

REVISIONS TO THE STATE IMPLEMENTATION
PLAN FOR HARRIS COUNTY
CONCERNING THE VEHICLE PARAMETER
INSPECTION AND MAINTENANCE PROGRAM

NOVEMBER 9, 1984

Preface

On January 25, 1984, the Texas Air Control Board (TACB) held a public hearing in Houston to receive comments on proposed modifications to the Vehicle Parameter Inspection and Maintenance Program adopted as part of the 1982 Texas State Implementation Plan for Harris County. These modifications included additional inspection procedures developed through negotiations with the U. S. Environmental Protection Agency (EPA) and Texas Department of Public Safety (DPS) to satisfy emission reduction criteria and to avoid threatened economic sanctions. The TACB adopted these changes on March 16, 1984. However, EPA subsequently stipulated that supplemental provisions to ensure enforceability of the program and current documentation of DPS inspection procedures must be included in the plan before final approval could be granted. Clarification and documentation of various other portions of the program were also requested.

The present TACB action is in response to EPA concerns regarding the documentation of new DPS regulations and adoption of appropriate enforcement provisions of the program.

The proposed revisions would add to or clarify the following requirements of the ozone control strategy:

- ° amend DPS rules (Appendix X) for vehicles beginning with 1980 and newer model year to incorporate additional inspection procedures and enforcement requirements adopted by the Public Safety Commission on May 11, 1984;
- ° amend pass/fail criteria to specify replacement within one year of the catalytic converter on 1980-1983 model year vehicles which fail specified pass/fail criteria;
- ° amend pass/fail criteria to specify immediate replacement of the catalytic converter on 1984 and newer model year vehicles which fail specified pass/fail criteria;
- ° amend pass/fail criteria to require all 1968 and newer model year vehicles currently registered and operated in Harris County to be subject to emissions parameter inspection program;
- ° amend pass/fail criteria to provide for prosecution of persons operating a vehicle with Harris County registration on the highways of Harris County without a valid inspection certificate with red numeral insert;
- ° amend Appendix X to include specific letters of commitment from local law enforcement agencies;

Preface
Page 2.

- ° amend appropriate sections of the program to provide for additional quality assurance and data reporting measures, mechanic training, and current emission reduction credit analysis and documentation.

The Vehicle Parameter Inspection and Maintenance portion of the Harris County ozone SIP incorporating the additional inspection, certification, and enforcement requirements is attached. Proposed revisions to the text are underlined and additional support documentation for inclusion in appropriate appendices is included. Comments will be received at a public hearing to be held in Houston, Texas on July 23, 1984.

(d) Vehicle Parameter Inspection and Maintenance Program

i. General

The FCAA provides that a state must "establish a specific schedule for implementation of a vehicle emission control inspection and maintenance program" for each area for which the Administrator approved an extension of the deadline for attainment of the ozone NAAQS until 1987 as part of the 1979 SIP revision approval action (Section 172(b)(11)(B)). EPA policy has expanded upon this FCAA requirement to specify that SIP revisions required in 1982 include enforceable measures to implement a mandatory vehicle inspection and maintenance program. On December 18, 1979, EPA approved the inspection and maintenance portion of the 1979 SIP revision for Harris County submitted to EPA on April 13, 1979 (FR 74830) by the Governor of Texas.

The 1979 SIP revisions included an amendment of the Texas Clean Air Act requiring the TACB, with the cooperation of Texas Department of Public Safety (DPS) and the State Department of Highways and Public Transportation to:

- o Conduct a vehicle inspection and maintenance pilot program and study to evaluate the effectiveness and feasibility of various in-use vehicle emission control options.
- o Prepare for a vehicle inspection and maintenance program in Harris County to allow for full implementation no later than December 31, 1982, and
- o Report to the 67th Session of the Texas Legislature concerning the results of the required study and planning activities on or before December 1, 1980.

During 1980, the TACB conducted a pilot program and study of motor vehicle emissions and emissions control options to evaluate technically the cost, effectiveness, and feasibility of various vehicle emission control programs. The results of this study are contained in a report, "Program to Control Motor Vehicle Emissions in the State of Texas," prepared by the TACB for the 67th Texas Legislature (Appendix W). The results of this project suggest that the effectiveness of vehicle emission inspection programs depends in large measure on the degree of public support and acceptance of the need for vehicle emissions control and on the ability of automobile service technicians and mechanics to maintain current technology vehicles properly. Further, the results indicate that for current technology vehicles the effectiveness of the inspection program is not particularly dependent on the type of inspection-idle emissions check or parameter check.

As a result of the work conducted during this pilot study and subsequent studies, as well as a general review of information regarding motor vehicle use in Harris County, several important factors which differentiate Harris County from other major urban areas have been identified. (See Section VI.B.5.b.1) for a general discussion of these factors.) For example, tampering and misfueling occur, 18 percent in Harris County, at a higher rate than is typical of other areas, 8 percent according to EPA Mobile 2 model. Emissions from motor vehicles account for less than one-third of the total VOC emissions. In addition, there are more newer model year vehicles in Harris County than in most urban areas in the country. Because of this higher proportion of new vehicles in Harris County, in-use emission control measures applicable to new model (computer-controlled) vehicles are especially important.

