1979, the Texas Air Control Board, along with the Department of Highways and Public Transportation, and Department of Public Safety, were required by the state legislature to conduct a pilot I/M program in the Harris County area (Houston), perform

studies of such programs, analyze results, and provide a report to the legislature by December 1980. The Board found the total annual cost for full implementation of a program in Harris County to control excessive emissions would range from \$18 million to \$30 million, depending on the number of vehicles tested. At the same time, however, a program was expected to reduce the total hydrocarbon emissions in Harris County by only 2 to 2.8 percent. As a result of its efforts, the Board was unable to recommend an I/M program as a prudent air pollution control strategy.

Oregon and Arizona studies
provide contrasting views on whether
I/M improves air quality

Independent studies were made of two of the older and more established I/M programs in the country--Arizona and Oregon. These evaluations have produced divergent views concerning whether these I/M programs have improved the air quality in their respective areas.

EPA contracted with a University of Wisconsin professor and two of his associates to conduct a statistical analysis of carbon monoxide air quality trends in Portland, Oregon, for the 1970-79 time period. This study, released in May 1981, concluded that carbon monoxide concentrations were 8 to 15 percent less in Portland than they would have been without the biennial I/M program which became operational in July of 1975. On the basis of the study results, EPA calculated that an annual I/M program which inspected vehicles each year would result in a carbon monoxide improvement of between 10 and 19 percent. EPA has cited the results of the Portland study as support for the effectiveness of an I/M program.

Several weaknesses, however, have been linked with the Portland study by EPA as well as by the auditor general of Arizona during an assessment of the Arizona I/M program. First, a reduction in carbon monoxide attributable to the program was found at only one of four monitoring sites used to provide data for the study. Second, at that one site, results were confounded by movements of the monitoring probe and by major traffic disruptions in the area. Third, none of the four monitoring sites had complete data for the period studied, and several sites had large gaps in the data.

Another program that has been ongoing for some time is the Arizona program. This program, which became operational in 1977, requires annual inspection and repair of certain vehicles in the Phoenix and Tucson urban areas. The I/M program budget for fiscal year 1982 to 1983 was about \$6.7 million. In February 1983, the Office of the Auditor General in Arizona completed a performance audit of the state's program. The auditor general concluded that it was not effective and that it may not be a reliable strategy for meeting air quality standards by 1987. Furthermore, the

consultants assisting the auditor general concluded that no scientifically valid research had demonstrated I/M's effectiveness.

Using a mathematical (time series) analysis covering the 8-year period 1974 through 1981, the consultants hired by the auditor general concluded that the program had not reduced carbon monoxide levels. During the years tested, the study specifically evaluated the impact on carbon monoxide levels of two significant events. One event was the introduction of the program in 1977 and the other was the introduction of more stringent program standards in 1979.

The auditor general's office concluded that it did not know for certain why the program was ineffective but offered several possible reasons based on the evidence collected:

- The program may not have significantly changed vehicle maintenance behavior since most motorists tune their vehicles and would continue to do so without an I/M requirement.
- Approximately 11 percent of the motorists readjusted their engines after I/M testing was completed and another 20 percent admitted to circumventing program requirements in the past.
- Older and out-of-state vehicles were excluded from test requirements.
- Automobile emissions vary significantly between inspection periods because of weather conditions, vehicle usage, and type of fuel used.

Several experts from EPA and academia objected to the auditor general's findings because of problems with the statistical approach used by the consultants and the conclusions drawn on the basis of the evidence gathered.

CONCLUSIONS

Although indications that the air in many portions of the country may be getting cleaner without I/M programs is encouraging, additional data particularly on the impact of new vehicle technology is needed to determine if the trends can continue in the I/M's absence. Only after more data on air quality trends and the impact of new vehicle technology are gathered by EPA can the future direction of I/M programs be known.

