OPTIONS TO REFORM THE CURRENT INSPECTION/MAINTENANCE PROGRAM

A Report to the Governor, the General Assembly, and the Air Quality Control Commission

> Prepared by the Regional Air Quality Council August 30, 2000

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Executive Summary

Last January Governor Bill Owens asked the Regional Air Quality Council (RAQC) "to study additional options to reform the current I/M [inspection/maintenance] program." The Governor's request came after the RAQC proposed initial changes to the I/M program as part of a Carbon Monoxide Maintenance Plan and Redesignation Request that has been submitted to the U.S. Environmental Protection Agency (EPA) for approval. The Governor asked for a report to his office, the Colorado General Assembly, and the Colorado Air Quality Control Commission (AQCC) by September 1, 2000.

The Governor's request is particularly important at this juncture since the current contract with Envirotest Systems Corp. for operation of the centralized-testing program expires on December 31, 2001. Now is the time to consider modifications to the program that can make it more effective and reduce the burden on area motorists.

Over the past several months, with the assistance of a subcommittee of interested parties and local experts, the RAQC assessed the current program and evaluated options for improving the emission reduction effectiveness of the program as well as reducing the inconvenience and cost for area motorists. The RAQC has developed a series of recommendations that will improve the program significantly.

1. After considering all current information, the RAQC concluded that <u>an inspection/maintenance</u> **program will be needed in the Denver metro area for the foreseeable future** to maintain compliance with federal air quality standards and other requirements of the federal Clean Air Act. While emissions from motor vehicles are expected to continue to decline as result of advances in new vehicle technology, thus offering greater flexibility to design a less expensive, more effective and more convenient inspection/maintenance program, significant growth in vehicle travel in the region will put pressure on these technological gains and must be considered in future mobile source control efforts.

- 2. While the inspection/maintenance program has been successful in combating carbon monoxide pollution, other pollution problems, such as ozone and fine particulate matter, are emerging as more serious challenges for the Denver area in the future. The RAQC believes <u>more should be done</u> to address hydrocarbons and nitrogen oxide (NOx) emissions and identify high-emitting and smoking vehicles to realize important air quality benefits.
- 3. The RAQC also concluded that <u>maintaining a contractor-operated centralized program</u>, <u>utilizing both IM240 technology and remote sensing</u>, is an effective and technically-sound <u>approach</u> when the current emissions testing contract expires. Ultimately, the region's goal should be to move from the current program that tests many vehicles unnecessarily to a program that more effectively targets high-emitting vehicles, without compromising the air quality benefit. The recommended approach represents an appropriate transition to the ultimate goal.

The new program will require a staged transition since no other state has utilized a remote sensing clean screen and high emitter program at the scale we are recommending. We cannot look for experience elsewhere to assess the practical feasibility or implementation costs of such a large-scale program. Therefore, it is essential to phase in the program gradually so that we can learn from our experience as we go.

To ensure a smooth transition without a lapse in the program, it is imperative the State move forward quickly with developing a new contract, either by seeking authority from General Assembly to negotiate extending the current contract, or through a rebidding process required by current statute. The program should be extended for no more than five years, and the future need and direction for the program should be reassessed when improved technical evaluation tools are available.

While maintaining the framework of a contractor-operated centralized program is recommended, the RAQC identified several improvements that should be made to the program:

- 4. <u>Implement the remote sensing clean screen program contained in the Carbon Monoxide</u> <u>Maintenance Plan</u>. By exempting at least 60-70% of the registered vehicles from routine testing by 2006, the clean screen approach will significantly reduce the burden on area motorists with little impact on air quality.
- 5. <u>Add a high emitter identification and enforcement component to the program</u>. By utilizing the clean screen remote sensing network, a high-emitter component should be added to reduce emissions from problem vehicles. This approach will not only improve the effectiveness of the current program, but data gathered from the program can be used to evaluate the State's ability to increase reliance on this type of program in the future.

- 6. <u>Improve the effectiveness of emission-related repairs</u>. Improvements can be made to ensure that problem vehicles are repaired and that repairs remain effective. Improving the reporting of repairs, placing particular emphasis on verifying repairs of high-emitting vehicles, and expanding the outreach and technical assistance with the repair industry will result in more effective repairs and less emissions.
- 7. <u>Increase or eliminate the current \$450 repair waiver limit.</u> The current limit has not changed since the program started in 1995. No repair limit, or a higher waiver limit, will allow more effective and lasting repairs performed on problem vehicles.
- 8. <u>Establish a low-income assistance program to provide financial support for low-income</u> <u>motorists to obtain necessary repairs for problem vehicles</u>. The cost of necessary repairs for some motorists may result in less-effective repairs or avoidance of program requirements. A financial assistance program, similar to one recently implemented in California, may help lowincome motorists obtain necessary repairs that will improve air quality.
- **9.** <u>Place greater emphasis on public education of the benefits of emission-related repairs</u>. The economic, as well as environmental, benefit of effective repairs should be emphasized through a public education effort.
- 10. Institute an improved and more systematic approach for evaluating program effectiveness. A more complete and effective evaluation process should be designed, one that takes into account all of the data derived from the program. In addition, a baseline study of motor vehicle emissions and ongoing evaluations should be conducted to evaluate the effectiveness of the program and make adjustments in its implementation.
- 11. Establish a fee on all vehicles registered in the program area to finance all aspects of the <u>new program</u>. The current approach for paying for the program will be cumbersome and will result in an inefficient delivery of services in a new program that incorporates remote sensing. The RAQC recommends a single fee on all vehicles registered in the program area that will be used to cover the cost of IM240 testing, remote sensing, high emitter identification and enforcement, and program evaluation. The fee also could be used to pay for the low-income assistance program and public education efforts. Any fee that is established must be structured to be consistent with the provisions of TABOR so that it does not result in unacceptable consequences for state revenues.
- 12. Evaluate eliminating the oxygenated gasoline requirement when improved mobile source emissions models are available. In well-maintained, newer technology vehicles, oxygenated gasoline is less effective in reducing carbon monoxide emissions. Therefore, the emissions reduction potential from oxygenated gasoline will be reduced significantly in future years. When EPA's MOBILE6 emissions model is available, the RAQC and AQCC should evaluate accelerating the phase-out of the oxygenate requirement for wintertime gasoline.

