HIGH ALTITUDE VEHICULAR EMISSION CONTROL PROGRAM
VOLUME XII ANALYSIS OF THE PRACTICAL APPLICATION OF AN INSPECTION AND MAINTENANCE PROGRAM IN THE PUBLIC AND PRIVATE SECTORS

FINAL REPORT

SEPTEMBER 1975

PREPARED FOR:

STATE OF COLORADO
DEPARTMENT OF HEALTH
DENVER, COLORADO 80220

ATL / AUTOMOTIVE TESTING LABORATORIES

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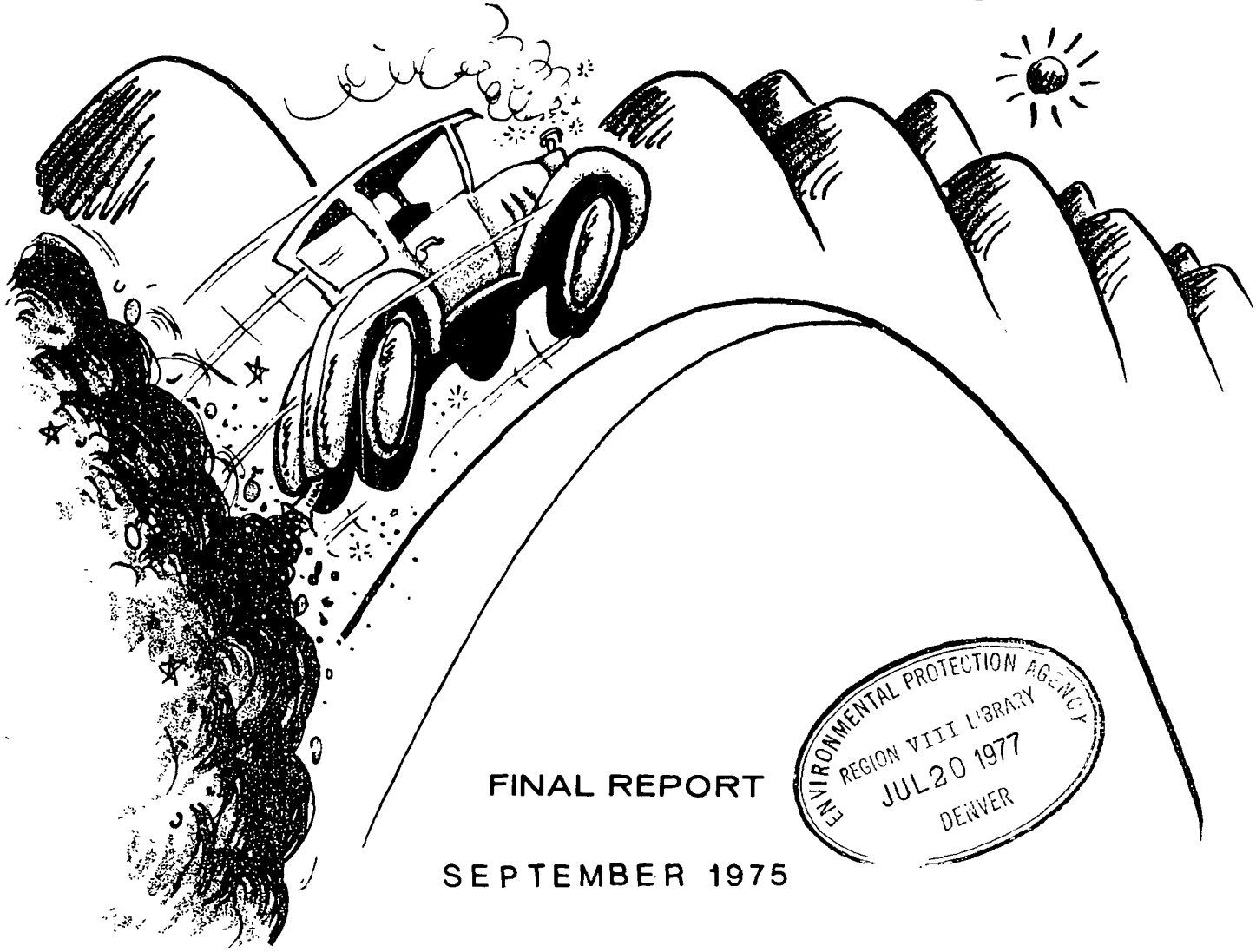

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An Analysis of the Practical Application of an Inspection and Maintenance Program in the Public and Private Sectors

prepared for

State of Colorado
Department of Health
Denver, Colorado 80220

submitted by

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SUMMARY

The study was designed tc investigate on a pilot scale the social and economic impacts of an area wide light-duty vehicle inspection/ maintenance program in both the public and private sectors. Toward this end, we employed ten privately-operated Metro-Denver automotive service centers to act as a pilot inspection network. The network was comprised of: a fleet vehicle maintenance facility, three independent garages, three service stations and three new car dealerships. A single state-operated inspection facility was utilized to evaluate a program in the public sector.

We employed the pilot network to develop a variety of technical, cost and other data and information.

It was used on an experimental level to inspect a representative sample of 1100 vehicles from 1960 through 1974 model-years. The sample included a representative sub-sample of 300 vehicles which were strenuously tested by laboratory procedures both before and after station inspection. The data which resulted from laboratory tests were used to evaluate the condition of the vehicle population as reported in previous studies. In this respect, we found the more current exhaust hydrocarbon emission levels to be significantly lower than in previous studies while carbon monoxide levels remained essentially unchanged. We attribute the lower hydrocarbon levels to HC reducing maintenance factors precipitated by the energy crisis. We also found that the I/M procedures relative to the subject study were less effective in achieving HC and CO emission reductions than those applied previously. We believe this finding merely demonstrates the sensitivity of I/M procedures.

We also utilized the network and other information to provide indications of workload capabilities which were used to define minimum network requirements. In this respect, we found the minimum requirement for a public sector network to be 36 test lanes. The minimum number of private sector test lanes or facilities was found to be 410. Based on other available information, however, it is reasonable to expect that 663 privately-operated facilities will participate. We also found that the existing repair network is capable of handling any additional work resulting from an I/M program in either network.

Using cost data we developed from pilot station operation and other sources, coupled with certain elements we propose in connection with program administration, enforcement and public protection measures, a table of program supporting fees was developed for various amortization schedules and vehicle rejection rates. At a 30 percent rejection rate, 5 year amortization period, for example, the fee is $2.95 per vehicle for a state-operated network. The corresponding fee for a privately-operated network is $5.76 per vehicle.

We also made a determination of costs to the motorist in connection with I/M time and travel requirements relative to each sector. Using

data derived from the pilot effort, we found the time and travel cost factor for a network in the public sector to be $8.67 per vehicle while the cost factor associated with a private sector network is $6.97 per vehicle.

Information resulting from network operation and other sources was used to establish skill and training levels required of inspection and repair personnel. In this respect, we found that functional literacy as defined by the U. S. Office of Education is more valid as an educational requirement than a minimum level based on formal education. We also found performance of inspection and repair personnel to be satisfactory after a minimum training period of 6 hours and 32 hours respectively. We propose that qualified inspectors and repairmen have at least one year of recent vehicle tune-up experience.

To document the requirement for public protection measures, we administered questionnaires to the one-thousand private car owners participating in the effort. These questionnaires were designed to elicit opinions regarding vehicle related air pollution in the Denver AQCR. They were also designed to measure any changes in opinion resulting from the I/M process. While a quantity of information was developed in these regards, one of the more significant findings is that the public is apparently willing to accept an I/M program administered through either the public or the private sector. Another finding of particular significance is that the public is strongly in favor of a referee site being provided for a second opinion. We recognized the possibility that participant responses may have inherent biases. For this reason we surveyed a number of randomly selected vehicle operators. While certain disparities in opinion was evident between the two groups, we found the majorities to be in agreement on major issues.

In conclusion, we also used the pilot operation to identify enforcement problems and to develop recommendations on administrative and procedural rules which would be needed to expand the effort to an area-wide program. In these respects, our more significant findings indicate; the need for a comprehensive study to provide strategic public sector station locations; requirements for an adequate network surveillance program; the advisability of limiting the inspection requirement to a single re-test; the importance of an active data monitoring program; the importance of a stringent instrument accreditation and monitoring program; and the utilization of a single sticker to indicate compliance with both safety and emission inspection requirements.

CONCLUSIONS

1. The emission data which resulted from the subject study were used to evaluate the condition of the vehicle population as reported in previous studies. We found the more current exhaust HC levels to be significantly lower (at a 90% confidence level) than those reported in previous studies, while CO emissions remained essentially unchanged. Using sample means, the subject baseline HC, CO and NO_x levels are 5.35 g/m, 91.1 g/m and 2.49 g/m for 1968-1974 model-year vehicles compared to 6.36 g/m, 91.3 g/m and 2.87 g/m for the previous year which covered the 1968-1973 model-years. Where applicable, these same trends apply on a vehicle age by vehicle age basis. We attribute the lower HC levels to HC reducing (fuel economy) maintenance factors precipitated by the energy crisis.

   We consider the fleet HC, CO and NO_x baseline levels of 4.07 g/m, 77.3 g/m and 2.76 g/m to be reflective of near minimum emission levels achievable as a result of an I/M or mandatory maintenance effort.

2. We also found that the I/M procedures applied relative to the subject effort were less effective in achieving HC and CO reductions than those applied previously. Using sample means for comparison purposes, the subject effort at a 40 percent rejection rate, for example, produced HC, CO and NO_x reductions of 6.6%, 5.7% and 0.3% on the newer cars as opposed to earlier reductions of 18.0%, 10.8%, and 1.1% using somewhat different procedures. We atttribute the smaller HC reductions not only to the procedures, however, but also to the lower HC baseline or before maintenance state. We believe the relatively small reductions found in the subject effort merely demonstrate the sensitivity of maintenance procedures.

   Fleet vehicle HC, CO and NO_x reductions of 0.4%, 1.0% and 0.2% were found to be minimal for the reason given above. Using failure limits for privately owned vehicles, the actual failure rate for the fleet was 16 percent.

3. Using data derived from the state-operated station, we concluded the following relative to an annual inspection program.

   3.1 Based on the idle test procedures used in the investigation, we found that a state lane could process and inspect about ten vehicles per lane per hour.

   3.2 Assuming that 10 year old and newer vehicles are subject to the inspection requirement and a second retest will not be required, we project an annual requirement for 1,020,000 inspections. This projection also assumes full implementation beginning mid-1977 and a 30 percent rejection rate.

3.3 A state-operated network should be comprised of a minimum of 36 test lanes to service the DAQCR. This estimate includes a factor of 30 percent to compensate for irregular workload demands. Additional lanes are desirable, however.

3.4 Using the existing voluntary inspection site as a model, the land (75 feet wide by 130 feet deep) required for a two lane operation is estimated to cost $50,000. Other criteria used to derive the estimate are that the site is to be situated about one-half city block from a major arterial road and that it be zoned for business or light industry.

3.5 The analytical, data processing and office equipment is estimated to cost $81,000 per site.

3.6 Construction of a two-lane facility is estimated to cost $57,000, a figure which includes the building and site improvements.

3.7 Annual operating costs, including direct labor and overhead is estimated to cost $79,900 per site.

3.8 Administrative costs are estimated to be $185,300 annually.

3.9 At a 30% rejection rate, 5 year amortization schedule, the fee to support the above costs is estimated to be $2.95 per vehicle.

3.10 Assuming the motorist's time is valued at $5.00 per hour and his vehicle operating cost is 12 cents per mile, time and travel requirements relative to the I/M process are estimated at $8.67 per vehicle.

3.11 Combination of the 30% rejection rate fee and time and travel costs results in a total cost to the motorist of $11.62 per vehicle.

4. Using data derived from the privately-operated network, we concluded the following relative to an annual inspection program.

4.1 The requirement for 1,020,000 inspections per year applies to a private-sector network as well.

4.2 Taking current workloads into consideration, a privately-operated network should be comprised of a minimum of 410 stations. It is more realistic to believe that 663 stations will participate, however.

4.3 We visited 43 repair facilities to determine building and equipment investment requirements. From this survey we concluded that the average building improvement and equipment requirements would cost about $2,300 per lane.

4.4 We also solicited extensive cost data from each of the facilities. From these data we derived an average direct labor rate of $4.67 per hour and an average overhead rate of 90.2% per direct labor hour.

4.5 We also found the average inspection time to be 0.3 hours.

4.6 The public strongly favored the concept of referee test sites. We concluded that six should be provided to adequately service the DAQCR. The investment and operating costs of such sites were assumed to be equivalent to those established for a public sector network.

4.7 Program administration including both the private network and the public referee sites is estimated to cost $120,800 annually. Certain other administrative costs are included in referee site operation.

4.8 We proposed a manual data collection process in connection with a private sector network. Operation of this process is estimated to cost $166,000 annually.

4.9 At a 30 percent rejection rate, 5 year amortization schedule, the fee to support the above requirements is estimated to be $5.48 per vehicle.

4.10 Assuming the motorist's time is valued at $5.00 per hour and his vehicle operating cost is 12 cents per mile, time and travel requirements in connection with the I/M processes are estimated to cost $6.97 per vehicle.

4.11 Combination of the 30 percent rejection rate fee and time and travel costs results in a total cost to the motorist of $12.45 per vehicle.

5. With regards to maintenance costs, we found the average to be $11.00 per failed vehicle for vehicles tested in the private sector and $13.75 per failed vehicle for vehicles tested in the state facility. While the higher cost factor associated with state failed vehicles may indicate some disparity between the two sectors, the higher state-inspected vehicle repair cost is related almost exclusively to the fact that many of the state-failed vehicles were repaired at the facility found otherwise to exhibit the highest repair charges. In examining the factors affecting repair costs, we found no reason to believe a repair cost disparity would exist between the two sectors.

   At $10.76 per failed vehicle, the fleet vehicle repair costs (at fleet repair rates) are nearly the same as those found in connection with the privately-owned vehicles.

   These cost data compare favorably with the $10.57 per failed vehicle established in the previous study.

6. Our survey of the 43 privately operated repair facilities included questions regarding facility workloads and personnel utilization. On this basis we concluded the Denver AQCR repair facilities could handle any additional work resulting from a program in either sector.

7. After deliberating over the problem of enforcement, we concluded that the only workable solution was to implement a single sticker system to indicate compliance with both safety and emission inspection requirements regardless of the sector chosen. Since the logistics requirements relative to the stickers are currently handled within the Department of Revenue and reasons for altering this practice have not emerged, we believe the practice should be continued.

8. While there may be specific reasons, either political or otherwise for collecting the inspection fee at the time the vehicle is presented for inspection, we believe the fee-payment process should be made a part of the motor vehicle registration requirement.

   With respect to a privately-operated network, however; since the station level fee collecting process of the safety inspection program has a record of satisfactory operation, there is no reason to believe the same procedures should not be utilized.

9. Based on data developed during the subject effort training phase and the Colorado State University pilot training program, we conclude that functional literacy as defined by the U. S. Office of Education is more valid as an educational requirement for inspectors and repairmen than a minimum level based on formal education.

   We also found performance of inspection and repair personnel to be satisfactory after a minimum training period of 6 hours and 32 hours respectively.

   In addition, we propose that qualified inspectors and repairmen have at least one year of recent vehicle tune-up experience.

10. From our opinion survey of the one-thousand vehicle owners who participated in the study we have concluded:

    10.1 The majority of participants believe the air pollution problem in Metro-Denver is serious.

    10.2 The majority believe automobile exhaust emissions are a major source of pollution.

    10.3 The majority also believe the state should require automobile emission inspections.

    10.4 Participants were divided on the question of who should conduct the inspections, the state versus the private sector. However, those frequenting the state station were more in favor of the state performing the inspection after the process was experienced while those frequenting the private stations were more

in favor of private stations performing the inspection after the process was experienced. On this basis, we have concluded that motorists would accept a program in either sector.

10.5 The majority favored an annual inspection frequency as opposed to a semi-annual frequency.

10.6 The majority considered $5.00 to be a reasonable inspection fee. However, after the inspection process was experienced, the number of state lane participants who supported the fee dropped a significant amount. The number of private lane participants who supported the fee remained the same after the process was completed. On this basis we have concluded that motorists would accept a $5.00 fee for inspection in the private sector but may possibly object to the same fee in the public sector.

10.7 The majority of participants favored the concept of a referee test site.

10.8 The majority also believed an inspection program would reduce air pollution.

10.9 We also surveyed a number of randomly selected vehicle operators. While certain disparities in demographics and opinions were evident between the test participants and the randomly selected group, we found the majorities to be in general agreement on major issues.

11. We also used the pilot operation to identify enforcement problems and to develop recommendations on administrative and procedural rules needed to expand the effort to an area wide program. Our conclusions in these regards are as follows:

11.1 Participants tended to frequent those facilities which provided inspection services outside the normal business hours. On this basis we have concluded that the motorist should be provided with an area wide network which offers this kind of service.

11.2 On the basis of the relatively poor correlations between laboratory and station inspection, we have concluded that an inspection instrument certification program is essential to the success of an area wide program.

As a result of our inspection instrument monitoring program, we have also concluded that the analytical instruments should be completely recalibrated at intervals not to exceed two months.

On this basis we have also concluded that the minimum frequency at which private sector facilities should be inspected is each two months.

11.3 It is our opinion that the problems we encountered in the pilot effort were minimal primarily due to: the quality of personnel we employed; the training provided not only in the classroom but the on-site program as well; the forms utilized to document the I/M process; the network monitoring strategy which includes surveillance of both network personnel and equipment; and the fact that participating motorists were well informed as to the I/M procedures. Consequently, we came to certain conclusions regarding program elements that would provide the degree of public protection necessary. These are:

11.3.1 The success of any I/M program rests within the ability of the repair industry to provide the required maintenance.

11.3.2 With reference to personnel training, we have concluded that adequate training must be mandatory for those engaged in the I/M process regardless of the sector chosen.

11.3.4 We are of the opinion that some form of mechanic or repair facility certification will be required to provide protection not only to the consumer but to the repair industry as well.

In this same respect, we have concluded that each phase of the I/M process should be properly documented.

11.3.5 Virtually all of the major I/M related problems could be easily identified and expeditiously corrected through properly designed and frequently updated data monitoring procedures.

11.3.6 With regards to the above, we cannot help but conclude that a well informed public would be a key factor as it relates to the public providing its own protection.

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1. INTRODUCTION

The 46th Colorado General Assembly launched a formal program to investigate and find solutions to the State's air pollution problems through its establishment of the Air Pollution Control Commission (APCC) in 1970. The assembly's purpose in establishing the APCC was to take the air pollution control standards setting process out of the legislature and place it into a smaller regulatory body. Consequently, the APCC was directed to develop and administer the State's air pollution control programs. As the significance of the contribution of motor vehicles to the air pollution problem began to emerge, the 48th General Assembly enacted a bill to establish the Motor Vehicle Advisory Committee (MVAC) to the commission. The MVAC was directed to develop and evaluate experimental motor vehicle emission data and report on the effectiveness and the social and economic impact of various motor vehicle emission control alternatives.

The legislative effort to establish a technical program culminated in Senate Bill 393 which was enacted in June of 1973. The study programs conducted during this first phase of technical effort provided detailed and specific information on various motor vehicle emission control alternatives including related costs and effectiveness of each alternative investigated. The study program consisted of the following experiments:

- A survey to establish the frequency and extent of engine maladjustments and malfunctions in the vehicle population of the Denver Air Quality Control Region (DAQCR).
- Experiments to characterize the costs and effectiveness of both an idle inspection and repair program and a mandatory engine maintenance program.

- A survey to establish the effectiveness of Denver area garages in measuring emissions and diagnosing necessary engine repair or adjustments based on those measurements.
- Experiments to determine the costs and effectiveness of high altitude engine parameter modification kits and several leading sea-level retrofit kits.
- Experiments to establish the influence of selected engine adjustments on vehicular emissions.
- Experiments to ascertain the effect of altitude on vehicular emissions.

The results of these studies demonstrated that an inspection and maintenance (I/M) program and a retrofit program could provide a significant reduction in the emissions of hydrocarbons and carbon monoxide to the atmosphere. Both strategies were shown to be effective and cost effective. Still unanswered, however, were questions regarding the effect of engine degradation with its consequent increase in emissions and the procedural, logistic and administrative guidelines necessary to properly manage the programs.

The technical investigation into the effect of engine degradation, comprising the second phase of the I/M study, required a year to complete. The study concluded, after allowances for engine degradation, that I/M was still a viable emission control strategy.

The third phase of the program was designed to explore in more detail the administrative, logistic and procedural requirements of I/M and retrofit programs. During the initial part of Phase III, the criteria for accreditation of retrofit devices, emission inspection instruments, emission inspectors, inspection stations and inspection procedures were developed. These criteria have been submitted to the Air Pollution Control Commission to be considered in the public hearing process.

This report presents study results comprising the middle and final part of Phase III. In response to questions regarding the social and economic aspects of an I/M program, experiments were undertaken to evaluate the positive and negative implications of an I/M program operated by the State versus privately owned and operated State-licensed emission inspection stations. Other goals of the study include identifying the various administrative requirements necessary to operate the program regardless of the sector chosen.

2. DISCUSSION OF STUDY DESIGN

2.1 OBJECTIVES

The major objective of this segment of the Phase III program was to investigate the socio-economic impact of an I/M program in both the State and private sectors. In this respect, the Colorado Health Department specified that idle inspection facilities be established in the State and private sectors to determine costs, effectiveness and cost/effectiveness of the two alternatives. More specifically, the services that were to be performed are listed as follows:

Ten privately-owned service centers which were to act as pilot emission inspection stations were to be established in the DAQCR. The centers were to be distributed throughout a large segment of the region so as to be convenient to a large segment of the motoring public. The centers were to include a representation of the various categories of motor vehicle service and repair facilities found in the region including both fleet and private vehicle repair facilities.

A State-operated facility which was to act as a State-operated pilot emission inspection station was also to be established. The State facility was to be situated such as to be convenient to a large segment of the motoring public.

Both the privately-operated and the State-operated facilities were to be used in support of the following tasks:

Task 1 - The centers were to be used for inspecting a representative sample of DAQCR light-duty vehicles. To be included in the sample was a statistically valid number of vehicles to be strenuously tested by mass emission testing procedures before and after inspection at the inspection facilities. The test data were to be utilized to evaluate the condition of automobiles as reported in previous studies.

Task 2 - The State and privately-operated facilities were to be used to determine the costs of idle emission inspections in both the public and private sectors. This determination was to include the required initial investment, actual direct labor costs, actual overhead labor allocations, in shop equipment evaluation, maintenance and calibration requirements, and other direct and indirect costs of operating such stations in the public and private sectors. This effort was to culminate in a precise recommendation concerning the inspection fee structure.

Task 3 - The service centers were to be utilized to document skills and training levels required for the proper operation of emission inspection equipment.

Task 4 - The pilot operation was to be used to document needed public protection measures. This information was to be obtained through such sources as interviews with test program volunteers, inquiries received during testing and reactions from those who passed or failed the test. Data were also to be acquired on possible areas of overcharge, on additional training or certification necessary for instruments and/or inspectors, on minimal data recording necessary in the event of court action and on areas of interference and non-cooperation by inspectors, investigators, owners of test vehicles and site operators.

Task 5 - The pilot operation was to be utilized to identify and make recommendations on enforcement problems and solutions and administrative procedural rules which would be needed to expand the effort to a region-wide program. Such recommendations were to help determine fair and reasonable variance criteria and procedural steps for variance and permanently exempt vehicles. It was also to be used to verify if search and inspection authority is needed and to identify those activities such as false documentation, operation without a permit and circumvention which should be designated as areas requiring legal study. Also to be included in the recommendations were data on investigator workloads, site inspection frequency, pattern and thoroughness and inspection time requirements under varying working conditions.

2.2 STUDY DESIGN

The overall objective of the program was to determine and subsequently investigate the major social and economic impacts of an I/M program as related to both the State and private sectors. One of the primary concerns in these regards was to obtain a measure of the motorist's reaction to both a State and privately-operated inspection program. Other considerations included a re-evaluation of the then current condition of light-duty vehicles, a determination of a reasonable inspection fee and other direct and indirect costs, minimum acceptable inspector skill levels, necessary public protection measures and needed enforcement and administrative rules and guidelines.

The program was approached by dividing the effort into specific tasks to coincide with the objectives described above.

2.2.1 Inspection Network

A network of privately-operated inspection facilities was established

to service the DAQCR test area, an area which included Commerce City to the north, Aurora to the east and was bounded by Colorado Boulevard on the west and Hampden Avenue on the south. The network was comprised of:

One (1) privately-owned fleet facility

Three (3) privately-owned service stations

Three (3) privately-owned independent garages

Three (3) privately-owned new car dealerships

A State-operated inspection facility was also provided by the Health Department.

A map showing the distribution of the privately-operated inspection sites and the location of the State-operated site is presented in Figure 2-1. Here it may be seen that the privately-operated inspection stations were well distributed throughout the test area and that the State-operated site was somewhat centrally located.

In preparation for the testing phase of the project, personnel from each facility were trained in accordance with the requirements of the study. The nucleus of the training effort was derived from the Motor Vehicle Emission Inspection/Maintenance program developed for the Department by Automotive Testing Laboratories, Inc. (ATL) under sub-contract to Colorado State University. The training program was abbreviated to provide 15 hours of classroom instruction and about 15 hours of on-the-job training.

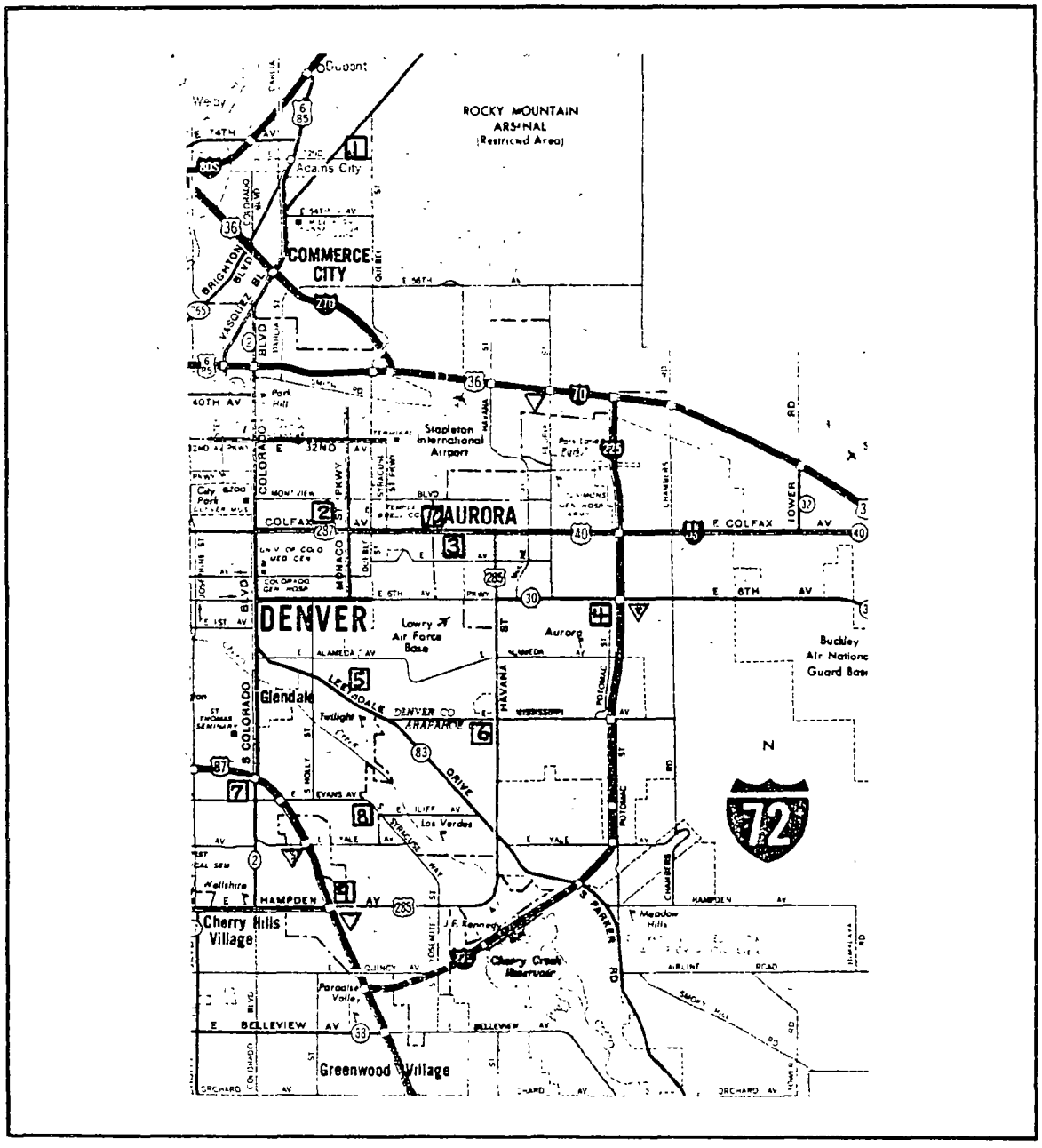

Figure 2-1. Distribution of Inspection Sites in DAQCR

2.2.2 Task 1, Vehicle Testing

A block diagram showing the general approach to the vehicle inspection task of the program is presented in Figure 2-2.

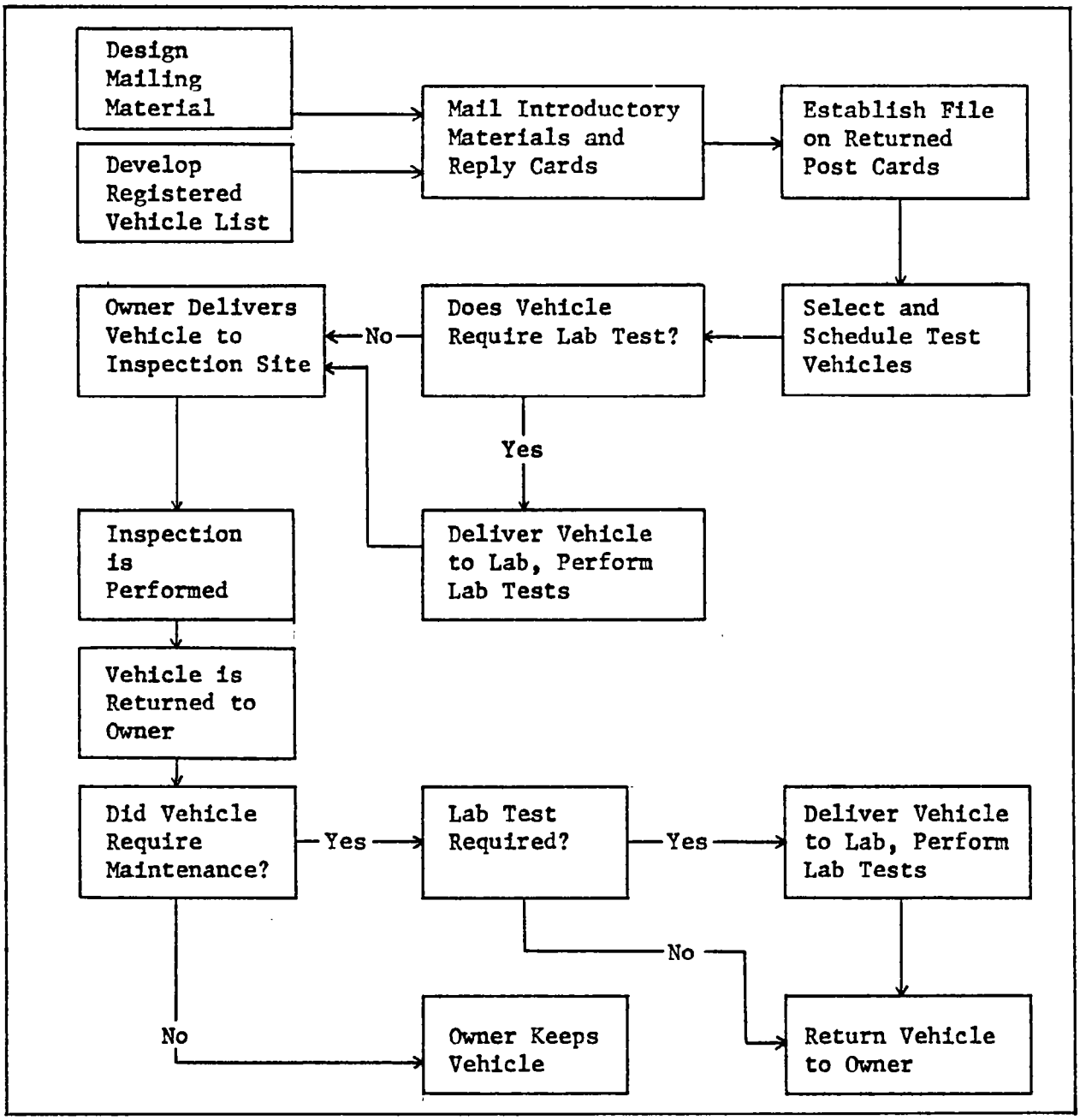

Figure 2-2. Inspection and Testing Phase Flow Diagram

Concurrently, mailing materials consisting of an introductory letter from the State (signed by the Governor), an introductory letter from ATL, and a post-paid information reply card and a list of vehicles registered within the test area were developed. The vehicle listing, comprised of a random (nth name) selection of registered vehicles, was derived from motor vehicle registration files and provided by the

Colorado Department of Revenue, Motor Vehicle Division. The letters and reply-cards which requested and provided for the submission of certain vehicle identification data were mailed to each of the 15,000 vehicle owners comprising the listing.

To develop a high affirmative response to the request for test candidates, incentives were offered. These were comprised of:

A $10 check to be provided each owner whose vehicle was selected for laboratory testing.

An additional $10 check to be provided each owner whose vehicle was selected for laboratory testing but whose vehicle failed the station inspection and was returned for a second laboratory test.

Up to $50 in maintenance to be provided each vehicle which failed the station inspection.

A late-model loan car to be provided each participant whose vehicle was selected for laboratory tests.

Fuel for the loan cars.

The inspection fee (somewhat arbitrarily established in advance at a cost of $4 per inspection).

Subsequent to the mailing, when affirmative replies were received, a reply-card file containing the requested vehicle and other information was established. This file was utilized to select vehicles for testing.

The test vehicle sample, comprised of 1,000 privately-owned DAQCR 1960 through 1974 model-year light-duty vehicles was selected on the basis of DAQCR vehicle-miles-traveled (VMT) by model-year and was further delineated by make, engine size, transmission and carburetion. The Mountain States Telephone and Telegraph Company (Mountain Bell) light-duty vehicle fleet was selected to evaluate fleet vehicle emission inspection. Consequently, a representative fleet sample of 100 Mountain Bell vehicles was chosen to evaluate the various aspects of

fleet vehicle emission inspection.

Of the privately-owned sample, 300 vehicles, comprising a valid sub-sample, were utilized as contol vehicles to obtain a measure of maintenance costs, effectiveness and other factors relating to the I/M program. Vehicles comprising this sample were routed in the following manner:

1. Vehicle delivered to laboratory by owner
2. Laboratory tests and vehicle examination
3. Vehicle delivered to station by owner
4. Emission inspection at station
5. Maintenance of failed vehicles
6. Final emission test at station
7. Maintained vehicles delivered to laboratory by owner
8. Final laboratory tests and vehicle examination

A sub-sample of 30 of the fleet vehicles were similarly routed.

The balance, 700 of the privately-owned and 70 of the fleet-owned vehicles, were routed as follows:

1. Vehicle delivered to station by owner
2. Emission inspection at station
3. Maintenance of failed vehicles
4. Final emission test at station

During the testing phase, vehicles were scheduled for station inspection at the rate of about 60 vehicles per week. Of these, about one-third were previously tested in the as-received condition by the more rigorous laboratory testing procedures, the 1975 Federal Test

Procedure. These same vehicles were emission inspected using the garage-type inspection equipment under laboratory conditions. Laboratory tested vehicles, included in the study to provide data to indicate the accuracy and effectiveness of the State, fleet and privately-operated facilities were integrated into the overall sample. Stringent control measures were developed and applied to assure the confidentiality of the control strategy relative to test site personnel. Maintained vehicles which failed inspection station tests, were subsequently retested by laboratory procedures to determine effectiveness and the validity of repairs.

2.2.3 Task 2, Determination of Idle Emission Inspection Costs

The methodology applied to determine costs associated with a State-operated network is shown in the flow diagram presented in Figure 2-3.

Costs associated with a State-operated network were determined on the basis of workload capabilities of the pilot site expanded to include minimum requirements of an area-wide program. Data were provided by the Colorado Health Department and are based on the actual personnel labor costs, personnel overhead and other overhead costs. Initial investment costs including typical real estate values, building costs and equipment costs were researched and developed. In addition, cost factors to describe the time and travel demands on the motorist were researched and developed.

Methodology applied to develop costs relative to a privately-operated network is shown in the flow diagram presented in Figure 2-4.

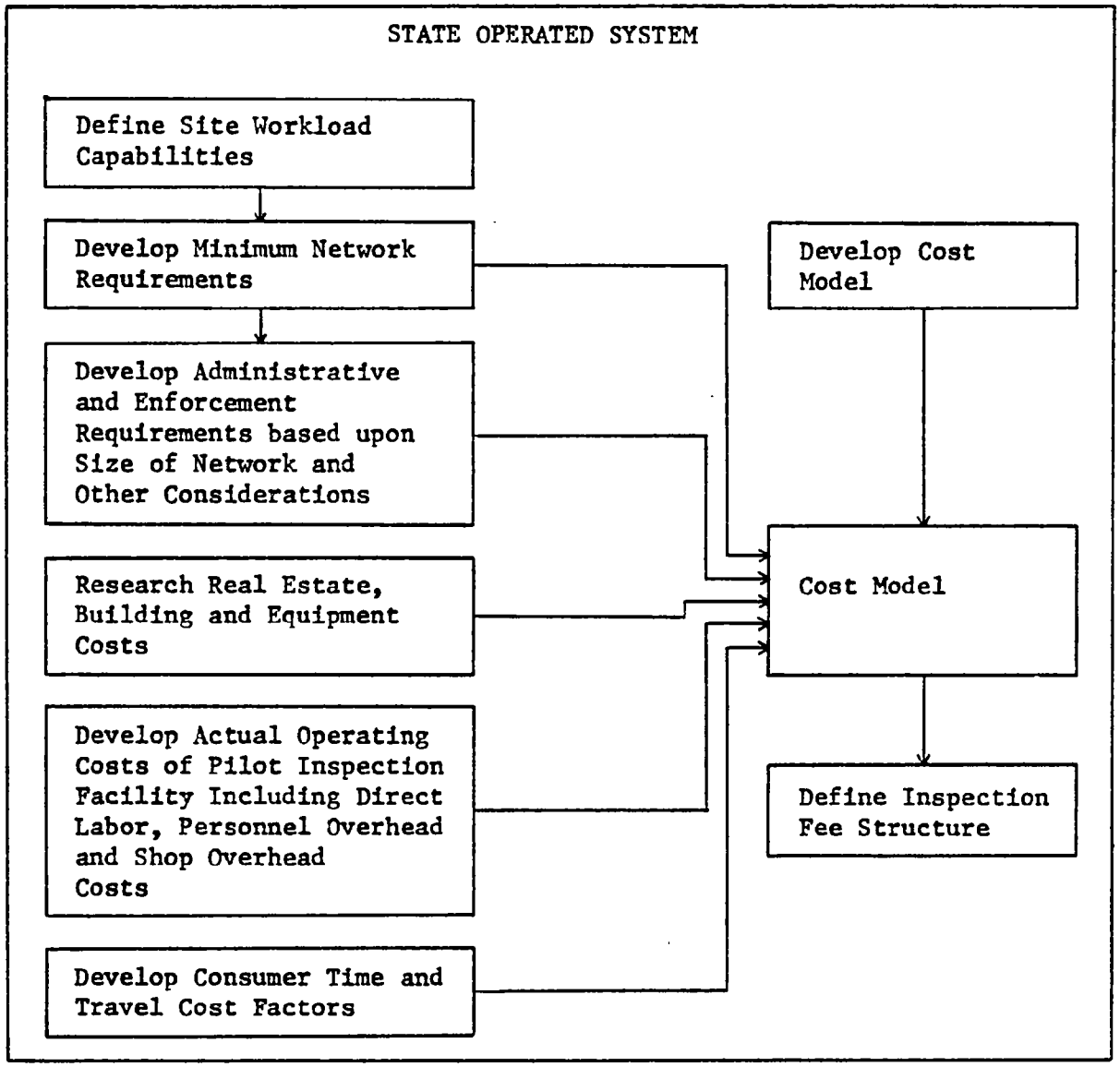

Figure 2-3, Task 2 Flow Diagram

With respect to initial investment by the private sector, real estate and building costs were not considered applicable and only the investment in test equipment was examined. Stations participating in the pilot effort were utilized to establish a cost basis for the inspection fee. This was derived from a determination of actual personnel pay rates, personnel overhead and shop overhead rates. Administration and enforcement costs were determined from an analysis

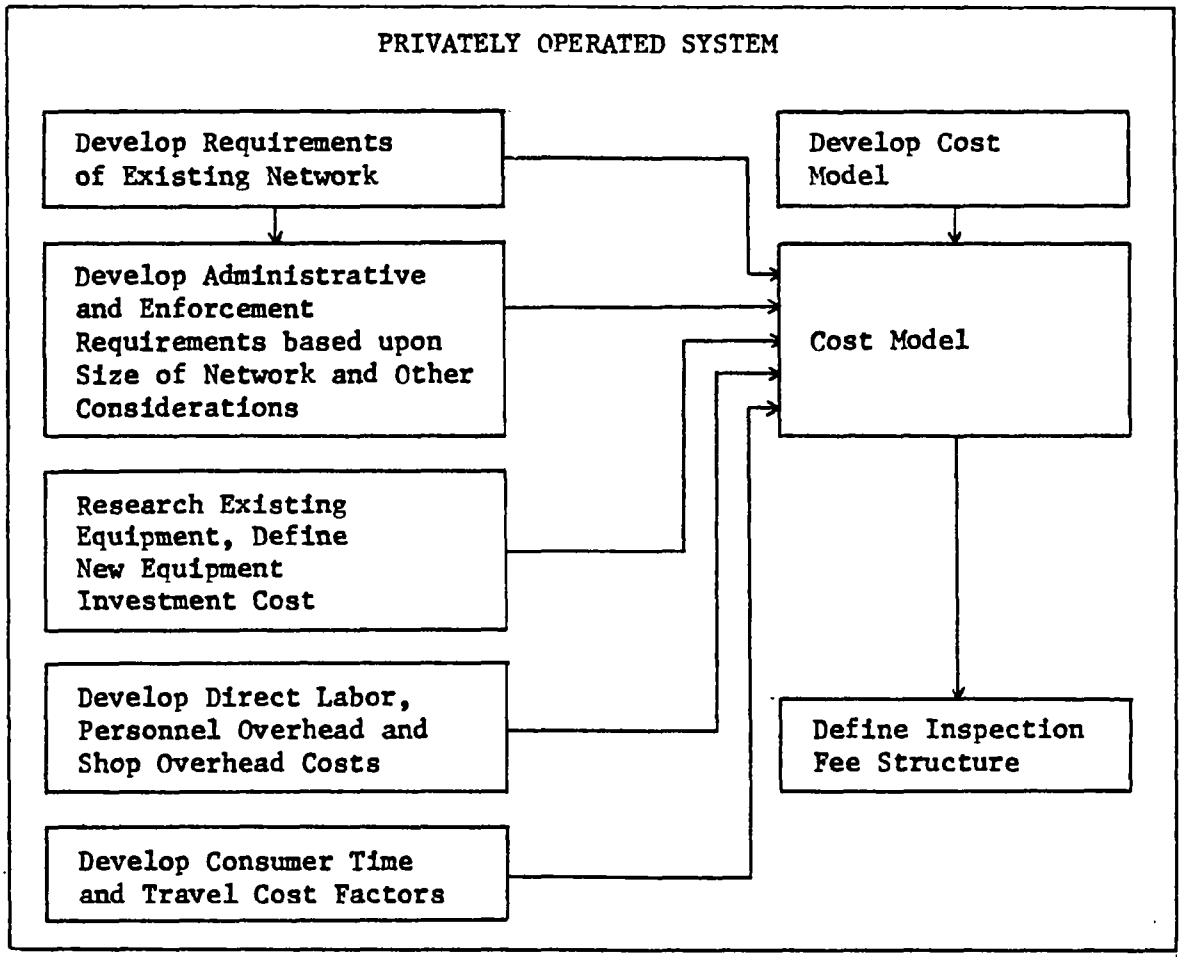

Figure 2-4, Task 2 Flow Diagram

of the number of DAQCR facilities expected to participate, site inspection requirements, the anticipated level of variance and referee related activities and the anticipated data handling, compiling and processing requirements.

2.2.4 Task 3, Required Inspector Skill and Training Levels

As indicated earlier, personnel from each participating facility were trained in accordance with study requirements. A training program of about 15 hours of classroom instruction was provided at the outset of the study. Additionally, a nominal 15 hours of on-the-job training was provided each emission inspector during the testing phase on a demand basis. This was provided through both scheduled and unscheduled

visits to each site by an emission inspection and control specialist from the ATL staff. During these visits the specialist provided guidance and assistance to site personnel in solving inspection and repair problems.

To document the minimum personnel skills and training levels required for the proper operation of test equipment, the experience and results of the Colorado State University (CSU) Mechanic/Inspector pilot training program were applied. The results of student testing during instrument operation training phases of the CSU pilot training project were referenced and applied towards developing the specific requirements related to this task. In addition, other criteria relating to minimum educational requirements and related work experience were investigated and developed. These criteria were used as the basis for evaluating inspection and repair personnel during the training and testing phases of the project. As a final result, recommendations regarding minimum educational and skill levels were developed.

2.2.5 Task 4, Documentation of Needed Public Protection Measures

The reactions of test participants to the pilot study and certain cost and other information developed during the testing phase were utilized to develop documentation relating to the requirement for public protection measures.

The reactions of participants were measured at two stages in the program, upon initial selection and acceptance of a vehicle and, consequently its owner, and again after all testing was completed. To measure these reactions, a questionnaire was devised which included questions relating to the causes of air pollution, the seriousness of the situation, who should conduct the inspections, the frequency of

inspection, inspection fees, and other questions relating to a mandatory inspection program. In addition, questions regarding a mandatory retrofit program were included. The questionnaires were also designed to elicit data relating to the so-called nuisance factors which include time and travel requirements and to the social, economic and enforcement implications of a mandatory program.

In addition to measuring participant reaction, estimates relating to possible areas of overcharge, additional training or certification necessary for instruments and/or inspectors, minimal data recording necessary in the event of court action and other factors were documented and evaluated.

The manner in which the requirements relating to Task 4 were approached is depicted in the Task 4 Flow Diagram presented in Figure 2-5.

2.2.6 Task 5, Enforcement Problems and Solutions

Much of the data and information to meet the requirements of Task 5 were developed in connection with the preceding tasks.

The pilot inspection network was utilized to identify enforcement problems and solutions and administrative guidelines needed to expand the effort to a region-wide program. Such recommendations were developed from this experience and from public reaction to the pilot network as reflected in the response to the questionnaires and the change in response. The pilot network and the public's reaction to its many aspects were also used as a measure to determine requirements for variance activities and for exempt vehicles, and to identify those activities such as false documentation, operation without a permit and circumvention which should be designated as areas requiring legal study.

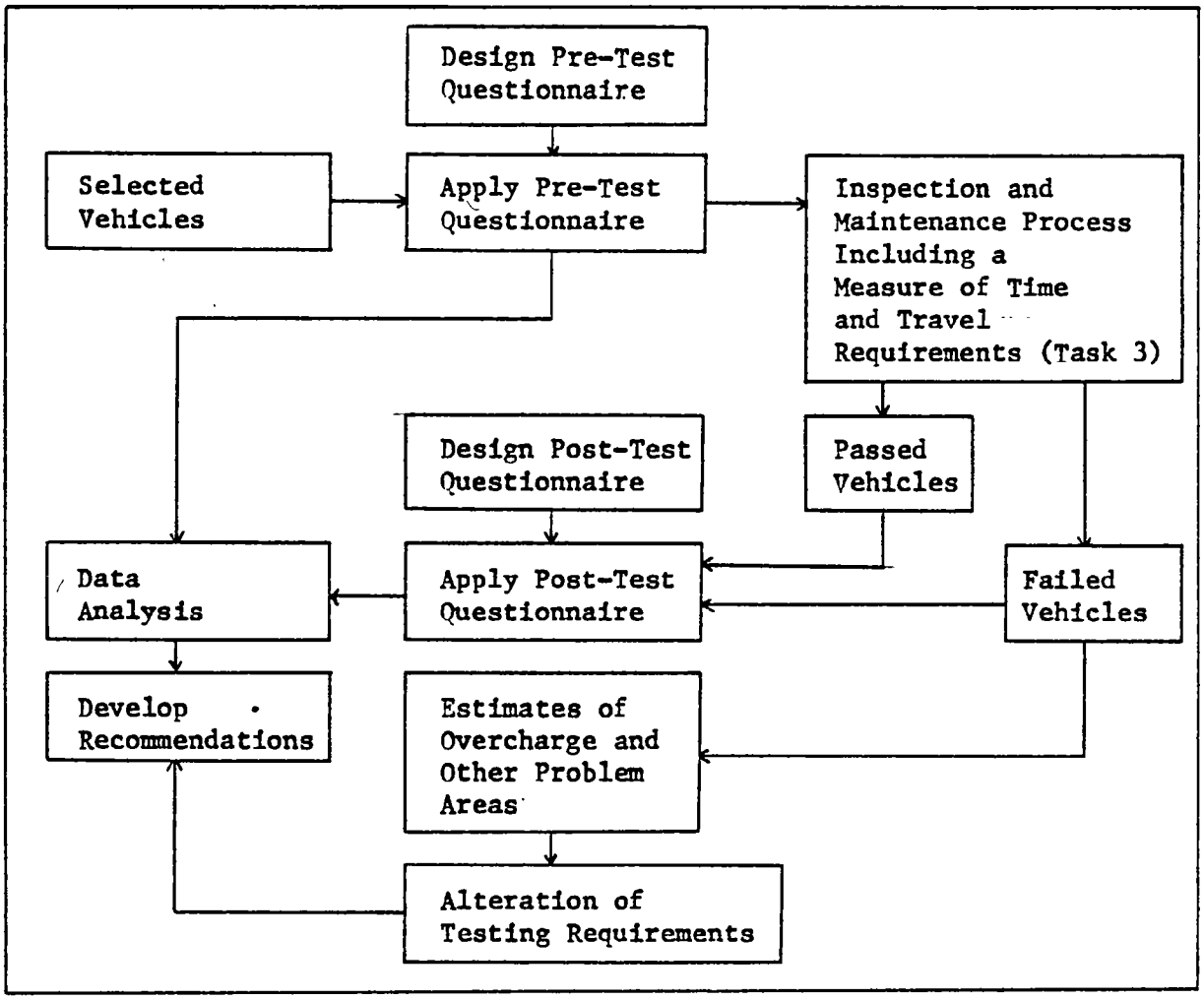

Figure 2-5, Task 4 Flow Diagram

3. DISCUSSION OF STUDY FINDINGS

In Section 2 of this report we described the program objectives and included a general discussion of study design.

