

Houston-Galveston SIP: Response to Comments

General

BP Amoco (BP) and 17 individuals stated general support for the HGA ozone State Implementation Plan (SIP) and associated rules. The commission Public Interest Counsel stated its general support for the SIP proposals.

The commission appreciates the support expressed for the SIP revision and associated rules.

General objections to the SIP were expressed by the Brazosport Area Chamber of Commerce (COC) and 18 individuals.

The commission understands that the SIP is going to be challenging to implement, but believes the measures are necessary to demonstrate attainment with the Federal Clean Air Act (FCAA).

Three individuals commented that a healthy habitat must be provided for plants, animals, and humans for the future. Sierra Club, Galveston Region (Sierra-Galveston) and two individuals commented that clean air is a fundamental right of all Texans. An individual commented that improved health and quality of life are important benefits of clean air. Sierra-Galveston commented that the number of premature deaths brought on by high ozone levels should be reduced to zero by a successful SIP. State Representative Jerry Madden commented that the SIP should document that the intended health benefits outweigh the health risks. Two individuals commented that economic impacts must also consider health-related costs and other effects caused by pollution.

The commission agrees that public health, safety and welfare is the objective of the SIP, and therefore agrees that a healthy environment is important. The federal ozone standard already considers health benefits and risks associated with air quality, but even this strictly health-based standard is not based on reducing risks to health to zero. While the commission considers health benefits when adopting rules, it must also consider whether rules are economically and technically feasible. Therefore, the commission must balance the health interests with the ability of the affected sources to economically and practically comply.

United Parcel Service and one individual commented that the state may accommodate both economic growth and a clean environment. Congressman Kevin Brady, State Senator David Bernsen, State Representative Joe Deshotel, State Representative John Culberson, and five individuals urged the commission to balance environmental priorities with economic considerations. State Representative Dennis Bonnen and four individuals commented that a cost-benefit analysis should be performed. Small Business United (SBU) of Texas commented that the focus should be on cost-effective measures that use proven methods. An individual commented that the costs of the SIP far outweigh the benefits. An

individual commented on the need for information on the high health costs related to pollution.

The commission agrees that providing healthy air to citizens of the state is a worthwhile goal. The commission must consider whether a rule is practical and economically feasible. In each proposed rule preamble, the commission must provide a cost analysis of the proposed rule. This analysis is provided in the sections titled “Fiscal Note and Costs to State and Local Governments,” “Public Benefit and Costs,” and “Small Business and Micro-Business Assessment.” The commission notes that considerable economic consequences may result from the failure to meet clear air obligations. Foremost among these are sanctions imposed by the United States Environmental Protection Agency (EPA), including withdrawal of transportation funds and more stringent limitations on growth in the area failing to attain the ozone standard.

An individual stated that leadership is needed. BP stated that synergies exist that allow nitrogen oxides (NO_x) reductions consistent with new growth. An individual cited a behavior management text, stating that a consequence that is personal, immediate, and certain is much more likely to influence behavior than one that is impersonal, delayed, and uncertain.

The commission agrees with the commenters, and believes that this SIP revision does reflect leadership at the city, county, and state levels. The commission also agrees that clean air and a healthy economic climate are not mutually exclusive goals.

An individual commented that the proposed SIP is an insult to individuals and companies in Texas, and stated that the commission is purposely trying to constrict the Texas economy to gain favor with Washington politicians and EPA. Three individuals commented that the proposed SIP rules were set up to embarrass Texas and the Governor. Texas Citizens for a Sound Economy (CSE) and an individual commented that the state’s substantial progress in reducing emissions, including toxics, has been misrepresented, and that the state has been unfairly singled out for attack by the federal government because of political reasons. CSE commented that the EPA is unfairly targeting Texas and is blackmailing the state into agreeing to Draconian measures that will cause tremendous economic disruption in the state. State Representative Tom Uher commented that until the FCAA is changed by Congress, EPA will run rampant in requiring states to implement Draconian control measures. Two individuals inquired as to why Texas is being singled out to comply with air quality requirements, when the air is not cleaner in other areas of the country. Congressman Ron Paul and one individual commented that EPA and other federal agencies have chosen this particular time for preparation of the HGA SIP to coincide with the presidential election year. Eight individuals commented that the SIP has more to do with politics than with air quality. Fifteen individuals stated that the SIP regulations would hurt business and the people, all for very little improvement in air quality and more governmental control. SBU Texas commented that the SIP represents a set of onerous and costly regulations. Two individuals stated that industry could be forced to relocate outside of Texas.

The commission's intent is to comply with the timelines provided in the 1990 FCAA amendments and subsequent EPA guidance for submitting rules to demonstrate ozone attainment in HGA. The requirements of the FCAA apply to all states. Accordingly, the commission has committed to adopting the majority of the necessary rules for the HGA attainment demonstration by December 31, 2000. The commission agrees that there has been much progress in reducing emissions, including toxics, but is aware of no misrepresentation regarding such reductions. Texas is home to a large industrial base of a variety of sources of air emissions, most notably the petrochemical industries along the Texas Gulf Coast. Additionally, the commission notes that the relevant measure for ozone attainment is the National Ambient Air Quality Standard (NAAQS), which is the target for the reductions that must occur. Title 42 USC, §7410 requires states to adopt a SIP which provides for "implementation, maintenance, and enforcement" of the primary NAAQS in each air quality control region of the state. The provisions of the FCAA recognize that states are in the best position to determine what programs and controls are necessary or appropriate in order to meet the NAAQS. This flexibility allows states, affected industry, and the public to collaborate on the best methods for attaining the NAAQS for the specific regions in the state. Thus, while specific measures are not prescribed, both a plan and emission reductions are required to assure that the nonattainment areas of the state will be able to meet the attainment deadlines set by the FCAA. The EPA has provided the criteria for both the submission and evaluation of attainment demonstrations developed by states to comply with the FCAA. These criteria require states to provide, in addition to other information, photochemical modeling and an analysis of specific emission reduction strategies necessary to attain the NAAQS. The commission's photochemical modeling and other analyses indicate that substantial emission reductions from both mobile and point source categories are necessary in order to demonstrate attainment.

Three individuals commented that the voice of the people should be heard by bringing air quality control issues to a vote. An individual commented that the proposed SIP does not conform to the commission's mission statement.

Holding hearings and providing the SIP for public comment are ways in which the commission can hear from interested parties regarding air quality goals. In addition, the commission worked closely with elected officials, who represent the people in the HGA area. Without the involvement of these elected officials, the SIP would not be able to be completed. The commission's mission statement states that the commission "strives to protect our state's human and natural resources consistent with sustainable economic development. Our goal is clean air, clean water, and the safe management of waste." The commission disagrees with the comment that the SIP does not conform to the mission statement.

State Senator Mike Jackson commented that it would be counterproductive for the Legislature to be in a position, during its next session, to be undoing measures adopted by the commission.

In adopting these strategies and the SIP, the commission is implementing the requirements of the Texas Health and Safety Code, Texas Clean Air Act (TCAA). The TCAA specifically directs the commission to “prepare and develop a general, comprehensive plan for the proper control of the state’s air.” TCAA, §382.012. The commission has adopted measures designed to meet the ambient air quality goals while imposing as little burden as possible. In light of limitations imposed by federal law on regulation of certain source categories, the commission was forced to choose from a limited list of control options for NO_x categories in the HGA area. In choosing from among these options, the commission sought input from elected officials and other interested parties on the best possible mix of controls with the least impact on the citizens of the area.

Two individuals commented that the public has the power to make a positive impact, pointing to consumer boycotts of products. Two individuals commented that EPA and the commission are not accountable to the public, and should have their funding cut or eliminated.

The commission agrees that public involvement makes a tremendous difference in the effective, timely implementation of SIP control measures. The commission disagrees that neither it nor the EPA is accountable to the public. One of the essential elements of SIP development is public participation through the hearing process. The commission staff also take part in numerous stakeholder activities, of which the public is an important part.

State Representative Dennis Bonnen and seven individuals commented that the commission and elected officials should stand up to EPA. CSE and two individuals commented that the state should refuse to implement EPA standards, and set the record straight about the state's environmental progress. An individual recommended that the commission admit to EPA that the proposals cannot be implemented, and negotiate more reasonable and cost-effective solutions. An individual recommended that the commission tell the EPA to leave Texas alone. Two individuals stated that Texas can work out its own solutions.

The commission is submitting the HGA attainment demonstration SIP to EPA as required by the FCAA Amendments, enacted by Congress in 1990. The underlying basis for this federal legislation was protection of human health from ozone exposure. The FCAA sets forth requirements and schedules for attainment of the one-hour ozone standard, but leaves the method of achieving this goal to the individual states within prescribed federal guidance. The consequences of not submitting a plan, or of having a submitted plan disapproved, are substantial. EPA could impose sanctions, including more severe restrictions on growth. EPA could also withhold transportation funds for highway construction projects. Ultimately, EPA could implement its own Federal Implementation Plan to administer and enforce the attainment strategy.

City of Houston Department of Health and Human Services (HDHHS) commented that, although the

current SIP is focused on attainment of the one-hour ozone standard, the new eight-hour ozone standard and its health benefits for the community need to be kept in mind. HDHHS also commented that measures to attain the ozone standard will result in fine particulate reductions as well, and that these health benefits should be considered in clean air planning. Mothers for Clean Air (MCA) and one individual commented that the HGA SIP proposals must work toward achieving not only the one-hour ozone standard, but also the imminent eight-hour ozone standard and the fine particulate matter standard. MCA further commented that the SIP emission controls should also reduce air toxics.

The commission appreciates the comments, and looks forward to working toward effective enforcement strategies in partnership with HDHHS. This SIP, which will demonstrate attainment with the one-hour NAAQS, will achieve significant progress toward meeting the disputed eight-hour ozone standard and fine particulate matter standard, if both are finally implemented.

HGAC, Clean Air Partnership (CAP), Harris County, and Houston urged the commission to apply the key guiding principles in implementing the SIP, namely, involvement of the entire nonattainment area in the solution, rapid implementation, consideration of lowest economic and social costs, exercise of flexibility and economic incentives, acceleration of some strategies at the national level, avoidance of EPA disapproval of the SIP, and more research to provide additional scientific information. Galveston County Judge Jim Yarbrough, Texas City Mayor Carlos Garza, LaMarque Mayor Dennis Rygaard, and nine individuals emphasized the importance of flexibility in meeting the SIP's goals.

The commission shares the views expressed by the commenters that sound science, stakeholder involvement, economic incentives, and flexibility are important for effective implementation of the SIP. The commission has solicited the active involvement of the entire nonattainment area throughout the SIP development process. The commission is working with EPA at the regional and national levels to accelerate mandated federal rules and to ensure approvability of the SIP.

Clean Air Force supported the SIP, commenting that transport from the HGA area contributes to background levels of ozone in Central Texas, making it more difficult for Central Texas to control its own ozone levels. Sierra Club, Houston Regional Group (Sierra-Houston) emphasized the importance of transport, and stated that the SIP does not address NO_x and volatile organic compound (VOC) emissions outside the 8-county HGA area.

The commission agrees that under certain meteorological conditions ozone and ozone precursors can be transported to Central Texas. The commission agrees that this attainment demonstration for the HGA will contribute to improved air quality in East and Central Texas. In April of 2000, the commission finalized rules implementing legislation reducing emissions from power plants, other industrial sources, and fuel quality which have been modeled to show a measurable and real air quality improvement for East and Central Texas. In addition, the

current SIP contains some measures that apply statewide, and will provide air quality benefits for the entire state.

State Senator David Bernsen commented that transport from HGA presents challenges for the Beaumont-Port Arthur (BPA) area to achieve the ozone standard, and recommended that transport be taken into account when developing the SIP rules. An individual commented that the BPA plan should address local sources of pollution in the BPA area to protect the residents.

The commission adopted the final attainment demonstration SIP for the BPA area on April 19, 2000, and in its submission to EPA requested that the attainment date for BPA be extended to 2007, the same as HGA's, due to transport effects. In its photochemical modeling in support of the BPA SIP, the commission staff considered the effects of downwind transport from HGA to BPA. On some days, transport from BPA affects the HGA area. Rules adopted for BPA point sources will achieve approximately 40% reduction in NO_x emissions; these reductions will produce local air quality benefits.

Port Arthur Economic Development Corporation commented that the commission should help develop financial mechanisms to assist small business in complying with SIP requirements.

The commission does not currently have the authority to develop such funding mechanisms. However, for several years, the commission's Small Business Assistance program has provided help to small businesses in the areas of permitting, compliance, and pollution prevention. Through this experience, the commission has gained an understanding of the needs of small businesses and the impacts that additional regulation can have on a small businesses. In order to provide as much flexibility as possible to all businesses that must comply with the rules, the commission has revised the HGA SIP to allow for the inclusion of economic incentive programs as a component of the HGA SIP for future consideration. Also, some of the rules adopted for the HGA SIP provide for the regulated entity to submit an alternative plan to achieve equivalent emission reductions. This alternative would enable small businesses to take advantage of an economic incentive program that is developed in the future, or to take advantage of more cost-effective emission reduction alternatives. The commission will continue to work with small business representatives to identify options for compliance which may currently exist or which may become available in the near future.

CAP, Harris County, and the City of Houston (Houston) pointed to the agreement between Houston, Continental Airlines, and the commission as an example of the type of flexibility that should be included in the SIP.

The commission has approved Agreed Orders with Continental Airlines, Southwest Airlines, and the City of Houston, making federally enforceable certain NO_x emission reductions to be undertaken by these parties in lieu of a commission rule requiring reductions from airport

ground service equipment (GSE). The sum of these agreed NO_x emission reductions is equivalent to the NO_x reductions proposed in the rulemaking package for airport GSE that is being withdrawn. The commission supports flexible approaches in achieving necessary emissions reductions, as evidenced by the alternative, equivalent approaches allowed in several of the adopted rules in this SIP. The commission will continue to work with the regulated community and other stakeholders to afford more opportunities for this kind of flexible arrangement.

Sierra-Galveston commented that the HGA area is facing potential sanctions and loss of highway funding because the commission and the Texas Legislature have ignored FCAA requirements for the past 30 years. Sierra-Galveston criticized the Legislature and Governor for abrogating its inspection and maintenance (I/M) contract with a centralized testing contractor. Sierra-Galveston commented on the need to clearly identify calculable goals such as vehicle miles traveled (VMT), fleet fuel efficiencies, and actual measurements of industrial emissions.

The commission disagrees that the Texas Legislature and commission have ignored FCAA requirements. The commission and its predecessor agencies have adopted numerous regulations that have reduced emissions and lowered ozone levels. The Texas Legislature decided to implement a decentralized I/M testing program, which has been running successfully and achieving emissions reductions for several years. The commission agrees that calculable goals should be included and, to the extent possible, has done so. For example, the 1997 emissions inventory, upon which the commission relied in developing its point source rule, contains extensive sampling and continuous emissions monitoring system (CEMS) emissions data.

Business Coalition for Clean Air (BCCA), Reliant Energy, Inc. (REI), ExxonMobil, and Phillips noted that Houston, Harris County, and HGAC (Houston-Galveston Area Council) have played a strong leadership role in planning and implementing clean air projects, and encouraged the commission and EPA to facilitate and allow local decision-making on SIP strategies to the greatest extent possible. Two individuals endorsed BCCA's positions.

The commission supports the concept of local decision-making and encourages participation at the local level. Throughout the development of the SIP, local stakeholders have played a key role in identifying and implementing certain of the control strategies. The commission will continue to work with city, county, and other local programs to ensure that SIP strategies reflect the input of these entities.

BCCA, REI, ExxonMobil, and Phillips commented that they encourage the use of technology-based programs whenever possible rather than use-restriction strategies. Two individuals endorsed BCCA's positions.

Traditionally, the commission has focused primarily on technology-based requirements in developing SIPs. Although technology-based programs continue to be essential to the control strategy, the commission has had to look beyond those types of measures to identify additional sources of reductions. The commission has provided flexibility in its regulations where feasible. For example, in the regulations imposing operating restrictions on construction equipment and lawn and garden equipment, affected sources may provide alternative reductions, typically in the form of lower-emission engines, to avoid the limitations provided for in the regulation.

Sierra-Houston and ED (Environmental Defense) commented that the HGA SIP is inadequate for showing attainment of the ozone standard by 2007. Sierra-Houston stated that the HGA area has exceeded its airshed capacity, thus accounting for the large number of ozone exceedances.

The commission disagrees, and believes that the SIP does provide for attainment of the ozone standard by 2007. Regulations and other measures adopted with this SIP submittal will provide significant reductions in total NO_x and VOC. Additional measures, submitted in the SIP as enforceable commitments, will provide the further reductions needed for attainment. The commission notes that, based on trend analyses, the number and severity of ozone exceedances have decreased over the years. Implementing the SIP control strategy will substantially reduce emissions in the HGA airshed. It should be noted, however, that although HGA emissions do not vary significantly from day to day, ozone exceedances are recorded for relatively few days out of the year. This points to the importance of meteorological factors in the formation of ozone.

Sierra-Houston, Lake Jackson, and five individuals objected to the commission's criticism of the public by stating that solutions, not complaints, are what it wanted to hear during the public hearing process. Five individuals commented that they do not understand the purpose of having public hearings, since the public will voice its displeasure and the commission will continue on the course it has already decided upon. Another individual stated that not enough notice was given for the SIP public hearings, and another individual commented on the need for more publicity for the hearings. An individual commented that if the hearings were advertised as forums for new ideas, more positive responses would be forthcoming. An individual commented that the regulated community should be brought into the planning process long before public hearings are held. An individual commented that press materials on the public hearings did not mention the use of buses or park and rides, and suggested that the agency emphasize this more in the future. An individual commented that parking facilities for bicycles were not provided at the public hearing, and directions to the hearing were not provided for public transit users. State Representative Bob Glaze requested that the commission hold an additional public hearing for the Tyler area. Chambers County Judge Jimmy Sylvia and one individual objected to the lack of a public hearing in Chambers County. An individual inquired why a public hearing was not offered in the Highway 290 corridor. An individual inquired why a public hearing was not offered in Baytown. An individual commented that many citizen complaints have been filed in Odessa, yet a

public hearing was not scheduled there. An individual commented that the commission's evening public hearings for the SIP were not convenient for residents of the Houston metropolitan area. An individual commented that the SIP public hearings are a sham, since 70% of them were held during the day when most people are at work. Sierra-Houston commented that the stakeholders referenced in the SIP are not representative of the diversity of the HGA community, and recommended that a citizens' advisory committee be formed. Four individuals and Sierra-Houston commented that air quality meetings should receive adequate advance publicity, and recommended more evening and weekend meetings so that working people could attend. An individual asked why the commission does not listen to the citizens of Brazoria County. A Sweeney Councilman commented that people are frustrated because crucial decisions are being made without their input or consent.

The commission is very interested in the opinions of the public, and carefully considers all comments received through the public hearing process. Fourteen public hearings on the SIP were held statewide, including eight in the HGA area. The commission complied with state law requirements for publication of notice of hearings in the *Texas Register* at least 30 days before any public hearing conducted by the commission. Notice of the hearings was published in the Houston daily newspaper and six other newspapers around the state. The public hearings received extensive coverage in the radio, television, and print media. Additionally, the commission provided notice of the public hearings through press releases, discussion with stakeholders, and the agency's public Web site. In addition, HGAC presented an informational seminar to educate the public on the SIP proposal. Because of the extremely short time frame available for the staff to conduct hearings, evaluate comments, and submit recommendations to the commission for their consideration for adoption on December 6, 2000, as many hearings as possible had to be scheduled the week of September 18-25, 2000. At least two hearings, and sometimes three hearings, were held each day. By offering more hearings than for any previous SIP revision, at a variety of times and locations, the commission hoped to maximize participation, convenience, and accessibility. Of the 14 hearings offered, 7 were in the morning, 3 were in the afternoon, and 4 were in the evening. The commission welcomes and encourages new ideas, and reserves time both before and after public hearings to provide information and answer questions. However, the hearing itself is designed only for presentation of testimony by commenters. The commission agrees that advertisement of public transit and bicycling options is helpful information, and will work toward making this available in future hearing notices. With regard to involvement by the regulated community, the commission endeavors to include stakeholders in the rule development process whenever possible. Commission staff met and consulted with numerous interested parties before proposing the SIP. However, due to the large number of measures and the limited time and resources available to develop them, this could not be done for every regulation, nor could it include every stakeholder.

Lake Jackson and three individuals commented that more study and analysis needs to be done in order to employ good science in the SIP control strategy, and stated that, by the commission's own

admission, the science used to devise the proposed rules is incomplete.

The commission agrees that the science surrounding photochemical modeling is constantly improving. The commission will continue to evaluate new approaches to photochemical modeling, and will strive to make improvements to existing models and input data in a timely manner. The commission has committed to a formal mid-course review process to be completed in the 2004 time frame. This review will allow the commission to incorporate further advanced photochemical modeling to further improve the science behind the SIP.

Lake Jackson urged that a “cookie-cutter” approach not be used, and that strategies should be tailored to the specific area of concern.

The commission agrees that “one size” does not necessarily fit all, and where appropriate the commission has provided flexibility, recognizing the individual challenges faced by different areas.

Regional Air Quality Consensus Group (RAQCG), Harris County, Houston, and Lake Jackson stated opposition to a 20% driving restriction, or “no-drive days.” Three individuals expressed support for general restrictions on driving. An individual recommended voluntary no-drive weekends.

In the previous “gap closure” SIP proposed by the commission in December 2000, 20% restrictions on VMT were contained as a potential control strategy. This strategy, however, was not included in the SIP adopted in April 2000, and was not part of the proposal for the current SIP. The commission is not considering imposing driving restrictions in the HGA area in the current SIP.

Sierra-Houston commented that the commission characterized the SIP measures as “potential,” and that the commission plans to make major changes to the SIP without giving the public a full 30 days to review and comment on these changes before the SIP is submitted to EPA. Sierra-Houston commented that on pages I-3 and I-11 of the SIP, the control measures are referenced as “potential,” and stated that the commission will not make a commitment.

The references to “potential” measures on pages I-3 and I-11 in the proposed SIP are referring to previous SIP revisions, not the current attainment demonstration SIP. The first citation, page I-3, refers to the Phase I SIP submitted to EPA on November 15, 1993. This SIP contained a commitment by the state to submit additional rules and contingency measures for HGA and other areas by May 15, 1994. Since the final adopted measures came from a list of possible candidates, the SIP appropriately referred to this tentative list of control measures as “potential.” The second citation, page I-11, refers to the April 28, 2000 SIP revision, known as the “gap closure” SIP. In that SIP, the commission made a number of enforceable commitments, including a listing and quantification of potential control measures to meet the

shortfall of NO_x reductions needed for attainment in HGA. In proposing the current SIP, the commission drew from the list of possible measures previously submitted in the April 2000 SIP. Since none of the new attainment demonstration control measures had been implemented by April 2000, the use of the term “potential” was likewise appropriate. In portraying certain elements of these past SIP revisions as “potential,” the commission indicated its willingness to make a commitment for the current attainment demonstration SIP.

Sierra-Houston commented that the initial list of brainstorming strategies contained in Appendix L is presented in two parts, making it impossible to compare different control strategies.

The spreadsheet originally contained in Appendix L extended beyond the width of a page, so that two pages of paper were required to print each page of the spreadsheet. This appendix has been converted to Portable Document Format (PDF) and posted on the commission’s Web site, where it may be viewed online or printed.

An individual commented that the proposed SIP is illegal under the interstate transportation act, which prohibits laws that favor one state over another, or that create unequal taxes that interfere with interstate commerce.

The commission disagrees with the commenter. The rules promulgated by the commission and the SIP are specifically designed to attain a federal standard that applies equally in all states. Texas must comply with these limits like all states, and in so doing must choose which sources to regulate. The commission’s actions do not place burdens on interstate commerce, but simply regulate local activities within the HGA area, and thus violate neither the Commerce Clause nor Equal Protection under the U.S. Constitution. Although the commission disagrees that there is any burden placed on interstate commerce by the SIP, any burdens that might be found are merely incidental, and thus the regulations are allowable exercises of the state’s police powers to promote health and safety. The U.S. Supreme Court has consistently held that the Commerce Clause is not an absolute bar to state regulation. “The limitation imposed by the Commerce Clause on state regulatory power is by no means absolute, and the states retain authority under their general police powers to regulate matters of legitimate local concern, even though interstate commerce may be affected.” Maine v. Taylor, 477 U.S. 131, 138 (1986) citing Lewis v. BT Investment Managers, Inc., 447 U.S. 27, 36 (1980). The Court has also consistently ruled that states may impose incidental burdens on interstate commerce, so long as the burdens are not “clearly excessive in relation to the putative local benefits.” Pike v. Church, 397 U.S. 137 (1970). It has also been held that “[t]he protection of the environment and conservation of natural resources . . . are areas of legitimate local concern” justifying incidental burdens on interstate commerce. New York State Trawler’s Assoc. v. Jorling, 16 F.3d 1303, 1308 (2d Cir. 1994). The SIP will promote attainment of the ozone NAAQS in the HGA area, benefiting the health of the residents of that airshed. The minimal burdens, if any, imposed on interstate commerce clearly pale in

comparison to these real gains in air quality.

An individual commented that pollution credits must be distributed to the states that produce the nation's energy, petrochemicals, and steel before the task of reducing emissions can begin.

The protection of individual health and the environment is important in all areas of the country. The commission disagrees that the health of individuals living in the HGA area should be compromised so that petrochemical and other industries do not have to implement control measures.

An individual commented that the time schedule for compliance should be reasonable. An individual commented that compliance dates should be less stringent in counties whose measured air quality levels are not as high.

The commission agrees that compliance schedules should be reasonable, provided that overall SIP goals and mandated attainment deadlines can be met. The commission has made some changes in individual rules to provide more flexibility. For example, the phased compliance schedule for point sources has been extended, with final compliance now required by March 31, 2007 instead of the end of 2004. Also, in its I/M rule, the commission has provided a phased-in schedule whereby the more rural counties have more time to implement the program.

State Senator Carlos Truan and 15 individuals commented that grandfathered facilities should be controlled. State Senator Carlos Truan commented that a problem with the proposed rules is that they do not deal with grandfathered facilities and that the commission has let these facilities avoid permitting through the use of standard exemptions. Sierra-Houston commented that all grandfathered facilities should be permitted with best available control technology (BACT), NO_x, and VOC monitoring requirements, stringent recordkeeping requirements, cumulative effects modeling, and operation and maintenance procedures. Sierra-Galveston disagreed with the voluntary permitting program enacted by the Legislature. Galveston-Houston Association for Smog Prevention (GHASP) commented that all grandfathered facilities should be investigated to be certain that they are properly so designated, since many of these facilities have made modifications.

The point source rule adopted by the commission with this SIP revision applies equally to permitted and non-permitted facilities. The TCAA does not authorize the commission to require grandfathered sources to obtain permits in order to operate, or to prohibit operation of those sources. A grandfathered facility is one that existed at the time the Texas Legislature amended the TCAA in 1971. These facilities were not required to comply with (i.e., were grandfathered from) the then new requirement to obtain permits for construction activities. Whenever a grandfathered facility is modified (as that term is defined in the TCAA), it is required to comply with the TCAA permitting requirements in order to be authorized to

construct and operate that modification. If a grandfathered facility has never been modified, it continues to be authorized by the TCAA to operate without a permit. Further, the definition of “modification” specifically excludes changes to facilities that are authorized by an exemption, i.e., any facility, including a grandfathered facility, can make a change using a commission exemption (now permit by rule) and this change is not considered to be a modification that would trigger the permitting requirements of the TCAA. The adopted rules that apply to facilities, for example the Chapter 117 NO_x requirements and the Chapter 115 VOC requirements, apply to both permitted and non-permitted (“grandfathered”) sources in HGA. During the 76th Texas Legislative session in 1999, the issue of grandfathered sources was addressed by two different legislative programs. Senate Bill 766 was passed which provided a framework for a voluntary permitting program for grandfathered sources under the TCAA, and Senate Bill 7 was passed which requires mandatory permitting and emission reductions from electric generating facilities. The commission continues to pursue enforcement action against companies that are not in compliance with the permitting requirements of the TCAA. However, Senate Bill 766 does provide for amnesty from enforcement for facilities that failed to obtain a permit when required, if the owner of the facility applies for a voluntary emission reduction permit by the TCAA deadline of September 1, 2001.

State Senator Carlos Truan, GHASP, and four individuals supported a program to monitor and control upsets. An individual commented that all upsets should be included in the commission's emissions inventory. An individual commented that upset emissions should be included within the permitted allowable for a plant. State Senator Carlos Truan commented that the commission should rely more on emissions testing in addition to the reported emissions inventory.

The commission agrees with the commenter that emission upsets should be looked at to identify ways to reduce these emissions. The commission also agrees that additional monitoring may be beneficial in helping to reduce these emissions. The commission is planning a thorough review of ways to diminish emissions upsets during the SIP mid-course review.

Sierra-Houston commented that each major NO_x or VOC source of 25 tpy or greater should submit to the commission and implement an upset, maintenance, start-up, and shutdown emissions reduction plan, with EPA oversight and citizen review, in order to achieve appropriate emission reductions.

ExxonMobil recommended that the commission develop a voluntary plan to reduce shutdown, upset, and maintenance emissions. Sierra-Galveston and one individual recommended higher fines for failure to report upsets. An individual urged the commission to track upsets. BCCA, REI, ExxonMobil, and Phillips also encouraged similar voluntary programs to reduce upset and maintenance emissions. Two individuals endorsed BCCA's positions.

The commission is planning a thorough review of ways to diminish emissions upsets during the

SIP mid-course review. There may be a number of better ways not yet identified to track, monitor, and reduce emission upsets. Several types of programs could be developed including voluntary and mandatory measures.

Two individuals commented on the need to restrict growth. An individual commented that the ultimate solution is to put a constraint on the growth of the city until more occupants can be accommodated. An individual commented that Los Angeles has implemented stringent control measures, yet the growth rate is very high. Seven individuals commented that a moratorium should be imposed on the construction and operation of large polluting industries. Sierra-Galveston called for rejection of new permits for high-emitting facilities, such as hazardous waste incinerators, until attainment is achieved. An individual commented that all permit applications should be reviewed for positive or negative impacts on the environment. An individual commented that permit applicants should be required to create a net decrease in emissions.

The cap and trade program will cap the level of NO_x emitted from stationary sources in the HGA area, thus stopping the possible growth of emissions. Any new source will be required to find and retire allowances equal to the amount of their actual NO_x emissions from sources already participating in the cap. Thus, this program does not limit growth, but it does limit growth of emissions. The commission also notes that all permit applications are reviewed to determine the impact on the environment, through case-by-case review or through standardized review of categories of sources. Federal permitting requirements for major sources in nonattainment areas do require a net decrease in emissions; however, the commission does not have authority to require such a net decrease in emissions for other permitting actions.

An individual commented that power plants and cogeneration facilities should be converted to cleaner burning fuels and required to install BACT.

The commission has included additional requirements for power plants and cogeneration facilities in this SIP. The point source NO_x rules adopted with this SIP revision will achieve an overall 93% reduction from utilities. This is equivalent to a reduction from 42 parts per million (ppm) NO_x (previous rule) to 4 ppm (current rule). This level of emissions reductions exceeds current BACT requirements. The commission is currently processing permit applications for approximately 6800 MW of total electric generating capacity from cogeneration facilities. Many of these facilities will have emission rates below the 4 ppm limit required by the current rule.

Sierra-Galveston commented that more funding should be devoted to monitoring sources in heavily industrial areas, instead of relying on voluntary self-reporting from industry. An individual objected to industrial self-reporting.

The commission appreciates the commenter's suggestion, and agrees that direct monitoring of all sources would be ideal. However, the commission does not have the resources to perform direct monitoring of all sources. The commission notes that it does have an extensive ambient air monitoring network in the HGA nonattainment area, and additionally, there are numerous other privately funded monitors considered technically reliable by both the commission and EPA. EPA and commission regulations require substantial reporting of emissions information, which is subject to both quality assurance verification and penalties for inaccurate or incomplete data. Commission enforcement staff, as well as local air pollution control agencies, can inspect records to verify compliance with the regulations.

Sierra-Houston commented that there is no ozone maintenance plan in the SIP, which is required to ensure that attainment is maintained once it is achieved.

The commission is planning a thorough mid-course review. The mid-course review will help the commission identify additional measures or change previously adopted measures in order to ensure that compliance with the ozone NAAQS is maintained.

Sierra-Houston commented that the SIP is six years late, and the EPA has illegally allowed the delayed submittal of the attainment SIP. GHASP commented that the commission missed the deadline for submitting its clean air plan by four years. Two individuals commented that the proposed measures are Draconian because the prior necessary actions to attain the ozone standard were not taken. An individual expressed disappointment that it has taken ten years since the 1990 FCAA Amendments to propose attainment rules.

The commission has been working to adopt measures to meet the health-based ozone standards. The science of ozone formation continues to mature, and the commission has constantly modified the SIP over the past 10 years since the FCAA was signed into law. The FCAA did provide that the deadline for submitting HGA's ozone attainment demonstration was 1996. This deadline was changed in 1995 when the EPA issued guidance that allowed states to postpone completion of their attainment demonstrations until an assessment of the role of transported ozone and precursors was completed for the eastern half of the nation, including the eastern portion of Texas. Texas participated in this study, which found that Texas does not significantly contribute to ozone exceedances in the Northeastern United States. Since then, in accordance with EPA guidance, Texas has committed to adopt the majority of the necessary rules for the HGA attainment demonstration by December 31, 2000. It is important to note that none of the changes in the submittal deadlines have resulted in changing the attainment deadline in the FCAA, which requires HGA to attain the one-hour ozone standard by November 15, 2007. The measures adopted by the commission reflect the latest science and argue for the level of control adopted in the attainment demonstration. There will be an opportunity to revisit the level of control in the adopted rules and in the SIP through a formal mid-course review process scheduled for the 2004 time frame.

Sierra-Houston commented that the SIP narrative makes reference to the 1995 SIP by saying that that plan "included modeling demonstrating progress [emphasis added] toward attainment," although attainment was not actually demonstrated in that submittal. Sierra-Houston disagreed with the statement in the SIP that "there is a shortage of control options," stating that in fact there are many control strategy options available.

The commission agrees that there were some control measures still available; however, the majority of these measures had the potential of severe limitation on individual behavior or limitations on business development and economic viability for the area.

An individual commented that the SIP measures focus more on citizens and small businesses than on industrial and corporate concerns.

Of the approximately 760 tpd NO_x reductions needed for the SIP control strategy for HGA, 593 tpd, or about 78%, of the reductions come from industrial point sources as a result of the Chapter 117 regulation. Additional reductions by industry are required by such measures as the construction equipment operating restrictions and accelerated purchase of Tier 2/3 diesel equipment. The commission's photochemical modeling has shown that completely eliminating industrial point source emissions would not bring the HGA area into attainment. Therefore, the SIP must contain effective measures to control automotive vehicles and other mobile sources. In order to implement control strategies that are equitable and reasonable, all sectors of the economy and population must participate in this process.

Two individuals objected to the emission credit banking and trading system. One individual commented that the emission allowance system should be repealed and reset to obtain earlier emission reductions. An individual recommended that requirements for other pollutants, for which the HGA area is in attainment, be relaxed in exchange for more stringent NO_x reduction requirements.

The commission disagrees with the commenters. The commission believes that a vibrant credit banking and trading system should be established to provide for the most innovative and flexible ways for entities to make the level of reduction required by this plan. The commission does not set the level of pollutants an area can have. Congress established these pollutant levels, and the commission does not have the ability to exchange one for the other.

Baytown, Baytown COC, Hispanic COC of Greater Baytown, and Baytown/West Chambers County Economic Development Foundation each submitted resolutions supporting the establishment of a cost-effective SIP, specifically, one that adopts proven standards such as those implemented in California, disregards excessive or unproven methods, adopts national fuel and motor vehicle standards, disregards high-cost fuel blends for specific regions, establishes the maximum time allowed by law for

installation of controls, and provides incentives for market-based applications or new innovative technology. Similar comments were received from four individuals.

The commission disagrees with the commenters. A complete analysis was done of the level of control needed to reach attainment. In most cases the California regulations did not go far enough in the control of NO_x to demonstrate attainment with the ozone standard in HGA. Regarding cost effectiveness, the commission strives to identify the most cost-effective strategies for reducing emissions that will provide for attainment of the ozone NAAQS. The modeling done in support of the SIP considered all the applicable federal standards. The adopted rules and the SIP allow for as much time to comply as is legally possible.

The Victoria City Council and Victoria County submitted resolutions requesting that the commission eliminate the application of HGA SIP rules to the Victoria area, and that the commission continue to support the Victoria area's long-range program to maintain its ozone attainment status.

The commission disagrees with the comment. There are no regulations proposed for HGA which are also being adopted solely for Victoria. There are, however, several measures which either have been adopted or are being adopted as part of this action which have broad East and Central Texas applicability or have statewide applicability. The commission has determined that these measures are best implemented on a broad regional scale in order to improve overall air quality in the state.

State Senator Carlos Truan, State Representative Vilma Luna, State Representative Jaime Capelo, State Representative Gene Seaman, Port of Corpus Christi Authority (PCCA), Port Industries, Corpus Christi, Corpus Christi COC, Coastal Bend Council of Governments (COG), Corpus Christi Air Quality Committee, and eight individuals commented that the HGA control measures should not be implemented in the Corpus Christi area, stating that other areas in the state cannot attain the ozone standard until Houston itself reaches attainment. An individual commented that inclusion of Corpus Christi in the HGA SIP would be a disincentive for small businesses. PCCA commented that the Corpus Christi area, by being the largest metropolitan area in Texas in attainment with the ozone standard, enjoys a competitive advantage over nonattainment areas based solely on FCAA requirements. State Representative Vilma Luna, State Senator Carlos Truan, State Representative Jaime Capelo, PCCA, Port Industries, Corpus Christi, Mayor Loyd Neal, Corpus Christi Air Quality Committee, and five individuals noted that the Corpus Christi area's own efforts to implement voluntary measures, enforced through the Flexible Attainment Region (FAR) agreement, have resulted in improvements in Corpus Christi's air quality, and that extension of statewide controls would be seen as a violation of trust. State Senator Carlos Truan, State Representative Vilma Luna, State Representative Gene Seaman, San Patricio County Judge Josephine Miller, Corpus Christi Councilman Arnold Gonzales, Corpus Christi Air Quality Committee, and three individuals supported renewal of the Corpus Christi FAR agreement for an additional five years. Nueces County Judge Richard Borchard and Mayor Loyd Neal commented that Corpus Christi citizens and industry should not be penalized for

Houston's pollution problems. Corpus Christi commented that rules designed to achieve attainment must be proposed in a separate rulemaking specific to the area in question. Similar comments were received from four individuals.

The commission agrees that several other areas around the state may face challenges in reaching and/or maintaining compliance with the NAAQS until the HGA area reaches attainment. The commission further agrees that implementation of the FAR concept in Corpus Christi has been a key part to the continued improvement in the air quality there. The commission believes that continued air quality improvements are necessary in order for the Corpus Christi area to maintain its air quality. However, the commission does not agree that Corpus Christi is being penalized in any way, nor are the reductions required by this plan for the Corpus Christi area solely for the benefit of the HGA area. Any further reductions in the Corpus Christi area or the broader East and Central Texas areas will benefit these areas to a greater extent than the HGA area.

Sierra-Houston commented that just as Corpus Christi is affected by transport, its own pollution also affects other areas downwind.

The commission is aware of modeling which indicates that under certain meteorological conditions the emissions from the Corpus Christi area can be detected over other areas of the state.

Six individuals commented that experts outside the commission should be consulted, and that careful study and common sense must be employed before making decisions that could be proven to be incorrect.

The commission does consult with other experts in the field of photochemical pollutant formation, and will continue these efforts. The staff of the commission consults with several technical oversight groups across the state for thoughts on how to better model and plan for reductions in photochemical smog.

Galveston Bay Conservation and Preservation Association (GBCPA) stated its concern that emissions from port vessels, trains, trucks, and cranes and other cargo equipment have been under-represented in the emissions inventory, and requested that the commission reconsider the emissions calculations from these sources before the final SIP is completed.

The commission has worked with the Port of Houston Authority, the City of Houston, maritime organizations, consultants, engine manufacturers, other state agencies, Port industries, and the federal government to characterize emissions from the Port. The commission has received and is incorporating a revised emissions inventory for the Port's mobile sources. The commission believes it has the most accurate and up-to-date inventory

for the Port that can be achieved at this time.

GBCPA and five individuals expressed concern that operational emissions from ports such as the proposed Bayport container facility could generate an additional 5 to 10 tpd NO_x from non-road sources. Gulf Coast Institute (GCI) and five individuals also expressed concern about the Bayport expansion. An individual commented that it makes no sense to impose stringent measures on industry and the public when the Bayport expansion is allowed. Sierra-Houston commented that future Bayport emissions have not been quantified. GBCPA commented that if Bayport's operational emissions are not addressed under general conformity rules, they must be specifically incorporated into the SIP. GBCPA stated that since these emissions have not been included in the SIP, this omission is a fatal flaw in the SIP.

Emissions associated with Port growth, either through the proposed Bayport project or other projects, have been taken into consideration as part of HGA's attainment plan.

Outdoor Power Equipment Institute (OPEI), Briggs & Stratton, and one individual commented on the desirability of a spill-proof gasoline container rule in preference to the proposed operating restrictions on lawn service equipment. In support of this rule, OPEI stated that the rule would actually reduce rather than shift emissions, would improve water quality, and would improve overall fuel efficiencies. OPEI also commented that, based on California Air Resources Board's (CARB) methodology and experience in quantifying SIP credits for a spill-proof gasoline container rule, the HGA area could realize 11.63 tpd VOC reductions from such a rule.

The commission completed an analysis of the effectiveness of a spill-proof gas can rule in place of the lawn and garden shift rule adopted as part of this attainment demonstration. The results of this analysis indicated that a spill-proof gas can regulation would not yield the ozone benefits in the HGA area compared to the shift as adopted here. However, the commission has made changes to the lawn and garden rule to allow substitute programs in lieu of complying with the shift. A spill-proof container program implemented in conjunction with other emission reduction measures could be used to avoid having to comply with the shift.

MCA and six individuals commented on the need for public education to inform the public and enlist their cooperation. An individual recommended a public relations campaign to inform the public on how to report pollution-related incidents. An individual recommended that a pollution hotline be available, and that personnel be available to investigate incidents while they are occurring.

The commission agrees that public education is vital to increase understanding of the reasons for pollution formation. The commission has been actively engaged with the public and has implemented several pollution awareness programs. The commission does have a hot line for reporting smoking vehicles (1-800-453-SMOG). The commission agrees with the commenter and will work to continue to improve public education regarding pollution.

Sierra-Houston and MCA expressed concern that, since the one-hour ozone standard requires three years of monitoring data with no more than three ozone exceedances by the attainment year of 2007, the proposed control strategy timetable does not allow enough time for reductions to occur by 2005. MCA recommended that the timetable be accelerated to implement the measures as soon as practicable. An individual commented that economic injury from air pollution justifies early implementation of controls.

The commission disagrees with the commenters. The measures adopted here are being implemented as expeditiously as practicable while balancing the need for affected sources to have the time necessary to make operational changes in order to comply with the adopted rules and the SIP. The commission believes that the measures adopted here will be sufficient to demonstrate attainment with the one-hour ozone standard along the time line indicated by federal guidance.

Baytown COC and three individuals commented that the maximum allowable time permitted by EPA for implementation of SIP control strategy rules—2007—be given for point sources to comply and for federal fuel standards to be implemented. An individual recommended that demonstration of attainment be extended to 2010. State Representative Tommy Williams, RAQCG, Harris County, and an individual recommended a mid-course correction to allow for substitution of better proven technology and modeling improvements. Three individuals supported rapid implementation of SIP measures; one of the individuals commented that compliance deadlines should be no later than 2002.

The commission has modified the original proposal to call for the final phase of reductions after the mid-course review and in the 2006/2007 time frame. The commission agrees that a mid-course correction be part of this attainment demonstration. The commission further agrees that if the science allows substitution of one program for another, this should be done, so long as there is no significant loss of air quality benefits through substitution of measures. The measures adopted here are being implemented as expeditiously as practicable. The commission believes that the measures adopted here will be sufficient to demonstrate attainment with the one-hour ozone standard along the time line indicated by federal guidance.

ED commented that the commission's commitment to perform a mid-course review does not relieve it of the responsibility to submit an acceptable attainment demonstration by December 2000. ED further commented that the commission should provide an enforceable commitment to perform the mid-course review, explaining the specific actions to be taken and stating the criteria for making any possible corrections. Sierra-Houston commented that the mid-course review is a backloading strategy that will fail.

The commission agrees that a mid-course review does not relieve it of the obligation to submit an acceptable attainment demonstration by December of this year. The commission will submit a plan by December 31, 2000 which demonstrates attainment. The commission has

fully explained its intentions regarding enforceable commitments and the mid-course review in Chapter 7 of the HGA attainment plan. The commission disagrees with the comment that the mid-course review will fail. The mid-course review is a mechanism for the commission and the public to determine how the plan has worked so far, and will provide an opportunity to revisit the plan and make corrections if necessary to continue on the course for attainment by 2007.

