

EXECUTIVE SUMMARY

The Enhanced Inspection and Maintenance (I/M) program, known as Smog Check II in California, is achieving significant emission reductions which are needed to meet health-based air quality standards. In this report, we quantify the effectiveness of the Enhanced I/M program for the primary evaluation period of November 1998 through October 1999, and compare the results to the legal targets established by the California State Implementation Plan (SIP). We also examine the additional nitrogen oxide (NO_x) benefits that result from today's tighter NO_x inspection standards, which were not in place during the evaluation period. Finally, we identify feasible, effective options for improving the program.

Major Findings

Program Effectiveness in Summer 1999. Using roadside test data from nearly 9,000 vehicles, we estimate that the Enhanced I/M program achieved combined emission reductions of 40 tons per day (TPD) of hydrocarbons (HC) plus NO_x in Summer 1999, compared to the SIP target of 110 TPD. (The original SIP target of 112 TPD has been revised since the draft report because a new SIP has been federally approved for the South Coast.) Overall, the program achieved 36 percent of the expected emission reductions for 1999. The SIP target is the total emission reductions anticipated in 1999 for each of the six regions in the State required to implement Enhanced I/M.

Although the Enhanced I/M program has produced benefits, the reductions achieved fell short of the SIP target for three primary reasons: (1) more rigorous program elements have not been implemented because they are being phased in over a longer timeframe; (2) the SIP emission reduction target assumed that additional communities and vehicles would be subject to Enhanced I/M; and (3) legislative changes lessened the effectiveness of the Enhanced I/M program.

Program Effectiveness Today. The current program in place today is *more effective* than the program in place in Summer 1999, achieving an estimated 65 TPD of HC plus NO_x reductions, about 60 percent of the expected emission reductions compared to the same SIP target. This increase is due to the more rigorous NO_x inspection criteria implemented in October 1999 (at the end of the program evaluation period).

Given that the program is not using the more stringent final inspection standards assumed in the SIP to pass and fail vehicles, these results are encouraging. Nevertheless, the program is not accomplishing all of the expected reductions; changes to increase program effectiveness are needed.

Improvements Can Bring Program Into Full Compliance. This report identifies a set of options for improving the Smog Check II program. If the full set of options is implemented, the program can meet the legal emission reduction target in the SIP and satisfy the federal requirements for program performance. Improving the Smog Check II program to achieve the full emission reductions anticipated in the SIP would help areas attain the federal ozone standards on time. It should also allow transportation agencies to find that their transportation programs conform to the SIP, thereby avoiding the loss of federal transportation funding. The full combination of improvement options is needed to meet the SIP target in all Enhanced I/M areas of California in all years.

Changes from the Draft Report

In addition to expanding the section of the report which evaluates and quantifies options to improve the program, we have made several revisions to the draft report.

- **New SIP and Smog Check II target for the South Coast.** Since we released the draft report, the U.S. Environmental Protection Agency (U.S. EPA) has approved a 1999 revision to the South Coast Ozone SIP and that approval is now effective. The new South Coast SIP modified the Smog Check II program targets for the South Coast. We have incorporated these new targets into the report. The new SIP also uses a different motor vehicle emission inventory, based on the EMFAC7G model instead of the EMFAC7F model. The new statewide Smog Check target for 1999 is 110 TPD HC+ NO_x; the old target had been 112 TPD.
- **Roadside data for gas cap testing.** At the time we released the draft report, we had not yet analyzed the roadside data on gas cap testing to evaluate the program effectiveness in reducing evaporative emissions. We have now analyzed that data and have incorporated it into our analysis for program effectiveness in 1999. The new data indicate less evaporative emission reductions in 1999 from gas cap testing than the draft report. A complete discussion appears in Section V.
- **EMFAC2000 emission model approved by ARB.** Our analysis of the benefits of potential program improvements is based on the approved motor vehicle emissions model, EMFAC2000. We released the draft report prior to ARB's approval of the model at our May 2000 Board Meeting. The approved model does not change the results of our analysis of current program effectiveness in reducing exhaust emissions (see Section V); therefore, we have not revised this part of our analysis that is based on the draft model. However, the evaporative emission component of the model was not complete in the draft version. Consequently, we have updated our analysis of the evaporative program effectiveness for future years using the approved version of the model. As mentioned above, the 1999 program benefits for evaporative emissions are now calculated using roadside data.

