

The Texas Natural Resource Conservation Commission (commission) adopts revisions to the State Implementation Plan (SIP) for the Control of Ozone Air Pollution concerning the Attainment Demonstration for the Houston/Galveston (HGA) Ozone Nonattainment Area.

Explanation of the Proposed SIP

In November 1998, the SIP revision submitted to EPA in May 1998 became complete by operation of law. However, EPA stated that it could not approve the SIP until specific control strategies were modeled in the attainment demonstration. EPA specified a submittal date of November 15, 1999 for this modeling. As the HGA modeling protocol evolved, the state eventually selected and modeled seven basic modeling scenarios. As part of this process, a group of HGA stakeholders worked closely with commission staff to identify local control strategies for the modeling. This modeling showed attainment of the one-hour ozone standard with application of weight-of-evidence (WOE) arguments. As a follow-up to this SIP, the state is committing to refine emissions inventory estimates, conduct additional modeling, and submit adopted rules to EPA by December 31, 2000. The state also is committing to perform a mid-course evaluation in the 2003-2004 time frame.

Hearing and Commenters

The commission held a public hearing in Houston, Texas on August 2, 1999, and the public comment period closed on August 16, 1999. A total of 29 oral comments were received at the public hearing, and 140 written comments were received during the public comment period.

Evaluation of Testimony

Numerous commenters offered recommendations to include control strategies not previously modeled, or to revise modeled control strategies. Other commenters spoke to specific elements of the modeled strategies, with recommendations to consider cost, ozone benefits, and other environmental impacts.

The current SIP provides only modeling of control strategies for attainment of the ozone standard in the HGA area. Work will continue to further refine the emissions inventory and modeling, and to develop rules to implement the identified control strategies, for the next SIP to be submitted to the United States Environmental Protection Agency (EPA) in December 2000. The commission will consider additional strategies, or revisions to modeled strategies, during this process. The commission will also consider cost, ozone benefits, and other environmental impacts of the control strategies during the rule development process scheduled to take place during the first half of 2000. Extensive involvement with regional stakeholders, including private citizens, environmental groups, local governmental entities, and industry, will be a key element in the success of this effort. For more information on how to get involved, contact Mike Magee of the commission's Office of Environmental Policy, Analysis, and Assessment (OEPAA) at (512) 239-1511.

Several individuals commented that grandfathered sources should be controlled under the ozone attainment strategy.

Grandfathered status has never been the basis for exemption from reasonably available control technology (RACT) rules for volatile organic compounds (VOC) and nitrogen oxides (NO_x) in the HGA area. Over the past twenty years, the agency has implemented extensive VOC RACT rules for the ozone control strategy. In recent years, as the importance of NO_x reductions to ozone attainment have become apparent, the agency has adopted NO_x RACT rules. The next SIP

revision, to be submitted to EPA in December 2000, will contain rules to implement more stringent NO_x controls for point and other sources. All of these existing and future rules apply to grandfathered sources.

EPA commented that in order to be approvable, a SIP that relies on WOE arguments must include an enforceable commitment to perform a mid-course evaluation. AICHe, City of Houston, Reliant, EPA, and Judge Eckels suggested that future modeling be performed during implementation of the controls to confirm that progress is being made for a mid-course evaluation.

The commission plans to conduct additional modeling of the effects of future ozone strategy controls. This “mid-course evaluation” will enable the commission to evaluate the effectiveness of the strategy in achieving attainment, and to make appropriate adjustments in the strategy. The timing and scope of the mid-course evaluation are still under consideration by the commission. This SIP contains a commitment by the state to perform such an evaluation. Since a public hearing is required to meet FCAA requirements to make the commitment enforceable, the SIP also contains a schedule for conducting a public hearing on this matter in January 2000, and submission to EPA by April 2000.

EPA commented that the state must show that it has the statutory authority to adopt, implement, and enforce all of the modeled control measures.

The commission has not proposed any rules to implement the modeled control measures in this modeling SIP, and believes that the appropriate time to address this issue is with the next SIP submittal in December 2000, which will contain adopted rules.

EPA commented that any changes to the emissions inventory must have adequate public notice and comment in order to meet federal criteria for SIP revisions and conformity budgets. EPA added that all additional information submitted in the SIP must meet FCAA requirements for public notice and comment.

The commission presented a number of modeling scenarios for public comment, and later made modifications to some of them based on suggestions received from commenters. For example, changes were made to address EPA's concerns over the arbitrary 50% reduction in nonroad mobile emissions, as well as the accelerated onroad mobile source fleet turnover to 2015. These revisions resulted in changes to the transportation conformity budgets for both VOC and NO_x, which are represented in Table 2-1 of the SIP. However, additional revisions to the onroad mobile source inventory and, therefore, to the transportation conformity budgets will be made before the December 2000 SIP is submitted. These revisions will undergo public notice and comment, as required by the FCAA.

