



ARNOLD SCHWARZENEGGER, Governor

# *California Inspection and Maintenance Review Committee*

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## Review of the Smog Check Program

November 28, 2006

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# PART I

## EXECUTIVE SUMMARY

## **PART I: EXECUTIVE SUMMARY**

This report, by the Inspection and Maintenance Review Committee, presents discussion and recommendations on a variety of changes to the Smog Check program. More detailed information has been provided in Part II of this report. We have also included suggested program improvements that were first reported to the Legislature in the 2004 IMRC Report.

### **IMPROVE STATION PERFORMANCE BY IMPLEMENTING VEHICLE MODEL SPECIFIC EMISSION CUTPOINTS**

Motor vehicles that require a loaded mode emissions test either pass or fail the emission portion of the Smog Check inspection based on an emission cutpoint table identified in Title 16, Division 33 of the California Code of Regulations. The cut point table for passenger cars and light duty trucks consists of 52 different cutpoints. However, over 21,000 vehicle configurations currently exist in the vehicle population. Research commissioned by the Air Resources Board (ARB) has shown that model specific cutpoints would increase emission reductions of hydrocarbons and oxides of nitrogen by 5.5 – 7.8 tons per day, depending on the stringency of the new cutpoints.

#### **Recommendation for Administrative Action**

The Bureau of Automotive Repair (BAR) should revise cutpoints to more accurately reflect the emission performance capability by model year, make, model, engine size and configuration, tightening them based on more complete information and based on the report completed by Sierra Research in July 2005. Implementing the model specific cutpoints requires a modification to the Vehicle Look-up Table which is a reference table used by the BAR 97 Emission Inspection System (EIS). However, no additional software upgrades are required to accommodate the increase in the number of model specific outpoints. Therefore, BAR should modify the VLT to implement this strategy as soon as practical.

### **SMOG CHECK PROGRAM AVOIDANCE**

The number of vehicles observed on the road that do not have current Department of Motor Vehicles (DMV) registration tags has concerned the IMRC because the DMV registration is the enforcement mechanism used to ensure that vehicle owners comply with Smog Check inspection requirements set forth in section 4000.1 of the California Vehicle Code. Through data analysis the IMRC estimates that delinquent Smog Check repairs increase emissions of 1 – 2 ton per day of HC and NO<sub>x</sub>.

Section 4000.1 of the California Vehicle Code requires that vehicles undergo a Smog Check inspection biennially prior to the DMV registration due date. However, if a motorist delays the Smog Check inspection and pays DMV the correct fees on time, there is no additional penalty. Unfortunately, these delinquent vehicles continue to drive on the roadways emitting excessive emissions until the emission-related repairs are completed.

## **Recommendation for Legislative Action**

The IMRC recommends that the Legislature amend section 9552(b) of the California Vehicle Code to ensure that the DMV late registration penalties continue to accrue until the Smog Check requirement has been completed and received by DMV in addition to the required registration fees.

## **COMPARISON OF TEST-ONLY, GOLD-SHIELD, AND TEST AND REPAIR SMOG CHECK STATIONS IN TERMS OF STATION PERFORMANCE AND DIRECTION OF VEHICLES**

The IMRC has been analyzing Smog Check inspection data to compare the performance of Test-Only, Gold Shield, and Test-and-Repair Smog Check stations. Historically, the metric used for measuring station performance has been defined as the Smog Check failure rate. Based on a report by Dr. Jeffrey Williams, an IMRC member, we conducted an analysis of Smog Check inspection data to evaluate station performance based solely on the Smog Check inspection failure rate.

When the data are controlled for variables such as vehicle model year, mileage, vehicle type, and manufacturer, there is no significant statistical difference between the failure rates of the three station types. Among the sample “D” vehicles used for this analysis, the average failure rate was 14.3%. The analysis used Test-Only as the standard and indicates that Gold Shield stations fail 0.80% more vehicles than Test-Only while Test-and Repair stations fail 0.50% less than Test-Only. However, these differences are not statistically significant. The IMRC is continuing this evaluation using additional metrics and data and will provide a follow-up report.

Providing an adequate response to Assemblywoman Horton required a significant amount of research and confirmation of information, resulting in the belief that there is a great need to evaluate Smog Check station performance. A copy of our response is available in the Appendix of this report. It is our opinion that the decision to direct 36 percent of the vehicle fleet to Test-Only should be revisited. The fundamental rationale and basis for the percentage of vehicles directed to Test-Only requires a reevaluation.

## **Recommendation for Administrative Action**

The IMRC recommends that BAR and ARB reevaluate the basis and rationale for directing 36 percent of the enhanced vehicle fleet to Test-Only stations and report the findings to the Legislature.

## **VEHICLE PRECONDITIONING PRIOR TO A SMOG CHECK INSPECTION**

Based on information from Smog Check technicians and station owners, IMRC members had a concern regarding the consistency of proper warm-up procedures used by technicians to warm up a vehicle prior to conducting a Smog Check inspection. Incorrectly preparing a vehicle prior to a

Smog Check inspection leads to inconsistent Smog Check test results such as false failures or false passes. To determine the extent of the confusion, if any, IMRC staff conducted a telephone survey of Smog Check technicians.

### **Recommendation for Administrative Action**

The IMRC recommends that BAR make the following changes in regulations and the Smog Check Inspection Manual:

1. Define proper vehicle warm-up procedures in regulation.
2. Clarify the warm-up procedures in the BAR's Smog Check Inspection Manual.
3. Include warm-up procedure training in the Smog Check technician update training classes.

## **TIRE PRESSURE AND SAFETY INSPECTION**

IMRC staff examined the question of whether tire pressure and safety inspections should be added to the Smog Check requirements. Although a safety inspection falls outside the scope of the IMRC, a tire pressure test procedure could provide additional benefits to the Smog Check program. The tire pressure test would require that technicians check tire pressure prior to a Smog Check inspection and inflate tires to the correct pressure if they are below the recommended pressure. While emission benefits for such a program appear to be small, other savings are significant. We project that the tire pressure inspection could save approximately \$102.1 million annually (or 2.8 times the estimated cost) and we have identified the savings as follows:

1. Fuel savings, \$45.4 million (16 million gallons of fuel);
2. Safety (lives saved and injuries avoided), \$40 million;
3. Improved tread wear, \$8.2 million;
4. Reduced property damage and improved travel time, \$6.5 million; and,
5. Two million dollars worth of CO<sub>2</sub> emissions.

### **Recommendations for Administrative Action**

IMRC recommends that BAR and ARB briefly review the relevant data and conduct a sufficient number of ASM tests to better quantify emissions benefits of a tire inflation procedure.

## **CONSUMER INFORMATION SURVEY**

In 2004, the IMRC conducted a statewide consumer survey with phone interviews of 566 randomly-selected motorists whose vehicle failed the Smog Check inspection. The findings and recommendations were reported to the Legislature in July 2005 and are reprinted in this report. IMRC investigated a number of issues of consumer awareness, information and preferences.

Key findings included:

1. Fifty-one percent of respondents indicated that they did not perform any routine maintenance or repairs within 30 days prior to their Smog Check inspection. Almost all of the motorists whose vehicle failed the Smog Check inspection believed their cars to be pretty well or well maintained.
2. When selecting a repair shop for emission-related repairs, 82 percent indicated that they did not shop around for cost quotes. Very few were looking for a shop that would help them get financial assistance from BAR's Consumer Assistance Program (CAP).
3. The CAP was used by only 7 percent of the sample. Among those identified in the survey as eligible, only 14 percent used it. Use of CAP varied significantly by Air Basin. The percentage of failed vehicle owners using CAP was highest in the Central Valley and lowest in Los Angeles County.

**Recommendation for Administrative Action**

The IMRC recommends that BAR implement the following processes:

1. Include surveys of motorists whose vehicle failed the Smog Check inspection in the evaluation of the Smog Check program on a routine basis.
2. For motorists whose vehicle failed the Smog Check inspection, evaluate whether additional outreach methods would assist them avoid a future failure by improving vehicle emission control maintenance knowledge and habits.
3. To improve CAP participation, increase outreach and awareness for motorists whose vehicle failed the Smog Check inspection and who reside in low income communities.
4. Investigate the causes of CAP participation variability between air basins, and if warranted, develop methods to reduce that variability.

## **PREVIOUS RECOMMENDATIONS FROM THE 2004 IMRC REPORT FOR LEGISLATIVE ACTION**

In addition to this report's topics, we also reaffirm our recommendations for the following topics from the IMRC 2004 Report. Both ARB and BAR endorsed the first two of the following recommendations in their joint report to the Legislature dated September 2005.

### **AUTHORIZE ANNUAL SMOG CHECK INSPECTIONS FOR OLDER MODEL YEAR VEHICLES**

#### **Recommendation for Legislative Action**

The IMRC recommends that the legislature adopt a statutory change that provides the following:

1. Authorizes the BAR to implement an annual Smog Check inspection for 15 year and older model-year vehicles provided that "income eligible" motorists have access to repairs funded by the Consumer Assistance Program;
2. Provides the BAR flexibility in identifying the appropriate model year vehicles required to be annually inspected;
3. Requires that the additional Certificate of Compliance fees be deposited into the High Polluter Repair and Removal Account;
4. Requires that the BAR also develop a methodology to excuse specific vehicles or classes of vehicles likely to pass the annual Smog Check inspection;
5. Requires that owners of vehicles subject to the annual inspection qualify for a fair and accessible low-income Consumer Assistance Program;
6. Continues the exemption for 1975 and older model year vehicles from the Smog Check inspection requirement;
7. Requires the BAR, the ARB, or the Inspection and Maintenance Review Committee to evaluate the effectiveness and impact of the Consumer Assistance Program;
8. Allows the consumer to select a Smog Check station type of their choice. These vehicles should not be directed to any specific station type.

### **AUTHORIZE ANNUAL SMOG CHECK INSPECTIONS FOR HIGH MILEAGE VEHICLES**

#### **Recommendation for Legislative Action**

The IMRC recommends that the Legislature adopt a statutory change that provides the following:

1. Authorizes the BAR to implement annual Smog Check inspections for any vehicle identified as a high annual-mileage vehicle;
2. Identifies high-annual mileage vehicles using a methodology and definition jointly developed by the ARB and the BAR;

3. Includes private vehicle fleets, government fleets, and individually owned vehicles in the high mileage annual inspection;
4. Allows the use of new technologies in lieu of annual inspections;
5. Authorizes Consumer Assistance Program paid repairs for motorists meeting the income eligibility requirements;
6. Continues the exemption for 1975 and older model-year vehicles from the Smog Check inspection requirement;
7. Allows the consumer to select a Smog Check station type of their choice. These vehicles should not be directed to any specific station type.

## **BAR BUDGET & FUNDING**

### **Recommendation for Legislative Action**

In the 2004 IMRC report, the IMRC recommended that the Legislature adopt a statutory change that provides the following:

1. Initiates a 5-year repayment schedule for the repayment of the \$114 million dollar loan from the Vehicle Inspection and Repair Fund to the General Fund.
2. Calculates the interest earned on the aforementioned loan at the same rate as the Pooled Money Investment Account.
3. Deposits the funds directly into the High Polluter Repair or Removal Account for use by the Consumer Assistance Program.

## **QUANTIFY THE EMISSION REDUCTIONS**

### **Recommendation for Administrative Action**

The IMRC reviewed the ARB/BAR methodology for estimating emission reductions from Smog Check and heard a number of questions raised by the public and IMRC members regarding the efficacy of the methodology used.

1. The IMRC strongly endorses the continuation of random roadside Smog Check inspections to monitor the emission reduction impacts of the program, since the present method of evaluation has resulted in numerous program improvements.
2. The IMRC recommends that BAR turn off the “Fast Pass” provision of the Smog Check inspection for a statistically valid sample of inspections to improve emission reduction analysis.

# PART II

## INTRODUCTION AND DETAILED REPORTS

## INTRODUCTION

### Background

The Inspection and Maintenance Review Committee's *Review of the Smog Check Program 2006* is hereby submitted to the Legislature and the Governor in accordance with Section 44021 of the Health and Safety Code. The review is based on research conducted by the Committee in 2005 and 2006. The Committee's concern is the impact of motor vehicle emissions on air quality.

The IMRC is authorized to have thirteen members appointed by the Governor, the Speaker of the Assembly, and the Senate Committee on Rules. The Committee has two vacancies. The members, their areas of expertise, and a short biography are identified in Attachment 1 of the Appendix.

### California's Smog Check Program

The Department of Consumer Affairs, Bureau of Automotive Repair (BAR) administers California's Smog Check program (Program). Smog Check is one of the state's most important air quality programs needed to meet state and federal air quality standards. State law requires that California-registered gasoline-powered motor vehicles have a Smog Check inspection biennially in the "enhanced" and "basic" areas of the state, and on change of ownership in other areas of the state. A loaded mode test is required in enhanced areas of the state whereas a less demanding two-speed idle test is required elsewhere. Attachment 2 of the Appendix illustrates geographical areas identified as enhanced, basic, or change-of-ownership areas. Eighty-seven percent of the vehicles subject to California's Smog Check program are in the enhanced areas of the state.

The BAR administers a "decentralized" Program which means that Smog Check stations are privately owned and operated. In 2005, BAR licensed approximately 9,700 Smog Check stations and almost 14,000 Smog Check technicians. Approximately 9.2 million Smog Check inspections were conducted at these Smog Check stations in 2005. The Smog Check program is an important component of California's strategy to improve air quality and costs consumers approximately \$770 million per year (using BAR's methodology from the Program Evaluation Report dated September 2005). This expenditure results in emission reductions of hydrocarbon and oxides of nitrogen that total approximately 337 tons per day in 2005 based on the ARB/BAR Smog Check Evaluation Report dated September 2005.

### Legislative Changes of 2005

The 2005 legislative session yielded one statutory change designed to improve the effectiveness of the Consumer Assistance Program (CAP) by increasing the low-income eligibility from 185 percent of the federal poverty level to 200 percent with authority to increase this amount to 225 percent if warranted. BAR recently adopted regulations to increase the low-income eligibility to 225 percent of the federal poverty level. In addition,

the bill requires that the BAR give priority to low-income motorists in the event that program demands exceed available funding levels.

## **Process**

IMRC subcommittees were assigned to specific topics for the IMRC's report of 2006. Each subcommittee was responsible for reviewing an assigned topic and reporting back to the full committee. The IMRC conducted monthly public meetings to discuss the findings of each subcommittee and receive comments from the public, the automotive repair industry, and other interested parties. The majority of these meetings were webcast which made them available to the public statewide. In addition, the subcommittees conducted meetings with DCA, BAR and the ARB.

Prior to submitting this report to the Governor and the Legislature, the IMRC distributed a draft report to the following state agencies and organizations to solicit their comments: California Highway Patrol, Department of Consumer Affairs, Department of Motor Vehicles, Bureau of Automotive Repair, California Air Resources Board, and the State and Consumer Services Agency. Another 130 interested parties were notified of the reports availability via email, US Mail, and fax.

## **Scope**

Part I of this report provides an Executive Summary of recommendations. Part II includes the IMRC's more detailed review for each of the report subjects. Part III contains some of the recommendations contained in the 2004 IMRC report. Part IV recaps the report comments submitted by state agencies, the public, and the automotive testing and repair industry; a copy of detailed comments is available upon request. Part V is the Appendix.

## **Previous Report Topics**

In addition to this report's topics, we also reaffirm our recommendations for the following topics. The first two topics were reported in the 2004 ARB/BAR Report dated September 2005.

- Annual Smog Check Inspection for Older Model Year Vehicles
- Annual Smog Check Inspection for High Mileage Vehicles
- BAR Budget and Funding
- Quantifying Emission Reductions

## **PART II: DETAILED REPORTS**

### **IMPROVE STATION PERFORMANCE BY IMPLEMENTING VEHICLE MODEL SPECIFIC EMISSION CUTPOINTS**

In their 2004 Smog Check evaluation report, the BAR and ARB noted that there were large differences between the average emissions of cars passing the Smog Check inspection and those which had failed and subsequently received repairs. For example, hydrocarbon emissions were 0.76 grams per mile for passing vehicles and 1.09 grams per mile for vehicles that had failed the Smog Check inspection and were subsequently repaired. The agencies concluded that cars were not being fully repaired and announced plans to study the benefits of requiring more stringent repair cutpoints to encourage more thorough emission related repairs.

However, in a 2005 study done under contract with the BAR and ARB, Sierra Research determined that meaningful benefits could be achieved at low cost by simply tightening the initial emission failure cutpoints for selected vehicles which normally operate much cleaner than current cutpoints require.

#### **Recommendation for Administrative Action**

The BAR should revise cutpoints to more accurately reflect the emission performance capability by model year, make, model, engine size and emission configuration, tightening them based on more complete information and based on the report completed by Sierra Research in July 2005. Implementing the model specific cutpoints requires a modification to the Vehicle Look-up Table which is a reference table used by the BAR 97 Emission Inspection System. However, no additional software upgrades are required to accommodate the increase in the number of model specific outpoints. Therefore, BAR should modify the Vehicle Look-up Table to implement this strategy as soon as practical.

#### **Background**

For many years, critics of the Smog Check program have argued that too many repairs are superficial. Vehicles are repaired so that they can pass cutpoints in the current round of testing, even though the repairs may not be effective for very long. They contend that repairs seldom bring vehicles back to an optimal or even an average operating condition. Instead, repair work tends to stop when a vehicle barely passes the current emission cutpoints.

