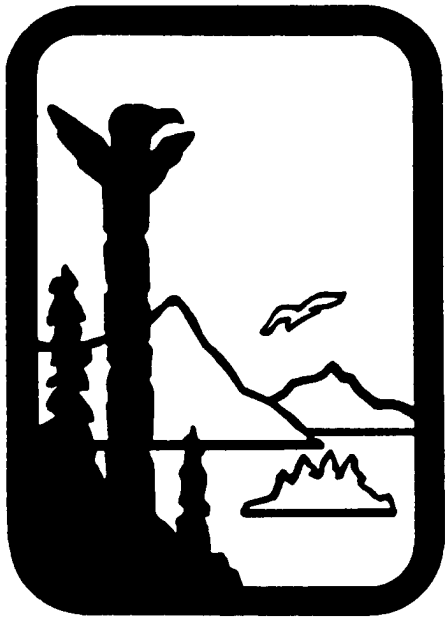
Alaska Department of Environmental Conservation



Amendments to:

State Air Quality Control Plan

Vol. II: Analysis of Problems, Control Actions

Section III.A: Statewide Carbon Monoxide Control Program

Adopted

August 5th, 2009

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Volume II, Section III.A is amended as follows:

> **Introductor, Note:** In this document each reference to "CAAA" means the Clean Air Act Amendments of 1990, P.L. 101-549.

III.A STATEWIDE CARBON MONOXIDE CONTROL PROGRAM

III.A.1. Health Effects of Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless, and poisonous gas produced by incomplete fuel combustion. Research indicates that high levels of CO deleteriously affects the human cardiovascular and central nervous systems. The health threat from CO appears most serious for those who suffer from cardiovascular disease, particularly those with angina or lung disease. Other probable risk groups include fetuses and young infants, pregnant women, and the elderly, especially those with compromised heart and lung function. There is also evidence that neurobehavior (e.g., eye-hand coordination, visual sensitivity, etc.) may be affected by exposure to CO concentrations above the National Ambient Air Quality Standards (NAAQS).

The NAAQS is set at 35 parts per million (ppm) for a 1-hour average and 9 ppm for an 8-hour average, not to be exceeded more than once per year. This health-based standard is intended to protect those most sensitive to the effects of CO exposure. In order for a community to violate the health standard it must have two exceedances at the same site during the calendar year (e.g., two exceedances equals one violation). Neither the Anchorage CO area nor the Fairbanks CO area has exceeded the 1-hour standard since 1980.

The 8-hour limit is the more restrictive level. The Anchorage CO nonattainment area had two exceedances of the 8-hour standard in 1994, none in 1995 and then violated the standard again in 1996. It has had no violations since. Fairbanks had one exceedance in 1996 and violations in 1997, 1998 and 1999. However Fairbanks had two years of clean data in 2000 and 2001, required for demonstrating attainment. In 2004, EPA redesignated both CO nonattainment areas to attainment and they continue to monitor CO levels under EPA-approved maintenance plans.

Table III.A.1-1 lists the number of exceedances of the 8-hour standard in Anchorage and Fairbanks from 1994 through 2004.

Table III.A.1-1
Number of 8-Hour CO Exceedances
1994-2004

Year	Anchorage	Fairbanks
1994	2	3
1995	0	9
1996	3	1
1997	0	4
1998	1	2
1999	1	3
2000	0	1
2001	1	0
2002	0	0
2003	0	0
2004	0	0

Physiological Processes

Exposure to high levels of CO causes adverse impacts to health, due primarily to diminished oxygen transport by the blood and interference with biochemical utilization of oxygen in the tissues. CO competes with oxygen for chemical binding with hemoglobin in the blood. Moreover, the binding of CO to hemoglobin is roughly 240 times stronger than that of oxygen. This binding results in elevated carboxyhemoglobin (COHb) levels, with a reduction in the oxygen-carrying capacity of the blood proportional to the amount of COHb present. As a result, elevated ambient CO concentrations cause the partial exclusion of oxygen from its normal physiological role in the human body.

High-level Acute Exposure

At extremely high CO concentrations (e.g., in the case of exhaust system leakage into a car's passenger compartment), COHb levels rapidly reach a level where inadequate amounts of oxygen reach the tissues, and carbon monoxide poisoning results. Such high-level, short-term exposures result in unconsciousness and death unless victims are removed from the CO source and provided with medical care. CO uptake in the blood is a reversible process. Because of this, medical care for acute CO poisoning often includes treatment with 100% oxygen. When available, hyperbaric oxygen therapy (where the victim is placed in a pressurized chamber filled with oxygen) is preferable.

Lower-level Acute Exposure

In urban areas, lower-level acute exposure to CO often results from concentrations near the NAAQS. Such marginal CO levels avoid the high-level acute effects, but still may

cause adverse cardiovascular and central nervous system effects. The NAAQS was therefore set at a threshold below the lower level where adverse human health effects begin to occur. In particular, it was set to protect the health of the most susceptible individuals, including those with cardiovascular conditions, pregnant women, and young children.

Chronic Exposure

In addition to the acute effects described above, there has been speculation that adverse health effects may be caused by exposure to very low-level, long-term chronic CO concentrations. This has led some Anchorage residents and others to suggest that ambient CO concentrations should be reduced well below the NAAQS.

According to an air quality criteria document previously prepared by EPA ("Air Quality Criteria for Carbon Monoxide," October 1979), a threshold is usually defined as the point where an effect is noticed 50 percent of the time. Although the NAAQS is set at a "safe" level, some research has indicated there is no CO level where all adverse health effects can be avoided. If chronic CO exposure produces adverse health effects, lowering ambient CO concentrations to levels well below 9 ppm for an 8-hour average could be expected to have some health benefits beyond merely achieving the ambient standard. The EPA criteria document, however, states that "the presence of a clinical state of chronic CO poisoning ... has not been verified." (This issue relates to possible adaptation to CO in humans resulting from chronic exposures.) No evidence is presented in the criteria document that supports the theory of adverse health effects from chronic exposure.

Medical experts believe that the NAAQS represents a level that reasonably protects public health from ambient CO pollution. Subsequent reviews of the CO NAAQS have reaffirmed the 9 ppm eight-hour standard.

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III.A.2 State Transportation Control Program

Provisions of the federal Clean Air Act as well as regulations adopted by ADEC directly influence local air quality. In both Fairbanks and Anchorage, elevated ambient CO concentrations have been predominantly caused by motor vehicles. Because of this, state air quality programs designed to assist the two areas in achieving and maintaining the NAAQS for CO largely focus on controlling CO emissions from motor vehicles. Local communities frequently implement the programs that reduce CO emissions. However, ADECis directly responsible for the commuter I/M program and was directly responsible for the oxygenated fuels program in Anchorage until it was suspended in 2004. Although the ethanol-blended gasoline program is no longer a primary measure in the Anchorage plan, it remains as a contingency measure as required by Section 175A.(d) of the CAAA. This section states that contingency measures are to be implemented "to correct any violation of the standard, which occurs after the redesignation of the area as an attainment area." A copy of the regulations necessary for reimplementing oxygenated fuels, 18 AAC 53, can be found in the Appendix to Section III.A.2.

ADEC, in cooperation with the Municipality of Anchorage (MOA) and the Fairbanks North Star Borough (FNSB), has been very active in addressing the problem of cold-start emissions and helped secure adoption of the cold temperature CO vehicle certification program in the 1990 Clean Air Act Amendments. ADEC has also played an active role in providing oversight and assistance to the inspection and maintenance (I/M) programs in the MOA and the FNSB. Each of these areas is addressed in more detail in the sections that follow.

Cold CO Certification Program

The 1970 Clean Air Act stated that new vehicles must meet a 90% emission reduction criteria "when in actual use throughout their useful life," in order to satisfy EPA certification requirements under the Federal Test Procedure (FTP), the laboratory test procedure used by EPA to certify new vehicles. EPA interpreted this to mean that the reduction must be met at ambient air temperatures of 68° F to 86° F. Thus, new vehicles were *not* required, to achieve a stringent CO standard of 3.4 grams per mile (g/mi) below the 68°-86° F temperature range. In fact, they were allowed to emit substantially higher levels of CO at lower ambient temperatures. This is the primary reason less progress has been achieved in the control of emissions during cold weather than under the temperatures similar to those used during EPA's certification testing. Thus, Anchorage and Fairbanks, which exceed the NAAQS for CO during cold wintertime air stagnation episodes, receive less benefit from EPA's vehicle certification program than warmer regions of the country.

Several factors contribute to the fact that exceedances of the CO NAAQS typically occur at temperatures well below those employed in the FTP. During the FTP, vehicles are required to be driven over a standard driving cycle at standard test conditions, which is limited to the 68°-86° F temperature-range. Starting a cold vehicle requires excess fuel that cannot be completely burned, and therefore results in higher levels of partially

burned fuel (carbon monoxide) and unburned fuel (hydrocarbons). In addition, the conversion efficiency of a catalyst (the primary CO control technology used on late-model vehicles) is very low during the first few minutes of a vehicle's operation. Also, periods of low winds and atmospheric inversions often occur during low temperatures. Therefore, it can be stated that because vehicles account for roughly 90% of the CO emitted in urban areas, the lack of cold temperature CO control is the primary reason that the Alaska CO nonattainment areas continued to exceed the NAAQS for CO throughout the 1980s and 1990s.

ADEC, in conjunction with the MOA and FNSB, devoted significant efforts during the 1980s to directing EPA's and Congress' attention to the issue of non-FTP (cold temperature) emissions. These efforts succeeded in getting non-FTP CO emissions addressed in the CAAA. As a result, CAAA section 202(j) (42 U.S.C. 7521 (j)) required EPA to promulgate regulations regarding CO emissions certification at 20° F, as well as under FTP conditions. Under EPA's final rulemaking on this program, emissions from light-duty vehicles may not exceed 10.0 g/mi CO at 20° F, and 3.4 g/mi under FTP conditions. (The relative difference in standards reflects the greater difficulty in controlling CO emissions under cold-temperature conditions, particularly during cold-start enrichment.) Light-duty trucks must meet a standard comparable in stringency to the cold CO standard for light-duty vehicles.

The above standards took effect beginning with the 1994 model year according to the following phase-in schedule:

- 40% of each manufacturer's sales volume of model year 1994 light-duty vehicles and light-duty trucks;

- 80% of each manufacturer's sales volume of model year 1995 light-duty vehicles and light-duty trucks; and

- 100% of each manufacturer's sales volume of model year 1996 and later light-duty vehicles and light-duty trucks.

In addition, because six or more CO nonattainment areas[1] remained nationwide as of June 1, 1997, EPA is required, under the CAAA, to promulgate the Phase II cold CO standard of 3.4 g/mi for light-duty vehicles and 4.4 g/mi for light-duty trucks beginning with model year 2002 vehicles. However, as of June 2005, the Phase II cold CO standard has yet to be implemented.

ADEC considers EPA's cold-temperature CO certification program an integral part of federal, state and local efforts to attain and maintain the NAAQS for CO in Anchorage and Fairbanks. However, the cold CO program provided relatively minor benefits in both communities by the moderate attainment deadline of December 31, 1995, because the phase-in schedule for the CO standard resulted in an insignificant turnover in local fleets to cold temperature-controlled vehicles. However, program benefits will grow significantly as fleet turnover continues, thus providing additional emission reductions

needed to help offset future growth in population and vehicle travel in Fairbanks and Anchorage. The first phase of the cold CO program has provided significant benefits for the serious area CO control plans, which had attainment deadlines of December 31, 2000 in Anchorage and December 31, 2001 in Fairbanks. As the fleet turnover continues, additional benefits will occur, however at some point in the future, no additional benefit will be seen as a result of the Phase I cold CO control program. ADEC considers the cold-temperature CO certification program to be the essential control strategy for ensuring long-term maintenance of the NAAQS for CO in the two communities.