EPA stated its concern over the commission's assumption that start-ups and shutdowns from the period 1990-1996 were considered indicative of future growth in the area. EPA's concerns stemmed from the banking of some of these shutdown emissions and the possible future return of the emissions to the atmosphere, the failure of banked shutdown emissions to meet the federal definition of "surplus," and the use of the same growth trend across all source categories. AIChE and an individual also expressed concerns about the process used to estimate emission growth to 2007.

The commission plans to address this matter with its next round of inventory and modeling refinement, drawing upon its recent analysis and adjustment of the point source growth rate for the

Beaumont/Port Arthur (BPA) attainment demonstration, based on EPA's comments. However, compared to BPA, banked emissions from shutdowns in HGA constitute a much smaller percentage of the bank total, so that the change in the projected point source growth rate is expected to be insignificant. The commission has established a work group to study better methods for point source growth projections, and plans to finish the work in time to incorporate the results into the December 2000 SIP.

EPA stated that, although the May 1998 SIP narrative contained a commitment to submit a Post-99 Rate-of-Progress (ROP) plan by December 2000, the proposed 1999 modeling SIP narrative lacked any references to the ROP requirements. EPA commented that the commission must clarify that it is still committed to submitting target calculations and rules to achieve the Post-99 ROP requirements.

The current modeling SIP follows up on, rather than supersedes, the May 1998 SIP. Therefore, the commission's commitment to satisfy Post-99 ROP requirements is still in place. This commitment is reiterated in Chapter 7, Future Attainment Plans, in the current SIP revision.

EPA and several other commenters took issue with the lack of commitments on the part of the state to implement the control strategies modeled for this SIP revision.

The purpose of this SIP revision is to conduct modeling of specific control strategies in order to evaluate their effectiveness in attaining the one-hour ozone standard, and to submit the results to EPA by November 15, 1999. Although significant progress has been made, a gap still exists. The commission is committed to closing that gap and demonstrating attainment. The control strategies modeled to date are an indication of what could be required to meet this commitment. A

transportation conformity budget is also being adopted as a part of this SIP. The commission is committing to adopt a control strategy with sufficient reductions from mobile sources to meet this budget. There is a strong process in place in the HGA area to close this gap. Analysis and evaluation are still underway at a vigorous pace, and there are still numerous options to consider. The commission will follow up with additional modeling and adopted rules to implement the strategies identified for the final attainment demonstration, and submit the final SIP revision relating to HGA ozone attainment to EPA by December 31, 2000.

George Beatty of the Greater Houston Partnership (GHP) commented that the commission should take a balanced approach to making reductions for the SIP, since the modeling has shown that attainment will not result from control of point sources alone.

The commission agrees that all sectors of the emissions inventory will have to bear a share of the reductions needed for attainment. In cooperation with regional stakeholders and a contractor, the commission is actively studying additional control strategies for the onroad and nonroad mobile source sectors of the inventory for submittal in the final attainment demonstration SIP in December 2000.

Andy Meyers, Fort Bend County Commissioner, Precinct 3, urged the commission to be fair and equitable in developing control strategies, so that any one particular area such as Fort Bend County is not unduly penalized.

The commission fully intends to implement control strategies for the HGA attainment demonstration in a fair and reasonable manner. Areas with few large industrial sources would

experience little direct impact from point source NO_x rules. However, other strategies affecting onroad and nonroad mobile sources would tend to be more widespread over the HGA area.

Several individuals commented that various regional stakeholder groups are neither inclusive nor representative of the general public.

It has been the commission's observation that regular meetings of several stakeholder groups in the HGA area are attended by a wide spectrum of the general public, and that many of these individuals participate actively in the groups' activities. The commission recommends that individuals interested in participating in the stakeholder process contact Ms. Lily Wells, H-GAC, at (713) 993-4537 to learn of upcoming meetings of the Regional Air Quality Planning Committee (RAQPC), air quality advisory committee to H-GAC.

Several individuals commented that they would like the opportunity to review the SIP revision before it is adopted by the commission in late October 1999.

The SIP revision prepared for the commissioner's consideration for adoption is available to the public after it is filed with the commission Chief Clerk, normally 19 days before the scheduled agenda date. The adopted SIP is posted to the agency Web site after the commission takes formal action at agenda. The SIP revision and rulemaking process is not structured to provide another opportunity for written public comments after the public hearing has been conducted. However, speakers may register at the agenda meeting and address the commission on the particular item. It should be emphasized that an intensive stakeholder process, followed by a public hearing, will take place during the coming year as modeling and adopted rules are developed for the December 2000

SIP revision.