ED commented that the commission should review a list of 51 strategies, originally submitted by ED for the Dallas-Fort Worth (DFW) SIP, and re-evaluate these strategies for inclusion in the HGA SIP.

The commission has evaluated these and other similar measures submitted by other interested parties. The commission has made its best effort to utilize these strategies where it has the authority to implement them or where the strategies identified are measurable, quantifiable, real, and practicable for implementation in the HGA area.

Enterprise commented that if a reasonable goal of 50-75% NO_x reduction could be achieved by 2005, a mid-course correction could be implemented by that time, allowing an opportunity to improve modeling techniques and develop better control technologies.

The commission agrees with the commenter that a mid-course review is an appropriate and necessary part of the HGA attainment demonstration.

ExxonMobil and one individual supported the Texas 2000 Air Quality Study to gather data to support better air quality decisions. ExxonMobil supported the incorporation of the study's results into air quality modeling so that a more accurate SIP can be developed during the mid-course review.

The commission appreciates the support and agrees with the commenter.

Public Citizen commented that the SIP proposal does not contain enough NO_x reductions to reach attainment of the ozone standard, nor does it allow for growth.

The commission disagrees with the commenter. The commission is committed to developing an approvable attainment demonstration that achieves the significant reductions necessary to ensure attainment of the ozone standard in HGA by 2007, and yet maintain robust economic growth. As a part of the ongoing review between December 2000 and May 2004, the commission will continue to evaluate the ability to modify the SIP to incorporate additional reductions from federal programs and new technologies beyond 2007. These changes will lead to necessary revisions to the control strategies, particularly with regard to the allocations issued under the cap and trade program, to allow for growth in all economic sectors.

An individual commented that any rules adopted should be applicable statewide, since air quality is not just a local issue.

The commission appreciates the commenters' support for statewide applicability of the rules. The commission notes, however, that it is not obligated to adopt all rules statewide in order to satisfy its commitments under the SIP, nor is the commission required to do so under the FCAA. Three of the proposed measures contain emission reduction strategies that have been proposed for statewide applicability: California Large-Spark Ignition Engines; Emissions Banking and Trading Program (that portion of the proposed rule which relates to the trading of emission reduction credits and discrete emission reduction credits); and Cleaner Diesel Fuel (that portion of the proposed rule which relates to on-highway fuel). In evaluating whether to implement all of the rules statewide, the commission took into account many concerns, including, but not limited, to the need for the marketplace to be able to respond to regulation, the possible impacts on transport and distribution systems, the possibility of increased costs and financial burdens on regulated entities, and regional needs and issues associated with statewide mandates. The commission analyzed where emission reduction measures are most needed and where emission reduction measures will be most effective in order to demonstrate attainment.

League of Women Voters of Texas (LWV-TX) and individuals supported adoption of strong measures that exceed the safety margin called for in the FCAA, since voluntary measures, behavior-related requirements, and reliance on future technologies and federal rules create uncertainties in the attainment strategy. An individual commented that reduction strategies should be developed past the 2007 attainment date.

The commission is adopting the measures that it believes are necessary and appropriate in order for the HGA nonattainment area to demonstrate attainment with the federal ozone standard by 2007. The commission agrees with, and supports, the EPA's commitment to innovative approaches to achieving air quality goals in the promotion of viable voluntary mobile source air quality programs. EPA guidance allows for voluntary measures, and, due to the extraordinary nature of the HGA area, the commission must take advantage of all options available in order to obtain emission reductions. The attainment deadline for the HGA nonattainment area is 2007, which does not allow the commission to delay consideration of strategies.

Houston Planning and Development Department commented on its Emission Reduction Plan to achieve 75% NO_x reductions by 2004, and committed to undertake additional measures such as pilot telecommuting programs and reduction of VMT from City vehicles. Houston also commented on work groups it created to explore clean air alternatives.

The commission appreciates the leadership role taken by the City of Houston in inventorying its own sources of emissions, developing a plan for reduction of these emissions, and implementing timely, appropriate measures in harmony with the goals of the SIP. The commission also wishes to commend the City for its proactive activities in identifying

innovative control strategies for its own operations and for the SIP.

An individual questioned the monetary effects of a cut in federal highway funds, and stated that these funds are not worth the damage to the Texas economy and aggravation to Texas citizens caused by the proposed SIP.

These sanctions are federally imposed on Texas if the state fails to submit an adequate plan. The commission believes that the imposition of federal sanctions could be far more damaging to the Texas economy and to its citizens than the implementation of the adopted rules and SIP measures. The commission believes the attainment plan submitted today will prevent these federal sanctions from being imposed on Texas.

ED commented that on three occasions prior to the current attainment SIP, the commission committed to conduct photochemical modeling to demonstrate the adequacy of its control strategy, but failed to do so. ED stated that the commission should honor its commitment and test its control strategy through modeling.

Federal guidance allows states to conduct base level modeling and then calculate what additional reductions are necessary for demonstrating attainment. The commission will continue to evaluate the necessity for additional photochemical modeling. The commission is committed to additional photochemical modeling and additional study during the mid-course evaluation.

ED commented that the commission should incorporate an environmental standard into contract specifications for construction projects managed by state agencies, in order to encourage construction companies to invest in emission reduction technology.

The commission has made provisions in its rules regarding construction equipment for alternative plans for emission reductions. If part of these plans are for contract specifications for additional emission reductions, the commission will evaluate these to determine how effective they may be. The commission does not have the authority to restrict contracts for other state agencies; however, if the legislature were to specify state agency contract specifications, the commission would be available for technical support from an air quality perspective.

An individual commented that it should be a federal mandate that emissions reduction proposals be accompanied by a disclosure informing the public of the amount of reduction expected from the strategy.

The commission makes every attempt to indicate the level of reductions and the costs associated with the proposed and adopted control strategies. Each of the adopted rules

provided information as to the amount of emission reductions expected from the rules. In addition, the proposed SIP provided detail on the expected emission reductions from each strategy. The rules and the SIP are required to undergo a public notice process that includes an opportunity for public comment.

Union Pacific commented that, due to the important role the railway system plays in interstate commerce, Congress has given preemptive regulatory rights to the federal government. The commenter stated that the commission's proposals would significantly interfere with interstate commerce into and out of Houston, one of the nation's largest port cities. Orsouth commented that the proposed SIP goes beyond Congressional intent and constitutional support for federal, not state, regulation of interstate and international commerce.

The commission disagrees with the commenter. The commission presumes that the comment relating to preemption relates to the NO_x Reduction System and the Diesel Emulsion Fuel proposed rules, which the commission has determined to withdraw from consideration for this SIP. The commission disagrees that any control measure included with the final SIP is preempted. The rules promulgated by the commission and the SIP are specifically designed to attain a federal standard which applies equally in all states. Texas must comply with these limits like all states, and in so doing must choose which sources to regulate. The commission's actions do not place burdens on interstate commerce, but simply regulate local activities within the HGA area, and thus violate neither the Commerce Clause nor Equal Protection under the U.S. Constitution. Although the commission disagrees that there is any burden placed on interstate commerce by the SIP, any burdens that might be found are merely incidental, and thus the regulations are allowable exercises of the state's police powers to promote health and safety. The U.S. Supreme Court has consistently held that the Commerce Clause is not an absolute bar to state regulation. "The limitation imposed by the Commerce Clause on state regulatory power is by no means absolute, and the states retain authority under their general police powers to regulate matters of legitimate local concern, even though interstate commerce may be affected." Maine v. Taylor, 477 U.S. 131, 138 (1986) citing Lewis v. BT Investment Managers, Inc., 447 U.S. 27, 36 (1980). The Court has also consistently ruled that states may impose incidental burdens on interstate commerce, so long as the burdens are not "clearly excessive in relation to the putative local benefits." Pike v. Church, 397 U.S. 137 (1970). It has also been held that "[t]he protection of the environment and conservation of natural resources . . . are areas of legitimate local concern" justifying incidental burdens on interstate commerce. New York State Trawler's Assoc. v. Jorling, 16 F.3d 1303, 1308 (2d Cir. 1994). The SIP will promote attainment of the ozone NAAQS in the HGA area, benefiting the health of the residents of that airshed. The minimal burdens, if any, imposed on interstate commerce clearly pale in comparison to these real gains in air quality.

An individual stated that the 2007 attainment date for HGA is arbitrary, and that flexibility should be allowed.

The date for attainment for Serious 17 areas, such as the HGA area, was established by the FCAA amendments in 1990. There is no flexibility in this date, however, The commission is committed to work with EPA to identify timing flexibilities for each of the adopted rules and SIP strategies.

An individual recommended that the impact on the individual citizen be minimized, stating that each person makes a very small impact overall.

In developing control strategies for the SIP, the commission has been keenly aware of the need to assign responsibility for reductions equitably across all sections of the economy and population. Although each person makes a very small impact at the individual level, the collective impact of many individuals' activities can be very large. One of the best examples is automobiles. Control measures for motor vehicles, such as speed limits and I/M emissions testing, can significantly reduce emissions when implemented on a broad scale. If the premise were accepted that individual contributions are not important, this would lead to the conclusion that industrial point source emissions, for example, should not be controlled because each individual unit's emissions makes an infinitesimal contribution to the overall problem. Applying this reasoning to the remaining emission sources in the HGA area would ultimately result in no controls at all. The burden imposed by the SIP on individuals is far less, comparatively speaking, than the controls being required for industrial point sources. Cooperation throughout the entire HGA area is the key to a successful attainment demonstration.

HARC CGS recommended that a technology assessment program be developed in the HGA area to help bring emerging technologies into use more quickly.

The commission agrees with the commenter. The commission has made provisions in Chapter 7 of this attainment demonstration for a thorough review of technology as part of its mid-course review process.

An individual questioned what air quality solutions, pursued by other states, were not included in the SIP proposal, and what alternatives existed for the SIP proposals. An individual stressed the importance of learning from others.

The commission agrees with the commenter that all ideas should be explored; however, the commission disagrees that this process was not done for the HGA area. In fact, hundreds of strategies were evaluated by the commission, local governments, EPA, and others. The commission believes it has made the best selections from these hundreds of measures to ensure that attainment is reached in the most expeditious and practicable manner.

Port of Houston Authority (PHA) commented that the Port and the marine industry support and will

implement the parts of the SIP that will work, and noted that the Port has experimented with a number of emission reduction programs.

The commission is aware of the significant efforts undertaken by the Port for technology demonstration programs. The commission appreciates the leadership role the Port has taken in identifying cutting edge technologies for considerations as control measures for this attainment plan.

SEED Coalition commented that lawsuits over the DFW SIP represented the opposite of what should be done.

The commission supports the right of individuals to seek judicial review of commission actions.

An individual expressed concern about environmental justice issues. Lake Jackson commented that the SIP would have a disproportionate impact on lower and middle class individuals. Clear Lake Area COC commented that no one group, industry, or segment of society should be the focus of emission reductions, in order to avoid disproportionate impacts.

The measures proposed under this SIP will not have a disparate impact on persons based on race, color, or national origin. The basis for the adopted rules and the SIP is protection of human health and the environment, and the rules and SIP are anticipated to provide significant reductions in the formation of ozone in the HGA area. Although it is not clear what, if any, legal standard the commenters allege the commission would violate in adopting the SIP, some state that the SIP would “disproportionately impact” minorities. This is clearly a reference to Title VI of the Civil Rights Act of 1964. In order for the commission to be shown in violation of Title VI, a disproportionately negative impact to minorities must be shown. The SIP will not have negative environmental impacts, thus it is impossible for negative impacts to be disproportionately borne by minorities. As for other potential negative impacts of the rules and SIP, these are clearly borne equally by all persons governed by the SIP and rules without any differentiation by race, color, or national origin.

Six individuals commented that EPA and commission staff are not elected, and challenged the agencies' authority to impose regulations on the public.

The commission disagrees with the individuals's comments that it does not possess the authority to impose the regulations and other measures contained in the SIP. The Texas Legislature has directed the commission to prepare plans to comply with the federal ambient air quality requirements. The TCAA specifically directs the commission to “prepare and develop a general, comprehensive plan for the proper control of the state's air.” TCAA, §382.012. The FCAA requires states to submit implementation plans to demonstrate

attainment of national ambient standards or face very onerous sanctions for failure to submit a plan or attain the standard. 42 USC §§ 7410, 7509, 7511a, 7511d.

An individual commented that the commission should protest to the EPA about inclusion of the entire consolidated metropolitan statistical area (CMSA) in the ozone nonattainment area, instead of the specific areas where violations are detected. Four individuals commented that rural counties should be excluded from the SIP requirements. An individual commented that, since the prevailing wind direction is from the south, all counties north of Harris County should be exempted from the SIP requirements. An individual commented that any county demanding to be excluded from a nonattainment area should be required to present data on the present and future number of deaths attributed to pollution, and the increased health care costs. Brazoria County and State Representative Tom Uher commented that the SIP fails to address Brazoria County as an individual entity, based on the rural conditions existing in that county. An individual recommended that Brazoria County be considered and regulated as two separate entities—the more rural area along the Gulf Coast, and the more urban area closest to Harris County. An individual also asked why the commission does not work to get Brazoria County out of the HGA nonattainment area, and instead submit a plan that addresses Harris County alone. Two individuals recommended that the SIP address Harris County first, then bring in additional counties only if needed. A petition signed by approximately 8,000 Brazoria County residents expressed opposition to being included in the HGA ozone nonattainment area and to the SIP, stating that the plan poses a potentially great financial hardship on all residents of the county. Similar comments were received from the Brazosport Area COC and seven individuals. Four individuals recommended that the commission remove Brazoria County from the HGA area and change the proposed SIP rules. Two individuals commented that any reductions needed in Brazoria County should be addressed by a separate plan for that county alone. An individual commented that Brazoria County was included in the HGA in order to dilute pollution over a larger area, thus helping Houston to solve its ozone problem. Chambers County Judge Jimmy Sylvia and four individuals objected to application of SIP requirements to Chamber County, stating that the county contributes no pollution to the environment and should not be penalized for its proximity to Harris County. Another individual commented that cleaning up Harris County alone would solve the problem, and urged the commission to look at the big picture. Liberty County Judge Lloyd Kirkham, Liberty County Commissioner Toby Wilburn, Dayton Area COC, Dayton Pipe, and six individuals commented that Liberty County should be excluded from the HGA SIP, stating that Liberty County does not contribute to Houston's ozone problem. Liberty-Dayton Area COC, Dayton Pipe, and one individual commented that Liberty County should not be penalized because of Harris County's ozone problems, and stated that the SIP would have a detrimental impact on small businesses in the county. An individual commented that Liberty County should be excluded from the HGA attainment plan, owing to the county's low median family income and high unemployment rate. Montgomery County Soil and Water Conservation District No. 452 (MCSWCD) commented that Waller County is included in the ozone nonattainment area simply because it borders Harris County. Montgomery County Judge Allen Sadler and one individual objected to the inclusion of Montgomery County in the SIP, stating that most of the problem is created by Houston area industries. RMT, Inc. (RMT) commented that exclusion of Montgomery County from the SIP would make no measurable

difference to the Houston ozone problem.

The FCAA Amendments of 1990 provided new requirements for areas that had not attained the NAAQS for ozone, carbon monoxide, particulate matter, sulfur dioxide, nitrogen dioxide, and lead, and new requirements for SIPs in general. EPA was authorized to designate areas failing to meet the NAAQS for ozone as nonattainment and to classify them according to severity. Section 107(d)(4)(A)(iv) of the FCAA mandated that areas designated as serious, severe, or extreme for ozone that were within a metropolitan statistical area (MSA) or consolidated metropolitan statistical area (CMSA) must have boundaries that include the entire MSA or CMSA. This requirement is supported by the legislative history for the FCAA Amendments in Senate Report No. 101-228, page 3399, “[b]ecause ozone is not a local phenomenon but is formed and transported over hundreds of miles and several days, localized control strategies will not be effective in reducing ozone levels. The bill, thus, expands the size of areas that are defined as ozone nonattainment areas to assure that controls are implemented in an area wide enough to address the problem.” The FCAA Amendments did provide the ability to exclude portions of the entire MSA or CMSA prior to designation, if the state conducted a study that EPA agreed proved that the geographic portion did not contribute significantly to violation of the NAAQS.

Redesignation has not occurred for any portion of the HGA nonattainment area, and is not currently being considered. For existing areas currently included within a nonattainment area, the specific area must be redesignated as attainment to be removed from a nonattainment area. Section 107(d)(3) provides that EPA may not redesignate a nonattainment area, or a portion thereof, to attainment unless several criteria are met, which include: a determination that the area has attained the NAAQS; there is a fully approved SIP for the area; there is a determination that the improvement in air quality is due to permanent and enforceable reductions in emissions; there is an approved maintenance plan for the area; and the state has met all requirements for the area under section 110 and Part D of the FCAA. However, even if a specific area within the HGA nonattainment area was redesignated by EPA as attainment for ozone, reductions associated with all adopted ozone control strategies would still be necessary because of the requirements of §107(d)(3) and FCAA §175A, which require maintenance plans for all redesignated areas. The maintenance plan must include the measures specified in §107(d)(3) and any additional measures that are necessary to ensure that the area continues to be in attainment with the NAAQS for 10 years after the redesignation. Eight years after the redesignation, the state is required to submit an additional revision to the SIP for maintaining the NAAQS for 10 years after the end of the first 10-year period.

Additionally, reductions associated with the ozone control strategies that will be implemented outside the HGA nonattainment area will benefit the HGA nonattainment area. This is due to the regional nature of air pollution, the contribution from mobile sources, and the economies

of scale and associated market advantages related to distribution networks for some strategies. At the time the 1990 FCAA Amendments were enacted, the focus on controlling ozone pollution was centered on local controls. However, for many years an ever-increasing number of air quality professionals have concluded that ozone is a regional problem requiring regional strategies in addition to local control programs. As nonattainment areas across the United States prepared attainment demonstration SIPs in response to the 1990 FCAA Amendments, several areas found that modeling attainment was made much more difficult, if not impossible, due to high ozone and ozone precursor levels entering from the boundaries of their respective modeling domains, commonly called transport. Recent science indicates that regional approaches may provide improved control of ozone air pollution. The commission has conducted air quality modeling and upper air monitoring that found regional air pollution should be considered when studying air quality in Texas' ozone nonattainment areas. This work is supported by research conducted by the Ozone Transport Assessment Group (OTAG), the most comprehensive attempt ever undertaken to understand and quantify the transport of ozone. Both the commission and the OTAG study point to the need to take a regional approach to controlling air pollutants.

Harris County Judge Robert Eckels and one individual commented that the entire region must work together to ensure an equitable and effective clean air plan, and that the residents and businesses in Harris County and outlying counties benefit from mutual growth. Galveston County Judge Jim Yarbrough commented that Galveston County receives benefits due to its closeness to Harris County, and that every day thousands of its citizens go into Harris County for employment, medical service, and entertainment. Judge Yarbrough further commented that participating in the clear air plan is a price that has to be paid for these benefits. Four individuals expressed general support for SIP measures in Brazoria County. An individual commented that the economy in Brazoria County benefits from its proximity to Houston, and that everyone contributes in some way to the pollution problem, such as driving to Houston every day. An individual commented that, with regard to concerns about hardships to the economy, a company trying to locate in Brazoria County is meeting opposition from residents because of health and safety concerns. An individual commented that the real issue is fear of change. Galveston County Commissioner Stephen Holmes commented that the SIP requirements would have a ripple effect on labor and employment in Galveston County.

The commission agrees with the commenter. Ozone is not a localized pollutant and does not respect county boundaries. An effective plan must include the entire nonattainment area, and in the case of some control strategies, East and Central Texas or even statewide controls are necessary to meet the federal NAAQS.

Congressman Ron Paul stated his opposition to the SIP proposal, and commented that the commission is blackmailing the citizens of Brazoria County into compliance by threatening to withhold tax dollars, although this would have a negative economic impact. Two individuals recommended that Texas refuse to comply with EPA's requirements.

The commission disagrees with the comment. Texas is required by federal law to comply with the health-based pollution standards or face sanctions from the federal government. Federal law allows the withholding of federal highway construction funding and other sanctions related to restricting economic growth. The commission is committed to avoiding federal sanctions in order to ensure the continued economic growth of the area.

Brazoria County Judge John Willy and County Commissioners, State Representative Dennis Bonnen, and Brazosport Area COC recommended that the commission implement only those rules that are justified by the actual ozone and NO_x levels produced in Brazoria County.

The commission believes it has developed a complete and fair attainment demonstration which has the appropriate level of controls applied across the area. In addition, the commission is committed to a mid-course review to reevaluate the effectiveness of the controls, and is committed to making revisions to the plan where necessary and called for by the science.

Brazoria County, Brazosport Area COC, and one individual commented that the SIP fails to take into consideration the significant progress made by Brazoria County in reducing NO_x emissions from all sectors of the inventory. Brazoria County further commented that the SIP does not have an appropriate review process by which progress in emissions reductions can be accounted for and credited to the areas making progress. An individual commented that in the period 1996-1999, point source NO_x emissions in Brazoria County decreased by 25% as the result of voluntary reductions. An individual compared the referenced 25% reduction to the 40% point source NO_x reduction mandated in the BPA attainment plan. An individual commented that Brazoria County's contribution to total HGA NO_x is less than 10%, not 16% as reported in the media. Brazoria County commented that the SIP's failure to acknowledge the county's individual emission reductions, independently of the rest of the HGA ozone nonattainment area, represents an unconstitutional imposition of sanctions against the county for the failure of other counties in the area to comply. Six individuals stated that the SIP proposals are not based on sound science.

The commission has incorporated all reductions of the emission inventory in each county in the photochemical model and has carefully considered these during the control strategy development. The commission disagrees with the comment that it has not had an appropriate review process for incorporating progress made by different areas. The commission has worked with the local governments including local elected officials to understand and give credit for reductions already achieved. All quantifiable, verifiable, and real emission reductions made regardless of the year have been implemented by a local entity. Brazoria County does contribute to the overall air quality in the area and therefore must be a part of the solution for cleaning up the air. The commission believes it has accurately captured the proportion of emissions associated with Brazoria County.

The photochemical models used by the commission undergo intense peer review before being released for use. Each time modeling is submitted as part of a SIP, it goes through a public comment period. The commission constantly improves the modeling inventories and tools that are being used, and acknowledges that there are other improvements that could be made. Additionally, the commission disagrees that the consideration of Brazoria County as part of the nonattainment area equals an unconstitutional imposition of sanctions against Brazoria County, since the FCAA prescribes the boundaries of the nonattainment area to include Brazoria County. Therefore, Brazoria County is properly included in the consideration of applicability of control measures necessary to reduce emissions in order demonstrate attainment.

Brazoria County commented that the remote sensing component of the program is a violation of the United States Constitution because it is covert surveillance of citizens without probable cause. Brazoria County stated that the proposed program violates the United States Constitution as it pertains to criminalizing innocent behavior and not affording the presumption of innocence, as well as proposing enforcement tactics that clearly violate the safeguards of probable cause in the criminal justice system.

The commission disagrees with the commenter that the remote sensing component of the program amounts to an illegal search. The remote sensing components detect emissions of vehicles which are operating on the public roadway in plain view, and therefore is not a search. There is no unlawful entry into private domain and the vehicle is not stopped at the time of the test, so there is no seizure. Further, as case law indicates, there is a reduced expectation of privacy associated with motor vehicles and therefore only probable cause is required to search an automobile.

The commission disagrees with the commenter's assertion that the program criminalizes innocent behavior. It is not a crime to be detected as a high-emitter by remote sensing equipment, so there is no presumption of guilt or innocence. In the event that a vehicle is detected as a high-emitter, the operator is required to bring the vehicle in for an emission test. The operator may choose to repair the vehicle before bringing it for a test, in which case a clean test will mean there are no further conditions upon that operator. If the operator then fails the emission test, the operator must either repair the vehicle or qualify for a waiver within a certain period of time. It is only the operator who does not bring the vehicle in at all or who does not follow-up after a failed test who is subject to penalty under the program. In these cases, probable cause has clearly been demonstrated and due process is provided through the enforcement phase.

Brazoria County submitted a report which concludes that remote sensing has little practical value or use in identifying individual, dirty or clean vehicles, that it predicts vehicle emissions at a rate less than chance and that measure emissions with unacceptably wide variations. The report also states that remote sensing can only view a part of the fleet. The commenter also stated that experience and data

from remote sensing in Texas show a high percentage of inaccuracy.

The commission acknowledges the comment from Brazoria County. The remote sensing program was not implemented for the purpose of replacing annual tail pipe testing. Remote sensing is used as a non-intrusive but efficient tool to monitor a portion of the vehicle fleet, and to identify excessive polluters as a complement to traditional mobile source emission control programs. The remote sensing program is designed to detect potentially high-emitting vehicles registered in or commuting into any of the affected nonattainment counties. Owners of vehicles identified as high emitters receive written notice instructing them to submit their vehicles to a tailpipe test at a state-certified emissions testing station to determine compliance with emissions regulations. The commission recognizes that remote sensing is not currently as accurate as the tailpipe test in characterizing vehicle emissions, and therefore requires identified vehicles to submit to a confirmatory tailpipe test for validation of the remote sensing results. The commission will continue to evaluate technological advances in remote sensing in order to insure the best possible equipment and testing methodologies are considered in future program development.

Brazoria County commented that the impact of the emissions testing and denial of re-registration of vehicles who do not pass the test has a disparate impact upon the economically disadvantaged citizens. The commenter stated that this denial of the right to use a vehicle is a taking of property without a hearing and without compensation. The commenter stated that the procedures contained in the SIP constitute an unlawful delegation of legislative authority to an administrative agency.

Although it is not clear what, if any, legal standard the commenter alleges the commission would violate in adopting the rule, the commenter states that the rule would “disproportionately impact” the economically disadvantaged. The commission understands that vehicle repairs can be costly. In order to assist the public, the vehicle emissions testing program includes two waiver options: the minimum expenditure waiver and the individual vehicle waiver. The minimum expenditure waiver is available to those who have made repairs to their vehicle within the established criteria and met the dollar limits established by the EPA rule. The individual vehicle waiver is for those who cannot meet emissions standards despite every reasonable effort by the motorist. In addition to these two waivers, the low income time extension is available for those who can demonstrate a financial inability to either afford adequate repairs or to meet the applicable minimum expenditure waiver amount. The waivers and extension are ways to ensure that motorists who are making a “good faith” effort to comply with the I/M program requirements do not incur excessive repair costs, are not excessively inconvenienced, or are not denied re-registration of their vehicle.

With regard to the idea that the program amounts to a taking of a vehicle, the commission disagrees with the commenter. Legally, this program is no different than the requirement that all drivers must carry liability insurance in order to operate their vehicle. While both

programs set conditions which must be met before operating a motor vehicle, the state's police power to protect the health and safety of the general public outweighs the burden on the individual driver. Neither program represents a taking of a vehicle without hearing or just compensation. Finally, the I/M program is not an unlawful delegation of legislative authority to an administrative agency. The Texas Legislature has defined and redefined the parameters of an authorized I/M program over the past decade. The current specific state authorization is found in the TCAA §§382.037 through 382.038. Additionally, the directive of the Legislature to adopt a program as required by federal law, TCAA §382.037(c)(1), was written in light of the specific federal program requirements found in FCAA §182(c)(3) and in EPA rules at 40 CFR Part 51, Subpart S. The I/M program has been lawfully authorized and the implementation of the program lawfully delegated to the commission.

Brazoria County commented that the study on the HGA registered vehicle fleet, prepared by the Harris County Tax Assessor-Collector's office, shows discrepancies between the original EPA data on vehicle fleets versus the most recent information on registered vehicle distributions and profiles. Brazoria County stated that the EPA model is skewed toward heavy vehicle classes and overestimates on-road mobile emissions.

The commission disagrees with the commenter. The commission has made every effort to accurately characterize the on-road fleet in the HGA area. The commission undertook an extensive reevaluation of this inventory. The VMT mix fractions used in the development of the 8-county on-road mobile source inventory are well documented in Appendix G of the November 1999 SIP entitled *Attainment Demonstration for the Houston/Galveston Ozone Nonattainment Area - Part II, Rule Log #99021-SIP-A*, dated October 27, 1999. The title of Appendix G is *Development of Gridded Mobile Source Emissions Estimates for the HGA Nonattainment Counties FY 2007 in Support of the COAST Project, Texas Transportation Institute (TTI)*. Copies of this Appendix are available from Mr. Chris Kite at either (512)239-1959 or <ckite@tnrcc.state.tx.us>. The approach taken to develop the VMT mix fractions for each of the eight vehicle types is well explained, beginning on page 77 of Appendix G. TTI relied on vehicle classification count data recorded on roadways throughout the 8-county area by Texas Department of Transportation (TxDOT) personnel utilizing automatic vehicle classification (AVC) equipment. This equipment is set up along the roadway and is calibrated to classify all of the passing vehicles into the following thirteen vehicle types used by the Federal Highway Administration (FHWA):

FHWA Vehicle Types

Vehicle Type Description	FHWA Label	TxDOT Label	TxDOT Code
Motorcycles and passenger vehicles	C	none	1

Two axle four tire single unit trucks	P	none	2
Buses	B	none	3
Six tire single unit vehicles	SU2	none	4
Three axle single unit vehicles	SU3	none	5
Four or more axle single unit vehicles	SU4	none	6
Three axle single trailer	SE3	2S1	7
Four axle single trailer	SE4	2S2, 3S1	8
Five axle single trailer	SE5	3S2, 2S3	9
Six or more axle single trailer	SE6	3S3, 3S4	10
Five or less axle multi trailer	SD5	2S1-2	11
Six axle multi trailer	SD6	2S2-2, 3S1-2	12
Seven or more axle multi trailer	SD7	3S2-2	13

These data are then broken down into the eight vehicle classifications used by EPA for MOBILE5 modeling purposes:

EPA MOBILE5 Vehicle Types

MOBILE 5 Code	Vehicle Type Description
LDGV	Light-duty gasoline vehicles
LDGT1	Light-duty gasoline trucks up to 6,000 pounds GVWR
LDGT2	Light-duty gasoline trucks from 6,001 to 8,500 pounds GVWR
HDGV	Heavy-duty gasoline vehicles over 8,500 pounds GVWR
LDDV	Light-duty diesel vehicles
LDDT	Light-duty diesel trucks
HDDV	Heavy-duty diesel vehicles over 8,500 pounds GVWR
MC	Motorcycles

The first step in the process of converting the 13 FHWA categories into the 8 MOBILE5 vehicle types is to aggregate the non-passenger car data into three different truck categories:

LDT	Light-duty truck
LDGT2	Light-duty gasoline truck 2
HDV	Heavy-duty vehicle

The following table summarizes the fractions of the 13 FHWA vehicle types which are allotted to these categories:

FHWA Vehicle Type Grouping

FHWA Vehicle Types	EPA Vehicle Types		
	LDT	LDGT2	HDV
Passenger cars (C)	NA	NA	NA
2-axle, 4-tire single unit (P)	0.80	0.20	
Buses (B)		0.20	0.80
2-Axle, 6-tire, single unit (SU2)		0.20	0.80
3-Axle single unit (SU3)			1.00
4-Axle or more single unit (SU4)			1.00
3-Axle single trailer (SE3)			1.00
4-Axle single trailer (SE4)			1.00
5-Axle single trailer (SE5)			1.00
6-Axle or more single trailer (SE6)			1.00
5-Axle or less multi-trailer (SD5)			1.00
6-Axle multi-trailer (SD6)			1.00
7-Axle or more multi-trailer(SD7)			1.00

Due to the fact that AVC equipment cannot distinguish vehicle fuel type on the roadway, the various vehicle categories are then separated out into their gasoline and diesel classifications, based on a combination of MOBILE5 defaults and county registration data. As a default, motorcycles are determined to be 0.1% of passenger cars. The table below summarizes this classification process:

MOBILE5 Vehicle Types

FHWA Vehicle Types	MOBILE5 Vehicle Types							
	LDGV	LDGT 1	LDGT 2	HDGV	LDD V	LDD T	HDD V	MC
Passenger cars (C)	0.996				0.003			0.001
2-axle, 4-tire single unit (P)		0.80	0.20					
Buses (B)			0.20	0.266			0.534	
2-Axle, 6-tire, single unit (SU2)			0.20	0.266			0.534	
LDT		0.994				0.006		
HDV				0.333			0.667	

In developing the VMT mix data to be used for the 2007 on-road mobile inventory, TTI used a combination of TxDOT AVC data from 1993, 1995, and 1996, as documented on page 78 of Appendix G from the November 1999 HGA SIP. During the period in 1998 when the 2007 inventory was first developed by TTI, 1995 and 1996 AVC data were the most recently available from TxDOT. However, only Monday-Thursday AVC data were available for 1995 and 1996. Thus, 1993 AVC data were used to augment the Friday, Saturday, and Sunday portions of the total AVC data set.

Using these data sets from 1993, 1995, and 1996, TTI was able to calculate VMT mixes both for various days of the week and for different roadway types. The tables provided below summarize the VMT mix factors utilized by TTI and are taken directly from page 80 of the November 1999 HGA SIP, Appendix G:

VMT Mix for Freeways by Type of Day

Subject Emissions Day	Vehicle Types							
	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
Weekday	0.723	0.137	0.040	0.032	0.003	0.001	0.063	0.001
Friday	0.716	0.129	0.041	0.037	0.003	0.001	0.072	0.001
Saturday	0.755	0.135	0.038	0.023	0.003	0.001	0.044	0.001
Sunday	0.741	0.151	0.041	0.021	0.003	0.001	0.041	0.001

VMT Mix for Principal Arterials and Others by Type of Day

<i>Subject Emissions Day</i>	<i>Vehicle Types</i>							
	<i>LDGV</i>	<i>LDGT1</i>	<i>LDGT2</i>	<i>HDGV</i>	<i>LDDV</i>	<i>LDDT</i>	<i>HDDV</i>	<i>MC</i>
<i>Weekday</i>	0.683	0.165	0.048	0.033	0.003	0.001	0.066	0.001
<i>Friday</i>	0.633	0.161	0.053	0.050	0.003	0.001	0.097	0.001
<i>Saturday</i>	0.679	0.163	0.048	0.035	0.003	0.001	0.069	0.001
<i>Sunday</i>	0.691	0.163	0.048	0.032	0.003	0.001	0.062	0.001

VMT Mix for Collectors/Locals by Type of Day

<i>Subject Emissions Day</i>	<i>Vehicle Types</i>							
	<i>LDGV</i>	<i>LDGT1</i>	<i>LDGT2</i>	<i>HDGV</i>	<i>LDDV</i>	<i>LDDT</i>	<i>HDDV</i>	<i>MC</i>
<i>Weekday</i>	0.657	0.204	0.057	0.026	0.003	0.001	0.051	0.001
<i>Friday</i>	0.685	0.180	0.051	0.027	0.003	0.001	0.052	0.001
<i>Saturday</i>	0.706	0.187	0.051	0.017	0.003	0.001	0.034	0.001
<i>Sunday</i>	0.714	0.189	0.050	0.014	0.003	0.001	0.028	0.001

Recently, TTI was contracted by the commission to update the 2007 on-road mobile source inventory for the 8-county HGA area. This revised inventory has recently been obtained by the commission. According to TTI, the most recently available observed AVC data were from 1997, 1998, and 1999. In order to avoid year-to-year fluctuations in the data set, TTI averaged the AVC data from these three years in order to obtain a more recent VMT mix, which was used in the revised 2007 inventory which they developed. This revised VMT mix is provided in the table below:

HGA Weekday VMT Mix by Roadway Type for 1997, 1998, & 1999

<i>Subject Emissions Day</i>	<i>Vehicle Types</i>							
	<i>LDGV</i>	<i>LDGT1</i>	<i>LDGT2</i>	<i>HDGV</i>	<i>LDDV</i>	<i>LDDT</i>	<i>HDDV</i>	<i>MC</i>
<i>Freeways</i>	0.744	0.131	0.040	0.019	0.002	0.002	0.062	0.001
<i>Arterials</i>	0.699	0.170	0.050	0.021	0.002	0.002	0.055	0.001
<i>Collectors</i>	0.590	0.242	0.072	0.032	0.002	0.003	0.059	0.001

Please note that only weekday VMT mix data are shown for the three roadway types. Due to limited time and resources in developing the revised 2007 on-road inventory, TTI provided

emissions estimates only for the Wednesday September 8 episode day. The commission has adjusted the revised Wednesday inventory to develop revised inventories for the other days in the photochemical modeling episode. For example, the ratio of “old Friday” emissions to “old Wednesday” emissions multiplied by “revised Wednesday” emissions yields “revised Friday” emissions.

In reviewing the VMT mix data developed by TTI based on TxDOT AVC data, it must be emphasized that these results are based on actual field observations of vehicles traveling on roadways throughout the 8-county HGA area. This is the single most direct way to measure VMT mix. ED implies that the LDGT2 VMT mix should perhaps be as high as 13.2%, which their study indicates is the LDGT2 portion of the registered fleet in the 8-county HGA area. However, it is very important to distinguish between registration distribution and VMT mix. Not all of the registered vehicle types travel the same distance on a daily, weekly, monthly, and/or annual basis. For example, the fact that the LDGT2 category may comprise 13.2% of the registered HGA fleet does not necessarily imply that the LDGT2 category is responsible for 13.2% of the entire HGA traffic.

The commission and TTI cannot simply take the TxDOT vehicle registration database and say that the VMT mix for the eight vehicle types should match the distribution of these same eight vehicle types in the registered fleet. In fact, this approach would significantly underestimate the total on-road mobile source inventory of NO_x emissions. This would occur because the heavy-duty diesel vehicle (HDDV) portion of the fleet accounts for a much smaller amount of the registered fleet than the HDDV VMT mix would suggest. This makes sense because each HDDV is driven many more miles per day on average than most light-duty vehicles and trucks. Due to the fact that NO_x emission rates from HDDVs can be up to ten times higher than NO_x emission rates from LDGVs, LDGT1s, and LDGT2s, it is critical that the VMT mix for HDDVs be properly ascertained. Consequently, the use of registration distribution information as a surrogate for VMT mix data would result in a significant underestimate of NO_x emissions.

When developing inputs for modeling a future on-road mobile source inventory, different schools of thought exist about the use of either the most recently available data on hand, versus the attempt to predict what that specific input will be in the future. In addition to VMT mix, one of the other critical inputs for mobile modeling is the vehicle registration distribution mentioned earlier. It is standard practice to use the most recently available registration distribution for modeling future inventories. For example, if we performed a modeling run today for a 2007 episode, it is common to use either 1999 or 2000 vehicle registration distributions, depending on which one is available and how much confidence exists in its accuracy. The case made for not projecting into the future is simply that the future is impossible to predict. While it is true that the sport utility vehicle (SUV) and light-truck portion of the vehicle fleet has increased over the last several years, it is impossible to

determine if and how that trend will continue into the future. For example, if we projected into the future by simply applying historical linear growth patterns to the LDGT1/LDGT2 portion of the fleet and applying historical decline patterns to the LDGV portion, eventually everyone would be driving SUVs/pickups and passenger vehicles would not exist. Sooner or later, the growth in the SUV and light-truck portion of the fleet is bound to taper off and plateau. The problem is that it is difficult to determine exactly when that will happen. Many unpredictable factors, such as the overall performance of the economy and the price of gasoline, are likely to affect SUV and light-truck sales.

As stated previously, the most direct way to measure VMT mix is to simply go out to various roadways within a given area and classify the vehicles using those roadways into appropriate categories. In the absence of such an approach, it is understandable that some analysts will base VMT mix on national defaults, trends in vehicle sales, registration distributions, etc. Nonetheless, the commission does not feel that a VMT mix estimate developed by any research organization could ever be classified as perfect. Consequently, the commission is willing to work with ED, TTI, North Central Texas Council of Governments (NCTCOG), and any other interested parties to review current methods and perhaps develop new ones for the estimation of appropriate VMT mix fractions for modeling purposes.

It is also important to note that the difference in emission standards between passenger cars and SUVs/light trucks is narrowing. For example, according to an EPA fact sheet on Tier 2 vehicles, “the new tailpipe standards are set at an average standard of 0.07 grams per mile (g/mi) for nitrogen oxides for all classes of passenger vehicles beginning in 2004. This includes all light-duty trucks, as well as the largest SUVs.” It is only the heaviest light-duty trucks, which represent a relatively small portion of the overall fleet, that are treated differently with respect to Tier 2. The Tier 2 standard for these vehicles begins at 0.6 g/mi in 2004, then a standard of 0.2 g/mi is phased-in between 2004-2007, with the 0.07 g/mi standard coming into effect for half of these vehicles in 2008 and the remainder in 2009.

It should also be noted that some passenger vehicle and light-truck emission standards are already the same. For example, EPA’s Tier 1 vehicles have a 50,000 mile NO_x standard for light-duty vehicles (LDVs) and light-duty “1” trucks (LDT1s) as 0.4 g/mi. The 50,000 mile light-duty “2” and “3” truck (LDT2 and LDT3, respectively) NO_x standard is 0.7 g/mi, and the 50,000 mile light-duty “4” truck (LDT4) NO_x standard is 1.1 g/mi. In addition, the National Low Emission Vehicle (NLEV) 100,000 mile NO_x standards are 0.3 g/mi for LDVs and LDT1s, 0.5 g/mi for LDT2s, 0.6 for LDT3s, and 0.9 for LDT4s.

As the Tier 1, NLEV, and Tier 2 standards are reviewed, it becomes apparent that the differences in emissions standards among cars, pickups, and SUVs become less and less over time. For example, the Tier 1 standards were phased in between model years 1994-1996, followed by the NLEV standards which start to appear in model year 2001, and the Tier 2

standards being phased in starting with model year 2004. During calendar year 2007, the 1994-1996 vehicles will be 11-13 years old. Based on current data, 11-13 year-old vehicles comprise roughly 80-87% of the gasoline-powered portion of the HGA 8-county vehicle fleet. If an equivalent registration distribution is assumed for 2007, then roughly 80-87% of the gasoline-powered vehicles in 2007 will be either Tier 1, NLEV, or Tier 2. Furthermore, it is well documented that the annual VMT accumulated by an “average” vehicle decreases with the age of the vehicle. Consequently, the total VMT in 2007 is likely to be more heavily weighted with Tier 2 and NLEV vehicles than with Tier 1 and older vehicles.

Brazoria County commented that a revised 2007 emissions inventory for construction equipment in HGA estimated 37.4 tpd NO_x, whereas the inaccurate EPA model had previously predicted 101.6 tpd NO_x.

The commission has made changes to the construction inventory to reflect the more accurate data.

An individual opposed the HGA SIP, commenting that Chambers County is primarily a farming community, and that the independent farmer would be punished by the proposed SIP.

The commission has made every effort to not impact any one group disproportionately to the amount of emissions for which they are responsible. The commission disagrees with the commenter that farmers in Chambers County are being “punished” by the SIP. In fact, some measures specifically exempt farming operations from the control measures adopted in the SIP. Specifically, farming operations including logging operations are exempted from Tier 2/3 rules, and farming equipment is exempted from the construction ban rules.

Montgomery County Commissioner Malcom Purvis commented that the proposed SIP measures would help neither Montgomery nor Harris County. MCSWCD commented that the proposed SIP measures would do more harm than good in Montgomery County.

The commission disagrees with the commenter. The commission is attempting to implement measures to meet the federal health based standards for ozone. Modeling and control strategy development were carefully considered in the selection of control strategies for all 8 nonattainment counties in the HGA area.

Waller County Commissioner John Isom commented that Waller County is predominantly rural and agricultural, and that it should be regulated according to the extent of its contribution to the ozone problem. An individual commented that Waller County has no ozone monitors, and that prevailing winds blow from Houston to Waller County, not the other way around.

The commission is aware of the differing emissions contributions from the eight counties in

the HGA area, and believes that the SIP requirements do not affect any one county disproportionately with respect to its individual contributions. Several of the SIP measures specifically exempt agricultural operations. In addition, the commission notes that the predominantly rural counties of Chambers, Liberty, and Waller have been excluded from the rules requiring operating restrictions on construction equipment and lawn service equipment. Although Waller County has no ozone monitors, the commission's modeling has shown that ozone exceedances can be widespread over large portions of the 8-county area, including Waller County. All eight counties in the HGA area must bear some responsibility for emissions reductions necessary for attainment.