The options recommended by the RAQC to reform the current inspection/maintenance program will, if implemented, result in a more effective and convenient program for the Denver metro area. They will reduce the burden and overall costs of the program on area motorists, while at the same time providing air quality benefits necessary to maintain air quality standards.

As we move into the future, as cars and trucks become cleaner, and as our modeling and evaluation tools become better, the metro region likely will be able to make further modifications to the program. With the data and experience provided by the new program, the region may be able to justify moving to a standalone high-emitter program or other modifications that will make the program even more efficient, more convenient, and less costly for area motorists within the next five years.

The remainder of this report provides more detail and rationale for the RAQC's conclusions and recommendations. The Council looks forward to working with the Governor, the General Assembly, the Air Quality Control Commission, the Department of Public Health and Environment, the Department of Revenue and other interested parties to consider these recommendations.

Report to the Governor, the General Assembly, and the Air Quality Control Commission

I. <u>GOVERNOR OWENS' REQUEST</u>

In a January 2000 letter to the Chairman of the Regional Air Quality Council, Governor Bill Owens asked the Council "to study and develop additional options to reform the current I/M [inspection/maintenance] program." The Governor's request came after the Council had successfully completed a Maintenance Plan and Redesignation Request for carbon monoxide, where the RAQC proposed initial changes in the inspection/maintenance program to make the program more cost-effective and convenient for area motorists.

In his letter, Governor Owens asked the RAQC to consider several points in its evaluation:

- Focus on options that would reduce or eliminate the burden of the program while still maintaining the current carbon monoxide standard;
- Evaluate the real benefits of the I/M program;
- Provide direction to the State when the current I/M contract expires on December 31, 2001;
- Provide information to the state legislature as it develops legislative proposals with respect to the I/M program;
- Consider the work done by the Office of the State Auditor in its "1999 Audit of the Colorado Air Program"; and
- Take into account the current analytical models supplied by EPA for regulatory purposes.

The Governor asked the RAQC to provide this report by September 1, 2000 to his office, the Colorado General Assembly, and the Air Quality Control Commission (AQCC).

II. RAQC'S PROCESS FOR EVALUATING THE PROGRAM

In response to the Governor's charge, the Regional Air Quality Council formed a Mobile Sources Subcommittee, chaired by Douglas County Commissioner Melanie Worley, and invited all interested parties to participate on the subcommittee. More than 30 individuals, representing a wide range of perspectives, participated in the subcommittee's deliberations. The subcommittee scheduled a series of technical and policy presentations and discussions to address the points outlined in the Governor's letter. The subcommittee held eight meetings and discussed a wide range of topics relating to the future inspection/

maintenance program, including:

- Presentation on the State Auditor's report, "1999 Audit of the Colorado AIR Program";
- Past studies estimating program effectiveness;
- Projected mobile source emission trends using available models and analytical tools;
- Overview of federal state implementation plan (SIP) and transportation conformity requirements;
- Emission testing contract issues;
- Other state programs and approaches;
- Clean screening options, including remote sensing, model year exemptions, and vehicle profiling;
- High emitter identification and enforcement approaches;
- Smoking vehicle identification and enforcement;
- EPA's On-Board Diagnostics program requirements;
- Emission-related repair effectiveness from the viewpoint of experts in the field;
- Program financing approaches; and
- HB00-1492, a bill to implement the remote sensing clean screen program that passed during the 2000 session of the General Assembly, but was vetoed by the Governor because of its adverse TABOR implications.

As a result of its information gathering process, the subcommittee proposed a list of conclusions and recommendations for consideration by the Regional Air Quality Council. The RAQC discussed the subcommittee's input at two meetings in August and formulated this report to the Governor, the General Assembly and the Air Quality Control Commission.

III. OVERALL CONCLUSIONS AND RECOMMENDATIONS

Based upon its review of the future of the inspection/maintenance program in the Denver metropolitan area, the Regional Air Quality Council offers the following overall conclusions and recommendations on the I/M program:

Despite significant growth expected in the region, emissions from new motor vehicles are expected to continue to decline, offering increased flexibility to design more effective and convenient local mobile source control programs (<u>See Recommendation #1, Executive</u> <u>Summary</u>).

Advances in motor vehicle emission control technology continue to produce cleaner cars and trucks, which are more durable and stay cleaner longer. These gains offer the State of Colorado greater latitude in reevaluating and redesigning its mobile source control strategies. At the same time, significant growth in vehicle travel in the region will put pressure on these technological gains and must be considered in future mobile source control efforts. □ The inspection/maintenance program should no longer focus primarily on carbon monoxide, but should address other criteria pollutants as well. The program should be improved to address emerging mobile source pollution problems relating to ozone, fine particulate matter, and visibility impairment through the use of tighter cut points for VOC and NOx, high-emitter and smoking vehicle identification, improved repair effectiveness, and other methods (*See Recommendation #2, Executive Summary*).

Colorado's current inspection/maintenance program was initially designed almost exclusively as a carbon monoxide control program. Control of volatile organic compounds (VOCs) and nitrogen oxides (NOx) has been secondary as a result. With ozone and fine particulate matter standards and visibility impairment emerging as more challenging air quality problems for the Denver metro area, more should be done to address these other pollutants to realize important air quality benefits.

Implementation: The Air Quality Control Commission (AQCC) should review Air Quality Regulation No. 11 to determine the extent of emissions reduction benefits that can be maximized for other pollutants.

□ The approach outlined in the recently adopted Carbon Monoxide Maintenance Plan for the Denver area is a reasonable approach in the near term for increasing the efficiency and cost-effectiveness and reducing the inconvenience of mobile source pollution control strategies on the motoring public (*See Recommendations #3 and #4, Executive Summary*).

The Carbon Monoxide (CO) Maintenance Plan and Redesignation Request was submitted to EPA for approval on May 10, 2000 by Governor Owens. The plan was developed last year by the RAQC, adopted by the AQCC in January 2000 and reviewed during the 2000 session by the General Assembly.