- **Minor updates and corrections.** We have reevaluated the roadside data, revising the 1999 program effectiveness in reducing HC, NOx, and carbon monoxide (CO) exhaust emissions. The new analysis incorporates improved data on the number of vehicles subject to Smog Check II and corrects some minor errors in our original analysis. These changes do not significantly affect the calculated percent reduction for the Smog Check II program. See Section III for a complete discussion.

Background

California has two types of inspection programs. Enhanced I/M, which is applicable to vehicles in the State's smoggiest urbanized regions, is a more rigorous version of the Basic I/M program. Both of these programs are administered by BAR to ensure vehicles stay "clean" as they age. In this report, we use the terms Enhanced I/M and Smog Check II interchangeably. The Smog Check programs are important strategies to improve air quality and protect public health by reducing vehicle emissions. Smog Check helps assure that vehicles continue to comply with applicable emissions standards through proper maintenance and repair of emission control systems or through vehicle retirement when repairs are no longer cost-effective.

Enhanced I/M is required by the federal Clean Air Act for regions with serious ozone or CO pollution problems. Enhanced I/M has been implemented in the urbanized portions of Los Angeles, Ventura, San Diego, the Sacramento metropolitan area, the Southeast Desert (Coachella and Antelope), and the San Joaquin Valley. Since ozone is formed in the atmosphere, the testing program measures the pollutants that cause ozone: HC and NOx. (Hydrocarbon emissions from vehicles have two sources – exhaust from the tailpipe and evaporative emissions from faulty gas caps and from fuel system leaks.) HC and NOx also react with other chemicals in the atmosphere to form inhalable particulate matter. Both of these pollutants cause or exacerbate lung disease.

The distinguishing features of the Enhanced I/M program include testing on a treadmill-like device (dynamometer) that allows measurement of NOx emissions, and inspection of vehicles most likely to have high emissions at stations that perform only tests and are prohibited from performing repairs (known as Test-Only stations). Basic I/M is in place in much of the remainder of the State. The Basic program does not measure NOx emissions, and all testing can be performed at the same station that performs repairs. Table ES-1 compares the Enhanced and Basic I/M programs in more detail. The key additional elements of the Enhanced program are shown in bold.

Our clean air plan is predicated on an effective Enhanced I/M program. Enhanced I/M is a key element of California's clean air plan – the Ozone SIP – which was adopted by local air districts and the ARB in 1994, making the emission reduction commitments federally enforceable. The U.S. EPA recently approved a revision to the South Coast's Ozone SIP, slightly modifying the emission reduction commitment for Enhanced I/M. In the SIP, Enhanced I/M is expected to provide about one-quarter of all

the new near-term emission reductions needed statewide to meet or make progress toward clean air standards.