USE OF CONTRACTORS IN I/M PROGRAMS

Private contractors play a major role in administering state I/M programs. Of the 17 states with programs as of December 31, 1983, 5 (slightly less than one-third) involved private contracting firms. Furthermore, three states yet to implement an I/M program--Kentucky, Maryland, and Wisconsin--were planning, as of December 31, 1983, to use outside firms to manage their programs. Thus, private contractors could be involved in as many as 8 of the 27 states expected to be operating I/M programs by August 1984.

CONTRACTING FOR I/M SERVICES

Currently, only two contracting firms are involved with state programs. The principal contractor is Hamilton Test Systems, Incorporated, a Delaware Corporation. The other contractor, Vehicle Test Technology, Incorporated, is owned and operated jointly by Systems Control, Incorporated, and Sun Electric Corporation. According to EPA's I/M status report as of December 31, 1983, Hamilton also was supposed to operate the Wisconsin program which was to get underway in April 1984. Two other firms were scheduled to be involved in I/M programs--Gordon Industries, Incorporated, a local firm in Louisville, is expected to operate the Kentucky (Louisville) program; and Systems Control, Incorporated, a California firm, is expected to operate the Maryland program.

The following contractors were involved with state I/M programs as of December 31, 1983:

Status of I/M Contractors as of
December 1983

<u>Contractor</u>	<u>State program</u>
Hamilton Test Systems, Incorporated (HTS)	Arizona, Connecticut, New Mexico, New York
Vehicle Test Technology, Incorporated (VTT)	Washington

The following breakout, by state, shows estimated gross receipts to each contractor for services performed. The New York program is not included since HTS only supplies and maintains the exhaust emission analyzers and is paid for these services by the individual licensed inspection garages.

<u>State</u>	<u>Con- tractor</u>	<u>Inspection fee</u>		<u>Estimated annual inspections</u>	<u>Estimated contractor gross receipts</u>
		<u>Amount charged motorists</u>	<u>Amount paid contractor</u>		
----(000 omitted)----					
Arizona	HTS	\$ 5.44	\$5.44	1,200	\$ 6,528
Connecticut	HTS	10.00	7.53	1,612	12,138
New Mexico	HTS	9.25	7.18	300	2,154
Washington	VTT	10.00	8.97	554	4,969

Our analysis of the HTS contracts with the three states showed that HTS generally is responsible for acquiring and designing the inspection facilities; providing and installing all inspection equipment; hiring and training personnel to run the facilities; designing and developing operating procedures and public information and educational systems; and designing and implementing a data system including monthly progress reporting to the state on such areas as the number of initial inspections and reinspections, waivers issued, and lane and facility downtime. HTS either collects the inspection fee at the time of inspection or submits monthly billings to the state when the fee is collected at the time of vehicle registration.

Besides providing all I/M services to a state, a contractor may have an exclusive contract for supplying and maintaining emissions inspection equipment. Such is the case for the New York program. Commencing May 9, 1980, and until January 1, 1987, HTS has been designated as the exclusive supplier of inspection equipment to licensed inspection stations participating in the New York program. Furthermore, HTS is the only party authorized to provide maintenance services on the equipment. Under contractual terms, the unit price of the equipment was set at \$5,850, and HTS was to supply a minimum of 4,000 exhaust emission analyzers. If a licensed inspection station wanted to lease instead of purchase the equipment, the lease charge is set at \$144.48 a month. Both the purchaser and lessee have to pay a monthly maintenance fee of \$99.

The inspection fee tends to be higher if a contractor is operating the program. The average fee for the 13 programs not operated by contractors was \$4.78 while in the four programs run by contractors--Arizona's, Connecticut's, New Mexico's, and Washington's--the inspection fee averaged \$8.67. The fee charged by the contractor for the Arizona, Connecticut, and New Mexico programs is based primarily on the total number of annual inspections projected for each state. The first reinspection is usually free, but if motorists fail the reinspection, the original fee may be charged for the next retest. If a motorist continues to not pass the emissions test, the original fee applies to each odd-numbered test (i.e., 3rd, 5th, 7th, etc.). In Arizona, for example, some motorists have been tested eight times. For the Washington program, if a vehicle does not pass the first test,

the motorist is given one free retest but has to pay the initial \$10 fee for all additional retests.