In this section, provided in 6 parts, we present our findings with additional amplification of the design elements when considered necessary to clarify certain aspects of the results.

Part I includes a discussion of the testing phase which describes: the administration of the experimental program; the inspection and repair procedures; and station performance including pass/fail rates, instrument drift rates, instrument correlations, maintenance costs, and emission related effectiveness.

Part II describes the public sector fee structure and the manner in which it was developed.

Part III describes the private sector fee structure and the manner in which it was developed.

Part IV describes the minimum inspector and repairman skill and training levels and the manner in which they were determined.

Part V describes the results of the public opinion survey, an estimate of overcharges, an evaluation of consumer complaints and a discussion of needed public protection measures.

Part VI includes a summary of the problems expected in connection with an area wide inspection network.

I.3.1 VEHICLE TESTING

I.3.1.1 Distribution of Test Vehicles by Station

Before the testing phase was implemented we developed several alternative plans to distribute test vehicles among stations comprising the network. These were presented to and discussed with the Department. At the outcome of these discussions, it was generally concluded that an approach which permitted the motorist freedom-of-choice relative to the site he selected would best meet program objectives. On the other hand, it was considered desirable to force the distribution such as to provide about 10 percent of the privately-owned vehicle sample to the State-operated test site. Consequently, the vehicle distribution by site was nominally 10 percent to the State site and 90 percent to the privately-operated sites. No attempt was made to bias the sample assigned to the privately-operated network along any particular lines. The fleet vehicles, of course, were limited to inspection at the fleet-owned station.

The distribution which resulted from the strategy is presented in Table 3-1. Here it may be seen that nearly 47 percent of the motorists assigned to the private network chose the three service stations in which to have the inspection performed. Of the balance, nearly 31 percent chose the new car dealerships and nearly 23 percent chose the independent garages. Of particular significance in this respect is that nearly 29 percent of the motorists chose SS-4 for the inspection. We attribute this to the greater number of hours this particular facility was available to perform inspections. Respective of this factor, we would be led to believe that stations comprising

Station Code	Type of Station	Veh. Inspected (#)	Veh. Inspected (%)*	Business Hours
IND-1	Indep. Gar.	98	10.7	8:00-6:00, 8:00-12:00 Sat.
IND-3	" "	88	9.6	8:00-5:30, 8:00-12:00 Sat.
IND-8	" "	20	2.2	7:45-5:30, Closed Sat.
		206	22.5	
SS-4	Serv. Sta.	261	28.5	7:30-8:00, 7:30-8:00 Sat.
SS-5	" "	44	4.8	7:30-6:00, Closed Sat.
SS-9	" "	122	13.3	8:00-5:00, 8:00-5:00 Sat.
		427	46.7	
D-2	Dealership	110	12.0	7:00-5:30 Closed Sat.
D-6	"	115	12.6	7:00-5:30 Closed Sat.
D-7	"	57	6.2	7:00-5:30 Closed Sat.
		282	30.8	
ST-10	State	85		N/A
FL-11	Fleet	100		N/A

* Percent of 915 total non-State tested privately-owned vehicles

Table 3-1, Resulting Distribution of Test Vehicles by Station.

any network should not be limited in operation to the "normal" (8:00 A.M. to 5:00 P.M., for example) business hours. Our opinion in this regard is also supported by the fact that, in general, stations which were closed Saturdays were selected less frequently than those which were open. In this same regard, however, we also believe the particular location of a facility, and the public's awareness thereof, is also an important factor.

I.3.1.2 Administration of Experimental Program

In designing the experiment, we attempted to develop a pilot network to represent what we considered to be real-world conditions inasmuch as practicable. The freedom provided the motorist in selecting a site was considered to be a necessary element. In addition, we also provided some freedom to the motorist to select a time period during

which the inspection was to take place. In this respect, a one week time period was prescribed. This information was provided by directing an appointment card, on which the prescribed week was indicated, to the motorists attention. The card not only alerted him to the inspection time requirement, but also served to introduce him at the inspection site. A map showing station locations and business hours and a detailed set of instructions were also provided.

The site manager was also provided instructions. With the motorist's arrival at the site, the station was instructed to:

1. Write up a repair (inspection) order as on any job.

2. Complete the last four lines on the inspection form (Figure 3-1, page II-6) using information provided on the customer's I.D. card.

   Verify the engine size before completing the bottom line of the inspection form.

3. When the inspection is completed:

   A. The original of the inspection form and one copy of the costed repair order is given to the customer.

   B. The remaining copy is to be mailed to the laboratory.

4. Invoice the laboratory on a monthly basis.

   Support the invoice with copies of repair orders.

   Maximum amount that will be paid for a "passed" vehicle is $4.00.

   Maximum amount that will be paid for a failed vehicle is $54.00 ($4.00 for inspection and $50.00 for repairs).

As indicated, the fee we provided for the inspection was $4.00 per vehicle, a cost excluding administrative fees determined on the basis of results obtained from the Volume II study report, High Altitude Vehicular Emission Control Program. A nominal maintenance cost, not to exceed $50 per vehicle, was also provided because of program cost constraints.

As also indicated, the motorist was provided a copy of the costed repair order. The particular purpose of this strategy was to bring repair costs to his specific attention. Since his opinion on the entire process was being measured, we believed this to be an acceptable substitute in lieu of his actually paying for the repairs.

I.3.1.3 Inspection and Repair Procedures

In designing the I/M procedure, it was our belief that greater exhaust hydrocarbon (HC) and carbon monoxide (CO) reductions could be achieved relative to the procedures applied in earlier high altitude I/M studies by slightly modifying the repair sequence. As will be later discussed, this did not prove to be the case. In any event, the procedures we prescribed were as follows:

1. Perform HC and CO inspection at curb idle.

2. If vehicle fails HC, CO or both, perform lean best idle and idle rpm adjustments.

   If vehicle fails HC, adjust ignition timing as well.

3. If after step 2 operations are performed the vehicle continues to fail, perform up to $50.00 in maintenance using procedures prescribed in the training program.

   As a final step, perform lean best idle and idle rpm adjustments.

4. If after step 3 operations are performed the vehicle continues to fail, estimate malfunction and probable cause.

Since the State facility performed no repairs, the function performed by State personnel was related solely to the inspection process. A vehicle which failed the test at the State station was required to utilize one of the nine private stations to have repairs performed. This facet of the inspection process obviously placed an additional burden on the motorist since he was required to take the

failed vehicle to a repair facility for repairs and return to the State station for a final inspection. In this respect, it should be noted that we did not require the process to be continued beyond the initial retest.

I.3.1.4 Station Performance

I.3.1.4.1 Pass/Fail Rates

Pass/fail limits were designed to fail 50 percent of the privately owned vehicles. These same limits were utilized as pass/fail criteria for fleet-owned vehicles. The HC/CO standards shown in Table 3-2 were applied in the inspection process and were determined in advance of the testing phase through a parking lot survey conducted by the Health Department.

Model Year	Failure Limits	
1968-1974	400 ppm HC	5.0% CO
1960-1967	900 ppm HC	6.5% CO

Table 3-2, Idle HC/CO Emission Inspection Standards

Using these limits, the actual pass/fail rates as determined in the testing phase are shown by inspection station in Table 3-3. As indicated, the actual pass/fail ratio for vehicles tested in the private sector was 54/46 while the ratio for vehicles tested in the State sector was somewhat different at 64/36. This disparity may be due to instrument, procedural and other factors which in our opinion are easily resolved and should not reflect on the quality of inspection in either sector. Not shown in the table is the pass/fail rate for fleet vehicles. This was found to be 84/16 which may indicate these

Station	300 Monitored Vehicles			700 Vehicles Not Monitored			All Vehicles		
	Tested #	Pass (%)	Fail (%)	Tested #	Pass (%)	Fail (%)	Tested #	Pass (%)	Fail (%)
IND-1	28	68	32	70	56	44	98	59	41
D-2	30	63	37	80	52	48	110	55	45
IND-3	26	69	31	62	55	45	88	59	41
SS-4	103	51	49	158	59	41	261	56	44
SS-5	11	54	46	33	58	42	44	57	43
D-6	26	54	46	89	56	44	115	56	44
D-7	13	31	69	44	48	52	57	44	56
IND-8	5	40	60	15	53	47	20	50	50
SS-9	28	46	54	94	39	61	122	41	59
Total	270			645			915		
Mean		55	45		53	47		54	46
ST10	30	57	43	55	67	33	85	64	36

Table 3-3, Pass/Fail Rates by Station and by Private and Public Sector.

vehicles were in a relatively good state of repair before inspection.

I.3.1.4.2 Inspection Instrument Drift Rates

Instrument models used in the nine private stations, the single State-operated station and the single fleet station are listed in Table 3-4. Also shown are maximum drift rates in percent of instrument full scale per month which we measured and recorded during the nominal three and one-half month operational interval. These rates were determined as a result of on-site inspection and calibration of the instruments made on a periodic basis throughout the interval.

Calibrations of these instruments were performed using standard HC and CO gas blends. No data were developed for the instrument used at the State site since the facility was in operation a relatively short period of time near the end of the testing phase.

With further regards to instrument drift rates, maximum observed drift for HC was -6.5 percent of full scale per month. The maximum

Station	Mfgr.	Model	Max. Drift (%F.S./Month)	
			HC	CO
IND-1	SUN	EPA-75	+1.0	+3.0
D-2	SUN	EPA-75	-4.0	±3.0
IND-3	SUN	EPA-75	-4.0	±5.0
SS-4	SUN	EPA-75	-6.5	+3.0
SS-5	SUN	EPA-75	-1.5	+2.0
D-6	SUN	EE-910	+1.5	+4.0
D-7	SUN	U-912	+2.5	±1.0
IND-8	SUN	EE-910	+5.0	±3.0
SS-9	SUN	EPA-75	-2.5	+2.0
ST-10	SUN	EPA-75	-	-
FL-11	SUN	U-912	+4.4	+5.0
"	SUN	EPA-75	0.0	+1.0

Table 3-4, Maximum Inspection Instrument Drift Rates by Station.

for CO was 5.0 percent per month. From this indication we concluded that it would be a good practice to perform a calibration using gas blends (as opposed to a mechanical or electrical calibration) at an interval not to exceed each two months. This conclusion is based on the assumption that the performance of the instrument becomes unacceptable when its response to a standard gas indicates it is out of calibration more than 10 percent.

I.3.1.4.3 Station Inspection Correlation With Laboratory Inspection

During the testing phase, we utilized a representative subsample of 330 vehicles to monitor the quality of station inspections and other aspects of an I/M program.

The monitoring strategy was applied to obtain an indication of instrument performance and the inspector's proficiency in operating the instruments and performing the inspections. The procedure involved a laboratory performed pre-station inspection of each of the 330 vehicles comprising the control sample. The inspection was performed using laboratory-grade HC and CO instruments (Beckman Model 315 NDIR analyzers) calibrated with standard gas blends.

After all data were gathered, correlation coefficients to describe the relationship between the laboratory and station inspections were developed. As shown in Table 3-5, where off-scale instrument readings are not considered, correlation coefficients for HC vary relative to private sector facilities from a low of .498 (IND-8) to a high of .745 (SS-9). Coefficients relative to the State operation and the fleet operation were found to be lower at .475 and .104. Correlation coefficients for CO vary in the private sector stations from .488 to .869 with the coefficient for the State site falling at .698, a point about mid-range in the coefficients found relative to the private sites. At .299, the fleet facility indicates the lowest coefficient for CO also.

Station	HC		CO	
	Observations	Coefficient	Observations	Coefficient
IND-1	26	.546	28	.634
D-2	28	.589	28	.755
IND-3	24	.674	26	.555
SS-4	91	.548	100	.611
SS-5	11	.669	11	.635
D-6	25	.549	23	.657
D-7	12	.771	13	.799
IND-8	3	.498	5	.488
SS-9	25	.745	27	.869
ST-10	30	.475	28	.698
FL-11	30	.104	30	.299

Table 3-5, Laboratory Inspection Versus Station Inspection Correlation Coefficients.

As we indicated earlier when discussing pass/fail rates, we do not consider the coefficients to be a true measure of station performance. The State, for example, did not derive full benefit from our instrument monitoring procedure since its facility was in operation for such a

short period of time. Also, we believe the apparent poor performance of the fleet facility is more a problem of instrument accuracy than inspector performance. As may be inferred from the relatively low fleet vehicle failure rate, many of the readings were taken on the lower end of the instrument scales where correlations are expected to be inherently poor.

I.3.1.5 Vehicle Maintenance Costs

Average maintenance costs associated with failed vehicles are shown in Table 3-6.

As indicated, the minimum average cost by station to repair a failed privately-owned vehicle was $8.17 while the maximum was $19.60. The mean cost to repair vehicles failed by the private sector network was found to be $11.00 while $13.75 was the cost associated with repairing vehicles failed by the State facility. While the higher cost factor associated with State failed vehicles may be construed to indicate some cost disparity between the two sectors, the higher

Station	# Veh. Tested	Pass/Fail (No./No.)	Avg. Cost/Failed Veh.
IND-1	98	58/40	$ 8.17
D-2	110	61/49	$ 9.68
IND-3	88	52/36	$19.60
SS-4	261	147/114	$ 8.30
SS-5	44	25/19	$14.41
D-6	115	64/51	$ 9.51
D-7	57	25/32	$12.57
IND-8	20	10/10	$13.12
SS-9	122	50/72	$12.59
ALL 9	915	492/423	$11.00
ST-10	85	54/31	$13.75
FL-11	100	84/16	$10.76

Table 3-6, Average Maintenance Costs Per Failed Vehicle by Station.

State-inspected repair cost is related almost exclusively to the fact that many of the State-failed automobiles were repaired at IND-3, the facility found otherwise to exhibit the highest repair charges. As also indicated, the average failed fleet-vehicle repair cost, $10.76 is very nearly the same as the failed privately-owned vehicle repair cost.

In examining the various factors affecting repair costs and further supported by actual data, we can find no reason to believe a repair cost disparity would exist between the two sectors.

I.3.1.6 Emission Related Effectiveness

In review: one aspect of the study was to test a representative sample of vehicles by model-year, make, engine size, etc. with the representation by model-year based on VMT. In this respect, it was intended that vehicle sub-samples be utilized to evaluate the advantages and disadvantages of inspection in the public versus the private sectors. While we originally designed with these factors in the forefront, it became increasingly more difficult to maintain the design criteria due to the delay in start-up connected with the State facility. As opposed to simply halting test activities, the testing rate was merely slowed considerably at some point to ensure that an adequate number of vehicles were available for testing at the State inspection site. As a consequence, the vehicle sample ultimately tested at the State site was skewed toward the newer model-years, a factor which need be considered as results are presented. In this same respect, the fleet vehicle sample may appear to be skewed toward the newer model-years. It should be remembered, however, that fleet vehicles represent the distribution of vehicles under the operator's control.

Aside from providing a quantity of vehicles to be used to evaluate the various aspects of a public versus a private sector network, the purpose of the testing phase was to provide an indication of the current emission related conditions of DAQCR motor vehicles in contrast to the conditions found in previous studies. In these regards the Department was particularly interested in comparing results from the subject program, which we will call the FY-74 program against the previous year's I/M study, which we will call the FY-73 program.

To make this determination we were particularly concerned with examining the 1968 and newer vehicle population and elected to utilize a 90 percent confidence level. With respect to both HC and CO emissions we looked for significant statistical differences as follows:

- FY-74 before I/M results versus after I/M results
- FY-73 before I/M results versus after I/M results
- FY-74 before I/M results versus FY-73 before I/M results
- FY-74 after I/M results versus FY-73 after I/M results
- FY-74 before I/M results versus FY-73 after I/M results
- FY-73 before I/M results versus FY-74 after I/M results

In these regards it should be noted that the after I/M data are based on slightly different rejection rates which we do not believe will alter the conclusions. The rejection rate we examined for the FY-74 program was 41% while the FY-73 rejection rate was 40%.

As may be seen in Table 3-7, at the 90 percent confidence level we found a statistically significant reduction in HC emissions resulting

from the current I/M process. Similarly, we found a significant reduction resulting from last year's I/M process. However, we also found a statistical difference in emission levels between last year's HC baseline sample and this year's baseline sample with the current year indicating a lower baseline level. With further regards to these data, we found no difference in the final HC levels between last year's and this year's program and no difference between this year's baseline and last year's after I/M HC levels. In addition, we did find a difference between last year's baseline and this year's after I/M HC levels.

Pairs Tested	#Veh.	Mean (gr/mi)	S.D. (gr/mi)	Statistical Difference?
FY-74 before I/M	231	5.35	2.2	
FY-74 after I/M	231	5.00	1.8	yes
FY-73 before I/M	190	6.36	4.7	
FY-73 after I/M	190	5.22	1.6	yes
FY-74 before I/M	231	5.35	2.2	
FY-73 before I/M	190	6.36	4.7	yes
FY-74 after I/M	231	5.00	1.8	
FY-73 after I/M	190	5.22	1.6	no
FY-74 before I/M	231	5.35	2.2	
FY-73 after I/M	190	5.22	1.6	no
FY-73 before I/M	190	6.36	4.7	
FY-74 after I/M	231	5.00	1.8	yes

Table 3-7, Results of Statistical Differences Test of Various Pairs of FY-73 and FY-74 HC Data at the 90 Percent Confidence Level, 1968 and Newer Model-Year Vehicles.

These findings would lead us to conclude that while the current year's I/M process resulted in statistically significant HC reductions, these reductions are not as great as those achieved previously due

apparently to a general lowering of the baseline level. This indicates to us that more attention was recently given the HC related tune-up parameters, a factor caused perhaps by the recently emerging energy shortage and its higher attendant fuel costs.

A similar analysis was performed relative to CO emission levels.

As may be seen in Table 3-8, at the 90 percent confidence level we found no significant reduction in CO emissions resulting from the current I/M process while we did find that the I/M process of last year produced a significant reduction in CO. However, we found no difference between last year's CO baseline sample and this year's baseline sample. With further regards to these data, we found no difference in the final CO levels between last year's and this year's program but did find a difference between this year's baseline and last year's after I/M CO levels. In addition, we found no difference between last year's baseline and this year's after I/M CO levels.

Our findings in these regards would lead us to conclude, very simply, that while the potential for CO reduction existed relative to the more recent effort, for some reason it was not attained. While we do not have solid evidence to indicate this to be the case, we have surmised that one of two factors, or both, tended to have an adverse effect on the I/M benefits. In viewing the two programs, the only real differences we could find, however subtle, were related to both the inspection and the repair procedures. In the prior year's program a two mode inspection procedure (curb idle and 2500 rpm) was employed while in the current study a single mode (curb idle only) procedure was utilized. Also, in the prior year, an engine rpm/lean

Pairs Tested	#Veh.	Mean (gr/mi)	S.D. (gr/mi)	Statistical Difference?
FY-74 before I/M	231	91.1	48.3	
FY-74 after I/M	231	86.0	47.1	no
FY-73 before I/M	190	91.3	44.1	
FY-73 after I/M	190	81.5	31.1	yes
FY-74 before I/M	231	91.1	48.3	
FY-73 before I/M	190	91.3	44.1	no
FY-74 after I/M	231	86.0	47.1	
FY-73 after I/M	190	81.5	31.1	no
FY-74 before I/M	231	91.1	48.3	
FY-73 after I/M	190	81.5	31.1	yes
FY-73 before I/M	190	91.3	44.1	
FY-74 after I/M	231	86.0	47.1	no

Table 3-8, Results of Statistical Differences Test of Various Pairs of FY-73 and FY-74 CO Data at the 90% Confidence Level, 1968 and newer Model-Year Vehicles.

best idle adjustment was prescribed for vehicles failing CO only. In the current program, this procedure was prescribed for all failed vehicles including those which failed HC as well as CO. In any event, we believe these varying degrees of success merely indicate the sensitivity of an I/M program to a variety of factors, not all of which are clearly understood.

In this light, the mean I/M emission level data for the current year are presented in contrast to the results obtained in last year's program. These may be seen in Table 3-9 where data relating to the fleet vehicles are also shown. In this regard, we are of the opinion that the data shown for the fleet vehicles, although based on the relatively low 16% rejection rate, are reflective of near minimum emission levels which may be achieved as a result of a totally effective I/M or mandatory maintenance program.

Rejection Rate	HC		CO		NO_x		MPG	
	'73	'74	'73	'74	'73	'74	'73	'74
Baseline	6.36	5.35	91.3	91.1	2.87	2.49	14.68	14.98
20%	5.56	5.06	86.1	87.6	2.84	2.49	14.79	14.98
30%	5.29	5.04	83.3	86.9	2.84	2.48	14.85	14.95
40%	5.22	5.00	81.5	86.0	2.84	2.48	14.88	14.93
Fleet 16%		4.07		77.3		2.76		14.50

Table 3-9, 1968 and Newer Model-Year Vehicle Emission Levels (gr/mi) at Various Rejection Rates for the FY-73 and FY-74 I/M Study Programs.

In Table 3-10 are shown effectiveness data in terms of percent reduction from the baseline condition. Regarding these data, we believe it important to note that at the higher rejection rates, the HC and CO effectiveness factors for the current year are respectively about 1/3 and 1/2 of what they were in the FY-73 program, the reasons for which have been discussed. It is also important to note that fleet emission reductions based on mean values were relatively insignificant.

More detailed data relating to the subject study are presented in Appendix B.

Rejection Rate	HC		CO		NO_x		MPG	
	'73	'74	'73	'74	'73	'74	'73	'74
20%	12.6	5.4	5.8	3.8	1.0	0.1	-0.76	0.03
30%	16.9	5.9	8.8	4.6	0.8	0.2	-1.14	0.30
40%	18.0	6.6	10.8	5.7	1.1	0.3	-1.37	0.40
Fleet 16%		0.4		1.0		0.2		-0.25

Table 3-10, 1968 and Newer Model-Year Vehicle Emission Reductions (%) at Various Rejection Rates for the FY-73 and FY-74 I/M Study Programs.

II.3.2 INSPECTION COSTS IN THE PUBLIC SECTOR

II.3.2.1 Site Workload Capabilities

The Department reported the capacity of a State-operated inspection facility having two inspection lanes would be about 12.5 inspections per hour per lane which is equivalent to 4.8 minutes per inspection. This information was obtained from the Department's experience in operating its pilot test site in Aurora. The Department further reported the estimate takes into account the amount of time required to:

- Elicit the needed information from the vehicle owner.
- Position the vehicle in the inspection lane.
- Connect the diagnostic and inspection equipment.
- Observe and record appropriate instrument readings.
- Relate test results to the owner.
- Respond to any questions the owner may have relative to the process.

However, the 12.5 inspections/hour/lane testing rate does not take equipment breakdowns, personnel absenteeism and other factors affecting production into account. It is our estimate, based on a survey of 43 automotive repair facilities, that an effectiveness factor of 0.8 may be applied to determine the effective production level of an automotive-oriented facility.

We agree with the Department's estimate relating to the inspection time. The Department provided estimate is roughly equivalent to the actual average inspection time reported by the vehicle owners who frequented the State-operated facility in connection with the testing phase. While an average of 6.3 minutes per inspection was reported, we believe the interval would eventually be reduced to coincide with

the Department's estimate as test personnel gain experience and the efficiency of the operation generally improves.

Taking the various factors into account, we believe the actual test rate would be more nearly 10 inspections/hour/lane.

II.3.2.2 Minimum Network Requirements

Our estimates on the number of inspections to be performed are based on:

- Projected light-duty vehicle population as of mid-1977.
- The assumption that 10 year old and newer vehicles are to be subject to the inspection requirement.
- A rejection rate of 30 percent.
- A second retest of a failed vehicle will not be required.

We project there will be about 891,000 light duty vehicles registered in the DAQCR in 1977. Approximately 88 percent or 784,000 will be 10 years old or newer. At a 30 percent rejection rate, the number of inspections required on an annual I/M basis would be about 1,020,000 inspections per year.

Drawing on our experience and the information developed during the testing phase, we believe the public should be provided, and would accept, a network which generally operates at a minimum:

Weekdays from 7:00 A.M. to 8:00 P.M.

Saturdays from 8:00 A.M. to 5:00 P.M.

thus providing about 74 hours/lane/week in which inspections may be performed. On this basis, and at a rate of 10 inspections/hour/lane, a total of 740 inspections/week or about 38,000 inspections per year may be performed in each lane. Considering the annual number of 1,020,000 inspections to be performed, about 27 lanes would be required. However,

this estimate assumes a uniform workload throughout the testing week. In order to prevent vehicle back-up in the test lanes, particularly during the late afternoon, evening and Saturday hours, we believe the number of lanes estimated above should be increased by a factor of 1.3 which results in a DAQCR requirement for about 36 test lanes.

II.3.2.3 Administrative and Enforcement Requirements

On the basis of experience derived in the pilot test lane effort, it would appear that many of the administrative tasks may be integrated into the duties performed by site management personnel. As a consequence, the purely administrative elements of a State-operated network appear to be minimal. We believe the same is true of the enforcement aspects whereby enforcement measures, excluding any activities which may be generated relative to the granting of variances, may be handled in much the same manner existing safety inspection regulations are handled, through local and State law enforcement agencies. If this strategy is employed, however, it would be necessary to modify certain of the regulations applicable to the safety inspection network.

The revisions should contain the following as a minimum:

- Provisions for applying the existing safety inspection sticker to indicate compliance with both safety and emission inspection requirements. Slight modifications to existing sticker design would be required.
- Provisions to require the existing safety inspection network and the proposed emission inspection network to transfer certain information from the old sticker to the new.
- Provisions within the regulations granting authority to law enforcement agencies to enforce the new and revised regulations.

In proceeding along these lines, the requirement for a second sticker would be negated and the enforcement problems connected with identifying

a vehicle registered within a county affected by the emission inspection requirements would be no greater than they currently are relative to the safety inspection program. Administrative elements of the proposed strategy are as follows:

- The safety inspector, at the time of inspection, would determine the county in which the vehicle was registered.

  If registration is found to be outside the DAQCR, the inspector would, in effect, grant a variance relative to the requirement for emission inspection and issue a safety inspection sticker which expires in 12 months.

  If registration is found to be within the DAQCR, the inspector would issue a sticker which expires when the next emission inspection is due.

- The emission inspector, at the time of inspection, would issue a sticker which expires when the next safety inspection is due.

Since the logistic requirements relative to the stickers are currently handled within the Department of Revenue and reasons for altering this practice have not become apparent, we believe the practice should be continued.

In line with the above discussion, we believe a State-operated network may be adequately administered by employing within the Health Department:

An administrator to provide overall direction relative to the program and to serve as the program spokesman.

An Assistant Administrator to assist in these regards and to coordinate activities within the Department of Revenue.

A Secretary to provide clerical and other administrative assistance.

Two Engineers with administrative experience to coordinate personnel assignments, equipment calibrations, logistics, and other network requirements.

One Data Analyst to coordinate data processing and related activities and review and modify pass/fail limits as applicable.

Two Electro-Mechanical Equipment Technicians to provide equipment calibration and maintenance support for the network.

It is also our belief that the Department of Revenue should employ in addition to its current staff:

An Engineer with administrative experience to coordinate Department of Revenue activities relative to the inspection network.,

Two clerks to provide assistance in issuing and accounting for the stickers used within the emission inspection network.

II.3.2.4 Data Processing Requirements

On the basis of our experience in the inspection phase of the pilot effort, coupled with our knowledge of the importance of maintaining accurate and current data files which help in indicating potentially troublesome areas, we believe the implementation of a data processing system is essential to the success of the program. In this regard, we recommend the quality and cost control procedures employed in the pilot effort be utilized with particular emphasis on the use of the Vehicle Inspection Form (Figure 3-1). This form, which requires some modification and refinement for use in connection with a computerized State-operated network, was and may be used to document emission readings, the type of adjustments and repairs made and repair costs relating solely to the I/M process. The form should be printed in an original and two copies with the following disposition:

In the case of a passed vehicle, the original is retained by the vehicle owner, and one copy is retained by the station for subsequent processing. The second copy may be destroyed or retained in a dead file.

In the case of a failed vehicle, the original and one copy is retained by the vehicle owner to be presented to the repair facility when repairs are scheduled. The repair facility is required to indicate on the forms the repairs made and the costs incurred. Subsequent to this, the owner is required to present the completed forms at the time of retest.

STOP WHEN VEHICLE PASSES!				
Model Year	Failure Limits			
1968-1974:	HC	400 ppm	CO	5.0%
1960-1967:	HC	900 ppm	CO	6.5%

		READING	COST
INITIAL INSPECTION	HC		4.00
	CO		
ADJUSTMENTS			
if vehicle fails: adjust idle RPM, set lean best idle	HC		
	CO		
if vehicle fails HC: adjust timing, set lean best idle	HC		
	CO		
REPAIRS ($50.00 LIMIT)			
	HC		
& set lean best idle	CO		
TOTAL COST			

If vehicle still fails, estimate malfunctions and probable cost _____

Inspection Station _____

Vehicle Owner _____

Vehicle Number _____ Year _____ Make _____

Engine Displacement _____ Number of Cylinders _____

Figure 3-1, Sample of Vehicle Inspection Form

If the vehicle passes the retest, the original is retained by owner and the copy is retained by the station for processing.

If the vehicle fails the retest, the original and one copy is to be again presented at the repair facility where additional maintenance is to be performed. The extent of this additional maintenance is to be recorded on the forms. We do not consider a second retest advisable. Consequently, the owner is simply required to present the completed form at an inspection site where a sticker will automatically be granted. At this time, the original is retained by the owner and the copy is retained by the station for subsequent processing.

It is our opinion that a minimal, yet effective, data collection and processing system comprised of both manual and automatic data processing operations could be implemented in a reasonably short period of time. In general, the system would utilize a keyboard terminal and a real-time mini-computer and would operate as follows:

When the initial test is performed, vehicle and owner data would be entered via keyboard and stored on magnetic tape. Subsequent to this and at the appropriate time, emission test data (HC and CO readings) would automatically be entered and stored on tape. Concurrently, a hard copy of the Vehicle Inspection Form would also be produced for utilization in the procedures relating to maintenance and cost data.

As described above, in the case of a failed vehicle the computer generated original and one copy would be retained by the vehicle owner for presentation at the repair facility.

Following repairs and the completion of the form by the repair facility, the vehicle would be returned to the inspection station to be retested. At this time, data relating to the vehicle, owner, retest emission levels, maintenance and costs would be entered and stored on tape for subsequent processing.

In the case of a second failure, the same information would again be recorded, this time to include maintenance and cost data relating to the second repair attempt.

Finally, the tape stored data would be collected periodically and transferred to a central data center for processing. At the center, data from the various stages would be combined and pass/fail rates, maintenance data, cost data and other desirable information would be reported in an appropriate format.

II.3.2.5 Collection of Inspection Fees and Handling of Purchasing Requirements

While there may be specific reasons, either political or otherwise, for collecting the inspection fee at the time a vehicle is first presented for the annual inspection, we believe the fee-payment process should be made a part of the annual motor vehicle registration requirement. Without getting into a detailed discussion of the security and other ramifications of an on-site fee collection process, we believe it sufficient to say that a combined registration/inspection fee collecting arrangement at the time the vehicle is registered is a workable arrangement. A requirement for three or four additional personnel within the Department of Revenue to properly account for and transfer monies into the appropriate State fund and one or two additional personnel within the Purchasing Department to procure materials and supplies required by the network should be adequate.

II.3.2.6 Real Estate, Building and Equipment Costs

In researching real estate costs we found land values to vary over a wide price range. Values, for example, were on the high side for parcels of land situated with frontage on main thoroughfares in developing or newly developed neighborhoods and on the low side for parcels situated off main thoroughfares in or near decaying neighborhoods or undeveloped areas. After encountering such significant variations in values, we came to the realization we would have to rely on the opinion of real estate agents and appraisers.

In seeking such opinion we established the following criteria to describe a typical inspection site:

The site was to be of a size equivalent to the pilot test site

currently in operation in Aurora with a frontage of about 75 feet and a depth of 130 feet.

It was to be situated about one-half of a city block from a major arterial road.

It was to be situated in an area zoned for business or light industry.

In discussing such requirements with the various individuals and companies we contacted, the consensus of opinion was that such a site would cost about $50,000 on the average.

The Health Department provided cost data relating to certain of the equipment required. The Department indicated that capital outlay for an inspection facility could be divided into two major areas, scientific equipment and office equipment.

The scientific equipment cost estimate provided by the Department included an ignition analyzer, tachometer, dwell meter, volt-ohm meter, vacuum gauge, compression tester, positive crankcase ventilation tester and automotive repair and adjustment hand tools. These items were reported as costing $5,700 totally. In addition, we derived an estimate of $12,000 to provide an emissions analytical console containing laboratory-grade HC and CO pollutant measuring instrumentation and a CO_2 analyzer for inspection quality control purposes. The console also includes sample diverting, flow control and conditioning components. The data acquisition system (mini-computer) is estimated to cost about $25,000 and includes the computer with 16K memory, interface apparatus, a real-time clock, an A-D converter, a 30 cps terminal and sufficient software.

The Department provided estimate for office equipment was $1,500 and included items such as desks, chairs, file cabinets and storage cabinets.

We researched building costs and found the range to be from $20/sq. ft. to $30/sq. ft. In evaluating the design requirements of an inspection facility, we concluded that the $30/sq. ft. figure should be applied. This estimate takes into account a building of 35' X 45' dimensions which is provided with two separate restrooms, a heated and air conditioned two lane test area, an air conditioned office area, automatic garage door openers and an exhaust gas ventilation system. On this basis, the building is estimated to cost about $47,000. Other required site improvements including landscaping and asphalt paving came to an estimated total of $10,000.

II.3.2.7 Site Operating Costs

The Department also provided estimates based on actual operating costs of the Aurora facility.

In its estimate, the Department indicated each site would be staffed with 5 personnel consisting of:

> One Supervisor to: supervise personnel, maintain supply and material inventories, prescribe equipment calibration schedules, perform public relations activities and manage overall operations.
>
> Two Senior Engineering Technicians (one per lane) to operate scientific equipment and perform the inspections.
>
> Two Senior Maintenance Mechanics (one per lane) to operate the vehicle during the inspection process and otherwise assist in the inspection.

However, since the pilot effort did not include tasks which relate to the removal of old stickers and the installation of new, we believe one additional person (clerk) should be provided to perform these and related tasks in each lane.

Annual salaries of these individuals, including payroll overhead, was estimated at $72,250.

Annual operating expenses were reported at $7,650 and included office supplies, laundry, building and equipment maintenance, laboratory supplies, utilities and security system rental and maintenance.

II.3.2.8 Consumer Time and Travel Requirements

One of the purposes in conducting the testing phase of this study was to obtain a measure of the time and travel requirements placed on the motorist. This was accomplished by requiring the participants to record:

- The character of the trip. Was it made solely for inspection purposes or was it made in conjunction with other business?
- The distance to the site.
- The time in transit to the site.
- The time spent in waiting at the site not to include the time spent in the inspection process.

Data in these regards were reported by the motorists assigned to the State facility as follows:

- 67 percent reported the trip was scheduled solely for inspection purposes.
- 33 percent reported the trip was scheduled in conjunction with other business.
- 5.1 miles was the average distance traveled to the site.
- 15.1 minutes was the average time (one-way) spent in transit.
- 1.3 minutes was the average wait before the inspection process was started.

While it may appear that these data could not be applied to determine time and travel requirements relating to a State-operated network simply due to experimental design, we do not believe this to be the case. In support of our belief:

> The Denver-Metro area, including those suburbs bordering the Denver city limits, is contained within an area of 30 miles by 30 miles

square. It may be assumed that 50 percent or 9 of the 18 inspection stations will be situated within the square.

Further assuming the 9 stations are evenly distributed within the 900 square mile area, one station would service an area of about 100 square miles or 10 miles by 10 miles square. On this basis, the mean straight line distance to the site would be about 3 miles. Since straight line travel is rarely possible, however, a more realistic distance to the site would be 5 miles which is equivalent to the 5.1 travel miles reported by participating motorists.

It is our opinion that the only data reported by the motorist which does not necessarily apply to an area-wide network is the time spent in the waiting line. We believe this is a difficult question to resolve. For our purposes, however, we are assuming the average waiting time will be 15 minutes.

Regarding the above, we are now able to obtain an approximation of the costs, expressed in dollars, relating to motorist time and travel. The average cost of time and travel per vehicle is based on the following data:

Average distance to a test lane: 5.1 miles

Average waiting time before inspection: 0.25 hrs.

Average time during inspection: 0.10 hrs.

Average distance to a repair facility: 3.7 miles

Average waiting time before repairs: 0.17 hrs.

Average time for repairs: 0.9 hrs.

And the following assumptions:

Average transport speed: 20 mph

Average value of vehicle owner's time: $5.00 per hour

Average transport expense: $0.12 per mile

The cost of a special trip (s) is the transport expense plus the cost of time to the owner relating to: transport; the wait before inspection;

and the wait during inspection.

$$S = (2 \times 5.1 \times \$.12) + (.25 \times \$5 \times 2) + (.25 \times \$5) + (.10 \times \$5)$$

$$S = \$5.47$$

The cost of a trip combined with other business (B) is figured as specified above except that only one-half of the travel distance and time are charged to the inspection.

$$B = (5.1 \times \$.12) + (.25 \times \$5) + (.25 \times \$5) + (.10 \times \$5)$$

$$B = \$3.61$$

The cost of a repair trip (R) is the vehicle travel expense plus the time spent in travel; during the waiting period before repair; and during the repair process.

$$R = (2 \times 3.7 \times \$.12) + (.17 \times \$5 \times 2) + (.9 \times \$5)$$

$$R = \$7.09$$

The data also shows that 67 percent of all persons making the inspection trip made a trip specifically for inspection purposes. The remainder, 33 percent, combined the inspection trip with other business.

Assuming an initial test rejection rate of 30 percent and a second test rejection rate of 6 percent (Volume II, High Altitude Vehicular Emission Control Program), the total average expense in connection with time and travel is calculated:

$$TE = .67S + .33B + .30 \left\{R + (.67S + .33B) + .06 [R + (.67S + .33B)]\right\}$$

$$TE = .88S + .44B + .32R$$

$$TE = \$8.67 \text{ per vehicle}$$

II.3.2.9 Estimate of the Inspection Fee

On the basis of data provided by the pilot test effort and further utilizing the assumptions developed relative to these and other data and

information, we obtained an estimate of the fee connected with a public sector network.

The fee structure is based on the estimated number of inspections to be performed which in our opinion dictates the number and quality of personnel required to perform them and the facilities and equipment needed for this purpose. The fee is derived as follows:

1) Administrative Costs

In developing administrative costs we, firstly, established what we considered to be reasonable personnel requirements to cover the probable range of inspections required to achieve the I/M objectives. These were estimated to comprise the personnel listed in Table 3-11 at the salary levels indicated. Secondly, we assumed the total annual administrative costs would be equal to the total administrative personnel salaries.

Number of People	Position	Annual Salary
1	Administrator	20,000
1	Assistant Administrator	17,000
1	Secretary	9,800
2	Engineer - to coordinate program	14,500
1	Data Analyst	14,500
2	Equipment technicians	13,500
1	Engineer - to coordinate with Department of Revenue	14,500
2	Clerks	8,000
1	Accountant	13,500
3	Accounting clerks	8,000
	TOTAL	185,300

Table 3-11, Estimated Public Sector Program Administrative Personnel Requirements.

2) Number of Inspection Sites Required

To develop information relating to capital outlay and other program

requirements, we made a determination as to the number of sites that would be required to adequately service the DAQCR. This number is a function of the number of tests to be performed each year and can be expressed in equation form as follows:

$$NS = \frac{NV \times (FR + 1)}{NI}$$

where,

NS - the number of sites required
NV - the number of vehicles to be inspected per year
FR - the inspection failure rate, expressed as a fraction
NI - the number of inspections a site is able to perform per year

3) Facility and Equipment Costs

To develop the specific information relating to capital outlay requirements we made a determination of the costs of real estate, buildings and site improvements, analytical instrumentation and office equipment. Each of these items may be amortized over a given number of years to arrive at the respective annual cost. This cost can be expressed in equation form as follows:

$$FET = NS \times (RE + BI + CO)$$

where,

FET = Total facility and equipment cost per year
NS = Number of sites required
RE = Real estate cost per site amortized to a yearly figure
BI = Building and improvements per site also amortized
CO = Capital outlay cost per site also amortized

4) Site Operating Costs

Operating expenses include items such as materials and supplies, utilities, etc. Site operating personnel are also included in these requirements with each site staffed with the personnel shown in Table 3-12.

Number of People	Position	Annual Salary
1	Supervisor	14,250
2	Sr. Enginering tech.	11,500
2	Vehicle operator	9,500
2	Clerks	8,000
	TOTAL	72,250

Table 3-12, Estimated Public Sector Inspection Site Personnel Requirements.

Site operating costs in equation form are expressed as:

$$SO = NS \times (OE + SP)$$

where,

SO - Site operating costs per year
NS - Number of sites
OE - Annual expenses per site per year - $7,650
SP - Site personnel salaries per site per year - $72,250

5) Inspection Costs Per Vehicle

Inspection costs on a per vehicle basis may be found by adding annual administrative costs, amortized facility and equipment costs and annual operating costs and dividing by the number of inspections required on an annual basis as follows:

$$CV = \frac{AC + FET + SO}{NV}$$

where,

CV - Cost per vehicle for an inspection sticker
AC - Administrative costs to conduct the program per year
FET - Facility and equipment costs per year
SO - Site operating costs per year
NV - Number of vehicles tested per year

Using the various equations, we developed the data shown in Table 3-13 to indicate our estimate of what a reasonable public sector inspection fee under the conditions described should be.

Failure Rate	Amortization Period	Number of Sites Required	Administrative Costs per Sticker	Operating & Investment Cost/Sticker	Cost per Sticker
30%	10 years	18	.24	2.52	$2.76
40%	10 years	20	.24	2.80	$3.04
50%	10 years	21	.24	2.94	$3.18
30%	5 years	18	.24	2.71	$2.95
40%	5 years	20	.24	3.01	$3.25
50%	5 years	21	.24	3.16	$3.40

Table 3-13, Estimated Inspection Fee for Public Sector Program at Various Rejection Rates and Capital Outlay Amortization Schedules.

III.3.3 INSPECTION COSTS IN THE PRIVATE SECTOR

III.3.3.1 Site Workload Capabilities

To make a determination concerning the workload capabilities of a privately-operated network, we utilized two sources of information; the Safety Inspection Station Survey conducted by SRI Community Response, Inc. and our own survey which involved personal interviews of management personnel from 43 DAQCR automotive repair facilities.

SRI sought to determine the number of facilities currently performing safety inspections within the DAQCR that were interested in performing emission inspections over a range of inspection fees. For our purposes, we chose to evaluate network workload capabilities based on the number of stations which indicated a willingness to participate at the $6.00 fee level. Of the estimated 1252 DAQCR stations, approximately 60% or 663 stations (excluding service centers) responded in the affirmative to this fee level. SRI reported no statistically significant variances were found relative to sub-groups, although it did appear that independent garages and new car dealerships may have been slightly more definite about participating than service stations. Based on this information we conclude the following quantities of the various types of organizations will participate at a $6.00 level:

455 Service Stations

138 Independent Garages

70 New Car Dealerships

Our survey of 17 service stations, 17 independent garages and 9 new car dealerships indicated the following average numbers of repair personnel deemed to have the potential to become inspectors:

2.4 personnel at service stations

3.5 personnel at independent garages

6.2 personnel at new car dealerships

Our survey also indicated the following average number of hours each type of facility was open for repair work during the week:

Service Stations: 56 hrs.

Independent Garages: 51 hrs.

New Car Dealerships: 52.5 hrs.

In addition, it indicated the current shop workload based on the current personnel level at:

Service Stations: 72%

Independent Garages: 80%

New Car Dealerships: 82%

Using the total number of each type of repair facility expected to participate in emission inspection, the average number of personnel employed, the average number of hours each facility is open for repair (inspection) work and the average current shop workloads, we calculated the number of hours, on an annual basis, the network may have available to perform the inspection and possibly the repair work. Results of these calculations are as follows:

Service Stations: 890,000 hrs.

Independent Garages: 256,000 hrs.

New Car Dealerships: 213,000 hrs.

Total: 1,359,000 hrs.

In reference to the time required to perform both the inspection and related maintenance, we found the average inspection and maintenance

time, as reported by motorists assigned to the experimental privately-operated inspection network, to be 23.1 minutes (.40 hrs.). We believe this figure to be closer to 0.55 hrs. for a 30% rejection rate. Using our time factor and the annual inspection count of 1,020,000 inspections, we find the time required for the private sector to perform both the inspection and repairs (30% rejection rate) to be 561,000 hours. Comparing this figure to the 1,359,000 hours of work we estimated the network could handle before reaching capacity, we find a surplus of 798,000 hours. On this basis we conclude that a 663 station network can handle not only the 1,020,000 annual inspections, but also all of the repair work associated with the inspection process.

III.3.3.2 Minimum Network Requirements

By further utilizing the information presented above and assuming it is not advisable for a facility to operate at more than a 10 percent increase over the current workload, it is possible to make a determination regarding the minimum number of sites required to perform the projected number of inspections. While many combinations are possible, the following is one example of the composition of a minimum network:

252 Service Stations

100 Independent Garages

58 New Car Dealerships

The difference between the potential size of the network as revealed by SRI's survey and the minimum network size may allow the I/M administrators to establish relatively high station acceptance criteria, thereby improving the overall quality of the network.

III.3.3.3 Administrative and Enforcement Requirements

As we proposed relative to the State-operated network, we believe

the enforcement of a privately-operated network should closely parallel enforcement of the safety inspection program.

Enforcement of a privately-operated inspection program would also require modification of certain of the governing regulations. As we discussed earlier, the revised regulations should include provisions for applying the safety inspection sticker to indicate compliance with and violations of emission regulations as well. Revisions should be included whereby one network is required to observe sticker expiration dates as determined by the other network. In addition, the revised regulations should grant enforcement agencies authority to enforce the new and revised regulations. In this respect, we also propose that the safety inspector be required to determine the county in which the vehicle is registered. If registration is found to be outside the DAQCR, a 12 month sticker would be issued. If registration is found to be within the DAQCR, the inspector would be required to issue a sticker which indicates the expiration of the emission inspection certificate. Conversely, the emission inspector would be required to issue a sticker which indicated the expiration date of the safety inspection certificate.

We also believe that the Department of Revenue should continue to maintain its role in providing stickers, not only to the safety inspection network, but to the proposed emission inspection network as well. Beyond this task, the Health Department may be assigned the responsibility of maintaining accountability relative to the emission inspection network.

With regards to administration of a privately-operated network, we believe the top level should be structured along the same lines of a

State-operated network with personnel requirements as follows:

An Administrator

An Assistant Administrator

A Secretary

Two Engineers

One Data Analyst

We also believe a team of technicians (Investigators) to monitor inspection quality of the network should be provided.

During operation of the pilot network, we supplied calibration and other services to the experimental stations. As a result, we were able to obtain an approximation of a desirable calibration frequency and to define the other assistance a privately-operated station should be provided. On the basis of this experience, we concluded each site should have the calibration of its inspection equipment checked about each two months. We also concluded that one technician could perform 5 facility visits and calibrations per day for a total of about 1300 visits per year.

Assuming the network is comprised of 455 Service Stations, 138 Independent Garages and 70 New Car Dealerships for a total of 663 facilities, and further assuming each facility will be visited each two months, a total of about 4,000 calibration visits will be required each year to provide adequate quality control and surveillance of the network. On this basis and using the figure of 1300 technician visits per year, we estimate that a minimum of 3 technicians will be required to cover the calibration and surveillance activities. In this regard, however, it will be necessary for these technicians to cover the entire five county area comprising the DAQCR (Adams, Arapahoe, Denver, Boulder

and Jefferson Counties). Consequently, a minimum of 6 inspectors should be provided to cover the area which may be divided as follows:

Eastern halves of Adams and Arapahoe Counties

Western halves of Adams and Arapahoe Counties

Jefferson County

Boulder County

Northern Half of Denver County

Southern Half of Denver County

On this basis, each Technician would have roughly one-sixth of the DAQCR network under his surveillance.

To permit him to carry out his assigned duties, each technician should be supplied with a mobile standards laboratory. The laboratory may be contained within a one-half ton van and should include, as a minimum; network standard HC and CO calibration gases, a calibrated HC/CO analyzer, a standardized tachometer, a standardized timing light and other of the items listed in the Colorado Motor Vehicle Emissions Inspection Handbook, Volume I. An adequately equipped laboratory is estimated to cost $12,000.

In our discussions relating to the administration of a State-operated network, we indicated that the Department of Revenue should be staffed with three additional personnel, an Engineer to coordinate the Department's involvement relative to the issuance of stickers and other related matters and two Clerks to assist in issuing and accounting for the additional stickers, a requirement imposed by the emission inspection network. We believe these same personnel are required to help in administering a privately-operated network.

Another item to be resolved concerning a privately-operated network

relates to providing referee test sites. In our opinion survey of motorists who participated in the pilot effort, we found on the basis of the pre-test questionnaire that 86 percent of the sample employed to evaluate the private sector were in favor of a referee test site. Eighty-eight percent of the same sample expressed the same opinion after experiencing the inspection process. Similarly, the pre-test questionnaire indicated 88 percent of the sample employed to evaluate a State-operated program indicated they were in favor of a referee site. The percentage in favor of a referee site dropped slightly to 86 percent as indicated on the post-test questionnaire. In view of the opinions expressed so strongly in favor of a referee site, we believe such sites should be established. In a State-operated network, the fact that other State sites are available should satisfy this requirement. With reference to a privately-operated network, however, there are moderate indications that State-operated referee sites should be provided. This is evidenced by the fact that the survey of private sector participants indicated:

> Pre-test: 47 percent in favor of a State network and 39 percent in favor of a private network.
>
> Post-test: 42 percent in favor of a State network and 49 percent in favor of a private network.

while public sector participants indicated:

> Pre-test: 48 percent in favor of a State network and 34 percent in favor of a private network.
>
> Post-test: 65 percent in favor of a State network and 24 percent in favor of a private network.

which indicates a greater opinion change from pre to post-test in favor of a State network.