**Table ES-1
Comparison of Current Smog Check Programs**

	BASIC I/M	ENHANCED I/M
Test Frequency	Biennial (plus initial registration and change-of-ownership)	Biennial (plus initial registration and change-of-ownership)
Test Type	Visual and functional test; BAR-90 test (two-speed idle (TSI))	Visual and functional test; BAR-97 test (loaded-mode; Acceleration Simulation Mode (ASM))
Vehicles Tested*	PC, LDT, MDV, HDT <i>(excluding diesel & electric vehicles)</i>	PC, LDT, MDV tested with BAR-97; All-wheel drives & HDT tested with BAR-90 <i>(excluding diesel & electric vehicles)</i>
Evaporative Test	Gas cap pressure test	Gas cap pressure test
Pollutants Measured	HC, CO	HC, CO, NOx
Model Years Tested	4 year old & newer vehicles exempt; 1973 vehicles & older exempt until 2003 when anything older than 30 years will be exempt	4 year old & newer vehicles exempt; 1973 vehicles & older exempt until 2003 when anything older than 30 years will be exempt
Repair Cost Waiver and Hardship Extension	One-time \$450 (or \$250 through economic hardship extension); Gross polluters are eligible for waiver	One-time \$450 (or \$250 through economic hardship extension); Gross polluters are eligible for waiver
Repair Assistance/Vehicle Retirement	Up to \$500 repair assistance, \$1,000 vehicle retirement	Up to \$500 repair assistance, \$1,000 vehicle retirement
Station Types	Test and Repair	Test and Repair; About 15% of vehicles inspected at Test-Only
Test Result Transmission	Electronic	Electronic
Cut Points	Two-speed idle cut points	Initial cut points used in 1998-1999; More stringent NOx cut points instituted in October 1999

*PC = passenger car; LDT = light-duty truck; MDV = medium-duty vehicle; HDT = heavy-duty truck

About this report. The purpose of this report is to evaluate how well the Enhanced element of the I/M program is meeting the requirements of the SIP. This report is not intended to evaluate the fundamental design of the entire Smog Check program in California. We have developed this report to meet the requirements of state and federal law. These requirements are:

- State law (Health and Safety Code section 44021(e)) requires ARB, in cooperation with BAR, to compare the emission reductions being achieved to those required by the SIP, assess the emissions impact of continuing the new vehicle exemption, and make recommendations to improve the effectiveness and cost effectiveness of the program. Our report was due to the I/M Review Committee – a legislatively created Committee charged with analyzing the effect of I/M on vehicle emissions and air quality – in January 2000.

- Federal regulation (Code of Federal Regulations, Title 40, section 51.353(c)) requires us to submit a biennial report to the U.S. EPA that quantifies the emission reductions achieved from the Enhanced I/M program, and assesses whether the program is meeting the requirements of the Clean Air Act. The first biennial report was due February 8, 2000, which is two years after the “start date” of the Enhanced I/M program.

Delays in implementing the Enhanced program and collection of the data used to assess its effectiveness have delayed this report.

I/M Review Committee Report.

The I/M Review Committee is also preparing its own report to the Legislature on the effectiveness of the program and recommendations for change. The calculated emission benefits of the program (using the most current emission inventory) contained in the I/M Review Committee report and this report are relatively similar. However, there are still significant disagreements between the I/M Review Committee and ARB regarding the need and importance of considering the SIP targets, and program performance in relation to those targets. We also disagree about the most appropriate methodology to evaluate the Enhanced I/M program.

As of the end of June, the I/M Review Committee draft report does not contain specific recommendations regarding improvements to the Enhanced I/M program. However, the findings contained in that report appear to significantly disagree with the findings and options contained in our report. For example, the I/M Review Committee report finds that there is no performance difference between Test-Only stations and a type of Test and Repair stations allowed under a pilot program managed by BAR to certify gross polluters (Gross Polluter Certification stations). We disagree. As discussed in Chapter VI, BAR’s analysis shows that vehicles directed to Test-Only stations ultimately pass the smog inspection with much lower emissions than vehicles that use Gross Polluter Certification stations or the Test and Repair station network overall.

We have spent considerable time working with the I/M Review Committee, as well as its staff and contractors, in an attempt to resolve the differences between the analyses and program improvements presented in our respective reports. Our final report reflects some of the changes they recommended, and we will continue to suggest revisions to the I/M Review Committee report as it develops further.