Smog Check repair stations have responded that they cannot force customers to go beyond what is necessary to barely pass the inspection. They may explain to customers that simply putting a new catalyst on a polluting vehicle may produce a pass, but unless the condition that caused the previous catalyst to deteriorate is fixed, the vehicle is likely to fail again at its next inspection. As an example, failure to repair a malfunction such as an ignition misfire can destroy the new catalyst very quickly. Subsequently, the vehicle could quickly return to its original failing status until the next Smog Check inspection is due. There is wide agreement among Smog Check technicians and air quality authorities that better repairs are not only possible, but would benefit the Smog Check program.

### *Current Cutpoints*

When the BAR 97 loaded mode testing program began in 1998, BAR and ARB created 52 Emission Standards Categories (ESC) to be used for the tailpipe emissions pass/fail decision. These 52 ESCs cover current model-year passenger cars and light-duty trucks. However, the vehicle fleet includes over 21,000 vehicle configurations. Consequently, some vehicles included in the various ESCs may be capable of further emissions reductions without a heavy financial burden being placed on the consumer.

### *Model Specific Cutpoints*

Sierra Research, Inc. (Sierra) conducted a study that provides a compelling argument for a viable alternative to after-repair cutpoints and provides for significant emission reductions with a simple implementation process. Sierra compared Wisconsin and Arizona emissions data to California's. Both Wisconsin and Arizona use "transient testing", which measures emissions over a wider range of operating conditions and loads as compared to the two measurements (15 and 25 m.p.h.) used in California. They divided vehicles into many categories, using model year, manufacturer, make, model, engine displacement, and other factors.

For this group of vehicles, Sierra estimated that failure rates could be increased from the (then) current 10.4 percent to between 11.9 percent and 12.8 percent. This could be done at a very small cost in terms of increased errors of commission, i.e., falsely failing a vehicle, which would rise from 2 percent to 2.4 percent. This is well within the maximum of 5 percent allowed by Section 44013 of the Health and Safety Code. The emissions benefits range from 5.5 tons per day (tpd) to 7.8 tpd of Reactive Organic Gases (ROG) and Oxides of Nitrogen (NOx) depending on the stringency of the new cutpoints. Cost effectiveness ranges from \$7,100 per ton to \$8,200 per ton in 2010. Although BAR contracted for this research with Sierra Research, Inc., they have not yet proposed the regulation required to implement this Smog Check improvement.

### **Arguments Pro**

1. 7.8 tons per day is a meaningful statewide emission benefit.
2. The cost per ton is within the range ARB has found acceptable for emission reductions.
3. Sierra has offered three different options for cutpoint stringency that could be used to phase-in the implementation.
4. Based on BAR's Executive Summary for the 2005 calendar year, Smog Check repair costs equal 32 percent of the Smog Check program. The balance goes for testing and administration. Achieving more and better repairs improves the Program's cost effectiveness.

### **Arguments Con**

1. Tighter cutpoints could cost consumers an additional \$42 million in repairs.

## **Conclusions**

The ARB and BAR already agree that there is a need for more effective repairs. Tightening emissions standards will identify vehicles which need repairs and which aren't currently being effectively repaired. Even if vehicles in targeted groups are now failing, they may be repaired to a more stringent standard.

## SMOG CHECK PROGRAM AVOIDANCE

The large number of vehicles observed on the road that do not have current DMV registration tags has concerned the IMRC because the DMV registration is the enforcement mechanism used to ensure that vehicle owners comply with Smog Check inspection requirements. The requirements are set forth in section 4000.1 of the California Vehicle Code. IMRC has identified four potential sources of Smog Check Program avoidance which are as follows:

1. Biennial Smog Check inspections or repairs which occur after the DMV renewal deadline;
2. Change of Ownership Smog Check inspections that fail off-cycle and are not required to complete emissions-related repairs because ownership does not change or the new vehicle owner does not register the vehicle;
3. International Registration Plan registered motor vehicles; and,
4. Scofflaws who fail to register their vehicle with the DMV.

Using Smog Check and DMV data, the IMRC determined that motorists who fail to complete the Smog Check inspection requirement (Item #1 above) by the vehicle registration due date increase hydrocarbons and oxides of nitrogen emissions by 1 – 2 tons per day. The analysis for items 2 – 4 above has not been completed to date. In addition, the resolution for these items would be significantly different from the late registration issue. Therefore, we are making recommendations only to resolve item #1.

### **Recommendation for Legislative Action**

The IMRC recommends that the Legislature amend section 9552(b) of the California Vehicle Code to ensure that the DMV late registration penalties continue to accrue until the Smog Check requirement has been completed and received by DMV in addition to the required registration fees.

### **Suggested Legislative Language**

9552. (a) Whenever any vehicle is operated upon any highway of this state without the fees first having been paid as required by this code, and those fees have not been paid within 20 days of its first operation, those fees are delinquent, except as provided in subdivision (b).

(b) Fees are delinquent whenever application for renewal of registration *and any required Smog Check certificate of compliance*, or any application for renewal of special license plates, is made after midnight of the expiration date of the registration or special plates, or 60 days after the date the registered owner is notified by the department pursuant to Section 1661, whichever is later.

(c) Whenever any person has received as transferee a properly endorsed certificate of ownership and the transfer fee has not been paid as required by this code within 10 days, the fee is delinquent.

(d) Whenever any person becomes an automobile dismantler, dealer, manufacturer, manufacturer branch, distributor, distributor branch, or transporter without first having paid the license and special plate fees as required by this code, the fees are delinquent

## **Background**

1. Motorists whose vehicles are subject to biennial inspections receive their notices from DMV about 75 days before the registration DMV registration due date. However, approximately 30 percent wait until the last two weeks before the registration due date to have their vehicle tested when it requires a Smog Check inspection. This sometimes creates a problem in getting the vehicle repaired by the registration due date when the vehicle fails the Smog Check. In addition, 18 percent of motorists wait until after the registration due date to have their vehicle tested. Those vehicles that fail the Smog Check inspection continue to pollute the air when they should have been inspected and repaired prior to the DMV registration due date. As a result, our analysis indicates that these vehicles add 1-2 tons per day of “easily preventable” HC and NO<sub>x</sub> emissions to the air. By easily preventable, we mean that these additional emissions could have been reduced prior to the DMV registration due date without additional inspections, repair costs, tightening of emissions standards, annual testing, or other similar measures.

Although a significant percentage of motorists fail to complete Smog Check inspection repairs prior to the DMV registration due date, they can avoid any penalty by simply paying the DMV registration fees by the registration due date. The DMV does not send motorists the renewal tags until the Smog Check inspection has been completed but motorists can continue to drive their polluting vehicle for many miles before completing the repairs with no penalty for a delayed Smog Check repair. The Committee’s concern is that these vehicles continue to be driven without registration while emitting high levels of pollution.

2. Change-of-ownership inspections create another dilemma for the Smog Check program. Section 4000.1(a) of the California Vehicle Code requires that any vehicle undergoing a transfer of ownership or change in registration are required to have a Smog Check inspection. If the vehicle fails a change of ownership inspection, the vehicle owner may decide to keep the car and continue to drive it legally until the next biennial registration is due since the change-of-ownership test was conducted off-cycle, and no new registration was required. If the vehicle owner sold the vehicle, the new vehicle owner may fail to promptly register the vehicle and drive it without performing any repairs. In either case, the vehicle continues to emit high levels of pollution.

The change-of-ownership requirement constitutes a larger portion of the Smog Check program than is commonly understood: while 50 percent of eligible vehicles in enhanced areas of the state are slated for biennial inspections, the IMRC estimates that 20 percent of all gasoline-powered vehicles get change-of-ownership inspections each year. These vehicles tend to be somewhat older, with a higher expectation of failing the Smog Check inspection. If the vehicle owner decides not to sell the vehicle subsequent to the change of ownership Smog Check inspection, on average, they will drive the vehicle until the next

biennial Smog Check is due even though the current or newly acquired vehicle owner and the state are both aware of the vehicle's failing condition. We are continuing to retrieve and analyze data regarding this issue and will report on this issue at a later date.

3. The International Registration Plan (IRP) is a registration reciprocity agreement among states of the United States and provinces of Canada providing for payment of license fees on the basis of total distance operated in all jurisdictions. This provision allows the owners of vehicles that operate in multiple states and jurisdictions to display only one license plate with one registration card while at the same time ensuring that each state receives the appropriate fees for the miles driven in that state.

Approximately 1.7 million vehicles operate in California under this program but most are heavy-duty diesel trucks. DMV estimates that 10% are gasoline-powered vehicles. Normally these vehicles would be subject California's Smog Check program. However, because these vehicles operate under the provisions of the IRP, they are exempt from biennial Smog Check inspections. IMRC is continuing to research the impact of IRP vehicles and we will report on this vehicle fleet at a later date.

4. Scofflaws who own chronically unregistered vehicles represent 0.03% of the vehicle fleet or about 7,600 vehicles. Increased efforts to increase compliance on this portion of the fleet may be very costly. In addition, sections 9800 and 9801 et seq. of the California Vehicle Code already subject unregistered vehicles to significant penalties that include additional fines and liens. Therefore, we have no plans to further analyze this portion of the fleet or make any recommendations to enforce compliance on these vehicles.

## **Analysis**

### *Late Biennial Registration*

Based on a report by Dr. Jeffrey Williams, an IMRC member, the IMRC analyzed Smog Check inspection data and DMV registration data. These analyses suggest that 44% of vehicles that fail the biennial Smog Check inspection do not have emission-related repairs completed until after the registration deadline. Vehicles operating after the DMV registration due date that have failed the Smog Check inspection and have not been repaired continue to pollute more than they should until vehicle repairs are completed.

The data indicates that 18 percent of all Smog Check failures had not passed a retest within 30 days of the original Smog Check failure date and 10 percent had not passed within 60 days. On average, Gross Polluting vehicles were repaired 44 days after the DMV registration due date as compared to 31 days for other vehicles. Based on Smog Check inspection data, the IMRC found that vehicles are operated extensively during the time they are in a failing or high emitting condition and travel, on average, 574 miles per month. Motorists continue to drive these vehicles even though they have not completed the DMV registration renewal process.

## **Discussion**

Requiring prompt repairs for vehicles failing the Smog Check inspection addresses a large proportion of “easily preventable” pollution and would be very cost effective.

The IMRC believes that placing a vehicle in a planned non-operational status (PNO) should be an option to paying the fine. This is a traditional option for motorists and means that the vehicle cannot be driven legally on public roads. Once repairs are completed and a Smog Check certificate is issued, the vehicle owner may sell the vehicle or complete the registration process.

IMRC members believe that requiring a quicker repair will not cause new economic hardships. However, educating the motoring public of available options and penalties for failure to comply with the new law may require additional expenditures of the Vehicle Inspection and Repair fund to pay for the educational outreach.

## **Comparison to Other States**

Several other states have successfully used a penalty to improve Smog Check compliance rates. The following list illustrates those states and fines:

- Connecticut - \$20 late fee
- Massachusetts – They use window stickers – No sticker results in a \$50 - \$100 fine.
- New York – They use a window sticker – No sticker results in a \$75 fine.
- North Carolina - \$250 fine.
- Texas – They use a window sticker – No sticker results in a \$350 fine.

Implementing a penalty for late Smog Check inspection is not breaking new ground since five other states already use this type of penalty to improve Smog Check compliance.

## **Conclusion**

Approximately 18 percent of all Smog Check failures are 30 or more days delinquent, resulting in 1-2 tons of ozone precursors. Requiring late registration penalties to accrue until the Smog Check is complete will deter motorists from delaying Smog Check repairs.

## COMPARISON OF TEST-ONLY, GOLD-SHIELD, AND TEST AND REPAIR SMOG CHECK STATIONS IN TERMS OF STATION PERFORMANCE AND DIRECTION OF VEHICLES

The ARB/BAR Report dated September 2005 found a difference in station performance between Test-Only, Gold Shield, and Test and Repair stations. However, these findings were based on data from 1998 – 2001. In contrast, the IMRC has been analyzing very recent Smog Check inspection data to compare the performance of Test-Only, Gold Shield, and Test and Repair Smog Check stations. Smog Check Test and Repair station owners have long complained that they have been unfairly treated since a significant percentage of vehicles needing a Smog Check inspection are required to go to a Test-Only station. Based on a report by committee member Dr. Jeffrey Williams, the IMRC recently conducted an analysis of Smog Check inspection data to evaluate station performance based solely on the Smog Check inspection failure rate.

### **Recommendation for Administrative Action**

The IMRC recommends that BAR and ARB reevaluate the basis and rationale for directing 36 percent of the enhanced vehicle fleet to Test-Only stations and report the findings to the Legislature.

### **Background**

The BAR selects 0.1% of vehicles in the enhanced areas of the state subject to the Smog Check inspection. BAR labels these randomly selected vehicles as “D” for inspection reason. The owners of these vehicles are not required to go to any specific station type, even if they might otherwise score very high on the High Emitter Profile, but can go to any Smog Check station of their choice. Use of this sample allows analysts to compare Smog Check inspection data so that motorist behavior and other variables can be observed separately from the group of vehicles directed to Test-Only stations.

The IMRC reviewed an analysis of 25,000 sample “D” vehicles that were first designated “D” in 2002 and 2003. We noted the location where those vehicles had been tested in the previous cycle and also the test result. We then followed up to see what happened to the “D” vehicles when they were re-tested in the next biennial cycle, 2004 or 2005.

### **Findings**

We found that 41.8 percent of the “D” vehicles were first inspected at Test-Only stations. BAR annual reports indicate that 43.4 percent of vehicles in enhanced areas were originally tested at Test-Only stations in 2002 and 2003. It appears that the owners of “D” vehicles, who are not required to go to Test-Only stations, are voluntarily making similar choices about station type as compared to those who are required to go to Test-Only stations. For these “D” vehicles, we made the calculations illustrated in Table 1:

Table 1

|                                   | Test Only | Gold Shield | New Car Dealers | Other Test & Repair |
|-----------------------------------|-----------|-------------|-----------------|---------------------|
| # Vehicles Tested                 | 10,648    | 2,058       | 804             | 11,683              |
| Market Share                      | 41.85%    | 8.23%       | 3.21%           | 46.71%              |
| Smog Check Failure Rate           | 15.70%    | 14.40%      | 6.60%           | 13.70%              |
| Vehicles failed as Tampered       | 7.20%     | 6.40%       | 5.70%           | 5.50%               |
| Vehicles failed visual inspection | 14.80%    | 9.50%       | 11.30%          | 10.30%              |
| MIL/OBD II                        | 28.20%    | 29.00%      | 28.30%          | 27.30%              |
| Test Styles                       |           |             |                 |                     |
| Pre-tests                         | 0.60%     | 1.60%       | 2.60%           | 4.90%               |
| Preceded by an Aborted Test       | 3.10%     | 1.70%       | 6.00%           | 6.20%               |
| Correction of Failed Vehicles     |           |             |                 |                     |
| Never corrected                   | 20.30%    | 20.30%      | 13.20%          | 13.50%              |
| Corrected within 24 Hours         | 22.70%    | 33.80%      | 49.10%          | 35.80%              |
| Corrected in the same shop        | 51.00%    | 60.10%      | 69.80%          | 60.40%              |

Although new car dealers are normally treated as a subset of the Test and Repair category, not surprisingly, they appear to operate differently. On average the vehicles they inspect are newer than the vehicles inspected by other station types, which may explain why new car dealer failure rates tend to be much lower.

In general terms, the standard distinction between Test and Repair and Test-Only stations may not be the most appropriate for analysis. Several more categories of stations may be more pertinent. In other words, the very different composition of the fleets tested at various station types may impact their failure rates. As an example, Table 2 illustrates how failure rate differences change when the data are controlled for vehicle age. Using Test-Only as the standard, Gold Shield stations appear to fail a slightly higher percentage of vehicles than Test-Only, although this difference is statistically insignificant. In addition, Test and Repair stations fail a slightly lower percentage of vehicles than Test-Only stations but again, the difference is statistically insignificant. In contrast, new car dealers fail a significantly lower percentage of vehicles. These facts raise the question about why low-performing Test-and-Repair stations are allowed to continue in the Smog Check business. We also question how a station can be judged as low performing without some control for the type of vehicles inspected at that location.

Table 2

|  | Test-Only | Gold Shield | New Car Dealers | Other Test & Repair |
|--|-----------|-------------|-----------------|---------------------|
| Differences in failure rates, compared to Test-Only, controlling for age | ---       | +0.40%      | -5.00%          | -0.60%              |
| Change in "junk rate", compared to Test-Only                             | --        | -1.20%      | -1.80%          | -4.20%              |

An important finding of this study of sample “D” vehicles had to do with scrappage rates: vehicles that fail, and are subsequently scrapped or otherwise removed from service. Vehicles failing at Test-Only stations caused a higher rate of scrapping than for vehicles tested at other station types. As indicated in Table 2, again using Test-Only as the standard, all other station types had a lower contribution to scrapping vehicles than did the vehicles tested at Test-Only stations. At this time, an explanation for this change in scrappage rates remains unknown, but is worth considering since scrapping vehicles tends to be very effective for reducing mobile source emissions.

IMRC also explored how failure rates by station type differed from Test-Only when controlling for other variables, using a regression analysis as shown in Table 3.

Table 3

| Differences from Test-Only when:  | Gold Shield  | New Car Dealers | Other Test & Repair |
|---|--------------|-----------------|---------------------|
| Controlling for vehicle age— $R^2$ 0.037  | +0.40%       | -5.00%          | -0.60%              |
| Controlling for age, mileage, type and manufacturer - $R^2$ 0.062                         | +0.80%       | -3.30%          | -0.50%              |
| Also Controlling for style and place of test - $R^2$ 0.076                                | +0.60%       | -4.20%          | -1.70%              |
| Also controlling for previous test cycle (t-stat is given in parenthesis) - $R^2$ - 0.091 | +0.5% (0.64) | -3.7% (-3.00)   | -1.6% (-3.45)       |

To illustrate what this regression analysis implies, the raw difference in failure rates between Test Only (15.7% fail) and Gold Shield (14.4% fail) is 1.3 percent which means that Test-Only fails 1.3 percent more vehicles than Gold Shield. The average failure rate for sample “D” vehicles was 14.4%. However, as illustrated in Table 3, when a control is made for vehicle age, Gold Shield stations fail 0.4 percent more vehicles than Test-Only. When controlling for additional variables such as vehicle mileage, vehicle type, and manufacturer, Gold Shield improves even further over Test-Only to 0.80 percent. However, the difference does not meet the standard for statistical significance. In contrast, controlling for all the variables at new car dealerships indicates that they are still underperforming Test-Only by 4.2 percent, which is a statistically significant difference.