The computer-based technology which is being rapidly incorporated into new automobiles presents a major challenge to the automobile service industry. Without special training, automobile mechanics and service technicians will be unable to effectively and economically maintain new technology vehicles. The vehicle parameter inspection and maintenance program being developed for Harris County includes an aggressive mechanic training and certification program to assist the automobile repair industry to meet this new challenge. Studies have shown that most vehicles, especially new technology automobiles which are properly maintained, not only run better but also have lower VOC emissions and operate more economically.

Vehicle inspection programs based on measurement of vehicle idle exhaust gas emissions may be somewhat effective to detect older vehicles (pre-81) with excessive carbon monoxide emissions, but are relatively ineffective to detect new computer-controlled vehicles with excessive VOC emissions. Because of specific conditions that exist in Harris County, a special study was initiated to evaluate critical parameters to be included in a vehicle inspection and maintenance program appropriate for Harris County, that would also comply with the requirements of the FCAA (Appendix Y).

ii. Program Description

Based on this Harris County specific data, the TACB and DPS have developed a motor vehicle parameter inspection and maintenance program appropriate for Harris County. Statutory authority for the program is provided by the Texas Clean Air Act Section 3.10 (d) and by Article XV of the Texas Vehicle Inspection Act Sections 140-142.

TACB and DPS will coordinate revisions of the applicable rules and regulations or any needed statutory amendments to assure that all automobiles and light-duty trucks under 8500 pounds, gross vehicle weight, registered in Harris County are inspected as part of this program, in Harris County. The program will include enhanced anti-tampering requirements, voluntary mechanic training and certification, and public information program, as well as requirements for annual inspection of vehicle emission control components.

Each of the program elements emphasizes the importance of effective maintenance control of in-use vehicle emissions. Requirements for mandatory annual inspections are included to ensure the continued effectiveness of the program. The Harris County vehicle parameter inspection and maintenance program described in this section addresses all elements listed in EPA's 1982 SIP Vehicle Inspection and Maintenance program policy and includes additional elements necessary to effectively address in-use vehicle emissions control in Harris County.

o Vehicle Inspection Program
- Inspection Test Procedures -

A January 19, 1981 memorandum from EPA Deputy Assistant Administrator for Mobile Source Air Pollution Control to Air and Hazardous Materials Division Directors, Regions I-X, defines the objectives of the inspection procedures included in state vehicle inspection programs to be the identification of high emitting vehicles in need of maintenance and the verification, through post-maintenance retest, that proper maintenance has been performed.

The Texas Vehicle Inspection Act, Article XV - Inspection of Vehicles V.C.S. 6701d, Uniform Act Section 140 (Appendix X)

requires that all vehicles operating on the public roads of Texas be inspected annually to determine conformity with DPS Rules and Regulations Section C - Inspection Procedure (Appendix X). These regulations require inspectors to visually inspect the emission control system for all 1968 or newer model year vehicles. This inspection includes a visual check of the exhaust emission system components. These procedures have been enhanced by additions to reference diagrams used by DPS inspectors to assist the inspectors to determine an individual vehicles requirements for emission control related components included in DPS Rules and Regulations Section E - Reference Section (Appendix X). During 1983, Harris County DPS inspectors received upgraded training on inspection of emissions control systems.

On November 30, 1983, the Public Safety Commission approved a resolution committing to successfully implement additional inspection procedures for 1980 and newer model year vehicles in Harris County. On May 11, 1984, the Public Safety Commission adopted amendments to annual inspection procedures for 1980 and newer light-duty gasoline vehicles in Harris County. Such vehicles will be examined to determine the presence and apparent function of the equipment which was installed by the manufacturer to comply with the requirements of the federal motor vehicle control program (FMVCP) and other vehicle parameters considered critical to excess VOC emissions.

Each 1980 and newer model year light-duty vehicle in Harris County will continue to be inspected annually for (1) PCV system; (2) evaporate control system; (3) air injection system; and (4) choke heater and vacuum break. However, beginning July 1, 1984, the DPS will also include as part of the inspection procedures a visual examination of 1980

and newer model year light-duty vehicles for the presence of a catalytic converter, and fuel inlet restrictor and a simple test for lead in the exhaust pipes of those vehicles that are designed to use unleaded fuel.

DPS inspection procedures for 1984 and newer model year vehicles, in addition to all of the above criteria, will require examination of oxygen and other appropriate closed loop sensors. Such vehicles which evidence obvious engine misfires or for which the owner has failed to perform maintenance required by the manufacturer to protect the emission control performance warranty or to comply with a manufacturer's recall relating to VOC emission control systems will also be rejected.

DPS inspection procedures, Parameter Vehicle Emission Inspection and Maintenance Rules and Regulations for Official Vehicle Inspection Stations and Certified Inspectors (Appendix X), will be reviewed and amended annually beginning with the 1980 model year to provide current vehicle emission parameter inspection procedures for the most recent eight vehicle model years. Amended procedures will be submitted to EPA as proposed SIP revisions. DPS will provide training for inspectors necessary to implement appropriate inspection procedures.

Appendix X also contains resolutions from the City of Houston, and the Harris County Commissioners Court, correspondence from the Houston-Galveston Area Council requesting TACB to initiate these program changes, a Board Resolution to DPS requesting that these changes be added to their inspection procedures, a Public Safety Commission Resolution committing DPS to carry out the revised inspection program, and finally, DPS rule, TAC

Section 23.91, Parameter Vehicle Emission Inspection and Maintenance Program, adopting provisions of the revised inspection program.