Evaluation Method

In evaluating the effectiveness of the Enhanced I/M program, BAR and ARB used test data from vehicles randomly pulled over at the roadside. We believe this is the best available data from a real world standpoint. Before choosing this method, we considered using data collected by smog check station test instruments, using data collected by remote sensing (a radar-like device that uses an infrared or ultraviolet light

beam to instantly measure emissions from vehicles as they are driven), using test data from vehicles pulled over at the roadside, and several methods identified in guidance issued by U.S. EPA.

We chose the roadside pullover method for several reasons. It provides a good random sample of on-road vehicles, and we could test the vehicles with the same test equipment used in the licensed smog shops. It also accounts for actual inspections and repairs, pre-inspection and pre-repair (prior to the official Smog Check test), and fraud.

Control Program Effectiveness: Random roadside data collection and analysis. This method was used to assess the effectiveness of the program as it existed in 1999. BAR began collecting roadside data in February 1997. A uniformed California Highway Patrol officer randomly pulled over passenger cars, pick-up trucks and medium-duty vehicles. With the permission of the driver, BAR performed a short inspection of the vehicle. The inspection included an emission test using the same dynamometer and emission measurement equipment used in Smog Check stations. Collection of data began before the Enhanced I/M program was implemented. This provides an historic emission baseline that can be compared to roadside data collected in the future. Roadside data was continuously collected through late 1999. BAR inspected over 27,000 total vehicles, including the subset of about 9,000 vehicles that provide the basis for the evaluation in this report.

Enhanced Smog Check testing using dynamometers began in June 1998. In November 1998, NO_x inspection standards (or “cut points”) were lowered to approximately “gross polluter” levels. In October 1999, the cut points for NO_x were again made more stringent. We chose to analyze the roadside data collected between November 1998 and October 1999. During this period, the inspection standards were generally constant, and a portion of the fleet had undergone Enhanced testing while the rest had not. This provided a one-time opportunity to make a contemporaneous comparison of the emissions of vehicles that had undergone Enhanced inspection to those that had not.

The “Before” sample includes about 5,200 vehicles that had not yet undergone an Enhanced inspection, and the “After” sample includes approximately 4,200 vehicles that had been tested under the Enhanced program. Our roadside analysis determines the emission reductions achieved by the Enhanced I/M program during its initial stage of implementation – when the NO_x inspection standard was set at a relatively lax level designed only to identify gross polluters. We included the tighter NO_x cut points implemented in October 1999 when we calculated the effectiveness of the current program.

ARB and BAR staff believe that the “Random Roadside Analysis” is the most accurate methodology for evaluating the exhaust emission reductions of Enhanced I/M in 1999. It uses a proven emission measurement method on a random sample of on-road vehicles. It accounts for the effects of Smog Check inspection and repair, pre-inspection and pre-repair (prior to the official Smog Check test), and fraud.

Predicted Future Effectiveness: EMFAC2000 Emission Model. The roadside analysis allows us to evaluate the change in exhaust emissions due to Enhanced I/M at just one point in time. For the April 2000 draft report, we used the draft version of ARB's latest vehicle emissions inventory model – draft EMFAC2000 – to determine the benefits of changes to the program (such as the more stringent inspection standards implemented in October 1999) and to project the effectiveness of the current program in future years. We also used the model to quantify the evaporative emission reductions from gas cap inspections in future years, and the loss of benefits from the exemption of vehicles. We took the model results about program effectiveness and applied them to the emission inventory used in the SIP to forecast the emission reductions from Enhanced I/M in future years.

The Air Resources Board approved EMFAC2000 at its May 2000 meeting. Because the approved version of the model does not change the results of our analysis of program effectiveness in reducing exhaust emissions, we are not updating this part of our analysis. However, the evaporative emission component of the model was not complete when we released the draft model, so we have updated our analysis of the evaporative program effectiveness for future years using the new, approved model. In addition, the new analyses of options for improving the program are calculated using the approved EMFAC2000 model and then converted to the applicable SIP inventory to compare to the target.