With reference to the referee sites, we believe about six sites should be established to provide coverage of the areas described relative to our discussion of the mobile standards laboratories and the 6 technicians required to provide network surveillance. While there is no data to provide an estimate of the required referee site activities, it is our opinion that each of the sites should provide for two test lanes and be staffed with a minimum of three personnel. These same sites may be utilized as a center for storing surveillance gases and for conducting variance related activities.

III.3.3.5 Data Processing Requirements

We believe the discussion that was applied to describe the importance of data processing relative to a State-operated network, applies equally as well to a privately-operated network. While the end result should be the same regardless of the sector chosen, the intermediate steps are decidedly different.

Due to the significantly greater number of stations required to adequately administer a privately-operated network, an automated data acquisition (computerized) system appears to be highly impractical. As an alternative, we believe a more basic system should be implemented.

The Vehicle Inspection Form utilized in the pilot effort was used to determine data processing requirements. In our examination of the form, we found that an average of about 70 characters would be required to record on a per vehicle basis the vehicle/owner information and data and other information relating to the inspection and repair process. At this average level, the annual data requirements involve the transfer of information to data cards and subsequent computer processing of about 55,000,000 characters. These steps are considered necessary to

develop the information needed to properly administer the program and to provide the data upon which an adequate public protection program could be sustained.

With regards to the data processing operations, we estimate a key punch operator can produce at a rate of about 40 characters per minute, 16,800 characters per day or 3,500,000 characters per year. At this rate it would require about 16 operators to manually transfer data from the Vehicle Inspection Form to data cards for input to the computer.

On this basis, we estimate the personnel requirements to be:

A Supervisor

A Data Analyst

A Collating Machine Operator

16 Key Punch Machine Operators

We assume the existing State data processing center (ADP) will have the capacity to handle the additional network data processing requirements.

III.3.3.5 Collection of Inspection Fees

Since the station level fee collecting process of the safety inspection program has a record of satisfactory operation, there is no reason to believe the same procedures to collect fees could not be applied to a private sector inspection network. We recommended that fees relative to a State-operated emission inspection network be collected at the time of vehicle registration to eliminate cash handling problems at the inspection site. However, these problems in a privately-operated network would be of a lesser magnitude due to the smaller amounts of cash each station would be expected to handle.

III.3.3.6 Capital Outlay

While SRI's survey indicated that approximately 32 percent of the

sample was currently equipped with emission analytical equipment, no specific models were listed. For this reason and also due to the fact that no information is available to determine the percentage of instruments in use which may meet inspection instrument specifications, we are assuming that none of the instruments in use are suitable for inspection purposes.

In developing our estimates of private sector minimum investment requirements, we utilized appropriate sections of the Colorado Motor Vehicle Emission Inspection Handbook, Volume I as the standard for private sector stations. From the Handbook, we compiled a list of minimum site requirements relating to a proper emission inspection. The list included items such as: minimum floor area, fire prevention equipment, emissions analytical equipment and other engine diagnostic and repair equipment. In the course of our 43 station survey, we evaluated the existing floor space, safety equipment and engine diagnostic and repair equipment against the listing recommended in the Handbook. On this basis we concluded the average investment by each type of facility would be as follows:

Facility Type	Average Investment		
	Building Improvement	Equipment	Total
Service Stations	$88.00	$2200	$2288
Independent Garages	$73.00	$2200	$2273
New Car Dealerships	$62.00	$2200	$2262

III.3.3.7 Direct Labor and Overhead Costs

Our direct labor and overhead cost estimates are based on information provided by management personnel from each of the 43 facilities surveyed. In this regard, it should be noted that we had no particular

auditing authority and that the information was provided on a purely voluntary basis. Our inquiries were made from a list we developed which contained the 34 following items:

1. Sales Tax License
2. Rent or Mortgage Payments
3. Utilities
4. Insurance
5. Equipment Maintenance
6. Stock Shrinkage
7. Public Relations
8. Consumables
9. Advertising
10. Equipment Rent/Lease
11. Association Dues
12. Donations
13. Housekeeping Services
14. Workmen's Compensation
15. Federal Unemployment Tax
16. State Unemployment Tax
17. FICA
18. Vacation Pay
19. Sick Pay
20. Company Provided Employee Insurance
21. Franchise Payments
22. Office Supplies
23. Bookkeeping Services
24. Personal Property Taxes
25. Inventory Tax
26. Company Paid Personnel Training
27. Interest on Loans
28. P.U.C. License (Wrecker)
29. Credit Card Discounts
30. Building Maintenance
31. Stock Obsolescence Losses
32. Bad Debts
33. Subscriptions to Technical Publications
34. Shop Manuals and Reference Sources

We also inquired into direct labor rates payable to personnel classifications we deemed potentially qualified to perform emission inspections. We derived the following average pay rates from the information provided:

Service Stations: $4.33 per hour

Independent Garages: $5.35 per hour

New Car Dealerships: $5.60 per hour

By utilizing these average pay rates, the number of direct labor hours (percent of productive time) and total payroll and shop overhead costs (34 items listed above), we developed the following average overhead rates based on direct labor costs:

Service Stations: 89%

Independent Garages: 89%

New Car Dealerships: 101%

On this basis, we conclude the following average hourly rates may be applied to describe "break-even" points:

Service Stations: $8.18 per hour

Independent Garages: $10.00 per hour

New Car Dealerships: $11.26 per hour

III.3.3.8 Consumer Time and Travel Requirements

As indicated in our discussion of a State-operated network, a measure of time and travel requirements was made. Data in these regards were reported by motorists assigned to the privately-operated network as follows:

- 73 percent reported the trip was scheduled solely for inspection purposes.
- 27 percent reported the trip was scheduled in conjunction with other business.
- 3.7 miles was the average distance traveled to the site.
- 10.3 minutes was the average time (one way) spent in transit.
- 13.4 minutes was the average wait before the inspection.

We have no reason to believe the data provided above, with the exception of the time and distance data, are not representative of what could be expected relative to a privately-operated network. In evaluating

the validity of the time and distance data, the same procedures applied to test these factors relative to a State-operated network were applied here as follows:

> Again, the Denver-Metro area is contained within an area of about 30 miles by 30 miles square. It may be assumed that 50 percent or about 330 of the 663 inspection stations will be situated within the square.
>
> Further assuming the 330 stations are situated within the 900 square mile area, one station would service an area of about 3 square miles or 1.7 miles by 1.7 miles square. On this basis, the mean straight line distance to the site would be about 0.7 miles. Since straight line travel is rarely possible, however, a more realistic distance to the site would be about 1 mile. While this distance is theoretically possible as an average, it is reasonable to assume a person will not necessarily frequent the site closest to him. Consequently, an assumed average distance to the site of 2 miles will be used.

Using the data presented above, we are now able to obtain an approximation of the costs, expressed in dollars, relating to motorist time and travel. This average cost is based on the following data:

Average distance to a test site: 2.0 miles

Average waiting time before inspection: 0.25 hrs.

Average time during inspection (and repair): 0.55 hrs.

Average distance to a repair facility: 0.0 miles

Average waiting time before repairs: 0.0 hrs.

Average time for repairs: 0.0 hrs.

And the following assumptions:

Average transport speed: 20 mph

Average value of vehicle owner's time: $5.00 per hour

Average transport expense: $0.12 per mile

The cost of a special trip (s) is the transport expense plus the cost of time to the owner relating to: transport, the wait before inspection and the wait during inspection (and repairs).

$$S = (2 \times 2.0 \times \$.12) + (0.10 \times \$5 \times 2) + (.25 \times \$5) + (0.55 \times \$5)$$

$$S = \$5.48$$

The cost of a trip combined with other business (B) is figured as specified above except that only one-half of the travel distance and time are charged to the inspection.

$$B = (2.0 \times \$.12) + (0.10 \times \$5) + (.25 \times \$5) + (0.55 \times \$5)$$

$$B = \$4.74$$

The cost of a repair trip (R) is the vehicle travel expense plus the time spent: in travel; during the waiting period before repair; and during the repair process. Since these requirements were considered in the inspection process:

$$R = 0$$

The data also shows that 73 percent of all persons making the I/M trip made a trip specifically for I/M purposes. The remainder, 27 percent, combined the I/M trip with other business.

Assuming an initial test rejection rate of 30 percent and a second test rejection rate of 6 percent (Volume II, High Altitude Vehicular Emission Control Program), the total average expense in connection with time and travel is calculated:

$$TE = .73S + .27B + .30\{R + (.73S + .27B) + .06[R + (.73S + .27B)]\}$$

$$TE = .96S + .36B + .32R$$

$$TE = \$6.97 \text{ per vehicle}$$

III.3.3.9 Estimates of the Inspection Fee

Using data gathered from the pilot test program and using assumptions developed relative to this data we were able to arrive at an estimated fee structure connected with a privately operated inspection program. The estimated fee is based on the number of inspections required on the

vehicle population, the operating costs of typical inspection station operations, and the costs of administration connected with quality control and consumer protection.

The fee structure is broken down as follows:

1) Administrative Costs

These costs were determined by, firstly, establishing a reasonable requirement as to the personnel needed to effectively achieve the objectives of the program. These estimates are shown in Table 3-14 along with the salary associated with the position.

Number of People	Position	Annual Salary
1	Administrator	$ 20,000
1	Assistant Administrator	17,000
1	Secretary	9,800
2	Engineers - Program Coordination	14,500
1	Data Analyst	14,500
1	Engineer - Coordinate with Dept. of Renvenue	14,500
2	Clerks	8,000
	TOTAL	120,800

Table 3-14, Estimated Private Sector Program Administrative Personnel Requirement

It was further assumed that the total administrative costs would equal the total administrative salaries.

2) Facility and Equipment Costs

These items are related to the operation of six referee sites and six mobil equipment vans. The real estate and equipment costs were determined as described for a public inspection program. Each of the items may be amortized over a given number of years to arrive at an annual cost.

3) Facility Operating Costs

The operating costs of the sites and mobile units include such items as materials, supplies, utilities, etc. The salaries of required personnel are also included in this category. The estimated staff is listed in Table 3-15.

Number of People	Position	Annual Salary
6	Site - Supervisor	$ 14,250
6	Site - Sr. Engineering Tech.	11,500
6	Site - Sr. Maintenance Mechanic	11,500
6	Van - Mobile Laboratory Operators	13,500
	TOTAL	304,500

Table 3-15, Estimated Private Sector Referee Sites and Mobile Units Personnel Requirements

4) Data Processing Costs

The data processing costs were determined by calculating the number of data items generated during the course of the program from which we were then able to establish personnel requirements. These personnel are shown in Table 3-16.

Number of People	Position	Annual Salary
1	Supervisor	$ 15,500
1	Data Analyst	14,500
1	Collating Machine Operator	8,000
16	Key Punch Operators	8,000
	TOTAL	$166,000

Table 3-16, Estimated Private Sector Data Processing Personnel Requirements.

Again, we assumed that the total data processing costs would equal the total salaries.

5) Private Sector Capital Outlay

We determined these costs from the survey of various stations which revealed the average number of equipment items and facility improvements required to be licensed as a inspection facility. This was found to be a relatively minor item at about $2280.

6) Private Sector Break Even Inspection Labor

This cost is determined by the number of inspections required, the time necessary to perform the inspection, and the labor rate of the inspection station. We then combined these items to arrive at an average labor cost for an average station.

7) Inspection Costs Per Vehicle

Inspection costs per vehicle may be found by adding the various costs and dividing the total inspection cost by the number of vehicles to be inspected on an annual basis. The inspection costs are dependent on a number of factors as previously discussed and are best demonstrated as shown in Table 3-17.

Failure Rate	Amortization Period	State Costs Per Sticker	Private Sector Cost Per Sticker	Cost Per Sticker
30%	10 years	.90	4.56	5.46
40%	10 years	.90	4.84	5.74
50%	10 years	.90	5.10	6.00
30%	5 years	.92	4.56	5.48
40%	5 years	.92	4.84	5.76
50%	5 years	.92	5.10	6.02

Table 3-17, Estimated Inspection Fee for Private Sector Program at Various Rejection Rates and Amortization Schedules.

IV.3.4 MINIMUM INSPECTOR AND REPAIRMAN SKILL AND TRAINING LEVELS

In approaching this task we had one objective in mind respective of an emissions inspector, be he employed in either the private or the public sector:

to document the minimum inspector skill and training levels.

It was also our purpose to:

document the minimum skill and training levels required of an emission control technician

As an off-shoot of our efforts, we were also able to establish a basis for recommending the minimum requirements for a State-employed investigator.

In this phase of the study we utilized 31 men with various work backgrounds and educational levels who were to participate in the inspection effort. Our initial effort was to obtain an indication of the practicability of the Automotive Emission Control Technician (AECT) course developed by CSU as it applies to evaluating both the emissions inspector and the mechanic. Upon finding the AECT course to be satisfactory in this respect, we reviewed test results of those persons who took the AECT course and developed minimum inspector, investigator and repairman education and skill levels.

The AECT course was evaluated as follows:

By our definition, the 31 man study sample was comprised of two groups of persons which we classified as follows:

"A" Class - certain individuals who successfully completed the CSU AECT course.

"B" Class - certain individuals who had not participated in the CSU training program.

The sample was comprised of individuals employed in both government and industry with participants from industry representing both privately-owned garages and fleet-owned garages as follows:

Sector	No. of Participants "A" Class	"B" Class
Private	10	9
Fleet	4	4
State	0	4

The "B" class group was further divided into the classifications of Inspector and Repairing Technicians. "A" Class training sessions were held from September 16 through September 20, 1974 and "B" Class sessions were held September 23 through September 27, 1974. All sessions were held in the evenings during the hours of 7:00 P.M. - 10:00 P.M. which resulted in a course duration of 15 hours for each class. On-the-job training was provided during the period September 19 through October 12, 1975. Both groups received an abbreviated version of the AECT course.

The "A" Class training course placed emphasis on the task of inspecting and repairing vehicles. Hands-on experience, "live" demonstrations and diagnosis were stressed. Training aids and worksheets were developed to simulate the forms and procedures necessary to the pilot inspection program.

The "B" Class training course was structured to provide condensed instruction on the theory of emission control and principles of operation. In addition, the "B" Class students were provided with AECT course instructional materials. In cooperation with "A" Class students, the "B" Class participants were subjected to 3 hours of practical experience in inspecting, diagnosing and repairing malfunctioning vehicles under

the direct supervision of their more experienced counterparts.

The evaluation of the AECT course was performed in two segments: immediately after its abbreviated version was administered and again during the on-the-job training period.

The student's final examination prior to the OJT period was comprised of a practical examination. The examination consisted of an inspection phase whereby the student's inspection technique was tested and a repair phase whereby his diagnostic and repair ability was evaluated. "Live" vehicles with built-in malfunctions were used in the evaluation. On the basis of these exams, we concluded that the AECT course was adequate as it related to providing the specific knowledge required of both an emissions inspector and an automotive emission control technician. In this respect, however, we found the students somewhat deficient in the areas of meter reading, diagnosing engine malfunctions from meter readings and completing paperwork.

The OJT evaluation was not as much an examination as it was an effort to correct the deficiencies noted during classroom instruction and testing. The OJT program, followed by regular visits to each inspection site, minimized these errors and other field problems which otherwise would have required the continual presence of a fully trained and experienced automotive emission control specialist. It is our opinion that the duties performed by our specialist would closely parallel those of a State-employed investigator.

IV.3.4.1 Study Phase Findings

After finding that the AECT course embraced the elements required to adequately train both the emissions inspector and the automotive emission control technician, with exceptions as noted, we examined test

scores of students who participated in the CSU developed and administered pilot training program.

As shown in Table 3-18, the scores achieved on the Inspector's Examination after six hours of related training are generally acceptable for all students having from 9 to 18 years of formal education.

Years of Formal Education	Corresponding Student Test Scores (Percent)
9	81
10	75
11	93
12	84
13	90
14	80
15	87
16	91
17	N/A
18	87

Table 3-18, Student Test Scores, Inspector Examination after 6 Hours of Training vs. Years of Formal Education.

On this basis we concluded that the minimum educational requirement for an emissions inspector is at some point below the 9th grade level. However, since the CSU classes were not comprised of students having less than 9 years of formal education, we were not able to precisely define the minimum education limit to qualify a person as an emissions inspector. As an alternative, we propose that functional literacy as defined by the U.S. Office of Education is a more valid minimum requirement than a minimum level established on the basis of formal education. Having researched the concept of functional literacy, we concluded that if the prospective inspector can successfully complete the written examination and other requirements not relating to formal education, he is properly

equipped with the knowledge and skills necessary to perform the inspection tasks.

We then sought to establish the minimum skill level or experience required of an inspector. As shown in Table 3-19, relatively low scores were achieved on the pre-training examination for all students regardless of the number of years of tune-up experience. After six hours of training, however, generally high scores were achieved on the inspectors examination by all students. While the tests were structured differently and, consequently, no conclusions can be drawn to relate the specific value of the six hours of instruction to the student's progress, we can conclude that relatively little automotive experience is necessary to qualify a person as an emissions inspector. It should be noted, however, that each of the students was employed as a full-time tune-up technician.

Tune-Up Experience (Years)	Corresponding Student Test Scores (Percent)	
	Pretraining Evaluation	Inspector's Exam After 6 Hours
1	61	89
2	63	91
3	55	81
4	57	87
5	52	96
6-10	59	81
10-15	70	90
over 15	67	82

Table 3-19, Student Test Scores, Pretraining Examination and Inspector's Examination After 6 Hours of Instruction.

Having examined the minimum education and skill levels required on an inspector, we sought to establish minimum requirements for a repairing technician.

As shown in Table 3-20, the scores achieved on the Repairing Technicians Examination after 32 hours of instruction were generally acceptable for all students. On this basis we concluded that the minimum education requirement for a repairing technician is at some point below the 9th grade level. For this and the reasons presented in our discussions of inspector requirements, we concluded that the repairing technician be tested on the basis of functional literacy as opposed to requiring him to meet a minimum educational limit.

Years of Formal Education	Corresponding Student Test Scores (Percent)
9	81
10	77
11	84
12	84
13	86
14	84
15	88
16	88
17	N/A
18	90

Table 3-20, Student Test Scores, Repairing Technicians Examination After 32 Hours of Training versus Years of Formal Education.

The next data we examined was in an effort to establish minimum skill levels relating to a repairing technician.

As may be seen in Table 3-21, there is no apparent correlation existing between the tune-up technician's years of experience and either the test scores after 15 hours of instruction or the test scores after 32 hours of instruction. For this reason, we concluded that experience, at least over some minimum level, is not an acceptable criteria on which the technician should be judged. On the other hand, we see in examining test scores that 15 hours of training is apparently inadequate to

qualify a repairing technician as indicated by the relatively poor grades while 32 hours of instruction appears to be adequate as indicated by the generally high test scores. On this basis, we concluded that the amount of emission related training the technician is subjected to is a more acceptable criteria for establishing his skill level.

Years of Tune-Up Experience	Repairing Technician Exam Scores (Percent)	
	After 15 Hours	After 32 Hours
1	61	84
2	71	87
3	64	85
4	59	85
5	62	84
6-10	61	86
10-15	62	84

Table 3-21, Student Test Scores, Repairing Technicians Examination After 15 Hours of Instruction and After 32 Hours of Instruction versus Years of Tune-up Experience.

IV.3.4.2 Recommended Minimum Requirements

With regards to the emissions inspector, we recommend a potential inspector have at least one recent year of experience as an employed tune-up technician. We also recommend he be required to attend the six hour Emissions Inspector Course developed by CSU. In addition, we propose that he will have met minimum educational requirements by passing the emissions inspector's written and practical examination.

With reference to the repairing technician, we recommend a potential technician have at least one recent year of experience as an employed tune-up technician. We also recommend he be required to attend the 32 hour AECT course developed by CSU. In addition, we propose that he will have met minimum educational requirements by passing the automotive

emission control technician written and practical examinations.

Regarding the State-employed investigator, we propose the following:

All persons functioning as State investigators will be required to exercise dual roles. The primary task of quality control through surveillance of sites, inspectors, equipment and the inspection procedures will be equivalent in many respects to the role of the specialist we assigned to monitor the program. The investigator will also be involved in disciplinary actions and on many occasions will be required to mediate inspection related consumer complaints. Since the degree of consumer acceptance as well as the accuracy of the network will depend to a large extent on the expertise of these individuals, the minimum requirements for an investigator are recommended as follows:

We recommend a State-employed investigator have at least 12 years of formal education. The G.E.D. certificate should be an acceptable substitute. We also recommend he have at least five years of recent experience in the automotive repair industry, at least two years of which should be comprised of tune-up experience. We also believe he should have at least 3 years experience in some area involving contact with the public. This experience may be in the capacity of a salesman, policeman, automotive shop foreman, service writer, etc. In addition, we recommend he be required to take the courses prescribed for persons under his surveillance and to demonstrate his knowledge of the tasks of inspector and repairing technician by passing related tests. Finally, we recommend he be required to demonstrate his knowledge of regulations pertaining to his assignments by passing a test in these regards.

V.3.5 PUBLIC OPINION SURVEY - NEEDED PUBLIC PROTECTION MEASURES

One of the fundamental questions to be answered by the study was in relation to the public's opinion on the air pollution problem as a whole, its attitude toward an automobile inspection program, who should conduct the inspection and other related matters. We also believed the public should be provided the opportunity to express its opinion as to how often inspections should be performed, what a reasonable fee should be, and to help resolve questions relating to enforcement and other difficult matters to resolve. We also thought it would be of benefit to find out what the change in motorist's attitude might be in these same respects after the inspection/maintenance process was experienced. Toward these ends we designed and administered three questionnaires.

Questionnaire I (QI) was comprised of certain questions relating to air pollution problems and solutions and was administered by telephone prior to the participant's further involvement in the program.

Questionnaire II (QII) was comprised of questions relating to the inspection process. Included were questions concerning the purpose of the trip, distance to the site, time in travel to the site and the wait before and during the inspection process. The specific purpose of these questions was to gather information on time and travel and other information referenced earlier in this report. Questionnaire II also contained questions relating to the pass or fail status of the final inspection and the total charges incurred. The purpose in requesting information on the latter was to make certain the motorist was aware of the inspection and repair charges since the I/M fees, to a limit of $50.00, were provided at no charge to the participant. QII was administered

by providing the questions and the space to respond on a post-paid reply card. Instructions to complete the information as soon as practical were also provided.

Questionnaire III (QIII) was similar to (QI) and was administered by telephone after the I/M operations were completed. QIII also solicited certain demographic information.

The questionnaires were administered to several major subgroups as follows:

- 300 participants in quality control effort (laboratory tested)

  State tested

  Privately tested

  Non-differentiated

- 700 participants in the I/M effort only (non-laboratory tested)

  State tested

  Privately tested

  Non-differentiated

- 100 non-incentive oriented participants selected at random to determine if the responses of the above were forced by the program's monetary and repair incentives and other factors.

V.3.5.1 Analysis of Survey Results

A complete analysis of survey results to include both major and minor subgroups and combinations thereof is outside the scope of the study. However, we believed the response of incentive oriented individuals including those assigned to the State site, the privately-operated sites and the group as a whole, and the non-incentive oriented individuals, should be presented and discussed. In this regard, however, certain qualifications should be noted:

- Every effort was made to present the questionnaires in a uniform and unbiased manner. In this respect, however, some biases may

have been inadvertently introduced.

- Some of the data presented are based on hypothetical situations insofar as the respondents are concerned. In this respect the actual performance under given circumstances may or may not coincide with the individuals predicted performance. In this same respect, it should be remembered that opinions stated in this report are nothing more than opinions and may not represent a concrete measure of the public's actions when and if an I/M program is implemented.

V.3.5.1.1 Incentive-Oriented Total Population

In taking several of the more prominent subgroups into account, we believed the response of the incentive-oriented subgroup, comprised of the total population participating in the testing phase, should be presented and discussed firstly. In this same regard, we believed the response to QI, to QIII and the difference in the two responses should also be presented and discussed.

In Table 3-22 are shown the tabulated results where the column titled "Questionnaire I" indicates the opinions of all test lane participants (both State and private sector) before involvement in the I/M process and the column titled Questionnaire III indicates the opinions after the I/M process was completed.

Table 3-22, Survey Opinions Tabulated,
Non-Differentiated Incentive-Oriented Group

Question #			Questionnaire I N	Questionnaire I %	Questionnaire III N	Questionnaire III %
#1	Do you believe the air pollution problem in Metro-Denver is serious?	Yes	945	94.5	936	93.6
		No	43	4.3	47	4.7
		N/A	7	0.7	14	1.4
		Other	5	0.5	3	0.3
#2	Do you believe automobile exhaust emissions are a major source of our pollution?	Yes	797	79.7	827	82.7
		No	128	12.8	120	12.0
		N/A	61	6.1	45	4.5
		Other	14	1.4	8	0.8
#3	In order to reduce pollution should the State require automobile emission inspections?	Yes	891	89.1	907	90.7
		No	55	5.5	46	4.6
		N/A	48	4.8	45	4.5
		Other	6	0.6	2	0.2
#4	Who should conduct the emission inspections?	State	467	46.7	435	43.5
		Pri.Sta.	386	38.6	467	46.7
		N/A	113	11.3	70	7.0
		Other	34	3.4	28	2.8
#5	Do you believe the State can adequately supervise a private emission inspection program?	Yes	710	71.0	749	74.9
		No	181	18.1	167	16.7
		N/A	102	10.2	76	7.6
		Other	7	0.7	8	0.8
#6	Do you have confidence in the honesty and ability of private stations to perform these inspections?	Yes	440	44.0	501	50.1
		No	397	39.7	336	33.6
		N/A	49	4.9	64	6.4
		Other	114	11.4	99	9.9
#7	How often should automobiles be inspected for pollution?	6 mo.	339	33.9	311	31.1
		12 mo.	588	58.8	624	62.4
		N/A	63	6.3	52	5.2
		Other	10	1.0	13	1.3
#8	Would you consider two miles a reasonable distance to travel for an inspection?	Yes	935	93.5	967	96.7
		No	40	4.0	18	1.8
		N/A	22	2.2	12	1.2
		Other	3	0.3	3	0.3
#9	Do you think 30 minutes is a reasonable time for inspection?	Yes	856	85.6	930	93.0
		No	46	5.6	48	4.8
		N/A	92	9.2	18	1.8
		Other	6	0.6	4	0.4

Survey Opinions Tabulated (Cont.)

Question #			Questionnaire I N	Questionnaire I %	Questionnaire III N	Questionnaire III %
#10	Would you consider $5.00 a reasonable inspection fee?	Yes	740	74.0	741	74.1
		No	172	17.2	210	21.0
		N/A	63	6.3	31	3.1
		Other	25	2.5	18	1.8
#11	If your car fails an emission inspection, what do you consider a reasonable repair charge to be?	Avg. Ans.	5.84		9.53	
		N/A	813	81.3	685	68.5
#12	If a car fails the inspection and the owner believes it should have passed, should a referee test site be available for a second opinion?	Yes	862	86.2	874	87.4
		No	111	11.1	97	9.7
		N/A	23	2.3	26	2.6
		Other	4	0.4	3	0.3
#13	If your car was given a passed sticker and you know the inspection had not been performed would you return to the same inspector?	Yes	163	16.3	121	12.1
		No	805	80.5	851	85.1
		N/A	26	2.6	21	2.1
		Other	6	0.6	7	0.7
#14	Should automobiles be required to have pollution control devices?	Yes	729	72.9	742	74.2
		No	152	15.2	148	14.8
		N/A	104	10.4	89	8.9
		Other	15	1.5	21	2.1
#15	Should the State require additional devices be installed to further reduce pollution?	Yes	432	43.2	453	45.3
		No	393	39.3	382	38.2
		N/A	152	15.2	141	14.1
		Other	23	2.3	24	2.4
#16	Do you believe $40.00 would be a reasonable cost for such additional devices?	Yes	543	54.3	573	57.3
		No	204	20.4	234	23.4
		N/A	242	24.2	190	19.0
		Other	11	1.1	3	0.3
#17	If the owner cannot afford the cost of repairs or devices do you believe:					
		Car temp. excluded from req.	286	28.6	281	28.1
		Car banned from highway	301	30.1	346	34.6
		State assume costs	237	23.7	235	23.5
		N/A	150	15.0	118	11.8
		Other	26	2.6	20	2.0

Survey Opinions Tabulated (Cont.)

Question #			Questionnaire I N	Questionnaire I %	Questionnaire III N	Questionnaire III %
#18	Do you believe that penalties should be imposed on those who violate the vehicle emission control laws?	Yes	865	86.5	905	90.5
		No	76	7.6	56	5.6
		N/A	41	4.1	32	3.2
		Other	18	1.8	7	0.7
#19	Do you believe an automobile emission inspection program will reduce air pollution?	Yes	891	89.1	898	89.8
		No	53	5.3	51	5.1
		N/A	45	4.5	37	3.7
		Other	11	1.1	14	1.4
#20	If emission reduction results in poorer vehicle performance, what do you believe should have 1st consideration?	Perform.	329	32.9	351	35.1
		Emi. Red.	470	47.0	466	46.6
		N/A	135	13.5	135	13.5
		Other	66	6.6	48	4.8

An analysis of the incentive oriented population yields the following highlights:

1. As a general statement, it can be said that the respondents held the same opinions after the I/M experiences as before. In other words, in most cases there was no statistical difference in the before and after responses at the 95 percent confidence level.

2. The respondents overwhelmingly believed that air pollution is a serious problem in the Denver-METRO AREA (QI = 94.5% yes, QIII = 93.6% Yes).

3. The change (3%) in yes answers to the question, "Is the automobile a major source of pollution?" is just barely significant at the 95% confidence level. Perhaps more significant is the increase in yes answers from before I/M (79.7%) to after (82.7%).

   It is also interesting to note that a greater percentage believed the State should require automobile inspections to reduce pollution (appx. 89%) than thought the automobile was the major cause (appx. 81%). The difference is significant at the 99% confidence level.

   It should also be noted that some ambiguity apparently existed in the participant's understanding of the question. The

interviewers believed that many of the respondents failed to grasp the significance of the word "major" which may have biased the responses.

4. In response to the question, "Who should conduct the emission inspections?", 46.7% indicated the State while 38.6% indicated private stations before the I/M process was experienced, while 43.5% indicated the State and 46.7% indicated private stations after the I/M process was completed. While the change appears to favor a privately-operated inspection network, it should be considered in light of any changes relative to: the subgroup frequenting the State site and the subgroup frequenting the privately-operated sites: as will be discussed later in these regards.

   The questions, "Do you believe the State can adequately supervise a private emission inspection program?" and "Do you have confidence in the honesty and ability of private stations to perform these inspections?" should also be considered in this light.

   However, the overwhelming majority (QI = 71% yes, QIII 74.9% yes) believed the State could adequately supervise a private inspection program while approximately one-half (QI = 44% yes, QIII = 50.1% yes) expressed confidence in the honesty and ability of private stations to perform the inspections.

5. The majority favored an annual inspection as opposed to a semi-annual at a ratio of about 2 to 1.

6. An overwhelming majority (QI = 93.5% yes, QIII = 96.7% yes) believed two miles to be a reasonable distance to travel for an inspection. The distance of two miles was arbitrarily established. In view of our findings relating to time and travel requirements, the only value to be derived from this response is in connection with a privately-operated network.

   Similarly, an overwhelming majority (QI = 93.5% yes, QIII = 96.7% yes) indicated 30 minutes is a reasonable time for inspection.

7. Nearly three-fourths of the respondents considered $5.00 to be a reasonable inspection fee. No change was noted after the I/M process was completed. An increase in negative responses was noted, however, apparently at the expense of the no answer (N/A) and "other" responses which may reflect an increased awareness of the procedures.

   Related to the fee question is the question of reasonable repair costs. Respondents apparently had little knowledge of expense in repairing a failed vehicle. Prior to I/M, only 18.7% responded to yield an average repair cost of $5.84. After the

I/M process, 31.5% responded to yield an average repair cost of $9.53. The increase in both the number of respondents and the reasonable repair charge is probably indicative of an awareness of charges developed through contact with the I/M process.

8. An overwhelming majority of the respondents (appx. 87%) indicated they believed a referee site should be available for a second opinion if a car fails the inspection.

9. There is some evidence that a fairly substantial number of motorists would attempt to circumvent the program. When asked "If your car was given a passed sticker and you know the inspection had not been performed, would you return to the same inspector?", before the process, 16.3% admitted they would while after the process, 12.1% admitted they would.

10. Several of the questions attempted to elicit opinions on the need, cost and socio-economic affects of emission control devices. Question 14 was in regards to a requirement for use of emission control devices (i.e., new car devices) while question 15 related to a requirement for additional (retrofit) devices. About 73% were of the opinion that automobiles should have pollution control devices while about 44% thought the State should require additional devices. It should be noted, however, that the respondents may not have been able to discern this subtle difference.

    A majority (54.3%) thought $40.00 was a reasonable cost for such additional devices while 20.4% did not. After the I/M process, both responses increased about 3% at the expense of those who indicated no answer initially.

11. The respondents had rather interesting opinions regarding the enforcement of emission control laws. While they approved overwhelmingly (QI = 86.5% yes, QIII = 90.5% yes) of penalizing violators, they indicated no strong opinion as to any relief which may be a part of such laws. Before the I/M process, 28.6% indicated the car should be temporarily excluded from the requirement, 30.1% indicated it should be banned from the highway and 23.7% believed the State should assume the costs of repair. The only significant change after the I/M process was that an additional 4.5% thought the car should be banned from the highway.

12. Finally, when asked "If emission reduction results in poorer vehicle performance, what do you believe should have first consideration?" 32.9% indicated performance and 47.0% indicated emission reduction. After the I/M process, the percentage indicating emission reduction remained unchanged while the percentage indicating performance increased 2.2%.

In Table 3-23 are shown the demographic responses to the survey.

			N	%
1.	Participant age (QIII 21)	18-24	48	4.8
		25-34	193	19.3
		35-49	280	28.0
		50-64	310	31.0
		65 or over	164	16.4
		N/A	5	0.5
2.	Sex (QIII 26)	Male	727	72.7
		Female	273	27.3
3.	Education (QIII 22)	Eighth grade or less	24	2.4
		Some high school	77	7.7
		High school grad.	221	22.1
		Some college	308	30.8
		College grad.	206	20.6
		Post grad.	130	13.0
		Vocational school	27	2.7
		N/A	7	0.7
4.	Income (QIII 23)	Less than $5,000	48	4.8
		$5,000-$7,999	69	6.9
		$8,000-$10,999	151	15.1
		$11,000-$14,999	220	22.0
		$15,000-$19,999	197	19.7
		More than $20,000	251	25.1
		N/A	64	6.4

Table 3-23, Survey Demographic Responses, Non-Differentiated Incentive-Oriented Group.

V.3.5.1.2 Non-Incentive Oriented Population

We recognized the possibility that responses of the incentive-oriented groups may have been biased. For this reason we thought it advisable to survey a number of randomly selected individuals to provide some indication of what these biases may have been. Our source for these individuals was the telephone book with the only acceptance criteria being that the respondent hold a valid Colorado driver's license. Data to compare responses of both the incentive-oriented and the non-incentive oriented total populations are shown in Table 3-24.

Table 3-24, Survey Opinions Tabulated, Incentive versus Non-Incentive Oriented Groups

			Questionnaire I	
			Incentive	Non-Incentive
#1	Do you believe the air pollution problem in Metro-Denver is serious?	Yes	94.5%	91.6%
		No	4.3	4.8
		N/A	0.7	2.4
		Other	0.5	1.2
#2	Do you believe automobile exhaust emissions are a major source of air pollution?	Yes	79.7	68.7
		No	12.8	16.9
		N/A	6.1	14.5
		Other	1.4	0.0
#3	In order to reduce pollution, should the State require automobile emission inspections?	Yes	89.1	75.9
		No	5.5	9.6
		N/A	4.8	14.5
		Other	0.6	0.0
#4	Who should conduct the inspections?	State	46.7	35.9
		Private	38.6	48.2
		N/A	11.3	16.9
		Other	3.4	0.0
#5	Do you believe the State can adequately supervise a private emission inspection program?	Yes	71.0	57.8
		No	18.1	30.1
		N/A	10.2	12.0
		Other	0.7	0.0
#6	Do you have confidence in the honesty and ability of private stations to perform these inspections?	Yes	44.0	42.2
		No	39.7	37.3
		N/A	4.9	14.5
		Other	11.4	6.0
#7	How often should automobiles be inspected for pollution?	6 mo.	33.9	30.1
		12 mo.	58.8	57.8
		N/A	6.3	12.0
		Other	1.0	0.0
#8	Would you consider 2 miles a reasonable distance to travel for an inspection?	Yes	93.5	91.6
		No	4.0	3.6
		N/A	2.2	4.8
		Other	0.3	0.0
#9	Do you think 30 minutes is a reasonable time for inspection?	Yes	85.6	80.7
		No	4.6	12.0
		N/A	9.2	7.2
		Other	0.6	0.0

			Questionnaire I	
			Incentive	Non-Incentive
#10	Would you consider $5.00 a reasonable inspection fee?	Yes	74.0	47.0
		No	17.2	42.2
		N/A	6.3	10.8
		Other	2.5	0.0
#11	If your car fails an emission inspection what do you consider a reasonable repair charge?	Avg. Ans.	$5.84	$3.67
		N/A	81.3	85.5
#12	If your car fails an inspection and the owner believes it should have passed, should a referee site be available for a 2nd opinion?	Yes	86.2	81.9
		No	11.1	15.7
		N/A	2.3	2.4
		Other	0.4	0.0
#13	If your car was given a passed sticker and you know the inspection had not been performed, would you return to the same station?	Yes	16.3	21.7
		No	80.5	75.7
		N/A	2.6	3.6
		Other	0.6	0.0
#14	Should automobiles be required to have pollution control devices?	Yes	72.9	62.7
		No	15.2	21.7
		N/A	10.4	14.5
		Other	1.5	1.2
#15	Should the State require additional devices be installed to further reduce pollution?	Yes	43.2	37.3
		No	39.3	36.1
		N/A	15.2	25.3
		Other	2.3	1.2
#16	Do you believe $40 would be a reasonable cost for such additional devices?	Yes	54.3	31.3
		No	20.4	39.8
		N/A	24.2	28.9
		Other	1.1	0.0
#17	If the owner cannot afford the cost of repairs or devices do you believe:			
		Car temp. excluded from req.	28.6	18.1
		Car banned from highway	30.1	31.3
		State assume costs	23.7	26.5
		N/A	15.0	24.1
		Other	2.6	0.0

			Questionnaire I	
			Incentive	Non-Incentive
#18	Do you believe that penalties should be imposed on those who violate vehicle emission control laws?	Yes	86.5	79.5
		No	7.6	10.8
		N/A	4.1	9.6
		Other	1.8	0.0
#19	Do you believe an automobile emission inspection program will reduce air pollution?	Yes	89.1	79.5
		No	5.3	10.8
		N/A	4.5	3.6
		Other	1.1	1.2
#20	If emission reduction results in poorer vehicle performance, what do you believe should have 1st consideration?	Perform.	32.9	39.8
		Emission Reduction	47.0	43.4
		N/A	13.5	15.7
		Other	6.6	1.2
	Age?	18-24	4.8	8.4
		25-34	19.3	47.0
		35-49	28.0	28.9
		50-64	31.0	9.6
		65 or over	16.4	6.0
		N/A	0.5	0.0
	Sex?	Male	72.7	34.9
		Female	27.3	65.1
	Education?	8th grade or less	2.4	3.6
		Some high school	7.7	3.6
		High school grad.	22.1	26.5
		Some college	30.8	44.6
		College grad.	20.6	14.5
		Post grad.	13.0	6.0
		Vocational school	2.7	0.0
		N/A	0.7	1.2
	Income?	less than $5,000	4.8	6.0
		$5,000-7,999	6.9	6.0
		$8,000-10,999	15.1	8.4
		$11,000-14,999	22.0	27.7
		$15,000-19,999	19.7	48.2
		more than $20,000	25.1	3.6
		N/A	6.4	0.0

In comparing the incentive-oriented population against the non-incentive oriented as related to the demographic data, we find that certain disparities exist. Nonetheless, we still find that survey

response trends which exist relative to the incentive-oriented sample also exist within the non-incentive oriented.

In these regards, we find that the majority of each group believes:

1. The Metro-Denver air pollution problem is serious where 94.5% of the incentive-oriented (I) sample and 91.6% of the non-incentive oriented sample (N-I) responded in the affirmative.

2. Automobile exhaust is a major cause of pollution (I = 79.7%, N-I = 68.7%).

3. The State should require auto emission inspections (I = 89.1%, N-I = 75.9%).

4. The State can adequately supervise a private program (I = 71.0%, NI = 57.8%).

5. Automobiles should be inspected each 12 months (I = 58.8%, N-I = 57.8%).

6. Two miles is a reasonable distance to travel (I = 93.5%, N-I = 91.6%).

7. 30 minutes is a reasonable time (I = 85.6%, N-I = 80.7%).

8. A referee site should be available (I = 86.2%, N-I = 81.9%).

9. Automobiles should be required to have pollution control devices (I = 72.9%, N-I = 62.7%).

10. Penalties should be imposed on those who violate vehicle emission control laws (I = 86.5%, N-I = 79.5%).

11. An auto emission inspection will reduce air pollution (I = 89.1%, N-I = 84.3%).

Irrespective of issues on which the majorities agreed, major disagreements within each population were in the areas of:

1. Who should conduct the inspections where 46.7% of the incentive-oriented sample indicated the State and 38.6% indicated private stations whereas 35.9% of the non-incentive oriented sample indicated the State and 48.2% indicated private stations.

2. The question of a reasonable inspection fee where 74.0% of the incentive-oriented group indicated $5.00 was reasonable and only 47.0% of the non-incentive oriented group had the same opinion.

3. The State requiring additional vehicle pollution control devices be installed where the I sample indicated 43.2% yes, 39.3% No and the N-I sample indicated 37.3% yes and 36.1% No.

4. The question of $40 being a reasonable cost for such additional devices where the I sample indicated 54.3% yes, 20.4% No and the N-I sample indicated 31.3% yes and 39.8% No.

5. On the question of enforcement; 28.6% of the I sample indicated the car should be temporarily excluded from the requirement as opposed to 18.1% of the N-I sample.

V.3.5.1.3 Incentive-Oriented Population Divided Into Persons Assigned to the State Site and Persons Assigned to Privately-Operated Sites

Table 3-25, presents a composite of opinions differentiated between those persons assigned to the State inspection site and those persons assigned to privately-operated inspection sites.

In these regards, specific mention should be made of sample size disparity. The number of vehicles tested at privately-operated stations was 915 while only 85 vehicles were tested in the State-operated station. Since the State-tested population was less than 10% of the privately-tested population some disparity in responses may be indicated. However, it is our opinion that the important thing to note is the difference in responses of each group from before to after the I/M process.

Table 3-25, Survey Opinions Tabulated, Incentive-Oriented State Lane Participants Versus Private Lanes Participants

Question #			Questionnaire I State %	Questionnaire I Private %	Questionnaire III State %	Questionnaire III Private %
#1	Do you believe the air pollution problem in Metro-Denver is serious?	Yes	90.6	94.9	90.6	93.9
		No	5.9	4.2	4.7	4.7
		N/A	3.5	0.4	4.7	1.1
		Other	0.0	0.5	0.0	0.3
#2	Do you believe automobile exhaust emissions are a major source of air pollution?	Yes	84.7	79.2	83.5	82.6
		No	11.8	12.9	10.6	12.1
		N/A	2.3	6.5	4.7	4.5
		Other	1.2	1.4	1.2	0.8
#3	In order to reduce pollution, should the State require automobile emission inspections?	Yes	90.6	88.9	88.2	90.9
		No	7.0	5.4	3.5	4.7
		N/A	2.4	5.0	7.1	4.3
		Other	0.0	0.7	1.2	0.1
#4	Who should conduct the emission inspections?	State	48.3	46.6	63.5	41.6
		Private	34.1	39.0	23.5	48.9
		N/A	14.1	11.0	10.6	6.7
		Other	3.5	3.4	2.4	2.8
#5	Do you believe the State can adequately supervise a private emission inspection program?	Yes	64.7	71.6	76.5	74.8
		No	29.4	17.0	17.6	16.6
		N/A	5.9	10.6	5.9	7.8
		Other	0.0	0.8	0.0	2.8
#6	Do you have confidence in the honesty and ability of private stations to perform these inspections?	Yes	42.3	44.2	27.1	52.2
		No	47.1	39.0	54.1	31.7
		N/A	4.7	4.9	11.8	5.9
		Other	5.9	11.9	7.0	10.2
#7	How often should automobiles be inspected for pollution?	6 mo.	34.1	33.9	37.6	30.5
		12 mo.	50.6	59.6	55.3	63.1
		N/A	14.1	5.5	4.7	5.2
		Other	1.2	1.0	2.4	1.2
#8	Would you consider 2 miles a reasonable distance to travel for an inspection?	Yes	94.1	93.5	96.5	96.7
		No	3.5	4.0	2.3	1.8
		N/A	2.4	2.2	1.2	1.2
		Other	0.0	0.3	0.0	0.3
#9	Do you think 30 minutes is a reasonable time for inspection?	Yes	90.6	85.1	89.4	93.3
		No	7.1	4.4	10.6	4.3
		N/A	2.3	9.8	0.0	2.0
		Other	0.0	0.7	0.0	0.4

Question #			Questionnaire I State %	Questionnaire I Private %	Questionnaire III State %	Questionnaire III Private %
#10	Would you consider $5.00 a reasonable inspection fee?	Yes	67.1	74.6	57.7	75.6
		No	27.1	16.3	37.6	19.4
		N/A	4.7	6.5	4.7	3.0
		Other	1.2	2.6	0.0	2.0
#11	If your car fails an emission inspection what do you consider a reasonable repair charge?	Avg. Ans.	$7.85	$5.65	$9.69	$9.51
		N/A	67.1	87.6	60.0	69.3
#12	If a car fails the inspection and the owner believes it should have passed, should a referee test site be available for a 2nd opinion?	Yes	38.2	86.0	86.9	87.5
		No	7.1	11.5	11.8	9.5
		N/A	3.5	2.2	2.3	2.6
		Other	1.2	0.3	0.0	0.4
#13	If your car was given a passed sticker and you know the inspection had not been performed would you return to the same station?	Yes	16.5	16.3	12.1	12.2
		No	77.6	80.8	85.1	85.1
		N/A	5.9	2.3	2.1	1.9
		Other	0.0	0.6	0.7	0.8
#14	Should automobiles be required to have pollution control devices?	Yes	67.0	73.4	69.4	74.7
		No	20.0	14.8	10.6	15.2
		N/A	11.8	10.3	12.9	8.5
		Other	1.2	1.5	7.1	1.6
#15	Should the State require additional devices be installed to further reduce pollution?	Yes	41.2	43.4	43.5	45.5
		No	42.3	39.0	36.5	38.4
		N/A	15.3	15.2	18.8	13.6
		Other	1.2	2.4	1.2	2.5
#16	Do you believe $40 would be a reasonable cost for such additional devices?	Yes	51.8	54.5	48.2	58.1
		No	25.9	19.9	30.5	22.7
		N/A	22.3	24.4	20.0	18.9
		Other	0.0	1.2	1.2	0.2
#17	If the owner cannot afford the cost of repairs or devices do you believe:					
		Car temp. exc. from req.	31.8	28.3	27.1	28.2
		Car banned from highway	25.9	30.5	41.2	34.0
		State assume costs	15.3	24.5	12.9	24.5
		N/A	24.7	14.1	15.3	11.5
		Other	2.3	2.6	3.5	1.9

Question #			Questionnaire I State %	Questionnaire I Private %	Questionnaire III State %	Questionnaire III Private %
#18	Do you believe that penalties should be imposed on those who violate vehicle emission control laws?	Yes	83.5	86.8	87.0	90.8
		No	10.6	7.3	9.4	5.3
		N/A	2.4	4.3	1.2	3.4
		Other	3.5	1.6	2.4	0.5
#19	Do you believe an automobile emission inspection program will reduce air pollution?	Yes	87.1	89.3	91.8	89.6
		No	8.2	5.0	2.4	5.4
		N/A	2.4	4.7	3.5	3.7
		Other	2.3	1.0	2.3	1.3
#20	If emission reduction results in poorer vehicle performance, what do you believe should have first consideration?	Perform.	29.4	33.2	31.8	35.4
		Emission Reduction	47.1	47.0	49.4	46.8
		N/A	18.8	13.0	16.5	13.2
		Other	4.7	6.8	2.3	5.0

An analysis of the differentiated population yields the following highlights:

1. After the I/M process, the percentage of respondents assigned to the State-site who believed auto emissions were a major cause of air pollution dropped an insignificant amount (84.7% to 83.5%) while the percentage increased for persons assigned to the private stations (79.2% to 82.6%).

   The same is true regarding the question of should the State require automobile inspections to reduce pollution. State-lane respondents decreased slightly while private-lane respondents increased a slight amount.

2. After participation at the State site, many more (48.3% versus 63.5%) indicated the State should conduct the inspections. The change is significant at the 95% confidence level. At the same level of confidence, those persons assigned to private sites increased from 39% to 48.9% in favor of privately operated sites.

   After the I/M process, the percentage expressing the opinion that the State could adequately supervise the inspections increased for both groups (64.7% versus 76.5% for State-lane participants and 71.6% versus 74.8% for private-lane participants).

3. The participants had no predominant opinion regarding the honesty and ability of private stations to perform the inspections.

It is interesting to note that participants having their cars tested by the State more emphatically doubted the honesty and ability of private stations after the process. Conversely, the participants assigned to private stations increased their appreciation of these stations. The fact that neither group had its cars tested in the other's environment shows the responses to be more a comment on human nature than an evaluation of confidence in the private station.

4. Also of interest is the fact that the percentage favoring an annual inspection requirement increased in both groups (50.6% vs. 55.3% for State-lane participants and 59.6% vs. 63.1% for private-lane participants) although the percentage of State-lane participants favoring a semi-annual program also increased (34.1% vs. 37.6%) while private-sector responses favoring a semi-annual program decreased (33.9% vs. 30.5%).