## Conclusion

The IMRC is aware that Sierra Research is conducting a major study of Test-Only versus other station types, under contract with ARB. We are not ready to make specific recommendations on the issue of whether Gold Shield stations should be allowed to inspect directed vehicles at this time. However, this issue surfaced recently in the Legislature with the introduction of Assembly Bill 578 authored by Assemblywoman Shirley Horton.

In January 2006, Assemblywoman Horton requested information from the IMRC relative to this issue. In her correspondence, she asked the following questions:

1. According to law, how many vehicles is the BAR required to direct to Test-Only stations?
2. Why did ARB indicate that the State had committed to direct two million vehicles per year to Test-Only stations?
3. What are the emission-reduction benefits the state receives by directing vehicles to Test-Only stations?
4. How many vehicles are required to be directed to Test-Only to comply with the State Implementation Plan (SIP)?
5. Within the context of the SIP, is California required to direct vehicles using a High Emitter Profile model to Test-Only stations?
6. If the answer to question 5 is “yes”, then what portion of directed vehicles would be categorized as “high emitters”?
7. Is it possible for California to receive the same emissions reductions by directing only “high emitters” to Test-Only stations?
8. If the answer to question 7 is “no”, then what are the incremental benefits, in terms of emission reductions, that are being achieved by sending nonhigh-emitter vehicles to Test-Only stations versus “Gold Shield” stations?

Providing an adequate response to Assemblywoman Horton required a significant amount of research and confirmation of information, which resulted in the IMRC believing that there is a great need to evaluate Smog Check station performance. A copy of our response is available in the Appendix of this report. It is our opinion that the decision to direct 36 percent of the vehicle fleet to Test-Only should be revisited. The fundamental rationale and basis for the percentage of vehicles directed to Test-Only requires a reevaluation.

The intent of AB578 was to allow Gold Shield stations to test directed vehicles that are currently authorized to be tested exclusively at Test-Only stations. The assumption for the bill was that Gold Shield stations are equivalent in performance to Test-Only stations. Although our initial analysis indicates little, if any, difference exists between Test-Only and Gold Shield station performance, other issues require analysis before making any firm recommendations. We intend to continue analyzing Smog Check inspection data, in addition to roadside testing data and Smog Check repair data, to better evaluate station performance based on additional metrics rather than simply relying on Smog Check failure rates. We will also review the Sierra Research findings once they are available in an effort to validate any future recommendations.

## VEHICLE PRECONDITIONING PRIOR TO A SMOG CHECK INSPECTION

Based on information from Smog Check technicians and station owners, IMRC members had a concern regarding the consistency in warm-up procedures used by technicians to warm up a vehicle prior to conducting a Smog Check inspection. Incorrectly preparing a vehicle prior to a Smog Check inspection could lead to inconsistent Smog Check test results such as false failures or false passes. To determine the extent of the problem, if any, IMRC staff conducted a telephone survey of 397 smog technicians between July 28 and October 6, 2005. The survey focused on proper vehicle warm-up practices referred to as preconditioning.

### **Recommendations for Administrative Action**

The IMRC recommends that BAR make the following changes in regulations and the Smog Check Inspection Manual, Revision 6:

1. Define the appropriate vehicle warm-up procedures in regulation.
2. Clarify the warm-up procedures in the BAR's Smog Check Inspection Manual.
3. Include warm-up procedure training in the Smog Check technician update training classes.

### **Background**

#### *Legal and Procedural Requirements*

State law (H&S 44012b) requires that Smog Check inspections be “performed in accordance with procedures prescribed by the department” which “shall ensure” that “motor vehicles are preconditioned.” This does not require a specific preconditioning procedure for every test. The law does not say, “BAR shall require a preconditioning procedure for every test.” Rather, it requires that technicians verify that the vehicle is in a condition to make certain that the engine and emission control systems are up to operating temperature to ensure consistent and stabilized emission readings.

The Smog Check Inspection Manual, Revision 6, reasonably interprets the law. It prescribes a preconditioning procedure, which boils down to (a) verifying that the engine temperature is normal, and (b) not starting a test until the engine has been running for three minutes. In pertinent part, the Manual states:

“Before the licensed technician begins the emission portion of the inspection:

- Turn off all vehicle accessories....
- Make sure that the vehicle's engine is warmed up to normal temperature;

(Normal operating temperature may be confirmed by checking the coolant temperature gauge or by verifying that upper and lower radiator hoses are hot and appropriately pressurized).

- Begin the emissions test after the engine has reached normal operating temperature and the ignition switch has not been turned off for at least three minutes. This preconditioning helps ensure stabilized operation...and a representative emissions sample.”

The Smog Check Inspection Manual further prohibits efforts to superheat the catalyst. It should be noted that this manual is not codified in regulation, but rather is only a guideline for technicians. Therefore, the above referenced procedures could better be defined as best practices, but they are not required by law, rule, or regulation.

*Do Technicians Precondition?*

Unfortunately, the questionnaire results strongly suggest that technicians are confused about the manual’s intent or wording. When asked whether they preconditioned vehicles during the prior week, they replied with the following: 39.0 percent, “all the time”; 37.5 percent, “some of the time”; and the remaining 23.4 percent, “never”.

Do we believe that over 60 percent of technicians are at least occasionally not complying with the preconditioning procedure? Definitely not. Answers to other questions in our survey suggest that most or all technicians were concerned with testing vehicles in a properly warmed condition. What is more likely is that technicians are confused by the term “preconditioning”, or they believe that if the vehicle is somewhat warm, no further preconditioning is needed.

For example, in the BAR 90 program, preconditioning was mandatory, and consisted of running the vehicle for three minutes at 2,500 RPM. 27.2 percent of technicians reported that they used this procedure during the prior week. However, if that is how they define “preconditioning”, it’s understandable why someone who follows the manual precisely might not see themselves as having performed preconditioning. The same thing applies to the 20.7 percent of technicians who stated they drove the vehicle on the roadway to precondition.

Another confusing element in the manual is the phrase “the ignition switch has not been turned off for at least three minutes”. Does this mean

- it’s OK to test if the engine has been idling for three minutes?
- it’s OK to test if the ignition has been on for three minutes, even if the engine hasn’t been started?
- it’s OK to test if the ignition was turned off four minutes ago, but not less than three?
- it’s OK to test if the ignition was turned off one or two minutes ago, but no more than three?

Obviously, BAR means the first. However, because of the manual’s convoluted reference to switches, it isn’t clear that a 3-minute idling period is what BAR suggests as a method of preconditioning.

Here are some additional confusing points. If proper operating temperature has been verified, why is further preconditioning needed? If proper operating temperature hasn't been reached, will the 3-minute idle procedure be adequate to accomplish this goal; or is some other kind of preconditioning needed? Again, the reason we're raising these questions is to understand why 60 percent of technicians stated that they had not preconditioned the vehicle, at least some of the time. The answer may be that they were looking at the verification of operating temperatures as the core of BAR's requirement and they ignored any further procedure.

When we analyze other questionnaire results, we are confident that most technicians pay reasonable attention to proper engine-testing temperatures.

### *Other Findings*

The following are some of the more significant findings of the survey.

Technicians use a variety of methods to determine whether the engine is at operating temperature. 68 percent check the upper radiator hose; 98.2 percent check the temperature gauge; 20.2 percent use a pyrometer to check the engine temperature; 10.8 percent use a scan tool; and 56.4 percent wait for the cooling fan to turn on. The numbers exceed 100 percent because technicians may use different methods for different vehicles. No one reported that they had failed to use any of these procedures. However, our questionnaire couldn't determine that one of these methods was used on each and every vehicle inspected.

Technicians also use various preconditioning methods. 69.8 percent let a vehicle idle for at least three minutes; 40.1 percent let it run from 5-10 minutes; and another 14.4 percent let it run 10-15 minutes. 27.2 percent run the engine at 2,500 RPM for three minutes; and 46.9 percent let the engine run until the cooling fan cycled (indicating that the vehicle had reached the temperature where the manufacturer had designed the fan to turn on); and 20.7 percent drive a vehicle on the roadway. Again, the preconditioning methods add to over 100 percent because technicians may have chosen different methods for different vehicles and circumstances.

Although our questionnaire was not able to determine if every vehicle was preconditioned, it appears that most technicians use a minimum of three minutes idling for preconditioning, and that they choose other means of warming up vehicles when the conditions dictate the need.

22.2 percent of the time, technicians determine the preconditioning procedure based on vehicle age, 19.4 percent base it on vehicle mileage and 60.7 percent base it on wait time prior to conducting the Smog Check inspection. Some technicians listed several of these factors.

25.5 percent of those surveyed indicated that the vehicles wait less than 5 minutes to be tested; 47.7 percent wait 5-15 minutes; 21.2 percent wait 15-30 minutes; and 5.8 percent wait over 30 minutes.

15.4 percent retested failed vehicles from the prior week. When asked whether vehicles passed the re-test, 59 technicians responded. They reported that vehicles passed the retest an average of 51.2 percent of the time. It's important to avoid generalizing from these results.

We do not know if technicians retested every vehicle, most vehicles, or only vehicles which failed marginally and where the technician felt that more warm-up might help. If it was the latter, that would explain the high pass rate. It's also possible that more stations retested marginal failures, but the technician who answered the questionnaire couldn't recall having done so in the prior week.

When asked whether or not the technician performed pre-inspection repairs, 52.4 percent replied "never"; 44.3 percent replied "some of the time"; and 2.3 percent replied that they "usually performed them". It's not clear whether the last group usually perform pre-inspection repairs when needed, or whether they perform pre-inspection repairs on most vehicles they inspected.

Seventeen (17.4) percent of technicians reported that a vehicle had passed in their shop after failing somewhere else without having other repairs done before the second test. Not surprisingly, this occurred most often at Gold Shield stations, but it occurred 16.8 percent of the time at Test-Only stations and 14.9 percent of the time at Test-and-Repair stations. Twelve percent of technicians used additional warm-up procedures (compared to their normal procedures) if they knew the vehicle previously failed a Smog Check inspection. Only one percent claimed to be unaware of a prior failure, while 86.1 percent were "always" aware of the previous failure.

Based on the technicians' estimate of how many vehicles passed after failing elsewhere (and receiving no further repairs), we estimate that 1.17 percent of failures statewide pass at some other station without having repairs. This does not identify the state's false failure rate. We don't know the number of vehicles that falsely failed, (perhaps due to a lack of preconditioning or test variability) and then passed at the same station after what might have been unnecessary repair work. We also don't know how many stations received an improperly failed vehicle and then performed some repairs before retesting.

The good news here is that the 1.17 percent false failure rate that we can document from the survey is within the legislative prohibition against more than 5 percent errors of commission. The bad news is that the false failure data is incomplete. We note that 1.17 percent is only a survey estimate and that computing the overall false failure rate would require more elaborate engineering analysis.

That said, extrapolating from the BAR's August, 2005 Executive Summary Report data, the 1.17 percent false failure rate could be costing consumer's \$836,000 per year in unnecessary second-inspection fees, plus the inconvenience. The costs could be considerably greater at stations which did not retest marginal false failures and which provided repairs that were not necessary in order to get the vehicle to pass.

## **Discussion**

The primary objective of this questionnaire was to better determine the performance of stations in preconditioning and in checking vehicles to assure that they were properly warmed up. We were unable to accurately determine the technicians' preconditioning performance because technicians appear to be confused about the BAR's actual requirements. We don't believe that 60 percent of technicians sometimes fail to follow BAR's suggested guidelines for warm-up procedures, or that

23 percent are always out of compliance. Although this is what they stated, it doesn't make sense in terms of our experience with the industry, or even in terms of the answers which technicians provided to our other questions.

Many technicians commented anecdotally that they felt preconditioning was prohibited. This misconception regarding the preconditioning requirement appears to reflect the ambiguity in the BAR's Smog Check Inspection Manual, Revision 6.

The survey finds evidence that false failures, perhaps due to inadequate preconditioning, are costing consumers at least \$836,000 per year. This occurs when a vehicle passes at some other station after a prior failure and no evidence of repairs. Even if the false failure rate is well within the 5 percent statutory limit, overall costs could be much higher for vehicles receiving unnecessary repairs and retests.

## **Conclusion**

The Committee cannot recommend a specific methodology regarding the preconditioning procedure. However, we believe the issue requires additional study and clarification for technicians. The BAR should clarify the sections of the manual which address preconditioning and should use ET blasts or other means of emphasizing that preconditioning is both legal and encouraged. In addition, consideration should be given to specific preconditioning procedures that could be codified in regulation to ensure consistent test results and mitigate the additional program costs that result from false failures.

\* The survey was stratified by station type and limited to larger-volume stations which had conducted over 100 initial inspections per month during the final quarter of 2004. We interviewed the first available, licensed smog technician. 49 percent of phone contacts produced interviews. We assured respondents that their responses would be kept confidential. The survey asked for but did not find differences between behaviors in the last year and the last week. Data was analyzed by station type but we did not find significant differences that weren't explained by the rules under which the station type operated (e.g., Gold Shield stations saw a much larger percentage of vehicles that had previously failed somewhere else.)

**Selected Responses, by Station Type**

|  | Test Only | Test/Rep. | GS     | All   |
|--|-----------|-----------|--------|-------|
| <b>Wait time before test, last week</b>                              |           |           |        |       |
| Under 5 minutes  | 31.9%     | 18.8%     | 35.7%  | 25.5% |
| 5-15 minutes   | 50.0%     | 47.5%     | 35.7%  | 47.7% |
| 15-30 minutes  | 16.9%     | 24.8%     | 21.4%  | 21.2% |
| Over 30 minutes  | 1.2%      | 8.9%      | 7.1%   | 5.6%  |
| <b>Check upper radiator hose, last week</b>                          |           |           |        |       |
| Check upper radiator hose, last week                                 | 65.9%     | 66.3%     | 64.3%  | 66.0% |
| Check temperature gauge, last week                                   | 98.8%     | 97.5%     | 100.0% | 98.2% |
| Check with pyrometer, last week                                      | 13.2%     | 24.3%     | 32.1%  | 20.2% |
| Check with scantool, last week                                       | 2.4%      | 16.8%     | 17.9%  | 10.8% |
| Wait for cooling fan to turn on, last week                           | 62.3%     | 52.5%     | 50.0%  | 56.4% |
| <b>Precondition before test, last week</b>                           |           |           |        |       |
| Always   | 35.7%     | 43.1%     | 32.1%  | 39.0% |
| Some of the Time   | 37.1%     | 35.6%     | 53.6%  | 37.5% |
| Never  | 27.5%     | 21.3%     | 14.3%  | 23.4% |
| <b>Preconditioning methods</b>                                       |           |           |        |       |
| Idle, 3-5 minutes  | 65.9%     | 67.8%     | 82.1%  | 68.0% |
| Idle, 5-10 minutes   | 32.3%     | 44.1%     | 28.6%  | 40.1% |
| Idle, 10-15 minutes  | 7.8%      | 18.3%     | 25.0%  | 14.4% |
| 2500 RPM for 3 minutes   | 19.7%     | 31.7%     | 39.3%  | 27.2% |
| Run engine until cooling fan cycles                                  | 46.1%     | 45.5%     | 60.7%  | 46.9% |
| Drive vehicle on roadway   | 7.2%      | 29.2%     | 39.3%  | 20.7% |
| <b>Vehicle passes after failing elsewhere, past week</b>             |           |           |        |       |
| Vehicle passes after failing elsewhere, past week                    | 16.8%     | 14.9%     | 39.3%  | 17.4% |
| Passes per station   | 0.29      | 0.25      | 0.43   | 0.28  |
| Tests per week   | 58.6      | 27.2      | 32.9   | 40.6  |
| <b>If vehicle failed at your station, did you re-test, last week</b> |           |           |        |       |
| If vehicle failed at your station, did you re-test, last week        | 21.6%     | 9.9%      | 17.9%  | 15.4% |
| Percent of re-tests which passed                                     | 56.0%     | 50.3%     | 22.2%  | 51.3% |
| <b>Number of stations</b>  |           |           |        |       |
| Number of stations   | 167       | 202       | 28     | 397   |

## TIRE PRESSURE AND SAFETY INSPECTIONS

IMRC staff examined the question of whether tire pressure and safety inspections should be added to the Smog Check requirements. Although safety inspections fall outside the scope for the IMRC, tire-inflation pressure has an influence on loaded mode emission test results and was therefore considered for this report. We found that although such a program would be cost beneficial, the emission-reduction benefits appear to be small.

### Recommendations for Administrative Action

IMRC recommends that BAR and ARB briefly review the relevant data and conduct a sufficient number of ASM tests to better quantify emissions benefits of a tire-inflation procedure.

### Background

The current Smog Check Inspection program requires that a vehicle be in a testable condition prior to the start of any inspection. Being testable includes a visual inspection of the tires. However, some modern tires may not visually appear to be under inflated even when they are under inflated.