U.S. EPA Methods. In 1998, U.S. EPA published guidance describing Enhanced I/M program evaluation methods. Two of these methods use test data that can be correlated to the U.S. EPA-preferred IM240 test, but cannot be easily correlated to the Acceleration Simulation Mode (ASM) test used in California. U.S. EPA did not approve the use of remote sensing data for these evaluations, pending further study.

A third approved method compares post-inspection emissions and functional inspection results (such as the gas cap check for evaporative emissions) to the emissions data collected in the State of Arizona's Enhanced inspection program. U.S. EPA believes the Arizona program (in which all inspections are performed at centralized, Test-Only stations using the IM240 dynamometer emission test and advanced testing of evaporative emission control performance) establishes the "benchmark" Enhanced I/M program to which other state programs can be compared.

Although several states have used this method to compare their programs' emission reductions to Arizona's, we do not believe that the "benchmark" methodology provides an honest portrayal of the effectiveness of California's Enhanced I/M program. We retained the consulting firm that developed the method for U.S. EPA to advise us on its use in California. The firm determined that the method has not been properly used to date because the data available from Arizona's program did not meet the criteria needed for use in the method. During the 1998-1999 evaluation period for our program, Arizona's program did not meet U.S. EPA specifications. For example, Arizona did not require vehicles to be warmed-up (or "preconditioned") prior to testing, as envisioned

under U.S. EPA specifications. In addition, at that time, Arizona was using interim, less stringent cut points than required by U.S. EPA. In January 2000, Arizona changed its program to require pre-conditioning and improved the inspection standards to meet U.S. EPA requirements.

Because there is not yet sufficient data from Arizona, we have concluded we cannot use the Arizona “benchmark” methodology to evaluate our program at this time. When sufficient data from Arizona become available, it will be possible to use the “benchmark” method to evaluate California’s program.

U.S. EPA has encouraged states to propose alternative methodologies as appropriate, and we have done so – basing this report on the random roadside analysis supplemented with the emission model.

Results

The Enhanced I/M program is reducing emissions. We used the roadside data to compare the emissions of thousands of vehicles that had not yet been through Enhanced I/M to those that had. Based on the roadside data, the Enhanced I/M program reduced HC exhaust emissions by 14 percent, reduced NOx emissions by 6 percent, and reduced CO emissions by 13 percent in 1999 (see Chapter III, Table III-3). For NOx, the cut points in effect during roadside testing were at the looser gross polluter level, and relatively few vehicles failed due to high NOx emissions. Thus, it is not surprising that the reduction in NOx emissions is less than for the other pollutants. At the end of the roadside testing used in this report, BAR implemented more stringent NOx cut points, resulting in increased NOx reductions.

We used data on the number of vehicles in each model year, their travel frequency, and a correlation equation to convert the roadside test results (a steady state test that measures pollutant concentration) to fleet average emissions in grams per mile. We then calculated the percent reduction in fleet average emissions due to Enhanced I/M by comparing the fleet average emission rate for vehicles before Enhanced I/M to the rate for vehicles after Enhanced I/M. We used this percent change to calculate the reductions in exhaust emissions in the inventory of the SIP. We used the roadside evaluation of the effectiveness of gas cap testing to estimate the reductions in HC evaporative emissions (see Chapter IV). (Although not comparable to the SIP, we also examined the emission reduction benefits of the Enhanced I/M program in Summer 1999 using our most up-to-date inventory assumptions, as shown in Appendix A. This is the appropriate figure to use in calculating the cost-effectiveness of the program.)