- Emission Standards (pass/fail criteria) -

The previously referenced January, 1981 EPA policy memorandum requires that emissions standards, or pass/fail criteria, must be included in a state's vehicle emission inspection and maintenance program. These standards or criteria determine, in part, the emission reductions to be credited for program implementation.

The pass/fail criteria used by inspectors to inspect vehicles in Texas are defined in DPS Rules and Regulations Section C - Inspection Procedures (Appendix X). These rules require that inspectors must inspect for and reject all 1968 and newer model year vehicles if the exhaust emission system has been removed, disconnected, or altered in any manner to make it ineffective; the plumbing is loose, broken, leaking or improperly routed; or the air pump belt is loose or removed. The Texas Vehicle Inspection Act Article XV Inspection of Vehicles V.C.S. 6701d, Uniform Act Section 140(d) Compulsory Inspection (Appendix X) provides that if an inspection indicates any of these deficiencies exist the vehicle shall be adjusted or repaired before a certificate is issued. Reinspection within 15 days at the same inspection station shall be available free of charge after adequate repairs have been made.

To enhance the existing vehicle parameter inspection and maintenance program for 1980 or newer model year vehicles in Harris County, the Public Safety Commission, on May 11, 1984, adopted amendments to DPS rules to include additional

pass/fail criteria. DPS Handbook, Section 2 provides specific criteria for each inspection parameter.

For 1980-1983 model year vehicles, DPS pass/fail criteria provide for rejection of a vehicle on which the following equipment which was installed by the manufacturer to comply with the requirements of FMVCP has been disconnected or removed: (1) PCV system; (2) air injection system; (3) evaporative emission control system; (4) choke heater and vacuum break. Effective July 1, 1984, the pass/fail criteria will include a visual examination to determine the presence of the catalytic converter and fuel inlet restrictor on 1980-1983 and newer model year vehicles. The criteria will also include a procedure to test the exhaust pipes of 1980-1983 model year vehicles designed for the use of unleaded fuel for the presence of lead. Light-duty 1980-1983 model year vehicles not in compliance with the pass/fail criteria for the presence of the catalytic converter, fuel inlet restrictor, or lead deposits in the exhaust pipes, but otherwise passing the inspection, shall be issued a perforated inspection sticker. Stickers will not be re-issued to such vehicles at the next annual inspection unless the owner can provide evidence of having replaced the converter and, if applicable, the fuel inlet restrictor. Vehicle owner, upon catalyst replacement notification, shall be informed of the potential for subsequent lead test failures and catalyst replacement requirements if the vehicle tailpipe is not also replaced. Voluntary tailpipe replacement shall be advocated.

For 1984 and newer model year vehicles, DPS pass/fail criteria will provide for rejection of a vehicle on which the following equipment which was installed by the manufacturer to comply with the requirements of FMVCP has been disconnected or removed: (1) PCV system; (2) air injection

system; (3) evaporative emission control system; (4) choke heater and vacuum break; (5) oxygen or other appropriate closed loop sensors; (6) catalytic converter; and (7) fuel inlet restrictor. In addition, the pass/fail criteria will include provisions to reject vehicles which evidence obvious engine misfires and for which the owner has failed to perform maintenance required by the manufacturer to protect the emission control performance warranty or to comply with a manufacturer's recall relating to VOC emission control systems. The criteria will also include the procedure to test the exhaust pipes of 1984 and newer model year vehicles designed for the use of unleaded fuel for the presence of lead. However, light-duty 1984 and newer model year vehicles not in compliance with the pass/fail criteria for the presence of the catalytic converter, fuel inlet restrictor, or lead deposits in the exhaust pipes shall be required to replace the catalyst and, if applicable, the fuel inlet restrictor before an inspection sticker can be issued. Vehicle owner, upon catalyst replacement notification, shall be informed of the potential for subsequent lead test failures and catalyst replacement requirements if the vehicle tailpipe is not also replaced. Voluntary tailpipe replacement shall be advocated.

DPS rules adopted on May 11, 1984, (Appendix X), include provisions to ensure that all 1968 and newer model year vehicles currently registered and operated in Harris County are inspected under the parameter inspection program. Harris County registration is confirmed whenever a 1968 or newer model year light-duty vehicle is presented for inspection in Harris or contiguous counties by examining the number code printed on the rear license plate validation sticker and comparing it to a current list of validation sticker code numbers assigned to the Harris County Tax Collector. DPS rules also provide for prosecution of persons operating a vehicle with Harris County registration

on the highways in Harris County without displaying a valid inspection certificate with red numeral insert except under specified circumstances.

These pass/fail criteria will be reviewed annually and amended, as necessary, to provide current pass/fail criteria for the most recent eight model year vehicles. These rule amendments will be submitted to EPA as proposed SIP revisions following adoption by DPS. DPS will provide descriptions of appropriate pass/fail criteria in inspector training materials and inspector handbooks for each of the most recent eight model years beginning with 1980.

DPS pass/fail criteria were used in determining the emission reduction to be credited for program implementation (see Table 10).