The approach outlined in the plan continues utilizing the IM240 biennial transient test in the six-county Denver metropolitan area, but adds remote sensing clean screening to exempt a significant number of vehicles from routine testing. By 2006, the plan envisions evaluating 80% of the vehicle fleet operating in the Denver metro area with remote sensing, resulting in 60–70% of the registered vehicles being exempted from routine IM240 testing. This approach will save the motoring public time and money and will maintain the Carbon Monoxide National Ambient Air Quality Standard. In addition, the remote sensing program will allow a high emitter identification program to be added with little additional cost and greater air quality benefits.

Implementation: The Colorado Department of Public Health and Environment (CDPHE) and Colorado Department of Revenue (DOR) should implement the program outlined in the maintenance plan through a new contract that will take effect January 1, 2002. In addition, the General Assembly should consider legislation that will make implementation of the program more efficient and effective, as outlined later in this report.

□ The current inspection program utilizing the IM240 test is technically sound. However, data show that improvements are possible in the areas of repair effectiveness, unrealized emission benefits, better enforcement of unresolved failures, and on-road high emitter identification that will reduce the cost to motorists and make the program more cost-effective (*See Recommendation #3, Executive Summary*).

From a technological perspective, IM240 is generally considered the best testing procedure for detecting polluting vehicles during a drive cycle and diagnosing the necessary repairs. However, for a variety of reasons the current program is not realizing its full air quality benefit. Depending on method of calculation, it is estimated the program reduces CO emissions by up to 17%. Though significant, this is far short of the projected benefits. The current program can be improved by increasing the effectiveness of repairs; enforcing requirements against owners who operate their vehicles in the program area illegally; and improving methods for identifying high-emitting vehicles that are operating on the region's roadways.

□ In the future, there are likely to be additional options that can augment the current program and further reduce the number of vehicles tested, such as increased clean screening, model year exemptions and vehicle profiling (*See Recommendation #4. Executive Summary*).

More than 90% of the vehicles currently pass their routine emission tests. The challenge is to identify these clean vehicles and exempt them from routine testing. The current program exempts the newest four model years from routine testing since new cars tend to be clean. Remote sensing and vehicle profiling offer promising means to identify additional clean vehicles that do not need to be tested routinely, while at the same time identifying high emitters that contribute disproportionately to our pollution problems.

□ A high emitter identification and enforcement component should be added to the program to ensure reductions in mobile source emissions from problem vehicles (*See Recommendation #5, Executive Summary*).

The remote sensing network that will be established for the clean screen program can also be used to identify high-emitting vehicles that are still operating on the roadways and need to be repaired. While not envisioned as part of the federally-approved state implementation plan (SIP), a high-emitter component can provide additional air quality benefit by dealing with problem vehicles. Statutory authority is necessary to implement such a program and to provide the necessary enforcement mechanisms.

Implementation: The General Assembly should consider legislation that will authorize a high emitter identification program that includes appropriate enforcement, compliance and consumer-assistance mechanisms and necessary funding.

- **The process for evaluating program effectiveness should be improved and expanded** (*See Recommendation #10, Executive Summary*):

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- An independent baseline study of on-road motor vehicle emissions should be conducted in 2001 to establish a baseline of fleet emission characteristics for future comparisons.
- The annual evaluation of program effectiveness should be improved by utilizing data derived from all aspects of the program, such as remote sensing, other on-road measurements, IM240, high emitter identification, emissions profiling, and repair effectiveness.
- ► A comprehensive reevaluation of the program should be conducted within five years to evaluate further program improvements and direction.
- The General Assembly should provide sufficient funding for these evaluations, possibly through the recommended program fee or as part of the next emissions testing contract.

Historically, inspection/maintenance programs evolve over time as automotive emission control technology and emissions testing technology progress. While the approach outlined in the RAQC's recommendations is a reasonable direction over the next five years, the program should be reevaluated within this time period to assess the need for further program improvements and whether the program should continue. With a more complete and effective evaluation process, the State will be in a better position to support the direction of its program with a cohesive record of effectiveness of the components.

A baseline study prior to implementation of the new IM240/remote sensing program will be necessary to aid future evaluations. A methodology for establishing the current baseline should be established before the changes in the program begin. A methodology also should be in place to assess the impact of changes to the program, such as clean screening, emissions profiling and high emitter identification. A baseline study will allow the State to develop a more realistic evaluation of the IM240/remote sensing program and justify further program improvements.

The recommended annual evaluation is an expansion of the current evaluation conducted by the Air Quality Control Commission with assistance from the Air Pollution Control Division. This evaluation will analyze all the data derived from the program to determine program effectiveness and identify improvements in implementing the program. Such an assessment will be particularly important since the changes to the program will be phased in over four years and problems and necessary adjustments need to be identified.

Implementation: The General Assembly should consider including sufficient funding for periodic program evaluations, either through a program fee, through the next emissions testing contract, or through some other means. The General Assembly should consider appropriating funds to conduct an independent baseline study early in the 2001 legislative session and authorize completion of the study before December 31, 2001. The General Assembly should authorize, within the next five years, an evaluation of the continued need and the future direction for the program. The General Assembly should determine who should perform the evaluation, the objectives for the evaluation, and the deadline for the report.

IV. EXPANDED CONCLUSIONS AND RECOMMENDATIONS

The Regional Air Quality Council offers conclusions and expanded recommendations relative to specific issues, including:

- Negotiate a new emission testing contract
- Reduce the burden with clean screening methods
- Implement a high-emitter identification and enforcement program
- Improve emission-related repair effectiveness
- Establish a new approach for program financing
- Other issues:
 - Consider 1999 State Auditor's report
 - Improve modeling tools
 - Appropriately integrate on-board diagnostics (OBDII)
 - Reevaluate the future of oxygenated gasoline

The table at the back of this report summarizes the RAQC's recommendations, indicates which organization would be responsible for implementation, and whether the recommendations will result in increased costs or cost savings for the program.

A. <u>Negotiate a New Emission Testing Contract (See Recommendation #3, Executive</u> <u>Summary)</u>

□ A contractor-operated centralized IM240 program should be extended for no more than five years, either through the state's bidding process or through an extension of the current contract. The contract should be staged in increments to allow for modifications based on periodic evaluations to ensure continued improvements and continued program effectiveness.