Emission reductions increase with the newer, more stringent NOx cut points. The roadside data available were collected before the tighter NOx cut points were implemented last October. Since no roadside data are available to show the benefits of the tighter NOx cut points, we used ARB’s emission model, draft EMFAC2000, to assess the emission reductions associated with the change in NOx inspection standards. The model is designed to simulate the inspection and repair

process of typical I/M programs. The data upon which the model is built comes from testing thousands of cars at ARB's laboratory. The model includes the results of an I/M pilot program authorized by the Legislature, which was used to design the current Enhanced I/M program. The draft EMFAC2000 model shows that the more stringent NOx cut points implemented in October 1999 increase the NOx reduction from the Enhanced program to 16 percent, compared to the roadside results of 6 percent with the prior gross polluter cut points.

Emission reductions fall short of expectations. We also used the model to determine how well our current Enhanced I/M program is meeting our SIP commitments for emission reductions. Although the SIP goal was based on more rigorous cut points, annual inspections for gross-polluting vehicles, and no vehicle exemptions, these features are not being implemented based on post-1994 legislative changes and concerns about consumer acceptability. In addition, the SIP emission reductions anticipated an evaporative emissions test equivalent to the U.S. EPA-preferred pressure/purge test. We have implemented a gas cap check to reduce evaporative emissions, but are not achieving all of the anticipated evaporative emission reductions.

Since the SIP was adopted in 1994, we have significantly increased our understanding of vehicle emissions – including substantially higher vehicle emission rates in 1999 than had been projected five years earlier, changes in vehicle population and activity, and two revisions to the emission model used to determine the reductions that could be achieved from Enhanced I/M. Although these changes have occurred, the inventory used in the 1994 SIP (based on the model EMFAC7F) remains a legally enforceable document upon which we must determine the adequacy of the Enhanced I/M program for five of the six SIP areas. Since the draft report was published, a revised 1999 SIP for the South Coast Air Basin, which relies on a more recent vehicle emissions model (EMFAC7G), has become effective. Because of this, we have modified the SIP-related charts in this final report to reflect the modified Smog Check II commitment for the South Coast and translated the results of program effectiveness into the appropriate inventory for the new plan.

In addition to the effectiveness of the Enhanced I/M program, our progress toward meeting the SIP commitment depends upon whether the scope of the current program matches the assumptions modeled in the SIP to estimate program benefits. In retrospect, the SIP emission reductions assumed that additional communities outside the urbanized area, as well as heavy-duty gasoline trucks, would be included in loaded-mode testing. Chapter V provides estimates of emission reductions achieved, in terms consistent with the SIP, for each affected metropolitan area. Table ES-2 shows percent effectiveness of Enhanced I/M in reducing emissions to meet the SIP target in Summer 1999, based on roadside data. The effectiveness is shown statewide, however, the program is more effective in some areas, and less effective in others.

Table ES-2
Effectiveness of Enhanced I/M in Summer 1999¹
 (Based on roadside data)

HC (exhaust + evaporative)			NOx		
Emission Reductions Achieved	SIP Target	Effectiveness	Emission Reductions Achieved	SIP target	Effectiveness
28 TPD	56 TPD	51%	12 TPD	55 TPD	22%

¹These percentages represent the percent of the SIP target achieved statewide in Summer 1999. They are for NOx at gross polluter cut points. BAR increased the stringency of the cut points in October 1999.

²The Smog Check II program is more effective in some areas, and less effective in others. For example, in the Sacramento Region, for 1999, the Smog Check II program was only achieving 44 percent of the HC goal and 16 percent of the NOx goal in the SIP.

However, because BAR increased the stringency of the NOx cut points in October 1999, the roadside data shown in Table ES-2 does not provide an up-to-date portrayal of the SIP benefits of the current Enhanced I/M program. We used the draft EMFAC2000 model to estimate the change in effectiveness if the tighter NOx cut points had been in place for all of 1999. The results are shown in Table ES-3. The modeled effectiveness for HC differs from the roadside results for HC because the draft EMFAC2000 model is based on testing of different vehicles, using different test procedures, than the roadside measurements.