The City of Houston, Business Coalition for Clean Air (BCCA), and three individuals commented that the state should go back to the IM240 inspections and maintenance (I/M) emissions testing program that was in place several years ago.

In 1995, Senate Bill (SB) 178, passed by the 74th Texas Legislature, repealed the commission's legal authority to implement a centralized I/M program using an IM240 type emissions test in the eight nonattainment area counties. Two years later, SB 1856 was passed, which gave the commission the authority to establish the current I/M program.

The current I/M program, called the Texas Motorist Choice Program (TMCP), improved convenience by providing over 1,100 testing facilities in Harris County which can inspect vehicles, instead of 28 facilities in the old program. The TMCP conducts two speed idle testing for all gasoline vehicles. The test is significantly less expensive and less time consuming than IM240, and is also considered effective in identifying grossly polluting vehicles.

However, because the HGA nonattainment area now needs to reduce NO_x emissions, possible modifications to the current emissions testing program are being considered. One test type being considered is an Acceleration Simulation Mode (ASM) type test in addition to the implementation of On-Board Diagnostics (OBD). An ASM type test would achieve VOC and NO_x emission reductions comparable to those achieved by an IM240 type test, but at less than half the cost, and could be implemented through the current decentralized testing network. OBD will be implemented through the current testing network.

The Houston-Galveston Area Council (H-GAC), the City of Houston, the South Texas Section of the American Institute of Chemical Engineers (AIChE), Mothers for Clean Air, and the Honorable Robert Eckels, Harris County Judge commented that the state should implement an effective I/M program that achieves equivalent emissions reductions to those currently modeled for IM240.

Implementation of an ASM loaded mode test is one alternative being considered by the commission and the local MPO. An ASM type test would achieve VOC and NO_x emission reductions comparable to those achieved by an IM240 type test, but at less than half the cost.

The Texas Automobile Dealers Association (TADA) expressed concerns that the proposed revisions are focused on the reintroduction of an IM240 centralized emissions testing program, and that if the state mandates an IM240 program, then many of the businesses that currently perform emissions testing will fail because they have invested money in equipment that will become worthless. In addition, TADA is also concerned that a centralized system would result in fewer test sites, thus resulting in fewer jobs for Texans.

The commission has no intention of mandating an IM240 centralized program. However, in order to achieve equivalent emissions reductions to those modeled for IM 240 credits, modifications to the current emissions testing program may be considered. One test type being considered is an ASM loaded mode test. An ASM type test would achieve VOC and NO_x emission reductions comparable to those achieved by an IM240 type test, but at less than half the cost and could be implemented under the current decentralized testing system.

Continuation of the present decentralized system does not guarantee the health of prosperity of

any business. The majority of two speed idle emissions analyzers currently in use in the TMCP are 5 to 14 years old. According to the emissions analyzer manufacturers, many of the current emissions analyzers may have to be replaced due to age and the advances in technology based. Continued participation in the program as it evolves will be a business decision made by each individual station owner.

Two individuals commented that the state should enforce compliance of the I/M program so that failing vehicles will not be allowed to operate on public roads.

There are two methods of enforcement for the emissions testing program currently in place.

Vehicles registered in Harris County must pass the safety and emissions test to be issued a safety certificate. In addition, a vehicle must have a current, valid safety certificate to legally operate on public roads. The state has implemented a re-registration denial element to the I/M program for vehicles that fail to comply with the emissions testing program. Local law enforcement officials are responsible for ensuring that vehicles operated on public roads have a valid registration sticker and safety certificate.

The City of Houston, AICHE, and two individuals commented that the commission should implement a testing program throughout the eight-county HGA nonattainment area.

Although the current vehicle emissions testing program is limited to Harris County, any of the surrounding counties may petition the commission for adoption into the I/M program. The Texas Transportation Code §548.301(b) and the Texas Health and Safety Code §382.037(c) allow the commission to establish by rule an I/M program in a county provided the county and its most

populous municipality adopt a resolution requesting such a program.

Under the current TMCP, vehicles in the surrounding nonattainment counties are not necessarily exempted from emissions testing. Vehicles, registered in surrounding counties, that commute into Harris County are targeted by remote sensing. Those subject vehicles failing remote sensing are required to pass an emissions test or qualify for a waiver.

The City of Houston and one individual recommended that the state should increase the effectiveness and ensure proper coverage of the remote sensing element, as well as give adequate credit for this element.