Transportation Control Measures (TCMs)

BCCA, BP, Texas Association of Business & Chambers of Commerce (TABCC), and Texas Chemical Council (TCC) expressed general support for TCMs. BCCA also encourages the identification of other TCMs, especially in time for the mid-course correction. Phillips66 supports the comments of TCC, BCCA, Texas Industry Project (TIP), and Texas Oil & Gas Association (TxOGA). REI generally supports the comments and suggested rule revisions filed by TIP. RAQCG commented that the commission and the HGA nonattainment area should continue to work together to improve the emissions inventory and modeling, and to identify additional, feasible reductions from mobile sources, including transportation control measures and voluntary measures. Harris County Judge Robert Eckels supports the comments of RAQCG. One individual commented that TCMs require special attention to avoid double counting, and that the TCMs do not go nearly far enough for a city of Houston's size. Sierra-Galveston commented that more transportation dollars should be directed toward reducing VMT in the HGA nonattainment area. CAP, Harris County, and Houston stated that businesses should implement voluntary programs to reduce VMT. Two individuals supported general VMT reductions.

The commission acknowledges and appreciates the commenters' interest in and support for the TCMs.

TCC commented that it supports pilot projects such as telecommuting and bus fare promotions, and TCC would like to see some credit for voluntary industry efforts in support of such programs as telecommuting. TCC also made several suggestions for consideration by the commission, including the addition of Express Bus Routes from various transit centers to downtown, the expansion outside of Harris County of the Metro "Park-n-Ride" system, the use of additional alternative fuel vehicles as part of mass transit, free Metro rides on ozone alert days, public education about ozone alert days, and energy efficiency gains from various home and commercial product improvements.

The commission agrees with the comments and is working with the local planning organization to implement measures similar to those suggested.

National Motorists Association (NMA) suggested the prohibition of any program based on social engineering, that is, one that restricts personal freedom. NMA included HOV lanes, traffic calming, mass transit, trip reduction programs and sprawl as “buzz words” with the central theme of reducing personal freedom.

The commission disagrees that these measures restrict personal freedom. The measures are a necessary component of this attainment demonstration.

An individual suggested installing parking meters on more downtown streets, and charging a progressively higher rate after the first half hour. The individual recommended using the revenue to fund installation of battery-charging equipment for electric vehicles operated or leased by METRO. An individual commented that safety ads on television would help educate drivers on proper driving techniques in order to improve traffic flow. One individual commented that all local commercial vehicles over 1 ton should be required to have installed exhaust filters. One individual suggested that all commercial diesels be subjected to compression tests twice per year to ensure that unburned hydrocarbons are kept in check.

The commission appreciates these suggestions, and notes that the local planning organization would be the entity responsible for development of measures similar to these for implementation under the Voluntary Mobile Source Emissions Reduction Program (VMEP) portion of the SIP.

One individual asked whether TxDOT has considered diamond lanes for buses and carpools. Mustang Mowing suggested more carpool lanes be built into the freeway, and that incentives be provided for carpools. Dayton Pipe also suggested incentives for carpools and more incentive for use of special freeway lanes.

The commission appreciates the commenters’ suggestions, and notes that the local planning organization is incorporating commute solutions options as part of the VMEP portion of the SIP.

One individual commented that more arteries into and out of the city should be created. NMA commented that movable barricades should be placed to convert an 8-lane highway into a 12-lane highway going in, and a 4-lane highway going out. Two individuals recommended double-deck freeways to improve traffic flow. An individual commented that offering more north-south roadways could help disperse traffic and reduce congestion throughout eastern Texas. One individual recommended that more highways be developed and improved. An individual commented that more limited-access freeways should be built, and stated that better gas mileage is an indication that a vehicle is polluting less. An individual commented on the need for more through highways for trucks in order to decrease congestion. An individual stated that the transportation infrastructure encourages unnecessary driving. Another individual commented that the freeways being developed is what has made Houston

“number one instead of Los Angeles.”

The commission has researched roadway expansion and found that it rarely reduces pollution, and sometimes does not even reduce congestion along certain portions of that roadway. If the number of vehicles traveling on a roadway were kept constant at various times throughout the day, then increasing the number of lanes on that roadway would certainly result in a lesser amount of congestion. Adding more lanes to a roadway often attracts more traffic to that roadway and thus, the congestion problem is not solved. This problem has confounded transportation planners for decades. Typically, expanding the number of lanes makes a highway more desirable for travel, and traffic increases—sometimes beyond its free flow capacity—which leads to congestion. In addition, roadway expansion often attracts more residential and commercial development, which can further exacerbate traffic congestion problems. The commission agrees that mobile sources are a significant contributor to ozone nonattainment in the HGA nonattainment area.

One individual commented that more freeways are not only dangerous, but that they require the pouring of more concrete which causes flooding, and more freeways causes the destruction of trees and wetlands, and that this affects the tax base.

The purpose of the SIP is to address air quality concerns in the HGA nonattainment area, and while the commenter may be correct about other environmental impacts of roadway construction, those are beyond the scope of this document.

One individual suggested prevention of bottlenecks at major freeway interchanges. An individual recommended measures to help clear wrecked vehicles from highways in order to reduce traffic congestion. Two individuals expressed general support for improved road conditions and traffic flow. An individual commented that on and off ramps should be eliminated at every intersection, thus easing traffic flow on access roads. The individual also commented that streets should be rerouted to empty traffic, and all side accesses should be blocked to streamline the flow. The individual also commented on the need for visual barriers to prevent slowdowns when onlookers look at the accident. Another individual suggested that commercial traffic be offered other transportation roadways to help eliminate congestion. An individual commented that any other measures that required slowing down and then speeding up, such as control lights at freeway entrance ramps, should be eliminated in order to reduce mobile source emissions. One individual commented that control lights, such as those used on on-ramps, should also be used on the freeways to control traffic flow. An individual commented that contraflow lanes could be made more effective by restricting such lanes to through traffic only, allowing a 60-65 mph speed limit in the lane with no exits or passing, opening the lanes to through traffic after the rush period has ended, or widening the lane by including adjacent inside lanes.

Roadway construction and control methods can be used to reduce congestion by decreasing the total number of vehicle trips or by raising average vehicle speed. HGAC is the local

metropolitan planning authority that is responsible for determining the structure of the roadway network in the HGA nonattainment area. The commission has neither the appropriate legal authority nor the technical expertise to determine how the HGA transportation network should be designed.

An individual recommended that new truck and automobile traffic be prohibited in the HGA nonattainment area.

The commission considered but did not propose “no-drive days,” which is a strategy similar to the one the commenter proposes. Should they become necessary in the future, the commission will consider such strategies.

Two individuals encouraged general measures to reduce or eliminate congestion. An individual recommended restricting the number of wreckers at an accident site in order to reduce congestion. The individual also commented that police should direct traffic to reduce backed-up conditions.

Measures designed to avoid congestion are within the authority of HGAC and may be considered for inclusion into their strategies.

An individual recommended removing all 4-way stops as a measure to improve traffic flow.

TxDOT and local jurisdictions, not the commission, have responsibility for determining the need for 4-way stop signs to ensure public safety and to regulate traffic flow.

General comments in favor of HOV lanes were received by two individuals. State Representative John Culberson, NMA, and two individuals recommended that barrier-type HOV lanes be eliminated because of the increased congestion resulting from loss of lanes. An individual commented that HOV lanes should be open to all vehicles to encourage traffic flow. An individual commented that HOV lanes should have more exits. An individual recommended variable-load occupancy to optimize HOV lanes. An individual commented that HOV lanes should be opened after major events to efficiently carry more traffic away from downtown. An individual recommended that trucks should be allowed to use HOV lanes to minimize their time in the area. LWV-TX and Public Citizen support HOV lanes. Sierra-Galveston commented that HOV lanes have no significant impact on traffic congestion. An individual recommended that HOV lanes be added to arterial highways and extended farther out from downtown Houston. Additionally, the LWV-Tx and four individuals supported such programs as: converting HOV lanes to a monorail system that would service Katy, Sugarland, Baytown, Freeport, Galveston and Crosby to downtown Houston; opening up the HOV bus lane in the middle of I-10 for 18-wheelers that are driving through the area; have incentives for the public and businesses to use HOV lanes, as well as providing maps of HOV lane entrances and exits; adding additional HOV lanes; and allowing single drivers to use HOV lanes if they pay a toll.

The commission appreciates the commenters' statement in regards to HOV lanes in the HGA nonattainment area. The use of HOV lanes helps to reduce congestion by decreasing the total number of vehicle trips occurring on freeways. HGAC is the local metropolitan planning authority that is responsible for determining the structure of the roadway network in the HGA nonattainment area. These comments have been forwarded to the HGAC for their consideration in developing TCM initiatives. Any additional questions or comments regarding the development or implementation of this TCM initiative should be addressed to HGAC at P.O. Box 22777, Houston, Texas 77227-2777. The commission has neither the appropriate legal authority nor the technical expertise to determine how HOV lanes and other such features of the HGA transportation network should be designed.

State Senator Mike Jackson, LWV-TX, Public Citizen, NMA, and 27 individuals commented that traffic lights should be better synchronized. An individual recommended the use of Geographic Information Systems (GIS) technology to monitor and control traffic density through signalization improvements. An individual recommended traffic signals on freeways in order to avoid merging delays. An individual commented on the preferred location of traffic control signals as a measure to free up traffic in congested areas. Four individuals supported various improvements in traffic signalization. RMT commented that the proposed traffic signalization and bicycle/pedestrian projects would lower Montgomery County's NO_x emissions by 0.1 tpd, resulting in a difference of less than 0.001 parts per billion (ppb) ozone. RMT stated that this difference is not measurable by the commission's ambient ozone monitors. NMA recommended use of flashing yellow lights during low use hours.

The commission agrees that synchronization of traffic signals may assist in controlling traffic density. Synchronization of traffic signals is a component of the transportation control measures implemented by HGAC, and included in the SIP.

LWV-TX supports expansion of bicycle/pedestrian projects. Ten individuals commented on the need for more bicycle and pedestrian facilities. Six individuals recommended that bicycle commuting be further encouraged by developing parking lots for bicycles with lock boxes to protect the rider's bicycle and personal property, and that shower rooms be built at the end of bicycle trails for cyclists to clean up and dress for work. One individual suggested that local health clubs and the YMCA offer "shower" memberships so that people can ride their bikes to work. An individual recommended that employers should be required to allow bicycling and provide necessary support and facilities. An individual suggested that bicyclists should receive incentive rewards such as a vehicle sticker allowing 70 mph speeds or free emissions control testing for their automobiles. An individual commented on general incentives for bicycle use. Two individuals commented on education and advertising to encourage bicycle use and instruct motorists to respect cyclists on the road. One individual encouraged the development of wider roads with shoulders, bike lanes and sidewalks. Two individuals objected to bicycle lanes, stating that they remove traffic lanes and contribute to automobile congestion and increased emissions. An individual objected in general to bicycle use. An individual commented that

the proximity of bicycle lanes immediately adjacent to motor vehicle lanes increases health risks for cyclists, especially children, who breathe vehicle exhaust. Missouri City commented on the possible loss of federal funding if the city were unable to provide matching funding for bicycle lanes or other programs at the time required.

Local jurisdictions have authority to encourage and fund bicycle and pedestrian projects. Strategies by the local governments to increase bicycle and pedestrian travel and thereby reduce vehicle travel are encouraged by the commission and should assist in attainment for the HGA nonattainment area. Consideration of bicycle and pedestrian projects is a component of the transportation control measures implemented by HGAC, and included in the SIP.

Public Citizen supports telecommuting. Dow Chemical Company (Dow) suggested that the commission expand the telecommuting program to include VMTs reduced from business-to-business commerce.

The commission appreciates these suggestions, and notes that the local planning organization would be the entity responsible for development of measures similar to these for implementation under the VMEP portion of the SIP.

NMA and one individual commented that emergency response infrastructure should be improved.

Funding and operational control of emergency response entities rests with the local governments in the HGA nonattainment area. The commission does not have authority to restructure these entities.

Three individuals recommended streamlining toll booth collection procedures to relieve traffic pile-ups. Two individuals recommended that the tollway system be disbanded, and toll roads opened to all traffic. An individual commented that toll plazas should be eliminated, allowing only vehicles with EZ tags. Two individuals commented that use of the EZ tag should be required. NMA recommended that on ozone action days, the toll roads be prohibited from collecting tolls, and that the gates at toll booths be raised to cut down on the pollution generated by cars stopping and starting at the gates.

The fees charged and methods for collecting fees for toll roads would require legislation. The suggestion that strategies be tied to likely ozone conditions is a concept explored under VMEPs for ozone action days, which HGAC is responsible for administering.

Comments were received from Dayton Pipe, Sierra-Houston, Mustang Mowing, and 32 individuals on the need for an effective mass transit system such as light rail or more advanced systems such as those used in China, Europe, Japan and in East Coast cities of the United States. An individual recommended that HOV lanes be converted to rail systems. An individual objected to the downtown-

Astrodome rail project. Two individuals recommended the use of monorails. An individual recommended a subway system for Houston. An individual recommended elimination of the METRO bus system except for use as feeder points to high-speed rail stations. LWV-TX, Public Citizen, Dow, Rohm and Haas, and 15 individuals supported more use, and general improvement, of public transportation systems. An individual commented that interurban trains, which were formerly operated, should be resumed. Four individuals commented that METRO should stop thinking of downtown Houston as the ultimate destination of all their riders. An individual encouraged the introduction of mini-bus routes. An individual commented that mass transit options for university students should be expanded. An individual commented that buses in Galveston County should link up with the Houston METRO system. Dayton Pipe commented that there should be more incentive for people to use mass transit, that there should be more direct routes to reduce the need to transfer, and that there should be greater variation of schedules so people can use it after hours and not just to get to and from work. Sierra-Galveston commented that the SIP should reject any new major transportation systems until the impact on increased vehicular miles traveled in the region is calculated and until its impact on NO_x emissions is established. One individual suggested using the Bay Rail System, which could utilize existing rail lines from Houston to Galveston. One individual suggested the use of elevated rail.

Effective mass transit systems are an essential component of transportation planning for the HGA nonattainment area. The commission will work with the transit authorities and local governments as appropriate to assist in decisions regarding mass transit options. However, the ultimate decisions regarding the most appropriate mix of transit alternatives lies with those local entities. Mass transit planning is a component of the commute solutions measures implemented by HGAC, and included in the VMEP portion of this SIP.

GCI commented that METRO should reduce pollution on the same scale as other stakeholders (65-85%), provide attractive mobility choices, and take a symbolic leadership role. GCI commented that METRO should undertake large pollution reductions within its own fleet and achieve aggressive new ridership goals. An individual commented that METRO routes should be expanded to increase ridership to colleges, shopping centers, and recreation areas. An individual recommended that bus routes be altered to be more efficient. An individual commented that METRO should fund and provide electric vans for vanpools. Two individuals commented that existing METRO buses should be converted to natural gas fuel, and one individual commented that garbage trucks should be converted to less polluting fuels. An individual commented that all new buses should be electric or hybrid natural gas/electric. Mustang Mowing commented natural gas-powered buses would be better at reducing the amount of smog that is produced. An individual commented that funding should come from increases in the statewide gasoline tax and the METRO tax; this increased revenue should be applied to METRO's entire capital and operating costs, thus eliminating fares.

METRO, like other transit authorities in the state, is subject to the mass transit fleet vehicle requirements of the TCAA at Texas Health and Safety Code § 382.133. The commission

appreciates the commenters' suggestions, and encourages the commenters to offer these suggestions to the governing body of METRO. Any decisions regarding the makeup of the METRO fleet, beyond the TCAA requirements, is a matter for the METRO Board. Matters of funding or taxation are beyond the commission's jurisdiction.

An individual commented that Houston, Harris County, and Houston Independent School District vehicles should be converted to alternative fuels, and be scheduled for replacement with electric or hybrid powered vehicles. The individual also commented that U.S. Postal Service vehicles should be replaced with electric vehicles, funded by the federal government. An individual commented that METRO revenues should be used to provide electric taxicabs where cab stands are located, and that battery-charging equipment should be installed there. An individual supported the promotion of energy-efficient vehicles. An individual suggested the use of smaller buses, delivery vans, garbage trucks, etc. that emit less pollution.

The TCAA contains an alternative fuel fleet subchapter governing requirements for certain public and private fleets. The commission's authority regarding alternative fuel vehicles is limited to implementing the requirements of that subchapter.

An individual recommended that electric carts, such as golf carts, be legalized for general transportation.

The Texas Department of Public Safety (DPS), not the commission, has authority to define vehicles that are suitable for general transportation, and to regulate the use of such vehicles.

Sierra-Houston commented that the HGAC transportation plans do not seriously pursue major expansion of transit service and transit-related measures, but instead, continue to rely on massive highway expansion projects that worsen urban sprawl and necessitate longer commutes. Sierra-Houston also commented that significant air quality benefits can be achieved by modifying land development patterns to limit urban sprawl and facilitate transit commutes. An individual supported high-density development downtown and near large business centers, and expressed the need for discouraging outward expansion.

Development and urban sprawl are uniquely local issues requiring local decisions. The commission does believe that some aspects of smart growth-like initiatives are viable strategies for reducing ozone formation, and anticipates future review of these plans as appropriate.

Sierra-Houston stated that the travel demand model used by HGAC is faulty and therefore illegal, and that the motor vehicle emissions budget (MVEB) is not consistent with the SIP.

The commission staff has reviewed the submissions of HGAC regarding travel demand

modeling, and believes that it is consistent with EPA guidance and policy. The HGAC predictions for MVEB are the subject of litigation, which has been stayed. EPA has approved the current MVEB as adequate. The current SIP establishes a new MVEB, for which EPA will make an adequacy determination and which will become the basis for future transportation conformity determinations. In addition, the commission has committed that if a transportation conformity analysis is to be performed between 12 months and 24 months after the MOBILE 6 release, transportation conformity will not be determined until Texas submits an MVEB which is developed using MOBILE 6 and which the EPA finds adequate. Finally, the commission has recalculated and is resubmitting an MVEB with this SIP, as previously committed, since some of the adopted measures pertain to motor vehicles.

Sierra-Houston asked how the commission will ensure that all TCMs are implemented and effective, and it commented that the SIP does not state how TCM implementation will be enforced. Sierra-Houston referred to the HGAC's failure to meet its committed amount of construction of bicycle lanes, and stated that there is no mention of how these emission reductions will be recouped in the Master Transportation Plan (MTP) or Transportation Improvement Program (TIP) for the year 2000. CAP commented that some of the NO_x reduction strategies appear to be difficult to enforce. NMA commented that law enforcement officers should focus on drivers who impede the flow of traffic.

The commission performs oversight functions by auditing HGAC's TCM status report, which is required to be submitted annually, and by taking appropriate actions. Enforcement and implementation of TCMs is addressed in the Texas transportation conformity rule (30 TAC §114.260) and the Federal transportation conformity rule (40 CFR §93.113). Under these rules, HGAC is responsible for ensuring that TCMs are implemented on schedule. In May 2000, the commission adopted revisions to the TCM portion of the SIP that allow metropolitan planning organizations (MPOs) in nonattainment areas to substitute TCMs without a SIP revision, if the substitution results in equal or greater emission reductions. Therefore, HGAC may elect to substitute other measures for the uncompleted portions of the bicycle lane project. The Texas DPS and local jurisdictions have the option to adopt regulations against drivers impeding the flow of traffic. These measures would be enforced by the DPS or local law enforcement officers, not by the commission.

An individual commented that TCMs in the SIP will not be effective until advertising of automobiles is curbed.

The commission does not understand the alleged correlation between automobile advertising and effectiveness of TCMs. The commission notes that newer vehicles have lower emissions due to more stringent federal engine standards that apply to newer vehicles, thus any turnover of the vehicle fleet caused by increased sales of newer vehicles should result in improvements in air quality.

An individual commented that all through truck traffic should be routed around the city. An individual recommended that all through traffic in the Houston area without designated stops be required to use the center lane of Beltway 8 to go around Houston. Two individuals recommended banning large trucks in left freeway lanes. An individual commented that the Grand Parkway should be completed to enable truck traffic to bypass downtown. An individual suggested that the federal government build a two-lane highway across the nation, through less populated areas, for use by trucks only.

HGAC and the implementing agencies (including TxDOT) are responsible for determining the structure of the roadway network in the HGA nonattainment area. The commission has neither the appropriate legal authority nor the technical expertise to determine how the HGA transportation network should be designed. Use restrictions and enforcement of use restrictions on highways is not within the commission's jurisdiction.

An individual recommended a 45-degree incline on the edge of overpass highways to prevent heavily loaded trucks from tipping over. An individual commented that overpasses should be constructed for use by trucks only.

TxDOT is the entity responsible for issues concerning highway construction, and use restrictions and enforcement of use restrictions on highways are not within the commission's jurisdiction.

Six individuals commented that commercial trucks should be banned from interstate freeways during morning and evening rush periods. An individual recommended banning 18-wheelers from city streets and highways during peak traffic periods, and three individuals suggested rerouting 18-wheelers around the city. An individual commented that the driving of trucks should be limited to certain times outside rush hours. Another individual commented that in California and Los Angeles in particular, diesel trucks are restricted from being in the city during peak traffic periods and that the restriction has helped a lot. An individual commented that heavy-duty diesel trucks should be regulated.

Use restrictions and enforcement of use restrictions on highways are not within the commission's jurisdiction. The commission has limited authority relating to operation of on-road vehicles, but has included a rule relating to idling for heavy-duty vehicles to limit emissions from that source category.

Two individuals commented that part of the on-road mobile source problem is caused by trucks coming from Mexico, and asked whether these trucks should not also be subject to stringent restrictions. One individual commented that the North American Free Trade Agreement (NAFTA) is causing the increased truck traffic and traffic standstill problems on Highway 59, and suggested that Harris County create roads which will allow truck traffic to pass through Houston on roads with no exits or entrances.

The commission acknowledges that there may have been increases in truck traffic in the past

several years, but has no data to directly link the cause to NAFTA. HGAC and the implementing agencies (including TxDOT) are responsible for determining the structure of the roadway network in the HGA nonattainment area. The commission has neither the appropriate legal authority nor the technical expertise to determine how the HGA transportation network should be designed, nor the authority to regulate vehicles registered in Mexico.

State Senator Mike Jackson and two individuals commented that schools should be required to start after Labor Day. An individual commented that schools should start no earlier than 9:00 a.m., beginning with the 2002-2003 school year. An individual commented that universities should shift class schedules so that classes are held from 10:00 a.m. to 10:00 p.m. daily. An individual recommended that school hours be revised so that school bus and related traffic would be delayed later in the mornings and afternoons. The individual also recommended that school traffic zones be eliminated except those in close proximity to schools. An individual recommended that the number of evening school events be reduced to decrease the number of vehicle trips. Two individuals commented that school bus routes should be made more efficient to reduce trips by personal vehicles delivering and picking up students. Two individuals commented that student ridership of school buses should be maximized or made mandatory. Two individuals commented that student parking should be eliminated to encourage riding the bus. An individual recommended that parents should be prohibited from picking up and dropping off children at school. An individual commented that school buses should also be used to transport commuters and shoppers during the day, as has been done in Aruba. An individual suggested prohibiting high school students from driving to school unless the student is a senior in good standing and is gainfully employed. Another individual commented on general restrictions on driving by high school students.

The commission appreciates the commenters' suggestions; however, because of the many issues related to the potential effectiveness of school-related strategies for air quality benefits, the commission has chosen not to include these potential strategies at this time.

An individual recommended raising the legal driving age to 17 years, and another individual suggested 19 years. Another individual suggested suspension of driver's licenses for 16- and 17-year-olds, and raising the legal driving age to 18 years. An individual commented that teenagers should be prohibited from driving cars. An individual suggested that drivers 75 years of age and older be required to retake to renew their driver's licenses.

The commission does not understand the alleged correlation between driving age and air quality benefits.

EPA commented that, in order for TCMs to be approvable in the SIP, there must be a complete description of estimated emission reduction benefits for each measure, evidence of a complete schedule to plan, implement, and enforce each measure, and a description of the monitoring program. EPA

further commented that the table in Appendix I does not specify the emission reductions for each TCM or identify the implementation schedule for each measure. In addition, several projects are not identified with proper specificity, including the RCTSS programs. EPA commented that in order to receive TCM credit, documentation must be provided that the measure is properly adopted and has funding and appropriate approval, and that the measure has a complete schedule. EPA commented that the SIP narrative states that TCM reductions for NO_x are 2.13 tpd, while Table 6.3-9 in the SIP lists the reductions as 2.17 tpd. In addition, EPA pointed out that the SIP narrative refers to 0.60, whereas the accompanying chart contains 0.61. EPA further commented that the figures on the referenced table do not add to the total tpd figure on the table.

Appendix I, which contains documentation of TCMs, now includes the emission reductions from each TCM. Inclusion of the TCMs in the HGAC transportation plan and TIP constitutes evidence of a specific schedule to plan, implement and enforce the measures. The HGAC is required by 30 TAC §114.260 to submit an annual TCM status report to the commission. The report must include the TCM's implementation date and emissions reduction status. The status report and supporting activities serve as the TCM monitoring program. The discrepancy in TCM reductions between the SIP narrative and the referenced table has been corrected.

Three individuals suggested the elimination of automotive sport events. An individual advocated changing sporting event schedules to have more night games, and providing remote parking lots and shuttles to transport spectators. An individual recommended a \$1 parking surcharge for all vehicles parking at professional sports stadiums, and to use the revenues to fund safe bicycle paths in Houston. The individual proposed a similar surcharge for vehicles parking in downtown Houston parking lots, with the revenues used to close more streets to vehicular traffic and to construct street malls and small parks. One individual commented that an evaluation has not been available (if performed at all) of proposals to locate and concentrate large entertainment facilities in downtown Houston that cause a large concentration of traffic in a small area. An individual commented that Houston should discourage people from driving to work downtown, and that new downtown parking lots should be banned.

The commission appreciates the commenters' suggestions, and notes that some of these types of strategies may be appropriate for consideration as local measures. HGAC, the local planning organization, is incorporating commute solutions options as part of the VMEP portion of the SIP.

Four individuals commented that road construction projects should be coordinated and accelerated to minimize traffic disruption. NMA and an individual commented that bonuses be given to construction projects finishing ahead of time. An individual commented that new highway construction be prohibited until existing construction is at least 75% complete. An individual recommended permits be issued to construction companies when road blockage is foreseen.

The commission does not have authority to prescribe contract conditions for roadway construction.

An individual commented that all vehicles larger than passenger models be restricted to the same standards imposed on those automobiles. The individual also recommended a moratorium on the manufacture and import of large trucks and trailer trucks. The individual suggested a ban on the importation of foreign vehicles not meeting EPA standards. An individual commented that recreational vehicles should have emission standards or limitations on hours of operation.

The commission notes that the recent EPA Tier 2/Tier 3 regulations address engine standards for vehicles other than typical passenger automobiles. Additionally, there are some restrictions currently in effect relating to the standards applicable to imported vehicles. The commission is preempted from creating engine emission standards under the FCAA, and does not believe that use restrictions on recreational vehicles would be practical.

An individual commented that building codes for nursing homes, apartment buildings, etc. require provision of screened-in seating areas to encourage residents to seek recreation closer to home. An individual recommended locating more prisons in the urban area, thus eliminating long trips to rural prisons. An individual supported building more dormitories around universities to reduce vehicular traffic.

The commission generally supports measures to decrease VMT, but believes that the suggestions would be impractical to implement. No changes were made in response to the comments.

An individual recommended staggered work hours in the downtown Houston business district to decrease traffic congestion, and encouraging businesses to go to 10- or 12-hour work days. Rohm and Haas recommended a 4-day work week. Thirteen individuals expressed support, or recommended tax or emissions credit incentives, for employers who offer compressed work weeks and flexible work schedules, such as 9/80 schedules. An individual recommended that employers hire people who live near their work. An individual suggested that newspapers categorize job listings by location of employment, so that people may select employment based on short commute times. One individual commented that businesses should be asked to contribute to park and ride passes or bus passes.

The commission appreciates the commenters' suggestions, and notes that these types of strategies may be appropriate for consideration as local measures. HGAC, the local planning organization, is incorporating commute solutions options as part of the VMEP portion of the SIP.

Three individuals recommended elimination of drive-through lanes.

The commission appreciates the commenters' suggestion; however, because of the many issues related to this strategy's potential air quality benefits, the commission has chosen not to include this strategy at this time.

Thirteen individuals objected to the use of speed humps as traffic calming devices. The comments generally opposed the use of speed humps and claimed that they are significant contributors to NO_x pollution in the HGA area. Five individuals commented that speed humps increase vehicle pollution because of the added braking and acceleration activity, and one individual commented that speed humps slow emergency vehicles and drainage, divert traffic to other streets, and cost the citizens \$30,000 per year in taxes. Some of the comments encouraged the commission to place a moratorium on new construction of speed humps and the removal of current ones. The comments referenced several studies which indicated that speed humps are a source of excessive pollution.

The commission appreciates the commenters' suggestions, and notes that these types of strategies may be appropriate for consideration as local measures. HGAC, the local planning organization, is responsible for developing and implementing such measures. The commission does not have the appropriate legal authority to require local municipalities to either add or remove any type of traffic control device. Traffic control devices are placed where the safety of drivers, passengers, and pedestrians warrants their installation. The decision about the type and placement of traffic control devices can only be made on a case-by-case basis by local area transportation planners.

One of the studies referenced in the comments was performed by Les Bunte and is entitled *Traffic Calming Programs and Emergency Response: A Competition of Two Public Goods*. This study specifically states that "the relationship between traffic management calming devices and the subsequent environmental impacts is a relatively new issue that will demand further exploration and analysis." Until conclusive evidence of pollution caused by speed humps is provided, the commission cannot confirm that speed humps are a cause of pollution. For the purposes of minimizing pollution, it would be ideal if all vehicle trips could be made at a constant speed. Of course, such an idea is impractical. It is possible that extra pollution can be caused if, instead of moving at a constant speed, a vehicle driver decelerates and then subsequently accelerates in response to a speed hump. While this may be true, the same could be said for yield signs, stop signs, and traffic lights. For obvious reasons, the fact that a stop sign or traffic light may result in increased pollution is not a strong enough reason to warrant its removal. The safety implications alone can outweigh any negative air quality impacts from traffic control devices.

Sierra-Houston requested a copy of the voluntary regional initiative to reduce vehicle trips, attributed in the SIP to HGAC. Sierra-Houston stated that the referenced document must be included in the SIP in order for the claimed emission reductions to be creditable.

The voluntary regional initiative to reduce vehicle trips is part of the VMEP commitments developed by HGAC and submitted as part of this SIP. A complete description of the program may be found under “Commute Solutions.”

An individual commented that better signage on expressways would prevent incorrect exits and decrease travel time, and also reduce “road rage.” The individual recommended that the public have access to a toll-free number to report bad signage, that property owners be fined for obstruction of signage by vegetation, and that law enforcement and other personnel be assigned to report signage problems. One individual recommended placing speed increase signs in downgrade locations rather than uphill.

The commission agrees that good signage should be properly visible from roadways, and understands that TxDOT regulations govern these issues. If obstructed or damaged signs are observed, citizens are encouraged to contact their local transportation authority or the TxDOT regional office.

An individual recommended a “211” system that motorists can dial to get information on local traffic conditions.

The United States Department of Transportation is currently working on making a new “511” system available to states and local jurisdictions across the country. The new system would replace existing traffic information telephone numbers with a universal “511” number. By dialing 511, motorists may obtain up-to-date information on traffic and road conditions.

An individual commented that TxDOT should use its highway construction funds to develop more mass transit.

The commenter’s suggested action is outside the scope of the commission’s authority.

NMA commented that EPA’s ability to formulate gasoline should be eliminated, noting that methyl tertiary butyl ether (MTBE) water contamination may be the largest mess in our history.

The commission acknowledges that MTBE contamination of groundwater is an issue of national concern, and is being addressed by EPA and the commission. However, the commission does not have the jurisdiction to limit EPA authority.

One commenter suggested that SUVs be taxed because they use more gasoline and pollute the environment more. Another commenter suggested that “gas guzzlers,” such as SUVs and pickups, be fined, and that the additional revenue be used to research reformulated gas and alternative fuels. An individual commented that stated that an emissions tax should be placed on certain recreational vehicles.

The commission is limited in its ability to assess fines or collect taxes, and the commenter's suggestion is beyond the commission's current authority. However, the commission notes that EPA regulations currently require payment of a "gas guzzler" tax on certain vehicles when they are purchased.

One individual commented that if these laws are implemented, there will be a great need at the local level for planning, expertise for GIS equipment, for hiring people who know about the technical aspects of pollution, and the seven counties surrounding Houston do not have that expertise at the local level. The commenter also stated that county governments should be given more time and more funds to develop their planning staff to address these issues, and that a task force should be formed from the communities and the civic organizations to address these issues.

The commission understands the commenter's concerns, and has set compliance schedules in the SIP measures designed to allow adequate time for compliance.

Three individuals commented that properly tuned vehicles produce less emissions, and one of those commenters voiced support for tailpipe testing. One individual commented that most cars on the road today already have pollution controls built into them that reduce tailpipe emissions, and that the real polluters (refineries) should be blamed for the pollution problems in the HGA.

The commission has included an emissions testing program for the HGA nonattainment area as one component of the HGA SIP, and appreciates the support for this program. The commission has proposed strategies that impact both stationary and mobile sources of pollution, in recognition of the fact that emission reductions from both of these categories are necessary in order to demonstrate attainment.

Voluntary Mobile Source Emission Reduction Program (VMEP)

General

Nine individuals, Missouri City, TABCC, Baker Botts, Phillips 66, Reliant Energy, Inc. (REI), Harris County Judge Robert Eckels, Metro, ExxonMobil, CSE, BP, and TCC expressed general support for VMEP programs. LWV-TX, BCCA, and HGAC expressed general support for VMEP programs with suggested changes. ED supports the VMEP program, but expressed some concerns.

The commission appreciates the support expressed for VMEP programs.

Five individuals, Lake Jackson, Montgomery County (via RMT), Sierra-Houston, and the Hispanic Community for Texas Citizens for a Sound Economy expressed general opposition to VMEP programs.

The commission understands that the SIP is going to be challenging to implement, and believes all measures, including VMEP programs, are necessary to demonstrate attainment with the FCAA.

EPA expressed concern about the level of commitment to many of the VMEP measures listed, and requested assurance that implementation will occur in the targeted time frame.

The commission supports the EPA's commitment to innovative approaches to achieving air quality goals in the promotion of viable voluntary mobile source air quality programs. The commission is committed to assuring that all strategies are accurately quantified and effectively implemented. The commission has identified a number of mandatory control strategies that could be implemented as enforceable commitments if VMEP programs fall short. The HGA SIP contains all appropriate and required information relating to VMEPs. The local area has worked hard to identify voluntary programs and is committed to the success of the VMEP program.

BCCA and the Transportation Policy Council (Council) commented that the emulsion and retrofit programs should be removed as mandatory measures from the SIP, and placed back into the VMEP category.

The commission has proposed to withdraw the emulsion and NO_x reduction systems rules for this phase of the SIP process. However, the commission will re-evaluate these rules for future use through an enforceable commitment.

The Liberty County Sheriff commented that Liberty County should be removed from the plan, and RMT commented that Montgomery County should be removed from VMEP.

The FCAA Amendments of 1990 provided new requirements for areas that had not attained the NAAQS for ozone, carbon monoxide, particulate matter, sulfur dioxide, nitrogen dioxide, and lead, and new requirements for SIPs in general. EPA was authorized to designate areas failing to meet the NAAQS for ozone as nonattainment and to classify them according to severity. Section 107(d)(4)(A)(iv) of the FCAA mandated that areas designated as serious, severe or extreme for ozone that were within an MSA or CMSA must have boundaries that include the entire MSA or CMSA. This requirement is supported by the legislative history for the FCAA Amendments in Senate Report No. 101-228, page 3399, "[b]ecause ozone is not a local phenomenon but is formed and transported over hundreds of miles and several days, localized control strategies will not be effective in reducing ozone levels. The bill, thus, expands the size of areas that are defined as ozone nonattainment areas to assure that controls are implemented in an area wide enough to address the problem." The FCAA Amendments did provide the ability to exclude portions of the entire MSA or CMSA prior to designation, if the state conducted a study that EPA agreed proved that the geographic

portion did not contribute significantly to violation of the NAAQS.

Redesignation has not occurred for any portion of the HGA nonattainment area, and is not currently being considered. For existing areas currently included within a nonattainment area, the specific area must be redesignated as attainment to be removed from a nonattainment area. Section 107(d)(3) provides that EPA may not redesignate a nonattainment area, or a portion thereof, to attainment unless several criteria are met, which include: a determination that the area has attained the NAAQS; there is a fully approved SIP for the area; there is a determination that the improvement in air quality is due to permanent and enforceable reductions in emissions; there is an approved maintenance plan for the area; and the state has met all requirements for the area under Section 110 and Part D of the FCAA. However, even if a specific area within the HGA nonattainment area was redesignated by EPA as attainment for ozone, reductions associated with all adopted ozone control strategies would still be necessary because of the requirements of §107(d)(3) and FCAA §175A, which require maintenance plans for all redesignated areas. The maintenance plan must include the measures specified in §107(d)(3) and any additional measures that are necessary to ensure that the area continues to be in attainment with the NAAQS for 10 years after the redesignation. Eight years after the redesignation, the state is required to submit an additional revision to the SIP for maintaining the NAAQS for 10 years after the end of the first 10-year period.

Additionally, reductions associated with the ozone control strategies that will be implemented outside the HGA nonattainment area will benefit the HGA nonattainment area. This is due to the regional nature of air pollution, the contribution from mobile sources, and the economies of scale and associated market advantages related to distribution networks for some strategies. At the time the 1990 FCAA Amendments were enacted, the focus on controlling ozone pollution was centered on local controls. However, for many years an ever-increasing number of air quality professionals have concluded that ozone is a regional problem requiring regional strategies in addition to local control programs. As nonattainment areas across the United States prepared attainment demonstration SIPs in response to the 1990 FCAA Amendments, several areas found that modeling attainment was made much more difficult, if not impossible, due to high ozone and ozone precursor levels entering from the boundaries of their respective modeling domains, commonly called transport. Recent science indicates that regional approaches may provide improved control of ozone air pollution. The commission has conducted air quality modeling and upper air monitoring that found regional air pollution should be considered when studying air quality in Texas' ozone nonattainment areas. This work is supported by research conducted by OTAG, the most comprehensive attempt ever undertaken to understand and quantify the transport of ozone. Both the commission and the OTAG study point to the need to take a regional approach to controlling air pollutants.

EPA commented that the values listed in Table 6.3-7 for Electric Airport Shuttle Buses (or fleet

controls) were confusing.

The commission notes that HGAC has deleted this specific measure from its list of potential VMEPs.

EPA commented that in the transportation category of pricing measures, the emissions estimate is based in part on a number derived from a survey published in the newspaper USA Today. Further documentation of the actual survey results would give more credibility to the estimated emission reduction credit claimed.

The commission agrees that further data would be beneficial, and is committed to working with HGAC to assure that all strategies are accurately quantified and effectively implemented.

EPA commented that in the transportation category under expanded transit service, the emission reduction estimate is based on the VMT of light duty cars and trucks, and the emissions from additional VMT generated by the expanded bus service area, expanded transit service fleet and any other transit service increases are not included. EPA also commented that the credits claimed are stated to be already included in the Commute Solutions measure.

The commission notes that HGAC has deleted this specific measure from its list of potential VMEPs.

EPA commented that utilizing emission reduction credits from a cap and trade program is more appropriately considered as an economic incentive program and not as a voluntary measure.

The commission appreciates the comments regarding the voluntary economic incentive program. The need for an economic incentive program rule will be re-evaluated during the mid-course review.

Sierra-Houston questioned whether NO_x emissions would increase from higher vehicle speeds resulting from improved vehicle flow due to the success of the Transtar initiative.

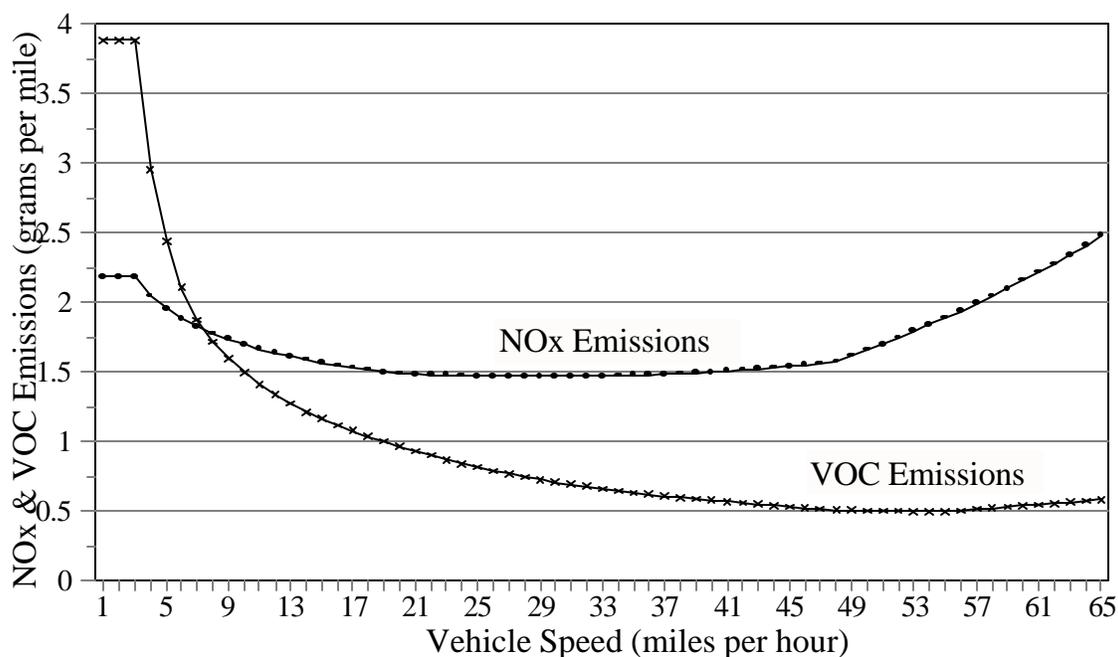
The commission notes that there is an associated increase in NO_x emissions due to acceleration to higher speeds, as well as deceleration resulting from traffic congestion or climbing hills. Output from the MOBILE5 model suggests that NO_x emissions tend to increase strongly with speed above about 50 mph, while VOC emissions increase slightly with speed above about 57 mph. Provided below is some sample output for a 2007 vehicle fleet from the MOBILE5 model of NO_x and VOC emission rates versus speed (0-65 mph) for all vehicle classes combined, as would be seen on a local street or freeway.

Note that NO_x emissions at very low speeds are in the 2-2.2 g/mi range and slowly taper off and plateau around 1.5 g/mi between roughly 20-45 mph. The NO_x emissions then start to increase sharply up to about 2.5 g/mi at 65 mph. VOC emissions at very low speeds are close to 4 g/mi, but then decrease sharply and begin to plateau around 0.5 g/mi at 45 mph. A slight increase in VOC emissions begins to occur around 57 mph. Note that the graph provided is just a sample based on specific MOBILE5 model inputs. Nonetheless, these outputs are representative of the overall trends of NO_x and VOC emissions as a function of speed within the MOBILE5 model. In general, it is true that vehicles produce greater emissions under acceleration than under other modes of operation, such as constant speed, deceleration, idle, etc. The commission agrees that there are many variables that determine actual speed-related emissions, but notes that EPA requires states to use the MOBILE emissions model when calculating emissions for regulatory purposes. The commission believes that the combination of improved vehicle flow due to the Transtar initiative and other strategies, such as speed limit reductions, will provide air quality benefits.

Sierra-Houston commented that the assumption of an average one way work trip distance of 30 miles

MOBILE5 Vehicle Emission Rates

Aggregate Sum of All Vehicle Types



is a vast overestimate.

The commission is committed to working with HGAC to assure that all strategies are accurately quantified and effectively implemented.

Commute Solutions Program

The TCC, the Council, the LWV-TX, Grandparents of East Harris County (GEHC), CSE, Houston, and thirty individuals commented on the need for local support of commute option programs in the HGA nonattainment area. The commenters supported such programs as mass transit; telecommuting; satellite office locations for employers in surrounding communities; flex time; laws to promote carpooling and vanpooling; bicycle and pedestrian projects; and for employers to discontinue free parking to encourage rideshare programs. Houston commented on the need for enforceable voluntary measures to reduce VMT by area workers from 15-25% by 2007. TCC commented on the need for additional express bus routes, expansion of park and ride facilities outside the Harris County area, and free Metro bus rides on ozone alert days. One individual commented that there should be covered parking at all park and ride lots with air conditioned waiting areas, and that Metro buses should have special lanes on roads. However, one commenter felt that commute option programs such as walking and bicycling should not be encouraged because of safety issues. Another commenter was also concerned that telecommuting would not be effective, because they felt that a majority of the jobs in the HGA nonattainment area are in manufacturing or service industry positions. An individual commented that personal safety, reliability, cost, number of available buses and routes, and how to provide for emergencies needed to be resolved. Another individual noted that public transportation would require lots of money to be spent.