Table ES-3
Effectiveness if Current Enhanced I/M Program
Had Been in Place Throughout 1999¹
 (Based on emission model)

HC (exhaust + evaporative)	NOx
60%	59%

¹These percentages represent the percent of the SIP target achieved in Summer 1999. They are for NOx at the current cut points implemented in October 1999.

Effect of vehicle exemptions. State law requires ARB to evaluate the emissions impact of exempting vehicles from the Smog Check program. Newer vehicles, four model-years and younger, and older, pre-1974 model-year vehicles, have been exempted from inspections by statute (the first four model-years still require a smog inspection upon change of ownership and upon initial registration in California). About 500,000 older vehicles and 3.8 million newer vehicles are exempt. We used the draft EMFAC2000 model to quantify the program effectiveness if these vehicles were

subject to inspection. Including older cars in the Enhanced I/M program would increase the effectiveness of the program from 60 to 66 percent for hydrocarbon. Because older vehicles have less refined NOx controls, the NOx impact of including these vehicles is much less significant. Requiring newer cars to be inspected at their second birthday would have a negligible impact on program effectiveness because newer vehicles rarely fail Smog Check. Table ES-4 shows the impact of eliminating the pre-1974 vehicle exemption on program effectiveness.

Table ES-4
Impact of Older Vehicle Exemption on Effectiveness in 1999¹
 (Based on emission model)

	HC (exhaust + evaporative)	NOx
Current program (Older vehicles and newer vehicles exempt)	60%	59%
Include 1966-1973 vehicles	66%	61%

¹These percentages represent the percent of the SIP target achieved in Summer 1999.

Options For Increasing the Effectiveness of the Smog Check II Program

With the increase in stringency of the NOx inspection standards implemented last October, the emission reductions being achieved by the Enhanced I/M program are significant. Nevertheless, the program is not achieving all of the emission reductions needed to meet the requirements of the SIP, and thus changes to increase the effectiveness are needed.

Based on ARB and BAR assessments, input from a public workshop, meetings with interested stakeholders, and written comments, several changes to increase the emission reductions from the program appear available. Chapter VI of this report contains an expanded discussion of each option, including the potential emission reductions benefits. While not an exhaustive list of all possible options, the following are the most significant options that we expect would have direct, quantifiable emission reduction benefits:

- A more comprehensive check for evaporative system and liquid leaks;
- Sending more vehicles to Test-Only stations and/or higher performing Test and Repair stations;
- More stringent inspection standards;
- Loaded-mode testing for heavy-duty vehicles;
- Remote sensing;
- Extending the program to all eligible vehicles registered in a nonattainment region already subject to Smog Check II; and
- Repealing the rolling 30-year exemption, which is scheduled to begin in 2003.

More Comprehensive Check for Evaporative System and Liquid Leaks. A more comprehensive evaporative system and liquid leak check/inspection could be developed and implemented as a new part of the Smog Check program. BAR has already initiated a pilot program to visually inspect for liquid leaks. We will work with BAR to assess the costs and benefits of a more comprehensive effort, including a low pressure evaporative system test.

More Vehicles to Test-Only and/or Higher Performing Test and Repair Stations. Currently, fewer vehicles are directed to Test-Only stations than the SIP emission reductions assumed. BAR studies show that more emission reductions are achieved from vehicles inspected at Test-Only stations than from vehicles inspected at Test and Repair stations as a whole. However, BAR studies indicate that the top 25 percent of Test and Repair stations perform as well as Test-Only stations. Directing more vehicles with suspected high emissions to Test-Only and/or higher performing Test and Repair stations would increase the emission benefits of the program.

More Stringent Inspection Standards. More stringent inspection standards could take several forms. One approach involves tightening the inspection standards for all vehicles, which would result in additional vehicles being repaired. Establishing more stringent NOx cut points, at a point half-way between current cut points and the final cut points envisioned in the SIP, would provide a significant increase in program effectiveness for controlling NOx emissions.