With properly inflated tires, vehicles use less fuel and engines do less work because the rolling resistance caused by tires is reduced. According to the National Highway Traffic Safety Administration (NHTSA), 27.46 percent of vehicles have one tire which is severely under-inflated by 25 percent of the placard (vehicle manufacturer's recommendation) value or more. 74 percent of all vehicles have an under-inflated tire, while 26 percent have proper inflation or higher.

Placard values for autos average 30 psi (pounds per square inch) and placard values for trucks average 35 psi. Autos with at least one severely under-inflated tire average 6.8 psi under-inflation for all four tires. For light-duty trucks, the average under inflation is 8.7 psi. Most tires are inflated with compressed air and, on average, lose 1 psi per month.

The NHTSA data originated from a study they completed in order to justify a regulation which requires all new vehicles to be equipped with a tire-pressure monitoring system by 2008 that will warn the driver when any tire becomes 25 percent under inflated. The regulation was finalized in October 2005. Their 243-page study is based on recent data and employs sophisticated survey research, engineering, and financial analysis. Because it was part of the regulatory process, it was subject to review and comment from automobile and tire manufacturers, as well as other parties. The report's findings appear to have broad agreement among stakeholders. The study entitled, *Tire Pressure Monitoring System FMVSS No. 138*, is available on request.

The NHTSA study allowed us to evaluate proposals without repeating all of that agency's expensive research. However, the study also has limitations:

1. We don't know how California compares to their national statistics. They surveyed nearly 10,000 autos, but we don't know whether our tire-inflation habits are better or worse than

the rest of the nation. Our autos probably last longer than their estimated average of 126,000 miles due to better climatic conditions.

2. Their analysis focused on vehicles with tires having 25 percent or more under inflation. Therefore, the NHTSA was silent on the 47.54 percent of vehicles with under-inflated tires less than 25 percent. We can make some estimates about these vehicles based on general rules which the NHTSA believed could be applied across the board (e.g., tread wear decreases 1.78 percent for every 1 psi under inflation). In other cases such as skid resistance, it appears improper to extrapolate from their analysis of tires with severe under inflation.
3. The NHTSA does not address some issues and potential benefits such as HC or NO<sub>x</sub> benefits possibly because they did not need to do so in order to justify their rule.
4. Their rule will work 365 days per year, for the life of the vehicle, since on-board vehicle sensors will continually monitor tire pressure and notify the driver when the pressure decreases 25% below placard. In contrast, Smog Checks occur only once every 22 months, on average. Consequently, the benefits of a Smog Check-related tire inflation program must be discounted accordingly.

A detailed analysis of this issue has been included in the Appendix.

## **Findings**

Our hypothesis was that there might be a benefit to require Smog Check technicians to check the pressure on each tire, and with the customer's permission, to refill tires to the lesser of the tire manufacturer's or the vehicle manufacturer's specification. The technician would also inspect the easily-visible portions of the tire for safety and report deficiencies to the vehicle's owner.

Although section 44018(a) of the Health and Safety Code authorizes a safety inspection that is advisory in nature, legislation might be needed that would authorize BAR to implement a mandatory tire-inflation procedure. The BAR could implement a pressurization component of the Smog Check program under its authority to reduce emissions. However, since emissions benefits appear to be very small, we believe it would be better to seek a legislative policy decision for this procedure.

This procedure may be expensive. If it took three minutes for this procedure, at a \$75/hour shop rate, the theoretical cost for 9.5 million vehicles would be \$35.6 million.

By adapting the NHTSA's methodology and logic to the proposed program, we project that the tire-pressure test procedure could save approximately \$102.1 annually (or 2.8 times the estimated cost) and we have identified the savings as follows:

1. Fuel savings, \$45.4 million (16 million gallons of fuel);
2. Safety (lives saved and injuries avoided), \$40 million;
3. Improved tread wear, \$8.2 million;

4. Reduced property damage and improved travel time, \$6.5 million; and,
5. Two million dollars worth of CO<sub>2</sub> emissions (approximately 414 tons per day).

However, there are some benefits we did not try to quantify.

1. Safety for vehicles with moderately under-inflated (1-24 percent of placard value) tires. These constitute 47.54 percent of the fleet, so the benefits will be substantial. However, it's not clear that the engineering estimates which the NHTSA applied to vehicles with severely under-inflated tires can simply be ratioed to these vehicles. We prefer not to speculate about this issue.
2. The benefits of the visual safety inspection. We don't know how many tires have visually-identifiable flaws, how many consumers are already aware of these flaws, or how many would take prompt action to fix the problem. Some data may be available from safety programs which operate in other states.
3. Increased tire purchases and tread-wear benefits. The NHTSA models used only the time value of money for estimating tread-wear benefits. The federal data assumed that passenger cars lasted an average of 126,000 miles, and that tire replacements would be needed at 45 and 90 thousand miles, but not 135,000 miles. Since California vehicles presumably last longer, a third replacement at 135 thousand miles would double the tread-wear benefits (using the NHTSA methodology).
4. Reduced false Smog Check failures. Low tire pressure increases "tire roll resistance" which has the effect of increasing the load on the vehicle. An increased load could result in false emissions failures. If one in a thousand vehicles were a marginal failure caused by low tire pressure, consumers would save \$250,000 in unnecessary repairs. We have no basis for speculating on the actual rate of false failures due to low pressurization, since it appears that no one has ever run tests on this issue.
5. Consumer education. The monetary savings we estimated above are low because Smog Checks occur once every 22 or so months and exclude newer vehicles. Since tires lose one psi per month, our estimates assumed that benefits were limited to six months. If tires were filled to 30 pounds and then deteriorated to 24 psi, the average benefit would be only three psi. However, the example set by a mandatory program, plus educational materials distributed at the time of the Smog Check inspection, could improve consumer behavior. This would affect the entire fleet, not just the vehicles that undergo a Smog Check inspection in a particular year.
6. Emission reductions. If these are proportional to fuel savings, they are 0.1 tons per day (tpd) of hydrocarbons, and 0.3 tpd of oxides of nitrogen; 2.7 tpd of carbon monoxide.

## **Conclusions**

This issue needs further study. Normally, justifying legislation and regulations for a new program would require considerable and expensive research. Because of the availability of the NHTSA data, this may be unnecessary. What we don't know is whether or not the benefits that can be confidently linked to the NHTSA's findings are in a realm of magnitude that would justify a program change.

Consequently, we recommend that the BAR and ARB undertake a brief and limited review of the NHTSA data. This should include a sufficient number of vehicle tests to determine if emissions benefits are indeed as small as they appear to be, and to better estimate false-failure rates. Eventually, more elaborate testing might be required either to justify a program or to document the benefits for purposes of ARB's emissions inventory.

In addition, California has a goal in place to reduce carbon dioxide, a greenhouse gas that is associated with global warming. Tire pressure testing provides another component to help reduce emissions of this gas by 414 tons per day.

The BAR or ARB may also want to reformulate the proposed program. An aggressive consumer education program may prove to be very cost beneficial.

Another option would be to limit inspections to the drive-wheel tires, or to a tire that visually appears to be low, or to a randomly-selected tire. What the NHTSA data suggests is that 26 percent of motorists do a good job of maintaining tire pressure, while 27 percent do a terrible job. Consequently, if one or two tires are found to be properly inflated, it may not be productive to check the other tires. If they were badly under inflated, checking and repressurizing the remaining tires would be warranted. These options cut the costs of our basic proposal, but might retain most of the benefits. In sum, we believe our findings strongly justify a limited study of the tire-pressure issue.

## CONSUMER INFORMATION SURVEY

Section 44021 of the Health and Safety Code requires that the Inspection and Maintenance Review Committee collect, analyze, and evaluate information relative to the Smog Check program. However, the IMRC had never conducted a consumer information survey.

### Recommendations for Administrative Action

IMRC recommends that BAR take the following actions:

1. Evaluate and implement additional methods that would encourage motorists to improve their vehicle-maintenance habits.
2. Increase outreach and awareness for motorists residing in low-income areas of the state.
3. Determine the cause of CAP participation variability that exists between air basins and if warranted, develop methods to reduce that variability.
4. Regularly survey consumer attitudes.

### Purpose of the Consumer Survey

The ARB/BAR report, *Evaluation of the California Enhanced Vehicle Inspection and Maintenance (Smog Check) Program* (dated April 2004) (Report) did not include an evaluation of consumer information aspects of the Program, nor did it include any analyses of the adequacy or performance of the Consumer Assistance Program. This gap in the information available to the Committee motivated Committee Members to initiate a consumer survey to test the feasibility of directly contacting motorists to evaluate their experience.

The purpose of the survey is to include vehicle owners in the assessment of the Smog Check program. The survey allows vehicle owners with failed Smog Checks in enhanced areas to report to the Committee on information that they have about the Program operation. It also allows the IMRC to obtain independent data on consumer perception of the Program and its impact on the consumer.

A number of issues were identified by IMRC for investigation. These included independent information about:

- a) consumer satisfaction with Test-Only, Test and Repair, and Gold Shield station performance;
- b) the level of consumer knowledge about the Consumer Assistance Program;
- c) the use of pre-inspection maintenance and repairs;
- d) the time required and the cost of repairs by vehicle age and type, by geographic area, by Gold Shield and Test and Repair; and,
- e) environmental justice impacts of the Smog Check program.

**Test-Only Versus Test and Repair** - A key issue was to investigate the experience of those motorists whose vehicle was directed to Test-Only stations in comparison with those who used Test and Repair stations for initial inspection. In accordance with state law, the BAR (BAR) implemented the Test-Only component of the Smog Check program in late 1997. That required some vehicle owners to have their vehicle’s Smog Check inspection performed at a Test-Only station as compared to the traditional Smog Check Test and Repair station. Although the initial implementation created some confusion for motorists, BAR conducted significant outreach and advertising campaigns to inform motorists of the new requirement. In 2000, the number of vehicles directed to Test-Only stations was increased to 36 percent of the enhanced vehicle fleet. That amounted to approximately 215,000 vehicles per month that were directed to Test-Only stations.

In 2003, the Bay Area was enhanced to include the Test-Only component of the Smog Check program. Consequently, as Test-Only stations opened in the nine Bay Area counties, more vehicles were directed to Test-Only stations. Today, BAR directs approximately 287,000 vehicles per month to Test-Only stations. This has caused many Test and Repair station owners to complain to the IMRC that their customers experience difficulty when attempting to get their vehicles tested at Test-Only stations. They also pointed to a “ping pong” problem in which motorists whose vehicles fail and are repaired face repeated cycles of test and repair in which vehicles “ping pong” between Test-Only stations and repair stations.

**Use of the Consumer Assistance Program**

**Income Eligibility** - Low-income motorists whose vehicles fail the Smog Check inspection may participate in BAR’s Consumer Assistance Program which pays for emission-related repairs. The Consumer Assistance Program will pay as much as \$450 for emissions-related repairs after the income-eligible motorist pays the required co-payment of \$20. The CAP repair must be performed at a Gold Shield station and requires that the motorist complete an application to confirm eligibility. BAR spent \$4.7 million on this assistance program in 2002/2003.

Income eligibility for CAP is determined on a sliding scale depending on the number of people living in a household and is based on 185% (this was recently changed to 225%) of the federal poverty level as outlined in Table 1. [It should be noted that these income levels do not apply to CAP repairs for vehicles directed to Test-Only stations.]

Table 1 (185% of Federal Poverty Level)

| Number of People In Household | Gross Household Income |                 |
|-------------------------------|------------------------|-----------------|
|                               | Maximum ANNUAL         | Maximum MONTHLY |
| 1                             | \$17,224               | \$1,435         |
| 2                             | \$23,107               | \$1,926         |
| 3                             | \$28,990               | \$2,416         |
| 4                             | \$34,873               | \$2,906         |
| 5                             | \$40,756               | \$3,396         |
| 6                             | \$46,639               | \$3,887         |
| 7                             | \$52,522               | \$4,377         |
| 8                             | \$58,405               | \$4,867         |

The IMRC received questions from environmental justice groups concerning the availability of the Consumer Assistance Program, including:

- a. Are low-income Californians receiving the benefit of the CAP?
- b. Are minority communities receiving information about the CAP?
- c. Should income eligibility be increased to include 225% of the federal poverty level, compared to 185% now in statute?

**Test-Only Eligibility** - Another way to qualify for the Consumer Assistance Program is to be directed to a Test-Only station for the biennial Smog Check. Vehicles directed to a Test-Only station automatically qualify for CAP repairs with no income eligibility requirement; however, the co-payment increases from \$20 to \$100. Although the vehicle owner automatically qualifies for CAP, the motorist must submit a CAP application in the same manner as required for the low-income applicant, but without household income related information. As previously stated, BAR spent about \$4.75 million on CAP in 2002/2003.

The IMRC received comments asking why Test-Only directed vehicles were eligible for CAP assistance. It is believed that the Legislature chose to provide eligibility because of the perceived hardship to vehicle owners of having to go to a Test-Only station for testing, then to a repair station for repairs, and return to the Test-Only station for the retest. [Subsequent legislation has authorized Gold Shield stations to retest and certify those vehicles that are repaired in the Gold Shield station.]

**Other Issues** - The IMRC also received comments during Committee meetings suggesting that the approval process required for CAP repairs caused delays in getting the vehicles repaired and back to their owners. Another issue raised was whether or not there are sufficient Gold Shield stations available to serve the income-eligible participants.

## **Survey Method**

The Form 10 Group (Form 10) conducted the telephone survey which consisted of approximately seventy questions and provided approximately 35,000 data points for analysis. The survey was developed by the IMRC and then pre-tested and validated by Form 10.

The IMRC also provided Form 10 with approximately 45,000 vehicle registrations and Form 10 used a tele-match service to obtain telephone numbers from the vehicle registration information. Vehicle registrations consisted of motorists whose vehicle previously failed the Smog Check inspection in the preceding ninety days. In addition, the survey sample was divided into a total of six air basins as illustrated in Table 2.

Table 2

| Group | Counties  | Number of Interviews |
|-------|---|----------------------|
| 1     | San Diego   | 53                   |
| 2     | Los Angeles   | 157                  |
| 3     | Orange, Riverside, San Bernardino, Ventura  | 115                  |
| 4     | Fresno, Kern, San Joaquin, Stanislaus   | 42                   |
| 5     | Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma | 151                  |
| 6     | Placer, Sacramento, Yolo  | 33                   |

Respondents to the survey had to meet the following requirements:

1. Had to have a telephone number that could be linked to the name and address information on their vehicle registration address;
2. Had to be at least eighteen years of age;
3. Had to verify vehicle ownership;
4. Remember failing the Smog Check inspection;
5. Be willing to take 15 minutes to answer the seventy questions; and,
6. Be able to communicate in English or Spanish.

## **Survey Results**

### **What sources of information did motorists use when informed they needed a Smog Check inspection?**

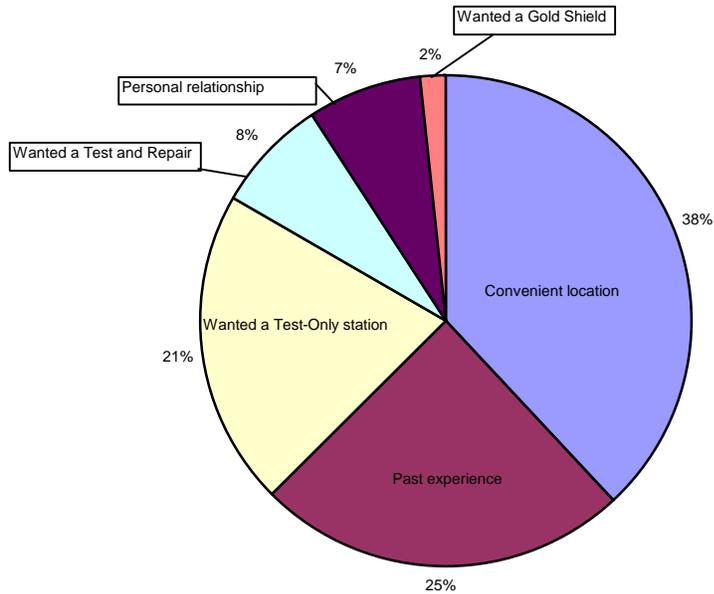
When notified of a Smog Check inspection requirement, motorists used various sources for information: shopping around was used by 28 percent of the motorists; 26 percent spoke with someone in the automotive repair business; and, 23 percent discussed the issue with a friend or family member. Although the BAR website contains a wealth of information concerning the Smog Check program, only 8 percent used it as a resource. Another 6.4 percent responded that they spoke with BAR. In reality, they probably contacted the Consumer Information Center whose toll free phone number is listed in the vehicle registration renewal packet mailed by the Department of Motor Vehicles (DMV). The Consumer Information Center is part of the Department of Consumer Affairs. It should be noted that respondents could answer “yes” to any of the options in this question and therefore the percentages are not cumulative.

### **What factors did motorists consider the most important when selecting a Smog Check station for the inspection?**

Thirty-eight percent of respondents indicated that a convenient location was the most important factor when selecting a Smog Check station. Twenty-five percent indicated that past experience

with the shop was the most important factor. Chart 1 illustrates the various responses to this question.

Chart 1: Most Important Factor: Selecting Smog Check Station



**Prior to the Smog Check inspection, what maintenance and repairs did motorists perform on their vehicle?**

Maintenance of Failed Vehicles: Ninety-five percent of respondents indicated that they had maintained their vehicle over the last 12 months. Among the 95 percent that responded that they had maintained their vehicle, 54 percent responded that their vehicle was very well maintained and 41 percent indicated that their vehicle was pretty well maintained. Fifty-one percent did not perform any routine maintenance or repairs 30 days prior to inspection. Forty-six percent performed routine maintenance such as oil change, tune-up, or spark plug replacement 30 days or less prior to the Smog Check inspection. Only 16 percent had repairs performed prior to the Smog Check. Eight percent had a pre-inspection performed on their vehicle 30 days or less prior to the test. Since it is generally accepted that routine maintenance prevents a vehicle from failing the Smog Check inspection, this issue may require additional research since a significant percentage of the failed vehicles had routine maintenance performed within 30 days of the Smog Check inspection.