The commission appreciates and supports the commenters' statements in regards to commute options in the HGA nonattainment area. The Commute Solutions Program is a portion of the area's attainment demonstration under the VMEP that the HGAC will be implementing. HGAC will be responsible for the development and implementation of VMEP initiatives in the HGA nonattainment area. HGAC has proposed that both the current and future Commute Solutions Program will include several individual transportation control measures that may include carpooling, vanpooling, transit-oriented park and ride program, teleworking, parking charges, and flextime and compressed work schedules. Therefore, comments and concerns have been forwarded to HGAC for their consideration. Any additional questions or comments regarding the development or implementation of these VMEP initiatives should be addressed to HGAC at P.O. Box 22777, Houston, Texas 77227-2777.

Clean Air Action

TCC and one individual commented on the need to provide an outreach program to inform citizens about air pollution and ozone. TCC recommended using public service announcements to educate the community on activities to "curtail during ozone alert days." An individual stated that the outreach program should give the public information on how they can personally make a difference in regards to

air pollution reductions.

The commission appreciates the commenters' statement in regards to air pollution and ozone outreach in the HGA nonattainment area. The Clean Air Action program is a portion of the area's attainment demonstration under the VMEP that the HGAC will be implementing. This comment has been forwarded to the HGAC for their consideration. Any additional questions or comments regarding the development or implementation of this VMEP initiative should be addressed to HGAC at P. O. Box 22777, Houston, Texas 77227-2777.

Hot Line / Smoking Vehicles

JBS and seven individuals commented on the need for an air pollution hotline to report smoking vehicles and excessive pollution from industry in the HGA nonattainment area. The commenters supported such programs as a phone number that is widely publicized to report smoking vehicles and industrial source polluters; empowering local law enforcement to be able to stop drivers of excessively smoking vehicles and fine them or have the smoking vehicle towed; "putting more teeth" in the state's Smoking Vehicle Hot Line program; and requiring repairs to smoking vehicles within 30 days after being reported or the driver could be taken to court and fined.

The commission appreciates the commenters' statements in regards to an air pollution hotline in the HGA nonattainment area. The commission has already established a hotline to report smoking vehicles. The phone number is 1-800-453-SMOG (7664). The owners of the reported vehicles are notified and encouraged to repair their vehicles, if needed. The Smoking Vehicle Program is also an element of the area's attainment demonstration under the VMEP that the HGAC will be implementing. HGAC's VMEP initiative will potentially address such issues as assistance in repairing smoking vehicles. HGAC will be responsible for the development and implementation of all VMEP initiatives in the HGA nonattainment area. Therefore, this comment has been forwarded to HGAC for their consideration. Any additional questions or comments regarding the development or implementation of these VMEP initiatives should be addressed to HGAC at P.O. Box 22777, Houston, Texas 77227-2777.

The commission has also established an Environmental Violations Hot Line to make it easier for people in any part of Texas to report environmental violations by calling a toll-free number. The hot line's phone number is 1-888-777-3186. When an individual places a call to this number, the call is automatically forwarded to the nearest commission regional office from the area where the call originated.

School Year Projects

The LWV-TX, HARC CGS, and two individuals commented on potential changes regarding school

activities to improve air quality. HARC and two individuals stated a variety of options that included delaying the start time of the school day to move student trips out of the rush hour traffic; offering incentives for parents with students living close to their schools for walking and bicycling to school; and moving the school year start date a month later or after the ozone season. The LWV-TX, however, urges that the local area use caution in making any changes to the school schedule. Sierra-Houston commented that they opposed the proposed school year changes as “Voodoo Science,” since a shift in the school year start and end dates may simply shift the ozone exceedances as well.

The commission appreciates the commenters’ statements in regards to school year activities in the HGA nonattainment area. The School Year Schedule Change was proposed as a portion of the area’s attainment demonstration under the VMEP. The commission notes that HGAC has deleted this specific measure from its list of potential VMEPs.

Alternative Fuels

Lake Jackson, GHASP, TCC, and 15 individuals commented on the need for alternative fuel vehicle programs in the HGA nonattainment area. Lake Jackson suggested that all state and federal governments be required to operate on alternative fuels in the HGA nonattainment area. GHASP suggested that public and private vehicle fleets should be required to comply with the Clean Fuel Vehicle Program. TCC suggested the use of additional alternative fuel vehicles as part of the mass transit system. The 15 individuals supported such programs as: METRO buses should be “cleaned up” over a period of time and eventually converted to natural gas fuels to reduce their emissions; fleets should be given incentives to use the cleaner vehicles of their choice; a certain percentage of vehicles purchased in the state should be required to be alternative fueled; fleet owners of trucks and heavy duty vehicles should be required to use alternative fuels that do not pollute as much as diesel; all school, city, county, state and federal vehicles should lead the way towards cleaner air by converting to an alternative fuel; fleet vehicles should be replaced with alternative fuel vehicles; compressed natural gas (CNG) replacement fueling areas should be available along the freeways to encourage use of CNG vehicles; and taxis and police should be encouraged to abandon gas guzzlers and use smaller, more efficient vehicles. One individual also commented that alternative fuels are unproven and will severely affect the economy.

The commission appreciates the commenters’ statements in regards to alternative fuel vehicles. A Fleet Measures Program is a part of the HGA nonattainment area’s attainment demonstration under the VMEP that the HGAC will be implementing. The Fleet Measures Program is proposed to encourage the use of alternative fuels with participants from municipal, county, or other public entities with the authority to develop and implement emission reduction plans. HGAC will be responsible for the development and implementation of all VMEP initiatives in the HGA nonattainment area. Therefore, all comments have been forwarded to HGAC for their consideration. Any additional questions or comments regarding

the development or implementation of these VMEP initiatives will need to be addressed by HGAC at P.O. Box 22777, Houston, Texas 77227-2777.

Private fleets with more than 25 fleet vehicles and local government fleets with more than 15 vehicles, that are operated in the HGA nonattainment area, are required to participate in the Texas Clean Fleet (TCF) program. The TCF program requires a percentage of affected fleet vehicle purchases be certified as low emission vehicles (LEV) or cleaner. Transit authority fleets in the HGA nonattainment area must also ensure that 50% of their fleet vehicles are certified to meet LEV standards under the TCF program. The Texas Transportation Code, which also affects transit authorities in the HGA nonattainment area, has a 100% LEV purchase requirement for motor vehicles. State vehicle fleets also have requirements to promote cleaner burning fuels. Fifty percent of their total fleet must be capable of operating on one of these specified fuels: electricity, liquefied petroleum gas (LPG), natural gas, ethanol, ethanol/gasoline blends of 85% or more ethanol (E85), methanol, and methanol/gasoline blends of 85% or more methanol (M85). Alternative fuels have been used as motor vehicle fuels since the 1930's in both commercial and agricultural environments. The use of alternative fuels in motor vehicles is required by both federal and state mandates for certain fleets, and has been proven to be a viable fuel.

Scrappage

BCCA, ExxonMobil, Sierra-Houston, the South Texas Representative for the Texas Vehicle Club Council, LWV-TX, and six individuals commented on the implementation of a scrappage program in the HGA nonattainment area. BCCA, ExxonMobil, LWV-TX, and four individuals commented on their support of a scrappage program in the HGA nonattainment area with additional program specifics. Sierra-Houston, South Texas Representative for the Texas Vehicle Club Council and two individuals oppose having a scrappage program in the HGA. One individual commented that the commission should not mandate the replacement of cars older than ten years. The South Texas Representative for the Texas Vehicle Club Council commented that lots of people drive old cars because they can't afford to buy a new vehicle with the amount of money that a scrappage program would provide, that the objective of the commission is to eliminate older vehicles, and when old vehicles are scrapped, parts available for older vehicles will diminish.

The commission appreciates the commenters' statements in regard to vehicle scrappage programs in the HGA nonattainment area. The Scrappage Program is a portion of the area's attainment demonstration under the VMEP that the HGAC will be implementing. HGAC will be responsible for the development and implementation of VMEP initiatives associated with scrappage in the HGA nonattainment area, including any available financial reimbursement. The proposed VMEP initiative has set a goal of scrapping 7,200 light-duty vehicles by 2007 from fleet turnover from the City of Houston. The commission has promulgated an on-road scrappage rule that outlines the on-road vehicle requirements, and offers flexibility for local

areas implementing scrappage programs. The scrappage rule does not mandate the replacement of vehicles older than ten years, and the program is strictly voluntary. The scrappage rule can be found in §114.1 (Definitions), §114.4 (Mobile Emission Reduction Credit Definitions), §114.211 (Purpose), §114.212 (Enterprise Operator Responsibilities), §114.213 (Vehicle Eligibility), §114.214 (Advertising), §114.215 (State Implementation Plan Credits for the Voluntary Accelerated Vehicle Retirement Program), §114.216 (Records, Auditing, and Enforcement), §114.217 (Credit Calculations) and §114.219 (Affected Counties). All comments have been forwarded to HGAC for their consideration in developing their scrappage program. Any additional questions or comments regarding the development or implementation of these VMEP initiatives should be addressed to HGAC at P.O. Box 22777, Houston, Texas 77227-2777.

Financial Incentives and Disincentives

Thirteen individuals commented on the need for incentives to encourage the use of fuel efficient vehicles and alternatively fueled vehicles in the HGA nonattainment area. The commenters supported such programs as tax incentives for fuel efficient vehicle purchase programs and using alternatively fueled or electric vehicles. Commenters also felt that it is important to offer financial incentives to convert vehicles to an alternative fuel. It was also suggested that the state initiate penalties for individuals that drive “gas guzzlers” such as having a gasoline tax. One individual proposed having a high emissions tax instead of banning cars.

The commission appreciates the commenters’ statements in regards to pricing measure programs in the HGA nonattainment area. Pricing measures are a portion of the area's attainment demonstration under the VMEP that the HGAC will be implementing. These comments have been forwarded to the HGAC for their consideration in developing VMEP initiatives. Any additional questions or comments regarding the development or implementation of this VMEP initiative will need to be addressed by HGAC at P.O. Box 22777, Houston, Texas 77227-2777.

Tax incentives to individuals and businesses are offered by the federal government for the use of alternatively fueled vehicles. The U.S. Internal Revenue Service (IRS) offers tax deductions for the purchase of clean-fuel vehicles and refueling property. These tax deductions range from \$2000 for a light-duty vehicle to \$50,000 for a heavy-duty vehicle (gross vehicle weight rating of over 26,000 pounds) or a bus with a seating capacity of at least 20 adults. The IRS Publication 535, Business Expenses, contains further information about these tax deductions.

Economic Incentive Program

The Council, Spring Valley, PHA, and BCCA commented that VMEP initiatives should be closely tied

to a voluntary economic incentive program. The Council and BCCA have also requested that offset ratios of 1.1:1 for the state's mobile source banking and trading program be increased, and the offset beyond 0.1 should be applied to the HGA nonattainment area's attainment demonstration. PHA and Spring Valley commented that voluntary programs are much more effective in reducing emissions when compared to controversial rules and ensuing litigation.

The commission appreciates the comments regarding the voluntary economic incentive program. The need for an economic incentive program rule will be re-evaluated during the mid-course review.

Legal Authority for VMEPs

ED commented that because the identified voluntary measures do not provide the certainty, enforceability, quantifiability, permanence, and accountability required of SIP attainment demonstrations, it questions whether the commission may rely upon VMEP reductions in the attainment demonstration. ED commented that the commission must either provide the necessary assurance and accountability to determine that the measures will achieve the claimed reductions, or identify additional measures that will bring the HGA nonattainment area into attainment. ED commented that the reliance upon voluntary measures as part of an attainment demonstration is inconsistent with the FCAA, and urged the commission not to rely upon VMEP measures in its attainment demonstration. ED also commented that if the commission did rely upon VMEP measures in order to demonstrate attainment, or if EPA approved such measures into the HGA SIP, that the HGA SIP would be subject to legal challenge. ED commented that the EPA guidance document "Guidance on Incorporating Voluntary Mobile Source Emission Reduction Programs into State Implementation Plans (SIPs)" dated October 24, 1997 ignores the statutory requirement that SIP emissions limitations and control measures must be legally and practically enforceable.

The commission appreciates the commenter's concern regarding the certainty of emission reductions associated with VMEPs. However, the commission also agrees with, and supports, the EPA's commitment to innovative approaches to achieving air quality goals in the promotion of viable voluntary mobile source air quality programs. The commission disagrees with the comment that EPA has no authority under the FCAA to approve voluntary measures in a SIP for emission reduction credit. The EPA guidance document regarding the use of VMEPs eligibility for SIP credit notes that a state must "submit a SIP which 1) identifies and describes a VMEP; 2) contains projections of emission reductions attributable to the program, along with relevant technical support documentation; 3) commits to monitor, evaluate, and report the resulting emissions effect of the voluntary measure; and 4) commits to remedy in a timely manner any SIP credit shortfall if the VMEP program does not achieve projected emission reductions." The EPA guidance document provides all necessary assurances regarding enforceability appropriate to SIP submissions. The HGA SIP contains all appropriate and required information relating to VMEPs. The commission disagrees that

reliance upon VMEPs in order to demonstrate attainment is inconsistent with the FCAA, but supports the right of all persons to seek redress in the courts.

Enforcement /Assurance of SIP Credit

One individual commented on the need to spell out enforcement strategies for all proposals, and the Liberty County Sheriff questioned who would enforce the regulations. Sierra-Houston commented that the commission has no surplus investigators to ensure that smoking vehicles will come in and test out of cycle.

The commission rules are enforced by staff in the commission’s regional offices, as well as local air pollution control programs. Local governments have the same power and are subject to the same restrictions as the commission under TCAA, §382.015, Power to Enter Property, to inspect the air and to enter public or private property in its territorial jurisdiction to determine if the level of air contaminants in an area in its territorial jurisdiction meet levels set by the commission. Local governments are not required to enforce commission rules, but may sign cooperative agreements with the commission to enforce the rules under TCAA, §382.115, Cooperative Agreements. Local programs can also enforce commission rules without signing a cooperative agreement. The authority of local governments to enforce air pollution requirements is specified in detail in TCAA, §§382.111 - 382.115, and local governments can institute civil actions in the same manner as the commission pursuant to Texas Water Code, §7.351.

The commission will work with local officials to ensure enforcement of the SIP and SIP Rules. The commission has existing relationships with pollution control authorities in the City of Houston, Harris County, and Galveston County for enforcement of other commission rules. The agency will continue enforcement relationships with these entities and develop relationships with other local officials as needed to create effective enforcement mechanisms for the SIP and SIP rules.

ED commented that the proposed VMEP measures must be concrete commitments, not “hypothetical scenarios.” ED feels that the proposed VMEP measures are poorly defined, and HGAC’s commitment is only to make “a best faith effort” to implement each measure. Sierra-Houston commented that allowing HGAC to say they will make a “best faith effort to implement this project” for all the VMEPs is tantamount to saying there is no commitment for these emission reductions. ED feels that this is not an acceptable or creditable mechanism for a SIP measure. ED questioned how the commission would guarantee that the VMEP programs will be implemented as claimed in the SIP, and what type of contingencies would be included in the SIP to ensure that the claimed reductions are achieved in practice. ED commented that there are significant errors in the calculations of emissions reductions from individual VMEP measures. ED commented that key VMEP measures double count

the projected benefits or fail to account for the impact of other emission reduction measures. Measures are very poorly documented and the assumptions on which the calculations are based are poorly justified. Additionally, ED commented that the commission must commit to a solid evaluation or auditing framework to monitor the performance of measures to ensure that measures that fail to deliver the claimed reductions will be replaced in a timely manner with other measures that are real, permanent, and enforceable. ED also commented that VMEP programs must show that the implementing agencies possess the necessary authority and financial resources. Sierra-Houston commented that it is opposed to including the VMEP program in the SIP, since the strategies are not firm commitments, and HGAC and the commission can change them at any time. Sierra-Houston also commented that it would like control strategies that “really reduce emissions and not some promise to try to voluntarily reduce emissions.”

The commission appreciates the commenters’ concern regarding the certainty of VMEP commitments. However, the commission also agrees with, and supports, the EPA’s commitment to innovative approaches to achieving air quality goals in the promotion of viable voluntary mobile source air quality programs. The commission is committed to assuring that all strategies are accurately quantified and effectively implemented. The commission has identified a number of mandatory control strategies which could be implemented as enforceable commitments if VMEP programs fall short. The HGA SIP contains all appropriate and required information relating to VMEPs. The local area has worked hard to identify voluntary programs and is committed to the success of the VMEP program.

Existing Voluntary Programs

An individual commented that the commission should take credit for existing voluntary programs like Clean Industries and Clean Texas.

The commission has attempted to identify all previous emission reduction efforts, both mandatory and voluntary, and incorporate them into the photochemical model. The commission has already taken credit for the voluntary grandfathered program for those industries that have completed or plan to complete an emission reduction plan.

Rate-of-Progress

Brazoria County commented that a revised 2007 emissions inventory for construction equipment in HGA estimated 37.4 tpd NO_x, whereas the inaccurate EPA model had previously predicted 101.6 tpd NO_x.

The 101.6 tpd NO_x value was developed with methodologies and data from approximately

1990 (NEVES). The revised 2007 emissions inventory for construction equipment in HGA used by the commission modeling staff was based on updated methodologies, revised equipment populations, and revised activity data (hours per year of operation by equipment type/hp range). The updated methodologies used were an integral part of the EPA Non-road model, versus the outdated NEVES methodologies. Diesel-powered construction equipment (> 50 hp) population data, except cranes, were from the Eastern Research Group (ERG)/Starcrest report (see Appendix B). All other population data used were Non-road model default values. The activity data used were developed by ERG and Starcrest as reported (see Appendix B) with the exceptions of diesel powered equipment < 50 hp and all cranes. The activity data used for diesel powered equipment < 50 hp and all cranes were EPA Non-road model default values. The current SIP has been updated with the more refined and accurate data.

GBCPA stated its concern that emissions from port vessels, trains, trucks, and cranes and other cargo equipment have been under-represented in the emissions inventory, and requested that the commission reconsider the emissions calculations from these sources before the final SIP is completed.

The commission uses the latest available data and methodologies to develop emission inventories when time and resource constraints permit. The commission recently completed survey work to refine the data sets needed to calculate the emissions from the commercial marine and construction equipment activity at the Houston port. The data were checked against independent data sources to provide corroboration of the activity estimates being made. The current adopted SIP reflects these updated, more refined emissions data.

EPA commented that in the 2002 ROP plan, no documentation was provided on any of the VOC emissions reduction strategies, and stated that the calculation of emissions reductions for pulp and paper, RFG tanks, loading racks, and non-road and on-road controls should be documented.

The commission agrees with the comment, and has added new appendices to the SIP containing documentation of the inventory development and control strategy reduction calculation methodologies for point, on-road mobile, and on-road mobile sectors of the emissions inventory.

EPA commented that the 2002 ROP target was reached in large part because of an unexplained reduction in area source VOC emissions from 1999 levels, and stated that these VOC reductions should be explained.

The 2002 emissions were originally calculated from annual totals instead of from ozone season daily emission rates. These were recalculated using the appropriate daily rates. However, the emissions remain low due to the EGAS growth factors being lower for 2002 and subsequent years. Review of individual EGAS growth factors (e.g., the Oil & Gas Production

category) indicates a reduction in activity for these categories for these years.

EPA commented that the calculation of on-road emissions used a 24 hour/facility methodology rather than a link-based approach, and stated that the final submission should rely on the more appropriate estimation techniques.

The commission appreciates the comment, and notes that in the final SIP, the on-road mobile source emission inventories have been updated with inventories calculated using a time-of-day/link-based approach for the rate-of-progress calculations, and an hourly/link-based approach for attainment demonstration modeling input.

EPA commented that in Table 5.1-3 and the top portion of Table 5.1-4, the 2002 on-road base inventory is shown as 189.97 tpd, but in the federally mandated portion of the latter table, it is shown as 192.54 tpd. EPA suggested that appropriate corrections be made to the tables.

The commission appreciates the comment, and notes that this error has been corrected as part of the update to both the referenced tables, which includes updated on-road mobile inventory values calculated using a time-of-day/link-based approach rather than a 24 hour/facility-based approach.

EPA commented that in Table 5.1-7 for the 2007 ROP, the 694 tpd of creditable point source reductions double counts the first 95 tpd of NO_x RACT emission reductions. EPA further commented that, although this does not have a substantive effect because of the large surplus of emission reductions, this should be corrected.

The commission disagrees with EPA's comment. Line 12 of the referenced ROP table summarizes creditable reductions to date (includes 1996, 1999, 2002, and 2005 ROP). The 95 tpd NO_x attributed to NO_x RACT first appears in the 2002 ROP table, and is continued in the 2005 ROP table. The 2007 ROP table represents application of the attainment demonstration point source rules, which realize a 593 tpd reduction in NO_x. Thus, the cumulative reductions properly include the first 95 tpd from NO_x RACT, which, when added to the 593 tpd reduction, give 688 tpd as the total reduction. (Revision of the point source rule after proposal resulted in the slightly lower reduction figure of 593 tpd, compared to the 599 tpd proposed. Adding 95 tpd to 593 tpd gives 688 tpd as the total cumulative ROP point source NO_x reduction).

EPA commented that details of the MOBILE model runs, used to determine reductions from federal on-road measures summarized in Appendix G, should be provided in order to make the documentation complete.

The commission appreciates the comment, and notes that complete documentation of the on-road mobile source inventory development, including input and output files for the MOBILE

model, have been added as an appendix to the final SIP document.

EPA commented that the actual inputs to the draft NOn-road model, used to determine reductions from federal non-road measures, should be provided in order to make the documentation complete.

The commission appreciates the comment, and notes that complete documentation of the non-road mobile source inventory development, including input and output files for the NOn-road model, have been added as an appendix to the final SIP document.

EPA commented that it is, or may be, planning to propose new controls for recreational vehicles; for large spark-ignition engine standards that would provide additional NO_x and VOC reductions from currently preempted farm and construction engines; and for recreational marine engines. EPA stated its willingness to work with Texas to determine emission benefits from these new rules.

The commission appreciates the comment, and notes that the commission is willing to work with EPA to update its emissions inventories and control program reduction calculations based upon the issuance of new guidance or methodologies.

Energy Efficiency

EPA stated that it cannot approve energy efficiency measures as part of the SIP because they are not enforceable. Sierra-Houston commented that enforceability of such measures is not explained. EPA recommended one option to make such measures enforceable, namely, to set aside 2 tpd of emission reduction credits from the utility industry's mass emissions cap for energy efficiency programs, then to give these credits to municipalities or building owners that implement such programs. Otherwise, there is the potential that utilities would sell the "saved energy" outside the nonattainment area, and no net reductions of NO_x would occur in the nonattainment area.

The commission disagrees with the commenter that energy efficiency measures are not enforceable. The federal government (Department of Energy) has required appliances (AC units, refrigerators, etc.) to be more efficient. The commission is taking credit for these enforceable measures implemented by the federal government. In addition, the commission has submitted, as part of the attainment plan, an enforceable commitment for energy efficiencies. The commission also disagrees that "saved energy" will necessarily be sold outside of the nonattainment area as energy savings occur under this measure. While it is possible that electric utilities could sell their excess generating capacity outside the area, Texas has an isolated grid system controlled by the Electric Reliability Council of Texas (ERCOT), and thus "wheeling" of power is limited to within that grid system. The typical energy production structure of the area is such that, during periods of peak demand, the units providing the power are not the most efficient units in the grid. The power providers of the

area are unlikely to keep these “peaking units” at their highest operating level unless needed to meet demands in the immediate area.

Sierra-Houston commented that there is no explanation of how emission reductions will be calculated from energy saved from energy efficiency measures.

The commission received detailed comments from the City of Houston regarding how energy and emissions can be saved through efficiency measures. Please see Chapter 7 of the attainment demonstration, pertaining to future attainment plans, for complete details of these plans.

BCCA, REI, ExxonMobil, and Phillips commented that they encourage municipalities in the HGA area to enact ordinances for energy efficiency measures, and recommended that the commission and EPA provide technical guidance to smaller municipalities to accomplish this goal. Two individuals endorsed BCCA's positions.

The commission agrees with the comment and supports efforts to enhancing energy efficiencies.

RMT commented that the commission had not provided information on the predicted reduction in NO_x and VOC emissions from energy efficiency measures.

The commission has completed this analysis and has included it as part of Chapter 7 of the adopted SIP, pertaining to future attainment plans.

The Park People, Texas Forestry Association, Texas Forest Service, GCI, MCA, Legacy Land Trust (LLT), University Place Association, GHASP, Spring Valley, and 29 individuals encouraged the planting of trees to reduce the heat island effect and decrease ozone production. An individual supported the use of plants to absorb carbon dioxide or to promote energy-efficiency homes. An individual commented that deed restrictions requiring grass should be eliminated in favor of plants that do not require mowing. An individual recommended that container gardens be planted on the roofs of high-rise buildings. GCI, GHASP, Spring Valley, MCA, and six individuals commented that use of materials with high albedo (surface reflectiveness) could provide cooler urban temperatures in the HGA area and result in lower ozone levels. An individual referred to the South Coast Air Quality Management District's (SCAQMD) 1997 ozone attainment plan, which contains measures for tree planting and light-colored roofing, building, and road materials. MCA also supported increased building insulation and other energy efficiency measures. LLT and one individual commented that brownfields and abandoned lots would be ideal sites for tree planting, and recommended a program to provide tax benefits to landowners who donated easements to the trust. An individual commented that a law should be passed requiring every citizen to cut down one tree, which would be as effective as the proposed SIP. Three individuals opposed the cutting of trees. SPX Corporation commented that

reducing urban heat would decrease evaporative emissions of VOC.

When an area is urbanized, the ambient temperatures go up. Researchers at Lawrence Berkeley National Laboratory have shown that urban temperatures can be reduced by changing the reflectivity of roofs, pavements, and other surfaces, and by planting trees on a large scale. Trees affect the ozone concentration in several ways. The shade provided by trees cools urban surfaces, and can reduce the need for air conditioning, which could reduce electricity consumption. By intercepting sunlight with their leafy canopy, trees absorb solar energy that would otherwise heat up surfaces. The trees use the solar energy in photosynthesis, and also in evaporating water from their leaves, thus further cooling the air. The reduced urban temperatures can in turn decrease emissions that are temperature-dependent, such as evaporative organic compound emissions from sources such as automobile gasoline tanks, and biogenic emissions from trees themselves. Lower temperatures may also slow down the chemical reactions that create ozone. Leafy canopies also directly absorb ozone and nitrogen oxides in a process called dry deposition. All of these processes could decrease ozone concentrations.

However, there are a few other effects of tree-planting that must be considered as well. For example, reducing the urban temperatures may decrease the mixing height in the lower levels of the atmosphere, and may decrease wind speeds by decreasing the differences in temperature between urban and rural areas, and between land surfaces and bodies of water. These meteorological effects could counteract the beneficial effects of temperature reduction. Another possible problem may arise from planting certain species of trees which emit large amounts of reactive organic compounds. A few genera of trees (oaks, sycamore, sweetgum, cottonwood, willows) have been found to emit 10-100 times more VOCs than lower-emitting species such as pecan, magnolia, pine, or hickory.

The overall result of heat island reduction measures must be determined by considering all of the individual effects. Each effect must be quantified, and interactions between the many effects must also be considered. Unfortunately, it is exceedingly difficult to quantify the impact of measures such as large-scale tree planting, converting traditional lawns to native vegetation, and other measures that alter the land surfaces of the city. Some of the efforts to quantify the air quality effects of heat island reduction measures (HIRM) (specifically, increasing the albedo of urban surfaces and tree-planting) are discussed below.

In the most recent state-of-the-science modeling study, Nowak et al. (2000) found that increasing tree cover from 20% to 40% in urban areas of the Mid-Atlantic states resulted in an average of only 1 ppb decrease in hourly ozone concentrations. Taha (2000), in a study for EPA, found that modeled air quality benefits for Baton Rouge, Salt Lake City, and Sacramento varied greatly by city, with Baton Rouge and Salt Lake City showing little benefit, and Sacramento showing large benefits and disbenefits in different parts of the city.

Hudeschewski and Douglas (2000), in another study for EPA, also showed both modeled benefits and disbenefits in their study of the New England states. Although Cardelino and Chameides (1990) found ozone benefits for a study they performed for Atlanta, these researchers used modeling tools that are no longer state-of-the-science. For example, they used a simple box model, OZIP, instead of a more realistic photochemical transport model such as UAM, CAMx, or MAQSIP. To calculate biogenic VOC emissions, they used the Tingey algorithms instead of the Guenther algorithms; the latter have been generally recognized as more accurate since the mid-1990s. Likewise, Taha (1996) showed ozone benefits in Los Angeles from applying HIRM, but used UAM-IV, a photochemical model that is no longer state-of-the-science. SCAQMD recently commissioned Environ International to perform a modeling study to evaluate the possible air quality benefits of HIRM in Los Angeles. Environ found that the benefits modeled for Los Angeles were so slight that no recommendations could be made regarding the effectiveness of HIRM as an air quality improvement measure. The results from these studies are quite mixed, and do not consistently show that large-scale tree-planting would be an effective control strategy. However, it is also clear that

1. Modeling results from one city probably cannot be applied to other cities, due to the uniqueness of each city's physical form and climatology; and
2. The current state-of-the-science modeling tools have been used in only one published study so far.

Based on the discussion above, the commission believes that although tree-planting programs are beneficial to a community in many ways, their effectiveness as a strategy for reducing ozone has not yet been proven. Therefore, to resolve this question, the commission is considering the authorization of a study of the effectiveness of urban heat island reduction measures in Houston, to be performed using state-of-the-science modeling techniques. In addition, the commission will continue to work with local government and non-profit organizations to educate the public about which tree species and planting strategies are most likely to benefit local air quality.

TCC, BP, TABCC, and SEED Coalition expressed support for energy efficiency programs. An individual supported energy efficiency measures for new building construction for the entire East Texas area, and stated that energy efficiency retrofits should be required for existing buildings.

The commission agrees in general with the comment that energy efficiencies may be one strategy to improving air quality. It remains to be seen to what extent these measures must be mandated, and where. At this time, the commission is actively evaluating energy efficiencies for the HGA area, but is open to exploring how these measures may also improve air quality in other parts of the state.

GCI commented that although the commission and EPA claim inadequate tools, models, and resources to evaluate Smart Growth solutions, in the Atlantic Steel XL Project in Atlanta, tools were found and creative approaches were used. GCI urged the commission to commit resources to prove the value of these new approaches, and to include a “black box” strategy in the SIP that provides 10 tpd NO_x reductions. Sierra-Houston commented that significant air quality benefits can result from careful land use planning, and cited a recent EPA-funded report identifying a number of U.S. cities that have adopted such strategies

The commission is not pursuing “black box” strategies as part of this implementation plan. The commission is working with the City of Houston and other local planning organizations to evaluate Smart Growth initiatives and how they may apply in Texas.

ED commented that a residential energy efficient building code should be applied to the entire East and Central Texas area, and urged the commission to require compliance with the American Society of Heating, Refrigerating and Air Conditioning Engineers/Illuminating Engineering Society of North America Standard 90.1-1999. ED also suggested energy efficiency retrofits with payback periods of less than five years for existing residential and commercial buildings. Independent Electrical Contractors, Inc. (IEC) objected to the 2000 International Energy Conservation Code in the SIP, stating that it was drafted without input from builders and tradesmen who actually install the components. IEC advocated the use of the National Fire Protection Association Codes, and also endorsed Houston’s Construction Industry Council draft rules. As an alternative to the 2000 International Energy Conservation Code referenced in the SIP proposal, Houston Planning and Development Department recommended other measures for new and existing equipment that were claimed to achieve greater NO_x reductions than the SIP proposal's estimated 2.0 tpd. Houston and Houston Construction Industry Coalition (HCIC) stated that imposing uniform building codes over the entire 8-county HGA area, particularly in unincorporated areas, would be difficult without legislation at the state level. HCIC commented that implementing an energy code increases bureaucracy and would apply only to new buildings. Spring Valley and an individual commented that adoption of the 2000 International Energy Conservation Code is not required, and that municipalities have the flexibility to develop their own alternative energy efficiency programs. Spring Valley and an individual recommended adoption of a statewide building code for unincorporated areas currently not under any building code requirements. Spring Valley and an individual also commented on the need to provide emission credits for performing beyond the minimum requirements. Missouri City commented on increased costs associated with additional training and staffing for building inspectors, and costs associated with retrofitting city facilities.

The commission agrees that energy efficiencies should be evaluated as part of this attainment demonstration, and has included an extensive discussion of our future planning efforts in Chapter 7 of this Plan. However, the commission agrees with the City of Houston comment that it may be more effective to adopt other energy saving measures in lieu of adopting building codes. These City of Houston ideas are explored in Chapter 7.

An individual commented that a research and education institute should be established to focus on advanced building techniques to promote energy efficiency.

The commission agrees that additional research needs to be completed, but disagrees that an education institute needs to be formed for this evaluation.

An individual commented that the use of air conditioning is excessive, and recommended some type of curbs in order to conserve energy.

The commission is not looking at decreasing AC usage. Instead, the commission is interested in increasing the minimum efficiency requirement for new AC units.

HARC CGS commented that nonattainment counties should be provided with the needed authority to develop and implement air quality regulations and programs, including building and development codes.

The Texas Legislature has tasked the commission with the authority for development of SIPs. With this authority comes the responsibility to work with local governments and the public at large to ensure all parties have had input into the plan. The commission takes this responsibility very seriously and has made every effort to ensure public input into the SIP process.

An individual commented that natural gas use should be reduced as an energy efficiency measure.

Natural gas is one of the cleanest fuels for the generation of electricity. The commission as a policy is fuel neutral and does not promote or discourage the use of any fuel type. The greatest concern to the commission is not what goes in the fuel tank but what comes out the tailpipe.

Enforceable Commitments

EPA commented that in its December 16, 1999 *Federal Register* action for the HGA area, it stated that the state could submit adopted rules for some of the measures on the shortfall list after December 2000, but as expeditiously as practicable. EPA commented that new modeling showing ozone benefits from additional VOC reductions may provide justification for more time for the state to adopt and submit VOC rules as part of the SIP, and that June 30, 2001 would be an expeditious date for this submission. EPA commented that it will work with the state to identify long-term enforceable commitments for promising new technologies, in the event that the state does not adopt and submit enough rules and short-term enforceable commitments by December 2000 to demonstrate attainment by 2007. EPA stated that, as part of this commitment, the state must demonstrate that it has adopted and submitted rules (or short-term enforceable commitments) for all practicable measures currently

being implemented in Texas or elsewhere. EPA commented that these long-term enforceable commitments, to be adopted and submitted by June 2001, would have to be very specific, provide adequate enforcement, and contain backstop measures.

The commission appreciates EPA's support for the availability of enforceable commitments for the HGA SIP attainment demonstration. Because of the magnitude of reductions required for attainment, and the extremely challenging process of identifying, quantifying, and implementing the control strategies, the commission believes that additional enforceable commitments may be necessary to achieve the full extent of reductions to demonstrate attainment. The commission has included in the HGA SIP a discussion of the measures identified for enforceable commitments, the associated emission reductions, and implementation timeframe in Chapter 7. The commission has also identified excess measures to ensure that adequate emission reductions to achieve attainment are implemented.

HGAC, Harris County, and RAQCG supported the use of enforceable commitments to adopt rules where control technology is not currently proven. BCCA, REI, ExxonMobil, and Phillips commented that new, more stringent federal emission standards for heavier on-road trucks and SUVs, as well as for heavy-duty on-road diesel vehicles, will not be implemented in time to make significant market turnover before the 2007 attainment date. BCCA, REI, ExxonMobil, and Phillips suggested that the commission and EPA work with automakers and other interested parties on a voluntary agreement to introduce Tier 2 vehicles into the Texas market prior to national introduction. Two individuals endorsed BCCA's positions.

The commission appreciates the commenters' support for the availability of enforceable commitments for the HGA SIP attainment demonstration. Because of the magnitude of reductions required for attainment, and the extremely challenging process of identifying, quantifying, and implementing the control strategies, the commission believes that additional enforceable commitments may be necessary to achieve the full extent of reductions to demonstrate attainment. The commission also agrees that voluntary agreements can be a viable method of obtaining emission reductions for SIP purposes, and is committed to working with all interested parties to determine if such agreements would be appropriate and workable. Regarding market turnover of new vehicles, the commission agrees that some federal measures will be implemented too late to be effective by HGA's attainment date of 2007. The federal government should act as quickly as possible in implementing these measures for which the state is preempted from setting standards.

RAQCG and Harris County recommended federal action to control federally preempted sources. State Representative John Davis, CAP, Harris County, Houston, Spring Valley, and one individual commented that the federal government should accelerate implementation of federally preempted controls, and give appropriate credit to the state for these reductions that will occur after 2006. HGAC supported the same acceleration, but with reductions occurring early enough to credit by the 2007

attainment date. Harris County commented that at least half of the associated emission reductions should be achieved by 2007. An individual commented that full credit should be allowed for federally preempted controls for fuels and vehicles through 2010. The individual also commented that HGA should not be overly controlled to compensate for other sources of federal preemption, such as aircraft, marine vessels, locomotives, and heavy-duty diesel trucks, which the state cannot control. Baker Botts, BCCA, T_xOGA, REI, ExxonMobil, and Phillips commented that the commission should incorporate an appropriate level of federal reductions into the SIP in order to restore balance and to address the SIP's undue reliance on state-regulated sources. BCCA, REI, ExxonMobil, and Phillips encouraged use of a flexible approach. Two individuals endorsed BCCA's positions. Dow commented that federally preempted requirements for on-road and non-road mobile sources should be incorporated into the SIP. Congressman Kevin Brady commented that EPA has been remiss in adopting federal standards for fuels and diesel engines, and recommended that the SIP contain a federal assignment section that details EPA's role in implementing control requirements.

The commission agrees with the commenters that emission reductions from federally preempted sources would provide benefits for the HGA SIP demonstration, and the inability of the commission to regulate certain source categories has necessitated the use of other ozone control strategies. However, the commission understands that the EPA SIP approval process does not provide a mechanism for credit for emission reductions that occur after the attainment date. The commission understands that EPA is not currently considering accelerating implementation schedules for existing federal rules. The commission is working with EPA to determine the availability of SIP credit for many non-traditional control strategy mechanisms, like economic incentive programs and flexibility for preempted source categories. Additionally, the commission is working with EPA to determine an appropriate federal contribution credit available for the HGA SIP.

Texas Railroad Association requested confirmation that the commission has taken credit for locomotive emission reductions already mandated by EPA.

The commission has taken approximately 6 tpd of NO_x credit for federal locomotive controls.

Economic Incentives/Disincentives

BCCA, REI, ExxonMobil, and Phillips encouraged the commission to pursue programs that generate voluntary credits, based on actual emissions and market prices, for the scrappage of non-road vehicles, engines, and equipment. BCCA, REI, ExxonMobil, and Phillips also encouraged similar programs for the repair, replacement, and retrofit of non-road vehicles and equipment. Two individuals endorsed BCCA's positions.

The commission appreciates the commenters' statements in regard to vehicle scrappage

programs in the HGA nonattainment area. The Scrappage Program is a portion of the area's attainment demonstration under the VMEP that HGAC will be implementing. HGAC will be responsible for the development and implementation of VMEP initiatives associated with scrappage in the HGA nonattainment area, including any available financial reimbursement. Any additional questions or comments regarding the development or implementation of these VMEP initiatives should be addressed to HGAC at P.O. Box 22777, Houston, Texas 77227-2777. The proposed VMEP initiative has set a goal of scrapping several thousand light-duty vehicles per year. The commission has promulgated an on-road scrappage rule that outlines the on-road vehicle requirements and offers flexibility for local areas implementing scrappage programs. The scrappage rule does not mandate the replacement of vehicles older than ten years, and the program is strictly voluntary. The scrappage rule can be found in §114.1 (Definitions), §114.4 (Mobile Emission Reduction Credit Definitions), §114.211 (Purpose), §114.212 (Enterprise Operator Responsibilities), §114.213 (Vehicle Eligibility), §114.214 (Advertising), §114.215 (State Implementation Plan Credits for the Voluntary Accelerated Vehicle Retirement Program), §114.216 (Records, Auditing, and Enforcement), §114.217 (Credit Calculations) and §114.219 (Affected Counties).

BCCA, REI, ExxonMobil, and Phillips commented that the commission should initiate state/industry development of voluntary industrial standards for scheduling major maintenance activities, so as to minimize ozone precursor emissions during periods prone to high ozone levels.

The commission has adopted a cap and trade program in order to ensure flexibility in the point source reduction program. The commission believes this program will provide the flexibility for coordinating the scheduling of major maintenance activities.

HGAC, BCCA, REI, ExxonMobil, and Phillips stated support for establishment of a grant fund to cover the incremental cost, on a competitive basis, of projects that achieve the most cost-effective NO_x reductions. BCCA, REI, ExxonMobil, and Phillips commented that such a program should be used as an alternative to the commission's proposed rules that are not technologically feasible or that have negative social and economic consequences. Two individuals endorsed BCCA's positions. RAQCG and Harris County recommended that the commission and the HGA area jointly advocate to the Texas Legislature and federal government a financial incentives program for air quality improvement. CAP, Harris County, and Houston recommended that alternative control strategies be obtainable through a private sector-financed market initiative, such as a Carl Moyer-type program. CAP, Harris County, and Houston favored appropriate trade-offs between NO_x emitted at ground level versus NO_x emitted by elevated stacks. Spring Valley recommended implementation of an economic incentives program, as developed by the HGAC, to avoid certain mandated control measures. Spring Valley expressed support for an emission credit trading program as a cost-effective alternative to traditional command and control. Spring Valley suggested that the commission establish backstop measures consisting of certain of the rule measures proposed in the SIP. Baytown COC, Harris County, the Council, and one individual recommended market-based incentives to reduce NO_x emissions, and suggested state and

federal incentives to develop and apply innovative retrofit technology.

The commission agrees that economic incentive programs can potentially be an effective tool for achieving air quality. One such program is the Carl Moyer program in California. That program appears to be successful in providing flexibility to the regulated industry while still achieving reductions in air emissions. The California program is authorized by and funded through the state legislative process, and such legislative approval does not currently exist for a similar Texas program. The commission will continue to try to identify economic incentives which it has authority to implement. Because the commission agrees that market-based incentive programs can be an important component in encouraging development of new technologies and/or greater or more cost effective emission reduction strategies, the commission has provided for the inclusion of economic incentive programs as a component of the HGA SIP in the future. Also, several of the adopted rules do provide for the regulated entity to submit an alternative plan to achieve equivalent emission reductions. This alternative would enable regulated entities to take advantage of an economic incentive program that is developed in the future. The commission will continue to work with industry representatives to identify options for compliance which may currently exist or which may become available in the near future. The commission is adopting, as part of this HGA SIP control strategy, an emission credit trading program, and appreciates the commenters' support for this alternative emission reduction strategy. The commission believes it has adequately planned out the SIP, including a mid-course review, such that excessive backstop measures will not be necessary.

United Parcel Service suggested incentives for vehicle/fleet operators to introduce cleaner CNG vehicles, such as TCM exemptions, "green curb" areas to provide preferential loading/parking zones, "green lanes" that permit normal rather than reduced speeds, incident management programs to reduce accident-related emissions and congestion, employer-sponsored training programs to educate employees about emission reduction strategies, and measures to mitigate congestion. Three individuals commented on state tax incentives to encourage increased sale of cleaner vehicles, such as LEV or alternative fuel vehicles. An individual commented that 15% of all vehicles sold in the HGA area should be equipped for alternative fuel use.

Encouragement of CNG-powered vehicles as well as preferential parking for clean vehicles is being explored, and would have to be implemented by the local planning organization, HGAC. Regarding tax incentives, the federal government has provided for federal income tax credit for alternatively fueled vehicles. The commission does not have taxing authority; however, the Texas Legislature may address this issue in the future. The commission does not believe a 15% requirement for alternative vehicles will improve air quality without a corresponding more stringent emission standard. In addition, the Texas Legislature has enacted legislation requiring the commission to require low emission vehicles for fleets.

An individual recommended using alternative fuels in portable generators. The individual also suggested using dimethylethyl as an alternative fuel for fleet diesel vehicles and certain stationary engines. The individual suggested emission control equipment on motorcycles and large gasoline-fueled trucks. The individual commented that Corporate Average Fuel Economy regulations should be enforced against vehicle manufacturers.

Alternative fuel use does not in itself improve air quality. The alternative fuel use must be combined with more stringent emission standards in order to have an emission reduction. The federal government has already established emission standards for on-highway motorcycles and gasoline-powered trucks. The EPA is also set to proposed emission standards for off-highway motorcycles in the near future. The CAFÉ standards for vehicle fuel economy is a federal regulation enforced by the federal government, when necessary, against vehicle manufacturers.

Waller County Commissioner John Isom and two individuals recommended incentives for reduced use of personal vehicles.

These types of measures are under consideration by HGAC, the local planning organization, for the VMEP program.

Two individuals stated that the state vehicle registration fee should be revised to offer positive incentives to purchase fuel-efficient gasoline cars and clean alternative fuel and electric cars, and to provide negative incentives to purchase fuel-inefficient vehicles. An individual recommended general incentives for the use of electric vehicles and installation of charging infrastructure. An individual recommended similar incentives for the rental car industry.