In the April 2000 draft report, we also discussed another approach which would require those vehicles that are failed to be fully repaired – the cut points following repair would be more stringent than the standards used initially to inspect the vehicle. This approach has several advantages. However, because of the lead time for implementation, we are focusing now on simply tightening NOx inspection standards for all vehicles.

Loaded-Mode Testing for Heavy-Duty Gas Trucks. The emission reductions in the SIP assumed heavy-duty gasoline trucks would be tested under loaded-mode conditions. BAR currently uses a two-speed idle test for these vehicles. To implement loaded-mode testing, loaded-mode cut points will need to be developed for heavy-duty gasoline trucks.

Remote Sensing. Many commenters suggested including remote sensing in the Smog Check II program. ARB and BAR will pursue a pilot study to evaluate how we can use remote sensing to identify high emitters which would immediately obtain a Smog Check. We will also assess the ability to use remote sensing to identify “clean” vehicles which could be exempted from their next inspection.

Extend Program to All Eligible Vehicles Registered in a Nonattainment Region Already Subject to Smog Check II. Because only “urbanized” areas with a population greater than 50,000 are subject to the Enhanced I/M program, not all vehicles registered in nonattainment areas are inspected using a loaded-mode test.

There are considerable opportunities to achieve additional reductions from this option in the Sacramento and San Joaquin Valley nonattainment areas.

Repeal the 30-Year Rolling Exemption. Older cars continue to contribute a disproportionate amount of emissions, despite their relatively low numbers and use. The current exemption of pre-1974 models becomes a rolling 30-year exemption in 2003 – institutionalizing the loss in emission benefits. One option would be to freeze the current exemption for 1973 and older models. Over time, as pre-1974 vehicles represent an ever smaller part of the fleet through retirement, the impact of having exempted these vehicles would become negligible.

Impacts of the Shortfall and Need to Implement Program Improvements

California must improve the effectiveness of the Smog Check II program or face serious legal and financial consequences – including the loss of over \$1 billion a year in federal transportation funding for the Los Angeles area alone. Urban areas subject to Smog Check II (including Sacramento, the San Joaquin Valley, and the greater Los Angeles region) must make affirmative findings this summer that their transportation plans “conform” to air quality goals to receive federal funding.

The Clean Air Act requires transportation agencies to find that their transportation programs conform to the SIP. For motor vehicle-related pollutants (such as HC, CO, and NOx), the SIP establishes an emissions “budget” for on-road motor vehicles based on progress and attainment needs. Motor vehicle emissions, with the planned transportation projects in place, must be within the budget in order to receive federal funding. If a region’s new transportation plan or projects within that plan would cause emissions to exceed the budget, conformity lapses and new expansion projects cannot be funded. The shortfall in the Smog Check II program creates a more difficult hurdle for transportation agencies to make conformity findings because it results in higher motor vehicle emissions.

Implementing Smog Check II program improvements would allow the transportation agencies to claim credit in their conformity analyses for the additional emission reductions. There is a critical need for improvements to be in place and achieving reductions by 2002 to help enable conformity findings in Sacramento and Los Angeles this summer.

Program improvements are essential for business interests, as well as transportation. A fully effective Smog Check II program is a key component of the effort in Sacramento, San Joaquin Valley, and Ventura to attain the federal ozone standard in 2005. If these areas fail to attain the standard on schedule, the federal Clean Air Act requires major sources of HC emissions (i.e., large facilities) to pay fees to the State as a penalty until the area attains.

If the full set of options for improving the Smog Check II program identified in this report are implemented, the program can achieve the full emission reductions

anticipated in the SIP. Thus, implementing all of the program improvements identified in this report would allow the State to meet its SIP obligations, which should enable transportation agencies to make positive conformity findings.

The draft report provided preliminary estimates of effectiveness for the Enhanced I/M program to support conformity assessments. We will revise the preliminary estimates based on the options presented in this final report, and provide those revisions directly to local transportation agencies.