Experience around the country has shown that centralized, contractor-operated programs generally result in lower testing costs for the motoring public than comparable decentralized programs. There are no compelling reasons at this time to change the operating structure of the current program and therefore the current contractor-operated program should be continued. In addition, the State should weigh the merits and decide whether it is best and more efficient to extend the program through a rebidding process or through an extension of the current contract with Envirotest Systems Corp.

Implementation: The Colorado Department of Public Health and Environment (CDPHE) and Colorado Department of Revenue (DOR) should begin the contract process as soon as possible and determine if rebidding the contract or extending the current contract is more beneficial. The General Assembly should consider giving CDPHE authority to extend the current contract if advisable.

A seamless transition to a new contract after the current contract expires on December 31, 2001 is in the best interest of the motoring public and the State.

However the State proceeds with the new contract, it is imperative that the program efficiently and smoothly transition into the new contract to avoid the start-up problems and public dissatisfaction that occurred in early 1995. The program cannot lapse because of its detrimental impact on the region's SIPs and transportation conformity.

Both the IM240 and remote sensing elements of the program should be integrated into a single contract, even if there are multiple providers.

Initially, the IM240 contractor will be testing all cars except the exempted model years. As the remote sensing program increases, ultimately achieving up to 80% coverage of the fleet, IM240 will be testing fewer vehicles. To ensure a cost-effective program for the motoring public, a single contract is recommended, even if there are multiple providers of the different testing technologies. A single contractor will allow the prime contractor to coordinate the remote sensing and IM240 portions of the program to ensure proper data handling, consumer convenience, and minimization of costs. Multiple contracts with competing contractors would not result in an efficient delivery of services and would require undue oversight and coordination from the State.

Implementation: CDPHE and DOR should consider this recommendation during the contracting process.

B. <u>Reduce the Burden with Clean Screening Methods (See Recommendation #4, Executive</u> <u>Summary)</u>

The remote sensing Clean Screen program should be implemented as envisioned in the Carbon Monoxide Maintenance Plan.

The CO Maintenance Plan envisions a phase-in of remote sensing clean screening from early 2002 through 2006. Initially, Clean Screen will evaluate 20% of the vehicle fleet in 2002, resulting in an estimated 9% of the fleet being exempted from routine testing. By 2006 the remote sensing clean screen program will be fully implemented and may evaluate up to 80% of the vehicle fleet.

Implementation: CDPHE and DOR should implement the program outlined in the maintenance plan through a new contract that will take effect January 1, 2002. In addition, the General Assembly should consider legislation that will make implementation of the program more efficient and effective, as outlined in this report.

The remote sensing program should begin as soon as possible so that vehicle

exemptions can begin in early 2002, resulting in cost savings for area motorists. An extension beyond December 31, 2001 for the current IM240 program, including a remote sensing component, will require time for design of the system, some construction and debugging the system. The envisioned phase-in period recognizes the fact that no other state has operated a clean screen program of such magnitude. Once a new contract or a contract extension has been executed system design can begin.

Implementation: CDPHE and DOR should negotiate a contract to implement the remote sensing program as soon as possible.

The provisions of the current first 4 model year exemption from testing should be retained, with the exception of vehicles identified as high emitters.

The current four model year exemption offers a cost-effective approach for exempting vehicles that have a very high tendency to be clean. However, although most new cars remain clean, there are a small portion that do not remain clean over the four-year exemption period. If a vehicle is identified as a high emitter through the remote sensing program during its four-year exemption period, it should be required to come in for a confirmatory test. If the vehicle fails the test, it should be repaired and placed in the testing cycle. In addition, the State should maintain the current requirement for emission testing upon change of ownership to protect consumers.

Additional model year exemptions are not recommended at this time. Adding more model year exemptions would require a revision of the carbon monoxide maintenance plan that has been submitted to EPA, thereby delaying approval of the State's redesignation request. In addition, adding more model year exemptions would delay implementation of the remote sensing clean screen program since the current maintenance plan analysis cannot accommodate implementation of the additional model year exemptions and remote sensing clean screening at the same time. Finally, reducing and delaying the clean screen remote sensing will make adding high-emitter identification more costly and less efficient, thereby negating any cost savings from additional model year exemptions.

Implementation: While maintaining the current first 4 model year exemption, the General Assembly should consider provisions requiring IM240 testing of high emitting vehicles identified by remote sensing within the four-year exemption period.

U Vehicle emissions profiling should be investigated as a means to augment the effectiveness of the remote sensing clean screen program.

As data are collected from remote sensing, IM240, and other methods, certain groups of vehicles identified by model year, make, model and engine size are likely to show a propensity for testing clean and remaining clean over a period of time. Such vehicle profiling could be used to exempt these classes of vehicles from routine testing.

Implementation: CDPHE should continue to analyze data from vehicle profiling and make recommendations to the AQCC and General Assembly for additional exemptions from routine testing.

Data from the remote sensing clean screen program should be used to help evaluate the effectiveness of the overall program.

Remote sensing clean screen and IM240 data should be used together to assess the effectiveness of the overall program. As the State moves forward in the next five years towards reevaluating the program, data on its effectiveness will be helpful in deciding the right program for Colorado and justifying program changes to EPA.

Implementation: CDPHE should compile and analyze remote sensing data as part of ongoing program evaluations.

C. <u>Implement a High Emitter Identification and Enforcement Program (See</u> <u>Recommendation #5, Executive Summary)</u>

A high emitter identification and enforcement program should be added to supplement the IM240 and clean screen programs.

High emitting vehicles represent a relatively small portion of the fleet, but cause a disproportionate amount of mobile source pollution. A greater focus placed on high-emitter remote sensing will ensure that high-emitting vehicles are identified and repaired to provide greater emissions reductions. A high-emitter component can be added to the clean screen remote sensing with little additional cost.

Implementation: The General Assembly should consider legislation that will authorize a high emitter identification program that includes appropriate enforcement, compliance and consumer-assistance mechanisms.