Inspection/Maintenance Improvements

In the early 1980s, ADEC was concerned about the effectiveness of motor vehicle emissions inspection and maintenance (I/M) programs in reducing cold-start and cold temperature emissions. Therefore, ADEC, with EPA's support, conducted a test program in Fairbanks in the winter of 1982-1983 to study this issue. ADEC and local communities used results from the test program to design I/M programs (subsequently implemented in Fairbanks and Anchorage) that would maximize the reduction of cold-start and cold temperature emissions.

In 1990, Section 187(a)(4) of the 1990 CAAA (42 U.S.C. 7512a (a)(4)) required moderate CO areas with existing I/M programs to upgrade the programs as necessary to be either no less stringent than that required by EPA prior to enactment of the CAAA or, if the SIP commitment was more stringent than EPA requirements, than that committed to in the SIP in effect at the time of enactment. Furthermore, section 182(a)(2)(B) (42 U.S.C._7511a(a)(2)(B)) required I/M programs already existing in 1990 in moderate areas to continue to meet a performance standard set by EPA for a "basic I/M program."

In November 1992, EPA adopted federal I/M regulations applicable to all state and local I/M programs. The regulations specify a basic performance standard that the MOA and FNSB I/M programs must meet. This performance standard requires all I/M programs to generate emission reductions that are equivalent to the benefits produced by a centralized inspection of all 1968 model year and later light-duty vehicles. Overall, the MOA and FNSB I/M programs are more effective than EPA's basic program. In addition, the federal regulations contain specific requirements that have mandated numerous changes in I/M program design and administration for both FNSB and MOA.

The State's I/M regulations (18 AAC 52) require the MOA's and FNSB's I/M programs to comply with the federal I/M regulations. However, ADEC considers some of the federal I/M provisions infeasible for Alaska. These provisions are highlighted in Table III.A.2-1, comparing the contents of the Alaska I/M programs and the federal regulations based on a January 1, 1996 evaluation. Data are presented to support ADEC's position, and an alternative to each requirement is presented whenever possible throughout this section. In addition, as discussed further in Section III.B.5, 18 AAC 52 includes an I/M program for vehicles commuting into the MOA. The commuter I/M program was implemented in February 1994.

Bills adopted during the 1995 and 1996 sessions of the Alaska State Legislature, mandated that all Alaska I/M programs implement biennial I/M testing, beginning no later than January 1, 1997.As required, I/M program amendments in 1997began a biennial I/M testing schedule in all Alaska I/M programs and delayed the initial test on new vehicles until its second year. In 2006 additional amendments delayed new vehicle testing until the vehicle's fourth model year. (For example, the initial inspection for a 2004 model-year vehicle begins in 2008 and every two years thereafter.)

Beginning early in year 2000, the Alaska I/M programs switched to the Alaska2000 Emissions Inspection System (EIS) specifications from the BAR-90 Test Analyzer System specifications (TAS). The reasons for this changeover include maintenance problems with BAR-90 hardware and necessary "Year 2000" (Y2K) adjustments. In addition, by July 2001, all light-duty 1996 and newer model year vehicles were required to have onboard diagnostic (OBD) testing. Alaska2000 EIS hardware has OBD testing capability.

Refer to the appendix to section III.A.2 for a copy of 18 AAC 52 as amended August 5th, 2009. These regulations include the State I/M Program Manual (consisting of the Alaska2000 Emissions Inspection System (EIS) specifications, Mechanic Training Course Requirements, General Information for Certified Mechanics, Inspection and Repair Procedures and Standards, and List of Approved Aftermarket Parts). Refer to Appendices III.B.5 and III.C.5, respectively, for MOA and FNSB I/M ordinances and I/M Program design documents.

Outlined below is a detailed description of each I/M program design element, as required by the 1992 federal I/M regulations (40 C.F.R. Part 51). Legal authority for implementation of the requirements of 40 C.F.R. 51 is found in Alaska Statute (AS) 46.03 and 46.14 (see the appendix to Section II for copies of 46.03.760, 46.03.765, 46.03.780, 46.03.790, 46.14.030, 46.14.400, 46.14.410, and 46.14.510). The legal authority does not contain any sunset provisions.

40 C.F.R. 51.350 Applicability - The Alaska I/M program is divided into three separate programs, based on the designated implementing agency. The I/M programs in Anchorage and Fairbanks are locally implemented and operated, with the MOA and the FNSB having legal and administrative responsibility for their respective programs. ADEC is responsible for administering an I/M program aimed at vehicles that commute into Anchorage for work or school.

Both Anchorage and Fairbanks have been classified as CO maintenance areas since 2004. The 1980 census population of each urbanized area was under 200,000, therefore neither community is required to implement an enhanced I/M program. Both areas, however, must continue to operate their existing programs and upgrade them as necessary to meet EPA's basic I/M performance standard and other program requirements. The existing programs cover the entire MOA and the FNSB, and thus meet the federal geographic coverage requirements. The state regulations for I/M programs are found in the Appendix to Section III.A and local ordinances establishing I/M program

requirements and boundaries for both MOA and FNSBare included in Appendices III.B.5 and III.C.1, respectively.

AS 46.14.510(e), included in the appendix to Section II, states "If the department adopts regulations requiring emissions inspection for a motor vehicle, the department may not require the vehicle be inspected more than once every two years." State I/M regulations (18 AAC 52) include this biennial-testing requirement. The local ordinances and program design documents, contained in Appendices III.B.5 and III.C.5, reflect the required switch over to biennial testing. Local I/M ordinances adopted by the MOA and FNSB must conform to the state regulations; therefore, inclusion of the state regulations in Appendix III.A is sufficient to demonstrate legal authority for biennial testing.

The ADEC-administered commuter I/M program is not linked to a specific geographical area, but is instead aimed at vehicles that are regularly operated in, but not registered in, the MOA I/M program area. Because of this, no specific geographical requirements apply to this program. The design document for the commuter I/M program is in the State I/M manual,adopted by reference in 18 AAC 52, and can be found in Appendix III.A.

40 C.F.R. 51.351 Enhanced I/M Performance Standard - Not applicable to Alaska.

40 C.F.R. 51.352 Basic I/M Performance Standard - Basic I/M programs must be equivalent (based on a 1996 analysis year) to a program that contains the following design features:

- centralized testing network,
- 1983 program startup date,
- annual testing of all 1968 and later light-duty vehicles,
- idle test required,
- emission standards as stringent as specified in federal regulation,
- no under-hood inspections required,
- 20% failure rate for pre-1981 model year vehicles,
- 0% waiver rate, and
- 100% compliance rate.

State I/M regulations (18 AAC 52.035(d)) require local I/M programs in Alaska to meet the federal basic performance standard. As of the 1996 evaluation year, the MOA and FNSB I/M programs, described in Sections III.B.5 and III.C.5 respectively, met the basic performance standard. Copies of the MOBILE5a input and output files supporting these determinations are included in the appendix to III.A.2. A summary of the features of the two I/M programs and the MOBILE5a modeling results for each program (based on a January 1, 1996 evaluation date) is included in Table III.A.2-1. The Anchorage commuter I/M program has the same design features shown in the table for the MOA I/M program.

A one-time evaluation date of calendar year 1996, as specified in 40 C.F.R. 51.352, was used to demonstrate compliance with the basic performance standard when the CO areas

were in nonattainment. EPA I/M staff in Ann Arbor directed ADEC to use a January 1, 1996, MOBILE5a evaluation date for comparison with the performance standard.[2] The modeling results summarized in Table III.A.2-1, therefore reflect the annual inspection frequency that was in place in both the MOA and FNSB on January 1, 1996.

Table III.A.2-1

1996 Comparison of the FNSB and MOA I/M Programs to EPA's "Basic Program" Parameters*

Parameter	"Basic Program"	FNSB	MOA
Network Type	Centralized	Decentralized	Decentralized
Start Date	January 1, 1983	July 1, 1985	July 1, 1985
Test Frequency	Annual	Annual**	Annual**
Model Year Coverage	MY 1968 and Newer	MY 1975 and Newer	MY 1968 and Newer
Vehicle Type Coverage	LDV Only	LDGV, LDGT1, LDGT2, and HDGV	LDGV, LDGT1, LDGT2, and HDGV
Tailpipe Test Type	Idle Only	Idle/2500 rpm	Idle/2500 rpm
Emission Standards	40 C.F.R. Part 85, Subpart W	Sliding scale/ Complies with minimum standards	Sliding scale/ Complies with minimum standards
Underhood Inspection	None	Visual and Functional Checks of MY 1975+ Vehicles	Visual and Functional Checks of MY 1975+ Vehicles
Waiver Rate	0%	1%	1%
Compliance Rate	100%	96%	95%
MOBILE5a Estimate of 1996 FNSB I/M Benefits	Composite CO emission factor = 35.683 g/mi Reduction in Emissions = 11.4%	Composite CO emission factor = 33.740 g/mi*** Reduction in Emissions = 16.2%	n/a
MOBILE5a Estimate of 1996 MOA I/M Benefits	Composite CO emission factor = 30.960 g/mi Reduction in Emissions = 11.2%	n/a	Composite CO emission factor = 29.752 g/mi*** Reduction in Emissions = 14.7%

* Based on an evaluation date of January 1, 1996.
** Due to extremely low failure rates, all models are exempted from the first inspection cycle.
*** Based on 85% of MOBILE5a test-only benefits.

Detailed descriptions of the current features of each program are contained for Anchorage in the I/M Ordinance found in Appendix III.B.5, and, for Fairbanks, in the FNSB Alaska

2000 Motor Vehicle Inspection and Maintenance Program Handbook found in Appendix III.C.5.

40 C.F.R. 51.353 Network Type and Program Evaluation - All three Alaska I/M programs are operated on a decentralized test-and-repair basis. For the 1996 evaluation presented in Table III.A.2-1, based on ADEC's "good faith estimate" of emissions reductions at that time, ADEC originally assumed an 85% credit in its MOBILE5a analysis. At that time, the state recognized that this credit request was probably conservative and that, based on their design and data, the Alaska I/M programs could justifiably request greater credit. In November 1998, ADEC submitted a qualitative evaluation of the I/M programs to EPA.[3] In addition, between 1998 and 2001 major revisions to the I/M program have further increased effectiveness. For this reason, ADEC has claimed that the Alaska I/M test and repair programs are 100% as effective as a test-only program. In Fairbanks their plan now claims 100% credit for a test-only program, as demonstrated by the data. However, in the MOA attainment plan, analysis continues to rely on an 85% credit. This conservative approach provides a extra margin of safety in their emission estimates, and is not a reflection of a less stringent I/M program.

40 C.F.R. 51.354 Adequate Tools and Resources - MOA, FNSB, and the state commit to providing the necessary administrative, personnel, and equipment resources to fully implement and maintain the Alaska I/M programs. The federal performance standard will be met or exceeded by all Alaska I/M programs by implementing all provisions of the Clean Air Act and 40 C.F.R. 51 applicable to Alaska. These include vehicle coverage, test frequency, test equipment and procedures, program enforcement, quality assurance and quality control procedures, data analysis, training, and public information. All of these will continue to be carried out under local or state oversight, with some being completed by government personnel and some being performed by one or more contractors. In addition, the state will continue to provide added oversight of the local I/M programs, to ensure that they are operated in accordance with 18 AAC 52 and 40 C.F.R. 51.

In the event that either MOA or FNSB is unable or unwilling in the future to provide adequate tools or resources, ADEC commits to ensuring that all necessary administrative, personnel, and equipment resources are provided to fully implement and maintain the Alaska I/M programs.

Under the authority of 18 AAC 52.030(a)(2), ADEC will, in its discretion, take over the administration of a local I/M program if the local implementing agency is found to be administering an inadequate program.