Instead of requesting that the I/M program be expanded beyond Harris County, the EPA approved the use of remote sensing to address the urbanized area shortfall of approximately 65,000 vehicles commuting into the core nonattainment county from the surrounding seven counties. As stated in the SIP, to satisfy the overall coverage requirements of the FCAA the state will also use remote sensing to identify a sufficient number of high-emitting commuting vehicles that are contributing to the overall mobile source emissions inventory of Harris County.

The remote sensing element of the vehicle emissions testing program is operated by the Department of Public Safety (DPS). To increase remote sensing coverage, the DPS plans to purchase an additional Remote Sensing Device for use in the program areas.

When a high emitting vehicle is identified by remote sensing, the registered owner of the vehicle in question will be notified by mail to take the vehicle in for a verification test at a certified emissions

testing facility. If the vehicle fails the verification test, the owner must repair the vehicle and pass a retest or qualify for a waiver/extension. Failure to comply with the notice is a criminal offense, punishable by a fine not to exceed \$350, and vehicle re-registration will be denied.

EPA recently released 40 CFR 51, “Additional Flexibility Amendments to Vehicle Inspection Maintenance Program Requirements; Proposed Amendment to the Final Rule.” Changes included in this proposal may allow additional emission reduction credit to be granted for the remote sensing element if the program can prove significant emissions reductions over and above those already predicted to be achieved by other aspects of the I/M program.

One individual suggested conducting additional remote sensing monitoring of vehicle exhaust on all freeways during rush hours (morning and afternoon) and ticketing owners of vehicles that are emitting more pollutants than allowed.

During a typical rush hour, accuracy using remote sensing equipment suffers due to a large number of vehicles in a concentrated area. With high traffic volume in a concentrated area, emissions from other vehicles can lead to a false reading when trying to single out a particular vehicle. Also, freeways do not provide suitable conditions for remote sensing equipment to properly operate. The ideal conditions for the identification of a high emitting vehicle are a single lane of traffic, such as an on-ramp, and conditions that allow for normal vehicle acceleration. Rush hour traffic tends to lead to static traffic conditions, where an accurate measure of emissions for a particular vehicle would not be possible.

One individual commented that drivers of smoking vehicles should be ticketed.

A current statewide commission regulation (Chapter 111.111 (a) (5)) makes it a violation for a vehicle to emit visible smoke for more than ten consecutive seconds. There is also a state statute (Transportation Code, Chapter 548.306) that makes it a misdemeanor for a smoking vehicle to be operated in Dallas, El Paso, Harris or Tarrant counties. Furthermore, many city ordinances in Texas have a similar 10-second violation. These laws can be enforced by various state and local law enforcement authorities, depending on the vehicle's location.

The City of Houston, AIChE, H-GAC, and one individual commented on the possibility of testing diesel vehicles.

The commission will take this into consideration during development of the December 2000 SIP. However, the EPA has not established national standards for diesel inspection and maintenance emissions testing for onroad vehicles.

One individual commented that drivers of low-mileage gas-guzzling cars should be taxed if they don't carpool.

The H-GAC has established carpooling incentives such as High Occupancy Vehicle lanes and van pools. The commission does not have the authority to levy taxes on vehicles based on their emissions or their fuel consumption.

GHP commented that even if the benefits of some proposed controls, for instance IM240, are determined to be less than originally modeled, viable alternative controls to achieve comparable

emission reductions from the same sources should be identified.

The commission agrees that if the benefits of any proposed controls are determined to be less than originally modeled, viable alternative controls to achieve comparable emission reductions from the same sources should be identified. Control strategies will be adjusted as necessary to meet clean air requirements. One mobile source control alternative being considered is to replace the current two-speed idle emissions test with an ASM loaded mode test. An ASM type test would achieve VOC and NO_x emissions reductions comparable to those achieved by IM240, but at less than half the cost.

TADA commented that there is no historical or scientific data to prove that a centralized “test-only” network is more effective than a decentralized “test-and-repair” network.

The commission agrees that there are no data to prove that a centralized “test-only” network is more effective than a decentralized “test-and-repair” network. The state submitted a report on the short-term effectiveness of the TMCP to the EPA on February 8, 1999. This “18-month evaluation” of the I/M program was a short-term evaluation that demonstrated the effectiveness of the state’s decentralized test and repair emissions testing network in addressing the emissions reductions claimed in the 1996 SIP revisions. The National Highway Systems Designation Act (NHSDA) of 1995 prohibited EPA from disapproving or applying an automatic discount of estimated emissions reduction credits because the I/M program had a decentralized or a test-and-repair component. In the evaluation report, the state requested the EPA to grant final approval of the SIP revisions based upon the determination of 100% equivalency between the “test-only” and “test-and-repair” emissions testing station. EPA has recently released 40 CFR Part 51,

“Additional Flexibility Amendments to Vehicle Inspection Maintenance Program Requirements; Proposed Amendment to the Final Rule” which removes the I/M rule provision establishing the decentralized, test-and-repair credit discount.