   Another interesting aspect is that the before-to-after responses of State-lane participants remained essentially unchanged (90.6% vs. 89.4%) regarding 30 minutes being a reasonable inspection time while more private-lane participants believed 30 minutes was reasonable (85.1% vs. 93.3%).

   Also interesting is the fact that fewer State-lane participants (67.1% vs. 57.7%) thought $5.00 was a reasonable inspection fee after the process while the percentage of private-station participants remained essentially unchanged on the question (74.6% vs. 75.6%). This change of opinion on the part of State-lane participants is probably reflective of the apparent relative ease by which State-lane inspections were performed. Also important to consider is the fact that no repairs were performed at the State site resulting in that inspection being relatively trouble-free.

5. The affirmative responses of each group remained essentially unchanged on the question of should a referee site be available for a second opinion.

A comparison of the demographic and inspection process survey results (Tables 3-26 and 3-27) also yields some interesting highlights.

After allowing for the previously described problem of sample size, the major discontinuity between the groups occurs relative to the inspection process itself. Participants at the State site traveled farther to reach the site and have the inspection performed. This was merely reflective of the fact that a single State site was provided

to service the test area. Consequently, the trip to the State site required more in the way of time.

Of greater importance is the actual time lapse during the inspection. The State site, which was specifically designed and operated around the inspection process was able to complete the inspection in about one-tenth the time required by the privately-operated stations.

Also of significance is the fact that total charges for the inspection/maintenance process, as viewed by the vehicle owners, is

			State Lane		Private Lanes	
			N	%	N	%
1.	Participant age (QIII 21)	18-24	3	3.5	45	4.9
		25-34	19	22.4	174	19.0
		34-49	26	30.6	254	27.8
		50-64	25	29.4	285	31.2
		over 64	11	12.9	153	16.7
		N/A	1	1.2	4	0.4
2.	Sex (QIII 26)	Male	60	70.6	613	67.0
		Female	25	29.4	302	33.0
3.	Education	eight grade or less	0	0	24	2.6
		some high school	9	10.6	68	7.4
		high school grad.	16	18.8	205	22.4
		some college	21	24.7	287	31.4
		college grad.	17	20.0	189	20.7
		post grad.	20	23.5	110	12.0
		vocational school	0	0	27	3.0
		N/A	2	2.4	5	0.5
4.	Income (QIII 23)	less than $5,000	1	2.3	46	5.0
		$5,000 to 7,999	4	4.7	65	7.1
		$8,000 to 10,999	14	16.5	137	15.0
		$11,000 to 14,999	26	30.6	194	21.2
		$15,000 to 19,999	11	12.9	186	20.3
		more than $20,000	22	25.9	229	25.0
		N/A	6	7.1	58	6.4

Table 3-26, Survey Demographic Results Differentiated by Testing Site.

the same for both groups although data reported by the repair facilities indicate somewhat higher costs to repair vehicles failed at the State site. We attribute this primarily to the fact that a relatively high percentage of State lane failures were repaired at a facility exhibiting higher than average repair charges.

			State Lane		Private Lanes	
			N	%	N	%
1.	Number of cars owned (QIII 24)	Avg.	1.58	-	1.90	-
2.	Perform own tuneups? (QI 21)	Yes	21	24.7	272	29.7
		No	62	72.9	617	67.4
		N/A	0	0	2	0.2
		Other	2	2.4	24	2.7
3.	Months between tuneup? (QI 22)	Avg.	6.26	-	6.86	-
4.	Miles between tuneup? (QI 23)	Avg.	5117	-	4908	-
5.	Cost of tuneups (QI 24)	Avg.	$28.93	-	$25.08	-
6.	I/M trip (QII 1)	Special	57	67.1	670	73.2
		w/business	28	32.9	245	26.8
7.	Distance to site (QII 2)	Avg.	5.1 miles	-	3.69 miles	-
8.	Trip time (QII 3)	Avg.	15.1 min.	-	10.3 min.	-
9.	Inspection wait (QII 4)	Avg.	1.3 min.	-	13.4 min.	-
10.	Inspection time (QII 5)	Avg.	6.34 min.	-	23.1 min.	-
11.	Inspection results (QII 6)	Pass	84	98.8	873	95.4
		Fail	1	1.2	42	4.6
12.	Total I/M charges (QII 7)	Avg.	$8.86	-	$8.87	-

Table 3-27, Survey Automotive Results Differentiated by Testing Site.

V.3.5.2 Estimate of Overcharges

As part of the program to document instances of overcharge or fraudulent and misleading inspection or repair charges, we required each privately-operated station to detail charges in connection with each phase of inspection, adjustment and repair. Details were supplied on the Vehicle Inspection Form. These and the repair orders provided by each site were monitored for indications of: overcharge, unnecessary work, work performed but not charged, work performed but not reported, and undercharge.

Vehicles comprising the 300 car control sample were utilized for this purpose. Within the control sample, 135 vehicles were reported by the stations as having failed the inspection. As they were returned to us for testing to determine the effectiveness of the repairs, each vehicle was subjected to a rigorous inspection as part of the post-repair operations. In evaluating the site reported repair information against the results of the physical inspection, we found 17 instances where they did not agree as follows:

8 instances involving unnecessary work were observed. The total charge in these regards was $81.26.

There were no instances where flagrant attempts to overcharge were observed.

There was one instance where work was performed but not charged. The estimate in this regard was $3.50.

There was one instance where work was performed but not the work reported on the forms. This amounted to an estimated $12.50 in favor of the vehicle owner.

There were two instances where corrective action which may have resulted in a passed vehicle was simply not attempted.

There were also two instances where questionable diagnostic procedures were applied.

Finally, there were three instances where vehicles were passed by the inspector while emission readings indicated a failure.

In evaluating the 8 cases involving unnecessary repairs, we found that four of these situations could be attributed to the technician's overzealous desire to perform additional work not essential to bring the vehicle into compliance and four could be related to incorrect diagnosis of the malfunctions causing failure. Of the $81.26 charged for additional work, $16.45 can be attributed to enthusiasm while $64.81 reflects charges due to incorrect diagnosis.

V.3.5.3 Consumer Complaints

During the course of the investigation, dissatisfaction with the repair effort was reported to us by four of the vehicle owners. These vehicles were recalled for a laboratory evaluation and the necessary corrective action. At the time of recall, concerted attempts were made to correct not only site related problems but also faults in the vehicle due to normal wear and tear.

Our findings indicated the following:

Three of the complaints were attributed to normal wear and tear.

In one of these cases, the site recorded the initial HC reading above the allowable maximum and performed the first step in the repair process involving an engine idle speed adjustment and a mixture adjustment to lean best idle. This brought the vehicle into compliance. However, the owner complained of hard starting and fast idling. We concurred. The subsequent examination revealed: ignition dwell was six degrees less than specifications, the distributor cap was not properly indexed and was attached by only one slip, the vacuum advance diaphram was ruptured, the spark plugs were gapped .005" too wide, the PCV vent filter was plugged, and the carburetor bowl overflowed after shut-down. If corrected in the average shop, total charges were estimated to be $32.00.

In the second case, the site recorded both HC and CO readings above standards and performed the first step in the repair process, an rpm and lean best idle adjustment. This brought the vehicle

into compliance. However, the owner complained that the air cleaner fell off. We concurred. The examination revealed that in the past the fuel line had been routed over the air cleaner housing air horn. Continual stress on the air horn eventually caused the air cleaner bracket to weaken and give way. If corrected in the average shop, total charges were estimated to be $61.75.

In the third case, the site recorded the initial CO reading above the standard and performed the first step in the repair process, an rpm and lean best idle adjustment. This brought the vehicle into compliance. However, the owner complained that the engine died after a cold start and died during drive-away. The examination revealed that a choke link was missing which caused the choke plate to bind in the mid-position. If corrected in the average shop, total charges were estimated to be $6.03.

One of the complaints was attributed to site error. In this case, the site recorded the initial HC reading above the standard and performed the steps prescribed in the repair process. Additional work was also performed to the $50.00 limit bringing the vehicle into compliance. However, the owner complained of dieseling after shut-down. We concurred. The examination revealed that initial timing had been mis-set. If corrected in the average shop, the charges would have been about $5.00.

V.3.5.3 Needed Public Protection Measures

It is our opinion that the problems we encountered in the pilot effort were minimal primarily due to:

The quality personnel selected to act as inspectors and repairing technicians.

The training provided not only in the classroom but the on-site OJT program as well.

The forms utilized to specify and document the inspection/repair process.

The network monitoring procedures employed which include surveillance of both network personnel and equipment.

Participating motorists were well informed as to the inspection/repair procedures.

Consequently, we came to certain conclusions regarding program elements that would provide the degree of public protection necessary.

Firstly, we are of the opinion that the key to the success of any

program be it in either the public or the private sector, rests within the repair industry. As demonstrated in the pilot effort, it was a relatively simple task to set-up the mechanical requirements of a network, i.e., to define and select a site, to define minimum equipment requirements and to define minimum inspection procedures. While the subject study was not designed to and did not provide information to document all of the negative aspects of an inspection program, we believe the subject effort represents significant improvements over prior work in the areas of defining inspector and repairmen qualifications and selecting personnel to meet these qualifications. We believe this is demonstrated by the mere fact that overcharges, consumer complaints and administrative problems were minimal compared to those encountered previously.

In these same regards, we would have to conclude that an adequate training program, such as that employed in the subject effort, be made mandatory as a prerequisite to the performance of emission related work on vehicles failing the inspection. While emission reductions were disappointingly low for reasons discussed, it is conceivable that no reduction would be attained without the utilization of proper repair and adjustment procedures. In addition, problems with the consumer's complaints would become staggering if he was unable to have his car repaired to such an extent that it would pass an inspection.

Regarding both personnel and their training, we are of the opinion that some form of mechanic or repair facility licensing will be required to provide protection not only to the consumer, but to the repair industry as well. Further, we believe these procedures should be implemented well in advance of a mandatory inspection program.

We also believe the forms, or appropriate versions thereof, utilized to specify and document the inspection/repair process, should be incorporated into, and made a part of, any I/M program. We recommend the repair facility be required to provide documentation relating to the repair process not only on the inspection form, but should also be required to detail and document the parts and labor employed. On the basis of our experience in evaluating complaints, we believe such documentation would serve as the basis for resolving legal problems.

In previous sections of this report we described the procedures employed to monitor emission analyzer accuracy and the performance of inspection and repair site personnel. On the basis of our findings, particularly as related to instrument performance, we are of the opinion that serious problems could develop due to poor instrument correlations within the network itself and between the network and the repair facilities. Consequently, we strongly recommend, firstly, that an inspection instrument accreditation program be implemented to include both those instruments used for inspection and for repair procedures and, secondly, that a site to site instrument correlation program be implemented as a primary part of the public protection program.

In a previous section we also described some minimal data processing requirements and recommended these be utilized to indicate potentially troublesome areas. Our experience relating not only to the subject study but also to prior studies indicates that virtually all of the major I/M related problem areas could be easily identified and expeditiously corrected through utilization of a properly designed and frequently updated data monitoring program. The program should have, as a

minimum, the capability of providing listings of pass/fail rates for each vehicle population by station (State or private) and I/M related repair costs by station, the latter again suggesting a requirement for State licensed repair sites. Implementation of these measures, we believe, will provide positive indications of inspection and maintenance related problems requiring State investigation.

With regards to the above, we cannot help but conclude that the public, well informed on the total I/M process, would be a key factor as it relates to the public providing for its own protection. In this respect, we believe a concerted effort to inform the public as to what the I/M process entails, the costs which may be expected, and what recourse it may have should be the major elements comprising the public protection program.

In final regards to the question of needed public protection measures, we believe the public has provided certain indications of what it would require as indicated in its response to the public opinion survey. In examining responses to one of the more significant questions which can be related to public protection, we found the public to overwhelmingly favor the concept of a referee test site. For this reason and because these sites can provide a variety of functions, we recommend the network, particularly a privately-operated network, contain at least a minimal number of referee sites.

VI.3.6 ENFORCEMENT PROBLEMS AND SOLUTIONS

In previous parts of this report we made reference either directly or indirectly to a variety of problems that either developed or may develop relative to an I/M program. In these respects, we consider it necessary to summarize some of these problems and briefly review the procedures we believe will serve to minimize them.

We believe there will be significant problems relating particularly to an I/M network in the public sector if the sites are not properly situated and distributed. In the pilot effort we saw indications that the car owners tend to favor one site over another for reasons probably relating to site accessibility due to both its location and its operating hours. Consequently, we believe a comprehensive study in this regard should precede the implementation phase. This may also be a problem with a private sector network if its size is much below the minimum we prescribed.

On the basis of our experience with I/M related studies over the last three years and as indicated in this report, we believe the I/M effort is sensitive to a variety of factors. Among these are the particulars of both the inspection and the repair process. For this reason, we also believe an adequate surveillance program is essential to maintaining the integrity of the program.

In the course of the State station inspection effort, we could see the distinct possibility that significant problems would develop if the motorist was required to return to a State site in repeated attempts to get his problem (either real or otherwise) vehicle passed. Consequently, we suggest the motorist be awarded a valid certificate at the time he

would ordinarily return for a second retest. The only requirement in this respect would be evidence showing he had a reasonable amount of the proper type of work performed. In effect the site would grant a variance to remain in effect until the next inspection became due. We believe the same criteria should be applied in a private sector network whereby the referee site would grant the variance upon submission of the proper evidence.

We believe the importance of an active data monitoring program cannot be over-emphasized. As we described, the program may be utlized to monitor both the I/M rejection rates on a per station basis and the repair charges on a per station basis. A properly implemented and active program will provide the basis for early disciplinary action and subsequent legal action if necessary.

We also believe the State should provide instrument calibration and monitoring services. In a public sector network, this function may be easily performed by on-site personnel. In a private sector network, this task should be performed by State personnel utilizing the portable standards laboratories we discussed. In these same regards, we believe a stringent analytical instrument accreditation program should be implemented. Not only our experience but the experience of State personnel operating the Aurora facility should provide strong indicators for such a program.

The overwhelming majority of the nearly 1100 licensed drivers we sampled indicated they believed a referee site should be available for a second opinion. We strongly recommend a minimum of six sites be established in the DAQCR to perform not only this function but also to provide logistics support for the mobile vans and to serve as the

zone headquarters for variance activities.

Regarding variance activities, we recommend these be handled in a State-operated network by site personnel. The State may wish to make provisions to this effect by assigning a number of people to the network for the purpose of handling variance related activities. We believe these matters may be handled in a private sector network by personnel assigned to the referee sites. The State may also wish to provide a complement of field investigators to be available on an as needed basis to respond to problems in the field.

As proposed, we believe enforcement of the emission inspection program should closely parallel enforcement of the safety inspection program to such an extent that the same window sticker and other certificates are used. The specific procedures for administering the issuance of certificates are discribed elsewhere in this report.

In all of our studies we can find no evidence to indicate a given class or category of light-duty motor vehicles should be granted across-the-board exemptions from compliance with emission requirements except as listed in the proposed Colorado Motor Vehicle Emission Inspection Handbook, Volume I submitted to the Department earlier this year.

Finally, while we have no cause based simply on the pilot test lanes effort to believe that any of the participating stations operated in other than strict compliance with the guidelines provided, we can envision a variety of situations in a region wide program where this may not be the case. With regards to areas requiring legal study, we propose that the Handbook, Volume I meets all of the requirements in this regard and need merely to be reviewed for possible conflict with existing regulations.

APPENDICES

IDLE INSPECTION CONTROL VEHICLES

VEHICLES TESTED IN THE PRIVATE SECTOR

VEH	YEAR	MAKE	MODEL	CID	CYL	CARB	TRAN	I.WT	ODOM.	FAILURE	COSTS INSP.	COSTS MTCE.
001	1967	FORD	FAIR	289	8	2	A	3000	077290	PASS	4.00	0.00
002	1971	CHEV	ELCA	250	6	1	3	3500	063508	HC	4.00	34.55
003	1967	BUIC	SPEC	340	8	4	A	3500	049527	CO	4.00	12.50
004	1968	BUIC	SPEC	350	8	2	A	3500	052191	BOTH	4.00	3.50
005	1964	CHEV	IMPA	283	8	2	A	4000	123000	PASS	4.00	0.00
006	1973	FORD	PINT	122	4	2	4	2750	015120	PASS	4.00	0.00
007	1972	PONT	VENT	350	8	2	A	3500	021668	PASS	4.00	0.00
008	1971	CHEV	CAPR	400	8	2	A	4500	050726	PASS	4.00	0.00
009	1974	AMMO	GREM	232	6	1	A	3000	013524	PASS	4.00	0.00
010	1974	VOLK	SEDA	97	4	1	A	2250	006608	HC	4.00	7.00
011	1973	CADI	DEVI	472	8	4	A	5500	011048	PASS	4.00	0.00
012	1974	DODG	DART	225	6	1	3	3500	007343	BOTH	4.00	3.50
013	1970	CHEV	IMPA	350	8	4	A	4000	100052	PASS	4.00	0.00
014	1973	PONT	LEMA	350	8	2	A	4000	016568	PASS	4.00	0.00
015	1962	FORD	GALA	352	8	2	A	4000	045453	CO	4.00	3.45
016	1961	CHEV	IMPA	348	8	4	A	4000	037830	BOTH	4.00	3.50
017	1971	FORD	GALA	351	8	2	A	4000	023924	PASS	4.00	0.00
018	1971	OLDS	CUTL	350	8	2	A	3500	010778	PASS	4.00	0.00
019	1974	CHEV	VEGA	140	4	1	4	2750	011267	PASS	4.00	0.00
020	1968	VOLK	SEDA	91	4	1	4	2000	098192	PASS	4.00	0.00
021	1963	VOLK	SEDA	72	4	1	4	1750	082984	CO	4.00	4.50
022	1973	FORD	MAVE	250	6	1	A	3000	019322	PASS	4.00	0.00
023	1961	FORD	STAW	292	8	2	3	4500	094163	BOTH	4.00	34.00
024	1962	PONT	CATA	400	8	2	A	4000	084794	PASS	4.00	0.00
025	1972	PONT	CATA	400	8	2	A	4500	027853	PASS	4.00	0.00
026	1960	FORD	FAIR	352	8	2	A	3500	059894	PASS	4.00	0.00
027	1966	PLYM	VALI	170	6	1	A	3000	078286	PASS	4.00	0.00
028	1973	CHEV	CAPR	400	8	2	A	4500	018543	PASS	4.00	0.00
029	1970	VOLK	SQBK	97	4	FI	4	2500	070234	PASS	4.00	0.00
030	1968	PLYM	FURY	383	8	2	A	4000	059717	PASS	4.00	0.00
031	1966	CHEV	NOVA	230	6	2	A	3000	042747	PASS	4.00	0.00
032	1960	CHEV	IMPA	283	8	2	A	4000	112456	PASS	4.00	0.00
033	1963	CHEV	IMPA	327	8	4	A	4000	094170	PASS	4.00	0.00
034	1963	FORD	STAW	260	8	2	A	4500	065575	HC	4.00	32.20
035	1964	BUIC	SKYL	300	8	2	A	3500	070080	BOTH	4.00	5.60
036	1970	BUIC	LESA	350	8	2	A	4000	061817	PASS	4.00	0.00
037	1963	PONT	LEMA	389	8	2	3	3000	080744	HC	4.00	32.98
038	1973	FORD	STAW	400	8	2	A	5000	020722	HC	4.00	0.00
039	1965	AMMO	CLAS	232	6	2	A	3000	049032	CO	4.00	2.50
040	1965	FORD	MUST	289	8	4	A	2750	060713	PASS	4.00	0.00
041	1970	DODG	DART	318	8	2	A	3000	038724	CO	4.00	2.50
042	1966	DODG	STAW	383	8	2	A	4000	081092	PASS	4.00	0.00
043	1970	FORD	GALA	351	8	2	A	4000	079302	PASS	4.00	0.00
044	1967	FORD	THUN	428	8	4	A	5000	041378	PASS	4.00	0.00
045	1969	CHEV	NOVA	230	6	1	A	3000	044243	BOTH	4.00	31.38
046	1969	AMMO	REBE	290	8	2	A	3000	073398	PASS	4.00	0.00
047	1969	BUIC	LESA	350	8	4	A	4500	052657	CO	4.00	7.50
048	1965	BUIC	SPEC	300	8	2	A	3500	090289	CO	4.00	5.60
049	1966	BUIC	LESA	340	8	4	A	4000	066834	CO	4.00	5.60
050	1966	FORD	STAW	200	6	1	3	3500	034377	PASS	4.00	0.00

IDLE INSPECTION CONTROL VEHICLES

VEHICLES TESTED IN THE PRIVATE SECTOR

VEH	YEAR	MAKE	MODEL	CID	CYL	CARB	TRAN	I.WT	ODOM.	FAILURE	---COSTS--- INSP.	MTCE.
051	1966	PLYM	FURY	318	8	2	A	4000	096614	HC	4.00	38.47
052	1974	PLYM	VALI	318	8	2	A	3000	005304	PASS	4.00	0.00
053	1973	FORD	MUST	302	8	2	A	3500	013197	PASS	4.00	0.00
054	1973	BUIC	APOL	350	8	2	A	3500	013157	PASS	4.00	0.00
055	1972	BUIC	SKYL	350	8	2	A	4000	025458	BOTH	4.00	44.30
056	1966	FORD	GALA	352	8	4	A	4000	089594	CO	4.00	13.23
057	1965	CHEV	CHE2	194	6	1	3	3000	100418	PASS	4.00	0.00
058	1972	CHEV	IMPA	400	8	2	A	4500	031472	PASS	4.00	0.00
059	1970	FORD	XL	390	8	2	A	4000	036248	PASS	4.00	0.00
060	1971	DODG	SWIN	318	8	2	A	3000	040117	CO	4.00	7.50
061	1968	PLYM	SATE	318	8	2	A	4000	099679	HC	4.00	5.50
062	1973	FORD	STAW	400	8	2	A	4500	009924	PASS	4.00	0.00
063	1968	AMMO	JAVE	232	6	1	A	3000	062696	HC	4.00	10.00
064	1968	CADI	DEVI	472	8	4	A	5000	070372	PASS	4.00	0.00
065	1972	AMMO	GREM	232	6	1	A	2750	025290	PASS	4.00	0.00
066	1972	CHEV	VEGA	140	4	1	A	2500	021880	HC	4.00	3.50
067	1969	CHEV	IMPA	350	8	4	A	4000	060644	CO	4.00	7.50
068	1974	CHEV	MONT	400	8	2	A	4000	011274	PASS	4.00	0.00
069	1971	CHEV	VEGA	140	4	1	A	2500	041462	BOTH	4.00	3.50
070	1971	PONT	CATA	400	8	4	A	4500	060266	PASS	4.00	0.00
071	1967	PLYM	STAW	318	8	2	A	4500	079614	CO	4.00	3.50
072	1971	CHEV	NOVA	307	8	2	3	3500	025580	PASS	4.00	0.00
073	1970	CADI	DEVI	472	8	4	A	5000	056530	PASS	4.00	0.00
074	1974	PLYM	DUST	318	8	2	3	3000	004552	PASS	4.00	0.00
075	1972	OLDS	DELT	455	8	4	A	4500	027534	PASS	4.00	0.00
076	1972	MERC	MONT	302	8	2	A	3500	022781	PASS	4.00	0.00
077	1972	PLYM	SATE	318	8	2	A	3500	023480	BOTH	4.00	3.50
078	1972	MERC	MONT	429	8	4	A	5000	029470	CO	4.00	4.50
079	1971	CHEV	NOVA	250	6	1	A	3500	026356	PASS	4.00	0.00
080	1973	PLYM	FURY	360	8	2	A	4000	006977	CO	4.00	3.00
081	1972	FORD	MAVE	302	8	2	3	3000	011805	PASS	4.00	0.00
082	1969	VOLK	FTBK	96	4	1	A	2250	046960	PASS	4.00	0.00
083	1971	CHRY	NEWP	383	8	2	A	4500	035271	PASS	4.00	0.00
084	1972	FORD	TORI	351	8	2	A	3500	021659	PASS	4.00	0.00
085	1973	CHEV	IMPA	350	8	2	A	4500	020355	PASS	4.00	0.00
086	1969	FORD	FALC	200	6	1	3	3000	046816	PASS	4.00	0.00
087	1972	FORD	TORI	351	8	2	A	4000	049611	PASS	4.00	0.00
088	1972	CHRY	NEWP	400	8	2	A	4500	026202	CO	4.00	7.50
089	1974	FORD	MAVE	250	6	1	A	3000	006265	PASS	4.00	0.00
090	1968	CHEV	CAPR	396	8	4	A	4000	065567	PASS	4.00	0.00
091	1971	VOLK	SEDA	97	4	1	4	2000	040296	PASS	4.00	0.00
092	1968	VOLK	TRAN	97	4	1	4	3000	045604	HC	4.00	0.00
093	1972	FORD	TORI	351	8	2	A	4000	040836	PASS	4.00	0.00
094	1964	OLDS	F85	330	8	2	A	3500	127483	CO	4.00	6.00
095	1965	CHEV	MALI	283	8	2	A	3500	055129	HC	4.00	10.00
096	1964	PLYM	SAVO	318	8	2	A	3500	063314	BOTH	4.00	2.50
097	1964	PONT	STAR	389	8	2	A	4500	097933	PASS	4.00	0.00
098	1969	CHEV	IMPA	350	8	4	A	4000	060710	BOTH	4.00	3.00
099	1969	CHEV	MALI	350	8	2	A	3500	046705	BOTH	4.00	3.00
100	1965	CHEV	MALI	283	8	2	A	3500	061679	PASS	4.00	0.00

IDLE INSPECTION CONTROL VEHICLES

VEHICLES TESTED IN THE PRIVATE SECTOR

VEH	YEAR	MAKE	MODEL	CID	CYL	CARB	TRAN	I.WT	ODOM.	FAILURE	---COSTS--- INSP.	MTCE.
101	1964	VOLK	SEDA	73	4	1	4	2000	118007	BOTH	4.00	12.00
102	1974	BUIC	LESA	455	8	2	A	4500	020427	PASS	4.00	0.00
103	1974	DODG	DART	318	8	2	A	3500	014159	PASS	4.00	0.00
104	1974	FORD	PINT	122	4	2	4	3000	005818	PASS	4.00	0.00
105	1970	VOLK	SQBK	97	4	FI	4	2500	049502	HC	4.00	0.00
106	1969	VOLK	SEDA	91	4	1	4	2000	103148	BOTH	4.00	2.50
107	1969	PONT	FIRE	350	8	2	A	4000	057767	BOTH	4.00	3.00
108	1971	CHEV	MALI	350	8	2	A	3500	045647	HC	4.00	3.00
109	1968	FORD	FALC	200	6	1	3	3000	060786	PASS	4.00	0.00
110	1974	FORD	MAVE	302	8	2	A	3000	009875	HC	4.00	3.50
111	1967	CHEV	IMPA	327	8	4	A	4000	073302	PASS	4.00	0.00
112	1974	VOLK	SEDA	97	4	1	4	2250	007751	HC	4.00	5.50
113	1973	CHEV	MALI	350	8	4	A	4000	038635	PASS	4.00	0.00
114	1973	CHEV	MALI	350	8	2	A	4000	008844	PASS	4.00	0.00
115	1973	AMMO	STAW	304	8	2	A	4000	029275	PASS	4.00	0.00
116	1974	OLDS	98	455	8	4	A	5500	004403	CO	4.00	3.00
117	1969	PLYM	FURY	318	8	2	A	4000	046524	PASS	4.00	0.00
118	1967	CHRY	NEWP	383	8	2	A	4000	079571	HC	4.00	16.95
119	1967	DODG	CORO	318	8	2	A	4000	061193	CO	4.00	7.50
120	1967	CHEV	MALI	283	8	2	A	3500	042473	PASS	4.00	0.00
121	1968	FORD	TRUC	240	6	2	3	3500	072021	BOTH	4.00	52.59
122	1970	CHEV	NOVA	307	8	2	A	3500	059371	CO	4.00	7.50
123	1970	AMMO	REBE	232	6	1	A	3500	052777	PASS	4.00	0.00
124	1970	FORD	MAVE	200	6	1	A	2750	060832	PASS	4.00	0.00
125	1970	PONT	LEMA	350	8	2	A	4000	031939	HC	4.00	28.65
126	1970	PONT	BONN	455	8	4	A	4500	078624	PASS	4.00	0.00
127	1967	CHEV	BELA	283	8	2	A	4000	118993	PASS	4.00	0.00
128	1969	FORD	FAIR	302	8	2	A	4000	048084	BOTH	4.00	6.00
129	1968	CHEV	CAME	250	6	1	A	3000	073994	PASS	4.00	0.00
130	1969	DODG	CHAR	318	8	2	A	3500	079527	HC	4.00	5.00
131	1973	VOLK	SEDA	97	4	1	4	2250	022713	BOTH	4.00	3.50
132	1968	FORD	STAW	302	8	2	A	4500	082941	HC	4.00	9.00
133	1970	OLDS	CUTL	350	8	2	A	3500	048024	PASS	4.00	0.00
134	1968	CHEV	BELA	307	8	2	3	4000	033260	PASS	4.00	0.00
135	1971	MERC	COME	302	8	2	A	3000	046702	CO	4.00	5.50
136	1973	CHEV	NOVA	350	8	2	A	3500	010191	PASS	4.00	0.00
137	1973	VOLK	SEDA	97	4	1	4	2250	023020	BOTH	4.00	2.50
138	1974	DATS	B210	78	4	2	4	2250	005038	BOTH	4.00	5.00
139	1973	DATS	610	108	4	2	4	2750	003278	BOTH	4.00	2.00
140	1973	AMMO	HORN	258	6	1	A	3000	016038	CO	4.00	3.00
141	1969	FORD	LTD	390	8	2	A	4000	078946	HC	4.00	49.89
142	1974	PLYM	DUST	225	6	1	A	3000	005882	PASS	4.00	0.00
143	1971	FORD	PINT	122	4	2	4	2250	054479	CO	4.00	2.50
144	1971	BUIC	SKYL	350	8	2	A	3500	026432	PASS	4.00	0.00
145	1971	FORD	MAVE	200	6	1	A	2750	040648	PASS	4.00	0.00
146	1971	DATS	B110	71	4	1	4	2000	048628	HC	4.00	29.82
147	1973	VOLK	THIN	97	4	1	4	2250	009888	BOTH	4.00	3.90
148	1971	AMMO	GREM	258	6	1	3	2750	040309	PASS	4.00	2.00
149	1965	DODG	DART	273	8	2	A	3000	101491	PASS	4.00	0.00
150	1968	DODG	CORO	318	8	2	A	3500	074515	PASS	4.00	0.00

IDLE INSPECTION CONTROL VEHICLES

VEHICLES TESTED IN THE PRIVATE SECTOR

VEH	YEAR	MAKE	MODEL	CID	CYL	CARB	TRAN	I.WT	ODOM.	FAILURE	COSTS INSP.	COSTS MTCE.
151	1967	VOLK	SEDA	91	4	1	4	2000	047804	HC	4.00	3.00
152	1971	PLYM	VALI	225	6	1	A	3000	033424	CO	4.00	3.00
153	1968	FORD	GALA	390	8	2	A	4000	082339	PASS	4.00	0.00
154	1971	FORD	TORI	351	8	2	A	3500	025800	CO	4.00	3.00
155	1973	DODG	DART	318	8	2	A	3000	019091	PASS	4.00	0.00
156	1973	FORD	TORI	351	8	2	A	4000	012048	CO	4.00	3.00
157	1973	PONT	CATA	400	8	2	A	4500	011289	PASS	4.00	0.00
158	1973	MERC	COME	302	8	2	A	3000	026388	PASS	4.00	0.00
159	1968	CHRY	NEWP	383	8	2	A	4000	070112	HC	4.00	68.68
160	1974	PLYM	DUST	318	8	2	A	3000	013232	PASS	4.00	0.00
161	1972	DODG	DEMO	225	6	1	A	3000	015321	CO	4.00	6.00
162	1974	AMMO	SPOR	304	8	2	A	3500	007974	PASS	4.00	0.00
163	1972	CHEV	CHEL	350	8	4	A	3500	007856	HC	4.00	5.00
164	1970	PLYM	VALI	225	6	1	3	3000	048935	PASS	4.00	0.00
165	1967	FORD	MUST	200	6	1	A	3000	056547	HC	4.00	174.72
166	1964	CHEV	NOVA	194	6	1	A	3000	105912	BOTH	4.00	7.80
167	1962	CHEV	IMPA	327	8	4	A	4000	070192	HC	4.00	44.15
168	1964	CHEV	IMPA	327	8	4	A	3500	103054	BOTH	4.00	7.50
169	1964	FORD	FALC	260	8	2	A	2750	063969	PASS	4.00	0.00
170	1965	OLDS	F85	330	8	2	A	3500	063234	CO	4.00	5.10
171	1962	BUIC	SKYL	215	8	4	A	3000	059028	BOTH	4.00	7.50
172	1974	TOYO	CORO	97	4	2	0	2250	013117	PASS	4.00	0.00
173	1965	FORD	FALC	200	6	1	A	2750	080112	PASS	4.00	0.00
174	1965	PLYM	VALI	225	6	1	A	3000	103808	BOTH	4.00	24.00
175	1965	PONT	TEMP	326	8	2	A	3500	071670	CO	4.00	3.90
176	1966	CHEV	CHEV	283	8	2	A	3500	079864	BOTH	4.00	5.10
177	1966	CHEV	IMPA	283	8	2	A	4000	055871	CO	4.00	7.50
178	1966	VOLK	SEDA	78	4	1	4	2000	072342	HC	4.00	50.00
179	1965	VOLK	SEDA	72	4	1	4	2000	094068	BOTH	4.00	6.00
180	1965	FORD	MUST	289	8	2	4	3000	051833	PASS	4.00	0.00
181	1966	OLDS	CUTL	330	8	4	3	3500	069083	HC	4.00	51.83
182	1974	BUIC	APOL	350	8	4	A	4000	003030	PASS	4.00	0.00
183	1966	CHEV	CORV	327	8	4	A	3500	047539	PASS	4.00	0.00
184	1966	FORD	MUST	289	8	4	4	3000	071043	PASS	4.00	0.00
185	1974	CHEV	NOVA	250	6	1	3	3500	013742	PASS	4.00	0.00
186	1964	FORD	STAW	170	6	1	A	3000	049241	BOTH	4.00	3.90
187	1967	PONT	LEMA	326	8	2	A	3500	090686	BOTH	4.00	3.00
188	1967	OLDS	F85	330	8	2	A	4000	028647	CO	4.00	3.00
189	1967	MERC	COUG	289	8	4	A	3500	026498	CO	4.00	3.90
190	1971	AMMO	MATA	304	8	2	A	4000	048757	PASS	4.00	0.00
191	1967	CHEV	CAME	250	6	1	A	3000	056744	PASS	4.00	0.00
192	1967	PONT	EXEC	400	8	2	A	4500	071009	PASS	4.00	0.00
193	1968	OLDS	DELT	455	8	2	A	4500	087392	PASS	4.00	0.00
194	1972	CADI	COUP	472	8	4	A	5000	029984	PASS	4.00	0.00
195	1973	DODG	DART	225	6	1	A	3000	012840	PASS	4.00	0.00
196	1963	AMMO	STAW	196	6	1	3	3000	057189	PASS	4.00	0.00
197	1972	DODG	CORO	318	8	2	A	3500	016720	PASS	4.00	0.00
198	1971	FORD	TORI	302	8	2	A	4000	062236	PASS	4.00	0.00
199	1969	CHRY	NEWP	383	8	2	A	4500	055612	BOTH	4.00	3.00
200	1972	FORD	MAVE	302	8	2	A	2750	029770	PASS	4.00	0.00

IDLE INSPECTION CONTROL VEHICLES

VEHICLES TESTED IN THE PRIVATE SECTOR

VEH	YEAR	MAKE	MODEL	CID	CYL	CARB	TRAN	I.WT	ODOM.	FAILURE	---COSTS--- INSP.	MTCE.
201	1970	CHEV	MONT	350	8	4	A	4000	055539	PASS	4.00	0.00
202	1968	PONT	FIRE	350	8	2	A	3500	069360	BOTH	4.00	7.50
203	1969	PLYM	FURY	383	8	2	A	4000	077968	BOTH	4.00	7.50
204	1968	CHEV	IMPA	327	8	4	A	4000	064555	HC	4.00	32.75
205	1968	MERC	COUG	302	8	2	A	3500	030565	BOTH	4.00	6.00
206	1969	DODG	POLA	383	8	2	A	4000	102126	BOTH	4.00	3.00
207	1968	PONT	GTO	400	8	4	A	4000	069074	BOTH	4.00	18.00
208	1969	CHEV	CHEL	307	8	2	A	3500	079338	HC	4.00	18.00
209	1966	PONT	BONN	389	8	4	A	4500	068383	HC	4.00	34.02
210	1968	CHEV	CAMA	327	8	2	3	3000	046003	PASS	4.00	0.00
211	1969	FORD	GALA	302	8	2	A	4000	078049	PASS	4.00	0.00
212	1974	FORD	STAW	400	8	2	A	4500	008903	PASS	4.00	0.00
213	1969	VOLK	SEDA	91	4	1	4	2000	078678	BOTH	4.00	8.00
214	1971	TOYO	CORO	71	4	2	4	2000	037302	HC	4.00	3.90
215	1969	MERC	COUG	351	8	4	A	3500	103036	PASS	4.00	0.00
216	1972	FORD	STAW	429	8	4	A	5000	026436	PASS	4.00	0.00
217	1974	OPEL	MANT	116	4	2	A	2500	009421	BOTH	4.00	18.00
218	1969	OLDS	CUTL	350	8	2	A	3500	077776	BOTH	4.00	6.00
219	1974	CADI	DEVI	472	8	4	A	5500	019737	PASS	4.00	0.00
220	1971	PLYM	SATE	318	8	2	A	3500	040273	PASS	4.00	0.00
221	1971	PLYM	FURY	383	8	2	A	3500	035336	CO	4.00	7.50
222	1970	FORD	STAW	302	8	2	A	4000	062317	CO	4.00	5.50
223	1970	FORD	FAIR	302	8	2	3	3500	052662	HC	4.00	3.90
224	1970	TOYO	CORO	113	4	2	A	2500	031163	PASS	4.00	0.00
225	1970	FORD	TORI	351	8	2	A	3500	043135	PASS	4.00	0.00
226	1970	CHEV	CAPR	400	8	2	A	4000	037056	PASS	4.00	0.00
227	1970	FORD	TORI	351	8	2	A	3500	038277	PASS	4.00	0.00
228	1972	TOYO	STAW	120	4	2	4	2750	030643	BOTH	4.00	6.00
229	1974	CHEV	NOVA	350	8	2	A	3500	003720	PASS	4.00	0.00
230	1974	FORD	BRON	302	8	2	3	3500	021491	PASS	4.00	0.00
231	1974	CHEV	IMPA	350	8	2	A	4500	009757	PASS	4.00	0.00
232	1974	MERC	MONT	400	8	2	A	3500	009600	HC	4.00	2.50
233	1974	MERC	COUG	351	8	2	A	4500	003527	PASS	4.00	0.00
234	1974	PONT	GRAN	455	8	4	A	4500	010666	BOTH	4.00	3.00
235	1974	FORD	TORI	351	8	2	A	4000	005348	PASS	4.00	0.00
236	1971	FORD	TORI	302	8	2	A	3500	064575	PASS	4.00	0.00
237	1969	PONT	FIRE	400	8	4	A	3500	102209	PASS	4.00	0.00
238	1970	CHEV	NOVA	230	6	1	A	3000	031259	BOTH	4.00	6.00
239	1970	MERC	COUG	351	8	2	A	3500	103270	BOTH	4.00	26.74
240	1974	VOLK	STAW	110	4	1	A	2750	006736	PASS	4.00	0.00
241	1966	FORD	GALA	352	8	4	A	4000	058060	CO	4.00	2.50
242	1974	CHEV	NOVA	350	8	2	A	3500	026874	PASS	4.00	0.00
243	1971	FORD	GALA	400	8	2	A	4500	049133	CO	4.00	3.00
244	1971	VOLK	SEDA	97	4	1	4	2250	042446	PASS	4.00	0.00
245	1974	FORD	BRON	302	8	2	3	3500	011950	CO	4.00	3.00
246	1971	CADI	COUP	472	8	4	A	5000	024499	PASS	4.00	0.00
247	1974	FORD	BRON	302	8	2	A	3500	006647	PASS	4.00	0.00
248	1973	PLYM	SATE	318	8	2	A	4000	017401	CO	4.00	2.50
249	1972	FORD	PINT	122	4	2	4	2500	021248	CO	4.00	3.50
250	1971	FORD	STAW	351	8	2	A	4500	047717	PASS	4.00	0.00

IDLE INSPECTION CONTROL VEHICLES

VEHICLES TESTED IN THE PRIVATE SECTOR

VEH	YEAR	MAKE	MODEL	CID	CYL	CARB	TRAN	I.WT	ODOM.	FAILURE	---COSTS--- INSP.	MTCE.
251	1973	FORD	MAVE	302	8	2	A	3000	018457	PASS	4.00	0.00
252	1973	CHRY	NEWY	440	8	4	A	4500	010086	BOTH	4.00	7.40
253	1971	DODG	POLA	360	8	2	A	4500	030632	PASS	4.00	0.00
254	1973	MERC	MONT	400	8	2	A	4500	019777	PASS	4.00	0.00
255	1973	PLYM	VALI	225	6	1	A	3000	015202	BOTH	4.00	6.00
256	1969	FORD	MUST	351	8	2	A	3500	060310	BOTH	4.00	2.50
257	1972	PLYM	SATE	318	8	2	A	3500	035226	PASS	4.00	0.00
258	1972	VOLK	SEDA	97	4	1	4	2250	029227	PASS	4.00	0.00
259	1973	FORD	MUST	351	8	2	A	3500	004015	BOTH	4.00	3.50
260	1970	PLYM	SATE	318	8	2	A	3500	075504	BOTH	4.00	2.50
261	1971	VOLK	STAW	97	4	1	4	2500	055622	PASS	4.00	0.00
262	1973	TOYO	CORO	120	4	2	4	2500	014673	BOTH	4.00	5.50
263	1974	FORD	STAW	400	8	2	A	5000	003484	PASS	4.00	0.00
264	1973	FORD	TORI	351	8	2	A	4000	022117	PASS	4.00	0.00
265	1972	PLYM	DUST	225	6	1	A	3000	024200	CO	4.00	8.14
266	1972	FORD	BRON	302	8	2	3	3500	032406	CO	4.00	2.50
267	1974	CHEV	IMPA	400	8	2	A	4500	013798	PASS	4.00	0.00
268	1973	CHEV	VEGA	140	4	1	3	2500	043040	BOTH	4.00	4.00
269	1973	OLDS	DELT	455	8	4	A	4500	015426	PASS	4.00	0.00
270	1972	VOLK	SEDA	97	4	1	4	2250	045721	PASS	4.00	0.00

IDLE INSPECTION CONTROL VEHICLES

VEHICLES TESTED IN THE PUBLIC SECTOR

VEH	YEAR	MAKE	MODEL	CID	CYL	CARB	TRAN	I.WT	ODOM.	FAILURE	---COSTS--- INSP.	MTCE.
272	1973	VOLK	SEDA	97	4	FI	A	2500	012541	HC	4.00	37.00
273	1974	CHEV	BLAZ	350	8	4	A	4500	013900	PASS	4.00	0.00
274	1974	VOLK	DASH	90	4	1	4	2500	004830	CO	4.00	7.50
275	1972	CHEV	MONT	350	8	4	A	4000	018592	PASS	4.00	0.00
276	1973	CHEV	NOVA	307	8	2	3	3500	020463	PASS	4.00	0.00
277	1972	CHEV	MONT	350	8	4	A	4000	059037	CO	4.00	7.50
278	1972	TOYO	CORO	97	4	2	A	2250	030422	BOTH	4.00	29.47
279	1972	CHEV	NOVA	250	6	1	A	3000	023513	PASS	4.00	0.00
280	1966	FORD	GALA	289	8	2	A	4000	028757	CO	4.00	2.50
281	1972	VOLK	STAW	103	4	FI	4	2500	025721	CO	4.00	7.50
282	1971	PONT	STAW	455	8	4	A	5000	054888	PASS	4.00	0.00
283	1967	FORD	STAW	390	8	2	A	4000	059755	PASS	4.00	0.00
284	1972	CHEV	CHEL	350	8	4	A	3500	037072	CO	4.00	13.00
285	1974	OLDS	OMEG	350	8	4	A	3500	021580	PASS	4.00	0.00
286	1971	VOLK	STAW	103	4	FI	A	3000	046019	PASS	4.00	0.00
287	1974	FORD	BRON	302	8	2	A	3500	003271	PASS	4.00	0.00
288	1973	TOYO	CORO	120	4	2	A	2750	019689	HC	4.00	13.50
289	1974	CHEV	MONT	400	8	2	A	4000	009321	PASS	4.00	0.00
290	1973	OLDS	OMEG	350	8	4	A	3500	016123	CO	4.00	6.00
291	1973	OLDS	CUTL	350	8	4	A	4000	020786	PASS	4.00	0.00
292	1974	TOYO	CORO	97	4	2	4	2250	010036	BOTH	4.00	23.50
293	1973	CHEV	IMPA	350	8	2	A	4500	017537	PASS	4.00	0.00
294	1974	DODG	DART	225	6	1	A	3500	007912	PASS	4.00	0.00
295	1972	FORD	PINT	122	4	2	A	2250	027331	CO	4.00	2.00
296	1974	FORD	PINT	140	4	2	A	2750	011192	BOTH	4.00	34.44
297	1973	FORD	STAW	400	8	2	A	4500	016744	PASS	4.00	0.00
298	1973	FORD	LTD	400	8	2	A	4500	032313	HC	4.00	49.80
299	1974	PONT	LEMA	455	8	4	A	4000	009748	PASS	4.00	0.00
300	1974	CHEV	NOVA	350	8	2	A	3500	004521	PASS	4.00	0.00

EXHAUST EMISSIONS BEFORE INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	4.34	1.5	77.98	28.6	419.7	80.3	2.73	1.66	16.2
BUICK	13	8.58	6.9	132.90	82.2	468.6	126.4	1.82	1.23	12.7
CADILLAC	6	4.28	1.4	127.12	47.2	726.7	63.9	1.90	.28	9.5
CHEVROLET	64	6.47	4.0	100.24	44.7	482.3	111.2	2.19	1.19	14.0
CHRYSLER	6	7.89	4.0	114.70	38.4	547.8	69.8	3.14	1.04	11.9
DATSUN	3	4.98	1.3	55.36	3.9	243.2	23.7	1.49	.14	25.7
DODGE	16	6.49	4.2	99.86	19.7	453.1	68.3	2.94	1.25	14.2
FORD	73	6.39	2.5	95.75	38.0	483.0	111.9	2.68	1.36	14.2
MERCURY	11	6.47	2.8	102.70	58.5	520.6	110.3	2.69	1.66	13.0
OLDSMOBILE	14	7.76	4.8	157.68	125.7	532.4	78.2	1.70	.97	11.6
OPEL	1	4.32	0.0	89.81	0.0	312.7	0.0	2.12	0.00	19.0
PLYMOUTH	24	9.80	16.3	121.48	41.2	436.7	83.6	2.24	1.11	13.8
PONTIAC	21	8.20	6.4	99.75	50.8	537.5	92.0	3.02	1.54	12.4
TOYOTA	8	4.24	0.6	62.12	16.0	286.7	40.6	2.66	.82	22.6
VOLKSWAGON	28	5.67	2.2	77.27	28.2	258.5	42.4	1.77	.88	22.5
VOLVO	0									
*MODEL YEAR										
1960	2	16.42	15.5	117.36	6.6	500.9	55.0	2.30	.15	12.0
1961	2	16.05	3.1	184.44	87.4	425.2	20.6	2.34	1.96	11.7
1962	4	11.87	7.7	142.07	90.1	452.2	103.9	2.98	1.86	12.6
1963	5	11.44	5.2	117.36	44.0	393.7	125.5	2.12	1.53	15.1
1964	10	8.95	2.9	129.13	37.8	370.8	78.5	1.97	.68	15.3
1965	13	10.17	5.3	131.33	48.9	330.6	72.8	1.52	.82	16.5
1966	16	15.71	19.5	147.25	54.6	396.4	69.7	1.91	1.32	13.6
1967	17	8.30	2.3	130.56	47.8	444.2	98.1	2.41	1.30	13.5
1968	22	6.13	1.5	103.77	42.8	480.0	112.2	2.63	1.08	14.1
1969	24	7.32	3.4	99.88	38.4	431.9	88.9	3.22	1.75	15.3
1970	25	5.21	1.6	84.41	36.3	471.9	101.5	2.96	1.12	15.0
1971	34	4.96	1.0	77.83	28.1	448.3	136.8	3.17	1.43	16.2
1972	36	5.11	1.6	91.73	40.6	470.0	138.3	2.52	1.01	15.1
1973	43	5.49	2.9	101.95	79.2	508.6	141.9	2.07	1.20	14.1
1974	47	4.41	1.5	83.54	37.6	497.8	157.1	1.66	.72	15.0
*DISPLACEMENT										
LESS THAN 151	50	5.16	1.9	71.51	25.2	272.4	42.3	2.00	.84	22.4
151 - 250	40	6.06	3.8	97.30	48.6	373.6	60.7	2.44	1.43	16.5
251 - 350	127	7.74	8.0	110.21	48.0	476.5	77.8	2.23	1.22	13.4
MORE THAN 350	83	6.49	4.2	107.43	64.6	585.5	86.4	2.85	1.42	11.7
*INERTIA WEIGHT										
1800 - 2799	55	5.12	1.9	71.57	25.1	286.1	65.7	2.11	1.03	21.9
2800 - 3799	127	6.68	3.6	103.12	45.1	439.4	81.6	2.21	1.19	14.5
3800 - 4799	105	7.82	8.9	111.97	64.0	545.0	84.0	2.73	1.46	12.1
4800 - 5799	13	5.35	2.0	122.44	51.0	684.9	76.4	2.66	1.24	10.0
*POPULATIONS										
1960 - 1967	69	11.36	10.4	135.26	50.5	399.0	92.5	2.07	1.21	14.3
1968 - 1974	231	5.35	2.2	91.12	48.3	476.8	133.6	2.49	1.30	15.0
ALL VEHICLES	300	6.74	5.9	101.27	52.2	458.9	129.5	2.39	1.29	14.8