All necessary program financing for each of the Alaska I/M programs is provided by I/M test fees assessed on each vehicle that passes an I/M test. The fee schedule for ADEC-administered programs is described at 18 AAC 52.020(f). When the I/M programs shifted from annual to biennial inspection in January 1997, the fee for a certificate of inspection increased from 10 dollars to 20 dollars. Based on past I/M program

performance, it is the position of MOA, FNSB, and ADEC that this financing mechanism will ensure adequate financing of the I/M programs in the future.

A discussion of adequate resources for the local MOA and FNSB I/M programs is included in appendices III.B.9 and III.C.9. Copies of the annual operating budgets and staffing levels for the MOA and FNSB I/M programs from 1994, which demonstrate adequate funding and personnel to properly administer the programs, are included in Appendices III.B.11 and III.C.11. The commuter I/M Program is financed at an annual level of roughly $100,000.

MOA, FNSB, and ADEC will work with their respective legislative bodies to budget for adequate equipment resources to achieve I/M program objectives and meet all I/M program requirements.

The MOA and FNSB referee facilities each provide multi-functional services for their program. MOA contracts with a private contractor for its referee facility while the FNSB referee facility is operated by FNSB staff. (ADEC and MOA have agreed to use the contractor-operated MOA referee facility for the commuter I/M program.) Services provided by the two facilities include public, motorist and mechanic information and assistance, mechanic training and certification testing, and referee functions. These facilities are equipped with at least one certified Alaska2000 Emissions Inspection System (EIS) and other diagnostic and repair equipment, which are used for referee inspections, verification of waiver requests, setting up and testing covert and overt vehicles, and other related functions. The referee facilities maintain inventories of calibration gases, and audit equipment and gases.

Data collection and processing are major elements of the Alaska2000 I/M testing program. Alaska2000 analyzers use a centralized host system called a Vehicle Information Database (VID) and an electronic transfer (ET) system that allows the transfer of data both from the VID to the EIS and from the EIS to the VID. Near the beginning of an Alaska2000 I/M test, the EIS electronically calls the VID to download the vehicle information and system parameters. At the end of the test, the EIS software automatically transfers (uploads) the results back to the VID with a second call.

The VID can also be used for a number of other actions, including the remote lockout of an EIS, the transmittal of messages to one or more EIS, and data analysis related to enforcement actions. A sophisticated I/M management software program performs many of the quality assurance/quality control (QA/QC), data analysis, and reporting, and enforcement functions required under 40 C.F.R. 51 and 18 AAC 52. Security and level-of- access controls are used to prevent tampering and loss of data.

Privately owned vehicles are obtained on an as-needed basis from the public for covert or overt performance audits. Adequate numbers of vehicles are used to prevent recognition by station mechanics and to maintain an I/M test fleet that, overall, is representative of the community's vehicle mix.

40 C.F.R. 51.355 Test Frequency and Convenience –All regulated vehicles within the Alaska I/M program areas were subjected to an annual I/M test until January 1, 1997. The MOA exempted all new vehicles subject to the program from their first annual inspection, due to the extremely low failure rate that new models experience during the first inspection cycle. As noted above, biennial testing for Alaska I/M Programs began on January 1, 1997. Beginning with model-year 2004, new vehicles are exempt from testing until expiration of the vehicle's second registration.. (For example, the initial inspection year for a 2004 model year is due no more than four years after its initial registration as a new vehicle.). Beginning with model-year 2006, new vehicles are exempt from testing until the current calendar year equals the vehicle model year plus six years; subsequent inspections are due every two years after the year the vehicle's first inspection is due.

Test frequency for the MOA and FNSB programs is enforced via the State of Alaska motor vehicle registration process. The vehicle registration database maintained by the Alaska Division of Motor Vehicles (DMV) includes a field that indicates whether each individual vehicle is subject to an I/M program. If a vehicle is listed as subject to I/M testing, a valid Certificate of Inspection must be submitted along with the vehicle's registration notice, before the vehicle can be re-registered. To be valid, a Certificate of Inspection must have an inspection date within the 90-day period before the registration date. DMV usually receives Certificate of Inspection information electronically within 24 hours of testing. This system allows motorists to register by mail, telephone, or over the Internet.

For the commuter I/M program, only those vehicles that commute (to work or school) into the MOA from areas outside of the municipal boundaries must be inspected. This program, therefore, is not linked to the DMV registration process. Instead, commuter vehicles subject to the I/M program are identified through searches of several confidential databases. The owners of vehicles identified in this manner are notified by ADEC of the requirement to obtain an inspection. Database tracking procedures implemented by ADEC track vehicles to ensure that they are brought in for I/M testing after notification and that they are renotified when a reinspection is required. A Certificate of Inspection issued to such a vehicle is not submitted to DMV upon registration, but must instead be kept in the vehicle with the vehicle registration.

ADEC acknowledges that it may be more difficult to maximize compliance in the commuter I/M program, as compared to the MOA and FNSB I/M programs, due to the absence of any link to the vehicle registration process. It is noted, however, that any significant level of compliance in the commuter I/M program will increase the compliance rate for the MOA I/M program overall.

Beginning in early 2000, under the Alaska2000 program, vehicles that either passed the I/M test or obtained a waiver received a windshield sticker along with the paper Certificate of Inspection. In 2005, vehicles began only receiving windshied stickers. The windshield sticker serves as either the vehicle's Certificate of Inspection or proof of inspection or maintenance exemption eligibility. Because a windshield sticker provides

immediate visual evidence that a vehicle has met the requirements of the I/M program it strengthens I/M program enforcement and compliance objectives.

40 C.F.R. 51.356 Vehicle Coverage - Except as provided in 18 AAC 52 (Appendix to III.A) or the local I/M program design documents (Appendices III.B.5 for Anchorage and III.C.5 for Fairbanks), all light-duty gasoline vehicles (LDGVs), light-duty and medium-duty gasoline trucks (LDGT1s and LDGT2s), and heavy-duty gasoline vehicles (HDGVs) lighter than 12,001 pounds unladen weight, that are principally located or operated in either the MOA or FNSB, are subject to I/M testing. In the MOA, all 1968 and newer models are subject to the program, while 1975 and newer models are subject to the FNSB program. Any 1968 or newer model used to commute into the MOA is subject to I/M testing as well. Visual and functional inspections are performed on only 1975 and later models in all three I/M programs. Amendments to 18 AAC 52 in 2001 allow implementing agencies the option of eliminating the visual and functional inspections requirement from their local program manual for 1996 and later model year vehicles which undergo on-board diagnostic testing. Diesel-powered vehicles are not required to be I/M tested, but must be inspected upon initial registration and after change-of-ownership to confirm the existence of a diesel engine. The following classes of vehicles are exempted from the programs:

- a vehicle not principally located or operated in an I/M area;
- a 1967 or older vehicle in the MOA;
- a 1974 or older vehicle in the FNSB;
- a new vehicle prior to its third registration ;
- a gasoline-powered vehicle that is over 12,000 pounds unladen weight:
- a special test vehicle that has a State exemption;
- a military tactical vehicle;
- a motorcycle, golf cart, all-terrain vehicle, snow machine, and moped;
- a vehicle in Alaska for less than 30 days;
- an electric vehicle;
- a motor vehicle for which the Division of Motor Vehicles has issued historic vehicle plates for historic exhibition use; and
- a motor vehicle for which the Division of Motor Vehicles has issued custom collector plates.

Fleet vehicles are subject to the same program requirements and testing procedures as other vehicles. Fleets may self-test; however, such fleet testing facilities must meet the following requirements:

1. they must be certified as official I/M test stations;
2. they must use certified I/M mechanics to conduct all I/M tests;
3. all I/M tests and certificate issuance must be conducted using certified Alaska2000 EIS; and
4. they must comply with all other I/M program requirements.

Vehicles registered in one I/M program area, but primarily operated in another I/M area, may obtain a certificate of inspection from any one of the three areas (MOA, FNSB or

the Mat-Su Valley) in which official I/M stations are located. At the request of a vehicle owner or lessee, an official I/M test can be provided to a vehicle registered elsewhere. With the exception of tactical military vehicles, all vehicles operated on federal installations in an I/M area must be tested, and the installation must provide proof of compliance to the I/M implementing agency. (Procedures for ensuring such compliance are included in Appendices III.B and III.C.)

The I/M program design documents including 18 AAC 52, local ordinance and Fairbanks Handbook include a detailed description of the type of vehicles covered by the I/M programs, and a plan for how those vehicles are to be identified. The program design documents include descriptions of the special exemptions and waivers granted by the programs as well.

The following information was developed as part of the 1996 comparison to the basic I/M program standards. The number of vehicles subject to the I/M programs in the MOA and FNSB were estimated in 1993 to be roughly 163,000 and 51,000, respectively. The estimate for FNSB includes seasonally waived vehicles, as described below, since they are subject to the I/M program. The FNSB estimate does not, however, include 1968-1974 model year vehicles, since they are not currently subject to the I/M program. The MOA and FNSB totals are both based on 1993 I/M test records coupled with estimated compliance rates for each area. It is noted that these vehicle counts differ substantially from the number of vehicles for each area contained in the DMV vehicle registration database. (For example, the DMV database shows roughly double the number of I/M-eligible vehicles for FNSB as the amount actually being I/M tested.) Large numbers of invalid entries in the DMV database are the suspected cause of this discrepancy, primarily due to vehicles that are maintained on the database for an extended period after not being re-registered.

Estimates of the percentage and number of vehicles affected by the special exemptions in each I/M program are presented below. For the purpose of developing these estimates, only those vehicles were included that would be included pursuant to the basic I/M program parameters contained in 40 C.F.R. 51 (i.e., 1968 and newer gasoline-powered light-duty vehicles) but which are exempted by 18 AAC 52 or local ordinance. For example, diesel vehicles are not listed as exempt (although they are exempted from I/M testing requirements), since they are not included in EPA's basic I/M program. Based on this methodology, the number of vehicles estimated to have received exemptions in 1995 are as follows:

Type of Exemption	MOA Total	FNSB Total
1968-1974 models	-0-	6,000
Seasonal exemption	-0-	4,000

The exemption of pre-1975 models has been incorporated into the 1996 FNSB MOBILE5a runs for comparison to the basic I/M performance standard. As noted above, this estimate of 6,000 vehicles would be in addition to the 51,000 vehicles estimated to be subject to the FNSB I/M program. The vehicles obtaining seasonal exemptions are

subject to the program; however, they are prohibited from being driven during the winter CO season. For this reason, they are assumed to not operate during the CO inventory and nonattainment period; thus, no discounting of those vehicles has been incorporated into the 1996 MOA or FNSB MOBILE5a runs. The seasonal waiver program began in MOA in 1995. Therefore, an estimate of the number of vehicles that would be exempted each year was not included in the 1996 comparison to the basic I/M performance standard since it was not available at that time. It is also noted that several categories of vehicles (i.e., LDGT1s, LDGT2s and HDGVs) not subject to the basic performance standard have been included in both the MOA and FNSB I/M programs.

In addition to the vehicle registration counts for MOA and FNSB, there are a number of vehicles that are registered outside the program areas but are primarily operated within them. Out-of-area commuter vehicles have been previously estimated by ADEC at between 3,900 and 7,400 in MOA. These vehicles are now subject to the commuter I/M Program.

MOA also estimated previously that an additional 5,000 vehicles were being used in the MOA but were illegally registered outside of the area, in order to evade I/M program requirements. Increased enforcement efforts by the MOA has reduced the number of program evaders. The total number of noncomplying vehicles in the MOA is estimated at roughly 8,000 (5%). A 95% compliance rate was conservatively estimated for the 1996 MOA MOBILE5a runs.