- Inspection Station and Inspector Licensing Requirements - EPA policy (July 17, 1978 EPA memorandum from David Hawkins to Regional Administrators) requires all inspection facilities to be licensed. A representative of the facility must have received instructions in the proper use of the instruments and in vehicle testing methods and must have demonstrated proficiency in these methods. The facility must agree to maintain records and to submit to inspection of the facility. The appropriate government agency must have provisions for penalties for facilities which fail to follow prescribed procedures and for misconduct.

All licensing procedures required by EPA for vehicle inspection and maintenance programs are satisfied through the provision of the Texas Vehicle Inspection Act Article XV Inspection of Vehicle V.C.S. 6701d, Section 141 State Appointed Inspection Stations (Appendix X). DPS Rules and Regulations Section A - Station Licensing and Operation (Appendix X) define the criteria for approval of inspection

stations. Under these rules and the provisions of the statute, DPS trains and certifies all inspectors and licenses all inspection stations. All inspectors and each of the approximately 1100 inspection stations must be recertified every two years. DPS can require additional inspector training at any time. The DPS has committed to developing and providing training to the inspectors. DPS requires each inspection station to keep records of all inspections performed, to maintain a copy of such records at the inspection station, and to submit to DPS periodic reports on inspections performed (see Record Keeping and Record Submittal Requirements). DPS takes corrective action against non-complying inspectors and inspection stations, including assessment of misdemeanor penalties and revoking inspector or inspection station licenses.

- Equipment Specifications -

EPA vehicle inspection and maintenance program policy (July, 1978 and January, 1981) requires specifications to be established for testing instruments to ensure that accurate inspections are conducted.

The DPS has authority under Texas Vehicle Inspection Act Article XV (Appendix X) to define equipment specifications and maintenance requirements for instruments and/or equipment used in vehicle inspections. DPS Rules and Regulations Section C - Inspection Procedures, require visual examination of exhaust emission systems. No equipment is required for the inspection of emission control components on 1968-1979 model year vehicles.

The following items will be specified as minimum station requirements for inspection of emission control components on 1980 and newer model year vehicles registered and operated in Harris County:

1. lead sensitive test paper - minimum of one
box
2. 15/16" dowel rod or leaded nozzle end
3. Mechanics or dental mirror
4. flashlight
5. clothespins or similar disposable clamps
6. squeeze or spray bottle for water
7. roll of paper towels or clean cloths
8. 1/4" round hole punch

- Record Keeping and Record Submittal Requirements -

Although EPA has not established specific data collection and reporting requirements for vehicle inspection and maintenance programs, annual reports on program implementation and enforcement are required to document the effectiveness of the program and to demonstrate reasonable further progress (RFP) in emission reductions.

The TACB will monitor the results of the vehicle parameter inspection and maintenance program in Harris County to determine the effectiveness of the program pass/fail criteria. This annual report will be based on data collected by DPS certified inspection stations, compiled by DPS and forwarded to the TACB. The report forms to be used by DPS inspectors to record and report data resulting from annual inspection of vehicle emission control systems are included in Appendix X (DPS Rules Section D and Supplement Section 3 - Reporting Requirements). Data reported will include the date of inspection, the inspection station, the make, model and year of the vehicle, and the repairs required for each of the emission control system components.

Program effectiveness will be determined through analysis of vehicle inspection reports including: (1) the

number of inspections conducted; (2) the number of emission control system related failures, and ; (3) the types of repair required and the maintenance performed.

DPS will also maintain and report to TACB inspection information for counties contiguous to Harris County. Analysis of Regulation IV compliance records will be included to determine the number of corrective action taken including the number of notices of violations issued for vehicle misfueling and tampering. The number of certifications and licenses issued and the number of non-compliance citations issued to vehicle inspectors and inspection station licenses revoked will be carefully monitored and reported by DPS. DPS will also maintain a record of the citations issued to motorists for failure to display a valid inspection certificate with red numeral insert on a vehicle registered and operated in Harris County. DPS will report this information to TACB.

Quality Control, Audit, and Surveillance Procedures - EPA policy (July, 1978) states that vehicle inspection and maintenance programs must include a quality assurance program consisting of periodic audits to assure that the inspection facilities are observing the proper test procedures, record keeping practices, and equipment calibration requirements.

DPS Rules and Regulations Section A - Station Licensing and Operation, and Section B - General Inspection Requirements (Appendix X), specify quality control procedures to be followed by licensed inspection facilities and individual inspectors. Official Vehicle Inspection Stations and qualified inspectors in Texas are licensed

and certified by the DPS on alternate years. Stations must meet specific requirements for proper facilities, adequate equipment, and qualified personnel before a license can be granted or renewed. Certified inspectors are required to attend specified training courses, pass qualifying examinations, and demonstrate their ability to conduct an acceptable inspection. Up-to-date inspection records must be available for examination by DPS troopers during normal business hours. DPS troopers will visit, announced and unannounced, each inspection station at least on a quarterly basis. In addition, the DPS investigates complaints in accordance with procedures specified in the Rules and Regulations for Official Vehicle Inspection Stations and Certified Inspectors, Section B, to determine whether there has been a violation of the Vehicle Inspection Act or regulations. Violations may be punishable by fines not to exceed \$200. Under authority of Texas Vehicle Inspection Act, Article XV - Inspection of Vehicles V.C.S. 6701d Uniform Act Section 141, (Appendix X), DPS can and does revoke the license of any facility or certificate of any individual inspector found to be out of compliance with the agency's rules and regulations.