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 12 HC FAILURES, 11 CO FAILURES, 9.1% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	4.34	1.5	77.98	28.6	419.7	80.3	2.73	1.66	16.2
BUICK	13	8.58	6.9	132.90	82.2	468.6	126.4	1.82	1.23	12.7
CADILLAC	6	4.28	1.4	127.12	47.2	726.7	63.9	1.90	.28	9.5
CHEVROLET	64	6.38	3.8	99.06	43.6	484.3	111.3	2.17	1.17	14.0
CHRYSLER	6	6.34	1.5	104.32	42.5	559.2	53.5	3.30	1.15	12.1
DATSUN	3	4.65	1.5	52.25	1.8	269.5	44.0	1.39	.30	24.4
DODGE	16	6.49	4.2	99.86	19.7	453.1	68.3	2.94	1.25	14.2
FORD	73	6.28	2.5	95.19	38.0	482.9	111.2	2.63	1.29	14.3
MERCURY	11	6.30	2.8	100.89	59.7	525.3	108.8	2.72	1.66	12.9
OLDSMOBILE	14	7.76	4.8	157.68	125.7	532.4	78.2	1.70	.97	11.6
OPEL	1	3.24	0.0	85.76	0.0	301.5	0.0	1.64	0.00	19.9
PLYMOUTH	24	9.13	16.3	113.13	40.2	444.0	85.2	2.33	1.20	14.0
PONTIAC	21	8.05	6.5	95.49	49.7	540.2	91.8	3.09	1.61	12.5
TOYOTA	8	4.24	0.6	62.12	16.0	286.7	40.6	2.66	.82	22.6
VOLKSWAGON	28	5.66	2.2	76.98	28.3	258.7	42.1	1.78	.88	22.6
VOLVO	0									
*MODEL YEAR										
1960	2	16.42	15.5	117.36	6.6	500.9	55.0	2.30	.15	12.0
1961	2	16.05	3.1	184.44	87.4	425.2	20.6	2.34	1.96	11.7
1962	4	11.87	7.7	142.07	90.1	452.2	103.9	2.98	1.86	12.6
1963	5	11.44	5.2	117.36	44.0	393.7	125.5	2.12	1.53	15.1
1964	10	8.95	2.9	129.13	37.8	370.8	78.5	1.97	.68	15.3
1965	13	10.17	5.3	131.33	48.9	330.6	72.8	1.52	.82	16.5
1966	16	15.71	19.5	147.25	54.6	396.4	69.7	1.91	1.32	13.6
1967	17	8.30	2.3	130.56	47.8	444.2	98.1	2.41	1.30	13.5
1968	22	5.86	1.3	98.96	41.6	484.9	113.7	2.64	1.11	14.2
1969	24	6.17	1.6	91.28	33.9	438.6	91.4	3.15	1.63	15.6
1970	25	4.96	1.0	81.47	32.9	475.6	102.7	3.02	1.20	15.0
1971	34	4.96	1.0	77.79	28.1	448.3	136.8	3.17	1.43	16.2
1972	36	5.09	1.6	90.93	40.5	470.6	138.6	2.54	1.00	15.1
1973	43	5.46	2.9	100.75	78.8	509.5	140.9	2.08	1.19	14.1
1974	47	4.32	1.5	82.63	37.6	500.3	153.8	1.63	.72	15.0
*DISPLACEMENT										
LESS THAN 151	50	5.06	1.9	70.49	24.8	274.9	43.1	1.97	.86	22.4
151 - 250	40	5.97	3.8	96.02	47.6	373.9	60.3	2.43	1.43	16.6
251 - 350	127	7.56	7.9	108.22	47.5	478.4	78.1	2.22	1.17	13.4
MORE THAN 350	83	6.28	4.0	105.57	64.7	587.4	84.4	2.89	1.44	11.7
*INERTIA WEIGHT										
1800 - 2799	55	5.03	1.9	70.64	24.7	288.4	65.7	2.09	1.04	21.9
2800 - 3799	127	6.54	3.6	101.40	44.4	440.3	82.0	2.20	1.18	14.6
3800 - 4799	105	7.59	8.8	109.69	63.9	548.0	81.8	2.75	1.44	12.1
4800 - 5799	13	5.35	2.0	122.44	51.0	684.9	76.4	2.66	1.24	10.0
*POPULATIONS										
1960 - 1967	69	11.36	10.4	135.26	50.5	399.0	92.5	2.07	1.21	14.3
1968 - 1974	231	5.15	1.8	88.91	47.3	479.2	132.9	2.49	1.29	15.0
ALL VEHICLES	300	6.58	5.8	99.57	51.8	460.7	129.2	2.39	1.28	14.9

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 12 HC FAILURES, 11 CO FAILURES, 9.1% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
BUICK	13	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
CADILLAC	6	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
CHEVROLET	64	0.09	0.9	1.18	5.7	-1.9	16.3	0.02	.25	-0.0
CHRYSLER	6	1.55	3.6	10.37	27.7	-11.5	20.9	-0.16	.33	-0.2
DATSUN	3	0.33	0.6	3.11	5.4	-26.3	45.6	0.10	.17	1.3
DODGE	16	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
FORD	73	0.11	0.5	0.56	4.0	0.1	12.1	0.05	.32	-0.0
MERCURY	11	0.16	0.5	1.81	6.0	-4.7	15.6	-0.03	.09	0.0
OLDSMOBILE	14	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
OPEL	1	1.08	0.0	4.05	0.0	11.2	0.0	0.48	0.00	-0.9
PLYMOUTH	24	0.67	2.1	8.36	23.5	-7.2	21.2	-0.10	.36	-0.2
PONTIAC	21	0.15	0.8	4.27	16.2	-2.7	10.3	-0.06	.28	-0.1
TOYOTA	8	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
VOLKSWAGON	28	0.01	0.0	0.29	1.6	-0.2	1.2	-0.01	.03	-0.0
VOLVO	0									
*MODEL YEAR										
1960	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1961	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1962	4	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1963	5	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1964	10	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1965	13	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1966	16	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1967	17	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	22	0.27	1.1	4.81	16.6	-4.9	15.8	-0.01	.18	-0.1
1969	24	1.16	2.7	8.59	23.5	-6.8	37.1	0.07	.76	-0.2
1970	25	0.26	1.4	2.93	11.7	-3.7	12.7	-0.06	.26	-0.0
1971	34	0.01	0.0	0.05	0.3	-0.0	0.2	-0.00	.00	-0.0
1972	36	0.02	0.2	0.80	3.4	-0.6	3.2	-0.01	.08	-0.0
1973	43	0.03	0.2	1.20	7.9	-0.9	5.9	-0.01	.05	-0.0
1974	47	0.10	0.4	0.91	4.5	-2.5	13.5	0.03	.14	0.1
*DISPLACEMENT										
LESS THAN 151	50	0.10	0.4	1.02	4.5	-2.4	13.1	0.03	.14	0.0
151 - 250	40	0.08	0.3	1.28	8.2	-0.4	7.5	0.01	.13	-0.1
251 - 350	127	0.17	1.0	2.00	9.4	-1.9	15.7	0.01	.31	-0.0
MORE THAN 350	83	0.21	1.3	1.86	12.4	-1.9	11.4	-0.03	.21	-0.0
*INERTIA WEIGHT										
1800 - 2799	55	0.09	0.4	0.93	4.3	-2.2	12.5	0.03	.14	0.0
2800 - 3799	127	0.14	0.7	1.73	9.7	-0.9	8.1	0.01	.19	-0.1
3800 - 4799	105	0.24	1.4	2.29	11.8	-2.9	18.4	-0.02	.33	-0.0
4800 - 5799	13	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
*POPULATIONS										
1960 - 1967	69	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968 - 1974	231	0.20	1.1	2.21	10.9	-2.3	15.1	0.00	.27	-0.0
ALL VEHICLES	300	0.16	1.0	1.70	9.6	-1.8	13.2	0.00	.24	-0.0

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 12 HC FAILURES, 11 CO FAILURES, 9.1% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	12	0.00	0.00	0.00	0.00	0.0	0.0	0.0
BUICK	13	0.00	0.00	0.00	0.00	0.0	0.0	0.0
CADILLAC	6	0.00	0.00	0.00	0.00	0.0	0.0	0.0
CHEVROLET	64	1.37	1.18	0.85	-0.07	15.7	208.6	3.3
CHRYSLER	6	19.62	9.04	-5.26	-1.85	97.1	650.4	-10.3
DATSUN	3	6.71	5.62	6.45	5.07	59.0	548.7	17.0
DODGE	16	0.00	0.00	0.00	0.00	0.0	0.0	0.0
FORD	73	1.80	0.59	1.93	-0.25	21.3	103.9	9.6
MERCURY	11	2.54	1.77	-1.06	0.24	36.1	398.8	-6.3
OLDSMOBILE	14	0.00	0.00	0.00	0.00	0.0	0.0	0.0
OPEL	1	24.97	4.51	22.51	-4.71	49.1	184.1	21.7
PLYMOUTH	24	6.86	6.88	-4.25	-1.18	144.1	1790.8	-20.4
PONTIAC	21	1.88	4.28	-2.06	-0.74	26.9	745.5	-10.9
TOYOTA	8	0.00	0.00	0.00	0.00	0.0	0.0	0.0
VOLKSWAGON	28	0.16	0.38	-0.30	-0.10	2.1	68.8	-1.2
VOLVO	0							
*MODEL YEAR								
1960	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1961	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1962	4	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1963	5	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1964	10	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1965	13	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1966	16	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1967	17	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	22	4.34	4.64	-0.32	-0.66	22.1	400.2	-0.7
1969	24	15.83	8.60	2.09	-1.56	196.6	1457.6	11.4
1970	25	4.91	3.48	-1.98	-0.21	48.8	559.3	-11.2
1971	34	0.12	0.06	-0.02	-0.01	1.2	9.2	-0.2
1972	36	0.30	0.87	-0.54	-0.09	3.4	178.4	-3.0
1973	43	0.62	1.18	-0.38	-0.21	8.2	290.0	-1.9
1974	47	2.20	1.09	2.05	0.39	18.6	174.8	6.5
*DISPLACEMENT								
LESS THAN 151	50	1.87	1.43	1.45	0.19	18.1	192.8	5.5
151 - 250	40	1.37	1.31	0.35	-0.35	13.1	202.1	1.3
251 - 350	127	2.21	1.81	0.58	-0.28	33.9	397.0	2.6
MORE THAN 350	83	3.16	1.73	-1.16	-0.28	41.4	375.2	-6.7
*INERTIA WEIGHT								
1800 - 2799	55	1.71	1.30	1.25	0.18	16.8	179.3	5.1
2800 - 3799	127	2.03	1.67	0.43	-0.35	26.3	335.8	1.9
3800 - 4799	105	3.02	2.04	-0.68	-0.26	42.9	414.7	-3.4
4800 - 5799	13	0.00	0.00	0.00	0.00	0.0	0.0	0.0
*POPULATIONS								
1960 - 1967	69	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968 - 1974	231	3.79	2.43	0.12	-0.22	36.2	394.7	0.5
ALL VEHICLES	300	2.32	1.68	0.10	-0.17	29.9	325.3	0.4

AUTOMOTIVE TESTING LABORATORIES,INC.
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EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 30 HC FAILURES, 30 CO FAILURES, 20.3% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	4.34	1.5	77.98	28.6	419.7	80.3	2.73	1.66	16.2
BUICK	13	8.50	6.9	129.86	83.8	468.1	126.5	1.84	1.28	12.8
CADILLAC	6	4.28	1.4	127.12	47.2	726.7	63.9	1.90	.28	9.5
CHEVROLET	64	6.31	3.8	98.56	43.6	486.3	110.5	2.15	1.11	13.9
CHRYSLER	6	5.34	0.7	85.66	18.6	580.3	58.6	3.50	1.02	12.2
DATSUN	3	6.67	5.0	59.87	13.3	297.0	65.2	1.46	.38	22.3
DODGE	16	6.40	4.3	97.96	19.4	454.2	67.1	2.95	1.25	14.3
FORD	73	6.23	2.5	93.84	37.7	483.1	110.2	2.63	1.28	14.3
MERCURY	11	5.96	3.0	97.08	60.5	534.2	107.5	2.74	1.64	12.9
OLDSMOBILE	14	7.68	4.8	163.61	133.0	531.9	74.9	1.74	.96	11.5
OPEL	1	3.24	0.0	85.76	0.0	301.5	0.0	1.64	0.00	19.9
PLYMOUTH	24	8.97	16.3	110.63	36.6	446.7	82.2	2.35	1.15	14.1
PONTIAC	21	8.05	6.5	95.49	49.7	540.2	91.8	3.09	1.61	12.5
TOYOTA	8	3.99	0.5	57.42	15.2	295.2	41.3	2.69	.81	22.6
VOLKSWAGON	28	5.69	2.2	78.88	25.6	259.3	43.4	1.71	.77	22.4
VOLVO	0									
*MODEL YEAR										
1960	2	16.42	15.5	117.36	6.6	500.9	55.0	2.30	.15	12.0
1961	2	16.05	3.1	184.44	87.4	425.2	20.6	2.34	1.96	11.7
1962	4	11.87	7.7	142.07	90.1	452.2	103.9	2.98	1.86	12.6
1963	5	11.44	5.2	117.36	44.0	393.7	125.5	2.12	1.53	15.1
1964	10	8.95	2.9	129.13	37.8	370.8	78.5	1.97	.68	15.3
1965	13	10.17	5.3	131.33	48.9	330.6	72.8	1.52	.82	16.5
1966	16	15.71	19.5	147.25	54.6	396.4	69.7	1.91	1.32	13.6
1967	17	8.30	2.3	130.56	47.8	444.2	98.1	2.41	1.30	13.5
1968	22	5.81	1.3	98.26	42.0	485.0	114.0	2.63	1.10	14.2
1969	24	6.06	1.6	88.64	31.5	441.6	91.9	3.10	1.52	15.6
1970	25	4.87	1.0	80.31	32.5	477.5	102.2	3.03	1.19	15.0
1971	34	4.95	1.0	76.66	27.5	450.0	137.0	3.16	1.42	16.2
1972	36	4.85	1.3	85.47	34.8	477.4	138.5	2.60	1.00	15.2
1973	43	5.43	3.1	99.85	77.6	511.9	136.6	2.07	1.15	14.0
1974	47	4.22	1.5	84.52	47.4	501.9	151.9	1.62	.70	14.9
*DISPLACEMENT										
LESS THAN 151	50	5.08	2.2	71.00	23.6	279.6	46.4	1.94	.80	22.1
151 - 250	40	5.85	3.7	93.66	44.9	375.8	59.1	2.41	1.33	16.7
251 - 350	127	7.53	7.9	107.24	47.8	479.4	78.5	2.23	1.17	13.4
MORE THAN 350	83	6.13	4.0	104.37	67.4	589.5	83.2	2.91	1.43	11.7
*INERTIA WEIGHT										
1800 - 2799	55	5.05	2.2	71.10	23.6	292.6	66.8	2.05	1.00	21.6
2800 - 3799	127	6.43	3.6	99.23	43.5	441.7	81.3	2.20	1.14	14.6
3800 - 4799	105	7.51	8.8	108.05	63.9	550.2	82.4	2.76	1.44	12.1
4800 - 5799	13	5.32	2.0	132.35	70.5	681.8	80.6	2.67	1.22	9.9
*POPULATIONS										
1960 - 1967	69	11.36	10.4	135.26	50.5	399.0	92.5	2.07	1.21	14.3
1968 - 1974	231	5.06	1.8	87.64	47.7	481.8	131.7	2.49	1.27	15.0
ALL VEHICLES	300	6.51	5.9	98.59	52.3	462.7	128.5	2.39	1.26	14.8

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 30 HC FAILURES, 30 CO FAILURES, 20.3% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	12	0.00	0.00	0.00	0.00	0.0	0.0	0.0
BUICK	13	0.96	2.28	-1.30	-0.94	10.7	395.1	-3.1
CADILLAC	6	0.00	0.00	0.00	0.00	0.0	0.0	0.0
CHEVROLET	64	2.44	1.68	2.15	0.27	24.3	259.2	7.3
CHRYSLER	6	32.29	25.32	-11.73	-3.12	138.3	1575.7	-20.0
DATSUN	3	-33.98	-8.15	1.76	13.41	-267.2	-712.7	4.1
DODGE	16	1.34	1.90	-0.09	-0.45	20.7	450.3	-0.6
FORD	73	2.62	2.00	1.83	-0.51	26.9	307.4	7.9
MERCURY	11	7.79	5.47	-2.02	0.49	70.0	779.9	-7.5
OLDSMOBILE	14	1.03	-3.76	-2.62	0.42	17.2	-1276.7	-9.6
OPEL	1	24.97	4.51	22.51	-4.71	49.1	184.1	21.7
PLYMOUTH	24	8.44	8.93	-5.33	-1.61	157.9	2073.2	-22.8
PONTIAC	21	1.88	4.28	-2.06	-0.74	26.9	745.5	-10.9
TOYOTA	8	5.99	7.55	-0.85	0.28	33.4	615.2	-3.0
VOLKSWAGON	28	-0.30	-2.08	3.26	0.73	-2.9	-274.1	9.9
VOLVO	0							
*MODEL YEAR								
1960	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1961	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1962	4	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1963	5	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1964	10	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1965	13	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1966	16	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1967	17	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	22	5.22	5.31	-0.22	-0.90	25.7	443.0	-0.5
1969	24	17.32	11.25	3.65	-1.62	167.4	1482.4	15.5
1970	25	6.48	4.86	-2.30	-0.24	53.4	649.1	-10.8
1971	34	0.29	1.51	0.17	0.05	2.8	226.2	1.0
1972	36	4.99	6.83	-3.16	-0.51	38.8	953.3	-12.1
1973	43	1.10	2.05	0.10	1.05	9.1	313.5	0.3
1974	47	4.42	-1.16	2.88	0.95	32.2	-160.2	7.9
*DISPLACEMENT								
LESS THAN 151	50	1.37	0.72	3.29	1.41	10.0	72.6	9.3
151 - 250	40	3.35	3.74	1.07	-0.66	27.4	491.5	3.5
251 - 350	127	2.67	2.70	0.22	-0.39	37.0	533.0	0.9
MORE THAN 350	83	5.47	2.85	-1.82	-0.39	57.2	493.1	-8.4
*INERTIA WEIGHT								
1800 - 2799	55	1.26	0.65	2.83	1.31	9.4	68.7	8.8
2800 - 3799	127	3.66	3.77	0.32	-0.67	41.8	666.6	1.2
3800 - 4799	105	3.95	3.50	-1.18	-0.31	46.1	585.7	-4.8
4800 - 5799	13	0.48	-8.10	-0.46	1.13	6.1	-2344.4	-2.9
*POPULATIONS								
1960 - 1967	69	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968 - 1974	231	5.44	3.82	0.11	0.03	42.1	502.3	0.4
ALL VEHICLES	300	3.33	2.64	0.09	0.02	35.9	428.3	0.3

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1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 30 HC FAILURES, 30 CO FAILURES, 20.3% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
BUICK	13	0.08	0.3	3.03	8.7	0.5	2.7	-0.02	.07	-0.1
CADILLAC	6	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
CHEVROLET	64	0.16	0.9	1.68	7.7	-4.0	18.0	0.05	.33	0.0
CHRYSLER	6	2.55	3.4	29.04	35.0	-32.6	38.7	-0.37	.46	-0.4
DATSUN	3	-1.69	3.8	-4.51	16.6	-53.9	46.7	0.03	.25	3.5
DODGE	16	0.09	0.3	1.90	7.6	-1.0	4.1	-0.00	.01	-0.1
FORD	73	0.17	0.6	1.91	7.4	-0.0	14.8	0.05	.32	-0.1
MERCURY	11	0.50	0.9	5.62	10.3	-13.7	23.5	-0.05	.11	0.1
OLDSMOBILE	14	0.08	0.2	-5.93	37.5	0.5	14.3	-0.04	.13	0.0
OPEL	1	1.08	0.0	4.05	0.0	11.2	0.0	0.48	0.00	-0.9
PLYMOUTH	24	0.83	2.1	10.85	27.6	-9.9	23.0	-0.12	.40	-0.2
PONTIAC	21	0.15	0.8	4.27	16.2	-2.7	10.3	-0.06	.28	-0.1
TOYOTA	8	0.25	0.5	4.69	9.7	-8.5	16.8	-0.02	.32	0.1
VOLKSWAGON	28	-0.02	0.2	-1.61	8.1	-0.9	2.8	0.06	.27	0.2
VOLVO	0									
*MODEL YEAR										
1960	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1961	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1962	4	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1963	5	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1964	10	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1965	13	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1966	16	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1967	17	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	22	0.32	1.1	5.51	18.1	-5.0	16.1	-0.01	.20	-0.1
1969	24	1.27	2.7	11.23	25.2	-9.8	37.7	0.12	.84	-0.2
1970	25	0.34	1.4	4.10	12.8	-5.6	15.4	-0.07	.26	-0.0
1971	34	0.01	0.1	1.18	6.2	-1.7	6.9	0.01	.03	0.0
1972	36	0.25	0.8	6.26	17.8	-7.3	20.7	-0.08	.27	-0.1
1973	43	0.06	1.2	2.09	13.9	-3.3	17.3	0.00	.25	0.1
1974	47	0.20	0.5	-0.97	20.3	-4.1	17.7	0.05	.17	0.1
*DISPLACEMENT										
LESS THAN 151	50	0.07	1.0	0.52	9.9	-7.2	18.7	0.07	.28	0.3
151 - 250	40	0.20	0.7	3.64	15.1	-2.3	11.4	0.03	.32	-0.1
251 - 350	127	0.21	1.0	2.98	11.1	-2.9	16.8	0.00	.32	-0.1
MORE THAN 350	83	0.35	1.4	3.06	21.8	-4.0	19.6	-0.05	.24	-0.0
*INERTIA WEIGHT										
1800 - 2799	55	0.06	1.0	0.47	9.4	-6.5	17.9	0.06	.27	0.3
2800 - 3799	127	0.24	0.9	3.89	13.5	-2.2	13.0	0.01	.26	-0.1
3800 - 4799	105	0.31	1.4	3.92	14.7	-5.2	21.6	-0.03	.36	-0.0
4800 - 5799	13	0.03	0.1	-9.92	35.8	3.1	11.0	-0.01	.04	0.1
*POPULATIONS										
1960 - 1967	69	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968 - 1974	231	0.29	1.2	3.48	17.2	-5.0	19.6	0.00	.34	0.0
ALL VEHICLES	300	0.22	1.1	2.68	15.1	-3.8	17.4	0.00	.29	0.0

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1968-1974 VEHICLES: 46 HC FAILURES, 45 CO FAILURES, 29.9% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	4.33	1.5	77.86	28.6	420.1	80.0	2.69	1.66	16.2
BUICK	13	8.50	6.9	129.86	83.8	468.1	126.5	1.84	1.28	12.8
CADILLAC	6	4.28	1.4	127.12	47.2	726.7	63.9	1.90	.28	9.5
CHEVROLET	64	6.33	3.8	97.80	44.0	487.7	110.3	2.15	1.12	13.9
CHRYSLER	6	5.34	0.7	85.66	18.6	580.3	58.6	3.50	1.02	12.2
DATSUN	3	6.79	4.9	65.86	13.5	307.7	48.0	1.37	.37	20.8
DODGE	16	6.46	4.2	98.27	20.0	451.0	68.1	2.88	1.24	14.3
FORD	73	6.19	2.5	93.25	38.2	483.2	110.3	2.63	1.28	14.3
MERCURY	11	5.77	2.9	90.35	52.2	546.1	114.2	2.84	1.72	12.8
OLDSMOBILE	14	7.68	4.8	163.61	133.0	531.9	74.9	1.74	.96	11.5
OPEL	1	3.24	0.0	85.76	0.0	301.5	0.0	1.64	0.00	19.9
PLYMOUTH	24	8.84	16.4	106.66	35.3	448.9	87.7	2.39	1.16	14.1
PONTIAC	21	8.15	6.5	99.19	53.7	542.0	93.8	2.99	1.63	12.4
TOYOTA	8	3.93	0.4	59.02	24.7	306.1	32.8	2.70	1.18	21.7
VOLKSWAGON	28	5.64	2.2	78.29	25.6	260.1	43.5	1.73	.76	22.4
VOLVO	0									
*MODEL YEAR										
1960	2	16.42	15.5	117.36	6.6	500.9	55.0	2.30	.15	12.0
1961	2	16.05	3.1	184.44	87.4	425.2	20.6	2.34	1.96	11.7
1962	4	11.87	7.7	142.07	90.1	452.2	103.9	2.98	1.86	12.6
1963	5	11.44	5.2	117.36	44.0	393.7	125.5	2.12	1.53	15.1
1964	10	8.95	2.9	129.13	37.8	370.8	78.5	1.97	.68	15.3
1965	13	10.17	5.3	131.33	48.9	330.6	72.8	1.52	.82	16.5
1966	16	15.71	19.5	147.25	54.6	396.4	69.7	1.91	1.32	13.6
1967	17	8.30	2.3	130.56	47.8	444.2	98.1	2.41	1.30	13.5
1968	22	5.89	1.4	101.28	43.6	486.5	114.2	2.56	1.15	14.1
1969	24	5.95	1.5	88.31	33.7	440.9	90.8	3.02	1.49	15.6
1970	25	4.96	1.1	79.45	33.5	480.1	102.0	3.04	1.20	14.9
1971	34	4.92	1.0	75.46	25.4	453.3	133.5	3.16	1.43	16.0
1972	36	4.76	1.2	83.92	30.7	481.4	140.8	2.63	1.11	15.1
1973	43	5.39	3.1	98.45	77.3	512.7	138.0	2.09	1.16	14.0
1974	47	4.19	1.5	83.53	48.1	502.8	152.0	1.63	.72	14.9
*DISPLACEMENT										
LESS THAN 151	50	5.06	2.2	71.28	24.3	282.4	45.4	1.94	.86	21.9
151 - 250	40	5.83	3.8	92.84	44.7	376.3	60.5	2.40	1.33	16.7
251 - 350	127	7.54	7.9	107.08	48.0	480.0	78.6	2.21	1.15	13.4
MORE THAN 350	83	6.07	4.0	102.84	67.4	591.7	84.4	2.92	1.46	11.7
*INERTIA WEIGHT										
1800 - 2799	55	5.03	2.2	71.36	24.3	295.2	65.8	2.06	1.05	21.4
2800 - 3799	127	6.42	3.6	98.35	43.8	442.4	81.9	2.19	1.14	14.7
3800 - 4799	105	7.51	8.8	107.96	64.3	551.2	83.0	2.75	1.44	12.1
4800 - 5799	13	5.16	1.8	127.86	67.5	687.5	81.5	2.74	1.31	9.9
*POPULATIONS										
1960 - 1967	69	11.36	10.4	135.26	50.5	399.0	92.5	2.07	1.21	14.3
1968 - 1974	231	5.04	1.8	86.93	47.6	483.6	131.7	2.48	1.28	14.9
ALL VEHICLES	300	6.49	5.9	98.04	52.3	464.1	128.7	2.39	1.27	14.8

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1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 46 HC FAILURES, 45 CO FAILURES, 29.9% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	0.01	0.1	0.13	0.4	-0.4	1.3	0.04	.13	0.0
BUICK	13	0.08	0.3	3.03	8.7	0.5	2.7	-0.02	.07	-0.1
CADILLAC	6	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
CHEVROLET	64	0.14	1.0	2.45	8.4	-5.3	18.9	0.04	.34	0.0
CHRYSLER	6	2.55	3.4	29.04	35.0	-32.6	38.7	-0.37	.46	-0.4
DATSUN	3	-1.81	3.8	-10.50	17.3	-64.5	28.3	0.12	.29	4.9
DODGE	16	0.03	0.5	1.59	10.6	2.1	12.8	0.06	.20	-0.1
FORD	73	0.20	0.7	2.50	8.8	-0.2	14.8	0.05	.32	-0.1
MERCURY	11	0.69	1.0	12.35	18.4	-25.5	30.1	-0.15	.29	0.1
OLDSMOBILE	14	0.08	0.2	-5.93	37.5	0.5	14.3	-0.04	.13	0.0
OPEL	1	1.08	0.0	4.05	0.0	11.2	0.0	0.48	0.00	-0.9
PLYMOUTH	24	0.96	2.1	14.82	28.9	-12.2	26.1	-0.16	.42	-0.3
PONTIAC	21	0.06	1.0	0.56	25.8	-4.5	13.3	0.04	.53	0.0
TOYOTA	8	0.31	0.7	3.10	16.9	-19.4	24.4	-0.04	.58	0.9
VOLKSWAGON	28	0.03	0.3	-1.01	8.5	-1.6	5.5	0.04	.28	0.1
VOLVO	0									
*MODEL YEAR										
1960	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1961	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1962	4	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1963	5	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1964	10	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1965	13	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1966	16	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1967	17	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	22	0.24	1.2	2.48	23.9	-6.5	16.7	0.07	.34	-0.0
1969	24	1.37	2.7	11.57	29.1	-9.1	39.8	0.20	.89	-0.3
1970	25	0.25	1.6	4.96	12.9	-8.2	17.5	-0.08	.26	0.0
1971	34	0.05	0.2	2.37	8.5	-5.1	17.3	0.01	.08	0.2
1972	36	0.35	0.9	7.81	20.9	-11.3	24.2	-0.11	.38	0.0
1973	43	0.10	1.2	3.49	16.4	-4.1	18.5	-0.02	.27	0.1
1974	47	0.22	0.5	0.02	21.0	-5.0	18.0	0.03	.20	0.1
*DISPLACEMENT										
LESS THAN 151	50	0.10	1.1	0.23	11.6	-10.0	20.7	0.06	.35	0.5
151 - 250	40	0.23	0.7	4.46	15.3	-2.7	14.5	0.03	.33	-0.1
251 - 350	127	0.19	1.1	3.13	12.4	-3.5	18.6	0.02	.35	-0.0
MORE THAN 350	83	0.42	1.5	4.59	25.3	-6.1	21.7	-0.06	.31	-0.1
*INERTIA WEIGHT										
1800 - 2799	55	0.09	1.0	0.21	11.0	-9.1	20.0	0.05	.33	0.5
2800 - 3799	127	0.26	0.9	4.77	14.3	-3.0	15.8	0.01	.27	-0.1
3800 - 4799	105	0.32	1.5	4.02	18.2	-6.1	22.2	-0.02	.41	-0.0
4800 - 5799	13	0.19	0.6	-5.42	40.5	-2.7	24.2	-0.09	.27	0.1
*POPULATIONS										
1960 - 1967	69	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968 - 1974	231	0.32	1.3	4.19	19.5	-6.7	21.9	0.01	.39	0.0
ALL VEHICLES	300	0.24	1.2	3.23	17.2	-5.2	19.4	0.00	.34	0.0

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1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 46 HC FAILURES, 45 CO FAILURES, 29.9% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	12	0.33	0.16	1.38	0.03	3.0	26.0	7.8
BUICK	13	0.96	2.28	-1.30	-0.94	10.7	395.1	-3.1
CADILLAC	6	0.00	0.00	0.00	0.00	0.0	0.0	0.0
CHEVROLET	64	2.23	2.44	1.76	0.33	21.2	359.0	5.7
CHRYSLER	6	32.29	25.32	-11.73	-3.12	138.3	1575.7	-20.0
DATSUN	3	-36.35	-18.96	8.09	19.09	-111.3	-645.1	7.4
DODGE	16	0.52	1.60	2.10	-0.93	6.7	318.7	12.4
FORD	73	3.18	2.61	1.81	-0.65	32.5	399.6	7.8
MERCURY	11	10.70	12.03	-5.63	0.81	85.3	1522.8	-18.7
OLDSMOBILE	14	1.03	-3.76	-2.62	0.42	17.2	-1276.7	-9.6
OPEL	1	24.97	4.51	22.51	-4.71	49.1	184.1	21.7
PLYMOUTH	24	9.81	12.20	-7.11	-2.14	170.6	2632.2	-28.2
PONTIAC	21	0.70	0.56	1.30	0.40	8.3	82.0	5.7
TOYOTA	8	7.32	4.99	-1.39	4.02	24.8	247.0	-2.9
VOLKSWAGON	28	0.55	-1.31	2.20	0.63	4.9	-160.0	6.1
VOLVO	0							
*MODEL YEAR								
1960	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1961	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1962	4	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1963	5	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1964	10	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1965	13	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1966	16	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1967	17	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	22	3.86	2.39	2.69	-0.12	17.3	181.1	5.2
1969	24	18.73	11.58	6.28	-1.81	162.7	1371.7	24.0
1970	25	4.75	5.87	-2.81	0.06	36.1	723.3	-12.1
1971	34	0.96	3.05	0.33	1.24	7.1	355.6	1.6
1972	36	6.84	8.52	-4.30	0.06	44.9	1004.7	-14.0
1973	43	1.84	3.43	-1.12	0.78	14.8	511.3	-3.4
1974	47	4.97	0.02	1.94	0.86	34.9	2.6	5.1
*DISPLACEMENT								
LESS THAN 151	50	1.93	0.33	2.93	2.35	11.4	26.6	6.7
151 - 250	40	3.72	4.58	1.28	-0.74	28.6	565.6	4.0
251 - 350	127	2.49	2.84	0.88	-0.35	32.7	531.6	3.3
MORE THAN 350	83	6.45	4.27	-2.27	-0.45	63.6	698.4	-9.9
*INERTIA WEIGHT								
1800 - 2799	55	1.77	0.30	2.52	2.19	10.9	25.4	6.4
2800 - 3799	127	3.83	4.63	0.57	-0.76	41.1	765.6	2.0
3800 - 4799	105	4.04	3.59	-0.74	-0.18	44.9	571.2	-2.9
4800 - 5799	13	3.58	-4.43	-3.23	0.96	41.8	-1184.9	-18.8
*POPULATIONS								
1960 - 1967	69	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968 - 1974	231	5.91	4.60	0.23	0.32	41.3	547.1	0.7
ALL VEHICLES	300	3.62	3.19	0.18	0.25	35.7	473.3	0.6

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 69 HC FAILURES, 70 CO FAILURES, 40.3% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	4.31	1.5	76.82	27.7	423.6	80.7	2.70	1.65	16.1
BUICK	13	8.46	6.9	129.38	83.8	472.7	127.7	1.87	1.29	12.8
CADILLAC	6	4.28	1.4	127.12	47.2	726.7	63.9	1.90	.28	9.5
CHEVROLET	64	6.32	3.8	97.54	44.1	488.2	110.2	2.16	1.12	13.9
CHRYSLER	6	5.34	0.7	85.66	18.6	580.3	58.6	3.50	1.02	12.2
DATSUN	3	6.79	4.9	65.86	13.5	307.7	48.0	1.37	.37	20.8
DODGE	16	6.20	4.2	95.85	21.5	448.2	70.9	2.86	1.23	14.5
FORD	73	6.14	2.4	92.21	36.8	484.8	110.1	2.62	1.27	14.3
MERCURY	11	5.77	2.9	90.35	52.2	546.1	114.2	2.84	1.72	12.8
OLDSMOBILE	14	7.60	4.9	160.81	134.4	536.9	81.6	1.77	.98	11.5
OPEL	1	3.24	0.0	85.76	0.0	301.5	0.0	1.64	0.00	19.9
PLYMOUTH	24	8.80	16.4	105.49	35.3	449.2	87.8	2.39	1.17	14.2
PONTIAC	21	8.15	6.5	99.19	53.7	542.0	93.8	2.99	1.63	12.4
TOYOTA	8	3.84	0.5	58.60	25.0	303.3	29.4	2.60	1.12	21.9
VOLKSWAGON	28	5.75	2.5	78.10	25.3	261.8	45.8	1.74	.77	22.3
VOLVO	0									
*MODEL YEAR										
1960	2	16.42	15.5	117.36	6.6	500.9	55.0	2.30	.15	12.0
1961	2	16.05	3.1	184.44	87.4	425.2	20.6	2.34	1.96	11.7
1962	4	11.87	7.7	142.07	90.1	452.2	103.9	2.98	1.86	12.6
1963	5	11.44	5.2	117.36	44.0	393.7	125.5	2.12	1.53	15.1
1964	10	8.95	2.9	129.13	37.8	370.8	78.5	1.97	.68	15.3
1965	13	10.17	5.3	131.33	48.9	330.6	72.8	1.52	.82	16.5
1966	16	15.71	19.5	147.25	54.6	396.4	69.7	1.91	1.32	13.6
1967	17	8.30	2.3	130.56	47.8	444.2	98.1	2.41	1.30	13.5
1968	22	5.89	1.4	101.28	43.6	486.5	114.2	2.56	1.15	14.1
1969	24	5.77	1.2	86.80	33.1	444.0	92.7	3.07	1.49	15.6
1970	25	4.96	1.1	78.96	33.8	480.3	101.7	3.01	1.20	15.0
1971	34	4.91	1.0	74.66	24.7	454.4	132.4	3.14	1.42	16.0
1972	36	4.73	1.0	82.63	28.8	482.4	141.4	2.62	1.10	15.1
1973	43	5.34	3.2	96.02	76.6	514.6	140.3	2.08	1.14	14.1
1974	47	4.17	1.4	83.55	48.3	504.3	151.0	1.66	.73	14.8
*DISPLACEMENT										
LESS THAN 151	50	5.13	2.4	71.47	24.0	283.1	45.7	1.92	.83	21.8
151 - 250	40	5.82	3.8	92.61	44.5	375.7	60.7	2.40	1.33	16.7
251 - 350	127	7.50	7.9	105.86	48.2	482.3	79.9	2.22	1.14	13.4
MORE THAN 350	83	5.99	3.9	101.98	67.1	591.6	84.5	2.92	1.46	11.8
*INERTIA WEIGHT										
1800 - 2799	55	5.09	2.4	71.53	23.9	295.9	65.8	2.04	1.03	21.3
2800 - 3799	127	6.38	3.6	97.12	43.8	443.9	84.0	2.19	1.12	14.7
3800 - 4799	105	7.44	8.8	107.20	64.1	552.0	82.5	2.76	1.44	12.1
4800 - 5799	13	5.16	1.8	127.86	67.5	687.5	81.5	2.74	1.31	9.9
*POPULATIONS										
1960 - 1967	69	11.36	10.4	135.26	50.5	399.0	92.5	2.07	1.21	14.3
1968 - 1974	231	5.00	1.8	85.95	47.1	484.9	131.9	2.48	1.27	14.9
ALL VEHICLES	300	6.46	5.9	97.29	52.2	465.1	129.0	2.39	1.27	14.8

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 69 HC FAILURES, 70 CO FAILURES, 40.3% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	0.04	0.1	1.16	3.6	-3.9	12.0	0.03	.14	0.0
BUICK	13	0.12	0.3	3.52	8.7	-4.1	17.0	-0.06	.13	-0.1
CADILLAC	6	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
CHEVROLET	64	0.16	1.0	2.70	8.6	-5.8	19.2	0.03	.34	0.0
CHRYSLER	6	2.55	3.4	29.04	35.0	-32.6	38.7	-0.37	.46	-0.4
DATSUN	3	-1.81	3.8	-10.50	17.3	-64.5	28.3	0.12	.29	4.9
DODGE	16	0.29	0.9	4.00	11.8	4.9	15.1	0.08	.34	-0.3
FORD	73	0.25	0.8	3.54	14.2	-1.8	17.5	0.06	.35	-0.1
MERCURY	11	0.69	1.0	12.35	18.4	-25.5	30.1	-0.15	.29	0.1
OLDSMOBILE	14	0.16	0.4	-3.13	39.4	-4.5	23.7	-0.07	.15	0.1
OPEL	1	1.08	0.0	4.05	0.0	11.2	0.0	0.48	0.00	-0.9
PLYMOUTH	24	1.00	2.1	16.00	28.6	-12.4	26.0	-0.16	.42	-0.3
PONTIAC	21	0.06	1.0	0.56	25.8	-4.5	13.3	0.04	.53	0.0
TOYOTA	8	0.40	0.7	3.51	16.9	-16.6	28.0	0.06	.65	0.7
VOLKSWAGON	28	-0.08	0.9	-0.83	9.0	-3.3	11.2	0.03	.31	0.3
VOLVO	0									
*MODEL YEAR										
1960	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1961	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1962	4	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1963	5	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1964	10	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1965	13	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1966	16	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1967	17	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	22	0.24	1.2	2.48	23.9	-6.5	16.7	0.07	.34	-0.0
1969	24	1.56	2.7	13.08	28.8	-12.1	40.9	0.15	.92	-0.3
1970	25	0.26	1.6	5.45	13.6	-8.4	19.3	-0.05	.32	-0.0
1971	34	0.06	0.3	3.18	9.1	-6.2	19.0	0.03	.22	0.2
1972	36	0.37	1.0	9.10	21.6	-12.3	25.8	-0.10	.39	0.0
1973	43	0.15	1.4	5.93	17.6	-6.0	22.7	-0.01	.31	0.0
1974	47	0.24	0.7	-0.01	24.2	-6.5	19.1	0.01	.22	0.2
*DISPLACEMENT										
LESS THAN 151	50	0.03	1.3	0.04	11.9	-10.7	22.4	0.08	.38	0.6
151 - 250	40	0.23	0.7	4.69	15.3	-2.2	15.0	0.03	.33	-0.1
251 - 350	127	0.24	1.1	4.36	15.3	-5.8	21.4	0.01	.37	-0.0
MORE THAN 350	83	0.49	1.5	5.45	25.5	-6.0	21.9	-0.06	.34	-0.1
*INERTIA WEIGHT										
1800 - 2799	55	0.02	1.2	0.04	11.3	-9.7	21.6	0.07	.36	0.6
2800 - 3799	127	0.30	1.0	6.00	16.7	-4.5	18.8	0.01	.31	-0.1
3800 - 4799	105	0.38	1.5	4.77	18.4	-6.9	22.8	-0.03	.42	-0.0
4800 - 5799	13	0.19	0.6	-5.42	40.5	-2.7	24.2	-0.09	.27	0.1
*POPULATIONS										
1960 - 1967	69	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968 - 1974	231	0.36	1.4	5.17	20.7	-8.1	23.6	0.01	.41	0.1
ALL VEHICLES	300	0.27	1.2	3.98	18.3	-6.2	21.0	0.01	.36	0.0

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 69 HC FAILURES, 70 CO FAILURES, 40.3% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	12	0.83	1.49	0.97	0.30	7.1	228.2	5.2
BUICK	13	1.42	2.65	-3.08	-0.43	14.7	426.3	-6.8
CADILLAC	6	0.00	0.00	0.00	0.00	0.0	0.0	0.0
CHEVROLET	64	2.41	2.70	1.42	0.34	22.7	394.0	4.5
CHRYSLER	6	32.29	25.32	-11.73	-3.12	138.3	1575.7	-20.0
DATSUN	3	-36.35	-18.96	8.09	19.09	-111.3	-645.1	7.4
DODGE	16	4.43	4.01	2.81	-2.40	50.3	700.3	14.5
FORD	73	3.92	3.70	2.18	-0.39	34.2	483.3	8.0
MERCURY	11	10.70	12.03	-5.63	0.81	85.3	1522.8	-18.7
OLDSMOBILE	14	2.11	-1.99	-4.01	0.47	32.3	-617.2	-13.4
OPEL	1	24.97	4.51	22.51	-4.71	49.1	184.1	21.7
PLYMOUTH	24	10.22	13.17	-7.11	-2.38	165.7	2645.1	-26.3
PONTIAC	21	0.70	0.56	1.30	0.40	8.3	82.0	5.7
TOYOTA	8	9.49	5.65	2.37	3.18	28.3	246.8	4.4
VOLKSWAGON	28	-1.33	-1.07	1.61	1.17	-10.7	-117.6	4.1
VOLVO	0							
*MODEL YEAR								
1960	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1961	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1962	4	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1963	5	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1964	10	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1965	13	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1966	16	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1967	17	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	22	3.86	2.39	2.69	-0.12	17.3	181.1	5.2
1969	24	21.24	13.10	4.61	-1.84	142.1	1194.6	13.6
1970	25	4.90	6.46	-1.78	-0.06	34.8	743.5	-7.2
1971	34	1.16	4.08	0.97	1.51	8.1	445.2	4.3
1972	36	7.31	9.92	-3.89	0.03	45.1	1099.6	-11.9
1973	43	2.70	5.81	-0.29	0.32	19.4	776.8	-0.8
1974	47	5.49	-0.01	0.56	1.43	37.0	-1.3	1.4
*DISPLACEMENT								
LESS THAN 151	50	0.51	0.06	4.03	2.76	2.7	4.4	8.5
151 - 250	40	3.82	4.82	1.43	-0.89	28.8	583.8	4.3
251 - 350	127	3.10	3.95	0.45	-0.29	38.5	698.9	1.6
MORE THAN 350	83	7.62	5.07	-2.19	-0.71	67.1	738.8	-8.5
*INERTIA WEIGHT								
1800 - 2799	55	0.46	0.05	3.48	2.56	2.6	4.2	8.2
2800 - 3799	127	4.53	5.82	0.63	-0.84	45.9	911.9	2.1
3800 - 4799	105	4.86	4.26	-1.11	-0.27	49.3	619.2	-3.9
4800 - 5799	13	3.58	-4.43	-3.23	0.96	41.8	-1184.9	-18.8
*POPULATIONS								
1960 - 1967	69	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968 - 1974	231	6.64	5.68	0.26	0.38	42.7	621.1	0.8
ALL VEHICLES	300	4.06	3.93	0.21	0.30	37.3	543.2	0.7

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EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 65 HC FAILURES, 74 CO FAILURES, 40.7% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	4.32	1.5	78.24	28.3	428.3	73.9	2.72	1.64	15.8
BUICK	13	8.46	6.9	129.38	83.8	472.7	127.7	1.87	1.29	12.8
CADILLAC	6	4.28	1.4	127.12	47.2	726.7	63.9	1.90	.28	9.5
CHEVROLET	64	6.32	3.8	97.54	44.1	488.2	110.2	2.16	1.12	13.9
CHRYSLER	6	5.34	0.7	85.66	18.6	580.3	58.6	3.50	1.02	12.2
DATSUN	3	6.79	4.9	65.86	13.5	307.7	48.0	1.37	.37	20.8
DODGE	16	6.20	4.2	95.85	21.5	448.2	70.9	2.86	1.23	14.5
FORD	73	6.14	2.4	92.21	36.8	484.8	110.1	2.62	1.27	14.3
MERCURY	11	5.77	2.9	90.35	52.2	546.1	114.2	2.84	1.72	12.8
OLDSMOBILE	14	7.60	4.9	160.81	134.4	536.9	81.6	1.77	.98	11.5
OPEL	1	3.24	0.0	85.76	0.0	301.5	0.0	1.64	0.00	19.9
PLYMOUTH	24	8.80	16.4	105.49	35.3	449.2	87.8	2.39	1.17	14.2
PONTIAC	21	8.15	6.5	99.19	53.7	542.0	93.8	2.99	1.63	12.4
TOYOTA	8	3.84	0.5	58.60	25.0	303.3	29.4	2.60	1.12	21.9
VOLKSWAGON	28	5.75	2.5	78.10	25.3	261.8	45.8	1.74	.77	22.3
VOLVO	0									
*MODEL YEAR										
1960	2	16.42	15.5	117.36	6.6	500.9	55.0	2.30	.15	12.0
1961	2	16.05	3.1	184.44	87.4	425.2	20.6	2.34	1.96	11.7
1962	4	11.87	7.7	142.07	90.1	452.2	103.9	2.98	1.86	12.6
1963	5	11.44	5.2	117.36	44.0	393.7	125.5	2.12	1.53	15.1
1964	10	8.95	2.9	129.13	37.8	370.8	78.5	1.97	.68	15.3
1965	13	10.17	5.3	131.33	48.9	330.6	72.8	1.52	.82	16.5
1966	16	15.71	19.5	147.25	54.6	396.4	69.7	1.91	1.32	13.6
1967	17	8.30	2.3	130.56	47.8	444.2	98.1	2.41	1.30	13.5
1968	22	5.89	1.4	101.28	43.6	486.5	114.2	2.56	1.15	14.1
1969	24	5.77	1.2	86.80	33.1	444.0	92.7	3.07	1.49	15.6
1970	25	4.96	1.1	78.96	33.8	480.3	101.7	3.01	1.20	15.0
1971	34	4.91	1.0	75.16	25.0	456.1	130.7	3.14	1.42	15.9
1972	36	4.73	1.0	82.63	28.8	482.4	141.4	2.62	1.10	15.1
1973	43	5.34	3.2	96.02	76.6	514.6	140.3	2.08	1.14	14.1
1974	47	4.17	1.4	83.55	48.3	504.3	151.0	1.66	.73	14.8
*DISPLACEMENT										
LESS THAN 151	50	5.13	2.4	71.47	24.0	283.1	45.7	1.92	.83	21.8
151 - 250	40	5.82	3.8	92.61	44.5	375.7	60.7	2.40	1.33	16.7
251 - 350	127	7.50	7.9	105.99	48.2	482.8	79.0	2.22	1.14	13.4
MORE THAN 350	83	5.99	3.9	101.98	67.1	591.6	84.5	2.92	1.46	11.8
*INERTIA WEIGHT										
1800 - 2799	55	5.10	2.4	71.84	24.2	296.9	66.2	2.04	1.02	21.3
2800 - 3799	127	6.38	3.6	97.12	43.8	443.9	84.0	2.19	1.12	14.7
3800 - 4799	105	7.44	8.8	107.20	64.1	552.0	82.5	2.76	1.44	12.1
4800 - 5799	13	5.16	1.8	127.86	67.5	687.5	81.5	2.74	1.31	9.9
*POPULATIONS										
1960 - 1967	69	11.36	10.4	135.26	50.5	399.0	92.5	2.07	1.21	14.3
1968 - 1974	231	5.00	1.8	86.02	47.1	485.1	131.6	2.48	1.27	14.9
ALL VEHICLES	300	6.46	5.9	97.34	52.2	465.3	128.8	2.39	1.27	14.8