PERFORMANCE OF I/M CONTRACTORS

Two programs (Connecticut's and New Mexico's) were just getting started and therefore were not reviewed. However, we did review reports evaluating the performance of contractors which were prepared by the states of Arizona and Washington.

Arizona's auditor general issued a February 1983 report identifying several problems with the performance of HTS, which was operating the state's program. The auditor general found that for fiscal year 1982, HTS made only 53 percent of the inspection station field audits required by the firm's own internal policy. Field audits were necessary to ensure that accurate and reliable emissions testing equipment was used to analyze emissions correctly. The audit report noted that the state's contract with HTS did not require it to make regular field audits nor report the results to state program managers--both of which should be minimum requirements. Other contractor problems identified follow:

- Adequate procedures were lacking to ensure the county/state collected fees from motorists at the time of vehicle registration for all tests performed.
- Station personnel did not always enter the proper engine size information (number of engine cylinders) into the system, resulting in the possibility that vehicles would be measured on the wrong standards.
- Contractor personnel can change vehicle information, which produces the potential for false billing for I/M tests by the contractor to the state. The auditor general's report added, however, that a spot check of billings did not indicate that such false billings had occurred.

For the Seattle, Washington, metropolitan area program, the contractor, VTT, built and operated six fully automated (computerized) multilane test facilities. The Washington State Department of Ecology (WDOE) is responsible for monitoring VTT performance. In monitoring service VTT provided at the test stations, WDOE checks waiting times of motorists at each station. Furthermore, once a week, WDOE checks the calibration of the testing equipment along with the performance of the testing personnel. Every month, VTT submits a computer tape containing all test data for WDOE to check for completeness and accuracy.

VTT also provides WDOE a copy of each Certificate of Acceptance (repair waiver) issued, along with the receipts presented by motorists as proof that they spent more than \$50 to meet emission standards after their vehicles failed the first test. WDOE checks this material to determine if VTT has followed the correct state

procedures. WDOE also monitors the performance of repair facilities and evaluates the validity of repair receipts.

In its January 1983 report on the first year of operation (1982), WDOE evaluated VTT's performance. In its weekly checks at the testing stations, WDOE found that the analyzers were operating within the accuracy specifications at least 99 percent of the time. Calibration of the analyzers is critical for valid test results. VTT is responsible for checking the analyzers both on an hourly and monthly basis. WDOE inspectors, however, check the calibration of each analyzer at the testing station at least once a week.

As a result of WDOE investigations of complaints concerning test stations' operations, in a few cases, motorists received either refunds or free retests. Rarely had an error occurred at the test stations that had penalized the motorist. WDOE also found that VTT had fully complied with contract provisions concerning waiting times of motorists for the emissions test.

WDOE concluded that VTT was successfully meeting all requirements of the contract to establish and operate motor vehicle emission inspection stations for the state of Washington. There were some startup problems including inaccurate data tapes and the issuing of repair waivers without proper documentation, but WDOE stated that these problems had since been resolved.

STATUS OF I/M ACTIVITY IN THE THREE STATESWHERE PROGRAM IMPLEMENTATION WAS CONSIDEREDUNCERTAIN BY EPA AS OF MAY 1984

The status of programs in three states was still considered uncertain by the Environmental Protection Agency (EPA) as of May 1984. These three states--Illinois, Michigan, and Ohio--had not made firm commitments for an I/M program. Illinois and Michigan believed they could meet 1987 standards without an emissions testing program. Ohio had demonstrated attainment of the national ambient air quality standard (NAAQS) by the end of 1982, but air quality monitoring data for 1983 showed the state had exceeded the standards. Therefore, EPA determined that the state needed an inspection and maintenance (I/M) program to again meet the standards. Whether Ohio will move expeditiously on a new I/M schedule is uncertain.