Additionally, DPS will provide TACB with quarterly inspection report summaries. Data on inspections performed, failures, re-inspections, and conditional (perforated) stickers issued will be analyzed closely. Individual stations will also be audited on a selected basis through a regular program for comparing County-wide inspection statistics to those of the station.

- Procedures to Assure that Noncomplying Vehicles are Not Operated on the Public Road -

EPA policy (January, 1981) states that an effective program must include provisions which ensure that noncomplying vehicles are not operated on public roads. Such provisions must be equally effective as prohibiting registration. The enforcement program must include identification of noncomplying vehicles, penalties and enforcement procedures.

The Texas Vehicle Inspection Act Article XV - Inspection of Vehicles Section 140 (Appendix X) requires that before a vehicle may be initially registered and titled in the county of residence, the owner must have the vehicle inspected at a state certified inspection station and receive a verification from the permanent identification number of the vehicle. Inspection is required once annually. All vehicles are required to display a valid inspection certificate.

Any person operating a vehicle on the highways of Texas, other than a vehicle licensed in another state and being temporarily and legally operated under a valid reciprocity agreement, in violation of the provision of the Act including operation of a vehicle which does not display a valid inspection certificate, is guilty of a misdemeanor and on conviction shall be punished as provided in Article XVI - Penalties and Disposition of Fines and Forfeitures Section 143 - Penalties for Misdemeanors (Appendix X), with up to \$200 fine. DPS rules, TAC 23.91, further prohibit the operation on highways in Harris County of a 1968 or newer model year vehicle registered in Harris County which does not

display a valid inspection certificate with red numeral insert. This rule is based on provisions of Texas Senate Bill 1205 and supported by a March 16, 1984, opinion by the Texas Attorney General (Appendix X). The Act provides for enforcement of these provisions by any peace officer in the state and specific letters of commitment are being obtained from law enforcement agencies in and around Harris County. (Appendix X)

In January, 1983, the DPS began issuing to vehicles inspected in Harris County an inspection sticker with a red numeral insert instead of the black insert that will continue to be used for the rest of the State. This Harris County specific inspection sticker reflects the increased emphasis being placed by DPS inspectors on the examination of vehicle exhaust emission systems. This emphasis will be provided by DPS through additional reference diagrams (Appendix X) and training to improve the ability of inspectors to determine if originally installed emission control systems are in place and operating. During 1983, Harris County inspectors received this additional training.

- Any Other Official Program Rules Regulations, and Procedures -

The Texas Air Control Board Regulation IV (31 TAC Chapter 114), Control of Air Pollution from Motor Vehicles, revised March 20, 1981 (Appendix X) requires the proper maintenance and operation of air pollution control systems or devices used to control emissions from motor vehicles. A more detailed description of these control requirements is provided in the Anti-tampering section of this program description.

- Mechanic Training Program -

In the January 19, 1981 EPA policy statement, EPA strongly encourages establishment of mechanic training programs in conjunction with inspection and maintenance programs. Current EPA policy does not, however, include emission reduction credit for mechanic training programs. EPA's failure to include such emission reduction credit in current policy apparently was based on the expectation that EPA would approve only state inspection and maintenance programs which unconditionally required that vehicles with excessive emissions be repaired to eliminate the excessive emissions without regard for cost. If cost is not considered, mechanic skill would not, therefore, be a factor. Recently, EPA has begun to approve state inspection and maintenance programs with specific limits on the maximum repair cost a vehicle owner may be required to bear. Consequently, the effectiveness of vehicle inspection programs is highly dependent on mechanic skills.

TACB will assure development of the mechanic training program. A contract was executed with Colorado State University (CSU) on March 16, 1984, to develop the curricula for a basic and an advanced level course in the repair and maintenance of late model vehicle emission controls. From April through September, 1984, CSU and TACB will prepare and evaluate a program to support in-service upgrade mechanic training in Harris County. Training of area mechanics will be initiated following a pilot test during August, 1984. This program will provide training to service technicians and mechanics on how to repair and service computer-controlled vehicles. Emphasis will be given to proper maintenance and repair of the emission control components of the system. Certification of completion of this training will be provided.

The TACB and CSU will coordinate development of this mechanic training program with representatives of automobile manufacturers, mechanics and garage owner associations, local government, and local training institutions. The initial training curriculum will concentrate on post-1980 and later model year vehicles. Yearly updates to the curriculum will provide new information relative to the new model year vehicles.

The mechanic training program will include a performance test. If the mechanic satisfactorily completes the performance test, he will be issued a certificate. This certificate will be suitable for display. Through the public information program, citizens will be informed of the meaning of the mechanic certification.

Currently EPA requires vehicle manufacturers to place under the hood of each new vehicle a label with general instructions on emission control systems and critical engine settings. The current requirement is very general and different manufacturers provide the required information in a variety of formats and at many different levels of detail. If EPA labeling requirements were revised to require that manufacturers include on the label affixed to each new vehicle in a consistent and easily understood format specific information on the type and location of emission control systems and components required on the vehicle as a condition of the vehicle certification and to provide a list of the maintenance and/or parts replacement necessary to protect the 50,000 mile vehicle emission control system warranty, cost or technical support needed to support the Harris County vehicle inspection program would be substantially reduced. Such labeling would enable every motorist and mechanic to know the specific requirements necessary to maintain a vehicle at its designed emission control performance level.