**For owners whose vehicles were directed to Test-Only stations, how did they learn of the Test-Only requirement?**

Sixty-seven percent of those surveyed were directed to Test-Only stations. Contrary to the many concerns expressed by members of the automotive industry to IMRC members, 80 percent of respondents indicated that they learned of the Test-Only requirement from the DMV registration

renewal information they received in the mail. Only 14 percent did not realize that their vehicle required a Test-Only inspection until they went to a Test-and-Repair station for the inspection. Overall, 79 percent rated finding a Test-Only station easy and another 4 percent said it was “somewhat easy”. Ideally, one would hope that all directed motorists realize they are being directed when they receive their DMV registration renewal notice. Evidence of variation by air district suggests that motorists learn to look for this as the Program matures. The Bay Area had the highest rate (32%) of missing this information on reading the DMV notification but the Bay Area had only implemented Test-Only direction in 2003.

### **How easy or difficult was it to comply with the Smog Check inspection requirement?**

Eighty-two percent of all respondents found that it was easy or somewhat easy to comply with the Smog Check inspection requirement. There was no significant difference between those directed to Test-Only and those not directed to Test-Only in how easy the respondents rated the Smog Check requirement.

Eighteen percent rated complying with the inspection requirement as somewhat or very difficult. From the 18 percent that experienced difficulty with the program, 54 percent found the expense was a problem and 34 percent thought the process was too time consuming. Also from the 18 percent, 30 percent of those found the Smog Check program difficult because they lacked an understanding of how the Program works. Finally, another 18 percent of those that had difficulty indicated that finding a Smog Check inspection station was difficult.

### **What factors did motorists consider the most important when selecting a Smog Check station for the vehicle repairs?**

When choosing a repair shop, 29 percent of respondents indicated that the most important factor in their decision was past experience with the shop. Twenty-one percent indicated that the most important factor for choosing a repair shop was location. (This contrasts with 38 percent that found location the most important factor when choosing a shop for the Smog Check inspection.) The following list ranks the most important factors respondents chose as most important for choosing a repair shop:

- Past experience with the shop – 29%
- Convenient location – 21%
- Personal relationship with the shop – 19%
- The repair estimate from the shop seemed reasonable – 13%
- A trusted person recommended the shop – 12%
- Wanted financial assistance from BAR – 5%
- Wanted a Gold Shield station – 0.2%

Most importantly, only 5 percent were looking for a station that would help them get financial assistance with repairs (CAP).

**How easy or difficult was it for motorists to have repairs performed on their vehicle?**

Eighty percent of respondents found it somewhat easy or very easy to fix their vehicle and 62 percent indicated that it took one day or less to complete the process. From the 18 percent that had difficulty getting their vehicle repaired, 67 percent found the expense of repair was difficult and 51 percent found the time required for repairs was difficult. Thirty-eight percent stated that understanding the repair requirement was difficult. Again, the last three responses were individual questions and therefore the percentages are not cumulative.

Respondents were also asked about repair choices. Ninety percent of the owners of failed vehicles said they were offered neither a cheap quick fix nor a more expensive and durable repair. Vehicle owners do not appear to be making choices for quick fixes.

**Cost and Time Involved in Repair and the Issue of “Ping-Pong”:**

Expense and time for repairs varied greatly. Twenty percent paid less than \$50 while 20 percent paid over \$450 dollars; 22 percent paid between \$51 and \$150 while 31 percent paid between \$151 and \$450 for repairs. Most vehicles were in the repair shop one day or less (62%), with 39 percent leaving the shop in less than half a day. Twenty-two percent were in the repair shop more than 2 days.

There was little evidence of a “ping pong” effect in which vehicle owners were bounced back and forth between testing stations and repair stations with conflicting readings. There was no statistically significant difference between those required to have their vehicle inspected at a Test-Only station and others regarding the ease in which they judged the first or the second Smog Check.

**How easy or difficult was it for motorists to have the second Smog Check inspection performed on their vehicle?**

Eighty percent of respondents indicated that the second Smog Check inspection was easy and another 12 percent indicated it was somewhat easy. Five percent indicated that it was somewhat or very difficult and 3 percent did not answer the question.

**How many motorists used BAR’s Consumer Assistance Program?**

Seven percent of respondents used BAR’s Consumer Assistance Program. From the 7 percent, 4.6 percent received Test-Only eligible assistance and 2.5 percent received income-eligible assistance. Sixty-seven percent were eligible for Test-Only directed assistance and about 27 percent of the state’s adult population are eligible for income assistance. Given limited income data provided in the survey, the respondents were classified according to income eligibility. Only 14 percent of those estimated to be income eligible reported receiving the assistance.

**Differences by Air Basin**

Respondent vehicle owners were chosen at random proportionate to their representation in the population by air basin. Six air basins were identified and analyzed. This analysis combines the two small valley basins into one and combines San Diego, Orange, Riverside and San Bernardino county respondents. The differences within these two groups are not significant. What is reported here are the statistically significant differences between these four areas: Los Angeles County (147 interviews), the Bay Area (149 interviews in nine counties), Other Southern California counties (170 interviews) and the San Joaquin and Sacramento Valleys (85 interviews).

**Wanted a Test-Only Station** - Percentage of respondents in the air basin that said in choosing a station to do the Smog Check they considered a Test-Only station.

**Considered a Test-Only Station**

|              |     |
|--------------|-----|
| S. J. Valley | 59% |
| Bay Area     | 62% |
| Other So Cal | 67% |
| Los Angeles  | 78% |

**After identifying factors they considered important, motorists were asked to pick the most important factor for them in making their choice for a testing station.**

**Most important factor in choosing a test station**

|                            | Bay Area | Los Angeles | S.J. Valley | Other So. Cal. |
|----------------------------|----------|-------------|-------------|----------------|
| Personal relationship/shop | 13%      | 5%          | 7%          | 5%             |
| Past experience with shop  | 10%      | 33%         | 26%         | 28%            |
| Convenient location        | 45%      | 33%         | 36%         | 38%            |
| Wanted Test-Only Station   | 22%      | 23%         | 18%         | 19%            |

Interpretation: about the same percentage picked the Test-Only station criterion as the most important factor in making their choice, but Angelenos were most likely to consider this factor and Valley motorists least likely.

**Asked of those directed to Test-Only: When did you learn that your vehicle was Test-Only?**

**Percent choosing “upon reading the smog check information in the vehicle registration.”**

|                |     |
|----------------|-----|
| Bay            | 70% |
| L.A.           | 81% |
| S. J. Valley   | 81% |
| Other So. Cal. | 86% |

**Asked of those directed to Test-Only: How difficult was it to find a Test-Only station?**

|                | Easy or Somewhat Easy | Somewhat Difficult or Very Difficult |
|----------------|-----------------------|--------------------------------------|
| Bay            | 88%                   | 12%                                  |
| L.A.           | 95%                   | 3%*                                  |
| S. J. Valley   | 93%                   | 7%                                   |
| Other So. Cal. | 95%                   | 5%                                   |

\*3% did not answer

Most Bay Area Test-Only directed motorists found it easy (68%) to find a Test-Only station but motorists in this region were the most likely to have difficulty probably due to the recent Test-Only implementation.

There was no statistically significant difference between regions in consumer response to “how easy was it to comply with the initial Smog Check?”

**How many days was your car in the shop for repairs?**

|                   | Bay | L.A. | S. J. Valley | So. Cal. |
|-------------------|-----|------|--------------|----------|
| Less than 1/2 day | 30% | 47%  | 41%          | 39%      |
| 1/2 to one day    | 32% | 19%  | 16%          | 23%      |
| 1-2 days          | 15% | 18%  | 16%          | 14%      |
| More than 2 days  | 24% | 16%  | 27%          | 25%      |

Note that there is correlation between both of these variables and whether the respondent received financial assistance from BAR (see following table) since those receiving CAP assistance had longer stays in the repair shop and CAP assistance varies significantly by air basin. It may be that the time in the repair shop difference is a function of the difference in CAP assistance processing and paperwork requirements.

**Received financial assistance from BAR**

|                |     |
|----------------|-----|
| S. J. Valley   | 17% |
| Other So. Cal. | 9%  |
| Bay            | 7%  |
| L.A.           | 3%  |

The Central Valley had the highest rate of assistance and Los Angeles County had the lowest rate of financial assistance for the repair of vehicles.

## Differences for Those Receiving BAR Assistance Versus Others

**Income Group.** *There was no statistically significant difference between the income groups identified in the survey in the proportion that received CAP assistance.*

Survey respondents chose from one of the following income groups:

- 1) below \$17,000
- 2) \$17,000 to \$22,999
- 3) \$23,000 to \$28, 999
- 4) \$29,000 and above.

Only 58 percent of those interviewed chose one of these categories as the income category for their household.

Income eligibility for the CAP assistance depends upon both household income and the number of members in the household. Looking at responses to the income questions, we were able to determine that 17 percent of the sample was income eligible for CAP, 37 percent was not income eligible and 46 percent could not be determined. Note that census data indicates that 27 percent of all adults 18-64 in California would qualify for CAP income eligible assistance.

Of the income-eligible respondents, 14 percent claimed to have received CAP assistance (that includes both types of assistance). Among those who were determined to not be eligible and among those for whom we could not determine eligibility, 7 percent claimed to have received CAP assistance. This was not a statistically significant difference.

## Days in the Shop for Repairs

For those who received financial assistance from BAR, 60 percent were in the shop more than one day and 40 percent were in the shop more than 2 days. For those who did not receive assistance, 36 percent were in the shop more than one day and 21 percent were in the shop more than 2 days.

Nevertheless, there was no statistically significant difference between those who received financial assistance and others in how easy they thought it was to get their vehicle repaired.

## How Much It Cost to Repair

There is clearly a tendency for those receiving assistance from BAR to have higher cost repairs. Thirty-seven percent of those receiving financial aid had repairs costing more than \$450, though this group is 20 percent of all surveyed. Less than 10 percent of the BAR assisted owners paid less than \$50 for repairs, yet this group is also 20 percent of all vehicle owners.

# PART III

## Previous Recommendations from the 2004 IMRC Report

## **PART III: PREVIOUS RECOMMENDATIONS FROM THE 2004 IMRC REPORT**

### **AUTHORIZE ANNUAL SMOG CHECK INSPECTIONS FOR OLDER MODEL-YEAR VEHICLES**

In 2004 ARB/BAR Report dated September 2005, BAR and ARB proposed the implementation of an annual Smog Check inspection for 15-year and older model-year vehicles.

#### **Recommendations for Legislative Action**

The IMRC recommends that the Legislature adopt statutory changes to enable BAR to require annual inspections of older model-year vehicles. These changes should:

1. Authorize the BAR to implement an annual Smog Check inspection for older model-year vehicles provided that “income eligible” motorists have access to repairs funded by the Consumer Assistance Program;
2. Provide BAR flexibility in identifying the appropriate model-year vehicles required to be annually inspected;
3. Require that the additional Certificate of Compliance fees be deposited into the High Polluter Repair or Removal Account;
4. Require that BAR also develop a methodology to excuse specific vehicles or classes of vehicles likely to pass the annual Smog Check inspection;
5. Require that owners of vehicles subject to the annual inspection qualify for a fair and accessible Consumer Assistance Program;
6. Require that 1975 and older model-year vehicles continue to be excluded from the Smog Check inspection requirement;
7. Require ARB/BAR and/or IMRC to evaluate the effectiveness and impact of the Consumer Assistance Program;
8. Allows the consumer to select a Smog Check station type of their choice. These vehicles should not be directed to any specific station type.

#### **Background**

The ARB/BAR Report shows that Smog Check inspection failure rates increase as vehicles age and the emission systems deteriorate. The failure rate for all model-year vehicles equals about 16 percent. By the time vehicles reach 15 years of age, the failure rate increases significantly and averages 30 percent with some early 1980s model-year vehicles reaching as high as a 40 percent failure rate.

The ARB/BAR Report estimates that annual testing of older model-year vehicles would reduce emissions by 25 tons per day of hydrocarbons and NO<sub>x</sub> in 2005 and 27.4 tons per day by 2010. This estimate assumes that 1981 and older model-year vehicles would be exempted by 2010 due to the 30-year rolling exemption; actual emissions benefits would be higher because this exemption no longer exists.

The ARB/BAR Report estimates that the Smog Check inspection and repair industry would inspect an additional 2.2 million vehicles annually at a cost of approximately \$101 million, assuming an average inspection cost of \$46.00 (based on 2002 DCA/BAR data). In addition, the ARB/BAR Report also indicates a failure rate of about 23 percent, which is projected to add another \$72 million in repair costs bringing total costs to \$173 million annually. This equates to a cost effectiveness of \$8,500 per ton for hydrocarbons and NOx emission reductions. In other words, these are relatively cost-effective emission reductions.

On average, older model-year vehicles are typically owned and driven by those that can least afford the additional costs of annual inspections and repairs. This presents an obstacle for effective annual testing since the increased costs would be borne disproportionately by those with limited discretionary income.

## **Proposal**

The IMRC recognizes the significant benefits of an annual Smog Check inspection for older model-year vehicles, but also understands the need to balance the benefits with other provisions that lessen the burden on those that can least afford the additional expense. Therefore, the addition of the annual Smog Check inspection should include increased funding for the Consumer Assistance Program, and assurances that the Consumer Assistance Program is accessible and equitable.

Annual inspections increase the sale of BAR's Certificates of Compliance by approximately 2.2 million certificates each year. At the current price of \$8.25 each, BAR's income increases by approximately \$18 million annually. Normally, these funds would be deposited into the BAR Vehicle Inspection and Repair Fund. Since these are additional funds, the IMRC suggests that they be deposited into the High Polluter Repair or Removal Account. This increases the funding available to assist lower-income consumers with their repair needs during the annual Smog Check inspection.

In addition to the certificate sales, the IMRC also suggests that any loan repayment by the Legislature of funds borrowed to cover the General Fund deficit, also be deposited directly into the High Polluter Repair or Removal Account for use by the Consumer Assistance Program. For more detail on this provision, please refer to the section entitled "BAR Budget & Funding" in this report. The additional funding for the Consumer Assistance Program could ameliorate the negative impact that such a program may have on lower income families. Using the additional Certificate of Compliance fees for Consumer Assistance Program repairs generates approximately \$18 million that will pay to repair 58,000 vehicles; assuming a Consumer Assistance Program repair averages \$313 per vehicle.

Finally, the ARB/BAR Report suggests a possible adjustment to the 15-year and older rule in future years due to the improved emission systems on vehicles beginning with the 1996 model year.

## **Options**

Since a significant portion of 15 year and older model-year vehicles pass the Smog Check inspection, the IMRC also agrees with the ARB/BAR Report that some older model-year vehicles should be excused from the annual testing requirement. One way to target an annual inspection program more effectively is to allow owners of cleaner emitting vehicles to opt out of an annual inspection and continue to be tested biennially. This provision could be accomplished by using several available options.

### **Clean Screen**

The concept of “clean screening” vehicles can be accomplished using several methods of identifying vehicles likely to pass the Smog Check inspection. One method, referred to as the Low Emitter Profile uses various vehicle data to classify or rank vehicles according to their probability of passing the test. Once the vehicles have been ranked, then only the “most likely to pass” vehicles would be excepted from the annual inspection.

Another method for identifying vehicles likely to pass involves the use of remote sensing devices. These devices are set up on city streets or highways to measure tail pipe emissions as the vehicle drives through the lane. The motorist is not required to stop and submit to any inspection since the device captures multiple measurements of the tail pipe emissions while the vehicle moves through the test lane. Vehicles identified as low emitters through the remote sensing lanes could be excused from the annual Smog Check inspection requirement. It is worth noting that BAR and ARB are jointly evaluating remote sensing devices for possible application in the Smog Check program.

Implementing a “clean screen” process by which some vehicles are excused from the annual Smog Check inspection provides an additional benefit by reducing the overall financial impact. As an example, excusing the cleanest 25 percent of the older model-year vehicles would reduce the annual cost by approximately \$25 million in testing fees.

### **Past Performance**

Another method for excepting vehicles from the annual inspection would be to allow vehicle owners to demonstrate that their vehicle passes the Smog Check inspection for 2 or 3 consecutive cycles and subsequently except them from the next annual inspection. If their vehicle continues to pass the biennial Smog Check inspection, as identified in BAR’s Vehicle Information Database, then their vehicle may be excused from the annual Smog Check inspection (though not a biennial inspection).

## **Impacts the IMRC Considered**

Requiring annual inspections for older vehicles involves risks that noncompliance could increase due to lack of financial capacity to conduct the repairs. The Consumer Assistance Program was designed to help consumers comply with Smog Check requirements. Both test-only referred vehicle owners and those meeting an income test can qualify for the Consumer Assistance Program. If an annual inspection were required, the Consumer Assistance Program would necessarily need to be augmented proportionately. Since the ARB/BAR Report estimates the annual cost at \$173 million for test and repair costs, we believe that this program requires additional funding in the Consumer Assistance Program to offset the financial impact and reduce potential non-compliance.

IMRC will further investigate both non-compliance and consumer information about and access to the Consumer Assistance Program in its next report. However, the investigations to date have been limited and legislative direction to evaluate the Consumer Assistance Program would be wise in light of increased social and economic impacts of Smog Check with annual inspections of older vehicles.

## **Emission Reduction Estimate**

Implementing the annual Smog Check inspection for vehicles 15 years and older increases the Program's emission reductions by 25 tons per day in 2005 and even more in future years which assists the state in achieving air quality goals.