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 65 HC FAILURES, 74 CO FAILURES, 40.7% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	0.02	0.1	-0.26	6.4	-8.6	19.4	0.01	.15	0.3
BUICK	13	0.12	0.3	3.52	8.7	-4.1	17.0	-0.06	.13	-0.1
CADILLAC	6	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
CHEVROLET	64	0.16	1.0	2.70	8.6	-5.8	19.2	0.03	.34	0.0
CHRYSLER	6	2.55	3.4	29.04	35.0	-32.6	38.7	-0.37	.46	-0.4
DATSUN	3	-1.81	3.8	-10.50	17.3	-64.5	28.3	0.12	.29	4.9
DODGE	16	0.29	0.9	4.00	11.8	4.9	15.1	0.08	.34	-0.3
FORD	73	0.25	0.8	3.54	14.2	-1.8	17.5	0.06	.35	-0.1
MERCURY	11	0.69	1.0	12.35	18.4	-25.5	30.1	-0.15	.29	0.1
OLDSMOBILE	14	0.16	0.4	-3.13	39.4	-4.5	23.7	-0.07	.15	0.1
OPEL	1	1.08	0.0	4.05	0.0	11.2	0.0	0.48	0.00	-0.9
PLYMOUTH	24	1.00	2.1	16.00	28.6	-12.4	26.0	-0.16	.42	-0.3
PONTIAC	21	0.06	1.0	0.56	25.8	-4.5	13.3	0.04	.53	0.0
TOYOTA	8	0.40	0.7	3.51	16.9	-16.6	28.0	0.06	.65	0.7
VOLKSWAGON	28	-0.08	0.9	-0.83	9.0	-3.3	11.2	0.03	.31	0.3
VOLVO	0									
*MODEL YEAR										
1960	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1961	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1962	4	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1963	5	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1964	10	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1965	13	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1966	16	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1967	17	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	22	0.24	1.2	2.48	23.9	-6.5	16.7	0.07	.34	-0.0
1969	24	1.56	2.7	13.08	28.8	-12.1	40.9	0.15	.92	-0.3
1970	25	0.26	1.6	5.45	13.6	-8.4	19.3	-0.05	.32	-0.0
1971	34	0.05	0.3	2.68	9.7	-7.8	20.9	0.03	.22	0.3
1972	36	0.37	1.0	9.10	21.6	-12.3	25.8	-0.10	.39	0.0
1973	43	0.15	1.4	5.93	17.6	-6.0	22.7	-0.01	.31	0.0
1974	47	0.24	0.7	-0.01	24.2	-6.5	19.1	0.01	.22	0.2
*DISPLACEMENT										
LESS THAN 151	50	0.03	1.3	0.04	11.9	-10.7	22.4	0.08	.38	0.6
151 - 250	40	0.23	0.7	4.69	15.3	-2.2	15.0	0.03	.33	-0.1
251 - 350	127	0.24	1.1	4.22	15.4	-6.3	21.8	0.01	.37	-0.0
MORE THAN 350	83	0.49	1.5	5.45	25.5	-6.0	21.9	-0.06	.34	-0.1
*INERTIA WEIGHT										
1800 - 2799	55	0.02	1.2	-0.27	11.6	-10.8	22.4	0.07	.36	0.6
2800 - 3799	127	0.30	1.0	6.00	16.7	-4.5	18.8	0.01	.31	-0.1
3800 - 4799	105	0.38	1.5	4.77	18.4	-6.9	22.8	-0.03	.42	-0.0
4800 - 5799	13	0.19	0.6	-5.42	40.5	-2.7	24.2	-0.09	.27	0.1
*POPULATIONS										
1960 - 1967	69	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968 - 1974	231	0.35	1.4	5.10	20.7	-8.3	23.8	0.01	.41	0.1
ALL VEHICLES	300	0.27	1.2	3.93	18.3	-6.4	21.2	0.00	.36	0.1

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 65 HC FAILURES, 74 CO FAILURES, 40.7% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	12	0.52	-0.34	0.48	2.02	4.3	-50.0	2.5
BUICK	13	1.42	2.65	-3.08	-0.43	14.7	426.3	-6.8
CADILLAC	6	0.00	0.00	0.00	0.00	0.0	0.0	0.0
CHEVROLET	64	2.41	2.70	1.42	0.34	22.7	394.0	4.5
CHRYSLER	6	32.29	25.32	-11.73	-3.12	138.3	1575.7	-20.0
DATSUN	3	-36.35	-18.96	8.09	19.09	-111.3	-645.1	7.4
DODGE	16	4.43	4.01	2.81	-2.40	50.3	700.3	14.5
FORD	73	3.92	3.70	2.18	-0.39	34.2	483.3	8.0
MERCURY	11	10.70	12.03	-5.63	0.81	85.3	1522.8	-18.7
OLDSMOBILE	14	2.11	-1.99	-4.01	0.47	32.3	-617.2	-13.4
OPEL	1	24.97	4.51	22.51	-4.71	49.1	184.1	21.7
PLYMOUTH	24	10.22	13.17	-7.11	-2.38	165.7	2645.1	-26.3
PONTIAC	21	0.70	0.56	1.30	0.40	8.3	82.0	5.7
TOYOTA	8	9.49	5.65	2.37	3.18	28.3	246.8	4.4
VOLKSWAGON	28	-1.33	-1.07	1.61	1.17	-10.7	-117.6	4.1
VOLVO	0							
*MODEL YEAR								
1960	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1961	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1962	4	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1963	5	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1964	10	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1965	13	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1966	16	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1967	17	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	22	3.86	2.39	2.69	-0.12	17.3	181.1	5.2
1969	24	21.24	13.10	4.61	-1.84	142.1	1194.6	13.6
1970	25	4.90	6.46	-1.78	-0.06	34.8	743.5	-7.2
1971	34	1.06	3.44	0.82	2.12	7.3	371.8	3.6
1972	36	7.31	9.92	-3.89	0.03	45.1	1099.6	-11.9
1973	43	2.70	5.81	-0.29	0.32	19.4	776.8	-0.8
1974	47	5.49	-0.01	0.56	1.43	37.0	-1.3	1.4
*DISPLACEMENT								
LESS THAN 151	50	0.51	0.06	4.03	2.76	2.7	4.4	8.5
151 - 250	40	3.82	4.82	1.43	-0.89	28.8	583.8	4.3
251 - 350	127	3.09	3.83	0.39	-0.09	38.2	675.6	1.4
MORE THAN 350	83	7.62	5.07	-2.19	-0.71	67.1	738.8	-8.5
*INERTIA WEIGHT								
1800 - 2799	55	0.41	-0.38	3.34	2.84	2.3	-30.2	7.8
2800 - 3799	127	4.53	5.82	0.63	-0.84	45.9	911.9	2.1
3800 - 4799	105	4.86	4.26	-1.11	-0.27	49.3	619.2	-3.9
4800 - 5799	13	3.58	-4.43	-3.23	0.96	41.8	-1184.9	-18.8
*POPULATIONS								
1960 - 1967	69	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968 - 1974	231	6.62	5.60	0.23	0.48	42.5	611.6	0.7
ALL VEHICLES	300	4.05	3.88	0.19	0.37	37.2	535.0	0.6

AUTOMOTIVE TESTING LABORATORIES, INC.
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EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

1960-1967 VEHICLES: 25 HC FAILURES, 29 CO FAILURES, 59.4% FAILURE RATE
1968-1974 VEHICLES: 65 HC FAILURES, 74 CO FAILURES, 40.7% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	4.29	1.5	76.24	26.6	428.8	73.4	2.71	1.64	15.9
BUICK	13	6.72	4.3	119.96	75.2	479.1	120.8	1.92	1.25	13.0
CADILLAC	6	4.28	1.4	127.12	47.2	726.7	63.9	1.90	.28	9.5
CHEVROLET	64	6.17	3.8	95.49	43.4	490.1	108.4	2.15	1.11	14.0
CHRYSLER	6	5.30	0.7	87.94	20.1	563.0	67.8	3.22	.81	12.5
DATSUN	3	6.79	4.9	65.86	13.5	307.7	48.0	1.37	.37	20.8
DODGE	16	6.19	4.1	96.48	21.7	445.3	69.5	2.80	1.20	14.6
FORD	73	5.79	1.9	89.25	36.5	487.0	108.0	2.64	1.27	14.4
MERCURY	11	5.62	2.5	87.75	45.4	546.9	112.6	2.86	1.69	12.9
OLDSMOBILE	14	7.05	4.3	155.63	134.6	536.4	81.2	1.76	.98	11.7
OPEL	1	3.24	0.0	85.76	0.0	301.5	0.0	1.64	0.00	19.9
PLYMOUTH	24	6.35	5.3	98.47	25.9	453.4	84.6	2.55	1.19	14.4
PONTIAC	21	9.15	10.4	109.09	59.6	537.8	100.1	2.80	1.73	12.1
TOYOTA	8	3.84	0.5	58.60	25.0	303.3	29.4	2.60	1.12	21.9
VOLKSWAGON	28	5.53	2.3	75.22	21.4	261.2	45.9	1.71	.79	22.6
VOLVO	0									
*MODEL YEAR										
1960	2	16.42	15.5	117.36	6.6	500.9	55.0	2.30	.15	12.0
1961	2	14.03	5.8	174.39	110.3	449.9	27.9	2.67	2.10	11.8
1962	4	9.05	4.7	124.53	89.1	444.2	103.1	3.01	1.89	13.5
1963	5	16.95	17.0	154.49	46.3	359.1	110.0	1.17	.57	14.7
1964	10	7.02	2.1	104.83	39.1	388.6	81.2	2.29	1.17	16.2
1965	13	8.89	4.5	118.95	46.5	344.3	76.7	1.56	.85	16.8
1966	16	11.30	7.8	134.46	54.3	401.1	70.5	1.94	1.36	14.2
1967	17	7.28	1.9	124.77	43.6	440.9	88.6	2.22	.99	13.9
1968	22	5.89	1.4	101.28	43.6	486.5	114.2	2.56	1.15	14.1
1969	24	5.77	1.2	86.80	33.1	444.0	92.7	3.07	1.49	15.6
1970	25	4.96	1.1	78.96	33.8	480.3	101.7	3.01	1.20	15.0
1971	34	4.91	1.0	75.16	25.0	456.1	130.7	3.14	1.42	15.9
1972	36	4.73	1.0	82.63	28.8	482.4	141.4	2.62	1.10	15.1
1973	43	5.34	3.2	96.02	76.6	514.6	140.3	2.08	1.14	14.1
1974	47	4.17	1.4	83.55	48.3	504.3	151.0	1.66	.73	14.8
*DISPLACEMENT										
LESS THAN 151	50	5.01	2.2	69.86	21.3	282.8	45.9	1.91	.84	22.0
151 - 250	40	5.10	2.4	86.66	40.3	379.8	59.7	2.42	1.33	16.9
251 - 350	127	6.73	4.0	102.51	45.0	485.1	75.5	2.23	1.13	13.5
MORE THAN 350	83	6.24	5.8	103.78	68.4	588.8	88.4	2.86	1.47	11.8
*INERTIA WEIGHT										
1800 - 2799	55	4.99	2.2	70.38	21.8	296.6	66.4	2.03	1.03	21.5
2800 - 3799	127	6.13	4.5	93.96	40.8	446.8	81.5	2.19	1.13	14.8
3800 - 4799	105	6.74	4.8	105.96	63.7	550.8	82.3	2.74	1.43	12.2
4800 - 5799	13	5.16	1.8	127.86	67.5	687.5	81.5	2.74	1.31	9.9
*POPULATIONS										
1960 - 1967	69	9.74	7.0	126.39	50.6	402.1	87.9	2.02	1.18	14.8
1968 - 1974	231	5.00	1.8	86.02	47.1	485.1	131.6	2.48	1.27	14.9
ALL VEHICLES	300	6.09	4.2	95.31	50.8	466.0	127.7	2.38	1.26	14.9

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EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

1960-1967 VEHICLES: 25 HC FAILURES, 29 CO FAILURES, 59.4% FAILURE RATE
1968-1974 VEHICLES: 65 HC FAILURES, 74 CO FAILURES, 40.7% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	0.05	0.1	1.74	9.5	-9.1	19.2	0.02	.15	0.2
BUICK	13	1.86	2.6	12.94	16.9	-10.5	18.8	-0.11	.18	-0.3
CADILLAC	6	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
CHEVROLET	64	0.30	1.1	4.75	11.4	-7.7	21.3	0.04	.38	-0.0
CHRYSLER	6	2.59	3.4	26.76	37.7	-15.2	68.2	-0.08	.97	-0.6
DATSUN	3	-1.81	3.8	-10.50	17.3	-64.5	28.3	0.12	.29	4.9
DODGE	16	0.30	0.9	3.38	12.3	7.8	18.2	0.15	.41	-0.4
FORD	73	0.61	1.7	6.50	20.3	-4.0	21.4	0.05	.52	-0.2
MERCURY	11	0.85	1.0	14.95	18.5	-26.4	29.4	-0.17	.29	0.0
OLDSMOBILE	14	0.71	1.5	2.05	41.7	-4.0	24.3	-0.06	.16	-0.1
OPEL	1	1.08	0.0	4.05	0.0	11.2	0.0	0.48	0.00	-0.9
PLYMOUTH	24	3.45	11.1	23.01	31.1	-16.6	29.0	-0.31	.55	-0.5
PONTIAC	21	-0.95	6.0	-9.34	47.8	-0.2	32.3	0.22	.86	0.3
TOYOTA	8	0.40	0.7	3.51	16.9	-16.6	28.0	0.06	.65	0.7
VOLKSWAGON	28	0.14	1.1	2.05	11.5	-2.8	12.4	0.06	.33	-0.1
VOLVO,	0									
*MODEL YEAR										
1960	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1961	2	2.02	2.7	10.05	22.9	-24.7	7.3	-0.33	.15	-0.1
1962	4	2.82	3.1	17.54	15.8	8.1	13.5	-0.03	.12	-0.9
1963	5	-5.52	11.9	-37.13	78.9	34.6	53.1	0.94	1.42	0.4
1964	10	1.93	3.2	24.30	34.9	-17.8	26.0	-0.33	1.00	-0.9
1965	13	1.28	2.0	12.38	18.6	-13.7	20.3	-0.04	.25	-0.3
1966	16	4.41	13.5	12.79	29.4	-4.7	14.4	-0.03	.41	-0.5
1967	17	1.02	1.7	5.79	12.2	3.3	34.1	0.19	.54	-0.3
1968	22	0.24	1.2	2.48	23.9	-6.5	16.7	0.07	.34	-0.0
1969	24	1.56	2.7	13.08	28.8	-12.1	40.9	0.15	.92	-0.3
1970	25	0.26	1.6	5.45	13.6	-8.4	19.3	-0.05	.32	-0.0
1971	34	0.05	0.3	2.68	9.7	-7.8	20.9	0.03	.22	0.3
1972	36	0.37	1.0	9.10	21.6	-12.3	25.8	-0.10	.39	0.0
1973	43	0.15	1.4	5.93	17.6	-6.0	22.7	-0.01	.31	0.0
1974	47	0.24	0.7	-0.01	24.2	-6.5	19.1	0.01	.22	0.2
*DISPLACEMENT										
LESS THAN 151	50	0.15	1.3	1.65	13.0	-10.4	22.9	0.10	.39	0.4
151 - 250	40	0.95	2.2	10.63	23.4	-6.3	19.7	0.01	.59	-0.4
251 - 350	127	1.01	5.0	7.71	19.2	-8.6	25.0	-0.00	.45	-0.1
MORE THAN 350	83	0.24	3.3	3.65	33.4	-3.3	28.8	-0.01	.53	-0.1
*INERTIA WEIGHT										
1800 - 2799	55	0.13	1.3	1.19	12.6	-10.5	22.8	0.09	.37	0.5
2800 - 3799	127	0.55	3.0	9.16	26.4	-7.3	24.7	0.01	.52	-0.2
3800 - 4799	105	1.08	5.5	6.01	21.9	-5.7	27.1	-0.01	.52	-0.1
4800 - 5799	13	0.19	0.6	-5.42	40.5	-2.7	24.2	-0.09	.27	0.1
*POPULATIONS										
1960 - 1967	69	1.62	7.6	8.86	32.2	-3.2	29.1	0.04	.68	-0.4
1968 - 1974	231	0.35	1.4	5.10	20.7	-8.3	23.8	0.01	.41	0.1
ALL VEHICLES	300	0.64	3.9	5.96	23.8	-7.1	25.2	0.01	.48	-0.0

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN BOTH SECTORS

1960-1967 VEHICLES: 25 HC FAILURES, 29 CO FAILURES, 59.4% FAILURE RATE
1968-1974 VEHICLES: 65 HC FAILURES, 74 CO FAILURES, 40.7% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	12	1.23	2.23	0.69	1.50	9.8	318.3	3.5
BUICK	13	21.70	9.74	-5.86	-2.57	168.0	1167.4	-9.6
CADILLAC	6	0.00	0.00	0.00	0.00	0.0	0.0	0.0
CHEVROLET	64	4.60	4.74	2.04	-0.02	36.3	579.0	5.5
CHRYSLER	6	32.80	23.33	-2.68	-5.17	121.8	1258.9	-4.0
DATSUN	3	-36.35	-18.96	8.09	19.09	-111.3	-645.1	7.4
DODGE	16	4.62	3.39	4.95	-2.68	48.4	546.4	23.5
FORD	73	9.47	6.79	1.69	-1.08	55.1	591.9	4.1
MERCURY	11	13.10	14.55	-6.45	0.32	100.1	1765.3	-20.5
OLDSMOBILE	14	9.17	1.30	-3.44	-1.10	72.7	210.0	-6.0
OPEL	1	24.97	4.51	22.51	-4.71	49.1	184.1	21.7
PLYMOUTH	24	35.24	18.94	-14.02	-3.78	388.0	2585.8	-35.2
PONTIAC	21	-11.56	-9.36	7.39	2.36	-91.3	-899.4	21.5
TOYOTA	8	9.49	5.65	2.37	3.18	28.3	246.8	4.4
VOLKSWAGON	28	2.46	2.65	3.30	-0.26	14.3	210.5	6.0
VOLVO	0							
*MODEL YEAR								
1960	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1961	2	12.59	5.45	-13.98	-0.60	88.9	441.7	-14.4
1962	4	23.78	12.35	-1.02	-6.88	158.9	986.7	-1.7
1963	5	-48.27	-31.64	44.57	2.49	-307.8	-2070.1	52.6
1964	10	21.53	18.82	-16.59	-5.91	225.8	2848.9	-38.2
1965	13	12.56	9.43	-2.40	-1.81	152.2	1475.4	-4.4
1966	16	28.08	8.68	-1.70	-3.85	256.9	744.6	-1.9
1967	17	12.26	4.43	7.98	-2.49	58.4	332.4	11.0
1968	22	3.86	2.39	2.69	-0.12	17.3	181.1	5.2
1969	24	21.24	13.10	4.61	-1.84	142.1	1194.6	13.6
1970	25	4.90	6.46	-1.78	-0.06	34.8	743.5	-7.2
1971	34	1.06	3.44	0.82	2.12	7.3	371.8	3.6
1972	36	7.31	9.92	-3.89	0.03	45.1	1099.6	-11.9
1973	43	2.70	5.81	-0.29	0.32	19.4	776.8	-0.8
1974	47	5.49	-0.01	0.56	1.43	37.0	-1.3	1.4
*DISPLACEMENT								
LESS THAN 151	50	2.84	2.31	4.87	1.95	13.3	150.0	8.9
151 - 250	40	15.72	10.93	0.47	-2.18	70.3	785.5	0.8
251 - 350	127	13.00	6.99	-0.20	-0.82	116.3	891.4	-0.5
MORE THAN 350	83	3.78	3.39	-0.20	-0.60	28.4	423.2	-0.7
*INERTIA WEIGHT								
1800 - 2799	55	2.55	1.66	4.06	2.09	12.5	114.4	8.2
2800 - 3799	127	8.25	8.88	0.53	-1.40	57.7	959.9	1.2
3800 - 4799	105	13.86	5.37	-0.28	-1.01	107.2	594.6	-0.8
4800 - 5799	13	3.58	-4.43	-3.23	0.96	41.8	-1184.9	-18.8
*POPULATIONS								
1960 - 1967	69	14.23	6.55	2.07	-2.91	113.8	624.4	3.0
1968 - 1974	231	6.62	5.60	0.23	0.48	42.5	611.6	0.7
ALL VEHICLES	300	9.57	5.89	0.60	-0.28	66.6	615.9	1.5

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSIONS BEFORE INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	4.34	1.5	77.98	28.6	419.7	80.3	2.73	1.66	16.2
BUICK	13	8.58	6.9	132.90	82.2	468.6	126.4	1.82	1.23	12.7
CADILLAC	6	4.28	1.4	127.12	47.2	726.7	63.9	1.90	.28	9.5
CHEVROLET	55	6.72	4.2	101.66	44.6	467.8	109.1	2.23	1.17	14.2
CHRYSLER	6	7.89	4.0	114.70	38.4	547.8	69.8	3.14	1.04	11.9
DATSUN	3	4.98	1.3	55.36	3.9	243.2	23.7	1.49	.14	25.7
DODGE	15	6.63	4.3	97.32	17.5	458.9	66.5	3.10	1.13	14.2
FORD	66	6.35	2.4	93.45	32.8	483.7	111.3	2.76	1.38	14.3
MERCURY	11	6.47	2.8	102.70	58.5	520.6	110.3	2.69	1.66	13.0
OLDSMOBILE	11	8.36	5.3	167.80	137.1	523.0	85.8	1.69	1.06	11.5
OPEL	1	4.32	0.0	89.81	0.0	312.7	0.0	2.12	0.00	19.0
PLYMOUTH	24	9.80	16.3	121.48	41.2	436.7	83.6	2.24	1.11	13.8
PONTIAC	19	8.72	6.6	106.55	47.9	527.4	89.0	2.83	1.45	12.4
TOYOTA	5	4.21	0.6	62.11	18.8	286.5	38.2	2.64	.87	22.8
VOLKSWAGON	23	6.02	2.2	80.01	27.8	249.1	37.1	1.72	.80	22.8
VOLVO	0									
*MODEL YEAR										
1960	2	16.42	15.5	117.36	6.6	500.9	55.0	2.30	.15	12.0
1961	2	16.05	3.1	184.44	87.4	425.2	20.6	2.34	1.96	11.7
1962	4	11.87	7.7	142.07	90.1	452.2	103.9	2.98	1.86	12.6
1963	5	11.44	5.2	117.36	44.0	393.7	125.5	2.12	1.53	15.1
1964	10	8.95	2.9	129.13	37.8	370.8	78.5	1.97	.68	15.3
1965	13	10.17	5.3	131.33	48.9	330.6	72.8	1.52	.82	16.5
1966	15	15.79	20.2	139.02	45.1	394.6	71.7	1.99	1.32	13.9
1967	16	8.36	2.4	130.78	49.4	439.2	99.1	2.37	1.33	13.6
1968	22	6.13	1.5	103.77	42.8	480.0	112.2	2.63	1.08	14.1
1969	24	7.32	3.4	99.88	38.4	431.9	88.9	3.22	1.75	15.3
1970	25	5.21	1.6	84.41	36.3	471.9	101.5	2.96	1.12	15.0
1971	32	5.01	1.0	78.60	28.8	448.2	137.2	3.13	1.37	16.2
1972	28	5.24	1.7	97.46	41.8	491.8	136.8	2.57	.98	14.3
1973	35	5.60	3.2	104.85	84.2	503.5	148.9	2.04	1.23	14.2
1974	37	4.38	1.6	81.53	34.5	499.0	153.6	1.66	.62	15.1
*DISPLACEMENT										
LESS THAN 151	40	5.37	2.0	72.66	25.5	265.5	40.5	1.94	.79	22.7
151 - 250	38	6.12	3.9	96.26	49.4	372.4	61.8	2.50	1.44	16.6
251 - 350	115	7.92	8.3	110.06	45.0	467.9	74.1	2.26	1.22	13.5
MORE THAN 350	77	6.62	4.3	109.53	65.8	583.4	88.2	2.86	1.40	11.7
*INERTIA WEIGHT										
1800 - 2799	46	5.27	2.0	72.59	25.0	283.8	69.6	2.07	1.02	22.0
2800 - 3799	118	6.78	3.7	103.19	45.4	434.7	77.3	2.26	1.21	14.6
3800 - 4799	94	8.09	9.3	112.84	62.9	540.7	84.3	2.80	1.46	12.1
4800 - 5799	12	5.43	2.1	127.73	49.4	693.7	72.6	2.39	.81	9.8
*POPULATIONS										
1960 - 1967	67	11.37	10.5	133.36	48.4	396.7	92.6	2.08	1.21	14.4
1968 - 1974	203	5.45	2.3	92.22	48.9	477.4	131.9	2.53	1.30	14.9
ALL VEHICLES	270	6.92	6.1	102.43	51.8	457.4	128.0	2.42	1.29	14.8

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 12 HC FAILURES, 9 CO FAILURES, 9.4% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	4.34	1.5	77.98	28.6	419.7	80.3	2.73	1.66	16.2
BUICK	13	8.58	6.9	132.90	82.2	468.6	126.4	1.82	1.23	12.7
CADILLAC	6	4.28	1.4	127.12	47.2	726.7	63.9	1.90	.28	9.5
CHEVROLET	55	6.64	4.0	100.51	43.4	470.0	109.4	2.20	1.15	14.2
CHRYSLER	6	6.34	1.5	104.32	42.5	559.2	53.5	3.30	1.15	12.1
DATSUN	3	4.65	1.5	52.25	1.8	269.5	44.0	1.39	.30	24.4
DODGE	15	6.63	4.3	97.32	17.5	458.9	66.5	3.10	1.13	14.2
FORD	66	6.26	2.4	93.28	32.8	482.9	111.6	2.72	1.30	14.3
MERCURY	11	6.30	2.8	100.89	59.7	525.3	108.8	2.72	1.66	12.9
OLDSMOBILE	11	8.36	5.3	167.80	137.1	523.0	85.8	1.69	1.06	11.5
OPEL	1	3.24	0.0	85.76	0.0	301.5	0.0	1.64	0.00	19.9
PLYMOUTH	24	9.13	16.3	113.13	40.2	444.0	85.2	2.33	1.20	14.0
PONTIAC	19	8.55	6.6	101.84	47.3	530.3	89.2	2.90	1.55	12.5
TOYOTA	5	4.21	0.6	62.11	18.8	286.5	38.2	2.64	.87	22.8
VOLKSWAGON	23	6.01	2.2	79.65	28.0	249.4	36.7	1.73	.80	22.8
VOLVO	0									
*MODEL YEAR										
1960	2	16.42	15.5	117.36	6.6	500.9	55.0	2.30	.15	12.0
1961	2	16.05	3.1	184.44	87.4	425.2	20.6	2.34	1.96	11.7
1962	4	11.87	7.7	142.07	90.1	452.2	103.9	2.98	1.86	12.6
1963	5	11.44	5.2	117.36	44.0	393.7	125.5	2.12	1.53	15.1
1964	10	8.95	2.9	129.13	37.8	370.8	78.5	1.97	.68	15.3
1965	13	10.17	5.3	131.33	48.9	330.6	72.8	1.52	.82	16.5
1966	15	15.79	20.2	139.02	45.1	394.6	71.7	1.99	1.32	13.9
1967	16	8.36	2.4	130.78	49.4	439.2	99.1	2.37	1.33	13.6
1968	22	5.86	1.3	98.96	41.6	484.9	113.7	2.64	1.11	14.2
1969	24	6.17	1.6	91.28	33.9	438.6	91.4	3.15	1.63	15.6
1970	25	4.96	1.0	81.47	32.9	475.6	102.7	3.02	1.20	15.0
1971	32	5.00	1.0	78.55	28.8	448.2	137.2	3.13	1.37	16.2
1972	28	5.25	1.7	96.86	41.9	492.5	137.2	2.57	.98	14.3
1973	35	5.56	3.2	103.38	83.7	504.6	147.7	2.05	1.22	14.2
1974	37	4.33	1.6	81.17	34.7	500.8	150.8	1.64	.62	15.0
*DISPLACEMENT										
LESS THAN 151	40	5.31	2.0	72.12	25.6	267.3	40.3	1.92	.79	22.6
151 - 250	38	6.03	3.9	94.91	48.4	372.8	61.3	2.49	1.43	16.7
251 - 350	115	7.74	8.3	107.96	44.4	470.0	74.6	2.25	1.17	13.6
MORE THAN 350	77	6.40	4.1	107.53	65.9	585.5	86.0	2.89	1.42	11.7
*INERTIA WEIGHT										
1800 - 2799	46	5.22	2.0	72.12	25.2	285.4	69.1	2.06	1.03	21.9
2800 - 3799	118	6.64	3.7	101.43	44.6	435.6	77.8	2.24	1.20	14.7
3800 - 4799	94	7.83	9.2	110.29	62.9	544.0	82.0	2.82	1.44	12.2
4800 - 5799	12	5.43	2.1	127.73	49.4	693.7	72.6	2.39	.81	9.8
*POPULATIONS										
1960 - 1967	67	11.37	10.5	133.36	48.4	396.7	92.6	2.08	1.21	14.4
1968 - 1974	203	5.23	1.9	89.91	47.8	479.8	131.4	2.53	1.29	14.9
ALL VEHICLES	270	6.76	6.1	100.69	51.4	459.2	127.9	2.42	1.28	14.8

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 12 HC FAILURES, 9 CO FAILURES, 9.4% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
BUICK	13	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
CADILLAC	6	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
CHEVROLET	55	0.09	1.0	1.15	6.0	-2.2	17.5	0.03	.26	-0.0
CHRYSLER	6	1.55	3.6	10.37	27.7	-11.5	20.9	-0.16	.33	-0.2
DATSUN	3	0.33	0.6	3.11	5.4	-26.3	45.6	0.10	.17	1.3
DODGE	15	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
FORD	66	0.09	0.5	0.17	2.1	0.9	11.2	0.04	.32	-0.0
MERCURY	11	0.16	0.5	1.81	6.0	-4.7	15.6	-0.03	.09	0.0
OLDSMOBILE	11	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
OPEL	1	1.08	0.0	4.05	0.0	11.2	0.0	0.48	0.00	-0.9
PLYMOUTH	24	0.67	2.1	8.36	23.5	-7.2	21.2	-0.10	.36	-0.2
PONTIAC	19	0.17	0.9	4.71	17.0	-3.0	10.8	-0.07	.29	-0.1
TOYOTA	5	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
VOLKSWAGON	23	0.01	0.1	0.36	1.7	-0.3	1.3	-0.01	.03	-0.0
VOLVO	0									
*MODEL YEAR										
1960	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1961	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1962	4	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1963	5	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1964	10	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1965	13	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1966	15	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1967	16	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	22	0.27	1.1	4.81	16.6	-4.9	15.8	-0.01	.18	-0.1
1969	24	1.16	2.7	8.59	23.5	-6.8	37.1	0.07	.76	-0.2
1970	25	0.26	1.4	2.93	11.7	-3.7	12.7	-0.06	.26	-0.0
1971	32	0.01	0.0	0.05	0.3	-0.0	0.2	-0.00	.00	-0.0
1972	28	-0.01	0.1	0.60	3.2	-0.7	3.6	0.00	.00	-0.0
1973	35	0.04	0.2	1.47	8.7	-1.1	6.6	-0.01	.06	-0.0
1974	37	0.06	0.2	0.36	1.7	-1.8	13.2	0.02	.09	0.1
*DISPLACEMENT										
LESS THAN 151	40	0.06	0.2	0.54	2.0	-1.9	12.7	0.02	.09	0.1
151 - 250	38	0.09	0.4	1.35	8.4	-0.4	7.7	0.01	.13	-0.1
251 - 350	115	0.18	1.0	2.10	9.8	-2.1	16.5	0.02	.32	-0.0
MORE THAN 350	77	0.22	1.3	2.00	12.9	-2.1	11.9	-0.04	.22	-0.0
*INERTIA WEIGHT										
1800 - 2799	46	0.05	0.2	0.47	1.9	-1.6	11.8	0.01	.08	0.1
2800 - 3799	118	0.14	0.8	1.76	10.0	-0.9	8.5	0.01	.19	-0.1
3800 - 4799	94	0.26	1.5	2.55	12.5	-3.3	19.5	-0.02	.35	-0.0
4800 - 5799	12	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
*POPULATIONS										
1960 - 1967	67	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968 - 1974	203	0.21	1.1	2.31	11.4	-2.4	15.7	0.00	.28	-0.0
ALL VEHICLES	270	0.16	1.0	1.74	9.9	-1.8	13.7	0.00	.25	-0.0

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 12 HC FAILURES, 9 CO FAILURES, 9.4% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	12	0.00	0.00	0.00	0.00	0.0	0.0	0.0
BUICK	13	0.00	0.00	0.00	0.00	0.0	0.0	0.0
CADILLAC	6	0.00	0.00	0.00	0.00	0.0	0.0	0.0
CHEVROLET	55	1.28	1.13	1.38	-0.03	15.1	202.4	5.4
CHRYSLER	6	19.62	9.04	-5.26	-1.85	97.1	650.4	-10.3
DATSUN	3	6.71	5.62	6.45	5.07	59.0	548.7	17.0
DODGE	15	0.00	0.00	0.00	0.00	0.0	0.0	0.0
FORD	66	1.41	0.19	1.62	-0.25	17.8	34.4	8.9
MERCURY	11	2.54	1.77	-1.06	0.24	36.1	398.8	-6.3
OLDSMOBILE	11	0.00	0.00	0.00	0.00	0.0	0.0	0.0
OPEL	1	24.97	4.51	22.51	-4.71	49.1	184.1	21.7
PLYMOUTH	24	6.86	6.88	-4.25	-1.18	144.1	1790.8	-20.4
PONTIAC	19	1.95	4.42	-2.43	-0.82	28.8	798.6	-11.7
TOYOTA	5	0.00	0.00	0.00	0.00	0.0	0.0	0.0
VOLKSWAGON	23	0.18	0.45	-0.37	-0.12	2.5	82.6	-1.5
VOLVO	0							
*MODEL YEAR								
1960	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1961	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1962	4	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1963	5	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1964	10	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1965	13	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1966	15	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1967	16	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	22	4.34	4.64	-0.32	-0.66	22.1	400.2	-0.7
1969	24	15.83	8.60	2.09	-1.56	196.6	1457.6	11.4
1970	25	4.91	3.48	-1.98	-0.21	48.8	559.3	-11.2
1971	32	0.13	0.06	-0.03	-0.01	1.3	9.7	-0.2
1972	28	-0.26	0.61	0.01	-0.03	-3.3	143.0	0.1
1973	35	0.75	1.41	-0.48	-0.26	10.0	353.5	-2.3
1974	37	1.28	0.44	1.25	0.54	12.2	78.2	4.5
*DISPLACEMENT								
LESS THAN 151	40	1.09	0.74	0.80	0.27	12.2	113.3	3.2
151 - 250	38	1.43	1.40	0.36	-0.37	13.5	208.7	1.4
251 - 350	115	2.28	1.91	0.83	-0.28	35.9	417.9	3.7
MORE THAN 350	77	3.34	1.83	-1.24	-0.30	44.0	398.4	-7.1
*INERTIA WEIGHT								
1800 - 2799	46	0.96	0.65	0.65	0.24	10.9	100.6	2.9
2800 - 3799	118	2.03	1.70	0.64	-0.36	26.9	342.9	2.8
3800 - 4799	94	3.27	2.26	-0.75	-0.29	46.5	448.9	-3.7
4800 - 5799	12	0.00	0.00	0.00	0.00	0.0	0.0	0.0
*POPULATIONS								
1960 - 1967	67	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968 - 1974	203	3.93	2.50	0.07	-0.23	38.3	413.5	0.3
ALL VEHICLES	270	2.33	1.70	0.06	-0.18	31.0	334.4	0.3

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 26 HC FAILURES, 27 CO FAILURES, 20.2% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	4.34	1.5	77.98	28.6	419.7	80.3	2.73	1.66	16.2
BUICK	13	8.50	6.9	129.86	83.8	468.1	126.5	1.84	1.28	12.8
CADILLAC	6	4.28	1.4	127.12	47.2	726.7	63.9	1.90	.28	9.5
CHEVROLET	55	6.57	4.1	100.39	43.0	471.5	108.1	2.15	1.08	14.2
CHRYSLER	6	5.34	0.7	85.66	18.6	580.3	58.6	3.50	1.02	12.2
DATSUN	3	6.67	5.0	59.87	13.3	297.0	65.2	1.46	.38	22.3
DODGE	15	6.53	4.4	95.29	16.8	460.0	65.1	3.10	1.13	14.2
FORD	66	6.21	2.4	91.87	32.3	482.9	110.4	2.72	1.29	14.3
MERCURY	11	5.96	3.0	97.08	60.5	534.2	107.5	2.74	1.64	12.9
OLDSMOBILE	11	8.26	5.3	175.34	145.1	522.4	81.8	1.74	1.05	11.5
OPEL	1	3.24	0.0	85.76	0.0	301.5	0.0	1.64	0.00	19.9
PLYMOUTH	24	8.97	16.3	110.63	36.6	446.7	82.2	2.35	1.15	14.1
PONTIAC	19	8.55	6.6	101.84	47.3	530.3	89.2	2.90	1.55	12.5
TOYOTA	5	4.03	0.6	56.76	17.7	291.1	44.6	2.78	.79	23.0
VOLKSWAGON	23	6.01	2.2	80.24	27.4	249.6	36.9	1.71	.78	22.8
VOLVO	0									
*MODEL YEAR										
1960	2	16.42	15.5	117.36	6.6	500.9	55.0	2.30	.15	12.0
1961	2	16.05	3.1	184.44	87.4	425.2	20.6	2.34	1.96	11.7
1962	4	11.87	7.7	142.07	90.1	452.2	103.9	2.98	1.86	12.6
1963	5	11.44	5.2	117.36	44.0	393.7	125.5	2.12	1.53	15.1
1964	10	8.95	2.9	129.13	37.8	370.8	78.5	1.97	.68	15.3
1965	13	10.17	5.3	131.33	48.9	330.6	72.8	1.52	.82	16.5
1966	15	15.79	20.2	139.02	45.1	394.6	71.7	1.99	1.32	13.9
1967	16	8.36	2.4	130.78	49.4	439.2	99.1	2.37	1.33	13.6
1968	22	5.81	1.3	98.26	42.0	485.0	114.0	2.63	1.10	14.2
1969	24	6.06	1.6	88.64	31.5	441.6	91.9	3.10	1.52	15.6
1970	25	4.87	1.0	80.31	32.5	477.5	102.2	3.03	1.19	15.0
1971	32	4.99	1.0	77.35	28.1	450.0	137.4	3.12	1.36	16.2
1972	28	4.96	1.3	90.75	34.7	499.3	134.8	2.63	.97	14.4
1973	35	5.52	3.4	101.30	83.3	507.1	143.0	2.07	1.22	14.1
1974	37	4.23	1.5	83.85	47.6	501.7	150.3	1.64	.61	14.9
*DISPLACEMENT										
LESS THAN 151	40	5.35	2.3	72.03	25.4	271.8	44.8	1.92	.79	22.4
151 - 250	38	5.91	3.8	92.43	45.5	374.8	60.1	2.47	1.33	16.7
251 - 350	115	7.70	8.3	107.10	44.5	470.6	74.7	2.25	1.17	13.6
MORE THAN 350	77	6.25	4.1	106.31	68.8	587.6	84.8	2.91	1.41	11.7
*INERTIA WEIGHT										
1800 - 2799	46	5.26	2.3	72.05	25.0	289.3	70.5	2.06	1.03	21.8
2800 - 3799	118	6.52	3.7	99.10	43.6	437.1	77.1	2.24	1.16	14.7
3800 - 4799	94	7.76	9.2	108.78	62.6	545.9	82.7	2.83	1.44	12.2
4800 - 5799	12	5.40	2.0	138.47	69.9	690.4	77.8	2.40	.78	9.7
*POPULATIONS										
1960 - 1967	67	11.37	10.5	133.36	48.4	396.7	92.6	2.08	1.21	14.4
1968 - 1974	203	5.14	1.9	88.48	48.5	482.2	130.1	2.54	1.26	14.9
ALL VEHICLES	270	6.69	6.1	99.61	52.1	461.0	127.2	2.42	1.26	14.8

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 26 HC FAILURES, 27 CO FAILURES, 20.2% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
BUICK	13	0.08	0.3	3.03	8.7	0.5	2.7	-0.02	.07	-0.1
CADILLAC	6	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
CHEVROLET	55	0.16	1.0	1.27	7.4	-3.6	18.2	0.07	.34	0.0
CHRYSLER	6	2.55	3.4	29.04	35.0	-32.6	38.7	-0.37	.46	-0.4
DATSUN	3	-1.69	3.8	-4.51	16.6	-53.9	46.7	0.03	.25	3.5
DODGE	15	0.09	0.4	2.03	7.8	-1.1	4.3	-0.00	.01	-0.1
FORD	66	0.14	0.5	1.58	6.9	0.8	14.4	0.04	.32	-0.1
MERCURY	11	0.50	0.9	5.62	10.3	-13.7	23.5	-0.05	.11	0.1
OLDSMOBILE	11	0.10	0.2	-7.54	42.6	0.7	16.3	-0.06	.14	0.1
OPEL	1	1.08	0.0	4.05	0.0	11.2	0.0	0.48	0.00	-0.9
PLYMOUTH	24	0.83	2.1	10.85	27.6	-9.9	23.0	-0.12	.40	-0.2
PONTIAC	19	0.17	0.9	4.71	17.0	-3.0	10.8	-0.07	.29	-0.1
TOYOTA	5	0.19	0.4	5.35	12.0	-4.6	10.2	-0.14	.30	-0.2
VOLKSWAGON	23	0.02	0.1	-0.23	3.4	-0.5	1.7	0.01	.09	0.0
VOLVO	0									
*MODEL YEAR										
1960	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1961	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1962	4	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1963	5	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1964	10	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1965	13	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1966	15	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1967	16	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	22	0.32	1.1	5.51	18.1	-5.0	16.1	-0.01	.20	-0.1
1969	24	1.27	2.7	11.23	25.2	-9.8	37.7	0.12	.84	-0.2
1970	25	0.34	1.4	4.10	12.8	-5.6	15.4	-0.07	.26	-0.0
1971	32	0.02	0.1	1.25	6.4	-1.8	7.2	0.01	.03	0.0
1972	28	0.27	0.9	6.71	19.7	-7.5	21.7	-0.06	.28	-0.1
1973	35	0.08	1.3	3.55	13.5	-3.6	19.1	-0.04	.13	0.1
1974	37	0.15	0.4	-2.32	22.2	-2.7	17.1	0.02	.12	0.1
*DISPLACEMENT										
LESS THAN 151	40	0.02	1.1	0.63	7.6	-6.3	18.7	0.01	.19	0.3
151 - 250	38	0.21	0.7	3.83	15.5	-2.4	11.7	0.03	.33	-0.1
251 - 350	115	0.22	1.1	2.96	11.4	-2.7	17.0	0.01	.32	-0.1
MORE THAN 350	77	0.37	1.4	3.22	22.6	-4.2	20.3	-0.06	.25	-0.0
*INERTIA WEIGHT										
1800 - 2799	46	0.02	1.0	0.55	7.1	-5.5	17.5	0.01	.17	0.2
2800 - 3799	118	0.25	0.9	4.09	14.0	-2.4	13.5	0.01	.26	-0.1
3800 - 4799	94	0.33	1.5	4.05	15.4	-5.1	22.2	-0.03	.37	-0.0
4800 - 5799	12	0.03	0.1	-10.75	37.2	3.3	11.5	-0.01	.05	0.1
*POPULATIONS										
1960 - 1967	67	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968 - 1974	203	0.31	1.3	3.74	17.9	-4.8	20.2	-0.00	.33	-0.0
ALL VEHICLES	270	0.23	1.1	2.81	15.6	-3.6	17.6	-0.00	.29	-0.0

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 26 HC FAILURES, 27 CO FAILURES, 20.2% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	12	0.00	0.00	0.00	0.00	0.0	0.0	0.0
BUICK	13	0.96	2.28	-1.30	-0.94	10.7	395.1	-3.1
CADILLAC	6	0.00	0.00	0.00	0.00	0.0	0.0	0.0
CHEVROLET	55	2.33	1.25	3.35	0.33	24.0	195.1	11.4
CHRYSLER	6	32.29	25.32	-11.73	-3.12	138.3	1575.7	-20.0
DATSUN	3	-33.98	-8.15	1.76	13.41	-267.2	-712.7	4.1
DODGE	15	1.40	2.08	-0.09	-0.48	22.0	478.7	-0.7
FORD	66	2.18	1.69	1.50	-0.53	26.7	305.6	8.0
MERCURY	11	7.79	5.47	-2.02	0.49	70.0	779.9	-7.5
OLDSMOBILE	11	1.22	-4.50	-3.36	0.54	21.1	-1565.8	-11.8
OPEL	1	24.97	4.51	22.51	-4.71	49.1	184.1	21.7
PLYMOUTH	24	8.44	8.93	-5.33	-1.61	157.9	2073.2	-22.8
PONTIAC	19	1.95	4.42	-2.43	-0.82	28.8	798.6	-11.7
TOYOTA	5	4.48	8.61	-5.14	-0.87	37.0	1048.9	-26.6
VOLKSWAGON	23	0.25	-0.29	0.64	0.18	3.2	-49.1	2.4
VOLVO	0							
*MODEL YEAR								
1960	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1961	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1962	4	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1963	5	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1964	10	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1965	13	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1966	15	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1967	16	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	22	5.22	5.31	-0.22	-0.90	25.7	443.0	-0.5
1969	24	17.32	11.25	3.65	-1.62	167.4	1482.4	15.5
1970	25	6.48	4.86	-2.30	-0.24	53.4	649.1	-10.8
1971	32	0.31	1.59	0.18	0.06	2.9	236.9	1.1
1972	28	5.24	6.88	-2.47	-0.65	41.8	1020.8	-9.6
1973	35	1.43	3.38	-1.81	0.56	16.7	737.4	-7.7
1974	37	3.46	-2.85	1.49	0.98	30.0	-459.6	4.9
*DISPLACEMENT								
LESS THAN 151	40	0.37	0.87	0.76	1.20	3.6	114.4	2.7
151 - 250	38	3.49	3.98	1.10	-0.70	28.2	505.2	3.6
251 - 350	115	2.72	2.69	0.66	-0.42	38.6	531.3	2.7
MORE THAN 350	77	5.66	2.94	-1.97	-0.41	65.4	563.0	-9.8
*INERTIA WEIGHT								
1800 - 2799	46	0.33	0.75	0.62	1.08	3.3	103.1	2.4
2800 - 3799	118	3.76	3.96	0.53	-0.69	43.4	696.2	2.0
3800 - 4799	94	4.11	3.59	-1.07	-0.36	52.0	632.7	-4.7
4800 - 5799	12	0.52	-8.41	-0.55	1.26	6.6	-2528.3	-3.1
*POPULATIONS								
1960 - 1967	67	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968 - 1974	203	5.65	4.06	-0.19	-0.12	47.3	574.5	-0.7
ALL VEHICLES	270	3.35	2.75	-0.15	-0.09	39.3	477.7	-0.6

AUTOMOTIVE TESTING LABORATORIES,INC.
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EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 41 HC FAILURES, 40 CO FAILURES, 30.0% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	4.33	1.5	77.86	28.6	420.1	80.0	2.69	1.66	16.2
BUICK	13	8.50	6.9	129.86	83.8	468.1	126.5	1.84	1.28	12.8
CADILLAC	6	4.28	1.4	127.12	47.2	726.7	63.9	1.90	.28	9.5
CHEVROLET	55	6.58	4.0	99.50	43.5	473.0	108.0	2.16	1.08	14.2
CHRYSLER	6	5.34	0.7	85.66	18.6	580.3	58.6	3.50	1.02	12.2
DATSUN	3	6.79	4.9	65.86	13.5	307.7	48.0	1.37	.37	20.8
DODGE	15	6.59	4.4	95.62	17.6	456.7	66.5	3.03	1.13	14.3
FORD	66	6.17	2.4	91.22	32.8	483.1	110.4	2.72	1.29	14.4
MERCURY	11	5.77	2.9	90.35	52.2	546.1	114.2	2.84	1.72	12.8
OLDSMOBILE	11	8.26	5.3	175.34	145.1	522.4	81.8	1.74	1.05	11.5
OPEL	1	3.24	0.0	85.76	0.0	301.5	0.0	1.64	0.00	19.9
PLYMOUTH	24	8.84	16.4	106.66	35.3	448.9	87.7	2.39	1.16	14.1
PONTIAC	19	8.66	6.6	105.93	51.3	532.3	91.7	2.79	1.55	12.3
TOYOTA	5	3.77	0.2	52.83	20.9	309.1	29.3	2.98	1.12	22.2
VOLKSWAGON	23	5.95	2.3	80.04	27.4	249.9	36.9	1.73	.78	22.8
VOLVO	0									
*MODEL YEAR										
1960	2	16.42	15.5	117.36	6.6	500.9	55.0	2.30	.15	12.0
1961	2	16.05	3.1	184.44	87.4	425.2	20.6	2.34	1.96	11.7
1962	4	11.87	7.7	142.07	90.1	452.2	103.9	2.98	1.86	12.6
1963	5	11.44	5.2	117.36	44.0	393.7	125.5	2.12	1.53	15.1
1964	10	8.95	2.9	129.13	37.8	370.8	78.5	1.97	.68	15.3
1965	13	10.17	5.3	131.33	48.9	330.6	72.8	1.52	.82	16.5
1966	15	15.79	20.2	139.02	45.1	394.6	71.7	1.99	1.32	13.9
1967	16	8.36	2.4	130.78	49.4	439.2	99.1	2.37	1.33	13.6
1968	22	5.89	1.4	101.28	43.6	486.5	114.2	2.56	1.15	14.1
1969	24	5.95	1.5	88.31	33.7	440.9	90.8	3.02	1.49	15.6
1970	25	4.96	1.1	79.45	33.5	480.1	102.0	3.04	1.20	14.9
1971	32	4.96	1.1	76.08	26.0	453.6	133.8	3.11	1.38	16.0
1972	28	4.81	1.2	87.60	29.7	504.5	136.7	2.70	1.07	14.4
1973	35	5.47	3.4	99.59	83.0	508.0	144.7	2.10	1.23	14.1
1974	37	4.20	1.5	82.92	48.4	502.4	151.0	1.65	.64	15.0
*DISPLACEMENT										
LESS THAN 151	40	5.30	2.3	71.88	25.8	275.0	44.2	1.95	.86	22.2
151 - 250	38	5.89	3.8	91.57	45.3	375.3	61.6	2.47	1.33	16.8
251 - 350	115	7.72	8.3	106.93	44.8	471.2	74.9	2.23	1.15	13.6
MORE THAN 350	77	6.18	4.1	104.66	68.9	590.0	86.1	2.93	1.44	11.7
*INERTIA WEIGHT										
1800 - 2799	46	5.21	2.3	71.91	25.3	292.1	69.4	2.08	1.07	21.6
2800 - 3799	118	6.51	3.7	98.16	44.0	437.9	77.9	2.24	1.16	14.7
3800 - 4799	94	7.75	9.2	108.68	63.2	546.9	83.4	2.81	1.44	12.1
4800 - 5799	12	5.22	1.9	133.60	67.1	696.5	78.1	2.48	.95	9.7
*POPULATIONS										
1960 - 1967	67	11.37	10.5	133.36	48.4	396.7	92.6	2.08	1.21	14.4
1968 - 1974	203	5.11	1.9	87.56	48.3	484.2	130.2	2.54	1.27	14.9
ALL VEHICLES	270	6.66	6.1	98.92	52.2	462.5	127.6	2.42	1.27	14.8