- A Public Awareness Plan

EPA policy (July, 1978) requires implementation of a public information program to publicize the inspection and maintenance program in the media. The TACB will assure implementation of the public information program, with the cooperation of those local agencies interested in participating in the public awareness program. Information on the appropriate local and state agencies activities will be provided along with letters of commitment by January 15, 1983. The DPS will post bulletins at all inspection stations in Harris County in January 1983 to explain the new inspection stickers and to inform the inspectors of the need to examine carefully vehicle exhaust emission systems. Notices to inform the public of the emphasis being placed on inspection of the vehicle emission exhaust system will also be posted. Also in January, 1983, the TACB will prepare and, in coordination with local governments, distribute brochures explaining the Harris County Vehicle Parameter Inspection and Maintenance Program. News releases and public service announcements will be prepared as a cooperative effort of the TACB, DPS and appropriate local agencies.

Public information materials will include information on the need for proper maintenance of vehicle emission control systems, the emphasis being placed on the annual inspection of these components by the DPS inspectors, the anti-tampering requirements of TACB Regulation IV, and the mechanic training and certification program. The media to be used to distribute this information will include brochures, posters, and T.V., radio and newspaper announcements.

The main thrust of this public information program will be to inform motor vehicle owners and operators of the need for and advantages of maintaining their vehicle's emission control system in good operating condition. Information regarding the penalties that could result from non-compliance with the TACB Regulation IV anti-tampering requirements as well as the annual inspection requirements that will detect such non-compliance will be included. Information about the mechanic training and certification program will be distributed to mechanics in the Harris County area and to the general public. This aspect of the public information program will provide citizens who are concerned about the need for and who recognize the advantage of proper emission control system maintenance information to aid them in selecting trained mechanics to service their vehicle.

The certificate provided to mechanics upon completion of the training program will serve as a recognizable sign of ability to perform proper maintenance on new technology vehicles including repair of emission control systems.

o Vehicle Maintenance Program

- Anti-tampering -

TACB Regulation IV, Control of Air Pollution from Motor Vehicles, as adopted October 30, 1973, and amended March 20, 1981 (Appendix X), requires that all motor vehicle owners or operators must use and maintain the vehicle's emission control system in good operating condition. The regulation further prohibits removal, replacement or deactivation of a vehicle emission control system except to install a system equally effective in reducing emissions from the vehicle. Sale of a vehicle without the original or equivalent emission control system in

good operating condition is prohibited. To enhance the effectiveness of these rules, the TACB initiated rule-making procedures to add additional requirements and specificity to certain existing requirements. This rule-making action was completed on September 9, 1983. These rule revisions prohibit misfueling of motor vehicles by individuals at any service station where unleaded gasoline is available, limit or prohibit misuse of parts and components designed to defeat or deactivate originally installed emission control systems, and, for 1984 and newer model year vehicles, require that prior to the transfer of ownership subsequent to initial sale as a new vehicle the seller of the vehicle must provide to the buyer certification that the vehicle complies with DPS emission control system inspection criteria at time of sale. A revision to the TACB Regulation IV resale certification provision expanding the program to include 1980 and newer model year vehicles was adopted March 16, 1984. Enforcement of the new Regulation IV requirements as well as the current requirements will be accomplished by appropriate state and local agencies. The TACB will implement this regulation through a surveillance program in Harris County. TACB and appropriate local agencies plan to investigate approximately 40 percent (not to exceed 200 annual investigations) of the largest service stations, automotive repair facilities, fleet repair and fueling facilities, etc., in Harris County and conduct necessary investigations of other operations to assess compliance with the provisions of Regulation IV. Appropriate enforcement actions (such as notices, fines, administrative enforcement conferences, or injunctive relief which might include replacement of tampered components) will be taken when violations of the provisions of the regulation are detected. Appropriate

enforcement action will be taken by the agency with jurisdiction over that area. Other tampering actions will be detected at the annual vehicle inspection.

iii. Estimated VOC Emissions Reduction Credits

EPA January 22, 1981, guidelines for developing 1982 SIP revisions require that, to be approvable, states must demonstrate that vehicle inspection and maintenance programs will provide hydrocarbon emission reduction credits equivalent to the reduction credits EPA would assign to implementation of an inspection program based on measurement of idle tail pipe exhaust emissions. According to initial EPA policy, this would require states to demonstrate emission reduction credits equal to 35 percent of the 1977 light-duty highway vehicle emissions.

EPA requires that a mathematical computer simulation model referred to as Mobile 2 be used to calculate 1978 mobile source emissions and that supplemental calculation procedures, inspection and maintenance credit model, be used to determine the amount of emission reduction credit which should be assigned to implementation of an idle exhaust test based vehicle inspection program. The current EPA inspection and maintenance credit model contains a programming error which results in calculations which overestimate the hydrocarbon emission reduction credits which should be assigned to vehicle inspection and maintenance programs by about 40 percent in 1987. Because of this error, EPA is in the process of changing its policy for assigning emission reduction credit for implementation of vehicle inspection and maintenance programs as a result of 1982 SIP revision requirements. Essentially, EPA will allow States which have developed 1982 SIP revisions for

ozone nonattainment areas using the model which has been found to be in error to use 25 percent hydrocarbon emission reduction in proposed 1982 SIP revisions. TACB has taken this policy change into account for preparation of 1982 Harris County SIP revisions. An EPA correspondence of December 28, 1983 (Appendix Y) estimates the Harris County vehicle parameter inspection and maintenance program provides sufficient hydrocarbon emission reduction credit to satisfy the required EPA policy. This determination was verified in a subsequent correspondence from EPA Deputy Administrator on February 23, 1984 (Appendix Y).