## AUTHORIZE ANNUAL SMOG CHECK INSPECTIONS FOR HIGH-MILEAGE VEHICLES

In 2004 ARB/BAR Report dated September 2005, BAR and ARB proposed an annual Smog Check inspection for all high mileage vehicles that travel more than 25,000 miles per year.

### **Recommendations for Legislative Action**

The IMRC recommends that the Legislature adopt a statutory change that provides the following:

1. Authorizes BAR to implement annual Smog Check inspections for any vehicle identified as a high-mileage vehicle;
2. Identifies high-mileage vehicles using a methodology and definition jointly developed by ARB and BAR;
3. Includes private vehicle fleets, government fleets, and individually owned vehicles in the high-mileage annual inspection;
4. Allows the use of new technologies in lieu of annual inspections;
5. Authorizes Consumer Assistance Program paid repairs for motorists meeting the income eligibility requirements;
6. Requires that 1975 and older model-year vehicles continue to be excluded from the Smog Check inspection requirement;
7. Allows the consumer to select a Smog Check station type of their choice. These vehicles should not be directed to any specific station type.

### **Background**

To evaluate the emissions impact of high-mileage vehicles, the ARB conducted a study of taxicabs in the Los Angeles and San Francisco areas in 2002. The study concluded that the average taxicab traveled 58,000 miles in 2002, almost 4 times the average miles traveled for passenger vehicles. ARB conducted approximately 1,600 inspections on these vehicles and found about 27 percent with some type of failure. In contrast, the failure rate for other 1992 – 2002 model-year passenger cars averaged about 5 percent, 22 percent lower than the taxicab fleet.

Based on the study of taxicabs in Los Angeles and San Francisco, ARB concluded that annual inspections of the taxicab fleet could produce emission reductions of 0.8 tons per day of HC and NO<sub>x</sub> and 3.7 ton per day of carbon monoxide emissions. The ARB/BAR Report also concluded that approximately 3 percent of the California vehicle fleet falls into the high-mileage category that is currently defined as more than 25,000 miles per year. Therefore, if all high-mileage vehicles receive annual Smog Check inspections, the emission reduction benefits could total 6 tons per day of hydrocarbons, 17 tons per day of NO<sub>x</sub>, and as much as 102 tons per day of carbon monoxide. It should be mentioned that this is an upper bound for potential benefits. On average, private and government-owned fleets and individually owned vehicles that meet the high-mileage definition may be maintained better than taxicabs.

Most cities and counties identify taxicabs in their local jurisdictions and the DMV database identifies vehicles used as a taxicab. The California Public Utilities Commission licenses “for

hire” limousines and other commercial carriers. Government fleets could be required to report mileage on these vehicles. However, an identification problem exists with privately owned fleets and individual owners of high-mileage vehicles since only the odometer indicates vehicle miles and this data is not transferred to the DMV except on change of ownership.

SB1107 (stats. 2004, chap. 280, §7) excepts the 5<sup>th</sup> and 6<sup>th</sup> model-year vehicles from the biennial Smog Check requirement. Therefore, early identification of potential high-mileage vehicles becomes impossible until the vehicle reaches seven years old and requires its first Smog Check inspection.

## **Proposal**

The IMRC agrees with the recommendation to implement an annual Smog Check test procedure for high-mileage vehicles. Unfortunately, vehicle identification appears to create a significant obstacle to this proposal. Therefore, the IMRC recommends that BAR, in cooperation with the DMV and ARB, develop a high-mileage vehicle identification protocol to select vehicles that travel more than twice the number of miles per year of the average passenger car or light-duty truck. The identification should include taxicabs, privately owned fleets, government fleets (such as police cars), and privately owned vehicles. Since the ARB/BAR Report estimates a 27 percent failure rate for high-mileage vehicles, BAR should develop a methodology to exempt some vehicles from the annual Smog Check inspection requirement and instead send only those most likely to fail the Smog Check inspection.

As an option, new technologies could be used in lieu of an annual inspection that could provide similar emission benefits. One such technology is called Networkcar™, which requires that a telematics device be installed in the vehicle and connected to the vehicle’s computer controlled emission system. When the computer control system identifies an emissions related problem, a message could be sent to BAR indicating an emissions related defect that requires the vehicle owner to have the vehicle repaired. The same system also sends information to BAR upon completion of successful emission-related repairs. The use of this system could eliminate the need for an annual inspection while ensuring that the vehicle remains in compliance. It should be mentioned that BAR and ARB have been testing the usefulness of this new technology with taxicabs for approximately two years.

## **Impacts the IMRC Considered**

The IMRC’s primary concern involves the inability of BAR or DMV to identify high mileage vehicles. Although many of these vehicles display commercial license plates issued by DMV, this information in and of itself does not identify the vehicle as high mileage.

In addition, some of the high-mileage vehicles include commuters who may drive as much as 200 miles per day. The annual inspection would place an additional burden on this segment of society (although some would qualify for the Consumer Assistance Program which minimizes the negative impact).

## **Emission Reduction Estimate**

An annual Smog Check inspection for high-mileage vehicles could provide additional emission reductions of 23 tons per day of hydrocarbon and NOx and 102 tons per day of carbon monoxide, at an estimated cost of less than \$10,000 per ton. Including a methodology to excuse some vehicles from the annual inspection requirement may improve the cost effectiveness. The additional option of using newer technologies such as Networkcar™ may also provide a low-cost alternative while ensuring that these vehicles maintain low emissions.

## **BAR BUDGET & FUNDING**

During the monthly meetings of the Inspection and Maintenance Review Committee, several attendees voiced concerns over the BAR budget and questioned transfers of funds to other government entities, loans to the General Fund, and recent statutory changes associated with smog abatement fees. The IMRC has reviewed the BAR budget process and has several recommendations.

### **Recommendations for Legislative Action**

The Committee recommends that the Legislature adopt a statutory change that provides the following:

1. Initiates a 5-year repayment schedule for the repayment of the \$114 million dollar loan from the Vehicle Inspection and Repair Fund to the General Fund;
2. Calculates the interest earned on the aforementioned loan at the same rate as the Pooled Money Investment Account;
3. Deposits the funds directly into the High Polluter Repair or Removal Account for use by the Consumer Assistance Program.

### **Background**

- a. The BAR is a specially funded organization that receives no funding from California's General Fund. The revenue sources BAR receives include monies from licensing fees, smog abatement fees collected by the DMV, the sale of Certificates of Compliance, and fines and penalties.

Owners of vehicles four years old and newer pay a \$6.00 Smog Abatement Fee as part of their DMV registration renewal. The Smog Abatement Fee is intended to be used to offset the potential emissions reductions lost as a result of these vehicles being excused from the Smog Check inspection for the first 4 years. Pursuant to Section 44091 of the Health and Safety Code, \$2.00 of the fee is deposited into the High Polluter and Repair or Removal Account while the remaining \$4.00 is deposited in the Vehicle Inspection and Repair Fund. The various licensing, smog abatement, and certificate fees collected amount to over \$120 million annually. The sale of Smog Check Certificates of Compliance generates the majority of BAR's funding. The Legislature annually appropriates the amount of funding based on their review of BAR's projected budget needs.

BAR funding is separated into two accounts: 1) the Vehicle Inspection and Repair Fund; and 2) the High Polluter Repair or Removal Account. The Vehicle Inspection and Repair fund pays for all BAR operations with the exception of the Consumer Assistance Program. The revenue source for the Consumer Assistance Program is generated primarily from \$2.00 of the \$6.00 Smog Abatement fee paid by owners of 4 year and newer model year vehicles, which is deposited into the High Polluter Repair or Removal Account. The Consumer Assistance Program derives additional funding from the sale of vehicles

impounded by local law enforcement agencies pursuant to §14607.6 of the California Vehicle Code.

During public meetings of the IMRC, attendees have complained that BAR funds were diverted to agencies other than BAR and for uses other than the Smog Check program. Although the IMRC lacks the resources required to perform a complete fiscal audit of BAR expenses, a subcommittee met with BAR staff and budget staff from DCA to review appropriations and expenditures. Based on numerous interviews with BAR and DCA staff to review BAR's budget process, the subcommittee found no evidence to substantiate the allegations. All expenditures and distribution of funds, including funds to cover the overhead charges and indirect expenses of the Department of Consumer Affairs and the State and Consumer Services Agency, appear to be reasonable and appropriate and compliant with state statute and the Department of Finance's policies and guidelines.

- b. In the last three years, the Governor and the Legislature have approved borrowing of approximately \$114 million from the Vehicle Inspection and Repair Fund to assist the State in offsetting the General Fund shortfall. In 2002, AB425 (stats. 2002, chap. 379, §2, Item 111-011-0421) transferred \$100 million from the Vehicle Inspection and Repair Fund to the General Fund and requires that the loan be repaid with interest at the rate earned by the Pooled Money Investment Account. Again in 2003, AB1765 (stats. 2003, chap. 157, §2, Item 1111-003-0421) transferred another \$14 million to the General fund with the same interest provisions on repayment.

Section 16320 (b) (1) of the Government Code states, in pertinent part, that "The Director of Finance shall order the repayment of all or a portion of any loan made pursuant to subdivision (a) if he or she determines that either of the following circumstances exists:

- (A) The fund or account from which the loan was made has a need for the moneys.
- (B) There is no longer a need for the moneys in the fund or account that received the loan."

Section 16320 of the Government Code suggests that the repayment requires a request from the lending agency and the lending agency must identify a specific monetary "need" prior to any loan repayment. However, it does not identify what qualifies as a "need" nor does it address whether expanding an ongoing program such as the Consumer Assistance Program would qualify as a "need".

- c. SENATE BILL 1107 (stats. 2004, chap. 280, §7 & 8), made significant changes to the Smog Check program and diverts some funds that would otherwise be deposited into the Vehicle Inspection and Repair Fund and the High Polluter Repair or Removal Account. These funds now will be deposited into the Air Pollution Control Fund, administered by the Air Resources Board (ARB). Specifically, SB1107 excepted the 5<sup>th</sup> and 6<sup>th</sup> model-year vehicles from the biennial Smog Check requirement and imposed a \$12 smog abatement fee on 6 year and newer model year vehicles effective January 1, 2005. SB1107 requires that \$6 of the fee be deposited into the Air Pollution Control Fund to provide additional

funding to the Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) administered by ARB. These additional funds for the Carl Moyer Program will achieve additional NO<sub>x</sub> and particulate matter emission reductions from mobile and stationary diesel sources.

### **Proposals**

The IMRC suggests that the Legislature initiate a 5-year repayment schedule of the \$114 million previously borrowed from the Vehicle Inspection and Repair Fund. These funds should be deposited directly into the High Polluter Repair or Removal Account to support the expansion of the low income Consumer Assistance Program. Based on a principal amount of \$114 million, the payment equals approximately \$22.8 million annually plus interest. As previously mentioned, the interest accrued would be equal to that earned by the Pooled Money Investment Account.

### **Benefits**

The suggested five-year repayment schedule provides a long-term repayment timetable to minimize the negative impact that an immediate repayment could have on California's current General Fund shortfall. Repayment of these funds would assist in the expansion of the low income Consumer Assistance Program.

## QUANTIFYING THE EMISSION REDUCTIONS

The IMRC reviewed the ARB/BAR methodology for estimating emission reductions from the Smog Check program and heard a number of questions raised by the public and IMRC members regarding the efficacy of the methodology used. ARB's response to these questions is included in the Appendix.

### **Recommendations for Administrative Action**

1. The IMRC strongly endorses the continuation of a random roadside inspection program to monitor the emission reduction impacts of the Smog Check program. The present method of evaluation has engendered a critical examination of the Program by the agencies that has resulted in numerous recommendations on ways to strengthen the emission reduction potential of the Program.
2. The IMRC recommends that BAR turn off the "Fast Pass" provision of the Smog Check inspection for a statistically valid sample of inspections to improve emission reduction analysis.

### **How Does ARB/BAR Estimate Benefits?**

ARB/BAR uses two methods for estimating emission reductions from Smog Check. First, they analyze the results of roadside inspections conducted from samples of in-use vehicles. Second, they use the EMFAC2002<sup>1</sup> model to simulate California vehicle emissions with and without the present Program. The results of these two methods are compared in the ARB/BAR Report, page 18, Table 3.5. Although both the roadside and the emissions factors model have specific limitations, both data sets produce similar results.

Roadside inspection data are the fundamental basis for the benefit assessment. This is an independent way to measure impacts through a permanent year-around roadside inspection with dynamometer tests of systematic samples of vehicles in the enhanced areas of the state. In addition to the random roadside inspections, the BAR and ARB have conducted special studies on smaller sub samples that have informed their decisions on specific issues such as gas cap testing, liquid leaks, on board diagnostic systems, and pressure tests. They also have lab-test results that inform estimates.

The IMRC was not able to perform an independent analysis of Smog Check records at this time. Due to the "fast-pass" mode used in the loaded mode test, Smog Check records of emissions fail to provide a reliable method for estimating the Smog Check impact on emissions. In a fast-pass mode, the test moves on as soon as the required emission level is passed.

As an example, the 15 MPH portion of the loaded mode test has a maximum time frame of 100 seconds. If the vehicle passes the tail pipe emission test with an average reading of "pass" in the first 30 seconds of the test, then the analyzer proceeds to the 25 MPH portion of the test. Therefore, test printouts are not a reliable indicator of on-road emissions. Moreover, the benefits of Smog Check go beyond tailpipe emissions. The total tons reported reduced includes

<sup>1</sup> EMFAC2002 is short for Emissions FACtor 2002, and is a computer model capable of providing estimates of current, past, and future emissions from on-road motor vehicles from 1970 to 2040.

evaporative emission reductions. Evaporative<sup>2</sup> emission benefits are substantial and have become a greater part of the program benefit in recent years.

### **Benefits Compared to Expected Benefits in the 1994 State Implementation Plan**

The IMRC heard criticisms that the State Implementation Plan (SIP) requirements established in 1994 and the Program's performance in relation to those requirements are not accurately portrayed in the evaluation report. The criticism implies that any shortfall between the 1994 SIP estimate of I&M benefits and actual performance is a failure on the part of the State in program implementation.

The IMRC found that the best response to these criticisms is to acknowledge the following:

- The 1994 SIP emission reductions were estimates based on theoretical knowledge at the time;
- Pilot projects provided more information about what could actually be achieved, and benefit estimates changed after pilot projects were completed;
- The 2000 ARB/BAR report compared before and after enhanced Smog Check. Then additional emission reductions were achieved by other unanticipated ARB measures that backfilled the 2000 shortfall;
- Since 2000 there have been two updates of EMFAC with a much better understanding of what is going on in the motor vehicle emission inventory;
- The 2003 SIP has a new inventory basis and new targets. For example, the EMFAC model assumes that vehicle failure occurs on average six months after Smog Check. The deterioration rate by model year is based on studies of samples of vehicles.

### **Does the Analysis Adequately Account for Deterioration After the Smog Check?**

One commenter asked that the IMRC perform a detailed examination of roadside data to compare failure rates before and after a Smog Check inspection. The purpose of this exercise appears to have been to provide more specific information regarding the durability of repairs and therefore the extent of emission reductions gained through repairs. The IMRC considered the requested data analysis and determined that it would not produce reliably better results than a similar analysis performed by ARB and reported in the Report's Technical Appendix on pages 2-24 to 2-30.

This analysis indicates that repairs frequently are not durable, likely due to both fraudulent testing and poor workmanship. However, there can be various causes for non-durable repairs including the consumer's willingness to pay. This same analysis is the basis for the vehicle failure rate assumed in EMFAC2002. In addition, the ARB commented on this issue with a detailed response and is included in the Appendix as Attachment 2.

<sup>2</sup> Evaporative emissions are vaporous emissions that emanate from the fuel tank, fuel delivery lines, gas cap, or any fuel evaporative system component.

## **Overall Assessment of Air Quality Benefits of Smog Check**

The IMRC recognizes that our ability to estimate the benefit of the Program is severely limited by the fact that no one can test and compare a population of vehicles subject to the Program with an identical population of vehicles not subject to the Program. In essence, it is not possible to quantify the full benefit of the California Smog Check program because no one can make this fundamental comparison.

There are a number of benefits of the Program that are not directly measured:

- The motivation for vehicle owners to maintain their vehicles so they do not fall into disrepair;
- The motivation of vehicle manufacturers to install durable emission control equipment;
- The motivation that vehicle owners have to avoid failing Smog Check, leading to pre-inspection repairs.

## **Conclusion**

The present method of evaluation has engendered a critical examination of the Program by the agencies that has resulted in numerous recommendations on ways to strengthen the emission reduction potential of the Program. The key to this method is a random roadside inspection program. The IMRC appreciates this approach and encourages the agencies to continue to look for cost effective emission reductions in the Smog Check process.

PART IV

COMMENTS

## **PART IV: REPORT COMMENTS**

As previously mentioned in the introduction of this report, the Inspection and Maintenance Review Committee (IMRC) distributed a draft report to the following state agencies and organizations to solicit their comments: the California Highway Patrol, the California Department of Motor Vehicles, the State and Consumer Services Agency, the Bureau of Automotive Repair, the Department of Consumer Affairs, and the California Air Resources Board. Another 130 interested parties were notified of the report via email, US Mail, and fax.

The IMRC accepted comments via e-mail, US Mail, and fax. As a result, we received a total of 6 comments from government agencies, organizations, and automotive shop owners. The following provides a summary of the comments from the various entities. A complete copy of the report comments is available upon request to the IMRC.

### **Government Agencies**

The DMV commented on three recommendations that impact their department. These include the additional penalties for late Smog Check for registration renewals; annual inspections of older model year vehicles; and annual inspections of high mileage vehicles. Each of these proposals would require that DMV reprogram their automated system and any associated costs have not, as yet, been determined. In addition, high-mileage vehicles would be difficult to identify since DMV only receives vehicle mileage information at the time of original registration and transfer of ownership.