□ Historical data indicate that approximately 25% of the vehicles failing the IM240 test do not return for a retest. Past evaluations indicate roughly 4% of these vehicles manage to be re-registered in the Denver metro area, 30-40% are registered in counties outside of the Denver metro area and the remaining 55-60% are not ultimately accounted for in the system.

These unresolved failures can be a significant source of pollution if the vehicles are still operating unrepaired in the metro area. More effective ways have to be found to track these vehicles and make sure they are no longer operating in the metro area if they have not been repaired and passed an emissions test. The remote sensing high-emitter program should be used to identify these vehicles that are avoiding the program requirements.

□ Once a vehicle has been identified as a high emitter and the owner is notified, the owner should be required to present the vehicle for a confirmatory test within 30 days. If the vehicle fails the confirmatory test, the owner should be required to obtain necessary repairs to the vehicle and pass a retest of the vehicle within 30 days. In addition, the vehicle subsequently could be placed on a more frequent inspection cycle to ensure the repairs remain effective.

If the vehicle fails to pass the confirmatory test or retest within the required time frames, enforcement options could include a fine, a suspension of the vehicle registration, revocation of license plates and/or a required emission test and fine at the time of registration renewal.

High-emitting vehicles should be tested and repaired as soon as possible after remote sensing identification to achieve the emissions reduction available. For those motorists who ignore the requirement to get a confirmatory test and necessary repairs, an enforcement mechanism is necessary to encourage compliance. Ultimately, the non-complying vehicle owner should be required to pass an emissions test and pay a fine before the vehicle can be registered at its next scheduled renewal. In the meantime, the vehicle owner could also be fined and/or the vehicle registration could be suspended and license plates could be revoked and confiscated until the owner complies.

Implementation: The General Assembly should consider such enforcement mechanisms to ensure compliance with the high-emitter requirements.

State statute should be changed to allow confirmatory tests at licensed emission testing facilities.

For high-emitting vehicles that are identified through remote sensing, current statute requires confirmatory tests performed at a state testing facility. These facilities are not designed or equipped to handle the volume of vehicles anticipated in a large-scale high-emitter program. The confirmatory tests should be performed at licensed emissions testing facilities that are designed for timely throughput of vehicles.

Implementation: The General Assembly should consider changing current statute to allow confirmatory testing at licensed emissions testing facilities.

☐ The high-emitter requirements should apply to all vehicles identified routinely operating in the metro area regardless of model year exemption, collector status, Colorado county of registration, or any other prior exemption.

Current statute allows for exemptions for new vehicles, collector vehicles, and vehicles registered in a county outside the area (if the vehicle owner does not work or go to school in the area). The high-emitter requirements, however, should apply to all vehicles identified as high emitters regardless of previous exemptions since such vehicles are contributing disproportionately to pollution in the Denver area. The remote sensing high-emitter program also should be used to identify high-emitting vehicles that are routinely driven in the metro area but are registered out of the area to avoid emission testing requirements.

Implementation: The General Assembly should consider statutory provisions that apply the enforcement requirements to all high emitting vehicles routinely operating in the metro area, regardless of model year exemption, collector car status, or Colorado county of registration.

□ A low-income assistance program (discussed below under "Improve the Effectiveness of Emission-Related Repairs") should be considered to encourage individuals to repair their high emitting vehicles and comply with the program requirements.

Many low-income individuals may not be able to comply with the high-emitter requirements because of economic hardship. A low-income assistance program will help these individuals and increase compliance with the requirement.

Implementation: The General Assembly should consider a low-income assistance program to encourage repair of high emitting vehicles.

Data from the RSD and I/M 240 program should be collected and analyzed to provide documentation on the effectiveness of the high emitter program.

EPA models currently give little credit for a high-emitter program, especially a stand-alone program, because there are little data supporting the effectiveness of such a program. Remote sensing high emitter data and IM240 data together will provide a significant data base that can be used to document the effectiveness of the high-emitter program. These data can be used in the reevaluation of the program within the next five years and can be used to provide justification to EPA for desired program changes and enhancements.

Implementation: CDPHE should compile and analyze all RSD and IM240 data to document the effectiveness of the high emitter program.

Appropriately trained state, county, and local law enforcement and environmental officers should be allowed to report smoking vehicles directly to the Department of Motor Vehicles. Once a vehicle has been identified and notified as a smoking vehicle, the owner should be required to complete a confirmatory test within 30 days and make necessary repairs. Enforcement for non-compliance should be the same as defined above for a vehicle identified as a high emitter by the RSD program.

Although it is illegal to operate a smoking vehicle in the State and many cities, towns and counties have similar regulations, there is currently little or no enforcement of any of the regulations in most jurisdictions. Most law enforcement agencies feel they have more immediate problems to address, and the time expended for a pullover, ticket preparation and potential court time are beyond their current resources.

This recommendation envisions basic training for law and environmental officers on how to identify smoking vehicles. When these trained personnel observe a smoking vehicle, the officer can report the vehicle directly to the DMV for follow-up. Once identified, the smoking vehicles would be treated as any other high emitting vehicles identified through remote sensing, i.e., a requirement for a confirmatory test and necessary repairs and enforcement for non-compliance. However, there may still be limited enforcement through this program because of resource constraints.

Implementation: The General Assembly should consider adding an enforcement mechanism as envisioned in this recommendation to the current statute concerning smoking vehicles. The CDPHE should provide the basic training, and DOR should incorporate the smoking vehicle reporting into the high emitter notification system for confirmatory testing.

D. <u>Improve the Effectiveness of Emission-Related Repairs</u> (See Recommendations #6-9, <u>Executive Summary</u>)

Data analysis presented by the Colorado Department of Public Health and Environment (CDPHE) shows that repairs have been effective in reducing emissions and most repaired vehicles have retained the apparent repair benefit through the next test cycle.

In a data base study conducted by CDPHE Mobile Sources Program staff, the repair benefit of 20,000 1985-2000 vehicles was evaluated. Repairs performed on failed vehicles showed an average 78% reduction in carbon monoxide emissions and 68% reduction in hydrocarbon emissions. In addition, matched vehicles from inspection years 1997-1999 that failed the initial test and passed the retest in 1997 retained 80-90% of repair effectiveness through the 1999 test cycle.