ILLINOIS

In its 1982 state implementation plan (SIP), Illinois stated that the I/M program was not a reasonably available control measure because of its low cost-effectiveness. Illinois further stated that the Clean Air Act does not require I/M implementation unless absolutely necessary to meet air quality standards. Following this reasoning in its SIP, Illinois stated that I/M will be adopted only if necessary to meet the standards by 1987, as determined through monitoring in future years.

On February 3, 1983, EPA ruled that Illinois' contingent commitment is inconsistent with the Clean Air Act and with EPA's I/M implementation policy, and that the Illinois program did not meet EPA's requirement to implement a program by December 31, 1982. In July 1983, EPA officials met with Illinois officials to discuss minimum I/M program requirements. As a result, the state submitted a new schedule for EPA's review including four program options, each of which would not result in program implementation any earlier than January 1986. An EPA I/M official told us in May 1984 that the Illinois senate passed a bill out of committee on May 3, 1984, which would require the establishment of an annual, contractor-operated program to begin in January 1986. The EPA official also stated that the Illinois house was considering a bill calling for a different type of program and one which would begin by January 1985. The official further told us that because of Illinois' lack of progress on I/M, EPA had proposed to impose highway funding limitations against the state in the May 4, 1984, Federal Register.

MICHIGAN

According to a Michigan I/M program official, the state had been reluctant to implement a program for several years because it

believed it could meet air quality standards without this program. The official said that the legislature did not adopt the administrative rules and procedures needed to operate the program. State-modeling efforts showed attainment of the standards could be reached by 1985 without a program. But the results of EPA models disagreed, and EPA concluded that Michigan will need to implement a program to reach attainment by 1987. As a result, according to EPA, Michigan has to either implement a program or be subjected to sanctions such as the loss of federal money. A Michigan air quality official said the state has subsequently agreed with EPA that it cannot meet air quality standards by 1987 without an I/M program.

In a meeting between the governor of Michigan and EPA officials in September 1983, it was agreed that sanctions would not be imposed if Michigan could show it was making reasonable progress in implementing an I/M program. However, as of May 1984, EPA was proposing to cutoff federal highway construction money for the Detroit area because of the state's failure to make reasonable efforts to implement an I/M programs.

OHIO

Both Cleveland and Cincinnati, Ohio, as well as three Kentucky counties (Boone, Campbell, and Kenton) located in the Cincinnati metropolitan area, were supposed to implement a program by December 31, 1982. However, using EPA-approved modeling and air quality data from 1979 through 1981, these areas projected attainment of the carbon monoxide and ozone NAAQS by the end of 1982. On February 3, 1983, EPA proposed to approve the attainment demonstrations and agreed that these areas would no longer need to implement a program. In its I/M status report as of December 31, 1983, EPA stated it is proposing to disapprove Ohio's ozone attainment demonstrations because 1982 and 1983 monitoring data showed that both Cleveland and Cincinnati (including northern Kentucky) had exceeded the ozone standard.

On March 28, 1984, EPA sent the governor of Ohio a letter requesting the state to submit an I/M implementation schedule within 60 days of that letter. In late April 1984, EPA headquarters officials met with a delegation from Ohio and an agreement was reached to set up a working group to discuss available options. Whether Ohio will move expeditiously on a new schedule for I/M implementation was uncertain, according to EPA. Various officials from the affected northern Kentucky counties met with EPA officials in April 1984 to discuss EPA's determination. These officials told us in April 1984 that it was highly unlikely that the counties would proceed to implement the I/M program that EPA is requiring because they believed their violations were unique and due to one summer of unusually severe hot weather.