The Bureau of Automotive Repair (BAR) and the Air Resources Board (ARB) jointly responded to the IMRC report. They responded to the recommendations in the report as follows:

1. Implementing Model Specific Emission Cutpoints – Support
2. Smog Check Program Avoidance – Support
3. Comparison of Test-Only, Gold Shield, and Test and Repair Stations – They are committed to evaluating the reason/s for any differences that may exist between stations types.
4. Vehicle Preconditioning Prior to a Smog Check Inspection – BAR is currently implementing this recommendation.
5. Tire Pressure and Safety Inspections – BAR and ARB believe that the best way to implement a tire pressure test is through public information campaigns. BAR has already begun a statewide outreach campaign on vehicle maintenance.

## **Automotive Associations**

The California Emissions Testing Industries Associations (CETIA) and the California Automotive Business Coalition (CalABC) also responded to the IMRC Report. CETIA addressed only one issue which was the Comparison of Test-Only, Gold Shield, and Test and Repair Stations. They are concerned with the validity of the comparison conducted by IMRC. Their comments state that OBD II reduces the opportunity for human error in the Smog Check inspection process and therefore the data does nothing more than confirm the expected results when implementing the OBD II technology. CETIA provided IMRC with suggested language that they believe should be used in the report. That language change was rejected by the IMRC.

CalABC generally agreed with the report but also commented in depth on three areas of the report which are as follows:

1. They agree with the recommendation regarding the Comparison of Test-Only, Gold Shield, and Test-and Repair, and further suggest that the direction of vehicles has been severely disruptive to small business owners.
2. CalABC also suggests that IMRC edit the recommendation regarding Tire Pressure Testing and instead request legislative action to implement this as a component of the Smog Check inspection.
3. CalABC does not support the recommendation for Smog Check authority to be transferred to the Air Resources Board. They are concerned that such a transfer in authority would result in the loss of stakeholder support for the Smog Check program. They recommended that this recommendation be removed from the report.

## **Automotive Shop Owners**

IMRC also received comments from two shop owners; Bud Rice, owner of Quality Tune-up Shops and Mike Cavanaugh, owner of Simple Smog Test Only Center. Mr. Rice addressed the following concerns:

1. Suggests that the reference for directing 36% of vehicle to Test-Only be further defined to indicate that currently, the 36% is applied to the entire enhanced fleet, not just those subject to the biennial Smog Check inspection.
2. Concerned about the suggestion that new technologies could be used in lieu of annual Smog Check inspections if annual smog check inspections were implemented for older model-year vehicles.
3. Opposes the continued exemption of 1975 and older model-year vehicles if older model year vehicles require an annual inspection.

Mr. Cavanaugh takes exception to the Comparison of Test-Only, Gold Shield, and Test and Repair Station topic and suggests that the Test-Only stations keep the test honest. He is also concerned that any change in direction of vehicles to Test-Only stations will have a negative impact on the Test-Only industry.

PART V

APPENDICES

| <b>Member Name</b>        | <b>Area of Expertise</b>                                   | <b>Date Appointed</b> | <b>Appointing Authority</b> |
|---------------------------|--|-----------------------|-----------------------------|
| Victor Weisser - (Chair)  | Representative of Stationary Source Emissions Organization | August 28, 2002       | Governor                    |
| Judith Lamare, Vice Chair | Expert in Air Quality                                      | April 23, 2003        | Senate Rules Committee      |
| Paul Arney                | Public Member  | November 6, 2003      | Governor                    |
| Dennis DeCota             | Representative of I/M Industry                             | August 25, 2003       | Senate Rules Committee      |
| John Hisserich            | Social Scientist   | November 6, 2003      | Governor                    |
| Bruce Hotchkiss           | Local Law Enforcement Agency                               | August 21, 2001       | Speaker of the Assembly     |
| Gideon Kracov             | Public Member  | August 25, 2003       | Governor                    |
| Al "Skip" Solorzano       | Public Member  | November 1, 2006      | Governor                    |
| Jeffrey Williams          | Economist  | August 28, 2002       | Governor                    |
| Eldon Heaston             | Air Pollution Control Officer                              | May 25, 2006          | Governor                    |
| Roger Nickey              | Representative of I/M Industry                             | August 24, 2005       | Governor                    |

(1)As defined by Section 44021 of the California Health and Safety Code

## **Committee Member Background**

### **Mr. Victor Weisser**

Mr. Weisser was appointed as Chairman of the Inspection and Maintenance Review Committee on August 28, 2002. Currently, he serves as President and Chief Executive Officer of the California Council for Environmental and Economic Balance (CCEEB) since 1989. He directs all Council activities including the management of advocacy, policy development and implementation, research, communications, member relations and administration. Mr. Weisser regularly works with elected and appointed government officials and business, community, and organized labor leaders regarding the development and implementation of programs aimed at achieving California's environmental and economic goals.

Prior to joining the Council, Mr. Weisser served as Executive Director of the California Public Utilities Commission, the last of several management positions he held in California state government. Mr. Weisser is a graduate of Michigan State University and received a graduate degree certificate in urban studies from Carnegie-Mellon University.

### **Dr. Judith Lamare**

Dr. Judith Lamare was appointed to the Inspection and Maintenance Review Committee on April 23, 2003 by the Senate Rules Committee. Since 1983, Dr. Lamare, of Sacramento, has been a self-employed consultant on air quality policy. In 2005 she retired as the founding manager of the Cleaner Air Partnership, public-private partnership sponsored by the American Lung Association of Sacramento-Emigrant Trails and the Sacramento Metropolitan Chamber of Commerce since 1986. Dr. Lamare's career has been focused on development of local, state and federal policy initiatives to clean up the air. She has conducted research on public participation in air quality improvements.

Prior to starting her consulting practice, Dr. Lamare was a consultant to the California Senate Office of Research, a Research Associate at UCLA, and a lecturer at several Universities. She has also received numerous awards including the Lifetime Achievement Award from the American Lung Association-Emigrant Trails and the Sierra Club Mother Lode Chapter Conservationist of the Year. Among other volunteer roles, she served many years as Sierra Club California's volunteer Air Quality Chair.

Dr. Lamare received her Bachelor and Masters of Arts degrees, and her Ph.D. in political science from the University of California, Los Angeles.

## **Mr. Paul Arney - Unavailable**

## **Mr. Dennis DeCota**

Mr. Dennis DeCota was originally appointed to the Inspection and Maintenance Review Committee in 1994 by Governor Pete Wilson and was reappointed by the Senate Rules Committee on August 25, 2003. Since 1991, Mr. DeCota has served as the Executive Director of the California Service Station and Automotive Repair Association. He oversees daily activities of Association and its annual budget, membership benefits programs. He also organizes and manages CSSARA's Board meetings and the annual general membership meeting. In addition, Mr. DeCota maintains good working relationships with all levels of management at State of the California, Department of Consumer Affairs, Bureau of Automotive Repair, California Air Resources Board, California Environmental Protection Agency, California Energy Commission and California Legislature.

Prior to his employment at CSSARA, Mr. DeCota was the Merchandising Sales Supervisor for Unocal Corporation from 1966 to 1978 and the Marketing Director for CSSA Pro from 1982 to 1985. Mr. DeCota has been instrumental in the passage of Legislation that has benefited both the Smog Check program and small businesses involved in oil company franchisees. These bills include SB 629 (statutes of 1994) and SB1178 (statutes of 1999). In addition, Mr. DeCota has served on the California Attorney General's Gasoline Pricing Task Force, the California Environmental Protection Agency Service Station Permit Regulatory Reform Task Force, the California Air Resources Board Cleaner Burning Gasoline Committee, the Bureau of Automotive Repair's Technical Education Committee, and the President of the Automotive Repair Coalition from 1999 - 2002.

## **Dr. John Hisserich**

Dr. John C. Hisserich was appointed to the Inspection and Maintenance Review Committee on November 6, 2003. He recently retired as the Associate Vice President for Health Affairs at the University of Southern California where he had participated in administration, teaching, and research for 32 years. In the past, he has served as a public member of the California Coastal Commission and the Committee of Bar Examiners. He now represents the public on the State Board of Food and Agriculture and the Court Reporters Board. In addition, he has served as a reserve Deputy Sheriff with the Los Angeles County Sheriffs Office for over 26 years. Dr Hisserich earned his Masters and Doctorate degrees in Public Health from the University of California, Los Angeles, and a Bachelor's degree in Government from California State University, Los Angeles.

## **Mr. Bruce Hotchkiss**

Mr. Bruce Hotchkiss was appointed to the Inspection and Maintenance Review Committee on August 21, 2001. Mr. Hotchkiss has worked for the Bureau of Automotive Repair (BAR) since 1991 and is currently assigned to the Hayward Complaint Mediation Center. Prior to this assignment, the BAR enforcement division employed Mr. Hotchkiss where he worked with automotive repair dealers to ensure compliance with the Automotive Repair Act.

Prior to his employment at BAR, Mr. Hotchkiss worked for Honda Canada, Inc., in Service Engineering; Chrysler Canada/American Motors Canada, as an Owner Relations Specialist in the Central Regional Office; and, Peterson, Howell, and Heather, Canada, as a Fleet Maintenance Specialist. In 1977, Mr. Hotchkiss earned a Certificate of Qualification as a Motor Vehicle Mechanic from the Province of Ontario's Ministry of Colleges and Universities automotive apprenticeship program. This was later split into two certificates, Automotive Service Technician and Truck and Coach Technician, which are kept current.

Mr. Hotchkiss writes a monthly automotive review column for the Pacifica Tribune, contributes to [www.AutoWire.net](http://www.AutoWire.net), and is a member of the Western Automotive Journalists. In addition, he was also a member of the Pacifica Planning Commission, from 1997 until March 2004.

Mr. Hotchkiss is the President of the California Association of Regulatory Investigators and Inspectors (CARII), an affiliate of CAUSE, a union of state public safety employees. Bruce is the Chairman of CAUSE's Scholarship Committee, and is a member of CAUSE's Controller's Committee, Political Action Committee and the Negotiation Team during the last two bargaining sessions (2001 and 2003).

## **Mr. Gideon Kracov**

Mr. Kracov is the principal of the Law Office of Gideon Kracov in Los Angeles, where he represents clients in civil law, environmental and regulatory matters. Previously, Mr. Kracov served as a Deputy Los Angeles City Attorney where he provided environmental and real estate counsel to City agencies. There he also prosecuted environmental crimes and unfair business practices. He is a member of the Executive Committee of the Los Angeles County Bar Association Environmental Law Section and has served as a board member of the Salvadoran American Leadership and Education Fund and the Progressive Jewish Alliance. In 2001, he was awarded the Marshall Memorial Fellowship by the German Marshall Fund of the United States. Mr. Kracov earned a Bachelor of Arts degree with high honors from the University of California, Berkeley, and a Juris Doctorate from Boalt Hall School of Law at the University of California, Berkeley.

## **Mr. Al “Skip” Solorzano**

As a corporate manager and independent consultant, Skip Solorzano has provided technical expertise and support to market, manage and facilitate the delivery of services in the utility, consumer services, health care and social service industries.

Formerly, Mr. Solorzano served as a manager with Pacific Gas and Electric Company. During his twenty-year tenure with the utility, responsibilities were directed to expand the level of services within target markets, enhance marketing efforts to increase program participation, and serve as a liaison to the diverse community segments. In 1991, the utility sponsored Solorzano as an executive on loan to the California Hispanic Chambers of Commerce. Under this assignment he served as the chief executive administrator for the statewide trade association.

Mr. Solorzano has been an entrepreneur for nineteen years and in 1993, established his consulting practice of Solorzano Communications Group. As a consultant, he has been affiliated with several statewide projects including serving as the bilingual media spokesperson for California deregulation campaign, Plug In California. An accomplished trainer, Mr. Solorzano has delivered curriculum in leadership and organization development, working with retail, employee groups and business organizations. In 2003, he served as the master trainer for the eligibility worker certification process of California's Healthy Families/Medi-Cal programs. Mr. Solorzano has held an array of leadership positions with nonprofit, business and community-based organizations. He has attained numerous commendations and awards for his distinguished service to the community. In 2006, Mr. Solorzano was appointed by California State Governor Schwarzenegger as a member of the Inspection and Review Committee under the Department of Consumer Affairs. Mr. Solorzano is a past award recipient of the National Concilio of America and the United Way Most Influential Hispanics of the Bay Area. To recognize his leadership and success in the unique development of business partnerships between major corporations and the Hispanic business community, Mr. Solorzano is a former recipient of the United States Hispanic Chamber of Commerce Corporate Advocate of the Year award. Mr. Solorzano is a graduate of LaSalle University, receiving a Masters of Science degree in Communications.

## **Dr. Jeffrey Williams**

Dr. Jeffrey Williams, 51, of Palo Alto and Davis, was appointed to the Inspection and Maintenance Review Committee on August 28, 2002 and has focused his career on economics for more than 20 years. Dr. Williams was an Assistant Professor in the Economics Department at Brandeis University from 1981 to 1987, and was a visiting economist at the Banca d'Italia in 1986. He worked for the Food Research Institute of Stanford University from 1987 to 1998 as an associate and full professor, and later as Director. In 1992, Dr. Williams was awarded a Quality of Research Discovery Award from the American Agricultural Economics Association for a book he authored entitled Storage and Commodity Markets. Since 1997, he has served as the Daniel Barton DeLoach Professor in the Department of Agriculture & Resource Economics at the University of California, Davis. Dr. Williams earned his Doctor of Philosophy and Masters of Arts degree from Yale University and a Bachelor of Arts degree from Williams College.

## **Mr. Eldon Heaston**

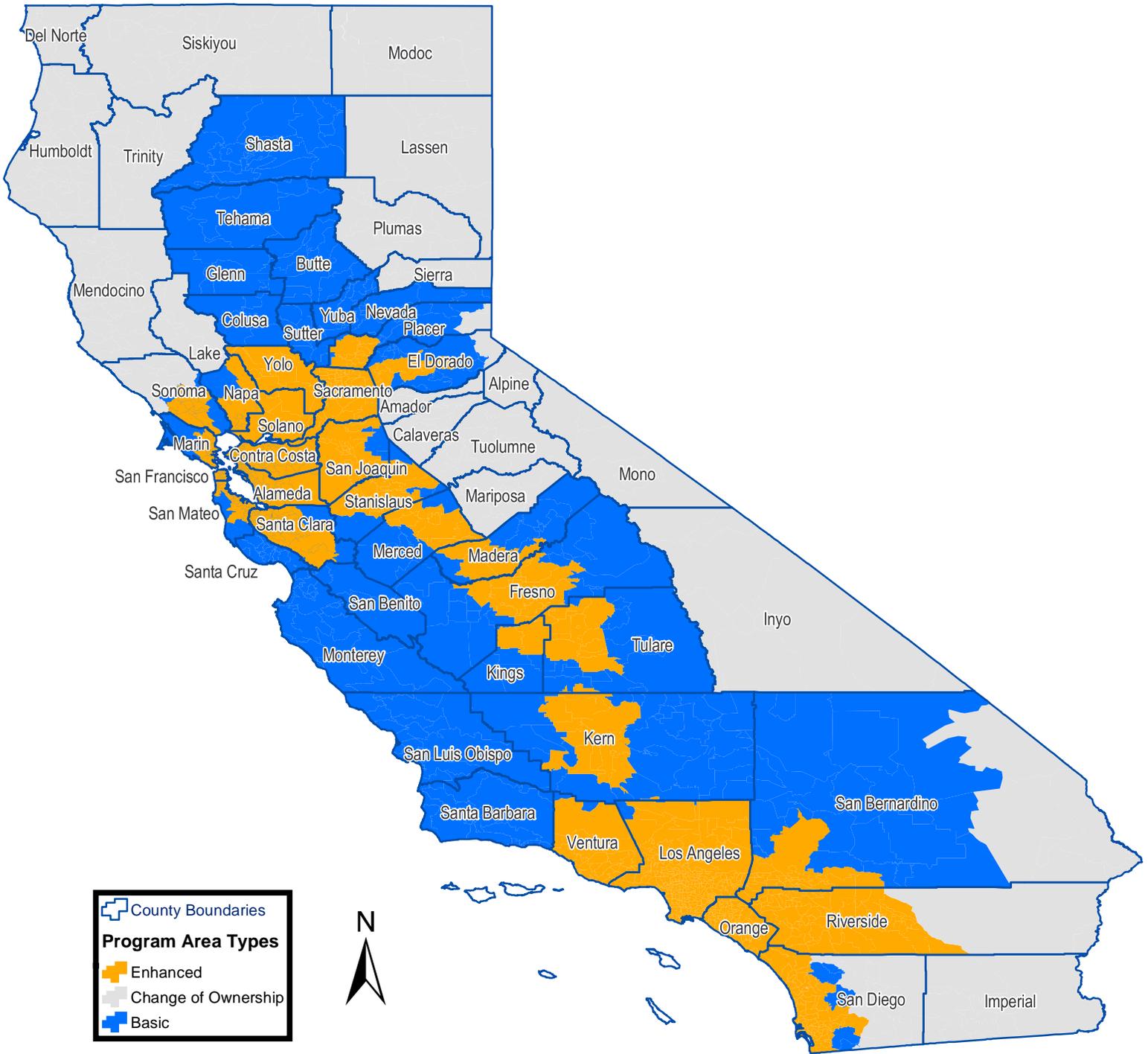
Eldon Heaston, 52, of Claremont, has been appointed to the Inspection and Maintenance Review Committee. Since 1991, he has served as executive director of the Mojave Desert Air Quality Management District. Previously, Mr. Heaston served as senior technical staff for the Computer Sciences Corporation from 1990 to 1991 and in refinery operations for the Atlantic Richfield Company from 1977 to 1987.