The contractor should improve the reporting of repairs performed and costs from repair technicians.

Despite the apparent effectiveness of most repairs, there is insufficient reporting of repairs conducted by repair technicians and actual repair costs. The CDPHE and the contractor should continue to work towards improved reporting. Better record keeping will aid in better understanding the impact of repairs on vehicle emissions.

Implementation: CDPHE and/or the AQCC should establish improved reporting requirements and work with the emission testing contractor and the repair industry to improve reporting of the appropriate cost and repairs from owners of repaired vehicles.

CDPHE's outreach program to the repair industry should be continued and enhanced.

The current CDPHE outreach program includes training, technology transfer, recommended repairs for problem vehicles and publication of a Repair Effectiveness Index (REI). Continued outreach to the repair industry is an extremely important component of the overall program. More training and information for repair industry management and technicians will lead to more effective repairs.

Implementation: The General Assembly should consider authorizing additional funding to expand the current CDPHE outreach program to the repair industry.

Effectiveness of repairs performed by shops and technicians should be tracked through a performance-based Repair Effectiveness Index (REI).

Technicians have noted that the current REI is based solely on whether repaired vehicles pass or fail required retests. Instead, the REI should be based on the emission reduction achieved so that full and necessary repairs are encouraged, not just minimum repairs to pass the test.

Implementation: CDPHE should consider a performance-based REI.

D Particular emphasis should be placed on verifying high-emitter vehicle repair effectiveness.

Data from numerous studies indicate that a relatively small portion of the fleet (5-20%) produce a disproportionate amount of the emissions of carbon monoxide, hydrocarbon or nitrogen oxides. The State should develop a system for verifying implementation and effectiveness of the repairs of these high-emitting vehicles in particular because they contribute disproportionately to excess emissions.

Implementation: CDPHE should develop a tracking system as soon as possible.

☐ The repair waiver limit of \$450 should be eliminated or increased, per current statute, to ensure effective repairs.

Current statute established a repair limit of \$450 for a failing vehicle to receive a certification of emissions waiver. While state statute also provides that the waiver limit should be adjusted annually by the consumer price index, the limit has never been raised and remains at \$450. According to automotive technicians, the current repair limit does not encourage the repair of problem vehicles, rather it allows the consumer to often refuse needed repairs. To ensure effective repairs, the General Assembly may want to increase or eliminate the waiver.

Implementation: The AQCC should consider increasing the current waiver limit, as directed by current statute, and annually thereafter. The General Assembly may also consider increasing or eliminating the waiver limit by statute.

A low-income assistance program, through a tax credit or some other means, should be considered to provide financial support and ensure compliance by repairing high-emitting vehicles.

Studies indicate that maintaining a vehicle is rated at the top of the list along with affordable housing as the chief economic concerns of low-income individuals. An increased emphasis on high emitter vehicle repair and an increased or eliminated waiver limit will impact more motorists. To ensure effective repairs and realize important air quality benefits, the General Assembly should consider establishing and funding an assistance program that can help low-income motorists afford effective repairs for their vehicles. Without such assistance, low-income individuals are confronted with the choice of avoiding the program requirements instead of repairing their vehicles. The assistance program could be funded through a tax credit, through the recommended program fee discussed later in this report, or through other means.

Implementation: The General Assembly should consider establishing a low-income financial assistance program.

To maximize the program's success there must be greater emphasis placed on public education of the benefits of clean vehicles.

Effective repairs are repairs that last and result not only in reduced emissions but also in improved drive ability and increased gas mileage. The economic as well as environmental benefits of operating a wellmaintained and repaired vehicle should be emphasized with the motoring public. The public education program should be funded through the recommended program fee discussed later under Program Financing.

Implementation: The General Assembly should consider authorizing funding for a public education program element.

E. <u>Establish a New Approach for Program Financing (See Recommendation #11, Executive</u> <u>Summary)</u>

A fee on all registered vehicles in the program area should be established to cover all program costs, including IM240 testing, remote sensing clean screen, high emitter identification enforcement, program evaluation, and possibly consumer assistance and education.

A single fee assessed on every registered vehicle will result in the most efficient delivery of testing services for the new program, and will make the program more convenient and less costly for area motorists. The fee should be established at a level sufficient to cover the costs of both IM240 and remote sensing testing. The fee could also be used to fund program effectiveness evaluations, a low-income assistance program, and other program-related functions as determined by the General Assembly.

Implementation: The General Assembly should consider establishing a single fee on all registered vehicles in the program area to cover the costs of all elements of the program.

□ Such registration fee should be structured to avoid TABOR limitations, such as creating a TABOR-exempted enterprise or a special purpose authority to administer the fee, or through other means.

The Governor vetoed HB00-1492 because the provisions in the bill related to collecting the registration fee posed unacceptable consequences under the TABOR provisions of the Colorado Constitution. However, there are ways to structure the revenue stream that would be created by a registration fee so that it would be exempt from the TABOR limits on fiscal year spending. An enterprise, which is defined under TABOR as a government owned business, or a special purpose authority could be created, both of which are exempted under TABOR. In addition, it has been suggested that vehicle owners could pay two checks – one to the county clerk and another to the emissions testing contractor to be deposited in a trust account. These options require more analysis and discussion so that an effective and efficient mechanism can be created under the TABOR restrictions.

Implementation: The General Assembly should structure the program fee to be consistent with TABOR provisions.

☐ The General Assembly should consider a performance-based program that incorporates a tax credit or other economic incentives for the contractor to make the emissions testing program more effective.

The next emissions testing contract should include economic incentives to encourage the contractor to looks for ways to make the program more effective and convenient for the consumer. In addition, incentives should be considered to encourage effective coordination between the remote sensing and IM240 portions of the program. A statutory change is necessary to authorize such economic incentives.

Implementation: The General Assembly should consider authorizing economic incentives for superior performance in the emissions testing contract.

F. <u>Other Issues</u>

1. <u>Consider 1999 State Auditor's Report</u>

□ The RAQC's findings and recommendations reflect consideration of the State Auditor's report, "1999 Audit of the Colorado AIR Program."