KEY ADVANTAGES AND DISADVANTAGES FOR
SELECTED AREAS BY I/M PROGRAM TYPE

<u>Advantages</u>	<u>Program type</u>		
	<u>Centralized</u>		<u>Decentralized</u>
	<u>Gov't</u>	<u>Contractor</u>	<u>Contractor</u>
<u>Consumer protection:</u>			
1. Inspection separate from repair; no conflict of interest.	x	x	-
2. Independent basis for judging the performance of the service industry.	x	x	-
3. Monitoring of instruments' and inspectors' performance facilitated, thereby reducing testing variability.	x	x	-
<u>Consumer convenience:</u>			
1. Greater number of facilities increases probability of minimizing travel and wait time.	-	-	x
2. Possibility for one-stop inspection/maintenance; with most safety inspection programs being decentralized, easy combination of tests is offered.	-	-	x
3. Training of inspectors involves direct contact between state and service industry; can promote communication necessary for proper implementation of program.	-	-	x
<u>Cost:</u>			
1. Potentially lower (inspection) labor costs compared with decentralized systems can mean lower recurring costs.	x	x	-
2. More efficient use of equipment than in decentralized systems, economy of scale of multilane stations.	x	x	-
3. All program costs borne by private sector except those associated with administrative oversight.	-	x	-

<u>Advantages</u>	Program type		
	<u>Centralized</u>		<u>Decentralized</u>
	<u>Gov't</u>	<u>Contractor</u>	<u>Contractor</u>
<u>Cost:</u>			
4. No risks of increasing long-term fixed governmental costs.	-	x	-
5. Permits use of corporate tax structure to reduce burden of start-up capital expenditures.	-	x	-
6. Lower start-up costs for state than in public centralized system; reduces financial burden of state-capital investments.	-	-	x
7. All operating program costs borne by private sector except administration and monitoring.	-	-	x
<u>Disadvantages</u>			
<u>Consumer protection:</u>			
1. Inspection not separate from repair; presents potential for conflict of interest which requires active state oversight.	-	-	x
2. No independent basis for judging performance of service industry.	-	-	x
3. Effective monitoring of inspectors and instruments is more difficult.	-	-	x
4. Possible adverse public reaction to corporation earning profits from "captive market."	-	x	-
5. Start-up time less than state but more than decentralized approach.	-	x	-

<u>Disadvantages</u>	<u>Program type</u>		
	<u>Centralized</u>		<u>Decentralized</u>
	<u>Gov't</u>	<u>Contractor</u>	<u>Contractor</u>
<u>Consumer convenience:</u>			
1. Fewer inspection facilities than with decentralized systems, thus an increased probability of longer travel and wait.	x	x	-
<u>Cost:</u>			
1. Start-up requires large public capital outlay if land and equipment acquisition and building construction is necessary.	x	-	-
2. All program costs borne by public sector.	x	-	-
3. Risk of increasing long-term fixed costs to government because of increase in number of potential retirement/pension beneficiaries.	x	-	-
4. Long lead time for land acquisition and construction.	x	-	-
5. Will sometimes require that state must obtain land.	x	-	-
6. Relatively greater number of state employees to hire than other options.	x	-	-
7. Generally high labor costs for monitoring licensed stations can mean high recurring costs.	-	-	x
8. Less efficient use of equipment than in centralized systems.	-	-	x
9. Inspector training involves greater numbers than in centralized systems and is therefore more costly.	-	-	x

<u>Disadvantages</u>	<u>Program type</u>	
	<u>Centralized</u>	<u>Decentralized</u>
	<u>Gov't</u>	<u>Contractor</u>
Cost:		
10. Potential for extensive and costly state administrative functions to monitor contract.	-	x