## **Mr. Roger Nickey**

Mr. Roger Nickey, 63, of Wilton, is the owner of Folsom Quick Smog, a smog emission test company. Previously, Mr. Nickey served as manager of Midas, an automotive repair shop. From 1996 to 1998, he was the owner of Automotive Technology Consultant, where he conducted undercover repair shop evaluations. He is a member of the California Emission Testing Industry Association and the Early Day Gas Engine Association.

# California's Smog Check Program Area Types

## Updated April 2005



Bureau of Automotive Repair  
Engineering  
April 2005

Check web site at [www.smogcheck.ca.gov](http://www.smogcheck.ca.gov) for updates

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May 2, 2006

Victor Weisser, Chair

Paul Arney

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Dennis DeCota

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Jeffrey Williams

Rocky Carlisle,  
Executive Officer

The Honorable Shirley Horton  
Assemblywoman, Seventy-Eighth District  
PO Box 942849  
Sacramento, California 94249-0078

Dear Assemblywoman Horton:

I am writing in response to your request dated January 4, 2006, regarding the air quality benefits associated with directing vehicles to Test-Only stations. In the intervening time since we received your letter, the Inspection and Maintenance Review Committee's (IMRC) Executive Officer, Rocky Carlisle, has discussed the issues raised in your letter several times with your staff to better understand your questions in order to prepare the best possible response. We appreciate the time and assistance your staff has provided and your patience during the time it has taken for us to research your questions.

My response represents the IMRC's current best understanding of the issues raised in your letter. In addition to meetings with the staff of the Bureau of Automotive Repair (BAR) and the Air Resources Board (ARB), we have relied upon the following documents to prepare this response and have included pertinent portions of them as attachments.

- The 1994 State Implementation Plan (SIP) dated December 1995, and the 2003 revision;
- The ARB Evaluation of California's Enhanced Vehicle Inspection and Maintenance Program, dated July 12, 2000;
- The BAR fact sheet entitled "*Test-Only Directed Vehicles*" dated 2003; and,
- The SIP update letter to U.S. EPA from ARB dated August 17, 2000.

Your questions raise some complicated issues which require some historical background to understand.

#### BACKGROUND

In 1994, the California Environmental Protection Agency (CalEPA) and the U.S. Environmental Protection Agency (U.S. EPA) negotiated changes to California's existing Smog Check program to ensure compliance with the Federal Clean Air Act of 1990.

Initially, the U.S. EPA established a performance standard for Smog Check programs that required California to implement a program where initial and post-repair inspections were performed at Test-Only stations. The U.S. EPA had concluded that such a program would be more effective in identifying failing vehicles and better ensure adequate repairs for failed vehicles. California's program had no Test-Only stations at that time.

After protracted negotiations, both CalEPA and U.S. EPA agreed to a hybrid program relying upon both Test-Only and Test and Repair stations to perform initial Smog Check inspections. The agreement required establishing a sufficient number of Test-Only stations to perform Smog Check inspections on vehicles most likely to fail the initial inspection and for retesting vehicles that previously failed. The remaining vehicles could continue to receive inspections at Test and Repair stations. The percentage of vehicles to be directed to Test-Only stations was established at 15 percent with provisions to allow increases if emission-reduction performance failed to meet the U.S. EPA performance standards.

As compared to U.S. EPA's proposal to create a network of contracted Test-Only stations, this hybrid approach allowed less disruption of the existing Test and Repair based program. The premise of the compromise was that the hybrid approach could achieve the same emission reductions as the U.S. EPA proposed approach for two reasons: First, those vehicles most likely to fail the Smog Check inspection would receive initial inspections at Test-Only stations. The percentage of "most likely to fail" vehicles was determined by modeling and found to be approximately 36 percent of the fleet needed to achieve the SIP commitment. Second, other features of California's hybrid program exceeded U.S. EPA's minimum program proposals.

The legislation passed to implement this agreement required BAR to establish a Test-Only station network that had the initial capacity to inspect 15 percent of the vehicle fleet subject to Smog Check. The law also provided for the number of Test-Only stations to be expanded as needed to meet the emission-reduction performance standards set forth by the U.S. EPA.

In order to develop the number of Test-Only stations, BAR began promoting the Test-Only licensing concept to the Smog Check industry in early 1997 and soon started directing vehicles to Test-Only stations in areas that had sufficient Test-Only capacity. By the end of 1998, BAR achieved the goal of directing 15 percent of vehicles subject to the program in enhanced areas of the state to Test-Only stations; however, only about 12 percent ended up actually being tested. The difference between the number of vehicles directed to Test-Only stations versus the number of vehicles receiving a test were identified as "no show" vehicles. These "no show" vehicles never appeared at a Test-Only station due in part to transfers in vehicle ownership, vehicles being sold out of state, vehicles being junked, and vehicles placed in a nonoperational status.

In 2000, BAR and ARB determined that the program was not achieving the emission-reduction goals committed to in the SIP. This shortfall resulted in a SIP update that was agreed to by both CalEPA and the U.S. EPA to increase the emission reductions of the program. In a letter addressed to U.S. EPA dated August 17, 2000 (copy attached), both ARB and BAR agreed to a number of program improvements. One of those improvements was to increase the percentage of directed vehicles to Test-Only stations from 15 percent to 36 percent, the same figure used in the 1994 SIP (refer to attachment #1) as needed to achieve emission-reduction performance standards set forth by the U.S. EPA.

The Bureau of Automotive Repair implemented that change according to the following schedule:

- October 1, 2001 – 25 percent
- February 2002 – 30 percent
- August 2002 – 36 percent

In 2005, the statewide vehicle fleet subject to the Smog Check program totaled approximately 23 million vehicles. Based on the ARB/BAR report entitled *April 2004 Evaluation of the California Enhanced Vehicle Inspection and Maintenance (Smog Check) Program*, 87 percent (20 million vehicles) of the vehicle fleet is subject to the enhanced area Smog Check program.

## STATE IMPLEMENTATION PLAN (SIP)

It is important to understand the role of the SIP and its impact on the Smog Check program in order to have a proper context to answer your questions. The SIP is California's commitment under the Federal Clean Air Act to implement measures in order to meet federal air quality standards. The SIP is enforceable in federal court. The Code of Federal Regulations Title 40, Chapter I, Part 52, Subpart F, Section 52.220, lists all of the items which are included in the California SIP. The SIP is not a single document, but rather a compilation of new and previously approved plans, programs, local air district rules, state regulations, and federal controls. Therefore, the revised 2003 SIP does not actually supplant the 1994 SIP, but rather serves to build upon the 1994 SIP to enhance and improve California's emission-reduction strategies for future years. The ARB and air districts are now engaged in preparing the new ozone SIP to show how they will comply with new federal standards for the "eight hour average" standard of ozone pollution. This plan must be submitted to U.S. EPA by June 15, 2007. The Smog Check program is expected to continue to provide a significant portion of required emission reductions.

With this information as background, I'll now respond as directly as possible to the questions raised in your letter. From your letter and our Executive Officer's conversations with your staff, we have identified eight questions that require individual answers. I've summarized your questions in italics at the beginning of each of the following sections:

1. *According to law, how many vehicles is the BAR required to direct to Test-Only stations?*

State law requires that California have the capacity to test at least 15 percent of the vehicle fleet, registered in enhanced areas of the state, at Test-Only stations. However, it also states that the capacity shall be increased to ensure attainment of the emission-reduction performance standard set forth by the U.S. EPA. The SIP identifies up to 36 percent as that fraction of the fleet that needs to be tested at Test-Only to achieve the emission-reduction goals (refer to attachment #1). State law identifies the fleet as "the total state vehicle fleet consisting of vehicles subject to inspection each year in the biennial program and that are registered in the enhanced program area." [Sections 44010.5(a) and (b)(1) of the Health and Safety Code].

A key question left unanswered is: "What vehicles are subject to the Smog Check program today?" How this question is answered may impact the number of vehicles that must be directed to Test-Only stations. Suffice it to say at this juncture that ARB and BAR have interpreted the statutes as requiring inclusion of all 1976 and newer gasoline-powered vehicles in defining the fleet. This includes those vehicles exempted from actual inspections (e.g. vehicles less than six years old). This results in a proportionally larger number of vehicles being directed to Test-Only stations than would be directed compared to 36 percent of the number of vehicles that are actually due for a Smog Check inspection. In reality, the percentage of vehicles currently being directed to Test-Only stations equals 48 percent of those due for a Smog Check inspection.

Although there are policy questions associated with this issue, disagreements regarding the current approach of the agencies must be resolved in the context of the current statutory construction and the SIP. Therefore, you might want to consult with the Office of the Legislative Counsel or the Attorney General for their opinions on this matter.

2. *Why did the Air Resources Board indicate that the State had committed to direct two million vehicles per year to Test-Only stations?*

The number cited by ARB was correct at the time because it did not include the Bay Area vehicle population. The ARB gave a presentation to the IMRC on March 21, 2005, regarding California's Smog Check program requirements. During that presentation, ARB indicated that California was required to "test" two million vehicles (based on the 36 percent figure in the SIP) at Test-Only stations. To achieve the target of two million Test-Only inspections, the Department of Motor Vehicles sent notices to 2.6 million vehicle owners. As previously mentioned, the higher number of notices was needed to compensate for the number of "no shows".

However, the two million-vehicle figure cited by ARB did not include vehicles in the Bay Area since the Bay Area had just become subject to the enhanced Smog Check testing requirements by the Legislature pursuant to the provisions of AB2637, stats. 2002, chap. 1001. Consequently, when the Bay Area vehicle population was added, the total number of vehicles directed to Test-Only stations increased to approximately 3.4 million per year.

3. *What are the emission-reduction benefits the state receives by directing vehicles to Test-Only stations?*

The California Air Resources Board quantifies emission benefits of Smog Check. The only report that quantifies emission reductions for vehicles directed to Test-Only stations is the July 12, 2000 ARB *Evaluation of California's Enhanced Inspection and Maintenance Program*, p. VI-8, Table VI-5 (refer to attachment #2). In the South Coast Air Basin, this report indicates that by increasing the number of vehicles directed to Test-Only stations from 15 percent to 36 percent, the reduction of hydrocarbon emissions (HC) improves by 0.8 tons per day (tpd) and the reduction of oxides of nitrogen (NOx) improves by 2.5 tpd by 2005. This represents a two percent increase in HC reductions and a 14 percent increase in NOx reductions towards the SIP commitment of 32.9 tpd of HC and 18 tpd of NOx in the South Coast Air Basin (refer to attachment #3).

4. *How many vehicles are required to be directed to Test-Only to comply with the State Implementation Plan (SIP)?*

The 1994 SIP required that a minimum of 15 percent (750,000 vehicles annually) be tested at Test-Only stations. The SIP further states that the number of directed vehicles should be adjusted in order to meet the desired emission-reduction performance standards set forth by the U.S. EPA. The 2003 SIP revision states that the increase from 15 percent to 36 percent was one of the improvements being made to augment Smog Check performance. The SIP does not limit the percentage of vehicles directed to Test-Only stations, but rather declares that the state may need to adjust the actual number of vehicles required for Test-Only to achieve sufficient emission reductions committed to in the SIP. Although the SIP states that motorists voluntarily choosing to go to a Test-Only station would be included in the percentage of vehicles directed to Test-Only, the volunteers are not counted at this time. Only vehicles directed from the High Emitter Profile (HEP) and random selection are currently counted in the 36 percent. This issue has been a source of controversy between Test-Only station owners and Test and Repair station owners since the percentage of directed vehicles was increased to 36 percent.

5. *Within the context of the SIP, is California required to direct vehicles using a High Emitter Profile model to Test-Only stations?*

The SIP does not specify the sole use of the HEP for vehicles directed to Test-Only stations. The 1994 SIP states in pertinent part:

*“The vehicles required to go to test-only stations for initial tests will consist of: 2 percent random sample, high mileage fleet vehicles, vehicles for hire, annual test for 2-5 years for vehicles previously identified as high emitters, likely high emitters identified through remote sensing and test and repair stations, and motorists voluntarily choosing to go to test-only stations. The remainder of the capacity will be used as necessary to meet the performance standard through likely high-emitters identified with the high-emitter profile (HEP).”*

State law requires a Test-Only station network with the capacity to test enough vehicles to achieve the emission-reduction performance standards set forth by the U.S. EPA. The vehicles directed to Test-Only stations should be those vehicles most likely to fail the Smog Check inspection, and computer modeling established that number to be 36 percent. The HEP was designed to select those vehicles most likely to fail and those vehicles are directed to Test-Only stations. [It should be noted that the annual test for 2-5 years for vehicles previously identified as high emitters referenced in the 1994 SIP was eliminated by legislation in 1997 (AB1492, stats. 1997, chap. 803).]

Currently, BAR directs 34 percent of the vehicles to Test-Only stations based on the HEP while the remaining two percent are selected at random. The BAR explains the methodology used to direct vehicles to Test-Only stations in a fact sheet entitled “Test-Only Directed Vehicles”. The following is a quote from that fact sheet:

*“The majority of vehicles directed to Test-Only stations are selected by application of the High Emitter Profile (HEP) which identifies the vehicles most likely to fail their Smog Checks. The High Emitter Profile (HEP) uses data from several different sources. Some of it comes from the state Vehicle Identification Database (VID), which collects data from each Smog Check performed in California. The VID is used by the Department of Motor Vehicles (DMV), BAR, and other government agencies. In addition, general vehicle data such as make, model-year, vehicle miles traveled, and engine size help define the HEP.”* (Refer to attachment #4)

Under the heading of “Two Percent Randomly Selected”, the same fact sheet states the following:

*“As required by State law, two percent of the vehicles in the Enhanced Areas are also directed to Test-Only stations for their Smog Checks. These vehicles are selected randomly to evaluate the overall effectiveness of the Smog Check Program.”*

6. *If the answer to question 5 is “yes”, then what portion of directed vehicles would be categorized as “high emitters”?*

Although many documents refer to high emitters, the term “high emitter” is not defined in statute or regulation. A more accurate term would be “potential high emitter” as a result of the vehicle being ranked high on the HEP. The HEP applies a methodology to rank all vehicles each month that are coming due for the biennial Smog Check inspection. By ranking, it assigns a probability of failure to each vehicle based on the likelihood of that vehicle failing the inspection. The BAR uses the HEP to select the vehicles more likely to fail Smog Check than other vehicles and these probable higher failing vehicles are directed to Test-Only stations; consequently, 34 percent could be categorized as being “potential higher emitters” since they are in the highest third of the HEP database. The remaining two percent are selected at random from vehicles subject to the Smog Check program.

7. *Is it possible for California to receive the same emissions reductions by directing only “high emitters” to Test-Only stations?*

Assuming this question refers to the previously identified “potential high emitters”, I believe this question refers to the exclusion of the two percent random selection. Any incremental loss in emission reductions from eliminating the two percent random selection directed to Test-Only stations, while unknown at this time, is not likely to be significant and may not even be measurable. However, elimination of testing of this random two percent would compromise an important source of data used to assess the effectiveness of Smog Check.

The purpose of the two percent selection is to collect data that can be used to analyze the emission reductions achieved by the Smog Check program. The random sample is directed to Test-Only stations because that type of station is believed by the agencies to provide the most unbiased testing which improves data analysis.

8. *If the answer to question 7 is “no”, then what are the incremental benefits, in terms of emission reductions that are being achieved, by sending nonhigh-emitter vehicles to Test-Only stations versus “Gold Shield” stations?*

The loss of emission reductions that result from dropping the two percent of directed vehicles has not been quantified. It appears likely that the state would receive the same SIP credit if it were to eliminate the two percent random selection that is directed to Test-Only stations.

## OTHER CONSIDERATIONS

The July 12, 2000 ARB report states that the top 25 percent of Test and Repair stations are equivalent in performance to Test-Only stations (refer to attachment #5). The same report also states that additional emission benefits are gained by directing more vehicles to Test-Only and/or higher performing Test and Repair stations. Therefore, performance measures could be the standard by which stations qualify to test directed vehicles.

The ARB and BAR have contracted with Sierra Research to perform a significant program evaluation which includes comparing the performance of the various Smog Check station types. Given the many variables that exist in the Smog Check program, determining the proper metrics to measure station performance is a challenging task. The IMRC is working with ARB and BAR on this important program evaluation.

I recognize that this is a somewhat complex and confusing mélange of issues and answers and truly hope my responses to your questions have been helpful. If you need additional information on these issues, please contact me directly at (415) 512-7890, extension 16, or the IMRC's Executive Officer, Rocky Carlisle, at (916) 322-8249. We look forward to working with you to improve the Smog Check program since it provides one of the most effective strategies for improving air quality in California.

Sincerely,



Victor Weisser  
Chairman

- Attachments:
- #1 - Excerpt from the 1994 State Implementation Plan (SIP) dated December 1995.
  - #2 - Excerpt from the ARB *Evaluation of California's Enhanced Vehicle Inspection and Maintenance Program* dated July 12, 2000.
  - #3 - Excerpt from the ARB *Evaluation of California's Enhanced Vehicle Inspection and Maintenance Program* dated July 12, 2000.
  - #4 - The BAR fact sheet entitled "*Test-Only Directed Vehicles*" dated 2003.
  - #5 - Excerpt from the ARB *Evaluation of California's Enhanced Vehicle Inspection and Maintenance Program* dated July 12, 2000.
  - #6 - The SIP update letter to U.S. EPA from ARB with Attachments A through E, dated August 17, 2000 .

cc: Mr. Tom Cackette, Chief Deputy Executive Officer  
ARB  
Mr. Richard Ross, Chief  
BAR