The commission agrees that this may be one way to get cleaner vehicles into the fleet. However, the commission does not have the ability to regulate vehicle registration fees, or to offer incentives for certain types of purchases.

MCA commented that an education program with incentives for additional clean air programs must be part of the SIP.

The commission agrees with the commenter that education regarding air pollution and ozone outreach in the HGA nonattainment area would provide benefits for the public. The Clean Air Action program is a portion of the area's attainment demonstration under the VMEP that the HGAC will be implementing. This program is intended to promote awareness in the HGA nonattainment area regarding ground level ozone pollution, ozone watches, ozone warnings, and EPA's Air Quality Index.

LWV-TX and one individual supported flexibility achieved by innovative programs that accomplish

emission reductions.

The commission agrees with the comment, and is working towards identifying new innovative programs for incorporation during the mid-course review.

Two individuals suggested tax incentives for the petroleum industry to allow rebuilding or modifying older facilities. Sierra-Galveston suggested tax incentives to encourage investment in new emission reduction technologies. An individual recommended that tax abatements to industry be eliminated. An individual commented that expenses for maintaining or installing pollution control equipment on motor vehicles should be deductible on one's federal income tax return. An individual commented that the depreciation period for business vehicles should be reduced from seven to three years to accelerate replacement by cleaner vehicles.

The commission appreciates the commenters' concern for promoting capital expenditures for air pollution equipment. 30 TAC Chapter 17, Tax Relief for Property Used for Environmental Protection, is the commission's program that provides tax relief for the purchase of pollution control property. On November 2, 1993, the voters of Texas approved a constitutional amendment, commonly referred to as "Proposition 2," that provides an exemption from property taxation for pollution control property. The intent of the constitutional amendment was to ensure that capital investment undertaken to comply with federal, state, or local environmental mandates did not result in an increase in a facility's property taxes. Legislation implementing that amendment, House Bill 1920, was passed during the 73rd Texas Legislative session which added a new §11.31 and §26.045 to the Texas Tax Code. The Tax Code provides that pollution control property could include any land purchased after January 1, 1994, or any structure, building, installation, excavation, machinery, equipment, or device and any attachment or addition to or reconstruction, replacement, or improvement of property that is used, constructed, acquired, or installed wholly or partly to meet or exceed rules or regulations adopted by any federal, state or local environmental agency for the prevention, monitoring, control or reduction of air, water or land pollution. Motor vehicles are specifically noted as being ineligible for an exemption under this provision of the Tax Code. The Tax Code contains a two-step process for securing an exemption from property taxes for pollution control property. An applicant must first receive a determination from the commission that the property is used for pollution control purposes. The applicant then can use this determination to apply to the local appraisal district for a property tax exemption. The commission does not have the legislative authority to either modify or eliminate such tax abatements or other relief.

An individual suggested a parking tax, or restriction of large vehicles to certain areas and roads to discourage use. Three individuals recommended penalties or taxes for large vehicles such as SUVs. An individual commented that the "gas-guzzler" tax be extended to SUVs and pickups, and the proceeds used to research alternative fuels, construct alternate transportation systems, and to subsidize mass

transit. An individual recommended elimination of taxes and licensing fees for vehicles three years old and newer.

The commission does not have taxing authority. The local planning organization is looking into reduced use of automobiles through VMEP programs. The federal government already has a “gas-guzzler” tax as part of the federal tax code. Any change in this statute would have to be done at the federal level. Changes to licensing fees for vehicles is also not within the commission’s authority; however, the commission agrees that this may be a way to encourage the use of newer cleaner vehicles.

An individual commented that people who work in Harris County, but live outside it, should be required to pay fees for vehicle permits, and that these fees could be used to pay for pollution controls.

This type of suggestion is beyond the authority of the commission to implement. It also may be very difficult to identify those who work inside Harris County but live outside. In addition, people who come into Harris County to work also spend money there for various things, and are paying taxes into the community.

Dow urged the commission to include opportunities for companies to document and to expand their e-commerce initiatives and to receive air pollution credits for these initiatives. Dow suggested that the commission allow companies that subsidize or introduce Internet purchasing to include the net reduction in emissions from this new mode of commerce.

The commission appreciates the commenter’s suggestion, but is not aware of whether or how EPA would allow claiming credit for the strategy. The commission is open to considering these types of ideas as long as they are quantifiable, real, and ongoing. This concept is included in Chapter 7 of the SIP, pertaining to future attainment plans.

An individual recommended statewide incentives for the installation of solar heating and use of solar power, wind power, and alternative electricity sources. GHASP supported the use of wind electric turbines.

The commission agrees that energy savings measures should be part of the solution for clean air. The commission is exploring these and other types of ideas in Chapter 7 of this attainment plan, pertaining to future attainment plans.

An individual recommended that construction and industrial plants be charged for the quantity of pollution emitted and the amount of time operated.

A similar measure is being adopted by the commission. Plants that are major sources and part of the cap and trade program are being given allowances, which authorize a specified

quantity of annual emissions. After all the allowances are used for any given year, the plant can no longer emit unless it purchases or trades for additional allowances. The total number of allowances are limited such that only a quantity which allows attainment to be demonstrated can be emitted by all plants in the HGA area.

Transportation Conformity and MVEBs

EPA commented that the process for determining the ROP budgets for VOCs should be explained. EPA noted that for 2002 in particular, subtracting the total reductions from SIP Table 5.1-4 from the number in Table 5.1-3 (189.97 – 85.82) results in 104.15 tpd, not the 123.24 tpd shown in Table 2.9-1 (attainment budget).

The commission agrees with this comment, and notes that additional ROP tables for VOC have been added for 2005 and 2007. In addition, several appendices have been added to the SIP, providing documentation of the methods and assumptions used in developing the ROP budgets for both NO_x and VOC. The subtraction error in the referenced table has been corrected.

EPA commented that the measures and emission reductions used to develop the attainment budget should be documented.

The measures and emission reductions used to develop the on-road mobile source attainment budget are well documented, both in the current and previous HGA SIPs. Appendix G of the November 1999 HGA SIP summarizes how the on-road mobile source inventory used in previous attainment demonstration modeling was developed under contract to the commission by TTI. The title of this report is *Development of Gridded Mobile Source Emissions Estimates for the Houston-Galveston Nonattainment Counties FY2007 in Support of the COAST Project, Technical Note, December 1998*. Appendix H of the November 1999 HGA SIP contains several of the MOBILE5 input and output files which were used by TTI during the development of this inventory. The title of this Appendix is *MOBILE5a-h Input and Output Mock-up Files Depicting Parameterizations Used in Emissions Modeling for FY 2007 Performed by Texas Transportation Institute in Support of the COAST Project*. As detailed in Section 3.4.3 of the current SIP, the same on-road mobile source inventory used for the current attainment demonstration modeling was used for the modeling for the November 1999 HGA SIP. In addition, Appendix G of the current SIP is a July 26, 2000 report by ERG summarizing the changes made to this inventory to model the on-road control strategies included with the attainment demonstration.

In October 2000, the commission received a revised on-road mobile source attainment inventory from TTI. A full discussion of this revised inventory is included in Section 3.8.2 of

the current SIP. In addition, several of the appendices to this SIP provide further detail concerning the development of this revised on-road mobile source inventory.

EPA recommended that text in the paragraph before Tables 2.9-1 and 2.9-2 in the SIP be revised to reflect that only Table 2.9-2 contains the attainment demonstration budgets.

The wording in the referenced paragraph has been changed to clarify that Table 2.9-2 contains the attainment demonstration budgets

EPA recommended that the order of columns in Table 2.9-2 containing NO_x and VOC budgets be reversed to be consistent with the column order in Table 2.9-1.

The order of columns has been changed to make the NO_x and VOC budgets consistent between the referenced tables.

ED commented that when EPA made a determination that the 195 tpd NO_x MVEB was adequate, this finding was based partly on the state's April 2000 commitment to reduce emissions by an additional 118 tpd beyond the amount identified in the November 1999 SIP. ED questioned EPA's adequacy finding if the state does not reduce emissions by at least 118 tpd.

In reviewing the NO_x MVEB for adequacy, EPA relied primarily on the budget contained in the November 1999 SIP, and also on the state's commitment, contained in the April 2000 SIP, to make further reductions needed for attainment. This shortfall or "gap" was calculated by EPA to be 118 tpd NO_x. Based on changes mainly to the non-road mobile source inventory, the commission modeling staff again performed the calculations for the gap, and provided a new gap figure of 78 tpd in the August 2000 proposal. Prior to adoption of the SIP, the commission refined the gap calculation and determined that it is 91 tpd, based on the best available information. EPA's adequacy determination for the MVEB was based on the state's commitment to close the gap. The state's provision of a more accurate gap figure does not change the nature of this commitment, nor should it bring the issue of budget adequacy into question.

GHASP commented that the MVEB underestimates the increase in VMT resulting from road and freeway expansion and from commercial and port development.

HGAC provided the commission with on-road mobile source input data obtained from travel demand modeling. These data were incorporated into the commission's photochemical modeling for the HGA attainment demonstration. HGAC has used all available planning data to project, as accurately as possible, future emissions from highway vehicles. The current attainment demonstration SIP provides for the necessary reductions to attain the ozone standard by 2007, but does not address emissions projected beyond 2007. The commission

has committed to perform additional mobile source modeling at a specified time after the new EPA mobile model, MOBILE6, is released. This new modeling, which will incorporate all known highway projects and use patterns, will establish a new MVEB, upon which future conformity determinations will be based.

Sierra-Houston commented that the public will not have 30 days to review and comment on the revised MVEB before the SIP is submitted to EPA in December 2000.

The commission took comments on the proposed MVEB during the public hearing process. However, the commission notes that EPA will take public comment on the adopted SIP prior to determining approval or disapproval of the SIP.

Sierra-Houston commented that the tables in Chapter 5 of the SIP show increasing area and non-road NO_x emissions until 2007, when all emissions unexplainably drop. Sierra-Houston stated that there is no documentation, in percent reduction, of the effectiveness of each control strategy.

Area sources decreased due to the EGAS growth factors being lower for 2002 and subsequent years. Review of individual EGAS growth factors (e.g., the Oil & Gas Production category) indicates a reduction in activity for these categories for these years. Non-road emissions dropped due to use of bottom-up methodology for some major categories (e.g., construction equipment, commercial vessels, and airport GSE), which caused emissions to be lower. With regard to documentation of the effectiveness of each ROP control strategy, the Non-road and MOBILE models do not separate individual components of the strategy. Previous ROP plans have provided complete documentation of point source control strategies, and the current SIP includes documentation of the attainment demonstration point source NO_x control strategy.

GCI commented that the HGA transportation conformity budget is too high, and that postponing several large planned projects could reduce the budget.

The transportation conformity budget does not tie vehicular emissions to specific roadways. It is assumed that the same number of vehicles would be traveling on the roadway network, regardless of whether specific projects were advanced or delayed. The transportation conformity budget, therefore, is more a function of total emissions than of individual roadway contributions. The results of the travel demand model are incorporated into the commission's photochemical modeling for the HGA attainment demonstration. Since the transportation conformity budget represents an allowable amount of on-road emissions that does not interfere with attainment, an approvable budget, by definition, is not "too high."

GCI and one individual questioned how the Grand Parkway [an additional outer freeway loop around Houston, with a circumference of 190 miles] has been factored into the attainment modeling. Sierra-Houston commented that the SIP does not contain estimates of future emissions from Grand Parkway.

The travel demand model, which HGAC uses to estimate future travel patterns, includes all highway projects known with reasonable certainty to be operational by 2007. These projects include Grand Parkway, for which the entire west loop is scheduled to be operational by 2007. The entire Grand Parkway project is not scheduled for completion until 2022, the outside year of HGAC's MTP. The commission processed the results of the travel demand model in the MOBILE5b mobile source model, and incorporated this output into the commission's photochemical modeling for the HGA attainment demonstration. However, emissions estimates for individual highway projects are not listed in the SIP.

GCI questioned why freeway construction is permitted to go forward at the expense of less harmful public transit systems. An individual commented that the SIP, by allowing funding of highway projects to sprawling suburbs, has a disproportionately adverse effect on low-income populations that do not have cars to drive.

HGAC is the local MPO responsible for developing the Transportation Implementation Plan (TIP), which sets out the nature, scope, and funding of all transportation-related projects. HGAC, not the commission, allocates funds to METRO and other participating entities. With regard to highway projects to suburbs, the TIP must demonstrate conformity to the SIP before federal transportation funds are made available. The commission does not participate in, and does not have oversight authority for, decisions to advance particular highway projects in given areas. Although "Smart Growth" initiatives are beginning to play a more prominent role in urban planning, current highway projects tend to provide better access to areas of growing population, which are primarily the suburbs. Provision of low-cost housing in the inner city is outside the scope of the commission's authority.

HARC CGS commented that federal transportation funds should be distributed sooner to counties that support air quality programs.

The commission has no jurisdiction over the distribution of federal transportation funds by the Federal Highway Administration.

An individual recommended that the commission emphasize to the federal government that withholding highway funding could make the problem worse, and that such funds should be spent where most needed.

The FCAA, enacted by Congress, sets out the consequences of a state's failure to submit an approvable attainment demonstration. These consequences may include federal sanctions, more stringent restrictions on growth, and withholding of federal highway funding. The commission's responsibility is to submit an approvable SIP in order to avoid such repercussions. The commission cannot overturn or disregard federal law.

An individual commented that no new highway/freeway construction should be allowed until the HGA area attains all federal air quality standards.

Federal and state conformity rules govern the process by which funding authorization is withheld from highway construction projects. As long as the appropriate planning entity can demonstrate conformity with established MVEBs, the commission has no authority to limit new highway construction.

Speed Limit

GHASP, TABCC, Chambers County Judge Jimmy Sylvia, and 25 individuals expressed general support for the 55 mph speed limit.

The commission acknowledges and appreciates the commenters' support for the 55 mph speed limit measure.

Montgomery County Judge Allen Sadler, Dayton Pipe, Sierra-Galveston, Sierra-Houston, SEED Coalition, and 58 individuals expressed general opposition to the 55 mph speed limit.

The commission appreciates the commenters' concerns, but has determined that the 55 mph speed limit measure is a necessary component of the attainment demonstration.

Two individuals recommended that the 55 mph speed limit be implemented sooner in order to save lives. An individual commented that the 55 mph speed limit should be implemented in Harris County first because that is where most of the pollution is generated by automobiles. One individual commented that the speed limit should be lowered only inside Beltway 8 starting May 1, 2002, and at that time, it should be implemented in Dallas and Austin as well. The commenter went on to say that wider coverage of the rule should be delayed until May 1, 2005, when quantitative NO_x/VOC reductions obtained in the three referenced areas are available. Four individuals questioned why the rule could not be implemented sooner than 2002. TxDOT commented that, since it will take six months to procure and install new speed limit signs, the May 1, 2002 implementation deadline can be met only if the commission provides necessary signage information six months prior to that date. An individual recommended that speed limits be phased in, starting with trucks.

The commission has determined that the implementation date is appropriate because the commission, working with TxDOT, must complete a detailed, technical analysis of a change in speeds. In addition, the commission will work with TxDOT to ensure that adequate time is provided to complete signage changes. The commission has determined that the scope of the speed limit change is adequate to demonstrate attainment.

Two individuals stated the benefits of better gas mileage and fuel savings while driving at speeds of 55 mph and below. Six individuals stated that modern cars get better mileage at 70 mph than at 55 mph. An individual commented that fuel savings is not a relevant argument in the justification of reduced speed limits.

The commission has determined through review of the technical data and mobile modeling that a change in speeds will benefit air quality and lead to an overall improvement in gas mileage for the vehicle fleet in the HGA area.

An individual stated that, in addition to air quality benefits, a reduced speed limit would generate income for cities. Three individuals stated that traffic ticket revenue is the underlying reason for the lowered speed limit.

The commission understands that traffic ticket revenue may be an additional benefit for cities; however, that was not a factor in the commission's consideration of this measure. The commission has determined through review of the technical data and mobile modeling that a change in speeds will benefit air quality and is necessary for the demonstration of attainment for the HGA area.

An individual stated that, in addition to air quality benefits, a reduced speed limit would lower the highway death rate. Three individuals commented that several studies have shown that accident rates decreased when speed limits were raised, and that disparity in speeds is responsible for accidents. Three individuals commented that lowering the speed limit to 55 mph did not provide additional safety on highways. ED commented that the speed limit should be lowered only as a safety measure, if warranted, but not exclusively as a pollution control strategy. ED commented that this measure will create hostility toward clean air plans, and that better reduction strategies exist. An individual commented that safety benefits are not relevant to the justification of a speed limit reduction.

The commission, working with TxDOT, must complete a detailed, technical analysis of a change in speeds to determine that there are no safety issues resulting from the speed limit change. If the results of these studies identify safety issues, this measure will be reevaluated.

An individual stated that, in addition to air quality benefits, a reduced speed limit would result in lower automobile insurance rates. An individual commented that insurance premiums would increase for violators of the speed limit.

The commission understands that reduced insurance rates may be an additional benefit for drivers; however, that was not a consideration in the commission's consideration of this measure. The commission has determined through review of the technical data and mobile modeling that a change in speeds will benefit air quality and is necessary for the demonstration of attainment for the HGA area.

Two individuals commented that a reduced speed limit would result in federal tax dollars being returned due to a decrease in drunk driving.

The commission is unsure what connection the commenters make between drunk driving, reduced speed limit, and a return of federal tax dollars. The commission notes that this rule does not relate to drunk driving or federal tax mechanisms.

An individual stated that reducing the speed limit would have little effect until motorists learn to drive properly, and the individual encouraged the use of television advertisements. Dayton Pipe commented that most drivers don't obey the current speed limits. One individual commented "if you're doing 70 on the freeway right now, you're being passed and you're creating a problem because you're driving too slow." Another individual commented that if you drive 65 miles per hour people "shoot all kinds of signals to you, some of them not so nice."

The commission appreciates the commenters' concerns and suggestions for improved driver safety.

An individual commented that this strategy has never been tried in any other area.

The commission disagrees with this comment, and notes that this strategy has been implemented in other areas of the United States, including the DFW nonattainment area.

Sierra-Houston commented that there is no commitment in the SIP as to how effective the lowered speed limit will be. An individual commented that the resulting reduction in on-road mobile NO_x and VOC is estimated to be less than 6% and 2%, respectively, which may not be measurable within the statistical error of the MOBILE5a model. An individual stated that the reduced speed limit won't be effective because about 11% of the total pollution problem is caused by mobile sources, and therefore 89% of the problem would still exist if no vehicles were driven at all. J&S wants assurance from the commission that the speed reduction will actually help HGA achieve the ozone NAAQS. LWV-TX urged caution in counting credits from the lowered speed limit. Eighteen individuals expressed the belief that the percentage of increased pollution going from 55 mph to 70 mph is negligible. ED and eight individuals expressed doubt that the reductions claimed by this measure are real, and requested documentation of how the emission reductions were derived. One individual questioned the 18.27 tpd of NO_x reduction attributed to the reduced speed limit.

The commission disagrees with the comment that mobile sources contribute only 11% to the total pollution problem. As stated in the SIP proposal, projected 2007 emissions of on-road mobile sources represent 20% of total NO_x and 5% of total VOC in the HGA area. The commission's photochemical modeling has shown that totally removing any one sector, such as point, area, on-road mobile, or non-road mobile sources, from the modeled inventory would not result in modeled attainment. The modeling further showed that reductions are needed

from all sectors of the emissions inventory in order to attain the ozone standard. Upon execution of the model, the commission determined there was a real and measurable benefit to a reduction in the speed. The reduced speed limit measure is therefore an important element of the overall attainment demonstration SIP.

On page 6-5 of the SIP proposal, Table 6.1-2 listed the benefits to be achieved from the proposed 55 mph speed limit reduction strategy as 18.27 tpd of NO_x and 1.40 tpd of VOC. At the time that these estimates were made, resources were not available to perform a detailed analysis of the impacts from reducing speeds to 55 mph. Hence, the figures in the SIP proposal can be considered estimates. Since the SIP proposal, TTI has performed a more detailed analysis of the speed limit reduction impacts for the 8-county HGA area. This more recent analysis used an 8-county HGA VMT figure of 129,362,378, as opposed to the 139,467,784 VMT figure used in the previous analysis. In order to ascertain the pollution reduction benefits from the 55 mph speed limit proposal, TTI developed on-road mobile source inventories for scenarios based on both the current speed limits and the 55 mph speed limit. By taking the difference in NO_x and VOC emissions between these two scenarios, the 55 mph speed limit reduction benefits can be ascertained. The resulting benefits of 12.33 tpd for NO_x and 1.76 tpd for VOC, contained in the adopted SIP, are summarized by county in the following table:

County	55 mph Speed Limit Benefits (tpd)	
	NO _x	VOC
Harris	7.68	1.14
Montgomery	1.46	0.18
Fort Bend	0.83	0.10
Brazoria	0.65	0.09
Galveston	0.54	0.06
Chambers	0.49	0.07
Liberty	0.40	0.07
Waller	0.28	0.05
8-county Total	12.33	1.76

Four individuals commented that lowering the speed limit would not reduce NO_x because high-

temperature conditions conducive to NO_x formation exist only during vehicle acceleration, not cruise conditions.

The commission partially agrees with the commenters. There is an associated increase in NO_x emissions due to acceleration to higher speeds, as well as deceleration resulting from traffic congestion or climbing hills. However, the vehicle spends relatively less time operating in these modes, and such conditions would exist regardless of the posted speed limit. At cruise conditions, vehicles experience higher road load and wind resistance conditions. Specifically, at cruising conditions above 55 mph, vehicles emit more NO_x due to increased aerodynamic force from wind resistance, which puts additional load on the engine. Similarly, the road load usually increases significantly with increased speed, which affects fuel consumption and therefore increases NO_x emissions. The commission does not agree that the reduced speed limit would be ineffective, since comparatively less NO_x is emitted when the cruising speed is 55 mph or less.

ED commented that the commission should explain how the speed limit reductions were treated in the photochemical model, including their time-of-day profile and geographical distribution.

The control measures submitted in the HGA attainment demonstration SIP can be classified into three categories: 1) mandated federal measures, such as automotive and other types of engine emission standards; 2) base measures which were modeled for the November 1999 SIP for HGA, and 3) “gap closure” measures, which were not modeled. The speed limit rule is part of the “gap closure” measures, and therefore was not modeled.

An individual requested information on the percentage reduction attributable to the speed limit rule. An individual commented that, although the SIP states that "significant" reductions will occur from the speed limit reduction, the claimed reductions in total NO_x and VOC would actually be less than 2% and 0.5%, respectively.

The commission disagrees with the comment. The percentage reductions attributable to the speed limit rule, compared to reductions from all state measures for this SIP, are 2% for NO_x and 5% for VOC. The commission agrees that the reductions resulting from this measure, when expressed as a percentage of the overall reductions, may appear small. This is true for many of the control strategies in the SIP. However, the 12.33 tpd NO_x reduction obtained from the speed limit rule represents 14%, or almost one-seventh, of the total 91 tpd NO_x needed to fill the attainment “gap.” This is a significant contribution to the attainment demonstration.

Montgomery County Judge Allen Sadler and RMT stated that, based on RMT’s studies, eliminating Montgomery County from the 55 mph speed limit program would result in a difference of less than 0.1% NO_x in the HGA area. RMT commented that the proposed 55 mph speed limit requirements

would lower Montgomery County's NO_x emissions by 0.9 tpd, resulting in a difference of less than 0.01 ppb ozone. RMT stated that this difference is not measurable by the commission's ambient ozone monitors. An individual commented that speed limit reduction in Montgomery County is especially unwarranted, since the prevailing wind from that county blows away from Harris County. An individual commented that most of the counties surrounding Harris County should be excluded from the speed limit rule because their incremental contributions are small. Spring Valley and two individuals also commented that higher NO_x emissions in rural portions of the HGA area will have little influence on ozone produced in urban areas. TxDOT commented that lower speed limits in Chambers, Liberty, and Waller counties are preferable to the proposed construction equipment operating restrictions.

The FCAA Amendments of 1990 provided new requirements for areas that had not attained the NAAQS for ozone, carbon monoxide, particulate matter, sulfur dioxide, nitrogen dioxide and lead, and new requirements for SIPs in general. EPA was authorized to designate areas failing to meet the NAAQS for ozone as nonattainment and to classify them according to severity. Section 107(d)(4)(A)(iv) of the FCAA mandated that areas designated as serious, severe or extreme for ozone that were within an MSA or CMSA must have boundaries that include the entire MSA or CMSA. This requirement is supported by the legislative history for the FCAA Amendments in Senate Report No. 101-228, page 3399, “[b]ecause ozone is not a local phenomenon but is formed and transported over hundreds of miles and several days, localized control strategies will not be effective in reducing ozone levels. The bill, thus, expands the size of areas that are defined as ozone nonattainment areas to assure that controls are implemented in an area wide enough to address the problem.” The FCAA Amendments did provide the ability to exclude portions of the entire MSA or CMSA prior to designation, if the state conducted a study that EPA agreed proved that the geographic portion did not contribute significantly to violation of the NAAQS.

Redesignation has not occurred for any portion of the HGA nonattainment area, and is not currently being considered. For existing areas currently included within a nonattainment area, the specific area must be redesignated as attainment to be removed from a nonattainment area. Section 107(d)(3) provides that EPA may not redesignate a nonattainment area, or a portion thereof, to attainment unless several criteria are met, which include: a determination that the area has attained the NAAQS; there is a fully approved SIP for the area; there is a determination that the improvement in air quality is due to permanent and enforceable reductions in emissions; there is an approved maintenance plan for the area; and the state has met all requirements for the area under Section 110 and Part D of the FCAA. However, even if a specific area within the HGA nonattainment area was redesignated by EPA as attainment for ozone, reductions associated with all adopted ozone control strategies would still be necessary because of the requirements of §107(d)(3) and FCAA §175A, which require maintenance plans for all redesignated areas. The maintenance plan must include the measures specified in §107(d)(3) and any additional measures that are necessary to ensure that the area continues to be in attainment with the NAAQS for 10 years after the

redesignation. Eight years after the redesignation, the state is required to submit an additional revision to the SIP for maintaining the NAAQS for 10 years after the end of the first 10-year period.

Additionally, reductions associated with the ozone control strategies that will be implemented outside the HGA nonattainment area will benefit the HGA nonattainment area. This is due to the regional nature of air pollution, the contribution from mobile sources, and the economies of scale and associated market advantages related to distribution networks for some strategies. At the time the 1990 FCAA Amendments were enacted, the focus on controlling ozone pollution was centered on local controls. However, for many years an ever-increasing number of air quality professionals have concluded that ozone is a regional problem requiring regional strategies in addition to local control programs. As nonattainment areas across the United States prepared attainment demonstration SIPs in response to the 1990 FCAA Amendments, several areas found that modeling attainment was made much more difficult, if not impossible, due to high ozone and ozone precursor levels entering from the boundaries of their respective modeling domains, commonly called transport. Recent science indicates that regional approaches may provide improved control of ozone air pollution. The commission has conducted air quality modeling and upper air monitoring that found regional air pollution should be considered when studying air quality in Texas' ozone nonattainment areas. This work is supported by research conducted by the OTAG, the most comprehensive attempt ever undertaken to understand and quantify the transport of ozone. Both the commission and the OTAG study point to the need to take a regional approach to controlling air pollutants.

The commission did not conduct modeling that deleted specific strategies from Montgomery County, nor was modeling conducted to determine the impact of leaving out Montgomery County altogether. However, inventories have been developed that detail the Montgomery County contribution to overall emissions and NO_x. As shown, the Montgomery County NO_x benefit from the 55 mph speed limit proposal is 1.44 tons, which is 0.14% of the 1,046 future base NO_x emissions outlined in Table 3.4-7 on page 3-15 of the HGA SIP proposed on August 9, 2000. This figure is higher than the 0.1% figure stated in a comment by RMT. At times, pollution from Montgomery County can affect the other counties in the area because the wind direction in the HGA area can vary and is not unidirectional. The commission has concluded that both the speed limit and construction shift measures are necessary for the demonstration of attainment.

An individual requested details on the dates that the EPA MOBILE model was last revised to reflect recent changes in engine technology. An individual requested the results of any pilot programs and actual measurements conducted that confirm the effectiveness of lowering the speed limit. An individual commented that a summary of the MOBILE5a model should be in the SIP, in particular an analysis of the uncertainty. NMA commented that for years, automobiles have been manufactured that produce zero NO_x emissions at 70 mph. An individual requested information on average emissions by vehicle

class at various speeds for given distances or times. J&S asked whether cars and trucks are more efficient at 55 mph or at 70 mph. An individual inquired as to why 55 mph was chosen instead of a higher or lower speed limit. Comments were received from 34 individuals that reducing the speed would result in more travel time on the road and more congestion. Dayton Pipe asked how lowering the speed limit would reduce emissions if cars are on the road longer. J&S asked "What about more time on the road at 55?" Three individuals commented that resultant traffic jams cost time and money, waste fuel, and increase the response time for emergency personnel. Two individuals commented on diminished quality of life due to less time with the family.

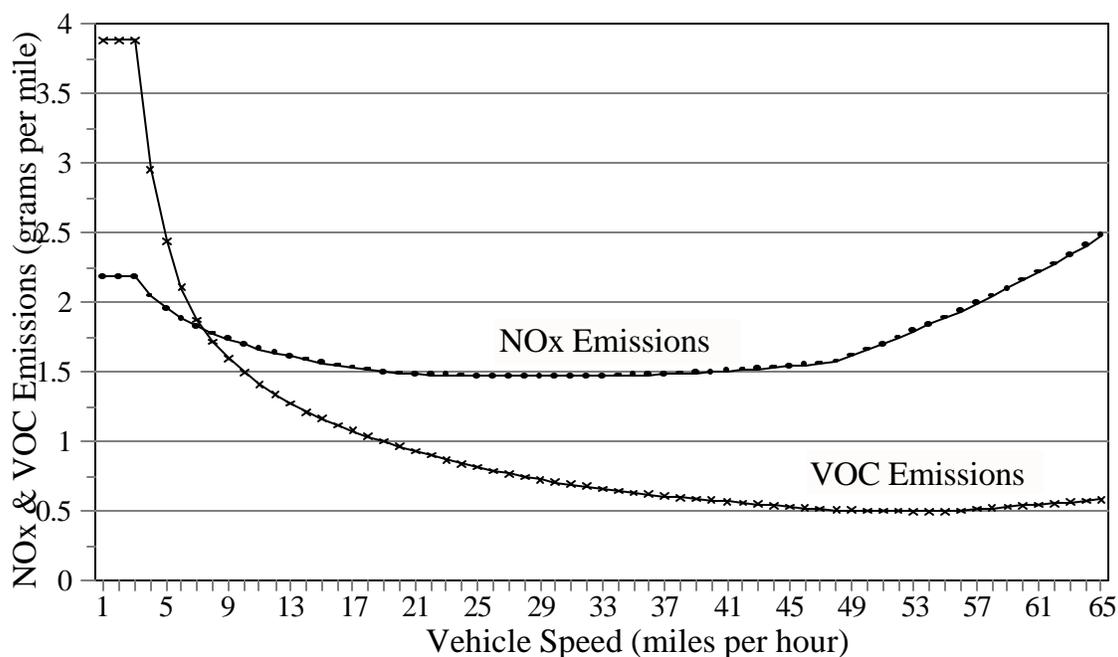
The technical basis for the emission benefits to be achieved from the proposed speed limit reduction is the MOBILE5 emissions model, which is available on the EPA website at <http://www.epa.gov/oms/m5.htm>. Since information regarding the MOBILE5 model is available publicly, the commission does not agree that it is necessary to summarize the model in the SIP. EPA last revised the MOBILE model in October of 1996. At this time, the commission is relying on model data to determine effectiveness of speed limit reductions. After the speed limit change is implemented, the commission anticipates completing an effectiveness study of this measure. EPA collects data on an ongoing basis from various in-use vehicles and codes these data into the MOBILE5 model so that various on-road mobile source pollution control scenarios can be evaluated. Output from the MOBILE5 model suggests that NO_x emissions tend to increase strongly with speed above about 50 mph, while VOC emissions increase slightly with speed above about 57 mph. Provided below is some sample output for a 2007 vehicle fleet from the MOBILE5 model of NO_x and VOC emission rates versus speed (0-65 mph) for all vehicle classes combined, as would be seen on a local street or freeway.

Note that NO_x emissions at very low speeds are in the 2-2.2 g/mi range and slowly taper off and plateau around 1.5 g/mi between roughly 20-45 mph. The NO_x emissions then start to increase sharply up to about 2.5 g/mi at 65 mph. VOC emissions at very low speeds are close to 4 g/mi, but then decrease sharply and begin to plateau around 0.5 g/mi at 45 mph. A slight increase in VOC emissions begins to occur around 57 mph. Note that the graph provided is just a sample based on specific MOBILE5 model inputs. Nonetheless, these outputs are representative of the overall trends of NO_x and VOC emissions as a function of speed within the MOBILE5 model. EPA is tentatively planning to release the next version of its mobile modeling software (entitled "MOBILE6") sometime in 2001. At some time after this tool is available, the commission plans to reevaluate the benefits to be achieved from the proposed speed limit reductions.

As the graph provided above indicates, traffic moving at 65 mph generates roughly 0.6 g/mi of VOC and about 2.5 g/mi of NO_x . At 25-30 mph, traffic generates roughly 0.75 g/mi of VOC and about 1.5 g/mi of NO_x . Thus, the statement that more vehicle pollution is generated at

MOBILE5 Vehicle Emission Rates

Aggregate Sum of All Vehicle Types



lower speeds (such as 25-30 mph) is true for VOC, but is not true for NO_x , and it is NO_x that

is the primary pollutant being controlled for the reduction of ozone levels in the HGA area. In general, it is true that vehicles produce greater emissions under acceleration than under other modes of operation, such as constant speed, deceleration, idle, etc. However, it is incorrect to say that little, if any, pollution is produced at constant speed. The commission does not have any evidence to support the claim that vehicles have better fuel economy at 70 mph than at 55 mph, but will review such information if it is made available.

The commission notes that it is not physically possible to test or measure the impact of reduced speed limits on actual region-wide mobile source emissions, since it is not possible to manipulate only the speed variable while holding all other control variables constant. On-road mobile source emissions estimation using traffic models and the MOBILE emissions model is accepted practice, and is currently considered to be the most accurate method of estimating on-road mobile source emissions. The commission agrees that there are many variables that determine actual speed-related emissions, but notes that EPA requires states to use the MOBILE emissions model when calculating emissions for regulatory purposes. The commission does not anticipate that the speed limit reduction strategy will result in significantly greater travel times.

One individual commented that cars and trucks which are “obviously polluting (smoke coming out the back)” and commuters from the suburbs should be targeted.

The commission agrees with the comment, and in fact has adopted regulations which prohibit operation of vehicles which emit visible emissions for more than 10 seconds. Additionally, the commission has a voluntary program for reporting of smoking vehicles by concerned citizens. This program provides information to owners of smoking vehicles on how to repair their vehicle and prevent visible emissions.

ED, MCA, NMA, JBS, State Representative Robert Talton, and 39 individuals commented that the reduced speed limit would be unenforceable or difficult to enforce. Spring Valley, Missouri City, and 11 individuals expressed concerns about the increased enforcement requirement. Two individuals commented that the additional new police cars and police car idling in general would offset the benefits of the reduced speed limit. Sierra-Houston commented that there is no commitment in the SIP to enforce the speed limit. NMA, CSE and 16 individuals stated that the previous attempt at lowering the speed limit in the 1970s did not work. An individual commented that the SIP presumes that drivers would exceed the posted speed limit by 10% in all cases, when an equally valid assumption could be made that drivers would be likely to exceed a lower speed limit by a greater percentage. An individual stated that the speed limit rule would lead to erosion of respect for law enforcement. Three individuals commented that they would disregard the lowered speed limit. JBS commented that the 55 mph speed limit will make lawbreakers out of 99 percent of Houstonians. Missouri City is concerned about costs associated with enforcement along portions of SH 6 and Beltway 8. CAP expressed concern that some of the proposed strategies are extraordinary NO_x reduction measures and they appear to be

difficult to enforce. CSE commented that individuals are outraged about the requirement that they limit their speed in specific geographic areas.

The commission understands that a number of drivers will exceed the 55 mph speed limit, just as many posted speed limits are currently exceeded on a regular basis. The modeling analysis conducted by TTI to determine the benefits of reducing the speed limit did take non-compliance into account. Although some drivers will exceed 55 mph, the end result is that the average freeway speed, and consequently NO_x emissions, will be reduced as a result of the lower speed limit. In 1974, the federal government enacted the national maximum speed limit rule, which restricted vehicle speed limits to 65 mph on rural freeways, and 55 mph on all other corridors, for highways receiving federal funding. The basis for this rule was to conserve fuel during the 1973 oil embargo and subsequent energy crisis. The national speed limit rule was repealed in 1995 largely because the energy crisis had subsided, not because the reduced speed limit was a failure. The commission has considered the effects of enforcement in its deliberations for this attainment demonstration.

As with all of its rules, the commission will enforce the requirements after the rule compliance date and take appropriate action for noncompliance situations. The rules are enforced by staff in the commission's regional offices, as well as local air pollution control programs. Local governments are not required to enforce commission rules but may sign cooperative agreements with the commission to enforce the rules under TCAA, §382.115, Cooperative Agreements. Local programs can also enforce commission rules without signing a cooperative agreement. The authority of local governments to enforce air pollution requirements is specified in detail in TCAA, §§382.111 - 382.115, and local governments can institute civil actions in the same manner as the commission pursuant to Texas Water Code, §7.351. The commission will work with local officials to ensure enforcement of the SIP and SIP Rules. The commission has existing relationships with pollution control authorities in the City of Houston, Harris County, and Galveston County for enforcement of other commission rules. The agency will continue enforcement relationships with these entities and develop relationships with other local officials as needed to create effective enforcement mechanisms for the SIP and SIP Rules.

Spring Valley and 21 individuals commented that a lower speed limit will have little or no effect on NO_x emissions during rush hours in urban areas, since vehicle speeds already tend to be lower than 55 mph due to traffic congestion. Three individuals commented that vehicles traveling slowly in congested traffic emit more pollutants than vehicles traveling the speed limit. One individual commented that developments such as stadiums in already congested areas just add to the traffic problems. Two individuals stated that slowing down due to congestion only increases NO_x due to increased braking and acceleration cycles. One individual blamed congestion on incompetent and shoddy street repair. One individual commented that vehicles idling due to traffic congestion contribute more to air pollution than vehicles traveling at 70 mph.

The commission disagrees with the comment that vehicles driving at a lower speed will necessarily generate more pollution because they will be on the roadway for a longer period of time than vehicles driving at a higher rate of speed. The amount of pollution generated by a specific automobile is primarily a function of the speed and distance traveled during the trip, and not the amount of time that it took to make the trip. For example, refer to the graph above and assume that a vehicle travels 10 miles at 65 mph. The vehicle would produce roughly 25 grams of NO_x (10 miles multiplied by 2.5 grams/mile) and 6 grams of VOC (10 miles multiplied by 0.6 grams/mile). If this same vehicle traveled that 10 miles at 50 mph, about 16.5 grams of NO_x would be produced (10 miles multiplied by 1.65 grams/mile) and roughly 5 grams of VOC would be produced (10 miles multiplied by 0.5 grams/mile). Certainly, at some very low speeds, higher emissions would be produced. However, it is speed and not time that determines the total emissions produced by a specific vehicle for a given trip.

It is true that vehicles operating at a constant speed along a specific length of freeway, for example, will tend to generate less pollution than vehicles accelerating and decelerating in stop-and-go traffic congestion. The average speeds for both the current and 55 mph speed limit scenarios are broken down in the tables below both by roadway type and by hour of the day. A 24-hour figure is provided along with average speeds for specific hours (12-1 a.m., 7-8 a.m., 10-11 a.m., 2-3 p.m., 5-6 p.m., and 8-9 p.m.) to demonstrate how the average speeds change throughout the day. Please note that only average speeds for the entire 8-county area are provided. These average speeds can vary considerably based on county, time of day, specific roadway link, etc. In addition, these data represent average modeled speeds of all vehicles traveling on specific roadway types. Certainly, individual vehicle speeds vary considerably, particularly on freeways and interstates. Finally, the last table shown below summarizes the differences in average modeled speeds, by roadway type, between the current speed limit and 55 mph speed limit scenarios.

55 mph Speed Limit Reduction Scenario - Average Speeds (mph) in 8-county HGA Area

<i>Roadway Type</i>	<i>24 Hours</i>	<i>12-1 a.m.</i>	<i>7-8 a.m.</i>	<i>10-11 a.m.</i>	<i>2-3 p.m.</i>	<i>5-6 p.m.</i>	<i>8-9 p.m.</i>
<i>Local (Intrazonal)</i>	29.1	30.1	29.9	29.3	29.0	29.2	28.2
<i>Urban Interstates</i>	55.9	57.6	52.0	57.2	56.7	51.5	57.5
<i>Urban Other Freeways</i>	56.6	58.3	52.1	58.1	57.7	51.5	58.2
<i>Urban Principal Arterials</i>	37.2	37.7	36.6	37.8	37.0	35.7	37.6
<i>Urban Other Arterials</i>	31.7	31.9	31.4	32.1	31.6	30.7	31.9
<i>Urban Collectors</i>	32.3	33.3	32.5	32.8	32.4	31.2	32.5
<i>Local (Central)</i>	24.2	24.8	24.7	24.3	24.2	24.3	23.8

<i>Connectors)</i>							
<i>Rural Interstates</i>	9.6	9.5	9.4	9.6	9.6	9.4	9.6
<i>Rural Other Freeways</i>	9.9	9.8	9.9	9.9	9.9	9.9	9.9
<i>Rural Principal Arterials</i>	5.1	5.4	4.8	5.3	5.2	4.9	5.3
<i>Rural Other Arterials</i>	3.8	4.0	3.7	3.9	3.9	3.8	3.9
<i>Rural Major Collectors</i>	3.9	4.0	3.8	4.0	3.9	3.8	4.0
<i>Rural Collectors</i>	1.3	1.3	1.3	1.3	1.2	1.2	1.2

Based on the on-road mobile source inventory provided to the commission by TTI for the 8-county HGA area, roughly 17.0% of the 24-hour NO_x emissions came from 6-9 a.m. and 21.8% came from 4-7 p.m. The corresponding figures for VOCs are 17.5% from 6-9 a.m. and 21.8% from 4-7 p.m. Collectively, this means that 38.8% of NO_x emissions and 39.3% of VOC emissions come from rush-hour traffic. This implies that over 60% of both NO_x and VOC emissions come from non-rush hour traffic in the HGA area.

It is true that vehicles traveling at lower speeds will have longer trip lengths, which will tend to keep more vehicles on the road at any given time. This can have a negative effect on congestion. However, this negative effect will typically only be felt at those times when congestion is going to occur anyway, such as rush hour. By definition, congestion occurs when the free flow capacity of the roadway is exceeded. During the times of day when the number of vehicles on the roadway is below the free flow capacity, a lower speed limit will not lead to congestion. Once the free flow capacity of the roadway is exceeded, the average speed tends to drop quickly, often far below the posted speed limit.

Senator Mike Jackson and one individual commented that the problem upon which we should focus is population. An individual recommended that population be taken into account when setting speed limits, so that more densely populated urban areas would have lower limits, but sparsely populated rural areas would not.

The commission appreciates the commenters' concerns about addressing population, however, that analysis is beyond the scope of this rulemaking.

An individual commented on lost productivity due to lower speed limits. An individual commented that the SIP should include an analysis of the cost of additional driving hours to local governments, employers, and citizens, as well as the cost of additional enforcement. An individual commented that no analysis of the economic impact of speed limit reduction was provided. An individual commented that no cost estimates or sources of funding for changing signs were provided in the SIP. An individual commented that the estimated cost of \$300 to \$600 per sign for the new speed limit is a waste of tax dollars.

The commission appreciates the commenters' concerns about cost analyses and economic impacts. However, because this measure is strictly a SIP initiative and not a rulemaking, the requirements of Tex. Gov't Code § 2001.024 are not applicable. The speed limit reduction measure is one that is needed to help the HGA achieve the ozone NAAQS by 2007. This measure is easily implemented over a broad area, therefore the commission continues to support this measure. The commission disagrees that this measure will result in a waste of tax dollars, and in fact, the SIP is intended to avoid imposition of federal sanctions that could include the withholding of federal highway funding that would result from failure to demonstrate attainment. Both the proposed and adopted versions of the SIP contain TxDOT cost estimates for sign replacement, namely, \$300 for small signs and \$600 for large signs.

An individual stated that some commercial and residential property values could decrease as a result of the reduced speed limit.

The commission does not understand the alleged correlation between decreasing commercial and residential property values and the reduction in speed limits.