Several additional factors were also considered by the TACB when calculating emission reduction credits for the Harris County vehicle parameter inspection and maintenance program. One such factor is that automobile standards are based on total hydrocarbon emissions and the EPA policy for evaluating the effectiveness of inspection and maintenance programs allows an area to demonstrate reductions based on total hydrocarbon emissions or on nonmethane hydrocarbon emissions. Methane is a nonreactive component of exhaust emissions which does not contribute to the formation of ozone. The methane fraction of a vehicle's emissions, according to EPA's Mobile 2 model, is 7 percent for pre-1975, 13 percent for 1975-1980, and 32 percent for post-1980 model years.

Another factor is that in Harris County, the 1982 EPA tampering survey indicates that approximately 17.7% of in-use vehicles have experienced emission system tampering and 15.03% were misfueled. EPA has estimated that nationally in non-I/m areas in-use vehicles were tampered or misfueled by 19.8% and 15.14%, respectively.

This data was taken into account in calculations used by EPA to develop I/M emission reduction credits included in the 1982 Harris County SIP revisions. All factors considered are more fully discussed in Appendix Y.

The original EPA model developed for use to estimate motor vehicle emissions (Mobile I) assigned emission reduction credits to mechanic training programs included in State Implementation Plan vehicle inspection and maintenance programs. EPA changed this policy, however, and refused to approve mechanic training emission reduction credits when Mobile I was revised and reissued as Mobile 2. Apparently EPA based this policy change on the assumption that all vehicles identified through state vehicle inspection and maintenance programs as excessive emitters (including computer-controlled technology vehicles) would be repaired to eliminate the excessive emissions without regard for cost. Using this assumption, emission reduction estimates would not be dependent on mechanic skills. Since that time, many state inspection and maintenance programs which EPA has approved establish the maximum repair cost which any individual vehicle owner may be required to bear as 100 dollars or less. The effectiveness of programs with such cost waivers to reduce emissions is highly dependent on mechanic skills.

The inspection criteria to determine the presence and apparent function of the air injection system, catalytic converter, and fuel inlet restrictor and to test for the presence of lead on exhaust pipes are intended to protect the catalyst from tampering or deactivation and to assure the replacement of

non-functioning catalyts. The effectiveness of these provisions for 1980 and newer model year vehicles constitutes the majority of emission reduction credits from the vehicle parameter inspection program in Harris County. However, due to the overlapping and synergistic effects of this combination of inspection requirements, it is difficult to separate the individual benefits of each component part. Therefore, emission reduction credits have been evaluated by EPA for the entire group as they apply to 1980 and newer model year light-duty vehicles in Harris County.

Considering these factors, following procedures consistent with EPA methods and procedures, and assuming the estimated percent reduction credit provided by EPA in a December 28, 1983 correspondence (Appendix Y), approximately 7235 tons per year of emissions reductions could be credited for the Harris County vehicle emissions inspection and maintenance program in the control strategy. Table 10 lists the individual program elements and the credit associated with each. A full description of each element is included in the program description section of the plan. Appendix Y contains the documentation of procedures used to calculate emission reduction credits.

iv. Implementation Schedule

In accordance with the 1979 SIP, the TACB has added milestones to the approved 1979 schedule for development and implementation of a vehicle inspection and maintenance program the milestones which will be following during implementation of the program in Harris County. This schedule incorporates mechanic and other personnel training, a public information program and an anti-tampering program, in addition to the actual vehicle testing.

Harris County Vehicle Parameter
Inspection and Maintenance Program

Implementation Schedule

- Nov 82 DPS and TACB identify rule changes needed to implement Harris County program. Needed rule changes might include requirements for certification of conformance with emission-related inspection criteria at time of resale, additional anti-tampering, and mis-fueling rules.
- Dec 82 TACB adopts SIP.
- Dec 82 DPS posts notices in Harris County inspection stations describing need for and effect of new emphasis on emission-related requirements (1 for inspectors; 1 for public).
- Jan 83 DPS initiates revisions to training for Harris County inspectors to emphasize emission-related portions of training.
- Jan 83 Harris County DPS inspection stations begin emphasis inspection of vehicle emission control components during annual inspections and to issue special stickers.
- Jan 83 TACB and DPS initiate rulemaking as necessary.
- Jan -
 May 83 DPS revises training program to include new vehicle inspection procedure for 1984 model year.
- Jan 83 DPS revises definition of catalyst to be emission control device for Harris County beginning with 1984 year model.
- Jan 83 Public information program to explain the vehicle parameter inspection program, to discourage tampering and misfueling, and to encourage good maintenance initiated.
- Jan -
 Aug 83 TACB develops and initiates program to maintain currency of inspection procedures for new model years and to provide in-service upgrade mechanic training and certification.