In Fairbanks, a much lower number of out-of-area commuter and program evader vehicles is estimated, due to the absence of a significant center of population within reasonable daily driving distance of the FNSB. Increased enforcement efforts by FNSB and the State are expected to reduce this number even further. A conservative estimate of 2,000 noncomplying vehicles (equivalent to a compliance rate of 96%) was assumed for the 1996 FNSB MOBILE5a runs.

As of September 2001, the following updated information is available with regards to vehicle coverage, exemptions, and waivers. Vehicle coverage remains essentially the same as in 1996. The Table III.A.2-3 presents the estimated number of vehicles subject to the I/M programs in the MOA, Mat-Su Valley, and FNSB along with the number of vehicles that are seasonally exempted, an estimate of the number of evaders, and the compliance rate.

Table III.A.2-3
I/M Program Coverage
2000-2001

	MOA	FNSB
Estimated Number of Vehicles Subject to the Program	163,000	51,000
Estimated Number of Seasonal	6,908	6,674

Exemptions		
Estimated Number of Evaders	8,000	2,000
Estimated Compliance Rate	90%	93%

The estimated number of vehicles subject to the I/M programs is based on the 1993 estimates discussed previously.

The estimated number of seasonal waivers for the MOA is based on the 18-month period from January 2000 through July 2001, which had 5,181 seasonal waivers. By assuming that this is only three-quarters of the total number of seasonal waivers, the total estimate came to 6,908 vehicles. The estimated number of seasonal waivers for the FNSB is based on the 16 month period from April 2000 through July 2001, which had 4,449 seasonal waivers. By assuming that this is only two-thirds of the total number of seasonal waivers, the total estimate came to 6,674 vehicles.

The estimated number of evaders for each program is based on the estimates used in the 1996 comparison to the basic I/M performance standard. The 2001 compliance rate for Fairbanks and Anchorage are lower than in previous SIP submittals. In 1995, ADEC began to conduct license plate surveys of local parking lots to track the I/M compliance rate of vehicles being operated in Fairbanks. Based on the survey results,[4] the 2001 compliance rate for FNSB is estimated to be 93% and for MOA is 90%, as shown in the table.

Comparing this 2001 value to the 95-96% rates that have historically been used in developing SIP-related emissions inventories for the area shows an apparent 3-5% decrease in the compliance rate since the previous SIP revision in 1996. This is inconsistent with the improvements in vehicle enforcement, which is most likely due to an inaccuracy in the previous estimate. The 95-96% rate was originally developed more than 10 years ago, and was not rechecked until the initiation of the above surveys. It is therefore considered likely that the I/M compliance rate actually declined over the last decade, a trend that was reversed due to the recent increase in vehicle enforcement-related efforts. It is also expected that increased enforcement efforts will produce further improvement in the future compliance rate.

40 C.F.R. 51.357 Test Procedures and Standards - Written test procedures (using a 2-speed idle test) and pass/fail standards that must be followed for all vehicles have been established for each of the I/M programs. State I/M regulations (18 AAC 52), local I/M ordinances, and State and local program design documents include requirements related to this effort.

18 AAC 52 does not require certified I/M stations to allow the motorist to have access to the test area to observe the entire I/M test. The federal requirement for access to the test area appears focussed on a centralized test-only environment where adequate space and safety requirements can be maintained. ADEC's position is that imposing such a requirement on Alaska's test-and-repair stations could affect test station insurance requirements/rates and exposes the state to unacceptable liability issues. However, the

Alaska I/M programs work cooperatively with the certified stations to ensure that motorists are given adequate opportunity, if desired, to observe I/M testing. In addition, 18 AAC 52 requires certified stations to fully inform motorists regarding the cost of the I/M test and the services to be provided in the test.

18 AAC 52 and each of the program design documents require that an official test, once initiated, be performed in its entirety, except in the case of invalid test conditions or unsafe conditions. This requirement is reinforced by the test procedures and EIS software logic required to be used in all Alaska I/M programs. Unsafe vehicles, including vehicles with leaking exhaust systems, must be rejected from testing, and vehicles must be completely retested after repairs are performed.

The Alaska2000 EIS specifications, included in each of the local program design documents, incorporate the quality procedures contained in 40 C.F.R. 51, Appendix A, and the test procedures specified in 40 C.F.R. 51, Appendix B. All vehicles are subject to the HC and CO emission cutpoints set forth in 18 AAC 52.050, and repairs must be made if a vehicle fails any of these cutpoints. The cutpoints contained in 18 AAC 52.050 vary by model year, vehicle type, and number of cylinders. As a result, some of the 1981 and newer LDGVs, LDGT1s, and LDGT2s have emission cutpoints in excess of 220 ppm and 1.2 percent CO. The 220 ppm HC cutpoints do not take effect for all vehicles until the 1994 model year. Some post-1980 LDGVs, LDGT1s, and LDGT2s (those equipped either with no catalyst or with oxidation catalysts, as opposed to those equipped with three-way catalysts) have to meet a less stringent CO cutpoint than 1.2 percent. Cutpoints as strict as the federal 1.2 percent CO warranty limit do not take effect for all LDGVs, LDGT1s and LDGT2s models until the 1984 model year.

Beginning with the 1994 model year, 18 AAC 52.050 includes a 0.5% CO cutpoint for LDGV and LDGT models covered by the I/M programs. This standard is more stringent than the federal warranty limit of 1.2% CO. ADEC's position is that the overall benefits of the cutpoints contained in 18 AAC 52.050 meet those that would be achieved using the prescribed federal warranty limits of 1.2% CO and 220 ppm HC for all 1981 and later models. ADEC is aware of the warranty implications of having a CO cutpoint more stringent than the federal warranty coverage limit of 1.2%. The Alaska I/M programs have maintained a CO cutpoint of 1.0% for several years with minimal warranty issues.

Emission control devices that are neither original equipment manufactured (OEM) nor approved aftermarket parts are cause for underhood failures. Vehicles with replacement engines are subject to emission standards for the chassis type and model year, including visual inspection for all parts in the original certified configuration. 18 AAC 52 also requires the resulting engine-chassis configuration to have been certified by either EPA or the California Air Resources Board (CARB) as having the same or lower emissions as the engine-chassis configuration originally installed in the vehicle. Vehicles that have been switched from an engine of one fuel type to another fuel type subject to the program (e.g., from a diesel engine to a gasoline engine) must meet the standards for the current fuel type.

40 C.F.R. 51.358 Test Equipment – A computerized EIS meeting the specifications contained in the program manuals (in Appendices III.A, III.B.5, and III.C.5) is required for all emissions measurements. To be certified for use in Alaska, each EIS is required by 18 AAC 52 to meet Alaska2000 equipment specifications that comply with those listed in 40 C.F.R. 51, Appendix D. Test equipment must be capable of testing all subject vehicles. The manufacturers of analyzers certified for use in Alaska must update the EIS from time to time, as requested by the State, to accommodate new technology vehicles and program changes.

The EIS are automated to the highest degree commercially available to minimize the potential for intentional fraud or human error. Detailed requirements that meet or exceed those listed in 40 C.F.R. 51.358 and 40 C.F.R. Part 85, Subpart W, must also be followed in issuing a Vehicle Inspection Report (VIR) to each vehicle owner or motorist who has a vehicle I/M tested. The EIS must meet specified functional characteristics that meet or exceed those listed in 40 C.F.R. 51.358. Written acceptance criteria and procedures for certifying an EIS for use in Alaska are included by reference in the Alaska2000 EIS specifications.

Table III.A.2-4
Federal Requirements for Gas Calibrations and Leak Checks

Federal Requirement	Low-Volume Stations (<4,000 tests/yr.)	High-Volume Stations (>4,000 tests/yr.)
Leak check	within 24 hours before a test	within 4 hours before a test
2-point gas calibration	within 72 hours before each test	once a day within 4 hours before the test
Multipoint gas calibration	every 6 months	Monthly

40 C.F.R. 51.359 Quality Control - Each EIS must incorporate detailed quality control procedures as specified in the Alaska2000 EIS specification. These procedures are very similar, but not identical, to those contained in 40 C.F.R. 51, Appendix A. Alaska is proposing the following exceptions to the federal quality control procedures:

1. Less frequent calibration requirements - Table III.A.2-4 shows the frequency requirements for mandatory emission measurement equipment gas calibrations and leak checks contained in 40 C.F.R. 51, Appendix A. In addition, EPA may also approve alternate procedures or calibration frequencies under 40 C.F.R. 51.359(a)(1) upon a demonstration of equivalent performance.

The frequency requirements for gas calibrations and leak checks contained in the Alaska2000 EIS are identical to those contained in the California BAR-90 TAS specifications. Under these specifications, mandatory 2-point gas calibrations and leak checks must be performed within 72 hours of the last gas calibration and leak check, or the system is locked out from further testing until the calibration is completed. Unlike the federal specification, this requirement is the same regardless of the number of inspections performed at the station. In addition, no multi-point calibration requirements are programmed into either the California or the Alaska2000 EIS software. However, the Alaska2000 EIS specifications for allowable tolerance limits are identical to those specified in 40 C.F.R. 51 for the multi-point calibrations.

ADEC believes that the more frequent schedule of gas calibrations and leak checks contained in 40 C.F.R. 51 is not needed to maintain acceptable accuracy in emissions measurements made by the Alaska2000 EIS. This position is based on the factors listed below.

- Review of emissions measurement equipment records - Available FNSB data for the period from 7/1/92 to 6/30/93 were analyzed to determine if there were any inspection stations in FNSB that would be considered high-volume stations under the federal criteria. One certified station conducted 10,996 tests during the year-long analysis period. However, tests at the station were performed using seven different measurement machines. The most tests run on a single machine during the year were 2,227, well below the 4,000-tests/year cutoff. No MOA data were available to perform a similar analysis, but anecdotal evidence, supplied by local I/M staff indicate that all stations in MOA are most likely below the federal high-volume limit. Given this information, the small size of the Alaska programs, along with the 1997 implementation of a biennial test program, which should reduce the per station test frequency even further, there appears to be no need to include a more frequent calibration schedule for high-volume stations in Alaska.

- Discussions with emissions measurement equipment manufacturers—Based on informal discussions held between the state's representatives and the manufacturers, the manufacturers also support the position that less frequent calibrations are required to maintain test integrity. They have indicated that they consider the more frequent federal requirements may be based on old data from outdated (BAR-84) emission analyzers.

- Multipoint calibrations - According to one manufacturer, the State of North Carolina required the manufacturers to include the federally-mandated multipoint calibration criteria in the measurement equipment designed for that state, but a high percentage of equipment has been failing the calibration. According to the manufacturer, the reason for these failures is that the equipment is required to meet an allowable tolerance range of +5% (based on combined tolerance limits of +3% for the TAS and +2% for the calibration gas) during the 2-point calibration. However, they are being required to meet a tolerance limit of +3% during the multipoint calibration. The problems experienced in meeting the calibration

limits thus appear related to an interpretation of how the tolerance limits are calculated, and whether or not an additional +2% tolerance be allowed during the multipoint calibrations to account for the tolerance limits of the span gas.

- Absence of past problems - Alaska's experience with the BAR-90 TAS equipment since January 1994 has shown little problem with zero drift or other indicators of analyzer calibration problems. Alaska's changeover to the Alaska2000 EIS equipment has produced equal or superior results. Experience supports the position of the manufacturers that less frequent calibrations are required than contained in 40 C.F.R. 51.

Due to these factors, ADEC incorporated the alternate calibration schedule (i.e., three-day, two-point calibrations and leak checks) in the Alaska BAR-90 TAS and will maintain this schedule under the Alaska2000 EIS specifications. The results of the FNSB TAS data analysis and the TAS manufacturers' comments support the continued use of the low-volume federal criteria (i.e., every three days) in the Alaska2000 EIS specifications for two-point gas calibrations. The manufacturers also support a three-day frequency for the required leak checks. Because problems have been experienced elsewhere in the country with "on-board" multipoint gas calibrations and I/M mechanics will continue to perform a quarterly gas audit of the accuracy of all EIS equipment (using a low-range audit gas), ADEC requests that EPA continue to waive this requirement for the Alaska I/M programs.