The RAQC and the Mobile Sources Subcommittee received presentations on the State Auditor's report and considered the findings and recommendations contained in the 1999 Audit of Colorado's AIR. Program. These discussions were incorporated throughout the committee process.

The State Auditor's contractor for the study, Air Improvement Resource, Inc., presented the audit report to the Mobile Sources Subcommittee. The 1999 program performance audit concluded that in the future, Colorado may not need an inspection and maintenance program to maintain compliance with national ambient air quality standards. The audit estimated the current effectiveness of the I/M program and analyzed various methods for screening out clean vehicles and identifying high-emitting vehicles.

In light of the November 30, 1999 carbon monoxide standard exceedance, however, the auditor also concluded that the state may want to implement a modified IM240 program to maintain good air quality until new technology vehicles comprise a larger portion of the fleet. The audit report concluded that if a program does continue it should focus on older technology, high emitting vehicles where the greatest benefit could be realized.

The RAQC incorporated elements of the audit's findings in its recommendations to limit future I/M program contracts to no more than five years, modify the I/M program to include remote sensing clean screen, and develop a high emitter identification program. The audit findings and a summary of the audit presentation are included in the RAQC's technical support document.

2. <u>Improve Modeling Tools</u>

All new mobile source emissions models are expected to show a more pronounced downward trend in emission rates than predicted using currently available tools because of tighter emission certification standards and the increased durability of emission control equipment.

Colorado and other states have been eagerly awaiting release of MOBILE6, EPA's new mobile source emissions model that will take into account more recent data on mobile source emission trends and the effectiveness of control strategies. The release of MOBILE6 has been delayed repeatedly over the last couple of years. EPA currently has scheduled its release by the end of this year or early 2001.

Unfortunately, MOBILE6 was not available for the RAQC's evaluation, but other updated emission models and emission projection tools were considered and reviewed. All of these tools indicate a more pronounced downward trend in future mobile source emission rates, based on new technology, than past estimates.

Until the MOBILE6 emissions model is released and available for use, there is no tool other than the current MOBILE5b model available for use for regulatory purposes.

MOBILE5b, EPA's current but outdated mobile source emissions model, is the only model that has been approved for SIPs and other regulatory purposes in Colorado. When MOBILE6 is available, the Regional Air Quality Council expects to reevaluate the current SIPs based on new emission projections and develop new SIP submittals that incorporate the newly available information.

☐ The development of a new modeling tool for regulatory purposes should allow the State to make further consumer-friendly modifications to the inspection/maintenance program, and may even allow the State to eliminate the program altogether at some time in the future.

If as expected MOBILE6 shows a pronounced downward trend in future mobile source emissions as a result of tighter emission standards and improved emission control technology, Colorado may be able demonstrate that the current I/M structure may be eliminated or significantly modified.

☐ The RAQC recommends the Governor consider sending a letter to the EPA urging the rapid completion and release of MOBILE6 so that Colorado and other states can employ a more realistic tool for future SIPs and other regulatory purposes.

The delay in finalizing MOBILE6 is causing problems for Colorado communities as they evaluate future air quality control strategies. A new modeling tool is needed before the Denver area and other areas of the state can move forward with realistic maintenance plans, transportation conformity determinations, and other assessments of future air quality conditions.

Implementation: Staff from CDPHE and the Governor's Office should draft a letter for the Governor to consider as soon as possible.

3. <u>Appropriately Integrate On-Board Diagnostics II (OBDII)</u>

□ The State has concerns if EPA's upcoming OBDII regulation requires emission-related repairs based on OBD failures identified solely by Malfunction Indicator Light (MIL) illumination.

The on-board diagnostics system identifies conditions that have a high probability of causing a current or future emissions level at least 1.5 times the Federal Test Procedure (FTP) Standard. When this set of conditions is identified, the Malfunction Indicator Light (MIL) is illuminated, indicating a failure.

A recent EPA study of the OBDII system conducted on vehicles in Phoenix, Denver and Ann Arbor recruited nearly 200 vehicles whose MIL light was illuminated. Of these vehicles, more than two-thirds passed a subsequent FTP test. This indicates OBD failures may not be well correlated with high emission failures and a program based solely on OBD failures may result in unnecessary and unwarranted failures.

CDPHE should continue to be involved with development of the EPA OBDII regulation to ensure that what works best for Colorado is available.

As discussed above, the current direction of the EPA may result in over-control for the current and future situation in Colorado and cause less cost effective repairs. The CDPHE should continue to remain involved with the development of EPA's OBDII system at the national level.

Implementation: CDPHE should remain involved with development of EPA's OBDII system at the national level.

□ The results of the ongoing Colorado OBD study should be used to inform the EPA regarding the direction of the State's program.

Based upon the results of the study, the State should consider integrating OBD into the IM240 program, using OBD as a clean screen tool and maximizing OBD's effectiveness for diagnosis and repair.

Implementation: CDPHE should provide EPA with the results of Colorado OBD studies.

□ The Colorado IM240 program rules should be amended to treat OBDII MIL (Malfunction Indicator Light) light illumination as advisory only unless the MIL light illumination is accompanied by a measured IM240 emissions test failure.

The current air quality regulation includes the EPA OBD program, which in 2001 will require that the OBDII MIL pass/fail test replace the IM240 program for newer vehicles (1996) and

require repair. Based on the current data this could impact the cost effectiveness of repair by requiring repair of vehicles with marginal excess emissions versus the IM240 program which, based on current cutpoints, identifies grossly excessive emissions.

The MIL has been a visual pass/fail criterion for the IM program since 1988. As an advisory tool it could indicate a vehicle that should receive an IM240 test.

Implementation: The AQCC should amend the current Regulation No. 11 to treat OBDII MIL (Malfunction Indicator Light) light illumination as advisory only, unless the MIL light illumination is accompanied by a measured IM240 emissions test failure.

4. <u>Reevaluate the Future Need for Oxygenated Gasoline (See Recommendation #12,</u> Executive Summary)

□ Inspection/maintenance and oxygenated gasoline strategies must be addressed for the short term in tandem with carbon monoxide emissions reduction benefits for regulatory purposes.