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 41 HC FAILURES, 40 CO FAILURES, 30.0% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	0.01	0.1	0.13	0.4	-0.4	1.3	0.04	.13	0.0
BUICK	13	0.08	0.3	3.03	8.7	0.5	2.7	-0.02	.07	-0.1
CADILLAC	6	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
CHEVROLET	55	0.14	1.1	2.16	8.4	-5.2	19.3	0.06	.35	0.1
CHRYSLER	6	2.55	3.4	29.04	35.0	-32.6	38.7	-0.37	.46	-0.4
DATSUN	3	-1.81	3.8	-10.50	17.3	-64.5	28.3	0.12	.29	4.9
DODGE	15	0.04	0.5	1.70	11.0	2.3	13.3	0.07	.20	-0.1
FORD	66	0.18	0.6	2.23	8.6	0.6	14.4	0.04	.32	-0.1
MERCURY	11	0.69	1.0	12.35	18.4	-25.5	30.1	-0.15	.29	0.1
OLDSMOBILE	11	0.10	0.2	-7.54	42.6	0.7	16.3	-0.06	.14	0.1
OPEL	1	1.08	0.0	4.05	0.0	11.2	0.0	0.48	0.00	-0.9
PLYMOUTH	24	0.96	2.1	14.82	28.9	-12.2	26.1	-0.16	.42	-0.3
PONTIAC	19	0.06	1.1	0.62	27.2	-4.9	14.0	0.04	.56	0.1
TOYOTA	5	0.44	0.5	9.28	11.0	-22.6	25.5	-0.34	.42	0.6
VOLKSWAGON	23	0.07	0.2	-0.03	3.5	-0.8	4.6	-0.01	.12	0.0
VOLVO	0									
*MODEL YEAR										
1960	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1961	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1962	4	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1963	5	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1964	10	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1965	13	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1966	15	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1967	16	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	22	0.24	1.2	2.48	23.9	-6.5	16.7	0.07	.34	-0.0
1969	24	1.37	2.7	11.57	29.1	-9.1	39.8	0.20	.89	-0.3
1970	25	0.25	1.6	4.96	12.9	-8.2	17.5	-0.08	.26	0.0
1971	32	0.05	0.2	2.52	8.7	-5.4	17.8	0.01	.09	0.2
1972	28	0.42	1.0	9.86	21.9	-12.7	25.7	-0.13	.36	-0.1
1973	35	0.13	1.3	5.27	16.5	-4.5	20.4	-0.07	.18	0.0
1974	37	0.18	0.4	-1.39	23.0	-3.4	17.5	0.01	.15	0.1
*DISPLACEMENT										
LESS THAN 151	40	0.08	1.1	0.78	8.4	-9.5	21.3	-0.01	.25	0.5
151 - 250	38	0.24	0.7	4.69	15.7	-2.9	14.8	0.03	.34	-0.1
251 - 350	115	0.20	1.1	3.13	12.8	-3.3	18.9	0.03	.36	-0.1
MORE THAN 350	77	0.44	1.5	4.88	26.3	-6.5	22.5	-0.07	.32	-0.1
*INERTIA WEIGHT										
1800 - 2799	46	0.07	1.0	0.68	7.9	-8.3	20.1	-0.01	.23	0.4
2800 - 3799	118	0.27	1.0	5.03	14.8	-3.2	16.4	0.02	.28	-0.1
3800 - 4799	94	0.34	1.5	4.15	19.1	-6.2	22.9	-0.02	.43	-0.0
4800 - 5799	12	0.21	0.6	-5.88	42.2	-2.9	25.2	-0.09	.28	0.1
*POPULATIONS										
1960 - 1967	67	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968 - 1974	203	0.34	1.4	4.66	20.2	-6.8	22.7	-0.01	.39	0.0
ALL VEHICLES	270	0.26	1.2	3.50	17.6	-5.1	19.9	-0.00	.33	0.0

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 41 HC FAILURES, 40 CO FAILURES, 30.0% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	12	0.33	0.16	1.38	0.03	3.0	26.0	7.8
BUICK	13	0.96	2.28	-1.30	-0.94	10.7	395.1	-3.1
CADILLAC	6	0.00	0.00	0.00	0.00	0.0	0.0	0.0
CHEVROLET	55	2.10	2.13	2.91	0.40	20.4	313.3	9.4
CHRYSLER	6	32.29	25.32	-11.73	-3.12	138.3	1575.7	-20.0
DATSUN	3	-36.35	-18.96	8.09	19.09	-111.3	-645.1	7.4
DODGE	15	0.54	1.75	2.13	-1.00	7.1	335.5	13.0
FORD	66	2.81	2.39	1.48	-0.69	34.2	427.9	7.8
MERCURY	11	10.70	12.03	-5.63	0.81	85.3	1522.8	-18.7
OLDSMOBILE	11	1.22	-4.50	-3.36	0.54	21.1	-1565.8	-11.8
OPEL	1	24.97	4.51	22.51	-4.71	49.1	184.1	21.7
PLYMOUTH	24	9.81	12.20	-7.11	-2.14	170.6	2632.2	-28.2
PONTIAC	19	0.72	0.58	1.54	0.45	8.8	86.8	6.1
TOYOTA	5	10.43	14.94	-12.89	2.79	62.1	1310.3	-48.1
VOLKSWAGON	23	1.22	-0.04	-0.32	0.09	15.0	-6.7	-1.1
VOLVO	0							
*MODEL YEAR								
1960	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1961	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1962	4	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1963	5	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1964	10	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1965	13	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1966	15	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1967	16	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	22	3.86	2.39	2.69	-0.12	17.3	181.1	5.2
1969	24	18.73	11.58	6.28	-1.81	162.7	1371.7	24.0
1970	25	4.75	5.87	-2.81	0.06	36.1	723.3	-12.1
1971	32	1.01	3.21	0.35	1.32	7.4	368.6	1.6
1972	28	8.11	10.11	-5.18	-0.52	60.1	1394.2	-18.8
1973	35	2.32	5.02	-3.33	0.23	26.0	1053.8	-13.6
1974	37	4.16	-1.71	0.54	0.89	35.5	-271.6	1.8
*DISPLACEMENT								
LESS THAN 151	40	1.42	1.08	-0.69	2.09	11.5	118.0	-2.0
151 - 250	38	3.87	4.87	1.31	-0.77	29.3	580.3	4.1
251 - 350	115	2.52	2.85	1.38	-0.37	33.8	529.8	5.3
MORE THAN 350	77	6.69	4.45	-2.45	-0.48	72.3	795.9	-11.4
*INERTIA WEIGHT								
1800 - 2799	46	1.25	0.94	-0.56	1.88	10.5	108.2	-1.8
2800 - 3799	118	3.95	4.88	0.79	-0.80	42.5	799.7	2.8
3800 - 4799	94	4.21	3.68	-0.59	-0.21	50.2	613.3	-2.4
4800 - 5799	12	3.82	-4.60	-3.90	1.07	44.8	-1270.3	-20.1
*POPULATIONS								
1960 - 1967	67	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968 - 1974	203	6.25	5.05	-0.21	0.13	47.4	649.0	-0.7
ALL VEHICLES	270	3.70	3.42	-0.17	0.10	40.1	548.1	-0.6

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EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 63 HC FAILURES, 61 CO FAILURES, 39.9% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	4.31	1.5	76.82	27.7	423.6	80.7	2.70	1.65	16.1
BUICK	13	8.46	6.9	129.38	83.8	472.7	127.7	1.87	1.29	12.8
CADILLAC	6	4.28	1.4	127.12	47.2	726.7	63.9	1.90	.28	9.5
CHEVROLET	55	6.57	4.1	99.20	43.7	473.6	108.0	2.17	1.08	14.2
CHRYSLER	6	5.34	0.7	85.66	18.6	580.3	58.6	3.50	1.02	12.2
DATSUN	3	6.79	4.9	65.86	13.5	307.7	48.0	1.37	.37	20.8
DODGE	15	6.32	4.3	93.05	19.0	453.7	69.8	3.01	1.12	14.5
FORD	66	6.11	2.3	89.90	31.2	485.1	109.9	2.71	1.28	14.3
MERCURY	11	5.77	2.9	90.35	52.2	546.1	114.2	2.84	1.72	12.8
OLDSMOBILE	11	8.26	5.3	175.34	145.1	522.4	81.8	1.74	1.05	11.5
OPEL	1	3.24	0.0	85.76	0.0	301.5	0.0	1.64	0.00	19.9
PLYMOUTH	24	8.80	16.4	105.49	35.3	449.2	87.8	2.39	1.17	14.2
PONTIAC	19	8.66	6.6	105.93	51.3	532.3	91.7	2.79	1.55	12.3
TOYOTA	5	3.77	0.2	52.83	20.9	309.1	29.3	2.98	1.12	22.2
VOLKSWAGON	23	6.02	2.7	80.15	26.8	250.6	38.5	1.75	.80	22.7
VOLVO	0									
*MODEL YEAR										
1960	2	16.42	15.5	117.36	6.6	500.9	55.0	2.30	.15	12.0
1961	2	16.05	3.1	184.44	87.4	425.2	20.6	2.34	1.96	11.7
1962	4	11.87	7.7	142.07	90.1	452.2	103.9	2.98	1.86	12.6
1963	5	11.44	5.2	117.36	44.0	393.7	125.5	2.12	1.53	15.1
1964	10	8.95	2.9	129.13	37.8	370.8	78.5	1.97	.68	15.3
1965	13	10.17	5.3	131.33	48.9	330.6	72.8	1.52	.82	16.5
1966	15	15.79	20.2	139.02	45.1	394.6	71.7	1.99	1.32	13.9
1967	16	8.36	2.4	130.78	49.4	439.2	99.1	2.37	1.33	13.6
1968	22	5.89	1.4	101.28	43.6	486.5	114.2	2.56	1.15	14.1
1969	24	5.77	1.2	86.80	33.1	444.0	92.7	3.07	1.49	15.6
1970	25	4.96	1.1	78.96	33.8	480.3	101.7	3.01	1.20	15.0
1971	32	4.95	1.1	75.22	25.3	454.7	132.6	3.09	1.36	16.0
1972	28	4.72	1.0	85.83	27.2	505.3	138.0	2.70	1.05	14.4
1973	35	5.47	3.5	97.81	82.2	509.0	145.0	2.10	1.23	14.2
1974	37	4.17	1.5	82.95	48.6	504.4	149.7	1.68	.65	14.8
*DISPLACEMENT										
LESS THAN 151	40	5.36	2.6	72.12	25.3	276.1	45.2	1.95	.86	22.1
151 - 250	38	5.88	3.9	91.32	45.1	374.7	61.7	2.46	1.33	16.8
251 - 350	115	7.68	8.3	105.92	45.0	473.2	75.4	2.24	1.14	13.6
MORE THAN 350	77	6.10	4.0	103.73	68.6	589.9	86.2	2.93	1.44	11.8
*INERTIA WEIGHT										
1800 - 2799	46	5.27	2.5	72.13	24.8	293.1	69.7	2.09	1.07	21.5
2800 - 3799	118	6.47	3.7	97.17	44.1	438.9	78.8	2.23	1.14	14.7
3800 - 4799	94	7.68	9.2	107.84	62.9	547.8	82.9	2.82	1.45	12.2
4800 - 5799	12	5.22	1.9	133.60	67.1	696.5	78.1	2.48	.95	9.7
*POPULATIONS										
1960 - 1967	67	11.37	10.5	133.36	48.4	396.7	92.6	2.08	1.21	14.4
1968 - 1974	203	5.06	1.9	86.64	47.9	485.4	130.1	2.54	1.27	14.9
ALL VEHICLES	270	6.63	6.1	98.23	52.0	463.4	127.6	2.42	1.27	14.8

AUTOMOTIVE TESTING LABORATORIES,INC.
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EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 63 HC FAILURES, 61 CO FAILURES, 39.9% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	0.04	0.1	1.16	3.6	-3.9	12.0	0.03	.14	0.0
BUICK	13	0.12	0.3	3.52	8.7	-4.1	17.0	-0.06	.13	-0.1
CADILLAC	6	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
CHEVROLET	55	0.15	1.1	2.46	8.6	-5.8	19.6	0.06	.35	0.1
CHRYSLER	6	2.55	3.4	29.04	35.0	-32.6	38.7	-0.37	.46	-0.4
DATSUN	3	-1.81	3.8	-10.50	17.3	-64.5	28.3	0.12	.29	4.9
DODGE	15	0.31	0.9	4.27	12.1	5.3	15.5	0.09	.35	-0.4
FORD	66	0.24	0.8	3.55	14.5	-1.4	17.4	0.05	.35	-0.1
MERCURY	11	0.69	1.0	12.35	18.4	-25.5	30.1	-0.15	.29	0.1
OLDSMOBILE	11	0.10	0.2	-7.54	42.6	0.7	16.3	-0.06	.14	0.1
OPEL	1	1.08	0.0	4.05	0.0	11.2	0.0	0.48	0.00	-0.9
PLYMOUTH	24	1.00	2.1	16.00	28.6	-12.4	26.0	-0.16	.42	-0.3
PONTIAC	19	0.06	1.1	0.62	27.2	-4.9	14.0	0.04	.56	0.1
TOYOTA	5	0.44	0.5	9.28	11.0	-22.6	25.5	-0.34	.42	0.6
VOLKSWAGON	23	0.00	1.0	-0.14	4.4	-1.5	10.4	-0.03	.18	0.1
VOLVO	0									
*MODEL YEAR										
1960	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1961	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1962	4	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1963	5	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1964	10	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1965	13	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1966	15	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1967	16	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	22	0.24	1.2	2.48	23.9	-6.5	16.7	0.07	.34	-0.0
1969	24	1.56	2.7	13.08	28.8	-12.1	40.9	0.15	.92	-0.3
1970	25	0.26	1.6	5.45	13.6	-8.4	19.3	-0.05	.32	-0.0
1971	32	0.06	0.3	3.38	9.3	-6.6	19.5	0.03	.23	0.3
1972	28	0.52	1.0	11.62	22.4	-13.5	27.1	-0.14	.36	-0.1
1973	35	0.13	1.5	7.04	16.9	-5.5	22.0	-0.06	.20	-0.0
1974	37	0.21	0.7	-1.43	26.7	-5.4	19.1	-0.02	.19	0.2
*DISPLACEMENT										
LESS THAN 151	40	0.01	1.3	0.54	8.8	-10.6	22.4	-0.02	.27	0.6
151 - 250	38	0.24	0.7	4.93	15.7	-2.3	15.4	0.04	.34	-0.2
251 - 350	115	0.24	1.2	4.14	15.5	-5.4	21.1	0.02	.38	-0.0
MORE THAN 350	77	0.52	1.5	5.80	26.4	-6.4	22.7	-0.07	.35	-0.1
*INERTIA WEIGHT										
1800 - 2799	46	0.01	1.2	0.47	8.2	-9.3	21.1	-0.01	.25	0.5
2800 - 3799	118	0.31	1.0	6.02	17.0	-4.2	18.5	0.02	.31	-0.1
3800 - 4799	94	0.41	1.6	5.00	19.3	-7.1	23.5	-0.03	.44	-0.0
4800 - 5799	12	0.21	0.6	-5.88	42.2	-2.9	25.2	-0.09	.28	0.1
*POPULATIONS										
1960 - 1967	67	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968 - 1974	203	0.38	1.5	5.58	21.3	-8.0	24.0	-0.01	.41	0.0
ALL VEHICLES	270	0.29	1.3	4.19	16.6	-6.0	21.1	-0.01	.35	0.0

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 63 HC FAILURES, 61 CO FAILURES, 39.9% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	12	0.83	1.49	0.97	0.30	7.1	228.2	5.2
BUICK	13	1.42	2.65	-3.08	-0.43	14.7	426.3	-6.8
CADILLAC	6	0.00	0.00	0.00	0.00	0.0	0.0	0.0
CHEVROLET	55	2.29	2.42	2.51	0.41	22.2	353.8	8.1
CHRYSLER	6	32.29	25.32	-11.73	-3.12	138.3	1575.7	-20.0
DATSUN	3	-36.35	-18.96	8.09	19.09	-111.3	-645.1	7.4
DODGE	15	4.63	4.39	2.85	-2.57	52.6	732.3	15.1
FORD	66	3.72	3.80	1.71	-0.42	37.0	556.7	7.4
MERCURY	11	10.70	12.03	-5.63	0.81	85.3	1522.8	-18.7
OLDSMOBILE	11	1.22	-4.50	-3.36	0.54	21.1	-1565.8	-11.8
OPEL	1	24.97	4.51	22.51	-4.71	49.1	184.1	21.7
PLYMOUTH	24	10.22	13.17	-7.11	-2.38	165.7	2645.1	-26.3
PONTIAC	19	0.72	0.58	1.54	0.45	8.8	86.8	6.1
TOYOTA	5	10.43	14.94	-12.89	2.79	62.1	1310.3	-48.1
VOLKSWAGON	23	0.03	-0.17	-1.48	0.53	0.4	-25.2	-4.7
VOLVO	0							
*MODEL YEAR								
1960	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1961	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1962	4	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1963	5	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1964	10	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1965	13	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1966	15	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1967	16	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	22	3.86	2.39	2.69	-0.12	17.3	181.1	5.2
1969	24	21.24	13.10	4.61	-1.84	142.1	1194.6	13.6
1970	25	4.90	6.46	-1.78	-0.06	34.8	743.5	-7.2
1971	32	1.22	4.30	1.04	1.61	8.3	460.4	4.4
1972	28	9.88	11.93	-5.30	-0.89	70.1	1576.5	-18.5
1973	35	2.38	6.72	-2.95	-0.04	24.6	1299.0	-11.1
1974	37	4.83	-1.75	-1.21	1.62	38.7	-261.2	-3.7
*DISPLACEMENT								
LESS THAN 151	40	0.16	0.74	-0.88	2.62	1.2	77.1	-2.4
151 - 250	38	3.98	5.13	1.47	-0.94	29.5	598.7	4.5
251 - 350	115	3.06	3.76	1.03	-0.31	38.8	664.4	3.7
MORE THAN 350	77	7.93	5.29	-2.37	-0.76	75.1	829.7	-9.7
*INERTIA WEIGHT								
1800 - 2799	46	0.14	0.65	-0.72	2.35	1.1	71.0	-2.2
2800 - 3799	118	4.54	5.84	0.97	-0.88	46.5	910.4	3.3
3800 - 4799	94	5.09	4.43	-0.99	-0.31	54.7	663.9	-3.7
4800 - 5799	12	3.82	-4.60	-3.90	1.07	44.8	-1270.3	-20.1
*POPULATIONS								
1960 - 1967	67	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968 - 1974	203	7.04	6.05	-0.35	0.21	49.3	716.2	-1.1
ALL VEHICLES	270	4.17	4.09	-0.28	0.16	42.1	612.4	-1.0

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 59 HC FAILURES, 64 CO FAILURES, 40.4% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	4.32	1.5	78.24	28.3	428.3	73.9	2.72	1.64	15.8
BUICK	13	8.46	6.9	129.38	83.8	472.7	127.7	1.87	1.29	12.8
CADILLAC	6	4.28	1.4	127.12	47.2	726.7	63.9	1.90	.28	9.5
CHEVROLET	55	6.57	4.1	99.20	43.7	473.6	108.0	2.17	1.08	14.2
CHRYSLER	6	5.34	0.7	85.66	18.6	580.3	58.6	3.50	1.02	12.2
DATSUN	3	6.79	4.9	65.86	13.5	307.7	48.0	1.37	.37	20.8
DODGE	15	6.32	4.3	93.05	19.0	453.7	69.8	3.01	1.12	14.5
FORD	66	6.11	2.3	89.90	31.2	485.1	109.9	2.71	1.28	14.3
MERCURY	11	5.77	2.9	90.35	52.2	546.1	114.2	2.84	1.72	12.8
OLDSMOBILE	11	8.26	5.3	175.34	145.1	522.4	81.8	1.74	1.05	11.5
OPEL	1	3.24	0.0	85.76	0.0	301.5	0.0	1.64	0.00	19.9
PLYMOUTH	24	8.80	16.4	105.49	35.3	449.2	87.8	2.39	1.17	14.2
PONTIAC	19	8.66	6.6	105.93	51.3	532.3	91.7	2.79	1.55	12.3
TOYOTA	5	3.77	0.2	52.83	20.9	309.1	29.3	2.98	1.12	22.2
VOLKSWAGON	23	6.02	2.7	80.15	26.8	250.6	38.5	1.75	.80	22.7
VOLVO	0									
*MODEL YEAR										
1960	2	16.42	15.5	117.36	6.6	500.9	55.0	2.30	.15	12.0
1961	2	16.05	3.1	184.44	87.4	425.2	20.6	2.34	1.96	11.7
1962	4	11.87	7.7	142.07	90.1	452.2	103.9	2.98	1.86	12.6
1963	5	11.44	5.2	117.36	44.0	393.7	125.5	2.12	1.53	15.1
1964	10	8.95	2.9	129.13	37.8	370.8	78.5	1.97	.68	15.3
1965	13	10.17	5.3	131.33	48.9	330.6	72.8	1.52	.82	16.5
1966	15	15.79	20.2	139.02	45.1	394.6	71.7	1.99	1.32	13.9
1967	16	8.36	2.4	130.78	49.4	439.2	99.1	2.37	1.33	13.6
1968	22	5.89	1.4	101.28	43.6	486.5	114.2	2.56	1.15	14.1
1969	24	5.77	1.2	86.80	33.1	444.0	92.7	3.07	1.49	15.6
1970	25	4.96	1.1	78.96	33.8	480.3	101.7	3.01	1.20	15.0
1971	32	4.95	1.0	75.76	25.6	456.5	130.8	3.10	1.36	15.9
1972	28	4.72	1.0	85.83	27.2	505.3	138.0	2.70	1.05	14.4
1973	35	5.47	3.5	97.81	82.2	509.0	145.0	2.10	1.23	14.2
1974	37	4.17	1.5	82.95	48.6	504.4	149.7	1.68	.65	14.8
*DISPLACEMENT										
LESS THAN 151	40	5.36	2.6	72.12	25.3	276.1	45.2	1.95	.86	22.1
151 - 250	38	5.88	3.9	91.32	45.1	374.7	61.7	2.46	1.33	16.8
251 - 350	115	7.68	8.3	106.07	44.9	473.7	74.4	2.24	1.14	13.5
MORE THAN 350	77	6.10	4.0	103.73	68.6	589.9	86.2	2.93	1.44	11.8
*INERTIA WEIGHT										
1800 - 2799	46	5.27	2.5	72.50	25.0	294.3	70.3	2.09	1.07	21.4
2800 - 3799	118	6.47	3.7	97.17	44.1	438.9	78.8	2.23	1.14	14.7
3800 - 4799	94	7.68	9.2	107.84	62.9	547.8	82.9	2.82	1.45	12.2
4800 - 5799	12	5.22	1.9	133.60	67.1	696.5	78.1	2.48	.95	9.7
*POPULATIONS										
1960 - 1967	67	11.37	10.5	133.36	48.4	396.7	92.6	2.08	1.21	14.4
1968 - 1974	203	5.07	1.9	86.73	47.9	485.7	129.7	2.54	1.27	14.9
ALL VEHICLES	270	6.63	6.1	98.30	52.0	463.6	127.4	2.43	1.27	14.8

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 59 HC FAILURES, 64 CO FAILURES, 40.4% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	0.02	0.1	-0.26	6.4	-8.6	19.4	0.01	.15	0.3
BUICK	13	0.12	0.3	3.52	8.7	-4.1	17.0	-0.06	.13	-0.1
CADILLAC	6	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
CHEVROLET	55	0.15	1.1	2.46	8.6	-5.8	19.6	0.06	.35	0.1
CHRYSLER	6	2.55	3.4	29.04	35.0	-32.6	38.7	-0.37	.46	-0.4
DATSUN	3	-1.81	3.8	-10.50	17.3	-64.5	28.3	0.12	.29	4.9
DODGE	15	0.31	0.9	4.27	12.1	5.3	15.5	0.09	.35	-0.4
FORD	66	0.24	0.8	3.55	14.5	-1.4	17.4	0.05	.35	-0.1
MERCURY	11	0.69	1.0	12.35	18.4	-25.5	30.1	-0.15	.29	0.1
OLDSMOBILE	11	0.10	0.2	-7.54	42.6	0.7	16.3	-0.06	.14	0.1
OPEL	1	1.08	0.0	4.05	0.0	11.2	0.0	0.48	0.00	-0.9
PLYMOUTH	24	1.00	2.1	16.00	28.6	-12.4	26.0	-0.16	.42	-0.3
PONTIAC	19	0.06	1.1	0.62	27.2	-4.9	14.0	0.04	.56	0.1
TOYOTA	5	0.44	0.5	9.28	11.0	-22.6	25.5	-0.34	.42	0.6
VOLKSWAGON	23	0.00	1.0	-0.14	4.4	-1.5	10.4	-0.03	.18	0.1
VOLVO	0									
*MODEL YEAR										
1960	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1961	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1962	4	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1963	5	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1964	10	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1965	13	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1966	15	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1967	16	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	22	0.24	1.2	2.48	23.9	-6.5	16.7	0.07	.34	-0.0
1969	24	1.56	2.7	13.08	28.8	-12.1	40.9	0.15	.92	-0.3
1970	25	0.26	1.6	5.45	13.6	-8.4	19.3	-0.05	.32	-0.0
1971	32	0.06	0.3	2.84	10.0	-8.3	21.4	0.03	.23	0.4
1972	28	0.52	1.0	11.62	22.4	-13.5	27.1	-0.14	.36	-0.1
1973	35	0.13	1.5	7.04	16.9	-5.5	22.0	-0.06	.20	-0.0
1974	37	0.21	0.7	-1.43	26.7	-5.4	19.1	-0.02	.19	0.2
*DISPLACEMENT										
LESS THAN 151	40	0.01	1.3	0.54	8.8	-10.6	22.4	-0.02	.27	0.6
151 - 250	38	0.24	0.7	4.93	15.7	-2.3	15.4	0.04	.34	-0.2
251 - 350	115	0.24	1.2	3.99	15.6	-5.9	21.6	0.02	.38	-0.0
MORE THAN 350	77	0.52	1.5	5.80	26.4	-6.4	22.7	-0.07	.35	-0.1
*INERTIA WEIGHT										
1800 - 2799	46	0.00	1.2	0.10	8.6	-10.5	22.2	-0.02	.26	0.6
2800 - 3799	118	0.31	1.0	6.02	17.0	-4.2	18.5	0.02	.31	-0.1
3800 - 4799	94	0.41	1.6	5.00	19.3	-7.1	23.5	-0.03	.44	-0.0
4800 - 5799	12	0.21	0.6	-5.88	42.2	-2.9	25.2	-0.09	.28	0.1
*POPULATIONS										
1960 - 1967	67	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968 - 1974	203	0.38	1.5	5.49	21.4	-8.3	24.2	-0.01	.41	0.0
ALL VEHICLES	270	0.29	1.3	4.13	18.7	-6.2	21.3	-0.01	.35	0.0

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 59 HC FAILURES, 64 CO FAILURES, 40.4% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	12	0.52	-0.34	0.48	2.02	4.3	-50.0	2.5
BUICK	13	1.42	2.65	-3.08	-0.43	14.7	426.3	-6.8
CADILLAC	6	0.00	0.00	0.00	0.00	0.0	0.0	0.0
CHEVROLET	55	2.29	2.42	2.51	0.41	22.2	353.8	8.1
CHRYSLER	6	32.29	25.32	-11.73	-3.12	138.3	1575.7	-20.0
DATSUN	3	-36.35	-18.96	8.09	19.09	-111.3	-645.1	7.4
DODGE	15	4.63	4.39	2.85	-2.57	52.6	732.3	15.1
FORD	66	3.72	3.80	1.71	-0.42	37.0	556.7	7.4
MERCURY	11	10.70	12.03	-5.63	0.81	85.3	1522.8	-18.7
OLDSMOBILE	11	1.22	-4.50	-3.36	0.54	21.1	-1565.8	-11.8
OPEL	1	24.97	4.51	22.51	-4.71	49.1	184.1	21.7
PLYMOUTH	24	10.22	13.17	-7.11	-2.38	165.7	2645.1	-26.3
PONTIAC	19	0.72	0.58	1.54	0.45	8.8	86.8	6.1
TOYOTA	5	10.43	14.94	-12.89	2.79	62.1	1310.3	-48.1
VOLKSWAGON	23	0.03	-0.17	-1.48	0.53	0.4	-25.2	-4.7
VOLVO	0							
*MODEL YEAR								
1960	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1961	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1962	4	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1963	5	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1964	10	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1965	13	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1966	15	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1967	16	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	22	3.86	2.39	2.69	-0.12	17.3	181.1	5.2
1969	24	21.24	13.10	4.61	-1.84	142.1	1194.6	13.6
1970	25	4.90	6.46	-1.78	-0.06	34.8	743.5	-7.2
1971	32	1.12	3.62	0.88	2.25	7.6	384.4	3.7
1972	28	9.88	11.93	-5.30	-0.89	70.1	1576.5	-18.5
1973	35	2.38	6.72	-2.95	-0.04	24.6	1299.0	-11.1
1974	37	4.83	-1.75	-1.21	1.62	38.7	-261.2	-3.7
*DISPLACEMENT								
LESS THAN 151	40	0.16	0.74	-0.88	2.62	1.2	77.1	-2.4
151 - 250	38	3.98	5.13	1.47	-0.94	29.5	598.7	4.5
251 - 350	115	3.04	3.63	0.97	-0.09	38.5	638.8	3.5
MORE THAN 350	77	7.93	5.29	-2.37	-0.76	75.1	829.7	-9.7
*INERTIA WEIGHT								
1800 - 2799	46	0.07	0.14	-0.89	2.68	0.6	14.8	-2.8
2800 - 3799	118	4.54	5.84	0.97	-0.88	46.5	910.4	3.3
3800 - 4799	94	5.09	4.43	-0.99	-0.31	54.7	663.9	-3.7
4800 - 5799	12	3.82	-4.60	-3.90	1.07	44.8	-1270.3	-20.1
*POPULATIONS								
1960 - 1967	67	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968 - 1974	203	7.02	5.96	-0.38	0.32	49.1	704.6	-1.2
ALL VEHICLES	270	4.16	4.03	-0.30	0.24	42.0	602.5	-1.1

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 25 HC FAILURES, 28 CO FAILURES, 59.7% FAILURE RATE
1968-1974 VEHICLES: 59 HC FAILURES, 64 CO FAILURES, 40.4% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	4.29	1.5	76.24	26.6	428.8	73.4	2.71	1.64	15.9
BUICK	13	6.72	4.3	119.96	75.2	479.1	120.8	1.92	1.25	13.0
CADILLAC	6	4.28	1.4	127.12	47.2	726.7	63.9	1.90	.28	9.5
CHEVROLET	55	6.41	4.0	96.82	42.9	475.8	106.1	2.16	1.07	14.2
CHRYSLER	6	5.30	0.7	87.94	20.1	563.0	67.8	3.22	.81	12.5
DATSUN	3	6.79	4.9	65.86	13.5	307.7	48.0	1.37	.37	20.8
DODGE	15	6.31	4.3	93.71	19.3	450.6	68.5	2.94	1.09	14.6
FORD	66	5.77	1.8	86.76	31.2	486.9	107.8	2.73	1.29	14.4
MERCURY	11	5.62	2.5	87.75	45.4	546.9	112.6	2.86	1.69	12.9
OLDSMOBILE	11	7.56	4.8	168.74	146.1	521.8	81.1	1.73	1.05	11.7
OPEL	1	3.24	0.0	85.76	0.0	301.5	0.0	1.64	0.00	19.9
PLYMOUTH	24	6.35	5.3	98.47	25.9	453.4	84.6	2.55	1.19	14.4
PONTIAC	19	9.77	10.8	116.87	56.7	527.6	98.2	2.59	1.64	12.0
TOYOTA	5	3.77	0.2	52.83	20.9	309.1	29.3	2.98	1.12	22.2
VOLKSWAGON	23	5.76	2.5	76.65	22.5	250.0	38.4	1.71	.82	23.1
VOLVO	0									
*MODEL YEAR										
1960	2	16.42	15.5	117.36	6.6	500.9	55.0	2.30	.15	12.0
1961	2	14.03	5.8	174.39	110.3	449.9	27.9	2.67	2.10	11.8
1962	4	9.05	4.7	124.53	89.1	444.2	103.1	3.01	1.89	13.5
1963	5	16.95	17.0	154.49	46.3	359.1	110.0	1.17	.57	14.7
1964	10	7.02	2.1	104.83	39.1	388.6	81.2	2.29	1.17	16.2
1965	13	8.89	4.5	118.95	46.5	344.3	76.7	1.56	.85	16.8
1966	15	11.29	8.1	125.93	43.7	396.6	70.5	2.02	1.37	14.5
1967	16	7.28	2.0	124.63	45.1	435.6	88.8	2.17	1.00	14.0
1968	22	5.89	1.4	101.28	43.6	486.5	114.2	2.56	1.15	14.1
1969	24	5.77	1.2	86.80	33.1	444.0	92.7	3.07	1.49	15.6
1970	25	4.96	1.1	78.96	33.8	480.3	101.7	3.01	1.20	15.0
1971	32	4.95	1.0	75.76	25.6	456.5	130.8	3.10	1.36	15.9
1972	28	4.72	1.0	85.83	27.2	505.3	138.0	2.70	1.05	14.4
1973	35	5.47	3.5	97.81	82.2	509.0	145.0	2.10	1.23	14.2
1974	37	4.17	1.5	82.95	48.6	504.4	149.7	1.68	.65	14.8
*DISPLACEMENT										
LESS THAN 151	40	5.21	2.4	70.11	22.1	275.8	45.4	1.93	.87	22.3
151 - 250	38	5.12	2.4	85.06	40.5	379.0	60.9	2.49	1.33	17.0
251 - 350	115	6.86	4.1	102.29	41.4	475.9	70.7	2.26	1.13	13.6
MORE THAN 350	77	6.37	5.9	105.68	69.9	586.9	90.3	2.86	1.45	11.7
*INERTIA WEIGHT										
1800 - 2799	46	5.14	2.4	70.75	22.4	294.0	70.5	2.07	1.08	21.6
2800 - 3799	118	6.20	4.6	93.77	40.8	441.9	76.1	2.24	1.15	14.8
3800 - 4799	94	6.92	5.0	106.54	62.6	546.0	83.2	2.80	1.43	12.3
4800 - 5799	12	5.22	1.9	133.60	67.1	696.5	78.1	2.48	.95	9.7
*POPULATIONS										
1960 - 1967	67	9.75	7.1	124.35	48.5	399.3	87.5	2.03	1.18	14.9
1968 - 1974	203	5.07	1.9	86.73	47.9	485.7	129.7	2.54	1.27	14.9
ALL VEHICLES	270	6.23	4.4	96.06	50.6	464.3	126.2	2.41	1.26	14.9

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 25 HC FAILURES, 28 CO FAILURES, 59.7% FAILURE RATE
1968-1974 VEHICLES: 59 HC FAILURES, 64 CO FAILURES, 40.4% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	12	0.05	0.1	1.74	9.5	-9.1	19.2	0.02	.15	0.2
BUICK	13	1.86	2.6	12.94	16.9	-10.5	18.8	-0.11	.18	-0.3
CADILLAC	6	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
CHEVROLET	55	0.32	1.2	4.84	11.8	-8.0	22.0	0.07	.39	-0.0
CHRYSLER	6	2.59	3.4	26.76	37.7	-15.2	68.2	-0.08	.97	-0.6
DATSUN	3	-1.81	3.8	-10.50	17.3	-64.5	28.3	0.12	.29	4.9
DODGE	15	0.32	0.9	3.61	12.7	8.3	18.7	0.16	.43	-0.4
FORD	66	0.58	1.7	6.70	21.0	-3.1	21.0	0.03	.54	-0.2
MERCURY	11	0.85	1.0	14.95	18.5	-26.4	29.4	-0.17	.29	0.0
OLDSMOBILE	11	0.80	1.7	-0.95	46.0	1.2	17.1	-0.04	.16	-0.2
OPEL	1	1.08	0.0	4.05	0.0	11.2	0.0	0.48	0.00	-0.9
PLYMOUTH	24	3.45	11.1	23.01	31.1	-16.6	29.0	-0.31	.55	-0.5
PONTIAC	19	-1.05	6.4	-10.32	50.3	-0.3	34.1	0.25	.91	0.3
TOYOTA	5	0.44	0.5	9.28	11.0	-22.6	25.5	-0.34	.42	0.6
VOLKSWAGON	23	0.26	1.1	3.36	8.6	-0.9	11.8	0.01	.23	-0.3
VOLVO	0									
*MODEL YEAR										
1960	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1961	2	2.02	2.7	10.05	22.9	-24.7	7.3	-0.33	.15	-0.1
1962	4	2.82	3.1	17.54	15.8	8.1	13.5	-0.03	.12	-0.9
1963	5	-5.52	11.9	-37.13	78.9	34.6	53.1	0.94	1.42	0.4
1964	10	1.93	3.2	24.30	34.9	-17.8	26.0	-0.33	1.00	-0.9
1965	13	1.28	2.0	12.38	18.6	-13.7	20.3	-0.04	.25	-0.3
1966	15	4.51	14.0	13.09	30.4	-2.0	9.7	-0.03	.43	-0.6
1967	16	1.08	1.8	6.15	12.5	3.5	35.2	0.20	.56	-0.4
1968	22	0.24	1.2	2.48	23.9	-6.5	16.7	0.07	.34	-0.0
1969	24	1.56	2.7	13.08	28.8	-12.1	40.9	0.15	.92	-0.3
1970	25	0.26	1.6	5.45	13.6	-8.4	19.3	-0.05	.32	-0.0
1971	32	0.06	0.3	2.84	10.0	-8.3	21.4	0.03	.23	0.4
1972	28	0.52	1.0	11.62	22.4	-13.5	27.1	-0.14	.36	-0.1
1973	35	0.13	1.5	7.04	16.9	-5.5	22.0	-0.06	.20	-0.0
1974	37	0.21	0.7	-1.43	26.7	-5.4	19.1	-0.02	.19	0.2
*DISPLACEMENT										
LESS THAN 151	40	0.16	1.4	2.55	10.4	-10.3	22.9	0.00	.29	0.4
151 - 250	38	1.00	2.2	11.19	23.9	-6.6	20.2	0.01	.61	-0.4
251 - 350	115	1.06	5.3	7.77	19.8	-8.0	25.0	0.01	.47	-0.1
MORE THAN 350	77	0.26	3.5	3.86	34.6	-3.5	29.9	-0.01	.55	-0.1
*INERTIA WEIGHT										
1800 - 2799	46	0.13	1.3	1.85	10.1	-10.2	22.7	-0.00	.27	0.4
2800 - 3799	118	0.57	3.1	9.42	27.2	-7.3	24.9	0.02	.53	-0.2
3800 - 4799	94	1.17	5.8	6.30	23.0	-5.3	27.9	-0.00	.54	-0.1
4800 - 5799	12	0.21	0.6	-5.88	42.2	-2.9	25.2	-0.09	.28	0.1
*POPULATIONS										
1960 - 1967	67	1.62	7.7	9.00	32.7	-2.6	29.1	0.05	.69	-0.4
1968 - 1974	203	0.38	1.5	5.49	21.4	-8.3	24.2	-0.01	.41	0.0
ALL VEHICLES	270	0.69	4.1	6.36	24.6	-6.9	25.6	0.00	.49	-0.1

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN PRIVATE SECTOR

1960-1967 VEHICLES: 25 HC FAILURES, 28 CO FAILURES, 59.7% FAILURE RATE
1968-1974 VEHICLES: 59 HC FAILURES, 64 CO FAILURES, 40.4% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	12	1.23	2.23	0.69	1.50	9.8	318.3	3.5
BUICK	13	21.70	9.74	-5.86	-2.57	168.0	1167.4	-9.6
CADILLAC	6	0.00	0.00	0.00	0.00	0.0	0.0	0.0
CHEVROLET	55	4.75	4.76	3.23	-0.00	37.5	568.5	8.5
CHRYSLER	6	32.80	23.33	-2.68	-5.17	121.8	1258.9	-4.0
DATSUN	3	-36.35	-18.96	8.09	19.09	-111.3	-645.1	7.4
DODGE	15	4.82	3.71	5.02	-2.87	50.5	569.4	24.5
FORD	66	9.18	7.17	1.24	-1.21	56.2	645.3	3.3
MERCURY	11	13.10	14.55	-6.45	0.32	100.1	1765.3	-20.5
OLDSMOBILE	11	9.55	-0.56	-2.63	-1.46	73.9	-87.5	-4.1
OPEL	1	24.97	4.51	22.51	-4.71	49.1	184.1	21.7
PLYMOUTH	24	35.24	18.94	-14.02	-3.78	388.0	2585.8	-35.2
PONTIAC	19	-12.02	-9.69	8.72	2.62	-94.8	-933.6	22.3
TOYOTA	5	10.43	14.94	-12.89	2.79	62.1	1310.3	-48.1
VOLKSWAGON	23	4.38	4.20	0.64	-1.19	30.3	386.0	1.3
VOLVO	0							
*MODEL YEAR								
1960	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1961	2	12.59	5.45	-13.98	-0.60	88.9	441.7	-14.4
1962	4	23.78	12.35	-1.02	-6.88	158.9	986.7	-1.7
1963	5	-48.27	-31.64	44.57	2.49	-307.8	-2070.1	52.6
1964	10	21.53	18.82	-16.59	-5.91	225.8	2848.9	-38.2
1965	13	12.56	9.43	-2.40	-1.81	152.2	1475.4	-4.4
1966	15	28.54	9.42	-1.42	-4.15	252.0	732.0	-1.6
1967	16	12.94	4.70	8.60	-2.63	59.2	336.9	11.2
1968	22	3.86	2.39	2.69	-0.12	17.3	181.1	5.2
1969	24	21.24	13.10	4.61	-1.84	142.1	1194.6	13.6
1970	25	4.90	6.46	-1.78	-0.06	34.8	743.5	-7.2
1971	32	1.12	3.62	0.88	2.25	7.6	384.4	3.7
1972	28	9.88	11.93	-5.30	-0.89	70.1	1576.5	-18.5
1973	35	2.38	6.72	-2.95	-0.04	24.6	1299.0	-11.1
1974	37	4.83	-1.75	-1.21	1.62	38.7	-261.2	-3.7
*DISPLACEMENT								
LESS THAN 151	40	2.96	3.51	0.20	1.63	17.9	287.1	0.4
151 - 250	38	16.37	11.63	0.48	-2.28	71.4	797.2	0.9
251 - 350	115	13.40	7.06	0.36	-0.90	119.5	875.4	0.9
MORE THAN 350	77	3.87	3.52	-0.22	-0.64	30.7	463.2	-0.8
*INERTIA WEIGHT								
1800 - 2799	46	2.56	2.55	-0.01	1.79	16.3	222.8	-0.0
2800 - 3799	118	8.48	9.13	0.87	-1.48	58.6	961.2	2.0
3800 - 4799	94	14.42	5.58	-0.05	-1.17	114.5	618.1	-0.1
4800 - 5799	12	3.82	-4.60	-3.90	1.07	44.8	-1270.3	-20.1
*POPULATIONS								
1960 - 1967	67	14.24	6.75	2.18	-3.00	112.0	622.6	3.1
1968 - 1974	203	7.02	5.96	-0.38	0.32	49.1	704.6	-1.2
ALL VEHICLES	270	9.97	6.21	0.16	-0.49	73.0	673.4	0.4

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSIONS BEFORE INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	0									
BUICK	0									
CADILLAC	0									
CHEVROLET	9	4.92	1.4	91.58	46.7	570.9	82.8	1.97	1.33	12.5
CHRYSLER	0									
DATSUN	0									
DODGE	1	4.47	0.0	137.96	0.0	366.1	0.0	0.65	0.00	14.9
FORD	7	6.79	3.6	117.44	71.1	476.6	126.1	1.92	.77	13.8
MERCURY	0									
OLDSMOBILE	3	5.56	1.2	120.61	78.5	566.5	27.1	1.75	.70	11.7
OPEL	0									
PLYMOUTH	0									
PONTIAC	2	3.30	1.6	35.19	33.6	634.2	77.8	4.84	1.47	12.7
TOYOTA	3	4.29	0.6	62.13	13.5	287.0	53.5	2.70	.91	22.4
VOLKSWAGON	5	4.06	1.3	64.67	29.2	301.7	41.8	2.00	1.30	21.4
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	1	14.52	0.0	270.67	0.0	423.8	0.0	0.59	0.00	9.9
1967	1	7.37	0.0	127.00	0.0	524.5	0.0	2.96	0.00	11.9
1968	0									
1969	0									
1970	0									
1971	2	4.25	0.2	65.59	9.4	449.9	182.8	3.86	2.86	16.4
1972	8	4.65	1.2	71.68	30.7	393.8	121.8	2.37	1.18	17.9
1973	8	4.99	1.4	89.23	54.9	530.7	111.6	2.22	1.13	14.0
1974	10	4.52	1.3	91.01	48.7	493.3	178.2	1.68	1.05	14.9
*DISPLACEMENT										
LESS THAN 151	10	4.29	1.0	66.91	24.5	300.2	39.6	2.27	1.04	21.3
151 - 250	2	4.79	0.5	117.05	29.6	394.9	40.8	1.22	.80	14.9
251 - 350	12	5.99	2.9	111.70	73.4	559.4	65.4	1.91	1.20	12.0
MORE THAN 350	6	4.73	2.0	80.44	41.1	612.4	59.1	2.80	1.85	11.8
*INERTIA WEIGHT										
1800 - 2799	9	4.31	1.0	66.32	26.0	297.9	41.3	2.32	1.09	21.5
2800 - 3799	9	5.39	1.1	102.25	44.1	501.9	113.0	1.55	.62	13.6
3800 - 4799	11	5.55	3.3	104.56	75.1	581.9	75.0	2.19	1.36	11.8
4800 - 5799	1	4.42	0.0	58.93	0.0	579.2	0.0	5.88	0.00	12.9
*POPULATIONS										
1960 - 1967	2	10.94	5.1	198.83	101.6	474.1	71.2	1.77	1.67	10.9
1968 - 1974	28	4.68	1.2	83.16	43.7	472.5	148.1	2.19	1.29	15.6
ALL VEHICLES	30	5.09	2.2	90.87	54.8	472.6	143.5	2.16	1.29	15.3

AUTOMOTIVE TESTING LABORATORIES,INC.
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EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 0 HC FAILURES, 2 CO FAILURES, 7.1% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	0									
BUICK	0									
CADILLAC	0									
CHEVROLET	9	4.82	1.3	90.23	46.0	571.1	82.6	2.02	1.33	12.5
CHRYSLER	0									
DATSUN	0									
DODGE	1	4.47	0.0	137.96	0.0	366.1	0.0	0.65	0.00	14.9
FORD	7	6.44	3.9	113.22	72.9	483.5	116.0	1.80	.83	13.9
MERCURY	0									
OLDSMOBILE	3	5.56	1.2	120.61	78.5	566.5	27.1	1.75	.70	11.7
OPEL	0									
PLYMOUTH	0									
PONTIAC	2	3.30	1.6	35.19	33.6	634.2	77.8	4.84	1.47	12.7
TOYOTA	3	4.29	0.6	62.13	13.5	287.0	53.5	2.70	.91	22.4
VOLKSWAGON	5	4.06	1.3	64.67	29.2	301.7	41.8	2.00	1.30	21.4
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	1	14.52	0.0	270.67	0.0	423.8	0.0	0.59	0.00	9.9
1967	1	7.37	0.0	127.00	0.0	524.5	0.0	2.96	0.00	11.9
1968	0									
1969	0									
1970	0									
1971	2	4.25	0.2	65.59	9.4	449.9	182.8	3.86	2.86	16.4
1972	8	4.54	1.0	70.16	28.3	394.1	122.0	2.43	1.15	17.9
1973	8	4.99	1.4	89.23	54.9	530.7	111.6	2.22	1.13	14.0
1974	10	4.28	1.4	88.05	48.6	498.2	173.0	1.60	1.06	14.9
*DISPLACEMENT										
LESS THAN 151	10	4.04	1.0	63.96	21.1	305.0	42.8	2.19	1.10	21.3
151 - 250	2	4.79	0.5	117.05	29.6	394.9	40.8	1.22	.80	14.9
251 - 350	12	5.92	2.9	110.68	73.4	559.5	65.2	1.95	1.20	12.1
MORE THAN 350	6	4.73	2.0	80.44	41.1	612.4	59.1	2.80	1.85	11.8
*INERTIA WEIGHT										
1800 - 2799	9	4.04	1.1	63.04	22.1	303.2	45.0	2.23	1.16	21.5
2800 - 3799	9	5.29	1.0	100.90	43.7	502.1	113.0	1.61	.65	13.7
3800 - 4799	11	5.55	3.3	104.56	75.1	581.9	75.0	2.19	1.36	11.8
4800 - 5799	1	4.42	0.0	58.93	0.0	579.2	0.0	5.88	0.00	12.9
*POPULATIONS										
1960 - 1967	2	10.94	5.1	198.83	101.6	474.1	71.2	1.77	1.67	10.9
1968 - 1974	28	4.55	1.2	81.67	43.3	474.3	146.3	2.18	1.31	15.6
ALL VEHICLES	30	4.98	2.2	89.48	54.6	474.3	141.8	2.15	1.30	15.3