As with previous Alaska I/M programs, there is an ongoing statistical process control on the calibration data from Alaska2000 analyzers to look for trends indicating that an analyzer is out of compliance. In the event that significant drift is detected universally, ADEC intends to revise the Alaska2000 EIS specifications to require a mid-point check and also to require an increase in the frequency of calibrations. This frequency is roughly equivalent to requiring a calibration every 48 hours on emissions measurement equipment that performs 4,000 I/M tests per year.

2. Eliminate ambient zero air requirement - 40 C.F.R. 51.359(b)(2) requires analyzers that use ambient air as zero calibration air to draw the air from outside the test bay where each analyzer is located. 18 AAC 52 does not require ambient zero air to be drawn from outside the test bay, because ADEC considers this neither necessary nor feasible at private garage inspection stations in Alaska. Drawing air in extremely cold ambient temperatures from outside the test facility during the wintertime in Alaska would be expected to cause temperature and humidity problems within the test equipment. This would lead to increased equipment problems and less reliable test results.

   This requirement appears to be aimed primarily at high-volume, centralized test facilities that may experience elevated interior ambient pollutant concentrations during periods of high volume vehicle testing. That situation is clearly very different from the low-volume, decentralized test-and-repair stations operating in the Alaska

I/M programs. EPA has waived this requirement for the Alaska I/M programs at ADEC's request.

As a result of the implementation of the Alaska2000 program, it was found that the new EIS were more sensitive to background pollutant concentrations from within the test bay. For this reason, the Alaska2000 EIS specifications have been updated to require zero air generators. The zero air generators pull air from within the test bay, which is then scrubbed of pollutants for use in the analyzer. This provides a good source of zero air for the analyzers while avoiding any temperature and humidity problems caused by drawing air from outside the test facility.

All other federal quality control requirements are incorporated into the Alaska I/M programs. The EIS must record quality control check information, lockouts, attempted tampering, service calls, etc., to ensure quality control. The EIS must be maintained according to good engineering practices to assure test accuracy. The EIS housing is required to protect the analyzer bench and electrical components from excessive ambient temperature and humidity fluctuations. The EIS must automatically purge the analytical system after each test.

All certificates of inspection are issued through the EIS in order to reduce the likelihood of counterfeiting or other document fraud. Each paper certificate contains a unique serial number that is also displayed in bar-coded format, and contains the seal of the I/M implementing agency (MOA, FNSB, or ADEC). Certificates are placed in a locked compartment in the EIS and an electronic "certificate tamper" record is created whenever the compartment is accessed. Bar codes are used in printing certificates and contain specific vehicle identifiers and information relevant to the inspection process.

Beginning on September 1, 2002, the I/M program began providing I/M test information to the Division of Motor Vehicles as an electronic record and no longer issues paper certificates to motorists. This means that motorists no longer have to present the paper certificate to the Division of Motor Vehicles before the motorist can receive a vehicle registration. Motorists continue to receive a windshield sticker that will act as the visual proof of the inspection status of their vehicle for field enforcement. This eliminates paperwork and the potential for certificate fraud.

40 C.F.R. 51.360 Waivers and Compliance via Diagnostic Inspection –State I/M regulations (18 AAC 52), local I/M ordinances, and State and local program design documents (Appendices III.A, III.B.5, and III.C.5) include requirements related to this effort. Waiver issuance procedures for the programs are also included in Appendices III.A, III.B, and III.C. Under 18 AAC 52, waivers may be issued in the Alaska I/M programs for the following reasons:

- repair cost exceeds minimum requirement;
- diesel engine;
- seasonal waiver;
- special circumstances that make it impractical to test a vehicle;

- pattern failure;
- modification to the dedicated use of an approved alternate fuel;
- out-of-area use;
- economic hardship; or
- parts unavailability.

Each of these waivers is described in 18 AAC 52 and the applicable design documents (not all waivers are issued by each program). Two of the most important of these waiver programs are discussed below.

1. Emissions-Related Repair Cost Minimum Waiver - requires the following actions:

    a. The vehicle must fail a retest after repairs have been made;

    b. Available warranty and insurance coverage must be used before repair costs can be counted toward cost limits;

    c. Repairs appropriate to the cause of test failure must have been performed;

    d. A visual check must be made to verify that the repairs were actually performed;

    e. Repairs must be performed by a certified mechanic to qualify for a waiver; and

    f. A minimum amount of money must have been spent to qualify for a waiver.

For the state I/M program, the amount of money that must be spent before a repair cost waiver may be issued is described in the state I/M regulations at 18 AAC 52.065.

The requirements for the MOA and FNSB I/M programs may be revised to include repair cost waivers, in response to state I/M regulation changes which allow this option. The MOA and FNSB I/M program requirements are required to be at least as effective in reducing emissions as the state requirements.

ADEC believes that the cost minimum on vehicle repairs in all three programs will have the same long-term effect as requiring immediate completion of *all* emissions-related repairs. It will also provide an equitable method for phasing in multiple expensive repairs. This is because at least one repair will be required each inspection cycle on a vehicle, regardless of cost, but allow deferral of additional repairs when the initial repair meets or exceeds the cost minimum. This position is supported by I/M data from the MOA I/M program. As discussed in Section III.B.5, MOA repair cost waiver requests have dropped to less than 1% of the vehicles in the I/M program (which is mostly comprised of non-tampered vehicles). This is the result of the phase-in of higher repair cost limits, particularly a one-repair-regardless-of-cost requirement. In addition, limiting the tampering-related cost ceilings to the modifications occurring before July 1, 1985 has ensured the rapid phaseout of all tampering-related repair-cost waivers. For these reasons, Alaska requested EPA approval of this exception to the federal I/M regulations.

A repair cost waiver rate of 1% of the vehicles in the MOA and FNSB I/M programs is assumed for both waiver categories (pre-1981 models, and 1981 and newer models) in the 1996 MOA and FNSB MOBILE5a computer runs, which demonstrate compliance with the federal basic performance standard. This waiver rate is based on those achieved by the MOA I/M program since the imposition of the one-repair-regardless-of-cost provision. ADEC commits to a waiver rate in practice that is equal to or lower than 1% of vehicles in either the MOA or the FNSB I/M programs. If the waiver rate for either program, as reported to EPA in the annual Alaska I/M report, is higher, ADEC will take corrective action to lower the applicable waiver rate. Possible corrective actions may include one or more of the following:

- requiring a motorist who applies for a waiver to reduce initial emissions by a specified amount before a waiver may be issued;
- limiting the model years that are eligible for a waiver;
- limiting waivers on vehicles to only one inspection cycle;
- raising the expenditure levels; or,
- other measures determined by ADEC or the local I/M Offices.

If any of the waiver rates cannot be lowered to the level committed to in the SIP, ADEC will revise the I/M emission reduction projections in the SIP and will implement other program changes as necessary to ensure the performance standard is met.

2. **Seasonal Waiver Program -** Under 18 AAC 52.060(a)(3), a seasonal waiver may be issued by an I/M program if the motorist agrees to not operate the vehicle in either a nonattainment or maintenance area during the winter CO season. The seasonal waiver program has been an integral part of the FNSB I/M program since its inception in 1985, and ADEC supports FNSB's position that this waiver program is an essential part of the I/M program. MOA implemented a seasonal waiver program in 1995. In both MOA and FNSB, vehicles for which seasonal waivers are issued receive different colored license tabs to make it easier to identify seasonally waived vehicles that are being operated illegally during the winter CO season.

   Additional provisions in 18 AAC 52.060 are also designed to limit the number of motorists who attempt to violate the seasonal waiver restrictions. If a motorist is proven to have been operating a vehicle in violation of I/M program requirements after the vehicle was issued a seasonal waiver, the seasonal waiver immediately becomes void. No seasonal waiver may be issued in the future to that vehicle or any vehicle owned by that motorist without good cause. If the vehicle is sold, the subsequent owner may be issued a seasonal waiver, if all seasonal waiver requirements are met. In MOA, a motorist will be subject to fines if found to be in violation of I/M regulations.

   All program waivers must be issued by the implementing agency's I/M Office or its contractor (e.g., MOA would be allowed to designate its referee facility contractor to issue waivers). Certified stations and mechanics are prohibited from issuing waivers. Vehicle owners must be informed of potential warranty coverage and ways to obtain warranty repairs. The primary mechanism for informing motorists of potential

warranty coverage is through a message that is printed on all vehicle inspection reports (VIRs) issued to failing vehicles.

Procedures for the issuance of waivers and other related administrative functions in the three programs are contained in Appendices III.A, III.B and III.C.

40 C.F.R. 51.361 Motorist Compliance Enforcement – State I/M regulations (18 AAC 52), local I/M ordinances, and State and local program design documents include requirements related to this effort. Appendices III.A, III.B.5, and III.C.5 also contain program procedures that describe the methods that will be used to identify and eliminate noncomplying vehicles. The primary enforcement mechanism will be through Alaska DMV denial of motor vehicle registration. The owner or lessee of a vehicle subject to either the MOA or FNSB I/M program must submit proof of passing an I/M test (i.e., a certificate of inspection), or a valid I/M waiver, which was issued within a 90-day period before the registration renewal date. The owner or lessee of a noncomplying vehicle operating illegally in I/M areas will be identified and issued a notice of violation (NOV). A motorist that is issued a NOV will have 15 days to provide proof of I/M compliance. In cases of continued noncompliance, the I/M programs will request that DMV revoke the vehicle's registration. The owner, lessee, or operator of a vehicle found to be operated with a revoked or expired registration may be prosecuted under the laws of Alaska.

Responsible agencies - I/M staff from ADEC, MOA, and FNSB will work with DMV to maximize vehicle compliance through the motor vehicle registration system. The Alaska State Troopers and local law enforcement agencies (e.g., Anchorage Police Department, Anchorage Parking Authority, and Fairbanks Police Department) will provide on-road enforcement against unregistered vehicles. Law enforcement agencies will also cite a motorist whose vehicle does not display a valid windshield sticker when a vehicle subject to an I/M program is stopped for another reason (e.g., during a traffic enforcement stop). 18 AAC 52 requires display of a valid windshield sticker on all vehicles subject to I/M in Alaska. In both MOA and FNSB, law enforcement agencies enforce seasonal restrictions against vehicles obtaining a seasonal waiver from the I/M programs. The different-colored license tabs issued to the seasonally waived vehicles will aid this enforcement effort.

ADEC and local I/M staffs conduct parking-lot surveys in FNSB and MOA to ensure that unregistered or seasonally waived vehicles are not being driven illegally in the two communities during the winter CO season. Local law enforcement agencies cite noncomplying vehicle owners or lessees, and the data from the surveys are used to supplement annual program evaluation and reporting efforts.

In addition, ADEC identifies program evaders through searches of several databases. The owner or lessee of a vehicle identified in this manner is notified by ADEC of the need to obtain an inspection. Database tracking procedures track vehicles to ensure that they are brought in for I/M testing after notification or appropriate enforcement actions are taken.

Beginning in January 2000, a windshield sticker was added to the I/M programs to assist with enforcement efforts. The windshield sticker provides a means for visually identifying those vehicles that have taken part in the I/M program. The sticker helps make it possible to identify non-complying vehicles that may not be caught through the DMV registration process, such as the commuter vehicles that travel into the Municipality of Anchorage as well as those that may be evading program requirements. Once identified, appropriate enforcement and compliance actions can be taken to bring these vehicles into compliance with the requirements. The windshield sticker program became fully effective in January 2002 upon completion of the first biennial inspection cycle.