An individual commented that the commission cannot regulate speed limits, since that authority belongs to TxDOT. Another commenter stated that the commission is not the agency for setting speed limits in the state. TxDOT commented that the Harris County Toll Road Authority (HCTRA), not TxDOT, establishes speed limits for toll roads in Harris County. TxDOT stated that if speed limits are to be changed on toll roads, the commission will need to establish a plan, procedures, and timelines with HCTRA.

TxDOT, acting in conjunction with the commission, adopted environmental speed limit rules on May 25, 2000. These rules allow TxDOT to lower speed limits by up to 15 mph for environmental considerations based on requests from the commission. Any proposed reduction must be a control measure within an area's air quality plan or be a part of the area's transportation conformity demonstration.

An individual commented that the emissions from production and sale of radar detectors would offset any pollution reductions from the speed limit rule.

The commission has no specific information on emissions resulting from the production and sale of radar detectors. However, due to the large amounts of NO_x emissions coming from motor vehicles, it is likely that the benefits of reducing the maximum speed limit to 55 mph will significantly outweigh the increased pollution that will be generated from the manufacture and sale of additional radar detectors.

An individual commented that the speed limit proposal does not account for the large reductions in mobile source emissions over the past several years, resulting from improved emissions control

technology. Another individual commented that these improvements were not accounted for between 2000 and 2007.

The commission disagrees with these comments. In estimating the NO_x reductions achieved by the 55 mph speed limit, the commission used vehicle fleet data projected for 2007. Therefore, the improvements in emissions control technology are reflected in the emissions reductions resulting from the speed limit measure. The state is required to submit ROP plans that show continued progress toward achieving the ozone standard. In the current SIP, ROP plans are being submitted for the 2002 and 2005 milestone years, and for the 2007 attainment year. Each ROP plan provides projected emissions in the point, area, on-road, and non-road inventories, and documents creditable reductions for each of these inventory sectors. Credit is specifically taken for reductions in on-road mobile source emissions resulting from fleet turnover and improved emissions control technology.

An individual commented that the SIP presumes that drivers would exceed the posted speed limit by 10% in all cases, when an equally valid assumption could be made that drivers would be likely to exceed a lower speed limit by a greater percentage.

Two underlying assumptions support the modeled results: 1) the modeling assumes no emissions reductions from vehicles on roadways where the models indicate traffic is moving slower than the reduced speed limit and 2) the modeling assumes that vehicles will travel at speeds ten percent higher than the reduced speed limits. The commission agrees that other assumptions may be valid, but believes that the assumptions currently used are appropriate. The commission anticipates future evaluation of the effectiveness of the speed limit change.

An individual questioned whether higher speed limits will be reinstated once attainment is achieved.

Any control strategy submitted as part of the attainment demonstration becomes an integral, enforceable element of the SIP. Once the HGA area reaches attainment, it must maintain the control strategies necessary to keep the area in attainment. Therefore, the reduced speed limit will be continued unless other measures achieving equivalent emission reductions are implemented.

Two individuals recommended that alternate routes or wider roads be developed to disperse traffic. Four individuals recommended improvement of signal timing, acceleration of construction schedules, and compressed work weeks as an alternative to speed limit reductions. An individual recommended that congestion pricing, or road fees, be imposed to reduce traffic, and that the state gasoline tax be correspondingly reduced to balance the additional road fees. An individual commented that tachographs, which are installed on trucks to automatically measure and record speed at all times, would be an effective way to enforce truck speed limits. An individual commented that if the commission wants to ensure total compliance with a 55 mph speed limit, speed governors should be put

on each vehicle in the HGA area to prevent exceeding this limit. An individual recommended this strategy for all government vehicles.

The commission has researched roadway expansion and found that it rarely reduces pollution, and sometimes does not even reduce congestion along certain portions of that roadway. If the number of vehicles traveling on a roadway were kept constant at various times throughout the day, then increasing the number of lanes on that roadway would certainly result in a lesser amount of congestion. Adding more lanes to a roadway often attracts more traffic to that roadway and thus, the congestion problem is not solved. This problem has confounded transportation planners for decades. Typically, expanding the number of lanes makes a highway more desirable for travel, and traffic increases—sometimes beyond its free flow capacity—which leads to congestion. In addition, roadway expansion often attracts more residential and commercial development, which can further exacerbate traffic congestion problems. Synchronization is a component of the transportation control measures implemented by HGAC. Road fees and gas taxes are not within the jurisdiction of the commission. Compressed work weeks are included in the commute solutions program being implemented by HGAC as a VMEP measure. The commission appreciates the suggestion that it require installation of speed governors, but believes that installing governors on private and commercial vehicles, or specifically on government vehicles, is beyond the scope of the current SIP action.

An individual commented that less stringent speed limits on tollways, up to 70 mph, should be extended to other types of suitable highways. RAQCG and Harris County recommended that the speed limit in Harris and surrounding counties be revised by reducing all currently posted speed limits by 5 mph, based on VMT and emissions reductions. Public Citizen opposed speed limit reductions of only 5 mph in Liberty, Chambers, and Waller counties. Harris County recommended reducing the speed limit only on freeways in urbanized areas. An individual recommended reducing the speed limit to 55 mph within the Houston city limits, and to 60 mph throughout the remainder of the 8-county HGA area. One individual recommended a 65 mph speed limit throughout the HGA area, five individuals suggested 60 mph, and one individual suggested 50 mph. Spring Valley and an individual suggested that the maximum speed limit on expressways in urban areas be limited to 55 mph, while for rural areas, the speed limit remain at 70 mph for passenger vehicles and a 55 mph limit be considered for diesel trucks. An individual recommended that the speed limit be lowered only within the Houston city limits, not in the rural areas. Lake Jackson recommended that speed limits in rural portions of HGA be kept at 65 mph and 70 mph, while progressively lowering the limit as Houston is approached. Lake Jackson suggested it would be logical to keep SH 288 at 70 mph until SH 6 and then lower the speed limit to 60 mph, lowering it again at Beltway 8 to 55 mph, and finally lowering it once inside Loop 610 to 50 mph. Chambers County Judge Jimmy Sylvia expressed general support for the 55 mph speed limit, but stated that some of his constituents feel that the 55 mph speed limit is not appropriate for rural I-10 between Clear Bridge and Beaumont. Lake Jackson questioned the value of a lower speed limit in rural Brazoria County when one can sometimes travel for miles without encountering another vehicle.

The suggestions to reduce speed limits to no lower than 60 mph are certainly feasible, but less NO_x reductions would occur as a result. The same is true if speed limits were reduced to no lower than 65 mph. If either of these options were implemented, the emission reductions not gained by going to 60 or 65 mph instead of 55 mph would need to be made up by other pollution reduction strategies.

TxDOT recommended maintaining current speed limits on HOV lanes and toll roads, stating that higher speeds there may encourage greater use of these facilities. Three individuals recommended keeping HOV speed limits at 65 or 70 mph. Public Citizen opposed lower speed limits for HOV lanes. One individual commented that keeping HOV speed limits at 70 mph and reducing the freeway speed limit to 55 mph would encourage use of the HOV lanes. An individual commented that roadways should be improved so that rush hour traffic could travel at 55 mph, and suggested construction of additional HOV lanes and two-way HOV lanes.

The use of HOV lanes is a means of encouraging the use of carpooling to reduce congestion by decreasing the total number of vehicle trips occurring on freeways. HGAC is the local metropolitan planning authority that is responsible for determining the structure of the roadway network in the HGA area. The commission has neither the appropriate legal authority nor the technical expertise to determine how HOV lanes and other such features of the HGA transportation network should be designed.

BCCA, REI, ExxonMobil, and Phillips commented that a lowered speed limit rule should not be applied to the entire 8-county HGA area without a technical demonstration that it will result in emission reductions on individual roadways. BCCA supports a speed limit reduction for those roadways where it has been demonstrated through analyses that emission reductions could be expected to occur due to reduced speeds, and urges the commission to work with HGAC to evaluate roadways for use in such analyses. Two individuals endorsed BCCA's positions.

The technical justification demonstrating the effectiveness of the proposed speed limit reductions is provided elsewhere in this analysis of testimony. While it is true that roadways that will have a proposed 55 mph speed limit do not make up a majority of all the roadways, these roadways (defined as the freeways and interstate highways) account for 41.9% of the total vehicle miles traveled in the 8-county HGA area on a given weekday. Of the 139,467,784 vehicle miles of traveled modeled for the Wednesday, September 8 episode day in 2007, the interstates and freeways comprise 58,434,979 of this total. Due to the higher average speeds traveled on freeways and interstates compared with other roadways, the total NO_x emissions from interstates and freeways accounts for 45.9% of the total on-road mobile source NO_x emissions in the 8-county area, which is higher than the 41.9% that the VMT portion would suggest.

An individual suggested a system imposing a range of speed limits from 35 mph to 65 mph, applicable

only in certain communities within certain of the nonattainment counties, from dawn to dusk on weekdays, except on federal holidays, on overcast days with greater than 50% chance of rain, and on days when tropical storm evacuations occur.

The commission appreciates the commenter's proposal, but believes that the suggested scenario would be extremely difficult to implement and enforce. No changes were made in response to the comment. Additionally, this type of strategy would be prohibited by Section 123 of the FCAA.

An individual commented that the unpopular speed limit rule will undermine citizen support for other aspects of the SIP. Five individuals commented that lower speed limits will annoy drivers and increase stress and incidents of road rage.

The commission does not believe that the lower speed limit measure will make most people irritable, or will undermine citizen support for clean air plans. The commission notes that the American public has demonstrated a willingness to adjust their lifestyles for environmental reasons (recycling for example), and believes that many people will be willing to reduce speeds in order to improve air quality. The commission appreciates the commenters' concerns and suggestions for improved driver safety.

An individual commented that driving at slower speeds is boring, which may cause more accidents due to drivers falling asleep.

It is true that driving can become monotonous, thus inducing drowsiness in some people. Drowsiness while driving can occur at any speed, and accidents occurring at higher speeds tend to result in more fatalities than accidents occurring at lower speeds.

MCA commented that the lower speed limit should take into account the model year of cars that are on the road today. Three individuals commented that a differential speed limit should be set up to implement a 55 mph speed limit only for vehicles over a certain weight class, thus encouraging the use of smaller vehicles. Two individuals commented that the speed limit rule attacks all drivers indiscriminately, and suggested that higher speed limits be allowed for vehicles that are more fuel-efficient, have better emissions testing results, or carry more passengers.

The suggestion to exempt low-polluting or other favored vehicles from the 55 mph speed limit as an incentive to purchase cleaner cars is an interesting one. Further study would be required to determine the technical feasibility of applying speed detection and enforcement methods to such disparate classes of vehicles. In addition, it would be important to see if any adverse safety implications would result from the speed differences between certain classes of vehicles.

An individual commented in favor of allowing a 70 mph speed limit October through April. An individual recommended that the speed limit be lowered to 55 mph only during potential ozone episodes. Two individuals commented that electronic signs should be used to notify motorists that the 55 mph speed limit is in effect on ozone days. Three individuals questioned the value of lowering speeds at all times, when violations are recorded only a few days out of the year. An individual recommended lowering the speed limit only during hours of possible ozone formation. An individual recommended that the speed limit be lowered to 55 mph only during the daytime, and raised to 65 mph at night.

It is true that the effects of NO_x emissions on ozone formation are not constant over a 24-hour period. Many factors such as temperature, sunlight, and wind speed and direction affect how NO_x reacts in the atmosphere to form ozone. Nonetheless, it is beneficial to reduce NO_x emissions during all times of the day to reduce overall ozone levels. For example, even though ozone is not formed at 4:00 a.m. due to the lack of sunlight, the NO_x emissions emitted around 4:00 a.m. remain in the atmosphere at surface level (unless removed by a strong wind) and will add to the pool of NO_x which reacts to form ozone later in the morning when the sun comes out. This is also true throughout the entire year. High ozone levels tend to occur when temperatures are relatively high and wind speeds are relatively low. There are times in the HGA area, such as August and September, when the occurrence of high temperatures and low wind speeds are most common. Conditions favorable for the production of ozone can occur at any time throughout the year in the HGA area, thus, a lower speed limit at all times will help to reduce ozone levels. Additionally, imposing controls only during periods when ozone is likely to form is a violation of Section 123 of the FCAA.

One individual commented that engine revolutions per minute (rpm), not speed, creates additional pollutants.

The commission notes that NO_x formation is directly related to the heat in the cylinder of the vehicle engine. Increased rpm is not the only factor related to increased heat in a vehicle engine. The additional power required to move at higher speeds will also elevate temperature in the cylinder and therefore increase NO_x emissions.

One individual commented that reducing the speed limit to 55 mph is probably a good idea, but it is probably unenforceable unless the legislature changes the law on the use of electronic enforcement methods. One individual commented that police should be given smog-testing equipment that allows them to issue fines to cars not complying with emission limitations.

The commission has the authority under the TCAA to impose speed limit changes, which are enforced by local law enforcement agencies using a variety of means, including electronic enforcement methods. The commission also has implemented a program for remote sensing of vehicles to identify gross emitters of vehicle pollution.

One individual commented that the automobile manufacturers should give the option of an engine with a four stroke ratio of less than 0.9 because that will resolve a lot of the problem.

Automobile manufacturers are not limited to using ratios of less than or greater than 0.9 to comply with federal tailpipe standards. Automobile manufacturers have a number of different strategies available to them to meet federal tailpipe standards.

One individual stated that the reduced speed limit proposal is a political move and not an environmental action.

The commission disagrees that the intent in promulgating this rule is political, and notes that this measure is necessary to comply with the timelines provided in 1990 FCAA amendments and subsequent EPA guidance for submitting rules to demonstrate ozone attainment in HGA. Accordingly, Texas has committed to adopting the majority of the necessary rules for the HGA attainment demonstration by December 31, 2000.

Enforcement /Enforceability

An individual commented that the proposed rules are illegal, unconstitutional, and unenforceable. Montgomery County Commissioner Malcolm Purvis and twelve individuals commented that control measures must be enforceable.

In order for the SIP to be effective and to receive EPA approval, the control measures contained in the SIP must be enforceable. The commission believes that adequate enforcement measures exist to satisfy this requirement. As part of each rule proposal and adoption, the commission reviews its statutory authority to adopt such a rule, and believes that all measures contained in the HGA attainment demonstration SIP are within the commission's authority.

Four individuals recommended higher fines for polluters. Seven individuals commented that more enforcement is needed against industry. An individual stated that the commission budgets no money for enforcement, but rather develops rules for others to enforce.

The commission actively enforces its regulations and will continue to aggressively go after polluters.

HDHHS commented that the new SIP rules will entail more enforcement responsibilities for its agency, and expressed a desire to work with the commission and EPA to develop effective enforcement strategies.

The commission appreciates the comment, and looks forward to working toward effective enforcement strategies in partnership with HDHHS. The commission will work with local officials to ensure enforcement of the SIP and SIP rules. The commission has existing relationships with pollution control authorities in the City of Houston, Harris County, and Galveston County for enforcement of other commission rules. The agency will continue enforcement relationships with these entities, and develop relationships with other local officials as needed to create effective enforcement mechanisms for the SIP and SIP rules.

Modeling

ED commented that the commission's gap calculation is scientifically flawed; specifically, 1) Translating the curve to account for measures that do not reduce emissions of NO_x is not valid, since the "fundamental relationship between NO_x emissions and ozone levels has been altered," and 2) the curve was based on Phase 2 modeling, yet is being used with Phase 3 results (Phase 3 included inventory improvements and updated control strategy assumptions). EPA Region 6 commented that "the State should either develop a new relationship between NO_x emission levels and the modeled ozone concentrations, or adequately demonstrate why the relationship remains the same."

The commission disagrees with the comment. The commission recognizes that some of the relationships between ozone and NO_x may change as the modeling inputs change. The commission utilized the technique of translating the curve to pass through a new (O_3 , NO_x) ordered pair, as was done by EPA Region 6 when the original gap calculation was performed. Translating the curve accounts for much of the change in the relationship between NO_x and ozone. The commission has performed the necessary modeling analyses required to redevelop the O_3/NO_x curve, and this new relationship was used to calculate the final gap. This analysis was also explained in Chapter 3 and includes additional modifications made to the modeling inventory in response to other comments received.

EPA Region 6 noted that equation (4) as quoted in the SIP proposal yields a NO_x value of 321 tpd, instead of the 317 tpd reported.

The commission appreciates the comment, and notes that the discrepancy was the result of a typographical error in equation (4) which has been corrected in the final SIP revision.

EPA Region 6 noted that the emissions used in the modeling were larger than the emissions reported in Table 3.5-3.

The commission appreciates the comment and notes that Region 6 modeling staff directly calculated emissions in the 8-county nonattainment area by summing emissions in the grid cells in those counties. The staff then compared the results to reported emissions, and noted

a sizable discrepancy. The commission modeling staff met with Region 6 modelers on October 4, 2000 to attempt to resolve this discrepancy, and as a result discovered an error in the modeling input files prepared by the commission's modeling contractor. The files used in the modeling had double-counted the shipping emissions, along with some minor errors affecting railroad emissions and Louisiana area source emissions. The problems have been corrected and the control strategy modeling was revised to account for these corrections. The area/non-road mobile source emissions in Table 3.5-3 were correct (i.e., contained what should have been in the model), and are not changed.

ED suggested a "scientifically sound alternative approach" to calculating the gap. ED suggested that instead of translating the curve, an "adjusted ozone target level" be calculated which increases the threshold above 124 ppb to account for measures which do not reduce NO_x emissions.

While the commission appreciates ED's suggestion, it was not necessary to use either the suggested approach or the translation approach. The additional modeling used to re-establish the O₃/NO_x relationship already includes all the measures which do not reduce NO_x, so neither approach was necessary.

ED commented that the commission should use photochemical modeling to demonstrate that the HGA control strategy is adequate, rather than relying on a "gap" calculation. ED also commented that if the commission continues to use a Gap methodology that it should include additional documentation that the adopted control strategy will reach attainment of the ozone standard.

The commission disagrees with the comment. A methodology for demonstrating attainment using a gap calculation was provided in a 1999 EPA Guidance document. The intent of this document was to provide areas a means to show attainment without additional modeling. The particular gap methodology used in HGA was developed by EPA Region 6 specially for the HGA region, since the methodologies proposed in the Guidance were not applicable to the case in HGA. The commission accepts Region 6's methodology as a valid means of demonstrating attainment of the ozone standard. The commission has included several Weight-of-Evidence (WoE) arguments in both the 1998 and 1999 SIP revisions which point towards the HGA area reaching attainment by 2007. In addition, the commission has committed to performing a mid-course evaluation in the 2004 time frame to determine whether or not the area is on track to reach attainment. If the current strategy is found inadequate during this review, then additional measures to bring the area into attainment will be considered at that time.

EPA Region 6 commented that the modeling inventory for 1993 is significantly higher than the 1990 inventory.

The commission appreciates the comment and notes that the following language has been

added to the current SIP revision: The modeling inventory was based on the Coastal Oxidant Assessment for Southeast Texas (COAST) special study, and represents the best available characterization of the specific episode days modeled. Since 1990, many enhancements have been made to the modeling inventory, some of which have increased the emissions while others have decreased them. The 1998 and 1999 SIP revisions, along with this SIP revision, detail the evolution of the current modeling inventory. Thus, the emissions modeled in this attainment demonstration differ substantially from the 1990 base inventory, as expected.

Cliff Dusek, on behalf of Brazoria County, commented that there is no conclusive proof that emissions of NO_x in southern Brazoria County contribute to ozone levels in Harris County. He commented that even if the proposed regulations are implemented, there is no guarantee that ozone levels will come into compliance. Mr. Dusek also commented that the model was based on 1993 data and is being used to predict ozone formation in 2007, and thus can't be verified.

The commission appreciates the comment, and notes that the transport of ozone-forming chemicals has been conclusively demonstrated both in modeling and ambient air analyses over distances far greater than that from southern Brazoria County to downtown Houston. In fact, emissions from Brazoria County may well contribute to worsening air quality in Central Texas as well as in the HGA area. Mr. Dusek is correct in stating that there is no guarantee that the proposed measures will lead the area into compliance, but it is a given that strong measures must be taken, in order for the area to achieve compliance. The modeling process used by commission staff is based on the best available science, and is the only federally approved tool available for predicting future ozone levels and their response to proposed control strategies.

The Association of General Contractors (AGC) of Texas commented that shifting construction to start at noon could actually increase emissions. AGC notes that construction contributes 3.5% of total NO_x in the HGA area and that shifting these emissions results in a reduction of less than 1 ppb in peak modeled ozone. The AGC claims that these reductions do not provide any environmental benefit.

The commission disagrees with the comment, and is unaware of any objective studies showing an increase in emissions when construction is performed at night. Even if such an increase does occur, the additional emissions would fall outside the critical early-morning hours which are most conducive to ozone formation. Even though construction emissions form a relatively small fraction of the total emissions in the HGA area, the same can be said of most categories of emission sources. Exempting all source sectors because each individually contributes only marginally to the area's ozone problem would cumulatively result in an inadequate plan for the area's attainment of the ozone standard.

Montgomery County Judge Allen Sadler commented that the proposed controls in Montgomery County will reduce peak ozone on the worst day by less than 0.1 ppb. State Representative Ruben

Hope, Jr. commented that controls in Montgomery County “wouldn’t make a whole lot of difference.” Montgomery County Commissioner Malcom Purvis commented that complying with all the proposed regulations would not make enough difference “to show we’ve accomplished anything.” RMT commented that both the 55 mph speed limit and construction shift in Montgomery County would make insignificant differences in peak ozone in the HGA area.

The commission appreciates the comment, and notes that all eight HGA counties have been designated as nonattainment in accordance with the FCAA. All eight counties contribute to the overall challenge faced by the greater Houston area and must contribute in some way to cleaning the air. However, inventories have been developed that detail all eight counties’ contribution to overall emissions and NO_x. These inventories support the conclusion that in order for the HGA area to reach attainment, each county must reduce its NO_x emissions.

Montgomery County Commissioner Malcom Purvis commented that the problem should be re-analyzed using “real scientific data” before imposing controls in Montgomery County.

The commission agrees that more study is needed, and in fact participated in one of the largest air quality studies ever conducted last summer. The Texas Air Quality Study 2000 (TexAQS 2000) brought more than 300 researchers from around the country to Houston for a 30-day intensive study, which will greatly improve the understanding of the causes and possible remedies for ozone in the HGA area. However, an attainment plan must be submitted to EPA by December 31, 2000, while results from TexAQS will not be usable for regulatory decision-making for at least two years. Thus, the commission must act upon the best science available now. Based upon the results of TexAQS, the commission may submit new SIP revisions to add, modify, or drop rules as necessary to achieve the federal clean air standard.

ExxonMobil commented that using the September 8-11 episode is troublesome because it is the only one of seven episodes modeled that passed EPA’s acceptance criteria.

The commission appreciates the comment, and notes that the model, in some cases, overpredicts ozone formation. However, in other cases ozone formation is underpredicted. Specifically, the commission believes that the model performance for the September 8 episode day is within specified EPA model performance criteria. The commission is confident that it has accurately captured the level of reductions required to demonstrate attainment with the federal ozone standard with this episode.

ExxonMobil commented that on September 8, the day used to calculate the “gap,” the model overpredicted peak ozone concentrations in southwest Harris County by 73 ppb, and that this modeled peak which “is driving the immensity of the proposed HGA control strategy” never actually occurred in the region where it was modeled.

The commission appreciates the comment and notes that the model, in some cases, overpredicts ozone formation. However, in other cases ozone formation is underpredicted. The commission is confident that it has accurately captured the level of reductions required to demonstrate attainment with the federal ozone standard with this episode.

ExxonMobil commented that in the November 1999 SIP revision, the commission acknowledged that it believes the simulated peak is artificially enhanced, that the amount of NO_x reductions required to reach attainment may be lower than what the model is estimating, and that the commission failed to take this fact into account in the current proposed SIP revision.

The commission still believes that the simulated ozone peak on September 8 may be artificially enhanced because of being displaced westward from the observed area of high concentration over Galveston Bay to a biogenic emission-rich area in southwestern Harris County. This argument was presented as WoE in the November 1999 SIP revision. The commission will continue to analyze the causes and possible ramifications of this situation, and plans to reassess the conclusions of the modeling in the 2003-4 mid-course review.

ExxonMobil commented that EPA Region 6 also noted the poor model performance in the southwestern quadrant of Harris County and offered to work with the commission to address this mutual concern, but the latest simulations show no evidence of success.

The commission appreciates the comment, and notes that Region 6 has continued to work closely with commission modeling staff to improve the modeling in the HGA area, both through analysis of the current modeling and through participation in the planning for the TexAQS 2000. Region 6 and commission modeling staff will continue to work together to identify concerns and improve the inputs to the model.

ExxonMobil commented that the commission has not presented any evidence that the model is accurately simulating NO_x, VOC, or intermediate products in the vicinity of the simulated September 8 peak, and that the commission has not presented additional evidence supporting the extreme nature of the September 8 ozone predictions.

The commission appreciates the comment, but unfortunately, none of the monitors in southern Harris County recorded NO_x or VOC measurements during the September, 1993 time period, so it is not possible to compare measured and modeled ozone precursors (or intermediates) in that location. It should again be noted that the model did not overpredict ozone on September 8, but rather underpredicted the HGA peak by 27 ppb, so the “extreme” nature of the prediction is justified by observations. The real issue is the model’s lack of responsiveness to reductions in emissions, which the commission has addressed. Finally, in the current context, observation-based models (OBMs) are of limited utility, since they only apply to observed situations—OBMs cannot be used directly to make inferences in scenarios where conditions

differ markedly from the currently observable state (such as in the case of future large reductions of NO_x emissions).

ExxonMobil commented that the modeling for September 8, 1993 is flawed, and that this day should not be used as the controlling day. They recommended that the control strategies should be based on September 10 or 11, which showed better model performance than on September 8, and that using these days would reduce the NO_x and VOC emissions “gap” to 21 tpd and 37 tpd, respectively. ExxonMobil further commented that using the September 8-11 episode is troublesome because it is the only one of seven episodes modeled that passed EPA’s acceptance criteria.

The commission modeling staff, along with their support contractors, have extensively studied the question of the appropriateness and accuracy of the September 8, 1993 modeling episode for control strategy development. The commission technical staff believe that the modeling being submitted in support of this SIP submission is technically supportable as accurately characterizing the effects of NO_x emission reduction strategies proposed for the HGA area. The commission staff have also consulted with EPA technical staff, who concurred that the September 8 episode day meets their requirements for such modeling, and presents a reliable and accurate modeling scenario for ozone attainment demonstration in the HGA area. While there are areas of the modeling simulation on September 8 that could be improved, the overall model performance is acceptable under EPA criteria, and is clearly better than that seen on September 9 or 10. Model performance on September 11 was similar to that observed on September 8, but is not suitable to design control strategies, since it was a Saturday. Controls based on that day would still need to be shown to be effective in controlling ozone on a weekday, since the Saturday emissions from mobile and area sources differ considerably from their weekday counterparts. The commission has concluded that there is insufficient evidence at this time to justify removing September 8 from the set of days used in the control strategy development. Additional information can be obtained from the modeling staff.

The September 8-11 episode was the only one of four COAST episodes that showed acceptable model performance for HGA and BPA, but the August 31-September 2, 1993 episode (selected primarily for the BPA area) performed well in the BPA area. Also, two episodes modeled in the 1994 SIP revisions showed good performance in both areas for some days. The recently completed TexAQS 2000 will provide a vast array of information which will enhance our understanding of ozone formation in the HGA. This new information will allow the commission to confirm or modify its current understanding of the reduction needed in the HGA area to reach attainment by 2007.

TxOGA commented that the rules should allow VOC credits to be used to some degree for meeting the cap requirements, and claims that such a move is easily justified because of uncertainties in the modeling process.

The commission notes that the modeling does show some ozone reduction associated with reductions in emissions of VOC, but strongly favors NO_x reductions. It is extremely difficult to establish a NO_x/VOC equivalency with respect to ozone formation, since ozone production is affected by the timing, location, and chemical composition of VOC emissions as well as the magnitude. The commission will reevaluate this relationship as part of the mid-course evaluation.

BCCA commented that it supports increased federal and state funding for air quality studies, and indicates that it is difficult for anyone to feel comfortable with important decisions being made based on an imprecise model. An individual commented that there needs to be significant investment in modeling capability to better reflect Houston atmospheric, meteorologic and biogenic conditions.

The commission agrees that if additional state and federal funding for air quality studies were identified, including funding to assimilate the results of the TexAQS 2000 into the science behind the regulatory process, the model could be improved. The commission is confident that its control program is directionally correct, that is, reductions of emissions of NO_x will be necessary in order for the area to reach attainment. Future modeling enhancements, such as the incorporation of TexAQS 2000 data into the modeling process, will allow the amount of reductions necessary to reach attainment to be determined more precisely.

MCA commented that the modeling may not accurately represent emission sources in the HGA area, and consequently the effectiveness of proposed control measures. MCA also commented that the modeling must account for all known variables, including land-sea breeze effects, daylight savings time, and the model years of cars on the road today.

The commission has continually worked to ensure that its modeling inventory is as accurate and as current as possible, and intends to continue these efforts for the foreseeable future. As improvements are made, they are incorporated into the modeling process, providing improved assessments of the efficacy of control strategies over time. The modeling currently accounts for daylight savings time and uses current vehicle registration data. The episode modeled also included land-sea breeze effects. The commission will take the land-sea breeze flow reversal characteristics of episode days into account when new episodes for HGA are selected to model.

Baytown City Councilman Calvin Mundiger commented that if all Harris County industry were shut down, the area would still not meet federal clean air standards, and that the modeling is only accurate to a 35% margin of error.

The commission appreciates the comment, and notes that the commission has stated that in order to achieve attainment, reductions from all source categories will be necessary. The margin of error quoted by the commenter is the maximum allowable value of the normalized

gross error statistic used by EPA to assess model performance. The actual values for the four episode days modeled were somewhat lower, ranging from 23.6 to 28.2 percent.

Jenkins & Gilchrist, on behalf of TXI Operations, L. P., commented that its lightweight aggregate kiln is “an extremely small contributor to the total point source NO_x emissions in the HGA area, and claimed that it is “widely known that the ozone problem in nonattainment areas is largely the result of mobile source emissions.”

The commission notes that while mobile sources contribute a significant share of the ozone-forming pollutants in the HGA area, modeling analyses show that reducing mobile source emissions alone will not be sufficient to bring the area into attainment. In Houston, point sources contribute about half of the anthropogenic emissions of NO_x and about 30% of anthropogenic VOC emissions, which means that paradigms which apply to mobile source-dominated areas are not applicable in HGA.

Sierra-Houston commented that the proposed SIP revision uses WoE instead of using modeling to directly demonstrate attainment.

The commission used a methodology for demonstrating attainment using a gap calculation that was provided in a 1999 EPA Guidance document. The intent of this document was to provide areas a means to show attainment without additional modeling. The particular gap methodology used in HGA was developed by EPA Region 6 specially for the HGA region, since the methodologies proposed in the Guidance were not applicable to the case in HGA. The commission accepts Region 6’s methodology as a valid means of demonstrating attainment of the ozone standard. The commission has included several WoE arguments in both the 1998 and 1999 SIP revisions which point towards the HGA area reaching attainment by 2007. In addition, the commission has committed to performing a mid-course evaluation by 2004 to determine whether or not the area is on track to reach attainment. If the current strategy is found inadequate during this review, then additional measures to bring the area into attainment will be considered at that time.

An individual commented that she had downloaded emissions inventory information from the Internet, and believes the effects of these emissions are cumulative.

The commission used modeling analyses of the HGA area that indicate that pollutants emitted on one day can remain in the area for two or more days under the right meteorological conditions. The commenter is correct in asserting that these pollutants can accumulate over a period of days.

An individual commented that the commission should “go after the people that have the ability to correct the pollution problem in Harris and surrounding counties,” and said, “The Auto manufacturers

and the Oil companies can correct our air pollution problems by the time they must be placed in effect to make EPA happy.”

The commission notes that although automobiles and industrial plant emissions certainly are contributors to ozone levels in the HGA area, they only comprise a part of the problem. In the 1993 base-year inventory, light-duty gasoline vehicles contribute about 19% of anthropogenic VOC emissions and 17% of anthropogenic NO_x emissions, while oil refining, chemical manufacturing, and related industries are responsible for about 20% of anthropogenic VOC emissions and 31% of anthropogenic NO_x emissions. Together, these sources contribute about a third of anthropogenic VOC emissions, and slightly less than half of anthropogenic NO_x emissions. So, while an effective control program must include reductions for these sources, reductions must be made to the other sources as well, since modeling indicates that anthropogenic NO_x emissions must be reduced by at least 70% to reach attainment.

GBCPA commented that the proposed Bayport expansion could add 5 to 10 tpd of NO_x emissions per day if expanded to full capacity, and commented that these emissions have not been included in the “growth” emissions of the SIP. ED commented that the commission failed to account for new non-road sources in the region, including the voter-approved Bayport expansion.

The commission disagrees with the comment. The 2007 projected emissions from shipping were estimated by Starcrest, Inc. as part of their revised shipping inventory for the HGA area. Emissions from ships in the Houston area ports were explicitly included in the 2007 estimates, including a forecasted growth rate which will likely occur regardless if the planned Bayport expansion is completed or not. Emissions from construction equipment and heavy-duty diesel trucks were grown using demographic growth projections, hence include by default increases in activities such as those associated with Port growth.

An individual commented that it is time to “stop attainment ‘by standard’ through modeling,” “stop this illegal version of the State Implementation Plan you have based on inaccurate emissions inventory records,” and “stop your trumped up transportation modeling exercises and poor modeling assumptions.”

The commission notes that the 1990 FCAA Amendments set forth the methodology for areas to demonstrate attainment of the NAAQS. For areas designated Serious and above, this methodology required the use of photochemical grid modeling to demonstrate that the standard would be achieved by the area’s attainment date. The commission is thus required by federal law to demonstrate attainment through modeling. The staff have continually worked to improve the emissions for well over a decade. The commission modeling uses what is probably the best large-scale inventory of biogenic emissions ever developed. The commission has conducted several surveys to improve the emissions of specific categories, including shipping, construction, boating, and others. The transportation modeling used to

provide mobile-source emissions to the photochemical model is based on highly detailed travel-demand modeling using demographic projections developed by HGAC. All emissions estimates used in the modeling process use EPA-approved methodologies. Modeling assumptions are set forward in a protocol which is reviewed by the EPA regional office early in the modeling process, and updated as enhancements are made along the way.

Entergy Texas commented that “despite model performance statistics that fall within EPA’s guidelines for acceptability, serious reasons exist for doubting whether the model is simulating the meteorological and chemical processes with sufficient accuracy to predict the outcome of future emission reductions.” Entergy Texas further commented that the modeled peak ozone levels that are driving the control strategy are “just aberrations of poor model performance in a limited area of the modeling domain” and that the proposed emission reductions are based on a single day, September 8, in an area where the model overpredicted the observed peak by 50 parts per billion.

The commission agrees that the performance statistics for all four days modeled fall within the EPA guidelines for acceptability. As is always the case in a photochemical modeling exercise, there are areas within the simulation that do not correspond exactly with observations. In this case, the modeled wind fields tend to move the ozone plumes formed on all four days away from the areas where the highest concentrations were observed. This tendency does not in itself mean that the model is not usable for developing control strategies. Probably the most serious effect is to disperse the ozone plume more than would have happened in reality, thus producing peak ozone levels below the measured maximum values on three of the four episode days. The modeled peak on September 8 is pushed west of the observed peak, but underpredicts the observed peak concentration by 27 ppb. So while the model did overpredict locally by about 50 ppb at the Croquet monitoring site, this does not mean the model is producing higher ozone concentrations than were measured on that day, only that the model misplaced the peak. While September 8 is the day requiring the most control to show attainment, the modeling demonstration relies on four episode days (September 8 -11). September 8 is the focus of attention only because it is the most difficult day to control. The attainment demonstration must show that all days modeled are brought into attainment, not just September 8.

HGAC commented that the commission should “Continue to support improving the modeling process, including conformity analysis, and include the appropriate improvements in the SIP as soon as practicable,” and should model additional episodes for the mid-course review.

The commission agrees that the modeling process should continue to be improved, and in fact recently participated in the TexAQS, which will provide a rich set of data which can be used in model validation/enhancement efforts prior to the mid-course review and for years thereafter. The commission also plans to model at least one additional episode from the TexAQS period.

Sierra-Houston commented that the entire effort (the current proposed SIP revision) is “woefully inadequate” for showing attainment of the NAAQS.

The commission disagrees with the commenter. The commission has used EPA-approved modeling and analysis tools to show the proposed plan will achieve federal clean air standards by 2007, the area’s mandated attainment date.

Sierra-Houston commented that the proposed SIP revision does not contain a model run that shows attainment of the standard, and uses a method for showing attainment not used anywhere else in the country. Sierra-Houston further commented that the emissions inventory used in the modeling is incomplete.

The commission disagrees with the commenter. The overall methodology for demonstrating attainment is one that has been approved by the EPA and is an established and valid way of demonstrating attainment. Attainment is demonstrated using a WoE technique advised for use by EPA Region 6 for the HGA area. Emissions from all significant categories of known emission sources are included in the modeling.

Sierra-Houston commented that WoE is not appropriate for the HGA area (along with the DFW and BPA areas). They again note that the method used to show attainment is not allowed anywhere else, and that the two methods used elsewhere are not applicable to the HGA area. Finally, they comment that WoE consists of shaving measured and modeled peaks to allow attainment to be shown more easily.

The commission notes that the EPA has allowed WoE to be used in attainment demonstrations across the United States for areas which have had difficulty showing attainment via the deterministic test. The reason for this allowance is that the deterministic test is in reality much more stringent than the actual standard, which allows occasional exceedances of the standard. In 1999 EPA published guidance for demonstrating attainment by calculating a shortfall (gap) based on two linear extrapolation methods. Neither method was found appropriate for the HGA area, where the ozone response to reductions of NO_x is nonlinear. Thus EPA Region 6 developed a nonlinear method which could be applied in the HGA area, and this method was used in the proposed SIP revision. Finally, WoE can consist of a wide variety of analyses which can be used to augment the modeling demonstration. While some methods involve averaging measured and/or modeled peak ozone concentrations, the method used in the current SIP proposal to calculate the gap does not.

Sierra-Houston commented that the commission “arbitrarily reduces the NO_x emissions by saying this would be in line with VOC/NO_x ratios known by monitoring,” and that the commission applies changes which bring the area closer to attainment “whether the commission has proof for the changes or not.”

The commission disagrees with the commenter. The emission changes described in the proposed SIP revision were all based on scientifically valid survey methods and reviewed by EPA Region 6. No emissions were changed arbitrarily. The proposed SIP revision cites ambient VOC/NO_x ratios to provide independent evidence that the model changes were valid. During the course of developing the HGA SIP, the commission has made numerous improvements to the modeling inventory, several of which have increased emissions.

Sierra-Houston commented that the model continues to underpredict significantly and that the modeling performance is not acceptable.

The commission disagrees with the commenter. Model performance on all four episode days meets EPA performance criteria. Although the model did underpredict the observed peak ozone concentrations on three of the four days, the modeled predicted ozone concentrations in excess of 170 ppb on all days, with a maximum of 187 ppb on September 8.

Sierra-Houston commented that the commission uses local growth forecasts in developing future inventories, and that growth forecasts should be validated by comparing previous forecasts with observed growth.

The commission uses local data whenever possible in developing both base and future case inventories. The foremost reason is that local organizations generally are more knowledgeable about conditions in the area than are outside parties. The growth forecasts developed by the local council of governments are used in urban planning for the region, and therefore should provide a reliable basis for estimating future activities.

Sierra-Houston commented that “TNRCC underestimates emissions and defines away the NO_x gap,” and observed that the commission “miraculously” finds less pollution when faced with approaching SIP deadlines, but increases emissions estimates after SIP approval.

The commission notes that the method for calculating the NO_x gap was developed and approved by EPA Region 6 for application to the HGA area. The commission continually updates and improves its emissions inventories, which sometimes results in increases or decreases of the inventory.

Sierra-Houston commented that the commission does not know how much population, employment, change in population, and change in employment account for construction and growth, therefore does not know how to estimate emissions from growth, leading ultimately to inaccurate modeling results.

The commission disagrees with the commenter. Virtually all modeling analyses of any kind involve assumptions; these assumptions introduce some uncertainty in the result. In the case in point, the commission modeling staff replaced an assumption—that urban areas do not

expand geographically over time—with an assumption that is more realistic—that the urban areas do in fact expand geographically, and therefore future emissions from some sources will occur across a broader area than in the base case. While it is difficult to predict exactly how this growth will occur, the commission devised what it believes to be a reasonable methodology for allocating these future emissions spatially.

Sierra-Houston commented that modeling with CAMx does not show attainment of the standard.

The commission notes that while the control strategy modeled did not by itself show attainment, additional analysis determined the shortfall between this strategy and what would be needed for attainment (in NO_x tpd). The commission demonstrated attainment by developing reduction measures to cover the shortfall.

Sierra-Houston commented that the commission admits that there has been no model run with the specific rules proposed, instead modeling an across-the-board 90% NO_x reduction, and that the commission has no SIP that the public can review and comment upon with accurate modeling.

The commission appreciates the comment and notes that since the SIP revision was proposed, the commission has revised its modeling of point source emissions. Now, specific emission rates are modeled for all major electric generation facilities in the area. Other point sources (with the exception of some minor sources of NO_x such as flares) are now assumed to be reduced by about 85% overall. It is reasonable to assume an across-the-board reduction for the non-electric generation sources, since the commission plans to institute a cap and trade program for the area. Thus, modeling explicit reductions for all sources would be of limited benefit, since many sources will doubtless trade emissions allowances among themselves.

Sierra-Houston commented that Strategy H2 is flawed, and did not show attainment.

While the commission disputes the assertion that Strategy H2 is “flawed,” it agrees that the strategy did not show attainment by itself. The current proposed SIP utilizes a methodology for demonstrating attainment that has been approved by EPA and the commission has committed to a mid-course review to further refine any control measures, as appropriate, to ensure attainment.

Sierra-Houston commented that the modeling does not show attainment. They comment that the gap was reduced from 118 to 78 tpd, but the commission is unable to show a complete model run with all controls in place, and that the commission is in the process of revising the point source inventory. They further commented that the public will not have an opportunity to review and comment upon the final version of the model run.

The commission notes that earlier modeling provided in this SIP does indeed show attainment

through the gap analysis. The gap was reduced because of inventory improvements documented in the proposed SIP revision. The final model run was made in response to comments, and is documented in the final version of the SIP amendments, including some minor revisions to the point source inventory which account for additional emissions in the nonattainment counties. The EPA allows public comments during its SIP approval process, so comments on the final modeling run can be made at that time to EPA.

Sierra-Houston commented that on page 6 of the proposal a gap of 81 tpd is quoted, but elsewhere 78 tpd is quoted, and asks which is correct.

The commission appreciates the comment and notes that at the time of the proposal, 78 tpd was the correct figure.

Sierra-Houston commented that reductions of one pollutant should never be traded for reductions of another.

The commission notes that since ozone is a secondary pollutant, it may be reduced by appropriate reductions in its precursors, NO_x and VOC. In some cases, equivalent reductions in ozone may result from reductions of either precursor, and in these cases inter-pollutant trading may be considered, provided that this equivalence can be demonstrated.

An individual commented that the La Quinta trade gateway is proposed for the Corpus Christi region.

The commission appreciates the comment and notes that the HGA attainment modeling conducted to date has used econometric forecasts to estimate future growth in the Corpus Christi. However, specific details about large new sources can be used to develop more accurate future inventories. The commission invites stakeholders to provide detailed information about projects such as the La Quinta facility so that their effects on air quality can be more accurately assessed in any new modeling analyses.

RAQCG commented that the commission should continue to review the data and modeling used to support the air quality plan, and that the commission and the region should continue to work together to improve the emissions inventory and the modeling.

The commission has continually worked to improve the modeling process through better inventories and better science, and plans to continue this work in the future. Local involvement has always been an extremely valuable asset to the ability to accurately characterize conditions throughout the areas being modeled, and the commission plans to continue working closely with local groups in the future.

CAP commented that the commission should affirmatively demonstrate through photochemical

modeling that whatever mix of control strategies is finally selected will be sufficient to achieve attainment by 2007. Mr. Rittberg, representing Congressman Ron Paul, State Representative Vilma Luna, State Representative Joe Deshotel, Ms. Amy Fitzgerald representing State Senator David Bernsen, Brazoria County Judge John Willy, Mr. Keith Zimmerman representing Montgomery County Judge Allen Sadler, Criminal District Attorney Jeri Yenne of Brazoria County, Lake Jackson City Manager William P. Yenne, five individuals, and ExxonMobil questioned the quality of the science or data, or commented that the SIP should be based on sound science.

The commission has used the best information available, along with state-of-the-science modeling, to develop a plan that is expected to bring the area into attainment by 2007. As new information and better science become available over the next several years, the commission will continue to evaluate plans for the area, and, if necessary, refine the plans to reflect the most current information. The commission has utilized an EPA approved methodology in the final SIP, which combines photochemical modeling and gap analysis to demonstrate attainment.