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 0 HC FAILURES, 2 CO FAILURES, 7.1% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	0									
BUICK	0									
CADILLAC	0									
CHEVROLET	9	0.10	0.3	1.35	4.1	-0.2	0.6	-0.06	.17	-0.0
CHRYSLER	0									
DATSUN	0									
DODGE	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
FORD	7	0.35	0.9	4.22	11.2	-6.9	18.2	0.12	.32	-0.0
MERCURY	0									
OLDSMOBILE	3	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
OPEL	0									
PLYMOUTH	0									
PONTIAC	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
TOYOTA	3	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
VOLKSWAGON	5	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1967	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	0									
1969	0									
1970	0									
1971	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1972	8	0.12	0.3	1.52	4.3	-0.2	0.6	-0.06	.18	-0.0
1973	8	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1974	10	0.25	0.8	2.95	9.3	-4.8	15.2	0.08	.26	-0.0
*DISPLACEMENT										
LESS THAN 151	10	0.25	0.8	2.95	9.3	-4.8	15.2	0.08	.26	-0.0
151 - 250	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
251 - 350	12	0.08	0.3	1.01	3.5	-0.1	0.5	-0.04	.14	-0.0
MORE THAN 350	6	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
*INERTIA WEIGHT										
1800 - 2799	9	0.27	0.8	3.28	9.8	-5.3	16.0	0.09	.28	-0.0
2800 - 3799	9	0.10	0.3	1.35	4.1	-0.2	0.6	-0.06	.17	-0.0
3800 - 4799	11	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
4800 - 5799	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
*POPULATIONS										
1960 - 1967	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968 - 1974	28	0.12	0.5	1.49	6.0	-1.8	9.1	0.01	.19	-0.0
ALL VEHICLES	30	0.11	0.5	1.39	5.8	-1.7	8.8	0.01	.18	-0.0

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 0 HC FAILURES, 2 CO FAILURES, 7.1% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	0							
BUICK	0							
CADILLAC	0							
CHEVROLET	9	2.11	1.48	-2.83	-0.35	19.1	248.3	-10.2
CHRYSLER	0							
DATSUN	0							
DODGE	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
FORD	7	5.20	3.59	6.22	-0.24	39.6	472.9	13.4
MERCURY	0							
OLDSMOBILE	3	0.00	0.00	0.00	0.00	0.0	0.0	0.0
OPEL	0							
PLYMOUTH	0							
PONTIAC	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
TOYOTA	3	0.00	0.00	0.00	0.00	0.0	0.0	0.0
VOLKSWAGON	5	0.00	0.00	0.00	0.00	0.0	0.0	0.0
VOLVO	0							
*MODEL YEAR								
1960	0							
1961	0							
1962	0							
1963	0							
1964	0							
1965	0							
1966	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1967	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	0							
1969	0							
1970	0							
1971	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1972	8	2.51	2.12	-2.64	-0.27	20.8	270.4	-11.1
1973	8	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1974	10	5.47	3.24	4.97	-0.16	33.2	396.7	11.2
*DISPLACEMENT								
LESS THAN 151	10	5.77	4.41	3.68	-0.11	33.2	396.7	11.2
151 - 250	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
251 - 350	12	1.30	0.91	-2.19	-0.27	15.3	199.4	-8.2
MORE THAN 350	6	0.00	0.00	0.00	0.00	0.0	0.0	0.0
*INERTIA WEIGHT								
1800 - 2799	9	6.37	4.95	4.00	-0.12	35.1	419.2	11.9
2800 - 3799	9	1.92	1.32	-3.59	-0.32	19.1	248.3	-10.2
3800 - 4799	11	0.00	0.00	0.00	0.00	0.0	0.0	0.0
4800 - 5799	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
*POPULATIONS								
1960 - 1967	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968 - 1974	28	2.60	1.79	0.55	-0.14	21.4	261.5	2.1
ALL VEHICLES	30	2.23	1.53	0.52	-0.14	20.4	249.0	2.0

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 4 HC FAILURES, 3 CO FAILURES, 21.4% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	0									
BUICK	0									
CADILLAC	0									
CHEVROLET	9	4.76	1.3	87.40	48.3	577.0	81.0	2.09	1.38	12.5
CHRYSLER	0									
DATSUN	0									
DODGE	1	4.47	0.0	137.96	0.0	366.1	0.0	0.65	0.00	14.9
FORD	7	6.35	3.9	112.42	73.1	484.4	117.2	1.80	.83	13.9
MERCURY	0									
OLDSMOBILE	3	5.56	1.2	120.61	78.5	566.5	27.1	1.75	.70	11.7
OPEL	0									
PLYMOUTH	0									
PONTIAC	2	3.30	1.6	35.19	33.6	634.2	77.8	4.84	1.47	12.7
TOYOTA	3	3.93	0.2	58.54	13.4	301.9	43.3	2.53	1.01	21.9
VOLKSWAGON	5	4.23	1.1	72.61	15.4	304.2	46.4	1.72	.76	20.6
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	1	14.52	0.0	270.67	0.0	423.8	0.0	0.59	0.00	9.9
1967	1	7.37	0.0	127.00	0.0	524.5	0.0	2.96	0.00	11.9
1968	0									
1969	0									
1970	0									
1971	2	4.25	0.2	65.59	9.4	449.9	182.8	3.86	2.86	16.4
1972	8	4.47	1.1	66.98	29.9	400.6	131.2	2.51	1.18	17.9
1973	8	5.02	1.1	93.50	49.0	533.1	109.6	2.05	.87	13.5
1974	10	4.17	1.4	86.98	49.3	502.6	166.3	1.55	1.03	14.8
*DISPLACEMENT										
LESS THAN 151	10	4.02	0.8	66.85	14.5	310.7	40.6	2.00	.88	20.8
151 - 250	2	4.79	0.5	117.05	29.6	394.9	40.8	1.22	.80	14.9
251 - 350	12	5.87	3.0	108.56	75.0	563.9	64.6	2.00	1.24	12.0
MORE THAN 350	6	4.63	1.8	79.51	40.8	613.4	59.1	2.79	1.85	11.8
*INERTIA WEIGHT										
1800 - 2799	9	4.01	0.9	66.25	15.2	309.6	42.9	2.02	.93	20.9
2800 - 3799	9	5.29	1.0	100.90	43.7	502.1	113.0	1.61	.65	13.7
3800 - 4799	11	5.44	3.4	101.74	76.7	587.2	73.0	2.24	1.39	11.8
4800 - 5799	1	4.42	0.0	58.93	0.0	579.2	0.0	5.88	0.00	12.9
*POPULATIONS										
1960 - 1967	2	10.94	5.1	198.83	101.6	474.1	71.2	1.77	1.67	10.9
1968 - 1974	28	4.50	1.2	81.60	42.4	478.4	144.9	2.13	1.26	15.4
ALL VEHICLES	30	4.93	2.2	89.41	54.0	478.1	140.4	2.11	1.26	15.1

AUTOMOTIVE TESTING LABORATORIES,INC.
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EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 4 HC FAILURES, 3 CO FAILURES, 21.4% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	0									
BUICK	0									
CADILLAC	0									
CHEVROLET	9	0.16	0.3	4.18	8.9	-6.0	17.4	-0.12	.24	-0.0
CHRYSLER	0									
DATSUN	0									
DODGE	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
FORD	7	0.44	0.9	5.01	11.0	-7.8	17.9	0.12	.32	-0.0
MERCURY	0									
OLDSMOBILE	3	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
OPEL	0									
PLYMOUTH	0									
PONTIAC	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
TOYOTA	3	0.36	0.6	3.59	6.2	-15.0	25.9	0.17	.29	0.5
VOLKSWAGON	5	-0.16	0.4	-7.94	17.8	-2.5	5.6	0.27	.61	0.7
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1967	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	0									
1969	0									
1970	0									
1971	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1972	8	0.19	0.4	4.70	9.4	-6.8	18.5	-0.14	.25	-0.0
1973	8	-0.03	0.4	-4.27	14.5	-2.4	4.7	0.17	.48	0.4
1974	10	0.36	0.8	4.03	9.6	-9.3	19.6	0.13	.29	0.1
*DISPLACEMENT										
LESS THAN 151	10	0.27	0.9	0.06	16.9	-10.6	19.4	0.27	.48	0.5
151 - 250	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
251 - 350	12	0.12	0.3	3.14	7.9	-4.5	15.1	-0.09	.21	-0.0
MORE THAN 350	6	0.10	0.3	0.93	2.3	-1.1	2.7	0.00	.01	-0.0
*INERTIA WEIGHT										
1800 - 2799	9	0.30	0.9	0.07	17.9	-11.7	20.1	0.30	.50	0.5
2800 - 3799	9	0.10	0.3	1.35	4.1	-0.2	0.6	-0.06	.17	-0.0
3800 - 4799	11	0.11	0.2	2.82	7.7	-5.4	15.8	-0.05	.18	0.0
4800 - 5799	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
*POPULATIONS										
1960 - 1967	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968 - 1974	28	0.17	0.6	1.56	11.1	-5.9	15.3	0.06	.35	0.2
ALL VEHICLES	30	0.16	0.5	1.46	10.7	-5.5	14.8	0.05	.34	0.2

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 4 HC FAILURES, 3 CO FAILURES, 21.4% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	0							
BUICK	0							
CADILLAC	0							
CHEVROLET	9	3.35	4.56	-6.17	-0.15	26.3	665.9	-19.3
CHRYSLER	0							
DATSUN	0							
DODGE	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
FORD	7	6.50	4.27	6.31	-0.31	27.5	312.7	7.6
MERCURY	0							
OLDSMOBILE	3	0.00	0.00	0.00	0.00	0.0	0.0	0.0
OPEL	0							
PLYMOUTH	0							
PONTIAC	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
TOYOTA	3	8.46	5.78	6.15	2.22	30.7	303.6	14.0
VOLKSWAGON	5	-4.05	-12.28	13.69	3.42	-14.4	-696.6	24.0
VOLVO	0							
*MODEL YEAR								
1960	0							
1961	0							
1962	0							
1963	0							
1964	0							
1965	0							
1966	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1967	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	0							
1969	0							
1970	0							
1971	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1972	8	3.99	6.56	-5.76	-0.12	28.3	716.7	-20.8
1973	8	-0.52	-4.78	7.76	3.22	-1.7	-287.4	11.6
1974	10	7.88	4.43	7.93	0.84	36.4	411.6	13.6
*DISPLACEMENT								
LESS THAN 151	10	6.39	0.09	11.88	2.31	20.3	4.5	20.0
151 - 250	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
251 - 350	12	2.06	2.81	-4.78	-0.12	21.7	549.3	-16.0
MORE THAN 350	6	2.17	1.15	0.07	-0.09	8.4	75.4	0.2
*INERTIA WEIGHT								
1800 - 2799	9	7.06	0.10	12.93	2.54	20.9	4.6	20.6
2800 - 3799	9	1.92	1.32	-3.59	-0.32	19.1	248.3	-10.2
3800 - 4799	11	1.91	2.70	-2.41	0.12	11.5	306.2	-5.7
4800 - 5799	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
*POPULATIONS								
1960 - 1967	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968 - 1974	28	3.70	1.88	2.64	1.07	17.5	158.0	5.8
ALL VEHICLES	30	3.17	1.61	2.50	1.02	17.0	153.5	5.7

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 5 HC FAILURES, 5 CO FAILURES, 28.6% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	0									
BUICK	0									
CADILLAC	0									
CHEVROLET	9	4.76	1.3	87.40	48.3	577.0	81.0	2.09	1.38	12.5
CHRYSLER	0									
DATSUN	0									
DODGE	1	4.47	0.0	137.96	0.0	366.1	0.0	0.65	0.00	14.9
FORD	7	6.35	3.9	112.42	73.1	484.4	117.2	1.80	.83	13.9
MERCURY	0									
OLDSMOBILE	3	5.56	1.2	120.61	78.5	566.5	27.1	1.75	.70	11.7
OPEL	0									
PLYMOUTH	0									
PONTIAC	2	3.30	1.6	35.19	33.6	634.2	77.8	4.84	1.47	12.7
TOYOTA	3	4.20	0.6	69.33	31.7	301.1	44.5	2.23	1.37	21.0
VOLKSWAGON	5	4.23	1.1	70.20	13.3	307.4	43.6	1.75	.71	20.7
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	1	14.52	0.0	270.67	0.0	423.8	0.0	0.59	0.00	9.9
1967	1	7.37	0.0	127.00	0.0	524.5	0.0	2.96	0.00	11.9
1968	0									
1969	0									
1970	0									
1971	2	4.25	0.2	65.59	9.4	449.9	182.8	3.86	2.86	16.4
1972	8	4.57	1.1	71.03	32.9	400.3	131.6	2.39	1.28	17.6
1973	8	5.02	1.1	93.50	49.0	533.1	109.6	2.05	.87	13.5
1974	10	4.17	1.4	85.77	49.4	504.3	163.9	1.56	1.01	14.8
*DISPLACEMENT										
LESS THAN 151	10	4.10	0.9	68.88	18.1	312.1	39.3	1.93	.91	20.6
151 - 250	2	4.79	0.5	117.05	29.6	394.9	40.8	1.22	.80	14.9
251 - 350	12	5.87	3.0	108.56	75.0	563.9	64.6	2.00	1.24	12.0
MORE THAN 350	6	4.63	1.8	79.51	40.8	613.4	59.1	2.79	1.85	11.8
*INERTIA WEIGHT										
1800 - 2799	9	4.10	0.9	68.51	19.2	311.1	41.5	1.94	.97	20.6
2800 - 3799	9	5.29	1.0	100.90	43.7	502.1	113.0	1.61	.65	13.7
3800 - 4799	11	5.44	3.4	101.74	76.7	587.2	73.0	2.24	1.39	11.8
4800 - 5799	1	4.42	0.0	58.93	0.0	579.2	0.0	5.88	0.00	12.9
*POPULATIONS										
1960 - 1967	2	10.94	5.1	198.83	101.6	474.1	71.2	1.77	1.67	10.9
1968 - 1974	28	4.53	1.2	82.32	42.7	478.9	144.2	2.10	1.28	15.3
ALL VEHICLES	30	4.96	2.2	90.09	54.1	478.6	139.8	2.08	1.27	15.0

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 5 HC FAILURES, 5 CO FAILURES, 28.6% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	0									
BUICK	0									
CADILLAC	0									
CHEVROLET	9	0.16	0.3	4.18	8.9	-6.0	17.4	-0.12	.24	-0.0
CHRYSLER	0									
DATSUN	0									
DODGE	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
FORD	7	0.44	0.9	5.01	11.0	-7.8	17.9	0.12	.32	-0.0
MERCURY	0									
OLDSMOBILE	3	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
OPEL	0									
PLYMOUTH	0									
PONTIAC	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
TOYOTA	3	0.10	0.9	-7.20	22.5	-14.1	26.7	0.47	.46	1.4
VOLKSWAGON	5	-0.16	0.4	-5.53	19.8	-5.7	8.0	0.24	.63	0.7
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1967	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	0									
1969	0									
1970	0									
1971	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1972	8	0.09	0.5	0.66	16.2	-6.4	18.6	-0.02	.45	0.3
1973	8	-0.03	0.4	-4.27	14.5	-2.4	4.7	0.17	.48	0.4
1974	10	0.36	0.8	5.24	9.8	-10.9	19.4	0.12	.30	0.1
*DISPLACEMENT										
LESS THAN 151	10	0.19	1.0	-1.97	20.3	-11.9	19.2	0.35	.52	0.7
151 - 250	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
251 - 350	12	0.12	0.3	3.14	7.9	-4.5	15.1	-0.09	.21	-0.0
MORE THAN 350	6	0.10	0.3	0.93	2.3	-1.1	2.7	0.00	.01	-0.0
*INERTIA WEIGHT										
1800 - 2799	9	0.22	1.0	-2.19	21.5	-13.2	19.9	0.38	.54	0.8
2800 - 3799	9	0.10	0.3	1.35	4.1	-0.2	0.6	-0.06	.17	-0.0
3800 - 4799	11	0.11	0.2	2.82	7.7	-5.4	15.8	-0.05	.18	0.0
4800 - 5799	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
*POPULATIONS										
1960 - 1967	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968 - 1974	28	0.14	0.6	0.84	13.0	-6.4	15.4	0.09	.39	0.3
ALL VEHICLES	30	0.13	0.6	0.78	12.5	-6.0	14.9	0.08	.37	0.2

AUTOMOTIVE TESTING LABORATORIES, INC.
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PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 5 HC FAILURES, 5 CO FAILURES, 28.6% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	0							
BUICK	0							
CADILLAC	0							
CHEVROLET	9	3.35	4.56	-6.17	-0.15	26.3	665.9	-19.3
CHRYSLER	0							
DATSUN	0							
DODGE	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
FORD	7	6.50	4.27	6.31	-0.31	27.5	312.7	7.6
MERCURY	0							
OLDSMOBILE	3	0.00	0.00	0.00	0.00	0.0	0.0	0.0
OPEL	0							
PLYMOUTH	0							
PONTIAC	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
TOYOTA	3	2.25	-11.59	17.38	6.11	4.5	-332.4	21.7
VOLKSWAGON	5	-4.05	-8.55	12.20	3.29	-12.8	-428.6	18.9
VOLVO	0							
*MODEL YEAR								
1960	0							
1961	0							
1962	0							
1963	0							
1964	0							
1965	0							
1966	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1967	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	0							
1969	0							
1970	0							
1971	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1972	8	1.83	0.92	-0.97	1.71	8.3	64.1	-2.2
1973	8	-0.52	-4.78	7.76	3.22	-1.7	-287.4	11.6
1974	10	7.88	5.75	7.05	0.74	33.8	496.6	11.2
*DISPLACEMENT								
LESS THAN 151	10	4.52	-2.95	15.23	3.46	11.3	-114.7	20.1
151 - 250	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
251 - 350	12	2.06	2.81	-4.78	-0.12	21.7	549.3	-16.0
MORE THAN 350	6	2.17	1.15	0.07	-0.09	8.4	75.4	0.2
*INERTIA WEIGHT								
1800 - 2799	9	5.00	-3.30	16.57	3.82	11.6	-117.4	20.6
2800 - 3799	9	1.92	1.32	-3.59	-0.32	19.1	248.3	-10.2
3800 - 4799	11	1.91	2.70	-2.41	0.12	11.5	306.2	-5.7
4800 - 5799	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
*POPULATIONS								
1960 - 1967	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968 - 1974	28	3.09	1.01	3.89	1.64	12.9	74.7	7.6
ALL VEHICLES	30	2.64	0.86	3.67	1.56	12.5	72.9	7.4

AUTOMOTIVE TESTING LABORATORIES,INC.
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EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 6 HC FAILURES, 9 CO FAILURES, 42.9% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	0									
BUICK	0									
CADILLAC	0									
CHEVROLET	9	4.76	1.3	87.40	48.3	577.0	81.0	2.09	1.38	12.5
CHRYSLER	0									
DATSUN	0									
DODGE	1	4.47	0.0	137.96	0.0	366.1	0.0	0.65	0.00	14.9
FORD	7	6.41	3.8	113.96	71.8	482.3	120.6	1.76	.78	13.9
MERCURY	0									
OLDSMOBILE	3	5.17	0.9	107.56	81.8	590.0	67.1	1.86	.84	11.7
OPEL	0									
PLYMOUTH	0									
PONTIAC	2	3.30	1.6	35.19	33.6	634.2	77.8	4.84	1.47	12.7
TOYOTA	3	3.95	0.9	68.23	32.9	293.5	32.9	1.96	.95	21.5
VOLKSWAGON	5	4.49	1.1	68.67	15.4	313.2	44.7	1.72	.71	20.4
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	1	14.52	0.0	270.67	0.0	423.8	0.0	0.59	0.00	9.9
1967	1	7.37	0.0	127.00	0.0	524.5	0.0	2.96	0.00	11.9
1968	0									
1969	0									
1970	0									
1971	2	4.25	0.2	65.59	9.4	449.9	182.8	3.86	2.86	16.4
1972	8	4.78	1.0	71.42	33.0	402.1	130.3	2.34	1.29	17.4
1973	8	4.78	1.1	88.19	48.3	539.1	123.4	1.99	.71	13.7
1974	10	4.17	1.4	85.77	49.4	504.3	163.9	1.56	1.01	14.8
*DISPLACEMENT										
LESS THAN 151	10	4.19	1.0	68.86	18.7	311.2	37.7	1.80	.73	20.6
151 - 250	2	4.79	0.5	117.05	29.6	394.9	40.8	1.22	.80	14.9
251 - 350	12	5.77	3.0	105.30	75.3	569.7	70.7	2.02	1.25	12.0
MORE THAN 350	6	4.63	1.8	79.51	40.8	613.4	59.1	2.79	1.85	11.8
*INERTIA WEIGHT										
1800 - 2799	9	4.21	1.1	68.49	19.8	310.2	39.8	1.80	.78	20.7
2800 - 3799	9	5.16	0.9	96.55	43.5	509.9	122.4	1.64	.70	13.7
3800 - 4799	11	5.44	3.4	101.74	76.7	587.2	73.0	2.24	1.39	11.8
4800 - 5799	1	4.42	0.0	58.93	0.0	579.2	0.0	5.88	0.00	12.9
*POPULATIONS										
1960 - 1967	2	10.94	5.1	198.83	101.6	474.1	71.2	1.77	1.67	10.9
1968 - 1974	28	4.52	1.1	80.92	42.1	481.1	147.2	2.07	1.25	15.3
ALL VEHICLES	30	4.95	2.2	88.78	53.9	480.6	142.6	2.05	1.25	15.0

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EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 6 HC FAILURES, 9 CO FAILURES, 42.9% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	0									
BUICK	0									
CADILLAC	0									
CHEVROLET	9	0.16	0.3	4.18	8.9	-6.0	17.4	-0.12	.24	-0.0
CHRYSLER	0									
DATSUN	0									
DODGE	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
FORD	7	0.39	1.0	3.48	12.5	-5.7	19.8	0.16	.32	-0.0
MERCURY	0									
OLDSMOBILE	3	0.39	0.7	13.05	22.6	-23.4	40.6	-0.11	.19	0.0
OPEL	0									
PLYMOUTH	0									
PONTIAC	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
TOYOTA	3	0.34	1.0	-6.10	23.1	-6.5	34.7	0.74	.21	0.9
VOLKSWAGON	5	-0.43	0.6	-4.00	20.6	-11.5	12.1	0.28	.62	0.9
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1967	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	0									
1969	0									
1970	0									
1971	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1972	8	-0.13	0.7	0.27	17.0	-8.2	21.7	0.03	.47	0.5
1973	8	0.21	0.6	1.04	21.2	-8.3	27.0	0.23	.56	0.3
1974	10	0.36	0.8	5.24	9.8	-10.9	19.4	0.12	.30	0.1
*DISPLACEMENT										
LESS THAN 151	10	0.10	1.1	-1.95	20.8	-11.0	23.8	0.47	.49	0.7
151 - 250	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
251 - 350	12	0.22	0.4	6.40	12.9	-10.4	24.1	-0.12	.22	-0.0
MORE THAN 350	6	0.10	0.3	0.93	2.3	-1.1	2.7	0.00	.01	-0.0
*INERTIA WEIGHT										
1800 - 2799	9	0.11	1.2	-2.17	22.1	-12.3	24.9	0.52	.49	0.8
2800 - 3799	9	0.23	0.5	5.70	13.2	-8.0	23.4	-0.09	.19	-0.0
3800 - 4799	11	0.11	0.2	2.82	7.7	-5.4	15.8	-0.05	.18	0.0
4800 - 5799	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
*POPULATIONS										
1960 - 1967	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968 - 1974	28	0.15	0.7	2.24	15.1	-8.6	21.1	0.12	.42	0.2
ALL VEHICLES	30	0.14	0.7	2.09	14.6	-8.0	20.4	0.11	.41	0.2

AUTOMOTIVE TESTING LABORATORIES, INC.
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PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 6 HC FAILURES, 9 CO FAILURES, 42.9% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	0							
BUICK	0							
CADILLAC	0							
CHEVROLET	9	3.35	4.56	-6.17	-0.15	26.3	665.9	-19.3
CHRYSLER	0							
DATSUN	0							
DODGE	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
FORD	7	5.71	2.96	8.48	-0.15	23.8	213.1	10.0
MERCURY	0							
OLDSMOBILE	3	7.02	10.82	-6.31	0.20	65.1	2175.7	-18.4
OPEL	0							
PLYMOUTH	0							
PONTIAC	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
TOYOTA	3	7.96	-9.81	27.26	3.84	13.1	-233.1	28.1
VOLKSWAGON	5	-10.65	-6.19	13.90	4.31	-30.0	-278.0	19.3
VOLVO	0							
*MODEL YEAR								
1960	0							
1961	0							
1962	0							
1963	0							
1964	0							
1965	0							
1966	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1967	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	0							
1969	0							
1970	0							
1971	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1972	8	-2.78	0.37	1.47	2.58	-11.3	23.3	3.0
1973	8	4.26	1.17	10.40	1.91	12.3	60.2	13.4
1974	10	7.88	5.75	7.05	0.74	33.8	496.6	11.2
*DISPLACEMENT								
LESS THAN 151	10	2.24	-2.92	20.78	3.33	4.9	-100.1	24.2
151 - 250	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
251 - 350	12	3.69	5.73	-6.22	-0.07	35.6	1030.7	-19.1
MORE THAN 350	6	2.17	1.15	0.07	-0.09	8.4	75.4	0.2
*INERTIA WEIGHT								
1800 - 2799	9	2.48	-3.27	22.60	3.67	5.0	-102.2	24.7
2800 - 3799	9	4.34	5.58	-5.95	-0.26	38.3	933.3	-15.1
3800 - 4799	11	1.91	2.70	-2.41	0.12	11.5	306.2	-5.7
4800 - 5799	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
*POPULATIONS								
1960 - 1967	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968 - 1974	28	3.23	2.70	5.41	1.59	12.3	183.1	9.6
ALL VEHICLES	30	2.77	2.30	5.11	1.51	12.1	178.9	9.4

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TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 6 HC FAILURES, 10 CO FAILURES, 42.9% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	0									
BUICK	0									
CADILLAC	0									
CHEVROLET	9	4.76	1.3	87.40	48.3	577.0	81.0	2.09	1.38	12.5
CHRYSLER	0									
DATSUN	0									
DODGE	1	4.47	0.0	137.96	0.0	366.1	0.0	0.65	0.00	14.9
FORD	7	6.41	3.8	113.96	71.8	482.3	120.6	1.76	.78	13.9
MERCURY	0									
OLDSMOBILE	3	5.17	0.9	107.56	81.8	590.0	67.1	1.86	.84	11.7
OPEL	0									
PLYMOUTH	0									
PONTIAC	2	3.30	1.6	35.19	33.6	634.2	77.8	4.84	1.47	12.7
TOYOTA	3	3.95	0.9	68.23	32.9	293.5	32.9	1.96	.95	21.5
VOLKSWAGON	5	4.49	1.1	68.67	15.4	313.2	44.7	1.72	.71	20.4
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	1	14.52	0.0	270.67	0.0	423.8	0.0	0.59	0.00	9.9
1967	1	7.37	0.0	127.00	0.0	524.5	0.0	2.96	0.00	11.9
1968	0									
1969	0									
1970	0									
1971	2	4.25	0.2	65.59	9.4	449.9	182.8	3.86	2.86	16.4
1972	8	4.78	1.0	71.42	33.0	402.1	130.3	2.34	1.29	17.4
1973	8	4.78	1.1	88.19	48.3	539.1	123.4	1.99	.71	13.7
1974	10	4.17	1.4	85.77	49.4	504.3	163.9	1.56	1.01	14.8
*DISPLACEMENT										
LESS THAN 151	10	4.19	1.0	68.86	18.7	311.2	37.7	1.80	.73	20.6
151 - 250	2	4.79	0.5	117.05	29.6	394.9	40.8	1.22	.80	14.9
251 - 350	12	5.77	3.0	105.30	75.3	569.7	70.7	2.02	1.25	12.0
MORE THAN 350	6	4.63	1.8	79.51	40.8	613.4	59.1	2.79	1.85	11.8
*INERTIA WEIGHT										
1800 - 2799	9	4.21	1.1	68.49	19.8	310.2	39.8	1.80	.78	20.7
2800 - 3799	9	5.16	0.9	96.55	43.5	509.9	122.4	1.64	.70	13.7
3800 - 4799	11	5.44	3.4	101.74	76.7	587.2	73.0	2.24	1.39	11.8
4800 - 5799	1	4.42	0.0	58.93	0.0	579.2	0.0	5.88	0.00	12.9
*POPULATIONS										
1960 - 1967	2	10.94	5.1	198.83	101.6	474.1	71.2	1.77	1.67	10.9
1968 - 1974	28	4.52	1.1	80.92	42.1	481.1	147.2	2.07	1.25	15.3
ALL VEHICLES	30	4.95	2.2	88.78	53.9	480.6	142.6	2.05	1.25	15.0

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 6 HC FAILURES, 10 CO FAILURES, 42.9% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	0									
BUICK	0									
CADILLAC	0									
CHEVROLET	9	0.16	0.3	4.18	8.9	-6.0	17.4	-0.12	.24	-0.0
CHRYSLER	0									
DATSUN	0									
DODGE	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
FORD	7	0.39	1.0	3.48	12.5	-5.7	19.8	0.16	.32	-0.0
MERCURY	0									
OLDSMOBILE	3	0.39	0.7	13.05	22.6	-23.4	40.6	-0.11	.19	0.0
OPEL	0									
PLYMOUTH	0									
PONTIAC	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
TOYOTA	3	0.34	1.0	-6.10	23.1	-6.5	34.7	0.74	.21	0.9
VOLKSWAGON	5	-0.43	0.6	-4.00	20.6	-11.5	12.1	0.28	.62	0.9
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1967	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	0									
1969	0									
1970	0									
1971	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1972	8	-0.13	0.7	0.27	17.0	-8.2	21.7	0.03	.47	0.5
1973	8	0.21	0.6	1.04	21.2	-8.3	27.0	0.23	.56	0.3
1974	10	0.36	0.8	5.24	9.8	-10.9	19.4	0.12	.30	0.1
*DISPLACEMENT										
LESS THAN 151	10	0.10	1.1	-1.95	20.8	-11.0	23.8	0.47	.49	0.7
151 - 250	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
251 - 350	12	0.22	0.4	6.40	12.9	-10.4	24.1	-0.12	.22	-0.0
MORE THAN 350	6	0.10	0.3	0.93	2.3	-1.1	2.7	0.00	.01	-0.0
*INERTIA WEIGHT										
1800 - 2799	9	0.11	1.2	-2.17	22.1	-12.3	24.9	0.52	.49	0.8
2800 - 3799	9	0.23	0.5	5.70	13.2	-8.0	23.4	-0.09	.19	-0.0
3800 - 4799	11	0.11	0.2	2.82	7.7	-5.4	15.8	-0.05	.18	0.0
4800 - 5799	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
*POPULATIONS										
1960 - 1967	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968 - 1974	28	0.15	0.7	2.24	15.1	-8.6	21.1	0.12	.42	0.2
ALL VEHICLES	30	0.14	0.7	2.09	14.6	-8.0	20.4	0.11	.41	0.2

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 6 HC FAILURES, 10 CO FAILURES, 42.9% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	0							
BUICK	0							
CADILLAC	0							
CHEVROLET	9	3.35	4.56	-6.17	-0.15	26.3	665.9	-19.3
CHRYSLER	0							
DATSUN	0							
DODGE	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
FORD	7	5.71	2.96	8.48	-0.15	23.8	213.1	10.0
MERCURY	0							
OLDSMOBILE	3	7.02	10.82	-6.31	0.20	65.1	2175.7	-18.4
OPEL	0							
PLYMOUTH	0							
PONTIAC	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
TOYOTA	3	7.96	-9.81	27.26	3.84	13.1	-233.1	28.1
VOLKSWAGON	5	-10.65	-6.19	13.90	4.31	-30.0	-278.0	19.3
VOLVO	0							
*MODEL YEAR								
1960	0							
1961	0							
1962	0							
1963	0							
1964	0							
1965	0							
1966	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1967	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	0							
1969	0							
1970	0							
1971	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1972	8	-2.78	0.37	1.47	2.58	-11.3	23.3	3.0
1973	8	4.26	1.17	10.40	1.91	12.3	60.2	13.4
1974	10	7.88	5.75	7.05	0.74	33.8	496.6	11.2
*DISPLACEMENT								
LESS THAN 151	10	2.24	-2.92	20.78	3.33	4.9	-100.1	24.2
151 - 250	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
251 - 350	12	3.69	5.73	-6.22	-0.07	35.6	1030.7	-19.1
MORE THAN 350	6	2.17	1.15	0.07	-0.09	8.4	75.4	0.2
*INERTIA WEIGHT								
1800 - 2799	9	2.48	-3.27	22.60	3.67	5.0	-102.2	24.7
2800 - 3799	9	4.34	5.58	-5.95	-0.26	38.3	933.3	-15.1
3800 - 4799	11	1.91	2.70	-2.41	0.12	11.5	306.2	-5.7
4800 - 5799	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
*POPULATIONS								
1960 - 1967	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968 - 1974	28	3.23	2.70	5.41	1.59	12.3	183.1	9.6
ALL VEHICLES	30	2.77	2.30	5.11	1.51	12.1	178.9	9.4

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 1 CO FAILURES, 50.0% FAILURE RATE
1968-1974 VEHICLES: 6 HC FAILURES, 10 CO FAILURES, 42.9% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	0									
BUICK	0									
CADILLAC	0									
CHEVROLET	9	4.76	1.3	87.40	48.3	577.0	81.0	2.09	1.38	12.5
CHRYSLER	0									
DATSUN	0									
DODGE	1	4.47	0.0	137.96	0.0	366.1	0.0	0.65	0.00	14.9
FORD	7	5.98	2.8	112.78	68.8	488.8	118.1	1.77	.76	13.8
MERCURY	0									
OLDSMOBILE	3	5.17	0.9	107.56	81.8	590.0	67.1	1.86	.84	11.7
OPEL	0									
PLYMOUTH	0									
PONTIAC	2	3.30	1.6	35.19	33.6	634.2	77.8	4.84	1.47	12.7
TOYOTA	3	3.95	0.9	68.23	32.9	293.5	32.9	1.96	.95	21.5
VOLKSWAGON	5	4.49	1.1	68.67	15.4	313.2	44.7	1.72	.71	20.4
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	1	11.52	0.0	262.45	0.0	469.1	0.0	0.69	0.00	9.7
1967	1	7.37	0.0	127.00	0.0	524.5	0.0	2.96	0.00	11.9
1968	0									
1969	0									
1970	0									
1971	2	4.25	0.2	65.59	9.4	449.9	182.8	3.86	2.86	16.4
1972	8	4.78	1.0	71.42	33.0	402.1	130.3	2.34	1.29	17.4
1973	8	4.78	1.1	88.19	48.3	539.1	123.4	1.99	.71	13.7
1974	10	4.17	1.4	85.77	49.4	504.3	163.9	1.56	1.01	14.8
*DISPLACEMENT										
LESS THAN 151	10	4.19	1.0	68.86	18.7	311.2	37.7	1.80	.73	20.6
151 - 250	2	4.79	0.5	117.05	29.6	394.9	40.8	1.22	.80	14.9
251 - 350	12	5.52	2.2	104.61	73.7	573.5	63.0	2.03	1.24	12.0
MORE THAN 350	6	4.63	1.8	79.51	40.8	613.4	59.1	2.79	1.85	11.8
*INERTIA WEIGHT										
1800 - 2799	9	4.21	1.1	68.49	19.8	310.2	39.8	1.80	.78	20.7
2800 - 3799	9	5.16	0.9	96.55	43.5	509.9	122.4	1.64	.70	13.7
3800 - 4799	11	5.17	2.6	100.99	74.9	591.4	63.6	2.25	1.38	11.7
4800 - 5799	1	4.42	0.0	58.93	0.0	579.2	0.0	5.88	0.00	12.9
*POPULATIONS										
1960 - 1967	2	9.44	2.9	194.72	95.8	496.8	39.1	1.82	1.60	10.8
1968 - 1974	28	4.52	1.1	80.92	42.1	481.1	147.2	2.07	1.25	15.3
ALL VEHICLES	30	4.85	1.8	88.51	52.9	482.2	142.2	2.05	1.24	15.0

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 1 CO FAILURES, 50.0% FAILURE RATE
1968-1974 VEHICLES: 6 HC FAILURES, 10 CO FAILURES, 42.9% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	0									
BUICK	0									
CADILLAC	0									
CHEVROLET	9	0.16	0.3	4.18	8.9	-6.0	17.4	-0.12	.24	-0.0
CHRYSLER	0									
DATSUN	0									
DODGE	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
FORD	7	0.82	1.4	4.65	12.5	-12.2	24.5	0.15	.33	0.0
MERCURY	0									
OLDSMOBILE	3	0.39	0.7	13.05	22.6	-23.4	40.6	-0.11	.19	0.0
OPEL	0									
PLYMOUTH	0									
PONTIAC	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
TOYOTA	3	0.34	1.0	-6.10	23.1	-6.5	34.7	0.74	.21	0.9
VOLKSWAGON	5	-0.43	0.6	-4.00	20.6	-11.5	12.1	0.28	.62	0.9
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	1	3.00	0.0	8.22	0.0	-45.3	0.0	-0.09	0.00	0.2
1967	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1968	0									
1969	0									
1970	0									
1971	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1972	8	-0.13	0.7	0.27	17.0	-8.2	21.7	0.03	.47	0.5
1973	8	0.21	0.6	1.04	21.2	-8.3	27.0	0.23	.56	0.3
1974	10	0.36	0.8	5.24	9.8	-10.9	19.4	0.12	.30	0.1
*DISPLACEMENT										
LESS THAN 151	10	0.10	1.1	-1.95	20.8	-11.0	23.8	0.47	.49	0.7
151 - 250	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
251 - 350	12	0.47	0.9	7.08	12.8	-14.2	25.9	-0.13	.22	0.0
MORE THAN 350	6	0.10	0.3	0.93	2.3	-1.1	2.7	0.00	.01	-0.0
*INERTIA WEIGHT										
1800 - 2799	9	0.11	1.2	-2.17	22.1	-12.3	24.9	0.52	.49	0.8
2800 - 3799	9	0.23	0.5	5.70	13.2	-8.0	23.4	-0.09	.19	-0.0
3800 - 4799	11	0.38	0.9	3.57	7.8	-9.5	19.7	-0.06	.18	0.0
4800 - 5799	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
*POPULATIONS										
1960 - 1967	2	1.50	2.1	4.11	5.8	-22.7	32.1	-0.05	.07	0.1
1968 - 1974	28	0.15	0.7	2.24	15.1	-8.6	21.1	0.12	.42	0.2
ALL VEHICLES	30	0.24	0.9	2.37	14.6	-9.6	21.5	0.11	.41	0.2

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
TESTED IN PUBLIC SECTOR

1960-1967 VEHICLES: 0 HC FAILURES, 1 CO FAILURES, 50.0% FAILURE RATE
1968-1974 VEHICLES: 6 HC FAILURES, 10 CO FAILURES, 42.9% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	0							
BUICK	0							
CADILLAC	0							
CHEVROLET	9	3.35	4.56	-6.17	-0.15	26.3	665.9	-19.3
CHRYSLER	0							
DATSUN	0							
DODGE	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
FORD	7	12.01	3.96	7.79	0.11	48.9	279.0	9.0
MERCURY	0							
OLDSMOBILE	3	7.02	10.82	-6.31	0.20	65.1	2175.7	-18.4
OPEL	0							
PLYMOUTH	0							
PONTIAC	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
TOYOTA	3	7.96	-9.81	27.26	3.84	13.1	-233.1	28.1
VOLKSWAGON	5	-10.65	-6.19	13.90	4.31	-30.0	-278.0	19.3
VOLVO	0							
*MODEL YEAR								
1960	0							
1961	0							
1962	0							
1963	0							
1964	0							
1965	0							
1966	1	20.64	3.04	-15.66	2.50	460.9	1264.9	-14.3
1967	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1968	0							
1969	0							
1970	0							
1971	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1972	8	-2.78	0.37	1.47	2.58	-11.3	23.3	3.0
1973	8	4.26	1.17	10.40	1.91	12.3	60.2	13.4
1974	10	7.88	5.75	7.05	0.74	33.8	496.6	11.2
*DISPLACEMENT								
LESS THAN 151	10	2.24	-2.92	20.78	3.33	4.9	-100.1	24.2
151 - 250	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
251 - 350	12	7.86	6.34	-6.63	0.10	73.4	1104.0	-19.7
MORE THAN 350	6	2.17	1.15	0.07	-0.09	8.4	75.4	0.2
*INERTIA WEIGHT								
1800 - 2799	9	2.48	-3.27	22.60	3.67	5.0	-102.2	24.7
2800 - 3799	9	4.34	5.58	-5.95	-0.26	38.3	933.3	-15.1
3800 - 4799	11	6.82	3.41	-2.79	0.32	40.1	378.1	-6.5
4800 - 5799	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
*POPULATIONS								
1960 - 1967	2	13.69	2.07	-2.62	1.14	285.3	783.1	-8.8
1968 - 1974	28	3.23	2.70	5.41	1.59	12.3	183.1	9.6
ALL VEHICLES	30	4.73	2.61	4.97	1.57	20.4	200.9	9.1

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSIONS BEFORE INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
FLEET VEHICLES

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	4	3.55	1.0	49.93	13.4	488.4	108.3	3.51	.12	15.8
BUICK	0									
CADILLAC	0									
CHEVROLET	0									
CHRYSLER	0									
DATSUN	0									
DODGE	5	4.75	1.2	88.92	28.8	601.8	31.6	3.27	1.83	11.8
FORD	19	3.76	0.9	74.31	18.4	463.6	64.4	2.39	1.22	15.2
MERCURY	0									
OLDSMOBILE	0									
OPEL	0									
PLYMOUTH	2	6.27	0.7	130.79	43.2	505.8	25.6	3.55	.33	12.2
PONTIAC	0									
TOYOTA	0									
VOLKSWAGON	0									
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	0									
1967	0									
1968	0									
1969	0									
1970	5	4.93	1.2	80.25	46.4	550.5	36.9	3.88	1.44	12.9
1971	8	4.01	1.0	62.37	20.1	481.6	73.5	3.64	.36	15.2
1972	1	3.26	0.0	50.16	0.0	411.9	0.0	4.30	0.00	17.7
1973	6	4.97	0.9	94.20	17.7	584.4	39.9	2.21	.60	11.9
1974	9	3.32	0.6	82.93	20.5	429.9	48.1	1.44	.65	15.7
*DISPLACEMENT										
LESS THAN 151	9	2.91	0.5	75.37	17.1	405.2	22.1	1.94	1.23	16.7
151 - 250	3	3.66	0.4	60.67	13.3	438.7	23.6	4.16	.21	16.3
251 - 350	12	4.23	0.8	67.27	22.4	515.5	66.1	2.77	.90	14.2
MORE THAN 350	7	5.19	1.3	100.88	35.8	574.4	54.5	3.35	1.50	11.9
*INERTIA WEIGHT										
1800 - 2799	1	3.26	0.0	50.16	0.0	411.9	0.0	4.30	0.00	17.7
2800 - 3799	15	3.28	0.6	71.75	22.7	431.9	43.6	2.36	1.28	16.1
3800 - 4799	14	4.96	0.9	85.10	30.5	563.7	49.1	3.08	1.20	12.5
4800 - 5799	0									
*POPULATIONS										
1960 - 1967	0									
1968 - 1974	30	4.07	1.1	77.26	27.2	492.7	81.1	2.76	1.29	14.5
ALL VEHICLES	30	4.07	1.1	77.26	27.2	492.7	81.1	2.76	1.29	14.5

AUTOMOTIVE TESTING LABORATORIES, INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
FLEET VEHICLES

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 0 HC FAILURES, 2 CO FAILURES, 6.7% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	4	3.55	1.0	49.93	13.4	488.4	108.3	3.51	.12	15.8
BUICK	0									
CADILLAC	0									
CHEVROLET	0									
CHRYSLER	0									
DATSUN	0									
DODGE	5	4.68	1.2	85.94	29.6	588.3	20.5	3.20	1.85	12.1
FORD	19	3.76	0.9	73.89	18.6	465.0	65.8	2.40	1.23	15.2
MERCURY	0									
OLDSMOBILE	0									
OPEL	0									
PLYMOUTH	2	6.27	0.7	130.79	43.2	505.8	25.6	3.55	.33	12.2
PONTIAC	0									
TOYOTA	0									
VOLKSWAGON	0									
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	0									
1967	0									
1968	0									
1969	0									
1970	5	4.92	1.2	78.64	47.1	556.1	30.3	3.91	1.43	12.8
1971	8	4.01	1.0	62.37	20.1	481.6	73.5	3.64	.36	15.2
1972	1	3.26	0.0	50.16	0.0	411.9	0.0	4.30	0.00	17.7
1973	6	4.91	1.0	91.71	19.5	573.1	26.3	2.15	.53	12.1
1974	9	3.32	0.6	82.93	20.5	429.9	48.1	1.44	.65	15.7
*DISPLACEMENT										
LESS THAN 151	9	2.91	0.5	75.37	17.1	405.2	22.1	1.94	1.23	16.7
151 - 250	3	3.66	0.4	60.67	13.3	438.7	23.6	4.16	.21	16.3
251 - 350	12	4.22	0.8	66.60	22.5	517.9	66.3	2.78	.91	14.2
MORE THAN 350	7	5.13	1.3	98.75	37.1	564.7	44.8	3.30	1.53	12.1
*INERTIA WEIGHT										
1800 - 2799	1	3.26	0.0	50.16	0.0	411.9	0.0	4.30	0.00	17.7
2800 - 3799	15	3.28	0.6	71.75	22.7	431.9	43.6	2.36	1.28	16.1
3800 - 4799	14	4.93	0.9	83.46	31.0	560.9	41.5	3.07	1.21	12.6
4800 - 5799	0									
*POPULATIONS										
1960 - 1967	0									
1968 - 1974	30	4.05	1.1	76.50	27.2	491.4	77.9	2.76	1.29	14.5
ALL VEHICLES	30	4.05	1.1	76.50	27.2	491.4	77.9	2.76	1.29	14.5

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

EXHAUST EMISSION REDUCTIONS AFTER INSPECTION AND MAINTENANCE

1975 FEDERAL TEST PROCEDURE
FLEET VEHICLES

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 0 HC FAILURES, 2 CO FAILURES, 6.7% FAILURE RATE

	# OF VEH.	HC MEAN	HC S.D.	CO MEAN	CO S.D.	CO2 MEAN	CO2 S.D.	NOX MEAN	NOX S.D.	MPG MEAN
*VEHICLE MAKE										
AMER. MOTORS	4	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
BUICK	0									
CADILLAC	0									
CHEVROLET	0									
CHRYSLER	0									
DATSUN	0									
DODGE	5	0.07	0.2	2.98	6.7	13.5	30.2	0.07	.16	-0.3
FORD	19	0.00	0.0	0.42	1.8	-1.5	6.5	-0.01	.04	0.0
MERCURY	0									
OLDSMOBILE	0									
OPEL	0									
PLYMOUTH	2	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
PONTIAC	0									
TOYOTA	0									
VOLKSWAGON	0									
VOLVO	0									
*MODEL YEAR										
1960	0									
1961	0									
1962	0									
1963	0									
1964	0									
1965	0									
1966	0									
1967	0									
1968	0									
1969	0									
1970	5	0.01	0.0	1.61	3.6	-5.7	12.6	-0.03	.07	0.1
1971	8	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1972	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
1973	6	0.06	0.1	2.48	6.1	11.3	27.6	0.06	.14	-0.2
1974	9	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
*DISPLACEMENT										
LESS THAN 151	9	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
151 - 250	3	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
251 - 350	12	0.01	0.0	0.67	2.3	-2.4	8.2	-0.01	.05	0.0
MORE THAN 350	7	0.05	0.1	2.13	5.6	9.6	25.5	0.05	.13	-0.2
*INERTIA WEIGHT										
1800 - 2799	1	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
2800 - 3799	15	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.0
3800 - 4799	14	0.03	0.1	1.64	4.4	2.8	20.1	0.01	.11	-0.1
4800 - 5799	0									
*POPULATIONS										
1960 - 1967	0									
1968 - 1974	30	0.01	0.1	0.76	3.0	1.3	13.5	0.01	.07	-0.0
ALL VEHICLES	30	0.01	0.1	0.76	3.0	1.3	13.5	0.01	.07	-0.0

AUTOMOTIVE TESTING LABORATORIES,INC.
19900 E. COLFAX, AURORA, COLO. 80011

PERCENT REDUCTIONS AND REDUCTIONS PER DOLLAR

1975 FEDERAL TEST PROCEDURE
FLEET VEHICLES

1960-1967 VEHICLES: 0 HC FAILURES, 0 CO FAILURES, 0.0% FAILURE RATE
1968-1974 VEHICLES: 0 HC FAILURES, 2 CO FAILURES, 6.7% FAILURE RATE

	# OF VEH.	PERCENT REDUCTIONS HC	CO	NOX	MPG	MILLIGRAMS/MILE/DOLLAR HC	CO	NOX
*VEHICLE MAKE								
AMER. MOTORS	4	0.00	0.00	0.00	0.00	0.0	0.0	0.0
BUICK	0							
CADILLAC	0							
CHEVROLET	0							
CHRYSLER	0							
DATSUN	0							
DODGE	5	1.53	3.35	2.16	-2.45	14.7	603.5	14.3
FORD	19	0.09	0.57	-0.36	0.12	0.7	94.3	-1.9
MERCURY	0							
OLDSMOBILE	0							
OPEL	0							
PLYMOUTH	2	0.00	0.00	0.00	0.00	0.0	0.0	0.0
PONTIAC	0							
TOYOTA	0							
VOLKSWAGON	0							
VOLVO	0							
*MODEL YEAR								
1960	0							
1961	0							
1962	0							
1963	0							
1964	0							
1965	0							
1966	0							
1967	0							
1968	0							
1969	0							
1970	5	0.26	2.01	-0.84	0.52	2.2	274.2	-5.6
1971	8	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1972	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
1973	6	1.22	2.64	2.67	-2.02	12.7	519.3	12.3
1974	9	0.00	0.00	0.00	0.00	0.0	0.0	0.0
*DISPLACEMENT								
LESS THAN 151	9	0.00	0.00	0.00	0.00	0.0	0.0	0.0
151 - 250	3	0.00	0.00	0.00	0.00	0.0	0.0	0.0
251 - 350	12	0.13	1.00	-0.49	0.20	1.1	140.3	-2.9
MORE THAN 350	7	1.00	2.11	1.51	-1.73	11.1	455.7	10.8
*INERTIA WEIGHT								
1800 - 2799	1	0.00	0.00	0.00	0.00	0.0	0.0	0.0
2800 - 3799	15	0.00	0.00	0.00	0.00	0.0	0.0	0.0
3800 - 4799	14	0.62	1.93	0.44	-0.63	6.1	327.6	2.7
4800 - 5799	0							
*POPULATIONS								
1960 - 1967	0							
1968 - 1974	30	0.35	0.99	0.23	-0.25	3.2	171.2	1.4
ALL VEHICLES	30	0.35	0.99	0.23	-0.25	3.2	171.2	1.4

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