Fleet testing - All fleet vehicles, including rental cars, are subject to the same program requirements and testing procedures as other vehicles. Fleets may self-test; however, such fleet testing facilities must meet the following requirements:

1. they must be certified as official I/M Test Stations;

2. they must use certified I/M mechanics to conduct all I/M tests;

3. all I/M tests and certificate issuance must be conducted using certified Alaska2000 EIS specifications; and

4. they must comply with all other I/M program requirements.

Leased vehicles and other vehicles subject to one of the Alaska I/M programs but not necessarily registered in an I/M area must also comply with all applicable program requirements. Because Anchorage and Fairbanks are by far the largest cities in Alaska, statewide fleets (such as rental car companies) usually have their vehicles registered in one or the other of these areas. In many cases, such vehicles may be transferred between cities and used in an I/M area different from the one in which they are registered. To account for this, certificates issued by one of the I/M programs are considered valid for use in all I/M areas in Alaska.

Compliance rates – In 1996, compliance rates for the MOA and FNSB I/M programs were estimated to be 95% and 96%, respectively. These rates were based on 1992 information that may not reflect increased compliance achieved since that time (particularly in MOA) due to increased motorist compliance enforcement efforts. Compliance is also expected to increase in the future in both program areas due to an increased emphasis on interactive database searches and tracking efforts. The commuter I/M Program also has increased the MOA compliance rates. For modeling purposes in conducting the comparison to the federal basic I/M performance standard, the 95% and 96% compliance rates have been assumed to ensure a conservative estimate of I/M effectiveness. Table III.A.2-5 provides a breakdown of estimated effect of the factors affecting compliance loss in each I/M area.

Table III.A.2-5
Estimated Effect of Factors Affecting I/M Compliance Loss

Noncompliance Factor	MOA	FNSB
Illegal or unregistered vehicles	2%	2.5%
Out-of-area vehicle registrations	2.5%	1%
Fraud and counterfeiting	0.5%	0.5%
TOTAL COMPLIANCE LOSS	5%	4%

ADEC commits to the level of enforcement needed to ensure compliance rates of no less than 95% and 96%, in MOA and FNSB respectively, among vehicles subject to the I/M programs. These compliance rates reflect the rates used in the 1996 MOBILE5a runs for both I/M areas, which were used for comparison to the federal basic I/M performance standard. The enforcement methods described in this section are expected to continue to maintain or improve enforcement levels. If it is determined as part of the required annual program evaluation that one or both of the I/M programs are not meeting the compliance rates committed to in this air quality plan, the following measures will be investigated to improve compliance:

- better on-road enforcement of registration requirements;
- revisions to the registration process to remove any identified problem areas;
- higher penalties for noncomplying vehicle owners; and
- creation of a telephone hotline for reporting noncomplying vehicles.

In 2000 and 2001 serious area CO plans for Anchorage and Fairbanks were developed. As a result, the compliance rates shown for the Anchorage and Fairbanks I/M programs in Section III.B and III.C are updated values based on an analysis of recently collected data. In 1995, ADEC began to conduct license plate surveys of local parking lots to track the I/M compliance rate of vehicles being operated in the two communities. Based on the survey results,[5] the compliance rates for Anchorage and Fairbanks are estimated to be 90% and 93% respectively.

Comparing these 2001 values to the 95% to 96% rates that have historically been used in developing SIP-related emissions inventories for the area shows an apparent decrease in the compliance rates. This is inconsistent with the improvements in vehicle enforcement in each community. It appears that the historical estimates were inaccurate. It is therefore considered likely that the I/M compliance rate actually declined over the last decade, a trend that was reversed due to the recent increase in vehicle enforcement-related efforts in both communities. It is also expected that these efforts will produce further improvement in future compliance rates.

40 C.F.R. 51.362 Motorist Compliance Enforcement Program Oversight – State I/M regulations (18 AAC 52), local I/M ordinances, and State and local program manuals include requirements related to this effort. I/M program procedures governing such oversight activities are also included in Appendices III.A, III.B.5, and III.C.5. ADEC will audit the local I/M programs on a regular basis, and will implement a quality assurance program to ensure effective overall performance of the enforcement systems in both areas.

QA/QC program – All agencies and personnel involved in I/M enforcement are required to follow quality control and quality assurance procedures, including procedures for I/M document handling and processing (both in the local I/M programs and at the Alaska DMV). The MOA or FNSB inspect exempt vehicles to confirm their status. Bar code readers are used on the EIS and at DMV to facilitate the accurate collection of critical test data and vehicle identifier information. An audit trail is maintained to allow for the assessment of enforcement effectiveness. Personnel performance is audited, following written procedures established by the responsible agencies (e.g., MOA, FNSB, and DMV). Retraining or other disciplinary actions may be required for enforcement personnel found to be deviating from established requirements.

ADEC and the local I/M programs perform follow-up checks on out-of-area or exemption-triggering registration changes. ADEC, the MOA, and FNSB use PC-based I/M management software and DMV vehicle registration databases to analyze registration-change applications, to target potential program evaders, and to perform periodic audits of test records and registration files for renewals.

Certificate tracking - Alaska2000 EIS generated paper and sticker certificates prevent fraudulent use of blank certificates. All certificates, except for duplicate or waiver certificates issued by an I/M Office to specific vehicles, must be issued by the Alaska2000 EIS on the basis of information entered into the EIS and recorded in the test record file. Certificate numbers identified as damaged, lost, or stolen are recorded in a separate EIS file and investigated for verification by each I/M implementing agency. Certified stations will be held financially liable for the cost of the certificates that are damaged, lost, or stolen, unless such damage was caused by an EIS malfunction or another EIS-related error. All certificates are entered into the I/M management software upon receipt from the printer and are subsequently tracked throughout the I/M testing and vehicle registration process. The software tracks those certificates issued by either a certified station or an I/M Office as well as all voided (e.g., damaged, lost, or stolen) certificates.

Information management - Sophisticated PC-based I/M software is used to establish an information base to characterize, evaluate, and enforce the I/M programs. An EIS record database is maintained with an automated test record-cleaning program in order to ensure the accuracy of the data. The information management program compares EIS test records and the DMV vehicle registration database to determine accurate estimates of the subject vehicle populations and assure the accuracy of the registration database and other document files. Database comparisons will also be performed to determine program

effectiveness, establish compliance rates and trigger potential enforcement actions against motorists or operators of noncomplying vehicles.

ADEC, MOA, and FNSB also perform periodic parking lot surveys to assess the compliance rate of the in-use fleet.

40 C.F.R. 51.363 Quality Assurance – State I/M regulations (18 AAC 52) and the program design documents (Appendices III.A, III.B.5, and III.C.5) include requirements related to this effort. I/M program procedures governing such activities are also included in Appendices III.A, III.B, and III.C. An ongoing quality assurance program assures the discovery, correction and prevention of fraud, waste and abuse. The QA program determines whether procedures are being followed and are adequate, whether equipment is measuring accurately and whether other problems exist that would impede program performance.

Quarterly performance audits - Regularly scheduled performance audits, following established written procedures, will be conducted at all Certified I/M Stations on a quarterly basis. At a minimum, these audits will include checks for the following items:

- appropriate certificate security;
- required record keeping practices;
- proper display of certified station and mechanic licenses, and other required information;
- proper maintenance and calibration of the EIS; and
- ability of the certified mechanic to properly perform an I/M test.

Covert/overt vehicle audits - In addition to the quarterly audits, overt and covert vehicle audits are conducted on an unscheduled and as-needed basis. These audits follow established written procedures that are designed to provide sufficient legal basis for subsequent enforcement actions, if required. Such audits may be performed to investigate suspected cases of program violations by certified stations or mechanics, in response to consumer complaints or as the result of quarterly audits, data analysis or other I/M management activities. Such audits may also be performed on a random basis to ensure continued compliance by other certified stations and mechanics. Stations and mechanics will not be given any notice of an impending covert vehicle audit. I/M inspectors will introduce themselves at the beginning of an overt audit, but will not do so in a covert audit. At a minimum, at least one covert audit is conducted per year at each certified station, and the total number of annual covert audits conducted by an I/M program will at least equal the number of certified mechanics in the program area.

ADEC previously proposed the following exceptions to the federal performance audit requirements provided under 40 C.F.R. 51.363(a):

1. Two overt performance audits per year per test bay - ADEC proposed that EPA approve an alternative schedule of one quarterly performance audit per facility (i.e., four audits per station per year), plus at least one overt vehicle audit per station per year, in Alaska. Since most of the state's test-and-repair stations are relatively small, ADEC believes a "per-station" frequency requirement to be more appropriate than a "per-test-bay" requirement. In fact, the proposed alternative schedule would actually result in a greater frequency of audits at the majority of certified stations. In addition, due to other performance tracking and auditing tools (e.g., automated I/M data analysis and management software), ADEC believes that the federal per-test-bay frequency is not required to maintain effective quality assurance and compliance enforcement programs against the certified stations and mechanics.

2. One remote covert performance audit per year per certified mechanic working at high-volume stations - ADEC proposed that EPA approve the elimination of this requirement in Alaska. ADEC considers that this requirement is infeasible in Alaska due to the state's unique weather conditions, and resultant station design and operation. Unlike most other states, inspections in Alaska are conducted in enclosed test stations where remote covert observations are usually impossible, particularly during the wintertime. The small size of the Alaska I/M areas, particularly in the FNSB, also ensures that the I/M industry would learn very quickly of covert operations, rendering them ineffective as an audit tool. In addition, ADEC believes that other performance tracking and auditing tools (e.g., automated I/M data analysis and management software) dramatically reduce the need to use remote covert audits to maintain effective quality assurance and compliance enforcement programs against certified stations and mechanics.

Record audits – EIS test records are audited on a monthly basis, using established written procedures, to assess individual certified mechanic and station performance. PC-based I/M management software identifies statistical inconsistencies, unusual patterns, and other discrepancies. The record audit includes a comprehensive accounting of all certificates issued to each certified station. In addition, an I/M inspector may conduct an on-site audit (in addition to the regularly scheduled quarterly audits) of records not covered by electronic analysis (e.g., work orders).

Equipment audits - Equipment audits are performed during each quarterly performance audit, using established written procedures, to ensure the accuracy and reliability of all required test equipment. The audit includes an inspection and gas audit of each EIS at the certified station.

Inspector training and proficiency - Each I/M inspector will be formally trained and knowledgeable in all aspects of the I/M program, including the following subjects:

- basics of air pollution control;
- basics of motor vehicle engines and emission control systems;
- motor vehicle engine and emissions performance repair;
- program regulations;
- use and maintenance of the EIS;

- I/M test and repair procedures;
- evidence gathering;
- applicable administrative procedures laws and regulations;
- quality assurance practices; and
- covert and overt audit procedures.

Ongoing training will be provided to I/M inspectors to ensure that they maintain an adequate level of knowledge regarding new technology vehicles, I/M testing equipment, and other relevant subjects. The performance of each I/M inspector will be evaluated at least once annually to identify any possible problem areas.

40 C.F.R. 51.364 Enforcement against Contractors, Station Owners, Operators, and Mechanics – State I/M regulations (18 AAC 52), local I/M ordinances, and State and local program design documents (Appendices III.A, III.B.5, and III.C.5) include requirements related to this effort. I/M program procedures governing such enforcement activities are also included in Appendices III.A, III.B.5, and III.C.5.