Sierra-Galveston suggested that the commission is "hoodwinking the EPA" to produce a "successful" SIP.

The commission disagrees with the commenter. The commission has worked closely with EPA to ensure the SIP meets all of their criteria and is approvable.

An individual suggested that the commission employ "forward looking ideas" instead of stop gap measures.

The commission continues to evaluate new technology as it becomes available, and has laid out a plan in Chapter 7 on how it intends to incorporate these ideas into future planning.

Criminal District Attorney Jeri Yenne of Brazoria County commented that the plan "is not logical according to the science," then goes on to say that Brazoria County is unique.

The commission agrees that Brazoria County is unique in that the coastal portion of Brazoria County consists of a very large industrial complex located in an otherwise rural area, directly on the coast. The unique coastal location has an interesting effect. Since the prevailing wind is from the sea, maritime air (devoid of pollution sources) often gives the Brazoria County (Clute) monitor the lowest ozone readings in the State.

Occasionally, a meteorological pattern known as flow reversal occurs. In that case, an early morning (often predawn) land breeze carries emissions from industrial areas out to sea, where they slowly form ozone. In the late morning or early afternoon, the more common sea breeze develops, and returns freshly formed ozone to land, causing very high ozone exceedances.

Even when there is not a flow reversal, the Brazoria County emissions go somewhere and form ozone when conditions are conducive to its formation. Because it often takes an hour or two for ozone to form, and the only Brazoria County monitor is located too close to the major emission sources, ozone often goes undetected when it forms slowly. However, both the Baylor aircraft and the National Oceanic and Atmospheric Administration (NOAA) aircraft have observed ozone plumes downwind of the Clute monitor, while the Clute monitor reported only clean air from the Gulf. Because of the prevailing wind direction, the Brazoria County ozone problem is often worse than data from the Clute monitor indicates due to the ozone being detected at locations other than the Clute monitor.

While Brazoria County is indeed unique, and avoids many of the urban problems that challenge its neighbors, it also has many industrial sources, as do both Harris and Galveston County. Because the industrial sources are similar, they respond to many of the same control measures and should be included in the same plan.

Criminal District Attorney Ms. Jeri Yenne of Brazoria County commented that the scientific theories and modeling have never been tested by the scientific community or a court of law. Brazoria County Judge John Willy commented that he supports improvements in the modeling process, including the transportation conformity analysis, and include the appropriate improvements in the SIP as soon as is practicable. In addition, Judge Willy encouraged the commission to continue modeling for additional episodes for the mid-course correction.

The commission disagrees with the commenter regarding the scientific theories. The use of mathematical, or photochemical modeling, in order to demonstrate attainment of the ozone NAAQS is required by the FCAA, and is generally accepted within the scientific community. The scientific community has accepted the current modeling methods as the best generally available, and the models have been in use for years. While there will always be ongoing scientific debate about how to improve them, their general utility and scientific merit is well-accepted by the scientific community. EPA requires that every modeling demonstration begin with the verification of the computer model. In addition, the commission notes that the model verification must properly explain a documented historical ozone episode, as recorded by the monitors, before it can be used to justify rulemaking. In this case, the modeling replicated the September 8-11, 1993 episode to EPA's satisfaction. Other episodes, which the model could not properly explain, were discarded and are not part of this SIP. The commission continually works to improve the modeling done in support of SIP revisions. Additional episode(s) are currently under consideration.

An individual commented that lightning is associated with ozone formation.

The commission agrees that lightning does cause some ozone to form. However, the ozone problem is much more widespread than thunderstorms, and occurs most often when there are

no thunderstorms nearby. Therefore, the commission believes that manmade sources are a much greater cause of ozone.

State Representative John Culberson and two individuals commented that ozone is a natural substance created by sunlight and oxygen, not industry or automobiles, and its formation is beyond our control.

The commission agrees that oxygen and sunlight are critical to ozone formation, and that a small amount of ozone forms naturally. However, in the HGA nonattainment area, ozone can exceed 200 ppb, and has been observed as high as 251 ppb. Clearly, some manmade process is creating additional ozone and causing these very high levels.

An individual commented that ozone is correlated with high barometric pressure, which is beyond our control.

The commission agrees that barometric pressure cannot be controlled, but believes that we should consider it in our plans. The observation that high pressure is correlated with ozone formation is well-founded. However, high pressure is merely an indicator of the meteorological conditions (subsidence and light winds) that trap manmade pollution near the ground, forcing us to breathe it. By controlling manmade emission sources, we can control ozone pollution.

An individual commented that Better World Technology and United Community Services of America has developed an electrical generating system, based upon ideas of Nikola Tesla, that does not require fossil fuel and does not pollute.

The commission appreciates the comment. Staff found the International Tesla Electric Company & United Community Services of America Web page but were unable to make any type of analysis.

HGAC commented that the “commission and the region should continue to work together to improve the emissions inventory and modeling, and to identify additional, feasible reductions from mobile sources, including transportation control measures and voluntary measures.”

The commission concurs with this statement and will continue to work with HGAC and other local entities to meet the goals stated above.

Brazoria County commented that the on-road mobile source inventory used in the photochemical modeling is inaccurate. As a specific example, Brazoria County referenced a Harris County Tax Assessor Collector study of the registered fleet which indicated that emissions were being overestimated due to use of older data inputs.

The commission used the on-road mobile source inventory for the photochemical modeling that was originally developed in 1998 under contract to the commission by the Texas Transportation Institute (TTI). The development of this inventory is fully documented in Appendix G to the November 1999 HGA SIP. At the time that the inventory was developed, TTI relied on the most recently available registration data to estimate the vehicle type and age distribution of the registered fleet in 2007. When more recent registration data became available, the commission applied adjustment factors to the on-road mobile source inventory to account for the recent trend of an increased number of newer vehicles in the fleet. This trend would tend to make the overall projected fleet in 2007 cleaner, due to being more heavily weighted with newer vehicles. Under contract to the commission, ERG evaluated the impacts of the new registration information and summarized how the 8-county emissions should be adjusted in a November 4, 1999 memo. Beginning with photochemical modeling conducted after this memo was received by the commission, the following reductions were applied to this on-road mobile source inventory to account for updated registration distribution information:

<i>Counties</i>	<i>NO_x Registration Change</i>	<i>VOC Registration Change</i>
<i>Harris</i>	Decrease by 10%	Decrease by 5.2%
<i>Brazoria, Fort Bend, Galveston, & Montgomery</i>	Decrease by 2.8%	Decrease by 0.4%
<i>Chambers, Liberty, & Waller</i>	Increase by 17%	Decrease by 5.4%

In an April 7, 2000 memo, TTI performed an analysis for Harris County of the effects of revised registration distribution data on the overall inventory. TTI's conclusion was that the NO_x emissions for Harris County should be decreased by about 7% and the VOC emissions should be decreased by about 6%. At the time, this 7% NO_x reduction figure amounted to 13.3 tons, which is consistent with figures mentioned in the Harris County Tax Assessor's press release on the issue. Once these data were received by the commission from TTI, appropriate adjustments were made to the Harris County emissions. The adjustments for the other seven counties were consistent with what is listed in the above table.

Over time, newer registration distribution information became available and the registration adjustments changed once again. The basis for these adjustments is a 7-26-00 ERG memo which is provided as Appendix G to the current SIP. The photochemical modeling conducted for the HGA SIP used the following fleet registration adjustments:

<i>Counties</i>	<i>NO_x Registration Change</i>	<i>VOC Registration Change</i>
<i>Harris</i>	Decrease by 4.7%	Decrease by 1.4%
<i>Brazoria, Fort Bend, Galveston, & Montgomery</i>	Decrease by 1.4%	Increase by 2.4%
<i>Chambers, Liberty, & Waller</i>	Decrease by 3.5%	Increase by 0.1%

In October of 2000, a revised inventory was received from TTI for the entire 8-county area. The development of this inventory already has the most recently available registration distribution data incorporated into it. Consequently, no adjustments will be made to it unless and until even newer registration distribution data become available.

Sierra-Houston commented that the on-road mobile source inventory being used in the photochemical model is based on an inaccurate travel demand model. Sierra-Houston stated that HGAC is using a “discredited and inaccurate” motor vehicle emissions budget. Sierra-Houston also stated that the EPA MOBILE5 model used by the commission is inaccurate and underestimates vehicle emissions.

The commission notes that the development of the on-road mobile source inventory used in the photochemical modeling is performed under contract to the commission by the Texas Transportation Institute (TTI). TTI couples the travel demand model output from HGAC with MOBILE5 model runs to develop a full episode-specific on-road mobile source inventory to be used in the photochemical model. The development of this inventory is fully described in Appendix G of the November 1999 HGA SIP. Recently, a revised on-road mobile source inventory was developed by TTI in conjunction with recently revised travel demand model output from HGAC. The commission has very strong confidence in the ability of both TTI and HGAC staff to perform the extremely complex transportation modeling work that they are required to do. Both TTI and HGAC transportation modeling staff have a wealth of experience and are highly regarded as experts in their field.

The commission is aware that EPA’s MOBILE5 model in some cases makes estimates which result in emissions which are not completely accurate. Even EPA is aware of this and is planning to release MOBILE6, an updated and revised version of MOBILE5, in January of 2001. Once MOBILE6 is available, the commission will begin working with TTI, HGAC, and others to develop newer and hopefully more accurate on-road mobile source inventories. In the meantime, the commission is required to use MOBILE5 because it is the latest official mobile modeling software available from EPA. The commission is aware of the imperfections and limitations that exist in the tools used to predict travel demand and mobile emissions. Nonetheless, efforts are constantly being made to upgrade and improve the predictive accuracy of these tools. The commission will always work with TTI, HGAC, and others to

utilize the best available methods for predicting on-road mobile source emissions for photochemical modeling purposes. In addition, the inventories used by the commission are open to public comment and scrutiny.

ED questioned the “speculation by committee members” that a shift in the start of the school year “would result in a three percent reduction in peak traffic.” ED states that this claim is poorly documented, and that the assumptions upon which it is based are poorly justified. Other comments received suggested that the school year schedule change should be implemented because increased emissions from school-based traffic would be delayed until after the peak ozone season was over.

The commission appreciates the comment, and notes that because of the many issues related to the potential effectiveness of school-related strategies for air quality benefits, the commission has chosen not to include these potential strategies at this time.

An individual commented that 2-stroke engines (hand-held equipment) emit virtually no NO_x.

The commission notes that 2-stroke engines generally have low compression ratios, and valve (or port) timing that leads to relatively low combustion temperature and pressures. This means very little nitrogen (N₂) is dissociated to allow NO_x formation. This is also exactly why 2-strokes tend to emit much higher amounts of VOCs from unburnt fuel. VOCs are also highly reactive and contribute to ozone formation. Nearly the exact opposite is true for diesels.

Mr. Cliff Dusek, representing Brazoria County, commented that he has lower estimates for equipment than the commission is using.

The commission disagrees with the commenter. The commission believes its emission inventory for non-road equipment is more accurate than the one presented by the commenter.

Texas Waterway Operators Association commented that federal rules should be included, and thinks the commission means tugs when it says “harbor vessels.”

The commission notes that the entire shipping inventory included the effect of federal rules and fleet turnover. For modeling purposes, harbor vessels are used simply to contrast with ocean-going vessels. Pass-through vessels are correctly part of the modeled inventory. The 2007 future base 8-county harbor vessel inventory is given below to help clarify how these emissions were incorporated into the photochemical model runs:

Category

NO_x, tpd

Assist Tugs	2.21
Ferries	1.16
Towboats	8.54
Dredges	0.56
Barge Pumps	1.20
Harbor Vessel Total:	13.67

Two individuals commented that air traffic pollution is one of the biggest problems in Houston, with one citing Continental Airlines specifically.

The commission notes that the 8-county area has 7.4 tpd NO_x and 4.9 tpd VOC for aircraft in the 2007 inventory, with 7.26 tpd NO_x in Harris County.

An individual commented that the commission should go after flares, not cars and lawnmowers.

The commission notes that flares represent 0.24 tpd of NO_x; cars represent 180 tpd of NO_x. Mowers are not a significant NO_x source, but are a large part of the non-road VOC inventory.

GBCPA commented that the port emissions are underestimated based on comparison to other ports, and specifically mentioned vessels, tugs, dredges, dwelling, trains, trucks, and loading equipment. ED commented that shipping emissions are possibly low, adding that observations from the Baylor Aircraft indicate sulfur dioxide (SO₂) plumes may come from ships, and emissions from ships that were visually observed.

The commission disagrees with the commenter. The HGA Area Vessel Emissions Inventory is among the most accurate ever done. They are especially strong concerning all vessel emissions; emissions modeling was based on a detailed study funded by The Port of Houston and the commission. A related study also did a state-of-the-art study of cargo handling. Further study could improve the inventory for the trains and trucks moving the cargo in and out of the port via trucks and trains. The commission always hopes to improve its emissions modeling, but the Port and shipping have been a major focus, and the commission believes these emissions have been adequately characterized for the emissions modeling. The emissions modeling also includes perhaps the first application of treating ships as elevated sources to more accurately characterize their emissions. The aircraft observations are potentially important for particulate modeling (PM) or SO₂ modeling. Although the SO₂ may be attributable to point sources, it raises the issue concerning the potentially high-sulfur fuels that can be burned by ships.

Three individuals commented that the total NO_x emissions from tugs are overstated, and that an assumption was made that the main engines run 24 hours a day.

The commission disagrees with the comment. The commission's estimates of emissions for towboats were developed by Starcrest, using extensive locally obtained data. As an example, Starcrest used a 47% average time-usage figure for main engines (including 11% at slow).

Sierra-Houston commented that using 1992 data for landings and take-offs provides an inaccurate picture of GSE emissions, and that use of Houston airports has increased tremendously since 1992. Sierra-Houston also commented that 100% electrification is not likely.

The GSE inventory includes growth when projecting emissions to 2007 and is indeed larger than the 1993 inventory. The latest GSE inventory in the model, developed in Summer 2000, was developed by the Airline Transport Association and is presumably more accurate than old 1992-based estimates. The commission has withdrawn the GSE rule for the HGA area, and as part of the final SIP, the commission has approved Agreed Orders with Continental Airlines, Southwest Airlines, and the City of Houston, making federally enforceable certain NO_x emission reductions to be undertaken by these parties in lieu of a commission rule requiring reductions from ground service equipment.

ED commented that non-road vehicles account for approximately 21% of NO_x emissions in the HGA area, with construction equipment generating a significant percent of the non-road total.

The commission notes that in the future base, 147 of the total of 1083 tpd NO_x, or 14%, is from area and non-road sources. Thirty-two tpd are attributed to construction equipment. The percentage attributable to non-road and construction become higher in the control strategy case because point source emissions are projected to be cut so dramatically.

PCCA commented that control strategies in the Corpus Christi area would have an insignificant impact on attainment in Houston, and should not be included in the HGA SIP.

The commission believes that reductions associated with the ozone control strategies that will be implemented outside the HGA nonattainment area will benefit the HGA nonattainment area, due to the regional nature of air pollution, the contribution from mobile sources, and the economies of scale and associated market advantages related to distribution networks for some strategies.

An individual expressed concern that the commission has not put in a full toxics monitor in the Seabrook, Texas area.

The commission strives to ensure that all citizens of Texas have adequate protection from air

contaminants. An evaluation of the impact of toxics air emissions and a consideration of additional monitors will be considered in the future.

An individual commented that Spring and the Woodlands (North side of Houston) are being polluted by emissions from the Houston Ship Channel and Texas City.

The commission agrees that emissions from refineries or other significant point sources like those along the ship channel or Texas City may account for an important part of HGA area emissions. It is also true that all parts of the Houston/Galveston/Brazoria area make significant contributions to air pollution, and that reductions from major point sources alone will not be enough to meet federal air quality standards.

An individual commented that in the early 1990's, the HGA area averaged about 42 ozone exceedance days per year.

The commission believes that figure to be substantially correct, and is confident that this plan will substantially reduce the number of exceedances.

TXI (Jenkins & Gilchrist) commented that their facilities in the HGA area could not affect the area generally, and that all exceedances are to the east of their facilities.

The commission notes that all parts of the Houston/Galveston/Brazoria area make significant contributions to air pollution, and reductions from Houston sources alone will not be enough to meet federal air quality standards. It is not surprising that exceedances in the HGA area occur only to the east of TXI's kilns, since there are no air quality monitors to the west of Clodine, Texas.

An individual commented that ozone is caused by chemical refineries in the Houston and Galveston areas, and not from other types of sources.

The commission agrees that while it is true that emissions from refineries or other significant point sources like those along the ship channel or Texas City may account for an important part of HGA area emissions, it is also true that all parts of the Houston/Galveston/Brazoria area make significant contributions to air pollution and that reductions from major point sources alone will not be enough to meet federal air quality standards. For this to happen, it will be necessary for other sources of pollution to be reduced.

Twenty individuals questioned the inclusion of particular counties, specifically Chambers, Liberty, Waller and Brazoria, and the Corpus Christi area being included in the SIP for specific strategies and in general.

The commission agrees that while it is true that emissions from refineries or other significant point sources like those along the ship channel or Texas City may account for an important part of HGA area emissions, it is also true that all parts of the Houston/Galveston/Brazoria area make significant contributions to air pollution, and that reductions from major point sources alone will not be enough to meet federal air quality standards. For this to happen, it will be necessary for other sources of pollution to be reduced.

An individual commented, with supporting documents, that Brazoria County only exceeded federal air quality standards for ozone 0.126% of the time in 1999.

The commission notes that having only one monitor in a county limits the ability to assess ozone over the whole area. On days that ozone is high both in Harris County and at the Clute monitor in Brazoria county, the commission has data (aircraft observations) that ozone concentrations are high across Brazoria County. On days when ozone is high at the Houston Monroe and Croquet sites in southern Harris County, we expect ozone is also high in northern Brazoria County. For the one-hour ozone NAAQS, this latter condition has occurred roughly 15 times per year, on average, in recent years. Regarding the severity of ozone levels, both the Croquet and Monroe sites have recorded levels well over 200 ppb in the past three years, and we would expect levels in northern Brazoria County to have exceeded this threshold on the same days.

State Representative Tom Uher commented that the commission should consider the geographic and demographic aspects of Brazoria County that set it apart from Harris County and argue against its inclusion in the SIP.

The commission recognizes that Brazoria County is different than Harris County. In spite of those differences however, Brazoria County does have monitored ozone exceedances and has several major sources of ozone forming emissions within its boundaries. The boundaries of MSAs are determined by the U.S. Census Bureau. Congress elected to use these boundaries to designate nonattainment areas in the FCAA.

An individual commented that the commission's Web site provides data that Brazoria County's air quality has improved from 1997 to 2000, relative to the eight-hour standard.

The commission notes that the numbers cited by the commenter appear to be generally accurate; however, in this action Brazoria County is subject to a one-hour standard, not an eight-hour standard. Moreover, Brazoria County had two exceedances of the eight-hour standard in 2000, 9 in 1999, 5 in 1998, and 3 in 1997.

An individual commented that, after traveling to Denver, Atlanta, and Los Angeles, these cities have worse air quality problems than the HGA/Brazoria area.

The commission appreciates the comment. Each of these cities has a unique set of circumstances, and there are many different numbers that can show how "bad" or "good" one particular region is relative to another.

An individual commented that in 1997, Brazoria County experienced 3 hours of ozone exceedances, 8 hours in 1998, 11 hours in 1999, and 4 hours in 2000, amounting to an average of 0.078% of the time.

The commission believes that the data cited on exceedance hours are correct, but that the percentages used are incorrect because they do not take into account hours with missing or invalid data.

CSE submitted data supporting the argument that air quality is improving in Texas. The group also requested that the "true" environmental record be made a part of the SIP.

All of the data submitted by the Citizens for a Sound Economy come from the public record—much of which has been compiled by the commission. The air quality has improved in Texas over the last 5 to 6 years. However, the HGA area is still in violation of federal air quality standards and the public's health is being threatened. Further emissions reductions are needed if air quality is going to continue to improve, and the area is to demonstrate attainment in compliance with the FCAA.

An individual commented that the commission should collect better data for Brazoria County. In particular, the CAMS 11 monitor should be located to a more appropriate location. Sierra-Galveston commented that the commission should more closely monitor heavily industrialized areas such as Texas City, Deer Park, or Baytown.

The commission monitoring network is designed and maintained according to federal standards. Placing a monitor in a community is a process that seeks to include input from local officials. The commission is committed to working with local officials regarding monitor placement.

Tennessee Gas Pipeline, via El Paso, Energy, commented that many point sources operate only during fall and winter months and do not contribute significantly to ozone.

The ozone season in the HGA area covers 11 months. In 2000, the first exceedance occurred on April 14, and the latest exceedance occurred on October 20. October and April are two of the months cited by the commenters as unnecessary for regulation.

An individual commented that air quality is not a serious problem in Texas.

The commission disagrees. Four metropolitan areas of Texas have been designated as

nonattainment areas because the air does not meet federal standards for ground level ozone. Federal air quality standards are based on large amounts of scientific investigation, research, and debate.

An individual and Bonner and Company (Corpus Christi) commented that the primary wind direction in the Corpus Christi area is from the south-southeast (towards San Antonio) rather than Houston.

The commission notes that while it is true that the predominant wind directions in Corpus Christi are from the southeast, air from the Corpus Christi area does sometimes travel to Houston on ozone exceedance days. The commission believes that air pollution in the eastern part of Texas is a regional problem, and that regional reductions in NO_x will provide benefits for HGA to meet federal air quality standards.

An individual commented that Denver has a brown cloud during the day when buses are running, but not at night when buses are not running as frequently.

The commission notes that the Denver area is located in a geographical depression that creates unique meteorological patterns, and its air quality challenge is very different from the challenge identified in the HGA area.

An individual expressed concern about the impact that upset emissions might have on ozone production.

The commission agrees that this is an area that needs to be looked at more closely. This issues will be a part of the mid-course review.

An individual commented that there is a need to understand what levels of ozone naturally occur without man-made pollutants/activities.

The commission notes that, absent human activity, ambient ozone levels are generally assumed to be approximately 40 ppb(by volume). This level can vary with meteorology and geography.

An individual commented that the commission does not have enough scientific data to accurately assess the air quality situation in the Houston area.

The commission disagrees with the comment. The commission strives to provide the best possible scientific foundation for its policies. The proposed SIP is based on numerous modeling runs and technical evaluations, and represents the agency's best possible assessment of air quality in the Houston/Galveston/Brazoria area.

Montgomery County Judge Allen Sadler and Mr. Keith Zimmerman, a consultant for Montgomery County, commented that commission monitors cannot measure the air quality difference made by emissions reductions in Montgomery County.

While the commission agrees that the monitors may not be capable of measuring the air quality difference made by emissions from Montgomery County, the commission disagrees that this may be a reason for not including all 8 counties in this attainment demonstration. The attainment demonstration modeling and other analysis submitted for public hearing and comment concurrently with the HGA SIP shows that a significant amount of NO_x reductions practicably achievable are necessary from ozone control strategies in order for the HGA nonattainment area to achieve the ozone NAAQS by 2007, including reductions from surrounding counties included in the HGA CMSA.

An individual commented that emissions reduction requirements in the SIP affect their county disproportionately and are therefore unscientific. The individual further noted that the CAMS 11 monitor in Clute, Texas has average readings that are much more likely to be in compliance with federal air quality standards at any given time.

The commission notes that for each county in the nonattainment area, the commission develops a detailed emissions inventory specific to that county. The commission has used this emissions inventory as it performed extensive computer modeling. These results support the conclusion that emissions reductions from all parts of the Houston/Galveston/Brazoria area are necessary to meet federal air quality requirements. Over the past three years, CAMS 11 has measured seven exceedances.

Brazoria County officials commented that emissions reduction requirements in the SIP affect their county disproportionately and are therefore unscientific. They note that other parts (San Antonio, Austin, Victoria, and Laredo) of Texas which have worse air quality than Brazoria County have not been designated as nonattainment areas.

The commission disagrees that the emission reduction requirements disproportionately affect Brazoria County, or that the emission reduction requirements are unscientific. The commission, in accordance with EPA guidance and accepted scientific methods, has provided an attainment demonstration for the HGA nonattainment area that incorporates proposed emission reductions from many different source categories, as appropriate and necessary. The federal government has determined that San Antonio, Austin, Victoria, and Laredo have not violated the one-hour ozone standard.

An individual commented that wind data need to be more representative. Measurements should be made on windy and calm days.

The commission's air quality monitors record measurements 24 hours a day, every day. These measurements are taken regardless of ozone conditions. One might see wind data binned into calm versus breezy for many different days as scientists analyze this data, but it is representative of typical weather in the Houston/Galveston/Brazoria area.

An individual commented that marsh grass burning may have an impact on pollution in the Houston area. An individual commented that the air quality problem is overstated, and that some of it can be traced to outside sources such as smoke from fires in Mexico and Louisiana.

The commission appreciates this assessment of air quality in the HGA area. The commission believes that smoke from outside sources does sometimes influence ozone values in the Houston area. When this situation occurs, the commission petitions EPA for an exemption for ozone exceedances occurring on particular days. If there is sufficient scientific evidence, the U.S. EPA will designate those days as exceptional event days and they will not count against the nonattainment area. Although emissions from marsh grass burning may enhance ozone formation, the commission was not able to account for any such fires during the period of the modeling episode, September 8-11, 1993.

An individual commented that based on a comparison of Houston and Los Angeles, industry is the problem in Houston, not area and mobile sources.

The commission believes that there are major differences between Houston and Los Angeles that make it difficult to make a comparison between the two metropolitan areas. The two areas have very different weather and geography (humidity and mountains) and Texas has a much higher level of biogenic emissions. It is true that emissions from refineries or other significant point sources may account for an important part of HGA area emissions. It is also true that all parts of the HGA area make significant contributions to air pollution, and that reductions from major point sources alone will not be enough to meet federal air quality standards. For this to happen, it will be necessary for other sources of pollution to be reduced.

An individual commented that monitor measurements are not accurate, and that the results can be manipulated by technicians.

The commission notes that monitors used by the commission are manufactured according to strict federal and state standards, and collected data are handled according to strict Quality Control/Quality Assurance protocols. Monitoring data are sent from the regions to Austin before being submitted to EPA, where they may undergo further review and analysis.

An individual questioned the data being used to base decisions.

The commission disagrees with the comment. The data collected and used by the commission in assessing air quality are collected from a network of air quality monitors that monitors air quality 24 hours a day, seven days a week. The monitors meet federal standards for quality and are regularly maintained. Data collected from various scientific studies are also used. Federal air quality standards are set by EPA, based on the recommendations of a panel of scientific experts. EPA is required by law to review these standards every five years to ensure that they reflect the best scientific information available.

An individual commented that the prevailing southeast wind blows industrial pollution from the Baytown, Texas City, and Pasadena areas directly into Houston. The individual stated that industry in these cities is the cause of Houston's pollution problem, and that Montgomery County should not be subject to the speed limit reduction because the prevailing wind is from the southeast, and therefore does not affect Harris County. The individual stated that when the wind is from the north, pollution is at a minimum.

The commission agrees that Houston's prevailing surface winds are from the southeast. However, the most severe ozone exceedances occur when, several days preceding the episode, easterly winds elevate background levels of ozone and ozone precursors, the morning winds are from the northwest, the mid-day winds blow from the east along Galveston Bay, and the afternoon winds are from the southeast across most of the Houston area.

An individual commented that provisions for a mid-course correction should be included in the SIP. The mid-course correction should occur as soon as technically feasible, be based upon accurate and verifiable data, and include detailed modeling that accurately replicates the predominant meteorology in the areas and reflects review of new control technologies.

The commission concurs with this comment. The description of the mid-course evaluation is described in Chapter 7 of this SIP revision, pertaining to future attainment plans.

RMT commented on the meteorological data for the episode days. RMT noted that it used the NOAA computers to see where the air came from on those particular days. According to RMT, the computer models show that air was moving from the southeastern United States into the Houston area at the beginning of this entire episode. Looking at the National Weather Service observations for those days, it was also obvious that this air mass was already hazy and polluted as it was moving over southern Louisiana toward Texas. Unfortunately, this hazy air mass became stagnant over Houston on the days in question. RMT stated that there is no doubt that Houston contributed additional air pollution on the following days. However, a significant amount of air pollution came into the area from other regions. RMT concluded by stating that the September 1993 episode was an extreme example of the infrequent occurrence of the movement of ozone precursors across state lines from the east, followed by extended stagnant conditions over the Harris County area.

The commission researched this question and developed an ozone conceptual model for Houston. It was found that Houston high ozone events were preceded by easterly winds. This easterly flow contains ozone and ozone precursors that elevate ozone background values. Commission ozone forecasters utilize elevated ozone background levels as a primary indicator for Ozone Action Day forecasts. Therefore, it is not accurate to conclude that the September 1993 episode “was an extreme example of the infrequent occurrence of the movement of ozone across state lines from the east.”

An individual commented that the drought contributes to ozone formation because there is no rain to clean the air. An individual questioned if some of the poor air quality is due to the lack of rain in recent years.

The commission agrees that rain does have a benefit for cleaning the air. However, manmade sources are necessary in order for high levels of ozone to be formed. Certainly there is some temporary cleansing of the air with rainfall; however, air quality can quickly revert to poor when conditions conducive to ozone formation are present.

An individual commented on the quality of air in El Paso over the years since 1965, and how for the last few years it has become worse, and noted that banking and trading commitments need to be made.

The Texas Air Control Board (TACB), forerunner to the commission, developed SIP revisions for PM-10, CO, and ozone in the El Paso area in the early-mid 1990's. Although these SIPs acknowledged that there is an international aspect to the air pollution in the El Paso airshed, controls were imposed in the El Paso area. PM-10 may be thought of as an indicator of reduced visibility. An analysis of annual PM-10 concentrations made at the commission's Tilman monitor indicates a downward trend since 1991, when the El Paso PM-10 SIP was adopted. Due to the complexities involved in processing emissions and modifying the emissions inventory to reflect changes occurring as a result of an emissions trade, it is not feasible to rerun the photochemical modeling each time a trade is made.

Ms. Fitzgerald, on behalf of State Senator David Bernsen, commented that Southeast Texas has significant hurdles to overcome in reaching these very ambitious attainment standards. Being downwind of highly populated HGA has definite disadvantages, one of the more onerous being transport, by way of prevailing winds, of ozone and other harmful emissions into our air.

The BPA transport demonstration and attainment demonstration SIP revisions have already been approved by the commission and sent to EPA.

An individual commented that Houston does not have the geographic restrictions that Los Angeles has (i.e., mountain ranges preventing pollution from being blown away), that Houston still has the worst

pollution in the United States, and that stricter point source rules are needed.

The commission agrees with the commenter that Houston and Los Angeles have different geographical features that may either contribute to ozone formation or inhibit ozone formation and dispersion. For example, while HGA may not have nearby mountains that impede air flow, it does have a common summer weather pattern peculiar to this part of the Gulf Coast. The same air moves in from the Gulf during the day and out to the Gulf during the night, without really going anywhere (analogous to a bathtub sloshing effect). The geography of the Gulf Coast contributes to this weather pattern and makes it more difficult to attain the ozone standard. The commission continues to study the unique geographic and meteorologic features of HGA to determine their role in ozone formation and dispersion. Additionally, the adopted rules for HGA include an overall 85% NO_x reduction from point sources, as well as reductions in on-road mobile sources, non-road mobile sources, and area sources. It should be noted that the adopted stringent controls on NO_x point sources, plus the other control measures (including gap measures), are necessary for the commission's modeling to show modeled attainment in HGA. Therefore, controls on all segments of the inventory are needed

An individual commented that better data is needed. The monitor in Clute is inappropriately placed.

The commission disagrees. Although the Clute monitor is sited so as to pick up maximum concentrations of non-reactive pollutants, such as SO₂, it is not where it would measure the maximum ozone created by the Brazosport urban/industrial area. Such a monitor would probably need to be located several miles to the north or northwest. Indeed, such a monitor could serve as another background monitor for the Houston area.

Two individuals commented that Brazoria County should not be included in the SIP .

The commission disagrees. The fact that the Brazoria County monitor (at Clute) has had seven exceedances over the last three years indicates that the county would be in nonattainment, even if considered separately from Houston.

It is true that Brazoria County's population is much less than Harris County's. However, Brazoria County is also industrialized (one refinery, several petrochemical complexes), as are Harris County (and Galveston County). Brazoria County is also on the Texas coastal plain, as is Harris County, and both areas are subject to complex coastal meteorology (land breeze/sea breezes).

One individual commented that the Houston Ship Channel is the major source of pollution, and that restrictions should not be placed on individuals.

The commission disagrees. Point sources of NO_x in the HGA area will be required to reduce those emissions by 85% overall. However, previous model sensitivities conducted by the commission in 1997 indicated that when all point source emissions of NO_x (and VOC) were taken out of the inventory, the model still predicted exceedances of the ozone standard. Therefore, other sectors of the emissions inventory, such as on-road mobile sources (cars and trucks on streets and highways) and area/non-road mobile sources (lawn/garden equipment, construction equipment, shipping, etc) need to be reduced in order for air quality to improve enough to meet the federal standard.

One individual commented that the Houston area has a sea breeze land circulation pattern. Those emissions return and they help create high ozone again.

The commission agrees with the comment, and agrees that more study is needed. One of the most ozone-conducive meteorological regimes is what is known as flow reversal. Nighttime/morning emissions are carried out into the bay/gulf by the land breeze, and as the land surface heats up in the late morning/early afternoon, the winds switch around to the south/southeast, bringing the night/morning emissions back over the urban area. Steady south/southeasterly winds typically bring cleaner air in from the Gulf, but in the case of flow reversal, this returning air is laden with Houston's VOC and NO_x.

One individual commented that there are less than definitive conclusions on the effect of wind patterns in the Houston-Galveston-Beaumont triangle. Two individuals believe that weather is a significant player in ozone formation, as it is in Los Angeles.

Meteorology is a significant factor in ozone production along the Texas Gulf Coast. The attainment demonstration is based on a four-day episode with a different meteorological regime on each day. The commission funded several projects to study the wind patterns in the Houston-Galveston-Beaumont triangle and based the conclusions on sound scientific data. Weather is a significant factor in ozone production for both HGA and Los Angeles. Weather does play a role in the production of ozone; however it is only one of many factors.

ED requested that the commission clearly define the specific actions it envisions carrying out as a part of the mid-course review. ED also requested that the commission develop another modeling episode prior to January 2002.

The commission has defined the mid-course review as part of Chapter 7 of the SIP.

Three individuals were concerned about the amount of pollution moving into the HGA area from other areas. An individual was concerned that Katy was being impacted by emissions from sources on the ship channel.

The commission has accounted for these emissions. The commission developed boundary conditions to place in the model to properly simulate the level of pollutants that were transported into the HGA nonattainment area from other areas. This included analysis of monitoring data for sites that were upwind of the HGA nonattainment area and performance of regional scale modeling over a large domain that extended to the east beyond Atlanta, Georgia, and north to the northern boundary of Oklahoma. This modeling was used to establish the boundary conditions used in the modeling. The regional modeling results were compared to monitoring data over the whole large region to insure that the model was properly estimating boundary conditions.

State Representative John Culberson expressed concern about the effectiveness of various controls applied to specific sources.

The commission has used the 2007 future emissions inventory to develop applicable adopted state and federal controls. A number of sensitivity model runs were made with this inventory. These sensitivity analyses indicated that no one control measure would provide significant change in ozone concentrations. However, the modeling shows that when an ensemble of a number of controls were applied together, these will provide for significant reductions in ozone concentrations. The SIP outlines a number of controls that, when applied together, will provide for significant reductions in ozone.

Several comments were made that areas outside the HGA nonattainment area should not have to have controls to control the ozone in the HGA nonattainment area.

The commission disagrees. Ozone is a regional type of pollutant that requires some level of regional control in order to meet the federal health-based standard. The commission believes that reductions associated with the ozone control strategies that will be implemented outside the HGA nonattainment area will benefit the HGA nonattainment area, due to the regional nature of air pollution, the contribution from mobile sources, and the economies of scale and associated market advantages related to distribution networks for some strategies.

One individual asked if anyone had taken into consideration that Houston has the largest petrochemical facility in the world located to its southeast.

The commission considered this large complex in all of the modeling that was performed.

Sierra-Houston was concerned about the modeling used for the NO_x waiver that was issued, then removed.

The commission appreciates the comment. Initial modeling indicated that NO_x reductions would cause an increase in ozone unless very large reductions had been accomplished, but

that the increase would not occur if VOC reductions were made. Therefore, the agency went forward with a temporary NO_x waiver. The NO_x waiver was rescinded when the modeling from the 1993 episode showed that NO_x control was necessary, because reductions of anthropogenic VOC would not provide for attainment of the standard.

An individual commented that the commission does not commit to control NO_x and VOC emissions outside the 8-county ozone nonattainment area.

The commission disagrees with the comment. The commission does have a number of rules that reduce NO_x and VOC emissions from sources outside of the 8-county nonattainment area.

State Representative Vilma Luna expressed a desire that the commission develop a standard scientific modeling system. The Clean Air Action Corporation recommended that the commission abandon the notion that only reductions in the nonattainment areas can count towards attainment.

The commission has used state-of-the-science models and other tools to develop this SIP. The emissions inventory has been greatly enhanced beyond the level normally used by others for SIP development. The latest, most scientific models have been used. The data base used for the SIP modeling came from the extensive COAST air quality study performed by the commission in 1993. Furthermore, the commission coordinated a large air quality study in the summer of 2000 which, when all the analyses are completed, will provide enhanced science for the regulatory process.

An individual was concerned that the proposal would require that all refinery and chemical plants would have to be shut down and all motor vehicles removed to attain the standard.

The commission disagrees. Large reductions in point source, area source, non-road mobile and on-road mobile emissions are necessary to attain the standard, but complete shutdown is not listed as an option. It is the opinion of the commission that all reductions can be obtained.

Several companies in a joint letter commented that they have identified gaps in underlying factual data, methodology, and analysis made available. They note that the commission has not adequately responded to requests for additional information from stakeholders regarding the modeling of emissions, the corrected emissions inventory database, and the estimated costs of control.

The commenter did not provide detailed information as to what informational requests have not been responded to, nor did it they identify what offices had received such requests. The commission is unaware of any outstanding information requests. Modeling and emissions inventories are constantly being improved; they are not static, but staff must rely on

snapshots of data to provide data to the model for an attainment demonstration. Inventories for the Houston SIP attainment demonstration modeling have been improved since the proposals were made public.

EPA Region 6 commented that the SIP should acknowledge that there are other possibilities that could explain why the air quality simulations have isoprene concentrations much higher than observed, including chemistry, vertical diffusions, and meteorology.

The commission has revised the text to reflect this concern.

EPA Region 6 commented that on p. E-2, two biogenic model innovations are reported. EPA recommended that the appendix include equations showing the revised zenith angle and Beer's law corrections, and a table showing the speciation of the model's VOC compounds into Carbon Bond classes.

Comparison of factors used by BEIS2/BIOME and Globeis2 to convert monoterpenes and other VOCs to Carbon Bond IV classes (units are moles/kg).				
CBIV class	Total monoterpenes		Other Non-terpenoid VOCs	
	BEIS2/BIOME	Globeis2	BEIS2/BIOME	Globeis2
OLE	3.7	7.4	3.4	4.3
PAR	44	53.2	57	12.8
XYL	0	0.329	0	0
FORM	0	0	0	1.2
ALD2	11	6.2	0	3
ETH	0	0	0	2.1
MEOH	0	0	0	45
ETOH	0	0	0	2.1
NR	0	0.311	3.4	1.29

All equations used by the Globeis model are publicly available; they are included in the open source code of the Globeis model. This model is available free of charge, and may be downloaded from the Web site "www.globeis.com". Since the equations used by the BEIS-2 model are also included in the Globeis modeling package, the formulations of the two models can be compared by examining the Visual Basic source code.

Sierra-Houston commented that the commission uses the same land use data for base year scenarios and future year scenarios, even though land use will probably change during the intervening years.

The primary reason the commission assumes that land use is invariant is because it is extremely difficult to predict which areas of Houston and vicinity will be developed in 2007, and what form the development will take. The commission is investigating the use of various

scenarios of projected land use data in both the meteorological and air quality modeling.

BCCA commented that the predicted ozone maximum that the commission's control strategy struggles to abate, in reality, never occurred in the time and place the model said it did.

The commission disagrees. The basic result is that the modeling is appropriate for development of control strategies.

BCCA commented that in the August 2000 proposal, the commission simply cites the performance statistics in Table 3.3-4 as the basis for acceptable model performance, and fails to acknowledge or take account of the unacceptable model performance in precisely the areas that are requiring the most emission reductions needed to demonstrate modeled attainment.

The commission has performed additional statistical analyses on the modeling results. The level of control needed to attain the standard for times and locations where the model performed well was essentially the same as that needed when all of the results were used.

BCCA commented that the commission has not taken appropriate account of the graphical performance methods, such as the surface level isopleths and time series plots (as shown in Figures 1, 3 and 4) that its December 1998 modeling protocol says would be considered.

The commission disagrees. Various graphical methods were used when evaluating base case model performance. These are discussed in the previous SIPs and an extensive set of figures illustrating these analyses was included in the appendices to these SIPs.

BCCA commented that a model that cannot accurately predict the location of the ozone peak probably will not accurately predict the benefits of future emission reductions.

The commission appreciates the comment. On September 8, the wind fields generated by the meteorological model tend to move precursors to the west of their actual path, and therefore to overpredict ozone in some locations and underpredict ozone in others. These winds generated a meteorological scenario that did not actually occur that day, but it represents conditions typical of many ozone episodes which occur in the HG area.

BCCA commented regarding September 8 that if the commission and EPA Region 6 have worked to address concerns regarding this day, their efforts are not described in the August 2000 proposal.

The commission and EPA Region 6 have worked on the problem of day selection and meteorological conditions, but there are not any significant new results to show in the current SIP. There is a current contract between Harris County and Environ to use a different meteorological model to develop meteorological data for this episode and use it for

photochemical modeling. When this modeling is complete it will provide an alternate analysis of this episode. Also, it is anticipated that the mid-course evaluation will be based on additional data and science that can be used to improve the confidence in the modeling. Much of this new information will result from the Texas 2000 study.

BCCA commented that on three of the four episode days (September 8-10), the base case model underestimated ozone levels near the shores of Galveston Bay but overestimated ozone levels further inland, in south central and southwestern Harris County. Yet, the commission has provided no explanation for this poor spatial representation, nor has it provided any discussion of these impacts on the uncertainties of the proposed control strategy.

At some locations the model underestimated ozone and at other areas the ozone was overestimated. As indicated above, most of this was due to the performance of the meteorological model. In some cases, the ozone plume peaks were simulated in slightly different locations than occurred with the monitored results. Some analysis was performed with a generic wind direction and speed, but this showed a high peak in about the same vicinity. A number of additional analyses were performed, including process analysis, but no compelling justification has been identified to drop any of the modeling. With a contract between Harris County and Environ, additional modeling is being performed with a different meteorological model. These results will provide an alternate analysis. There is no other practical way to establish uncertainties in the proposed control strategy based on modeling uncertainties.

BCCA commented that the commission has presented no evidence that the model is accurately simulating NO_x or VOC levels, or other intermediate chemical species in the vicinity of the modeled peaks.

The commission disagrees. In 1993, VOC concentrations were measured at two locations in the HGA nonattainment area, and comparisons have been made between modeled and monitored concentrations. Similarly, there is a very limited number of locations where NO_x monitoring was performed, but at each of these sites comparisons have been made between modeled and monitored concentrations. All of these comparisons are included and discussed in previous SIPs.

Monitors measure the concentration at a point in space, and in practice, these concentrations can vary significantly over an area that is 4km square. This is true for VOC and NO_x precursors, and is especially true for precursors emitted by point sources. This is true for ozone if it is contained in a narrow “plume.” There is no way to develop an average concentration over a 4km square based on monitoring at a single point within that square. The model presents concentrations that are averaged over 4km squares, so it is very difficult to obtain a reasonable comparison between precursor modeled concentrations and monitored

concentrations. Over the whole domain and over all of the episode days, the comparisons that have been made indicate reasonable agreement between monitored and modeled concentrations considering the problems cited above. There are no monitoring results for intermediate species.

BCCA commented that the commission and its contractors have worked commendably to develop what may be, in many respects, the most accurate emissions inventory ever used in photochemical modeling. But major uncertainties still exist in other respects and in the model's representation of the chemical reactions and meteorological processes that determine the location, time, and magnitude of high ozone levels in Houston-Galveston.

The commission and its contractors have used state-of-the-science modeling approaches for development of the meteorological parameters used in the modeling. Since the initial modeling was performed, better, more robust models have come into use, and these will be applied in the HGA nonattainment area for future modeling efforts. However, it takes a significant amount of time to obtain the computer resources and train staff to run these models. Thus, these approaches cannot be used for the current SIP, but can be used for subsequent efforts such as the mid-course evaluation, which will also include results from the Texas 2000 study.