Over the last 15 years inspection/maintenance and oxygenated gasoline have been the two principal mobile source control strategies employed in Colorado. When evaluating the future direction of these programs, it is necessary to address the tradeoff between the two programs and their relative effectiveness and costs. The Carbon Monoxide Maintenance Plan envisions a gradual reduction of oxygen content over the next five years, but EPA's current MOBILE5b model does not support total elimination at this time.

□ In well-maintained, newer technology vehicles, oxygenated gasoline is less effective in reducing carbon monoxide emissions.

While oxygenated gasoline has been effective in reducing CO emissions in older technology higher emitting vehicles, recent studies have shown that oxygenated gasoline is less effective in newer technology vehicles with computer-controlled closed-loop catalysts. Therefore, the emissions reduction potential from oxygenated gasoline will be reduced significantly in future years.

□ When MOBILE6 becomes available, the RAQC and AQCC should evaluate eliminating the oxygenated gasoline requirement.

MOBILE6 will take into account the recent studies on the effectiveness of oxygenated gasoline in newer technology vehicles, and therefore may show much less benefit in the future for an oxygenated gasoline strategy. Once MOBILE6 is available, the RAQC intends to reevaluate the carbon monoxide maintenance plan and recommend elimination of the oxygenated gasoline requirement, if justified by the modeling analysis.

Implementation: The RAQC and AQCC, with the assistance of CDPHE, should reevaluate the oxygenated gasoline element of the carbon monoxide maintenance plan when MOBILE6 is available.

Options to Reform the Current Inspection/Maintenance Program

Summary of Recommendations

Recommendations for Program Improvement	Which of the Governor's Evaluation Criteria was Achieved	Implementing Authority	Cost Increase/Savings	Need for Legislation
1. An inspection/ maintenance program will be needed in the Denver area to maintain compliance with federal air quality standards and requirements	Provides direction to the State on the future of I/M Takes into account current analytical models supplied by EPA	Departments of Public Health/ Environment and Revenue	Recommended program expected to result in overall cost savings	No – current statute allows for continuation of program
2. Better address hydrocarbon and nitrogen oxide emissions and smoking vehicles	Provides direction to the State on the future of I/M Increases real benefits of program Considers elements of the State Auditor's 1999 report	Department of Public Health/ Environment	Cost increases for the public due to more emission-related repairs	No - law provides authority to improve current I/M program
3. Maintain contractor- operated inspection/ maintenance program, utilizing IM240 and remote sensing, for no more than next five years	Provides direction to the State on the future of I/M Reduces burden of the current I/M program Takes into account current analytical models supplied by EPA Considers elements of the State Auditor's 1999 report	Departments of Public Health/ Environment and Revenue General Assembly authorize contract extension	Clean screen program expected to result in cost savings since fewer vehicles undergo IM240 tests	No - law allows for rebidding contract Yes - authority needed to extend current contract
4. Implement remote sensing clean screen program	Reduces burden of the current I/M program	Departments of Public Health/ Environment and Revenue	Clean screen program expected to result in cost savings since fewer vehicles undergo IM240 tests	Yes - current law allows for the implementation of approved program, but legislation needed to improve funding mechanism

Recommendations for Program Improvement	Which of the Governor's Evaluation Criteria was Achieved	Implementing Authority	Cost Increase/Savings	Need for Legislation
5. Establish a high emitter program	Reduces burden of the current I/M program Increases real benefits of I/M program Considers State Auditor's 1999 report	General Assembly authorize high emitter program and establish enforcement mechanisms Departments of Public Health/ Environment and Revenue	Cost increase to add high emitter component, but still less expensive than current approach	Yes - to provide for enforcement and confirmatory testing at private inspection centers
6. Improve effectiveness of repairs	Increases real benefits of I/M program	Department of Public Health/ Environment	Net cost savings as better repairs result in the need for fewer repairs in the future	No - this could be implemented with resources for better technician training/education
7. Increase/eliminate \$450 repair waiver limit	Provides Legislature with information for new proposals for I/M Increases real benefits of I/M program	General Assembly to eliminate waiver Department of Public Health/ Environment Air Quality Control Commission	Cost increase to consumer in order to make repair, unless grants are available Could also reduce costs as better repairs result in the need for fewer repairs in the future	Yes - legislation needed to eliminate the limit AQCC could increase the limit
8. Establish low-income assistance program	Provides Legislature with information for program's future Reduces burden on low-income motorists	General Assembly to establish and fund program Departments of Public Health/ Environment and Revenue	Cost increase to fund the assistance/grant program	Yes
9. Increase public education on benefits of emission repairs	Reduces burden of the current I/M program Provides information on the real benefits of I/M program	General Assembly to fund program Department of Public Health/ Environment Regional Air Quality Council to help implement and seek other sources of funding	Cost increase for public education campaign There could be a cost savings as a result of better auto maintenance and repairs which could result in fewer future failures	No - however, may require additional appropriation

Recommendations for Program Improvement	Which of the Governor's Evaluation Criteria was Achieved	Implementing Authority	Cost Increase/Savings	Need for Legislation
10. Improve approach for evaluating program effectiveness	Evaluates and increases the real benefits of future I/M program Provides Legislature with information for new proposals for I/M Provides information to improve or augment EPA's analytical models	General Assembly provide funding for evaluations Department of Public Health/ Environment (AQCC provides annual report to Legislature) (Current law requires Audit by State Auditor every three years)	Cost increase for funding research and studies	Yes - appropriation and direction needed for studies
11. Establish a registration fee on all vehicles to finance all aspects of program	Reduces burden of the current I/M program Provides direction to the State on the future of I/M Provides Legislature with information for new proposals for I/M	Departments of Public Health/ Environment and Revenue	No net cost savings anticipated unless vehicle owners pay a reduced annualized fee compared to what they pay under the current program	Yes - registration fee must be consistant with the provisions of TABOR
12. Evaluate the elimination of the oxygenated gasoline requirements	Reduces burden of the current oxygenated gasoline program Considers State Auditor's 1999 report	Department of Public Health/ Environment	Potential for net cost savings if ethanol prices rise to a point where it would not be cost- effective for gasoline providers to blend ethanol into gasoline Reduces cost for regulatory oversight	No