Under the Administrative Procedure Act (AS 44.62), ADEC or another I/M implementing agency must provide notice and opportunity for hearing before suspending, revoking, or refusing to renew a station's or mechanic's certification issued under either 18 AAC 52 or the MOA or FNSB local implementing ordinances. In addition, neither ADEC nor the local implementing agencies have civil, administrative citation powers under the laws of Alaska. As a result of these factors, the Alaska I/M programs are unable to comply with requirements contained in 40 C.F.R. 51.364 for the imposition of mandatory minimum administrative penalties (e.g., fines) or the immediate suspension of station or mechanic certifications. If ADEC files a civil action under AS 46.03.760, there is a statutory minimum court imposed assessment of $500. (The only exception to the prohibition against immediate suspensions would be during an ADEC declaration of an emergency situation under AS 46.03.820.) In lieu of citation powers, ADEC applies an alternative enforcement mechanism, consisting of the following elements:

1. If an I/M program office finds that a certified station or mechanic has violated I/M program requirements, the I/M office will immediately issue a notice of violation (NOV) to the certified station or mechanic. The I/M program office will provide an opportunity for a response within 10 days after receipt of the notice.

2. A hearing will be held after an I/M office finding of such a violation. If the hearing results support the I/M office's finding, the corrective action to be taken against a mechanic or station will depend on the nature and severity of the violation. If the hearing results support a finding that the station or mechanic violated program requirements, resulting in a vehicle being improperly passed for any required portion of the I/M test, the station or mechanic's certification may be suspended.

3. If an I/M program office finds that a certified station or mechanic has violated an I/M program requirement, and the violation directly affects emission reduction benefits, the I/M office will work with ADEC to immediately suspend the certified station's or

mechanic's certification under ADEC's emergency powers authority, if possible. The criteria for declaring an emergency are defined in AS 46.03.820. In the case of an immediate suspension, ADEC will provide an opportunity for a hearing within three working days of the suspension.

Continued violation of program requirements may result in the permanent revocation of certification under 18 AAC 52, after notice and opportunity for hearing, or the filing of a civil or criminal action against a certified station or mechanic under AS 46.03.760 or 46.03.790.

A finding of certified mechanic incompetence will result in mandatory training before inspection privileges are restored. A certified station will be held fully responsible under this program for the performance of its mechanics.

The I/M implementing agency maintains records of all documentation related to enforcement activities against certified stations and mechanics, and maintains statistics on violations and penalties.

40 C.F.R. 51.365 Data Collection - The EIS specifications of 18 AAC 52 include detailed requirements for the collection of test data and quality control records. Each Alaska I/M program will collect test record and gas calibration record data, that meet the requirements of 40 C.F.R. 51.365, from the EIS used in the program.

40 C.F.R. 51.366 Data Analysis and Reporting - Under 18 AAC 52.037, each Alaska I/M program must submit a report described in (b) of this section to the department within 30 days of a request as required in (a) of this section that includes the data and information requirements of 40 C.F.R. 51.366(a)-(d). The report information includes statistics for the I/M test data, quality assurance results, quality control activities, and enforcement activities.

Under 18 AAC 52.037(c), each Alaska I/M program must submit a report to ADEC that that describes changes to the program, problems in the program, any steps planned or taken to address those problems, and the results of corrective actions taken as required by 40 C.F.R. 51.366(e). The report must address any change in program design, financing, personnel level, procedure, regulation, and legal authority. It must also include a detailed discussion and evaluation of the impact of any identified changeand any future corrective efforts that are planned. ADEC will submit, upon request, a biennial report that meets the reporting requirements of 40 C.F.R. 51.366(e) to EPA by July of every other year.

40 C.F.R. 51.367 Inspector Training and Licensing or Certification - Under 18 AAC 52 and the MOA and FNSB I/M implementing ordinances, formal training and licensing is required for all inspectors (certified mechanics). Mechanics receive required training covering the following topics:

- causes and effects of air pollution;
- the role of motor vehicles as sources of air pollution, particularly the problem of cold-temperature vehicle operation causing high carbon monoxide emissions;
- motor vehicle engine combustion and emissions;
- function and effect on emissions of all emission control systems;
- symptoms and causes of high CO or HC emissions;
- purpose, function, and goals of the I/M program;
- EIS operation, calibration, and maintenance;
- I/M test and repair procedures and rationale;
- quality control procedures and their purpose;
- public relations; and
- safety and health issues related to the inspection process.

ADEC certifies training courses meeting the minimum qualifications contained in 18 AAC 52 for the training of persons applying for certification as certified I/M mechanics, and ADEC monitors and evaluates the delivery of the training program.

Upon successful completion of the training course, an applicant must achieve a score of at least 80% on a written competency test covering all aspects of the training. The I/M office or its designee administer a one-day rules and regulations course to all applicants passing the written competency test. The rules and regulations course covers statutes, regulations, and other procedures governing the maintenance and repair of emission control systems on motor vehicles in Alaska, with an emphasis on I/M program requirements. A hands-on skill test administered by the I/M Office, requires an applicant to demonstrate an unassisted ability to properly follow all test procedures, and operate, calibrate, and maintain the Alaska2000 EIS.

After an applicant passes all training and testing requirements, the I/M office may license the applicant as a certified mechanic. Certification is good for a period of two years, with passage of a refresher-training course required for license renewal. The performance of all certified mechanics is monitored on a regular basis.

40 C.F.R. 51.368 Public Information and Consumer Protection - ADEC commits to operating an ongoing program designed to educate the public about the air quality problems in Alaska, and the need for and the benefits of the I/M program. This program

will be performed jointly by ADEC, MOA, FNSB, and the certified stations and mechanics. Procedures for this program are contained in Appendices III.A, III.B, and III.C. The program will utilize primarily print and radio media, including paid advertisements, newspaper articles, and regularly scheduled wintertime air quality forecasts. The public information program meets the requirements of 40 C.F.R. 51.368(a).

A motorist whose vehicle fails the I/M test, will be given a Vehicle Inspection Report (VIR) printed by the EIS, which includes software-generated diagnostic information based on the particular portions of the test that were failed.

Each I/M program maintains a referee facility to provide a mechanism for motorists to challenge inspection results, and to assist owners, if needed, in obtaining warranty coverage for failed vehicles. Protection to the extent allowed by Alaska law will also be provided to any "whistleblowers" who uncover fraud, waste, or abuse in the I/M program. Procedures for this program are contained in Appendices III.A, III.B, and III.C.

40 C.F.R. 51.369 Improving Repair Effectiveness - ADEC believes that effective repairs are the critical link to maximizing the effectiveness of the Alaska I/M program. Accordingly, it is imperative that ADEC work with MOA and FNSB to assist the motor vehicle industry in properly diagnosing and repairing emissions-related defects. Procedures for providing technical assistance in this area to the motor vehicle repair industry are contained in Appendices III.A, III.B, and III.C. This assistance will include each program's establishment of a telephone hotline service to assist certified mechanics and other qualified technicians with specific repair problems. Mechanics' newsletters will also be distributed to all certified mechanics on an as-needed basis, to inform them of program changes, training course schedules, common problems being experienced in the I/M program, and diagnostic tips.

Based on ADEC's assessment of the availability of adequate repair technician (certified mechanic) training in I/M areas, the State's Alaska Vocational Training Center (AVTEC) in Seward will continue to ensure that training is made available to all interested individuals. AVTEC has been certified by ADEC to present on-site Alaska2000 EIS mechanic training courses in both Fairbanks and Anchorage.

40 C.F.R. 51.370 Compliance with Recall Notices - Not applicable to Alaska.

40 C.F.R. 51.371 On-Road Testing - Not applicable to Alaska.

40 C.F.R. 51.372 State Implementation Plan Submissions: The following is a schedule of interim milestones and implementation dates for the Alaska I/M Program:

Milestones	Date
Passage of enabling statutory or other legal authority	No new authority required.
Proposal of draft regulations	04/12/93
Public hearings on draft regulations:	
- Anchorage	05/17/93
- Palmer	05/18/93
- Fairbanks	05/19/93
Adoption of regulations by emergency order	01/21/94
Effective date of regulations	02/01/94
Permanent adoption of regulations	03/24/94
Begin certifying BAR-90 Stations and Mechanics	02/01/94
Begin mandatory BAR-90 testing for all subject vehicles	03/01/94
Full stringency cutpoints in effect	03/01/94
Issuance of final BAR-90 specifications and procedures	04/15/94
Submittal of I/M SIP to EPA	07/11/94
First annual reporting date to EPA	07/01/95
Submittal of I/M credit SIP revision to EPA	03/27/96
First biennial report due to EPA	07/01/97
Begin biennial test frequency	01/01/97
Begin I/M credits test program	01/06/97
Complete I/M credits test program	06/07/97
Introduce Alaska2000 EIS I/M Program	01/01/00
OBD II & Oxyfuel Fee	12/30/00
Implement On Board Diagnostic Testing	07/01/01
Fairbanks Serious CO SIP	09/21/01
Anchorage Serious CO SIP	01/27/02
I/M Update (2002)	03/27/02
Anchorage Maintenance Plan (2004)	02/20/04
Fairbanks Maintenance Plan (2004)	06/24/04
I/M program flexibility updates	09/19/06
I/M Suspension & Reestablisment Requirements	04/04/08

An analysis and demonstration that the MOA and FNSB I/M programs meet the federal basic performance standard under 40 C.F.R. 51.352 is contained in this plan. A description of the geographic coverage, under 40 C.F.R. 51.350, of the three Alaska programs and the program manuals are contained in Appendices III.A, III.B.5 and III.C.5 to this SIP. Required design elements for the Alaska I/M programs are discussed in detail throughout this section. Provisions for federal facility compliance under 40 C.F.R. 51.356 are included. Evidence of adequate funding and resources to implement all aspects of the Alaska I/M program under 49 C.F.R. 51.354 is contained in this plan.

Oxygenated Fuels Program

Section 211(m) of the CAAA (42 U.S.C. 7545 (m)) mandates the use of oxygenates in all CO nonattainment areas. Beginning November 1, 1992, all gasoline used in a CO nonattainment area, during the period of the year in which the area is prone to high CO concentrations, must contain at least 2.7% oxygen by weight. For MOA and FNSB, EPA originally set the applicable oxygenated fuels control period from November 1 to March 1 of each winter. ADEC initially adopted oxygenated fuels regulations on September 25, 1992, which meet the provisions of Section 211(m) (42 U.S.C. 7545 (m)).

ADEC suspended the oxygenated fuels program in the MOA in 2004 when EPA redesignated the MOA to attainment, concurrent with its maintenance plan approval. Congress exempted the FNSB from the oxygenated fuels program in the 1990s and the FNSB also was redesignated to attainment in 2004 without the use of oxygenated fuels. Oxygenated fuels remain as a contingency control measure in the MOA maintenance plan that would be reimplemented if a new CO violation occurs. The regulations for this control measure, *18 AAC 53, Fuel Requirements for Motor Vehicles*, are found in the Appendix to Section III.A.

The blending of gasoline with oxygenates such as alcohols or ethers has been found to greatly reduce exhaust emissions of carbon monoxide from both catalyst- and non-catalyst-equipped vehicles. Oxygenated fuels also affect HC emissions and oxides of nitrogen (NOx) as well as CO emissions. The effects, however, depend on the type of oxygenate employed and the age and maintenance of the vehicle fleet.

Fuel metering systems generally supply a fixed volume of fuel per unit of engine airflow. Thus, when an engine is running on a fuel that contains an oxygenate, it will have more oxygen than when it is running on straight gasoline. The extra oxygen leads to more complete combustion of the extra fuel used during the cold start, and thus reduces the level of CO and HC emitted.

To help communities evaluate the benefits of alternative oxygenates, EPA has incorporated oxygenated fuels credits into its mobile source emissions factor model, MOBILE. The model allows the input of any oxygen level up to the limit allowed by EPA regulation (i.e., 3.5% oxygen by weight, which is the level equivalent to a blend of 10% ethanol/90% gasoline). As EPA has updated the MOBILE model, the level of emission reduction credit for oxygenated fuels has also evolved. As a result of research into the benefits of oxygenated gasoline and adaptive memory features on late-model vehicles, EPA has updated the MOBILE model to reflect less benefit for oxygenated fuels in newer vehicles. MOBILE6 reflects this change.