- Jul 83 TACB adopts rule to prohibit misfueling by any individual and to discourage improper use of parts and components designed to defeat emission control systems.
- Nov 83 TACB adopts Board Resolution R83-8 requesting DPS to include additional provisions for 1980 and later year model vehicles required by EPA into existing inspection procedures.
- Nov 83 Texas Public Safety Commission adopts a resolution committing to implement additional inspection provisions.
- Dec 83 TACB forwards a draft of additional SIP revisions and regulation changes to EPA.
- Jan 84 TACB holds a public hearing in Houston to receive comments on proposed additional inspection provisions and regulation changes.
- Mar 84 TACB adopts additional inspection provisions and regulation changes and forwards SIP revisions to EPA.
- Mar 84 TACB contracts with Colorado State University (CSU) to develop and evaluate a mechanic training program.
- May 84 Public Safety Commission considers for adoption final DPS rule changes to include additional inspection procedures and ensure enforceability of inspection program.
- June 84 DPS incorporates into handbook appropriate inspection procedures for 1980-1983 model year vehicles.
- Jun 84 TACB begins implementation of Regulation IV changes requiring resale certification for 1980 and newer model year vehicles.
- Jul 84 DPS begins implementation of additional inspection provisions for 1980 and newer model year vehicles including mandatory repair of 1984 and newer model year vehicles.

- Jul 84 TACB holds a public hearing in Houston to receive
comments on proposed additional inspection provisions and
DPS regulation changes.
- Aug 84 CSU conducts a pilot test of the mechanic training
program. TACB initiates the program upon successful
completion of the test.
- Sep 84 DPS handbook updated to include inspection procedures for
light-duty trucks and newly certified light-duty vehicle
engine families.

Changes to Tables 10, 12 & 13

TABLE 10

1987 REDUCTIONS IN HARRIS COUNTY VEHICLE
HYDROCARBON EMISSIONS RESULTING FROM THE
HARRIS COUNTY VEHICLE PARAMETER INSPECTION
MAINTENANCE PROGRAM

<u>Program Elements</u>	<u>Affected 1968-1979</u>	<u>1987 Reduction NMHC (tons)²</u>	<u>%Reduction in 1987 LDV Emissions¹</u>
Air Pump	1968-1979	155	0.5
Air Pump/Catalyst/ Inlet Restrictor/ Lead Test ³	1980 and newer	6552	21.1
Evaporative System	1968 and newer	124	0.4
Choke System	1968 and newer	62	0.2
System	1968 and newer	342	1.1
Closed Loop Sensors	1984 and newer	0	0
Misfire Road Test	1984 and newer	0	0
Maintenance and Recall Documentation	1984 and newer	0	0
<hr/>			
Total Light-Duty Vehicle Emissions Reduction		7235	23.3
1987 Reduction of Total Mobile Source Emissions		7235	21.0

¹ Based on percent reductions provided by EPA for light duty vehicles and light duty trucks under 8500 pounds gross vehicle weight.

² Ton calculated by multiplying vehicle emission factor by vehicle mileage traveled (VMT).

³ Program elements grouped because of overlapping and synergistic effects of inspecting all the components.

Table 12

VOC EMISSIONS CHANGES for HARRIS COUNTY BETWEEN 1980 and 1987

	VOC REDUCTION		VOC INCREASE		NET EMISSION CHANGES	
	Tons	%*	Tons	%*	Tons	%*
FACB Regulation V Controls Adopted 3/30/79	25,968	11.2				
FACB Regulation V Controls Adopted 7/11/80	9,636	4.2				
FACB Regulation V Controls Adopted 12/3/82	33,233	14.4				
Increased Use of Water-based Paints in Agricultural Coatings	725	0.3				
Reduced Gasoline Sales	749	0.3				
Process or Plant Shutdowns or Retirements	2,313	1.0				
Area and Minor Source Growth			2,132	0.9		
Permits (Average 1978-1981)			2,255	1.0		
UBTOTAL (STATIONARY)	72,624	31.4	4,387	1.9	68,237	29.5
Federal Motor Vehicles Control Program (& highway growth)	25,576	11.1				
Transportation Control Measures (Level I Commitment)	1,664	0.7				
Vehicle Inspection and Maintenance	7,235 ϕ	3.1 ϕ				
on-highway Mobile Growth			1,705	0.7		
UBTOTAL (MOBILE)	34,475ϕ	14.9ϕ	1,705	0.7	32,770ϕ	14.2ϕ
TOTAL	107,099ϕ	46.3ϕ	6,092	2.6	101,007ϕ	43.7ϕ

Percent of 1980 Emissions Inventory (231,250 tons)

Not Itemized in Appendix Z

Adjusted to reflect results of revised EPA emission reduction credits

Table 13

1980-1987 Annual Harris County VOC
Emissions Estimates

<u>Date</u>	<u>Estimated VOC Emission in Tons</u>			<u>Amount of VOC Emissions Representing Linear Decrease</u>
	<u>Mobile Sources</u>	<u>Stationary Sources</u>	<u>Total</u>	
1980	67,098	164,152	231,250	231,250
1981	62,968	164,270	227,230	217,639
1982	58,340	126,004	184,844	204,029
1983	55,593 ϕ	126,043	181,636 ϕ	190,418
1984	47,735 ϕ	125,625	173,360 ϕ	176,807
1985	42,444 ϕ	121,349	163,793 ϕ	163,196
1986	38,057 ϕ	108,942	146,999 ϕ	149,586
1987	34,328 ϕ	93,154	127,482 ϕ	135,975

ϕ Adjusted to reflect results of revised EPA emission reduction credits.