SELECTED CHARACTERISTICS OF I/M PROGRAMS OPERATING
AS OF DECEMBER 31, 1985

State	Program start	Type	Area	Inspection	Emission test cost	Frequency	Vehicles covered	Estimated annual inspections	Repair waiver limits	Enforcement method	Administrative agency
New Jersey	2- 1-74	Centralized-State	Statewide	Emission & Safety	\$.50	Annual	All under 6,000 lbs	5,130,000	None	Sticker	Dept. of Motor Vehicles
Oregon	7- 1-75	Centralized-State	Portland	Emission	7.00	Biennial	All 1942 on	525,000	None	Registration	Dept. of Environmental Quality
Arizona	1- 1-77	Centralized-Contractor	Phoenix/Tucson	Emission	5.44	Annual	All for last 13 yrs.	1,200,000	\$75.00	Registration	Bureau of Vehicle Emission Inspection
Rhode Island	1- 1-79	Decentralized-State	Statewide	Emission & Safety	4.00 ¹	Annual	All over 8,000 lbs	515,000	None	Sticker	Dept. of Transportation
Colorado	1- 1-82	Decentralized-State	Denver/Colorado Springs/ Ft. Collins	Emission	10.00	Annual	1968 and newer up to 8,500 lbs	1,400,000	\$15(1968-80) \$100(1981 on)	Sticker	Depts. of Health & Revenue
New York	1- 1-82	Decentralized-State	Metro New York City	Emission & Safety	6.50	Annual	All to 8,500 lbs	3,700,000	Excessive repair costs	Registration/Sticker	Dept. of Motor Vehicles
Virginia	1- 1-82	Decentralized-State	Washington, D.C. suburbs	Emission & Safety	3.85	Annual	8 yrs. old to 6,000 lbs	400,000	\$75.00	Registration/Sticker	State Police
Washington	1- 2-82	Centralized-Contractor	Metro Seattle	Emission	10.00	Annual	All less than 14 yrs. old	550,000	\$50.00	Registration	Dept. of Ecology
Georgia	4- 1-82	Decentralized-State	Metro Atlanta	Emission	3.00	Annual	All under 10 yrs to 6,000 lbs	600,000	\$50.00	Sticker	State Police
North Carolina	12- 1-82	Decentralized-State	Metro Charlotte	Emission & Safety	4.25	Annual	All under 13 yrs. old	225,000	\$50.00	Sticker	Dept. of Motor Vehicles
Connecticut	12-31-82	Centralized-Contractor	Statewide	Emission	10.00	Annual	1968 and newer under 10,000 lbs	1,610,000	\$40.00	Registration/Sticker	Dept. of Motor Vehicles
Delaware	1- 3-83	Centralized-State	Metro Wilmington	Emission & Safety	4.00	Annual	18 yrs. old to 8,500 lbs	255,000	\$75.00	Registration/Sticker	Dept. of Motor Vehicles
New Mexico	1- 3-83	Centralized-Contractor	Albuquerque	Emission	9.25	Annual	1968 and newer to 8,000 lbs	300,000	\$75.00	Sticker	City Dept. of Environmental Health
Washington, D.C.	1-12-83	Centralized-City	Citywide	Emission & Safety	5.00 ¹	Annual	25 yrs. old to 6,000 lbs	240,000	Excessive repair costs	Registration/Sticker	City Dept. of Transport.
Massachusetts	4- 1-83	Decentralized-State	Statewide	Emission & Safety	10.00 ¹	Annual	15 yrs. old to 8,000 lbs	3,000,000	\$100 or 10% of value	Sticker	Registry of Motor Vehic.
Tennessee (Memphis)	8- 1-83	Centralized-City	Memphis	Emission & Safety	.00	Annual	All to 6,000 lbs.	350,000	\$50.00	Sticker	City Motor Veh. Insp. Bu
Nevada	10- 1-83	Decentralized-State	Las Vegas/Reno	Emission	8.00	Annual	1965 and newer up to 5,000 lbs.	400,000	\$18(1965-80) \$100(1981 on)	Registration	Dept. of Motor Vehicles

¹For combined emission and safety inspections

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