2001 Evaluation of Municipality of Anchorage Ethanol Program – In 2001, MOA evaluated the emission reduction benefits of wintertime use of ethanol-blended gasoline in MOA, as part of its serious area CO control plan. The elements of the ethanol-fuel program have not changed, however the updated MOBILE Cold CO model was used to prepare these estimates.

The MOBILE Cold CO Model was run to estimate the CO reduction benefit of using ethanol-blended gasoline in Anchorage during the year 2000 attainment year. According to the model, on-road CO emissions are reduced by 13.6%. The impact of the ethanol-blended fuel program on warm-up idle emissions is unknown. If ethanol is assumed to have the same percentage benefit on idle emissions as it does on on-road emissions, the total CO reduction from the program is computed to be 7.61 tons per day.

Health-Related Concerns - Under the oxygenated fuels regulations adopted by ADEC, local refiners and distributors may choose the type of oxygenate (e.g., MTBE, ethanol, ETBE, TAME, etc.) used to meet the minimum-required oxygen content. During the first winter of the program, operational and supply considerations led all marketers to choose MTBE for use in both MOA and FNSB. The program was implemented as scheduled on November 1, 1992; however, within a short period of time, ADEC began to receive a high volume of health-related complaints from the general public regarding the use of MTBE-blended gasoline in the two communities. In particular, a large number of individuals allegedly suffered adverse effects from the use of the MTBE blend in FNSB.

As a result of these complaints, ADEC worked with EPA and the federal Centers for Disease Control (CDC) to conduct a detailed analysis of the human health effects of the wintertime use of MTBE in FNSB. This included both the distribution of a detailed health-related questionnaire and the analysis of blood samples of local residents exposed to the MTBE blends. Based on the preliminary results of these studies, ADEC decided to suspend the oxygenated fuels program in FNSB until further analyses of the potential health effects of MTBE use in cold climates could be completed.

Because of possible health concerns, ADEC chose to suspend the oxygenated fuels program in both FNSB and MOA pending the results of further studies conducted in cooperation with EPA. The FNSB program was initially suspended by emergency regulation in December 1992. Subsequent regulatory amendments were adopted on September 8, 1993, in accordance with all applicable federal and State public notice and comment requirements. These amendments required ADEC, if it decided to resume the program, to publish a notice of intent to do so no less than 75 days before its resumption. In 1996, based on public comment, the oxygenated fuels regulation were amended so that if ADEC decided to resume the program, it is required to publish a notice of intent to do so no less than 180 days before its resumption.

In support of ADEC's position, Congress approved a one-year exemption for Alaska from the federal oxygenated fuel requirements as a rider to the 1994 federal funding appropriations bill. Under this exemption, EPA was precluded from enforcing the provisions of the CAAA related to oxygenated fuels in Alaska during federal fiscal year 1994. In the report accompanying the appropriations bill, Congress further stated its intent that Alaska and EPA jointly finance, with the assistance of the refiners and producers, studies by the EPA to resolve health concerns related to the use of MTBE in Alaska. FNSB was again exempted from the oxygenated fuel requirements as a rider to the 1996 federal funding appropriations bill.

ADEC and EPA held several discussions in 1993 and 1994 regarding the results of additional studies conducted on the use of MTBE at low temperatures. ADEC worked together with CDC to develop a coordinated approach to studying the use of other oxygenated-fuel blends in Alaska, as an alternative to MTBE use. These studies involved both technical (e.g., fuel blend distribution and vehicle driveability) and health-related concerns pertaining to the use of oxygenated-fuel blends at the temperatures commonly experienced in FNSB and MOA during the winter months, which can be as low as -60° Fahrenheit.

Based on the preliminary results of these studies, and at the request of MOA, an ethanol-based oxygenated-fuels program was implemented in the MOA from January 1, 1995 to March 1, 2003. The maintenance plan adopted in 2004 no longer relies on oxygenated fules as a primary control strategy, due to its diminishing effectiveness shown in MOBILE 6 modeling. The current primary control strategies selected for MOA are shown in Table III.B.5-3.

III.A.3. Agency Responsibilities

United States Environmental Protection Agency

The United States Environmental Protection Agency, because of its direct involvement in the Federal Motor Vehicle Emission Control Program (FMVCP), has major responsibilities in reducing CO emissions in Anchorage and Fairbanks. In particular, the agency has the obligation to ensure that the federal motor vehicle control activities are effective in cold weather regions such as Alaska. It also must ensure that sufficient federal funding will be available to carry out evaluation studies and control actions required of the state. In carrying out its functions, the Environmental Protection Agency is responsible for

- Establishing and enforcing requirements outlined in the 1990 CAAA for the Federal Motor Vehicle Control Program. The federal certification program requires all new cars sold in the 49 states (California has its own certification program) to meet certain emissions standards. While these standards vary according to vehicle age and type, new vehicles must generally meet more stringent emission standards than the older vehicles that they replace. This results in a decline over time in allowable emissions from newly manufactured vehicles, and thus a drop in overall emissions from the motor vehicle fleet as older, dirtier vehicles are replaced with newer, cleaner vehicles;

- Establishing and enforcing requirements for the cold temperature CO certification program for new motor vehicles, as described in Section III.A.2;

- Establishing and updating guidance on the structural requirements of the oxygenated fuels program;

- Working with the United States Department of Transportation (USDOT) to establish and amend conformity criteria as required by section 176(c) of the CAAA (42 U.S.C. 7506(c);

- Ensuring that Alaska has access to available federal money for implementation of control strategies;

- Providing technical assistance as necessary;

- Providing funding support for the needed local and state programs.

Department of Environmental Conservation

In the area of carbon monoxide control measures, ADEC is directly responsible for implementing the oxygenated fuels program, as is described in Section III.A.2. ADEC is also responsible for implementing and administering the commuter I/M program for out-of-area vehicles commuting into MOA. In addition, it provides technical and resource

assistance to the MOA and FNSB transportation control efforts, and oversight and performance auditing of the local I/M program.

In addition, ADEC coordinates and ensures that statewide air quality priorities and financing are accomplished in a rational and cost-effective manner. In carrying out these functions, ADEC is responsible for

- Advising and assisting Anchorage and Fairbanks MPOs in development of air quality control plans and transportation improvement programs;

- Maintaining active participation in the Anchorage Metropolitan Area Transportation Study (AMATS) and Fairbanks Metropolitan Area Transportation Study (FMATS) Air Quality Technical and Policy Committees, which are set up as a supplemental part of the transportation planning process;

- Providing technical assistance and air quality evaluations of proposed transportation projects, programs and plans. This is provided on an as-needed basis to the Alaska Department of Transportation and Public Facilities (ADOT/PF) for the Anchorage and Fairbanks areas and through regular participation in the interagency consultation process required under transportation conformity regulations;

- Annually coordinating, reviewing and making recommendations to the appropriate agencies concerning air quality control efforts for the coming year, including placing a priority on available funds.

Municipality of Anchorage

The MOA includes the following agencies:

- the Department of Community Planning and Development, which is responsible for transportation planning and implementation;

- the Transit Department, which operates Anchorage's "People Mover" public transit system and the Anchorage Rideshare program;

- the Department of Health and Human Services, which is responsible for air quality planning and air pollution control in Anchorage, including the operation of the Anchorage Vehicle Inspection Program; and

- the Anchorage Metropolitan Area Transportation Study (AMATS) planning group, which is the lead agency responsible for coordinating and complying with the 3C transportation planning process required under federal regulation. (Further information on the functioning of AMATS is provided in Section III.B.1.)

The MOA is the lead governmental agency for carrying out the Anchorage Air Quality Control Plan, and as such is responsible for the following:

- Developing, adopting and submitting an approvable air quality control plan to ADEC that demonstrates attainment and maintenance of the NAAQS for carbon monoxide. MOA is also responsible for implementing the local control measures included in the plan;

- Operating a motor vehicle inspection and maintenance program that complies with state I/M regulations;

- Evaluating and implementing transportation planning activities to ensure the continued federal certification of the Anchorage Metropolitan Area Transportation Solutions;

- Conducting ambient air and meteorological monitoring to characterize carbon monoxide concentrations throughout the maintenance area;

- Conducting an annual review of the Anchorage Carbon Monoxide Control Program, based on new monitoring data and ongoing control efforts through the AMATS Air Quality Technical and Policy Committees;

- Participating in the interagency consultation process required under transportation conformity regulations; and

- Enforcing the carbon monoxide episode plan.

Fairbanks North Star Borough

The FNSB was designated by ADEC in 1978 as the lead Metropolitan Planning Organization in the Fairbanks area. It thus has primary responsibility for carrying out an effective transportation control plan for the area. In accordance with this, its principal responsibilities are

- Developing, adopting, and submitting an approvable air quality control plan to ADEC which demonstrates attainment and maintenance of the NAAQS for carbon monoxide. The FNSB is also responsible for implementing the local control measures included in the plan;

- Operating a motor vehicle inspection and maintenance program that complies with state I/M regulations;

- Conducting ambient air and meteorological monitoring to characterize carbon monoxide concentrations throughout the maintenance area;

- Conducting an annual review of the Fairbanks Carbon Monoxide Control Program based on new monitoring data and ongoing control efforts;
- Participating in the interagency consultation process required under transportation conformity regulation;

- Enforcing the carbon monoxide episode plan; and

- Working with FMATS to ensure coordination between the air quality and transportation planning processes.

Department of Transportation and Public Facilities (ADOT/PF)

ADOT/PF is a key agency in controlling carbon monoxide emissions in both Anchorage and Fairbanks, because of its role in both communities' transportation planning and construction processes. ADOT/PF is represented on both the Policy and Technical committees of AMATS and FMATS. The responsibilities of ADOT/PF are:

- Providing technical assistance and support to AMATS and FMATS as needed;

- Participating in the air quality transportation planning process, through the Air Quality Technical and Policy Committees of AMATS and FMATS;

- Maintaining the Highway Performance Monitoring System (HPMS;

- Incorporating the latest and most accurate air quality data and analysis techniques into transportation project evaluations, and in major corridor studies as soon as the information becomes available. Assistance and support is provided by ADEC in this effort;

- Participating in the interagency consultation process required under transportation conformity regulations; and

- Participating, through the air quality transportation planning process, in the allocation of Congestion Mitigation and Air Quality funding to projects that reduce carbon monoxide emissions in both Anchorage and Fairbanks.

Federal Highways Administration (FHWA)

The FHWA has the responsibility for ensuring that federally funded transportation planning and construction in Alaska will be compatible with air quality objectives and requirements. Therefore, the FHWA provides an important function in ensuring that air quality criteria are effectively carried out in these activities.

In particular, FHWA is responsible for annually reviewing the Unified Work Program in Anchorage with all involved agencies, to ensure that needed air quality activities are

prioritized, funded and carried out. FHWA, along with the AMATS and FMATS planning groups in Anchorage and Fairbanks, is also responsible for ensuring that the long-term and short-term transportation activities that are federally funded will be compatible with air quality requirements. The overall objective of the conformity determinations is to ensure that the regional transportation plan for each community conforms to this SIP for all transportation projects. Conformity procedures applicable to transportation projects, plans, and programs in MOA and FNSB are described in Section III.I of Volume II and under state regulations in 18 AAC 50.700-725.

[1] Steubenville, Ohio and Oshkosh, Wisconsin were excluded from the count of CO nonattainment areas due to the non-vehicular nature of each area's pollution problems.
[2] Personal communication with David Sosnowski, United States Environmental Protection Agency, October 3, 1995.
[3] "Alaska ECOS/STAPPA/EPA I/M Credit Evaluation Data Submittal," Alaska Department of Environmental Conservation, November 1998.
[4] FNSB 1995-1999 Winter Parking Lot Sweep Summaries, provided by Joan Kassel, Alaska Department of Environmental Conservation, February 18, 2000.
[5] Ibid.