The chemical algorithms used in the modeling reflect the latest development in the state-of-the-science today. The commission is currently investigating various alternate chemical mechanisms, and this activity will be enhanced with analyses on the Texas 2000 study results. If enhancements are identified for the chemical algorithms in time, they will be utilized in the mid-course evaluation.

BCCA commented that doubts regarding the accuracy of the model predictions support the BCCA's recommendations that new emission controls be based on proven cost-effective technology and that stakeholders be given as much time to implement controls as the FCAA allows. The model simulations and basic science that are the foundations of the commission's control strategy are currently not strong enough to support the unproven, technically infeasible, or economically challenging measures in the proposal.

The commission and its contractors have used state-of-the-science approaches to support this plan. All data submitted during the comment period to improve the model were incorporated. Unfortunately, BCCA was not able to provide scientific data to enhance the model's performance.

BCCA believes that the commission must address the risk that the modeling uncertainties may have led the commission to a wrong estimate of the magnitude of emission reductions needed to attain the ozone NAAQS.

In the earlier SIPs, the effect of the uncertainty of the emissions relative to the reductions needed to attain the NAAQS was addressed. This involved developing an alternate emissions inventory that reflected uncertainties, evaluating base case model performance, and the effect on the reductions needed to attain the NAAQS with the future 2007 emissions. This modeling showed that the control path needed to attain the NAAQS did not change, and that the order of magnitude of the required reductions did not change much. This reinforced the necessity of obtaining the level of reductions contained in this SIP revision.

The current approach does not show attainment of the NAAQS at all locations on all days that were modeled, but uses other approaches to show that these reductions are adequate to attain the standard. If it were necessary to show attainment at all locations, further reductions would be needed. Furthermore, the mid-course evaluation will address the level of controls needed to attain the NAAQS. At that point, new science can be incorporated into the analysis and the response of the required controls will be evaluated.

BCCA commented that it supports the recent contract commissioned by Harris County with Environ. This work will re-run the model with an alternate meteorological simulation model, in a final attempt to address the non-performance of the grid cells in question.

The commission has worked with Harris County and Environ on the alternate meteorological simulation of the episode modeled by the commission. It takes substantial time and effort to develop meteorological data to be run in the photochemical model. After the data are developed, the model results must be evaluated for adequate meteorological model performance. Then the data must be used in the photochemical model to evaluate base case model performance with the new data set. If the revised base case modeling meets the performance requirements, then the model will be applied to the future 2007 emissions, and various control scenarios modeled. It is doubtful that all of these activities can be performed prior to the time the SIP must be adopted. These results can be used in future activities as appropriate.

BCCA commented that it believes the best way to manage the risks of making the wrong decision on the magnitude of the needed controls is to base HGA's control strategy on the modeling simulations that have the least uncertainty. Though all four days of the September 8-11, 1993 base case simulation are characterized by poor graphical performance, the greatest uncertainties by far exist for September 8 and 9. Therefore, BCCA believes that the control strategy should be based on modeling results from September 10 or 11.

The commission disagrees. The statement that the graphical performance of the base case is poor is not correct. For all days modeled, the graphical performance for the majority of the monitor sites was very good. There were a few times when the maximum concentrations at a site were either underpredicted or overpredicted, but this was not sufficient to claim that the

days be discarded. EPA guidance requires that a minimum of three episode days be modeled. With only four days, the number of episode days being used for control strategy evaluation is marginal. Moving to two days would not provide an acceptable number of modeling days.

During episode selection, a modification of the Predominant Wind Direction (P.D.) method was used to analyze each potential episode day. The wind analysis is based on morning winds and afternoon winds. The largest category was calm/calm with 10 of 71 cases. The second was Calm/SSE with 9 cases. September 11 is in this category. The third category was Calm/ESE with 8 cases. September 8 is in this category. There were no cases for the bin for September 9, which is NNW/NNW. The P.D. for September 10 is NNW/ESE, which had one case. Each day of the September 8-11, 1993 episode covers different meteorological conditions that are correlated with high ozone. To remove one or more of the four episode days would remove conditions that should be evaluated to provide assurance that the controls adopted in the SIP would be expected to show attainment of the NAAQS. September 10 had a peak value that was significantly lower than the design value. Control strategies based on this day would likely not be sufficient to bring the area into attainment. In addition, September 11 is a Saturday. Therefore, no days should be dropped from the analysis.

BCCA commented that evaluating Equations (3) and (4) for $OC = 124.5$ yields NO_x attainment targets of 374 tpd and 358 tpd for September 10 and 11, respectively. This results in gaps of 21 tpd and 37 tpd, respectively, for September 10 and 11, which could be filled (with surplus) from the list of gap measures given in Table 6.1-2 of the proposal.

The commission disagrees that September 10 and 11 are the appropriate controlling episode days. September 8 must be used as the controlling day based on EPA guidance. Latest modeling indicates that the gap shortfall on September 8 and September 10 is 90.9 tpd and 93.7 tpd NO_x , respectively; thus, there is no surplus.

BCCA commented that the Houston Regional Monitoring Network contracted MINC to perform supplemental modeling with alternate control strategy scenarios not modeled by the commission.

The commission appreciates the comment. Alternate modeling may be appropriate and the results considered if submitted to the commission in a timely fashion. First, the modeling would have to be submitted to the commission, then reviewed and quality-assured by commission staff. After the modeling is deemed to be appropriate, the results could be considered with the ensemble of the other modeling. However, to date, that modeling has not been submitted to the commission, nor has it been reviewed by commission staff. In addition, the modeling would have to be made available to the public for review and comment before it could be included in a SIP revision. Thus, these results cannot be used in decision-making

for the SIP at this time.

BCCA noted that the 91 tpd increase in point source NO_x emissions produced daily maximum ozone increases ranging from 1.5 ppb (on September 10) to 6.1 ppb (on September 11). BCCA also noted that the 91 tpd decrease in on-road mobile and non-road mobile source NO_x emissions produced ozone decreases, relative to HRM Strategy 1, ranging from 6.9 ppb (on September 11) to 10.8 ppb (on September 8). From this, BCCA sees relatively small benefits from the commission's 90% point source control proposal relative to a 75% point control level, but sees greater benefits if the same amount of incremental emissions was reduced from mobile sources.

The commission disagrees that days other than September 8 may be used to demonstrate attainment.

BCCA notes that mobile source emission reductions ranged from 1.1 to 7.0 times more effective than point source NO_x reductions at reducing ozone levels (given the ratio of mobile source to point source NO_x effectiveness). From this, it follows that mobile source NO_x emission reductions are on average 3 times more effective at reducing ozone levels than are point source emission reductions.

If the results are verified, it may be possible that mobile source reductions are more effective than point source reductions in certain areas of the modeling domain. The ensemble of emission reductions modeled for the SIP development was based on an analysis of potential reductions available from the various source categories by the attainment date. At this time it is not possible to identify additional mobile source reductions that are feasible. Additionally, the commission notes that reductions from point sources would still be necessary in order to demonstrate attainment of the ozone standard.

Miscellaneous

Four individuals disputed the unfavorable health effects of ozone. One individual commented that ozone is commonly present in the air after lightning discharges, and is sometimes used in bottled water as a purifier. An individual commented that use of an ozone generator prevents asthma attacks. An individual commented that the SIP is unrealistic, since VOCs in the HGA are predominantly of natural origin. Two individuals commented on the inconsistency of EPA's actions to ban freon because it depletes ozone, while at the same time enforcing requirements to reduce ozone. An individual commented that occasional exceedances of the ozone standard do not create a health risk, and that lowering the number of exceedances will not result in measurable improvement. The individual commented that ozone had merely replaced pollen as the popular reason for asthma attacks, and stated that elevated heat and humidity cause more unfavorable reactions than high ozone levels. An individual commented that life expectancy is much higher now, which indicates that pollution is not a

great concern. An individual minimized the health risks of ozone, stating that the human body will become accustomed to its environment.

The commission disagrees that unfavorable health effects from ozone exposure are non-existent or negligible. Numerous clinical studies have been conducted establishing that ozone, even at low concentrations, is harmful to the respiratory tract, especially for the young, the elderly, and those suffering from asthma and other respiratory conditions. Several criteria documents issued by EPA, upon which that agency relied in establishing and continuing the one-hour ozone standard, contain hundreds of citations documenting the harmful health effects of ozone. The Food and Drug Administration has never approved ozone generators or ozone gas for treating any medical condition, and has aggressively pursued marketers making such claims. It is important to note the distinction between ozone in the upper and lower atmosphere. Ozone in the upper atmosphere helps filter out damaging ultraviolet radiation from the sun. Although ozone in this region is protective, ozone in the lower atmosphere—which is the air we breathe—can be harmful to the respiratory system. The one-hour ozone standard established by EPA, and the focus of the HGA SIP control strategy, addresses ground-level ozone.

An individual commented that Houston has never been in violation for smog, only that it has violated ground level ozone standards. An individual commented that since Texas is a big state, it should be allowed to have more ozone than a smaller state. An individual commented that the ozone standard should be based on a per capita weighted average. An individual commented that Los Angeles, not Houston, has greater smog problems.

The term “smog” encompasses a variety of contaminants in the atmosphere, which, collectively, impair visibility and cause eye and respiratory irritation. There is no standard for “smog” as such. However, since ozone is the main component of smog, compliance with the one-hour ozone standard is determined by measuring the concentration of ozone in the ambient air. The ozone standard is designed to limit the concentration of ozone below levels shown to cause harmful health effects, so the population or size of the area in question is not relevant in determining compliance with the standard. Although both Los Angeles and Houston have made substantial progress in improving air quality, the two areas still have ozone problems. The commission believes that the key issue of concern is providing healthy air for HGA, not comparing or minimizing the area’s air quality conditions.

Three individuals recommended a state export tax on oil products produced in Houston and Texas to help pay for environmental control costs. An individual suggested that others across the country benefit from products coming from the HGA petrochemical plants and refineries, and should contribute to the cleanup.

The commission does not have taxing authority, and therefore could not consider this as an

air quality measure as part of this plan.

Sierra-Houston commented on page 3-9 of the SIP, stating that the expected percent compliance for Stage I in East Texas should be specified. Sierra-Houston also expressed concern about enforcement.

In the 95 ozone attainment and near-nonattainment counties of east and central Texas, the commission's Stage I rules are expected to have a rule effectiveness of 90%. The commission agrees that adequate enforcement is critical to the success of the program. As with all of its rules, the commission will enforce the requirements after the final compliance date (April 30, 2000) and take appropriate action for noncompliance situations. Waste program inspectors from the Field Operations Division of the commission's Office of Compliance and Enforcement are responsible for petroleum storage tank (PST) rules at gasoline stations. For maximum efficiency of staff resources, these inspectors enforce the Stage I vapor recovery rules when conducting their routine PST inspections.

An individual recommended that one of every four service stations be required to install equipment to dispense alternative fuels. An individual commented that alternative fuels and electric charging stations should also be available at gasoline filling stations.

Alternative fuels by themselves will not ensure air quality benefits. Emission standards must accompany the cleaner fuel use. The Texas Legislature has issued statutes governing the use of alternative fuels and emission standard program requirements for fleets. Fuel availability must be combined with vehicles which use the fuel and meet a more stringent standard than today's automobiles.

An individual commented that after he complained to EPA about a local polluting industry, EPA personnel never arrived to take air samples.

The commission does not have oversight of EPA investigative procedures. Persons wishing to make complaints regarding pollution may also contact the commission's Regional Offices, of which there are 16 statewide.

An individual commented that airline fuel tanks vent to the atmosphere, and stated that VOC emissions could be reduced by 80% by using the individual's product on such tanks. An individual commented that a company has developed a product to drastically decrease carbon monoxide emissions, and offered to supply the commission with information about the product. An individual brought to the commission's attention an exhaust-driven fluid cooling system, recently patented, to improve fuel efficiency and economy in both mobile and stationary engines.

The commission appreciates the information provided by the commenters, and may explore

these options in the future if necessary to achieve additional reductions.

An individual resolved to fight the commission to prevent higher prices on goods caused by poorly conceived SIP plans. The individual vowed to fight for industrious people to have the freedom to work whenever they please.

The commission does not set prices for goods and services. The commission does not anticipate significant product increases associated with this SIP.

An individual suggested that Daylight Saving Time (DST) be eliminated throughout Texas to accomplish a similar effect to the proposed operating restrictions for construction and lawn service equipment. The individual also noted that transitions back and forth from Daylight Savings Time are responsible for higher accident rates and lower worker productivity.

The United States Department of Transportation has jurisdiction over DST in this country. DST was established nationwide by the Uniform Time Act of 1966. States or portions of states may be exempted from the federal requirement only by legislative vote in those states. Currently, the entire state of Texas observes DST, and any changes to this program would require action by the State Legislature. The commission is not aware of safety issues resulting from the transition to and from DST.

Sierra-Galveston and one individual recommended that the commission adopt California standards for fleet fuel efficiencies, including light trucks and SUVs. An individual commented that the commission require the development of emission-free cars, trucks, and machinery. Two individuals commented that SUVs and trucks should have to comply with the same emission standards as for light-duty passenger vehicles. An individual commented that dump trucks and construction trucks in particular should be regulated. An individual commented that no on-road vehicles, boats, or aircraft should be exempt from pollution controls. Two individuals commented that aircraft engines should be better controlled.

The commission is not aware of any California standards for automobile fuel efficiency. The commission is supportive of new technology to reduce emissions. The EPA has recently passed the Tier 2 new automobile standards, which will set the same standard for both cars and trucks/SUVs. Dump trucks and construction trucks have new standards established by EPA. The federal government is responsible for setting emission standards for vehicles, boats, and aircraft.

An individual commented that utilizing shift work and energy storage devices could minimize NO_x production during mornings and afternoons.

The commission appreciates the ideas for improved air quality and will complete a review of

alternative ideas during the mid-course review.

An individual asked what is being done to ensure that waterways and groundwater are being protected from pollution.

The commission implements various surface water and groundwater protection programs that focus on both prevention of contamination and remediation of existing problems through education, permitting, and enforcement. As the state lead agency for water resources, the commission administers both state and federally mandated programs, including the Resource Conservation and Recovery Act; the Comprehensive Environmental Response, Compensation, and Liability Act; the Clean Water Act; the Safe Drinking Water Act; and the development of state management plans for groundwater under the Federal Insecticide, Fungicide, and Rodenticide Act. This response is provided for information only, since the comment lies outside the scope of this rulemaking and SIP revision.

An individual stated that high voltage power lines are the worst producers of ozone. An individual commented that ozone is created exclusively from electrical discharges from electric power lines, neon signs, and spark plugs in internal combustion engines, and suggested solutions to reduce ozone from each of these sources.

Although it is true that small amounts of ozone may be created from high-voltage equipment and electrical discharges, the commission believes that these sources produce insignificant amounts of ozone which are fairly localized. The scientific information available to the commission suggests that photochemical reactions in the atmosphere produce the overwhelming majority of ground-level ozone. Therefore, the commission believes that the current strategy of reducing emissions of the ozone precursors NO_x and VOC should be continued.

An individual commented that the number and size of boat engines should be based on the size and weight of the boat. The individual further commented that all 2-cycle engines, especially outboard motors, should be eliminated and replaced with cleaner 4-cycle engines meeting emission standards.

The commission does not regulate the size of boat engines. The federal government is working to tighten emission standards for recreational boats.

Seven individuals objected to open burning, particularly at new construction sites. Two individuals objected to marsh burning. Two individuals recommended bans on outdoor burning, one for Harris County and the other for the entire HGA area. An individual recommended that fireworks be banned in Harris County.

Chapter 111 of the commission's rules specifies the conditions under which outdoor burning

can take place in the state. **Outdoor burning for land-clearing or maintenance purposes may be allowed, provided that these conditions are met. Coastal salt-marsh management burning may also be allowed in specified counties, under the restrictions contained in the rule.**

Commission rules generally prohibit outdoor burning, with very limited exceptions. If citizens observe outdoor burning they believe is not properly authorized, they are encouraged to call the commission's regional office for their area, or the commission's main office in Austin at (512) 239-1000, to report the event. Commission policy is to investigate complaints based on a priority system. The commission has considered the emissions from the limited amount of outdoor burning that is authorized in the area emissions inventory and the modeling of the HGA area. The commission does not exercise authority over the sale or use of fireworks, and does not believe that they contribute to ozone nonattainment in the area.

An individual recommended that ferry crossings for vehicles be eliminated.

Road projects are generally identified and funded through the local planning organization and TxDOT. The commission has worked with HGAC to identify roadways and bridges which best suit the community's needs and meet air quality goals.

An individual commented that all charcoal cooking should be prohibited.

Charcoal cooking does have some emissions associated with it. However, NO_x emissions are relatively low. NO_x emissions are the pollutant being considered by this SIP revision.

An individual commented that auto-igniters should be placed on all flares instead of continuously burning pilot lights, and that flares should be restricted to emergency purposes.

The commission recently passed a regulation covering all new sales of small boilers in the state. A part of this new regulation requires pilotless ignition. This measure also limits the amount of NO_x emitted from gas fired hot water heaters.

An individual recommended elimination of all aerosol products that use VOCs as a propellant.

In its consumer product rules in Chapter 115, the commission regulates VOC emissions from many types of aerosol products such as air fresheners, cleaners, insecticides, and personal care products. In many cases, no suitable alternatives to VOC propellants exist.

An individual commented that all livestock grazing or handling, including livestock shows within Harris County, be eliminated.

The commission does not see the usefulness of such a measure as an ozone control strategy.

An individual recommended that fuel spills be handled by use of clay absorbents instead of water washing, thus reducing evaporation and water contamination.

The commission appreciates the idea and may consider this and other ideas during the mid-course evaluation.

An individual recommended night-time garbage pickup to eliminate daytime emissions.

The commission appreciates the idea and may consider this and other ideas during the mid-course evaluation.

An individual commented that railyard schedules be revised to avoid/minimize daytime locomotive idling during switching operations. The individual also stated that for locomotives, either emissions control equipment or cleaner fuels should be required.

There are new locomotive emission standards established at the federal level. In addition, the commission and HGAC have been working with the railroad industry to identify ways to reduce emissions from railyard operations.

An individual commented that farm equipment needs emission controls.

Farming equipment emission standards have been set by the federal government.

An individual commented that leaf blowers/vacuums should be banned from sale or use in the state.

The commission has adopted a rule in this SIP to restrict the use of these and other small engines in the morning hours during ozone season.

An individual commented that a \$500 state sales tax surcharge should be levied on all gasoline-powered recreational vehicles/boats, and that the funds should be dedicated to buying and scrapping old cars and purchasing new low-emissions vehicles by low-income persons.

The commission does not have taxing authority. The federal government has recently modified the emission standards for boats.

An individual supported imposing a fuel surcharge on all aviation fuel used at HGA airports, and using the revenue for inspection/testing equipment to monitor aircraft and GSE, and to subsidize purchase of electric GSE. The individual recommended a similar fuel surcharge and inspection/testing system for locomotives throughout Texas.

The commission does not have taxing authority. The federal government has recently

modified the emission standards for locomotives, and it is anticipated they will consider changes to aircraft. The commission has entered into agreements with the major airlines and the City of Houston for reductions equivalent to a 90% reduction in NO_x from GSE.

An individual advocated a statewide conservation plan, similar to Oregon's, that requires retailers to set up a deposit and redemption system for various types of containers.

The commission supports activities that reduce the generation of waste otherwise requiring disposal. The commission's Pollution Prevention and Industry Assistance program educates private citizens and businesses alike on better ways to reduce pollution and to conserve resources. The container deposit and redemption system mentioned by the commenter would not appear to result in air quality benefits, however, and therefore is not included in the current SIP.

An individual commented on out-of-state cars apparently being road tested in the Corpus Christi area, and questioned whether there were restrictions on these contributions to air pollution.

The commission has no emission control requirements directed specifically at vehicles that are registered out of the state. Both federal and state law require that emissions control equipment be maintained in proper working order on all motor vehicles. Excessive visible emissions are prohibited by a statewide DPS rule, which is enforced at the local level (in some cases, by ordinance). Smoking vehicles may be reported by calling the commission's toll free hotline number: 1-800-453-SMOG. This is a public service to educate and inform vehicle owners about pollution, and is not an enforcement program.

An individual commented that improved fueling nozzles at service stations, designed to prevent spit-back, could result in significant VOC reductions.

The limited spit-back and dripless nozzles are both part of the new Enhanced Vapor Recovery program being initiated by CARB. Commission staff are currently investigating these nozzles, as well as many other technological advances, in order to determine which one(s) can achieve the most VOC reduction for the cost.

A company promoting alternatively fueled vehicles provided Web site references to help consumers compare the costs of gasoline versus CNG and other alternative fuels.

The commission appreciates the information.

An individual commented that overdrive should be a standard feature on all automobiles since it slows down the engine's rpm's and improves mileage.

Practically speaking, overdrive has become a standard feature in a majority of the new model automobiles. Most drivers apply it since there is an associated fuel economy and improved mileage. However, the increased emissions resulting from increased road load and wind resistance, which vehicles experience at increased speed, would essentially zero out any emissions reductions benefit that could be attributed to the use of overdrive.

BP stated its support for emission reductions outside SIP requirements, such as reduction of greenhouse gas emissions.

The commission appreciates the company proposing to go beyond the SIP requirements. The potential for credits may exist for ozone-forming compounds.

An individual commented that automobiles actually destroy ozone, and that the exhaust emitted from the vehicle tailpipe contains less ozone than the intake air to the engine. An individual commented that adjustment in the NO to NO₂ emission ratio produced by catalytic converters on new automobiles would result in cars destroying more ozone than they produce.

In response to the first comment, there might be traces of ground level ozone aspirated along with the normal air intake in automobiles, but the air (as well as the ozone and other impurities) is broken down and used up during the combustion process. The primary pollutants from the exhaust emissions are CO, NO_x, PM, and VOC, as well as other pollutants such as benzene and aldehydes. In response to the second comment, motor vehicles do not emit ozone directly from their exhaust. Ozone is formed in the atmosphere by the photochemical reaction of NO_x (which is a combination primarily of NO and NO₂) and VOCs emitted, among other sources, by motor vehicles.

An individual commented that METRO buses and 18-wheelers should undergo emissions testing.

The commission is evaluating the efficacy of conducting a diesel I/M program as part of its mid-course evaluation.

An individual commented that the number of helicopters in the airspace be limited, particularly news helicopters covering emergencies.

The emissions associated with news helicopters are a very minor part of the problem in the HGA area. The commission appreciates the comment and will consider it during the mid-course evaluation.

An individual recommended the reduction of tug, car, and boat traffic on days when emissions are high.

Although this idea may reduce emissions, it likely would be impracticable to implement.

An individual commented that natural gas is 21 times more harmful than automobile exhaust, and that incentives should be given to encourage oil and gas production companies to reduce valve leaks as a cost-effective alternative to reducing NO_x.

There are no NO_x emissions associated with leaking natural gas valves that the commission is aware of. A reduction in these emissions is important, however, from a health-based perspective.

An individual commented that catalytic converters and other controls should be imposed on on-road and non-road mobile sources within a matter of years.

The federal government has established emission standards that may require catalytic converters for some of these non-road sources.

An individual commented that the newer higher stroke ratios develop more heat, thus running less efficiently and emitting more pollution, and recommended that lower stroke ratio engines be brought back.

Regardless of the vehicle type and engine design parameters, all vehicles/engines are typically certified to meet certain emission levels, depending on the model year and size. These emission levels are specific to the vehicles' class and engine type. All engine designs are covered, including those with higher or lower bore/stroke ratio characteristics. A key requirement is that the vehicles must comply with the limit of their certified emission levels. While a lower bore/stroke ratio may have some advantage, the higher bore/stroke ratio engines coupled with the advanced catalyst systems are also designed to perform within specified low emission levels. Operation of any vehicle beyond its performance range (speed, driving cycle/limit, or operational mode) will result in increased exhaust emissions.

An individual recommended that all drivers be given an equal pollution allowance for automobile usage, and that drivers exceeding the allotment would be fined, and those not using the full allotment would receive rebates. The individual added that emission test results and annual mileage could be used to determine compliance.

The commission appreciates the idea. Although this may be one way to reduce pollution, it is may not be practicable in its application.

An individual commented on the need for zero-tolerance enforcement against heavy-duty diesel polluters. An individual suggested that particulate emissions from diesel trucks be regulated.

The commission appreciates the comment, and would like the commenter to know that the federal government recently reached an agreement with several heavy-duty engine manufacturers for alleged violations of emission standards. While particulate emissions also have an impact on human health, the current PM standards are being met by the HGA area. If PM emissions are identified as a significant problem, the commission will look again at these types of emissions from diesel trucks.

Brazoria County and an individual commented that several areas of the state currently classified as attainment under the one-hour ozone standard show average ozone concentrations that are higher than for Brazoria County, which has the lowest average of the areas compared, and that Brazoria County exceeded the one-hour ozone standard for only 11 hours in 1999. Another individual commented that Brazoria County exceeded the ozone standard 0.078% of the time in the period 1997-2000. An individual commented that air monitoring data for certain months in 1997 and 2000 showed no exceedances of the eight-hour ozone standard, and concluded that Brazoria County does not exceed the ozone standard. An individual asked why, if the air quality in Brazoria County is so poor, the commission does not impose the same stringency for Austin, whose air quality is far worse than that of Brazoria County.

The commission disagrees with the comment that Austin's air quality is worse than Brazoria county. If the one hour ozone standard was violated in the Austin area a one hour SIP would be developed.

An individual commented that the continuous monitoring station in Clute, Brazoria County is not sited in an appropriate location to obtain representative ozone data for the county. One individual commented that the one ozone monitor in Clute is not sufficient for Brazoria County. An individual stated that if the Clute monitor were moved to another location in Brazoria County, it would probably show the area to be in attainment. Two individuals commented that conclusive proof has not been shown that point source NO_x produced in Brazoria County actually contributes to ozone problems in Harris County.

Although the Clute monitor is sited so as to pick up maximum concentrations of non-reactive pollutants, such as sulfur dioxide, it is not located where it would measure the maximum ozone created by the Brazosport urban/industrial area. Such a monitor would probably need to be located several miles to the north or northwest. Indeed, such a monitor could serve as another background monitor for the Houston area. However, in this new location the monitor would probably record more ozone exceedances, since the ozone scavenging effect due to NO_x plumes from nearby industries, which occurs at the current monitor location, would not likely be as pronounced at the new location. These suspected high ozone levels in north Brazoria County contribute to the background ozone in Harris County. It should be emphasized that in its present location, the Clute monitor has recorded violations of the one-hour ozone standard, averaged over the most recent three-year period of 1997-1999.

An individual wanted to know the HGA ozone level in 1990 compared to that today, and questioned whether we have made progress. An individual stated that he has seen dramatic negative changes in the air quality in the past 30 or more years. Another individual commented that air quality has become progressively worse over the past 37 years.

Comparing air quality monitoring data between two years (such as 1990 and 1999, for example) may allow statements to be made regarding which year had better air quality; however, doing so can lead to incorrect conclusions about whether emissions have actually changed between the years. The location, type, rate, and mass of emissions of pollutants, the weather, and the number, location, and types of air pollution monitors all contribute to the air pollution data collected during a given period. To account for these factors, commission staff generally look at a rolling period of three years to perform comparisons, and use the area design value as an indicator of the severity of the area's ozone problem. A design value is calculated to determine the difference between the monitored level of ozone and the federal ozone standard. Using three years tends to smooth out the favorable or unfavorable meteorological factors from one particular year. The 1991 HGA design value, based on data from the period 1989-1991, was 0.22 ppm. The 2000 design value, based on data from the period 1998-2000, is 0.20 ppm. The national standard is 0.12 ppm. Thus, we can say that there has been a small improvement since 1990, although the area is currently not yet in attainment.

An individual questioned whether there are adequate monitors to properly assess air quality. An individual recommended that the number of monitors be expanded, and that media report air quality levels to the public. An individual requested information on the ambient air monitoring stations that determine announcement of ozone watches for the Cypress Fairbanks Independent School District. An individual commented that until it is known what the emissions and ozone levels were in the HGA area before humans arrived, the necessary baseline is not present to plan a control strategy. An individual recommended that ozone monitors be sited on every corner of each chemical plant's property to provide a more detailed analysis of the ozone problem. An individual commented that industrial emissions should be monitored 24 hours a day.

The commission, in conjunction with local city and county governments, has established an ozone watch and warning program in the HGA and DFW areas. Ozone watches are issued in advance when weather conditions are forecast to be favorable for high ozone levels. Ozone warnings are issued whenever any monitoring site in the area measures high ozone levels.

Harris County officials are examining the possibility of establishing one or more additional ozone monitoring sites in Harris County to supplement the existing network. The commission is currently considering funding options for these additional monitors. The commission is considering a request to the State Legislature for funding additional ozone monitoring sites in counties surrounding ozone nonattainment and near-nonattainment areas,

including Houston.

An individual commented that siting and local influences should be reviewed for the commission's ambient air monitoring stations. An individual recommended that ambient air measurements be taken on windy days as well as on still days, and that measured values reflect the entire day instead of the morning hours only. An individual requested confirmation that an entire 24 hours of monitoring constitutes a monitored day.

Siting of monitors is guided by EPA regulations. The commission sites a wide variety of monitors for air pollution and meteorological data. Local influences such as roads, buildings, topography, trees, and land use are all considered in siting monitors. Often, the commission is limited by lack of easements or infrastructure in selecting optimal sites. However, the commission audits its sites and maintain photos and maps of the surroundings to judge the representativeness and quality of the data expected to be collected. More information on monitoring is available from the EPA's Web site at <http://www.epa.gov/oar/oaqps/qa/monprog.html> or from the commission's Web site at http://www.tnrcc.state.tx.us/cgi-bin/monops/psi_rpt. The commission's continuous monitoring stations measure ambient air quality data 24 hours per day.

Brazoria County and seven individuals commented that the majority of pollution is emitted by industry, not motor vehicles. Two individuals commented that motor vehicles, not industry, are the major cause of pollution. Five individuals commented that ordinary citizens should not have to help clean up pollution caused by industry. An individual commented that cars are not the major pollution source, based on observations that Beijing has pollution problems where most traffic is on foot and by bicycle. An individual suggested that the commission go to the heart of the problem and leave the taxpayers alone.

Although automobiles and oil companies certainly are major contributors to ozone levels in the HGA area, they only comprise a part of the problem. In the 1993 base-year inventory, light-duty gasoline vehicles contribute about 19% of anthropogenic VOC emissions and 17% of anthropogenic NO_x emissions, while oil refining, chemical manufacturing, and related industries are responsible for about 20% of anthropogenic VOC emissions and 31% of anthropogenic NO_x emissions. Together, these sources contribute about a third of anthropogenic VOC emissions, and slightly less than half of anthropogenic NO_x emissions. So, while an effective control program must include reductions for these sources, reductions must be made to the other sources as well, since modeling indicates that anthropogenic NO_x emissions must be reduced by at least 70% to reach attainment.

An individual commented that the commission should investigate ozone exceedance episodes to determine the origin and reason for the incidents.

The commission staff does not have the analysis tools or resources that would allow it to investigate the specific causes of every ozone exceedance. However, the staff does model cases believed to be representative of a large number of days in order to determine what precursor emissions should be reduced to reduce ozone most effectively. For several individual ozone (and other pollutant) episodes, the commission staff has performed air parcel trajectory analyses to suggest what upwind sources may have contributed to the pollution reported by a monitor.

An individual commented that cooling towers should be monitored and inspected, stating that the resulting VOC reductions could eliminate the need for some of the proposed SIP measures.

The commission agrees that cooling towers can emit significant quantities of VOC, and has begun preliminary research concerning such a possible rule.

An individual questioned the need for all the commission staff, and suggested that this money could be better used by building a bypass highway around Houston.

The Legislature appropriates funds for this state agency and all state agencies. In addition the Legislature sets maximum employee staffing levels. The commission disagrees that a bypass around Houston would solve the nonattainment problem facing the HGA area.

An individual stated that if the air quality in HGA were unbearable, the population growth would not have increased at such a high rate, and commented that residents are free to stay or leave.

The commission disagrees with the comment, noting that the high population growth rate in HGA in fact makes a major contribution to ozone levels in the area. The purpose of air quality standards is to insure that communities have safe, clean air to breathe. Offering citizens no other alternative than to leave their communities behind if they desire clean air is not an acceptable health or public policy option.

Five individuals commented that environmental factors such as biogenic sources and meteorological events, such as high temperatures and lack of rain, should be considered when evaluating compliance with the federal ozone standard. An individual recommended that the commission study outside influences on HGA air quality, such as upwind industries and fires in Mexico.

In 1998, EPA allowed some high ozone days for some areas in Texas to be flagged as exceptional events because of the influence of smoke from Mexico and Central America in producing abnormally high regional background ozone levels. Normally, EPA allows only events that cannot be controlled or regulated by state or federal authorities to be classified as exceptional events.

GCI commented that government should lead the way in converting its fleets to low- or zero-emission vehicles by 2007. GCI recommended that government construction contracts should specify stringent equipment performance standards and green building techniques and materials.

The Legislature has recently passed legislation covering state government fleets. The commission appreciates the comment, and will evaluate this measure during the mid-course review.

GCI supported the use of fuel cell and solar power innovations, and questioned how these applications were modeled in the SIP. Two individuals supported fuel cell technology. An individual supported hydrogen automotive engines. Two individuals expressed support for hybrid vehicles, and recommended incentives to encourage more sales of these vehicles.

The commission has not yet modeled these measures. However, the commission has committed to a review of this technology as part of the mid-course evaluation.

An individual commented on the need to accurately quantify and assess the impact of all sources of pollution, noting that pine forests emit VOCs. An individual commented that oak trees cause low-level ozone, and the ground produces NO_x.

VOC emissions from trees and other vegetation, as well as NO_x emissions from bacterial activity in the soil, are known as biogenic emissions. The commission staff quantifies these emissions and evaluates their role in the production of ozone in its photochemical modeling work. Emissions projections for 2007 in the HGA show that biogenic VOC represents 67% of the total VOC, and biogenic NO_x represents 2% of the total NO_x. These figures indicate that biogenic VOC is a significant contributor to total VOC, but biogenic NO_x is an insignificant contributor to total NO_x. It is important to note that, although VOCs from biogenic and manmade sources facilitate the reactions that form ozone, ozone is actually created from NO_x and oxygen. Thus, without the man-made emissions of NO_x, ozone levels would be quite low in the HGA area. Therefore, the commission does not agree that oak trees “cause low-level ozone.”

An individual suggested that industries along the Houston Ship Channel inject waste gas into drilled wells as an alternative to burning it, similar to the way that unwanted salt water is disposed of.

Because of the heating value of waste gas, refineries and petrochemical plants typically burn it in boilers, heaters, incinerators, and other combustion equipment, or else dispose of it by flaring. The combustion of fossil fuels (primarily natural gas with lesser amounts of waste gas) in these units creates NO_x emissions, which are being controlled in this SIP revision by the mass cap and trade rule. Proven technologies exist to control NO_x emissions from most of these combustion units, but the commission believes that underground injection of waste

gas would be impractical and technically infeasible.

An individual requested the percentage contribution of pollution from personal use vehicles compared to commercial vehicles.

State vehicle registrations are maintained in the TxDOT registration database, which does not contain a specific field for distinguishing commercial from personal use vehicles.

Therefore, a response cannot be given based on available information.

An individual commented that all automobiles operated by all branches of government, not used for law enforcement or emergency purposes, be sold, and that mileage allowances for use of private vehicles within government be discontinued. The individual listed air quality, monetary, and health benefits of such a program. The individual commented that the calculated emission reduction of 297 tons per year would far exceed any of the proposed control strategies except for industrial point sources.

The commission generally supports reduction of VMT through all sectors of employment, but sees no practical benefit to the commenter's suggestion to limit such a measure to the governmental sector. The calculated emission reduction of 297 tons per year is equivalent to 0.8 tpd, which would by no means be the largest emission reduction next to industrial point sources.

An individual commented that Texas should challenge the federal gasoline tax and all other illegal taxes imposed by the federal government.

The proposed action is not within the scope of the commission's authority.

An individual recommended that emissions of particulate matter, carbon dioxide, and all other pollutants be reduced from all sources.

The commission has adopted rules for the control of particulate matter and certain other pollutants, but not for carbon dioxide.

An individual commented that city governments be required to use a certain low-VOC paint and a certain non-polluting pesticide.

The commission enforces federal requirements for architectural coatings, and enforces its own rules for insecticides. These rules apply to all persons in the state, including city governments. However, the commission does not endorse, or require the use of, specific products to achieve compliance with the rules.

Two individuals commented on a specific tire storage and disposal facility in Liberty County. Two individuals commented on permits issued to two separate petrochemical plants in Harris County. An individual commented on a specific crushing plant in her neighborhood. An individual commented on a specific waste landfill site in Chambers County. An individual commented on a specific chemical distribution facility in Brazoria County.

All of these comments are beyond the scope of this action.

An individual commented that the solution to pollution is dilution. The individual further commented that industry should be encouraged to relocate to less inhabited areas of the state, and that people seeking employment would follow by default.

When businesses evaluate potential sites for locating industrial facilities, the nonattainment status of the area in question likely plays an important role in the decision whether or not to locate there. Stringent permitting and offset requirements apply to nonattainment areas, assuring that no net emission increases result from new or modified sources of air pollution. Permitting requirements also apply in attainment areas, although they are somewhat less restrictive than in nonattainment areas. It is not the role of the commission to determine where industries should locate, but rather to address air quality problems where they exist.

An individual suggested designating certain days of the week for truck deliveries within cities.

The commission will review this idea along with other innovative ideas during the mid-course evaluation.

An individual recommended eliminating some flights out of Houston airports, stating that higher-capacity aircraft could be used instead.

This action is not within the commission's jurisdiction, because the Federal Aviation Administration has sole authority to regulate commercial airline flights.

An individual commented that offices should be moved away from downtown to reduce commute times, and suggested starting with governmental agencies and people who deal with them.

This solution is problematic in that the new location of the offices might not decrease commute times, and in fact might increase them, depending on the location of origin of the commuter trips.

An individual commented on the need to remove haze around parks and recreation areas to encourage tourism.

The primary goal of achieving the ozone standard is to protect public health. The SIP is concerned with improving air quality throughout the entire HGA area, so parks and recreation areas would benefit as a result.

An individual advocated prohibiting the sale of all items on Sundays to decrease VMT on those days, thus allowing the opportunity for pollution to clear out from the area.

For some time, so-called “blue laws” in Texas have restricted the sale of certain items on Sunday. Since 1985, when the law was revamped, the law restricts only automobile dealerships in Texas from operating on consecutive Saturdays and Sundays. Any actions to broaden the scope of the law would have to be undertaken by the State Legislature.

An individual advocated the use of solar-powered gardening equipment. Another individual recommended that solar-powered fan/smog filter systems be installed on road vehicle barriers to reduce pollutants at the source.

The commission is not aware of solar-powered gardening equipment or fan/smog filter systems that are commercially available.

An individual commented that the entire cause of the pollution problem could be emissions from unregulated vehicles belonging to people who are in the area illegally.

The commission has no data indicating that foreign vehicles are a significant part of the pollution problem in the HGA area.

An individual provided information on an ionizing tower designed both to remove ozone from the air and to generate auxiliary power. An individual recommended use of an aerostat balloon to provide ductwork that would convey cold, clean air aloft down to the surface, thus lowering heat and humidity and displacing air contaminants.

The commission appreciates the innovative approaches suggested by the commenters. However, insufficient information is available at the present time for the commission to perform a thorough evaluation of such measures.

An individual provided information on an opposed-piston automobile engine designed to operate with greater fuel economy than conventional engines.

The commission currently does not have the resources or funding to develop the engine technology described by the commenter. The commission relies on currently available technologies that have been federally tested, certified, and approved for marketing and use. It is recommended that the developmental efforts envisioned by the commenter be shared or

coordinated with EPA, automotive industries, universities, or research groups who may willing to provide sponsorship.

An individual inquired as to why inert gas discharges, containing high concentrations of sulfur and VOC, are allowed from crude tankers.

The commission has regulations prohibiting the discharge of controlled gases into the atmosphere.

An individual inquired as to why tank cleaning operations are allowed.

The commission regulates the cleaning and degassing of stationary tanks, marine vessels such as barges, and transport vessels such as trucks or rail cars, in Chapter 115. Sources affected by the rule's applicability requirements must apply appropriate controls to reduce VOC emissions.

An individual inquired as to why lightering operations are allowed without vapor balancing or vapor recovery.

Lightering refers to the transfer of cargo from one marine vessel to another, usually for the purpose of enabling large, deep-draft vessels to be loaded or unloaded without entering shallow coastal waters. In a typical lightering scenario, shallow-draft vessels are used to transport the VOC cargo from a marine terminal to deeper waters, where a larger vessel is located. Vessel-to-vessel transfer then occurs.

The commission adopted the Chapter 115 marine vessel loading rules on May 4, 1994. The rules were developed by a workgroup that included agency, industry, and environmental organization representatives. The commission determined not to regulate sea-based lightering operations because there are a variety of difficult issues associated with this activity. However, transfer of VOC from one marine vessel to another marine vessel is subject to the Chapter 115 marine vessel loading requirements if the VOC transfer uses loading arms, pumps, meters, valves, or piping that are part of a marine terminal. The commission may consider emission reductions from lightering in the future, if those reductions are determined to be necessary to reach attainment with the ozone standard.

Sierra-Houston commented that under the provisions of Clean Air Texas 2000, participating industries were to have reduced emissions by approximately 50%, and stated that it has been unable to confirm whether these reductions have actually taken place.

The commission has recently completed a report on grandfathered emissions which is available on the Web site at: www.tnrcc.state.tx.us.

An individual commented that in order to solve our pollution problems, we must address our system of life that depends on the use of fossil fuels and nuclear energy. An individual commented that oil usage should be slowly phased out.

Although our individual and collective choices do affect the environment, the commission believes that the types of far-reaching changes suggested by the commenters are beyond the scope of this SIP revision. The HGA ozone attainment demonstration must assure that the necessary reductions for attaining the ozone standard by 2007 are achieved.

An individual commented that an environmental regulation agency is needed to force businesses to compete for the best environmental performance and guide consumers in choosing products based on environmental records of the producing companies.

The commission appreciates the suggestion and support.

An individual commented that if the amount of operation time is taken into account, the emissions from a single truck would equal the emissions from 1,000 to 10,000 cars.

Based on the wording in the comment, it is assumed that the mention of “single truck” refers to a HDDV truck. The statement that the emissions from a single HDDV truck would emit the equivalent of 1,000 to 10,000 cars would only be true under certain specific conditions. Emission rates from both cars and trucks vary with speed. Based on some sample MOBILE5 output for both 1999 and 2007, the emission rates of light-duty gasoline vehicles (LDGVs) and HDDVs in g/mi for NO_x, VOC, and CO between the speeds of 1 to 65 mph are presented below:

Emission Rates from 1 to 65 mph	1999 Emissions			2007 Emissions		
	NO _x	VOC	CO	NO _x	VOC	CO
LDGV average emission rate (g/mi)	1.4	1.3	10.2	1.0	0.7	6.8
HDDV average emission rate (g/mi)	10.9	1.9	10.9	7.2	1.8	10.7
HDDV/LDGV average ratio	7.7	1.4	1.1	7.5	2.5	1.6
Number of truck miles to emit 1,000 times a car driven 1 mile	130	714	909	133	400	625

Number of truck miles to emit 10,000 times a car driven 1 mile	1,299	7,143	9,091	1,333	4,000	6,250
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As the table demonstrates:

- **NO_x emission rates from trucks are roughly 7.5-7.7 times higher than from cars;**
- **VOC emission rates from trucks are roughly 1.4-2.5 times higher than from cars; and**
- **CO emission rates from trucks are roughly 1.1-1.6 times higher than from cars.**

Using these figures, a truck would need to drive roughly 130 miles in order to emit 1,000 times as much NO_x as a car driving one mile. In order for the truck to emit 10,000 times as much NO_x as the car, it would need to drive about 1,300 miles for every mile driven by the car. The comparable figures for VOC and CO are much higher due to the fact that the HDDV/LDGV ratios for these pollutants are smaller.

An individual commented that the dumping of aviation fuel into the atmosphere above airports should be controlled.

Jettisoning of aviation fuel by airborne aircraft is primarily a safety measure implemented in emergency landing operations, and is regulated by the Federal Aviation Administration. The commission has no jurisdiction in this area.

An individual commented that the air conditioning systems and storage compartments of ships should be tested for leaks.

The commission is unaware of how AC system discharges impact tropospheric ozone. Ship loading and unloading emissions are regulated by the commission.

An individual expressed support for fusion plants, and commented that development of more efficient electric generating plants would solve the ozone problem.

The commission is supportive of energy efficiency programs, and has committed to evaluating future energy efficiency programs.

An individual commented that priority should be given to reducing pollutants such as chlorine and benzene rather than ozone.

The commission is concerned with ozone as a part of this action. The commission will be exploring the role of chlorine and other emissions as part of the mid-course review.