One individual commented that the I/M program needs a consumer protection element so consumers do not get ripped off for unnecessary repairs.

The current I/M program includes DPS oversight of recognized repair facilities. Repair information is stored on a centralized database, and repair effectiveness statistics are generated biannually, listing the repair success rate for each facility. Any anomalies are forwarded to DPS for investigation.

AIChE stated that, since the difference between the modeled ozone concentrations and the measured concentrations was greater than the model response for implementation of various control scenarios, the results were adequate to demonstrate attainment.

The commission agrees. The exact value predicted by the model is not as important as the relative response of the model when various controls are applied to the emissions. The main role of the model is its use as a planning tool, to evaluate various control options.

AIChE suggested that the commission continue to investigate and model temporal and spatial control measures.

The commission plans to continue the efforts to evaluate and refine the emissions inventories and

to evaluate potential control strategies. In the SIP to be submitted in December 2000 with the rule package, specific proposed rules will be applied to the emissions and will be modeled.

AIChE, City of Houston, Texas Chemical Council (TCC), H-GAC, GHP, Greater Houston Builders Association (GHBA), Gilpin, Paxson, and Bersch , Exxon, Chevron, BP Amoco, Reliant Energy (Reliant), Judge Eckels, and an individual indicated that additional episode days should be modeled to evaluate controls when a flow-reversal occurs.

The commission, in conjunction with Harris County, has a work order with MCNC, the commission's modeling contractor, to evaluate modeling of an additional episode involving flow-reversal. It should be noted that although commission staff have previously spent considerable resources on this episode, it did not meet EPA performance criteria. It is anticipated that this modeling will be included in the December 2000 SIP, if the episode meets EPA performance criteria.

AIChE indicated that ozone should be recognized as a surrogate for measuring air quality.

This has been done, and ozone measurements are included in the air quality index calculations reported on a daily basis to the news media. The air quality index is calculated daily and reported by the agency's Monitoring Operations Division. This activity has been in place for a number of years. More information can be obtained from Mr. Bryan Lambeth, Monitoring Operations Division, at (512) 239-1657.

AIChE and an individual commented indicating a concern that the commission had used the Urban

Airshed Model (UAM) for the 1998 SIP, but changed to the Comprehensive Air Quality Model with Extensions (CAMx) model for the 1999 SIP. The concern was that the CAMx model is new and not as accurate as the UAM.

The algorithms used in the UAM and CAMx are the same, with very minor modifications. CAMx has a number of capabilities that make its use more desirable than UAM. It can be used for source apportionment work, has a module that makes it easy to modify the chemistry used in the model, and has three different advection schemes. The version of CAMx used for this SIP uses the same algorithms used in UAM. The commission has performed extensive model comparisons between the UAM and CAMx, and found that both models perform at about the same level. Even though there are minor differences in the computer codes, they provide equivalent results.

One commenter expressed concern about the ability of CAMx to simulate ozone.

CAMx is a state-of-the-science model, and there is no other operational model that has been developed that uses significantly different algorithms for simulating surface ozone. An additional burden of using the UAM series is the cost of continuing a license, the cost of having to pay for resolution of difficulties in the model code, and the cost of providing upgrades to the model. The commission is actively investigating additional chemical mechanisms that are unique to the Gulf Coast area. It is an easy matter to make these chemical changes to CAMx, but a costly, time-consuming matter to make those changes in the UAM series. Furthermore, it has been necessary to evaluate various algorithms used in the models for performance problems. This is simple with CAMx because the computer code is readily available, but is impossible with the UAM series, because the code is not available.

AIChE, City of Houston, GHP, and Gilpin, Paxson, and Bersch indicated concerns about the accuracy of the onroad and nonroad mobile emissions.

The commission is continuing its efforts to refine emissions estimates as appropriate data become available. Throughout the process, the best available data have been used for all aspects of the emissions inventory development and modeling. Recently, the commission completed an analysis of the nonroad mobile source inventory in the Los Angeles, California area, which resulted in adjustments to the corresponding HGA inventory. Work is ongoing with HGA regional stakeholders to better characterize nonroad mobile source emissions.

AIChE commented about the lack of information on the setting of options for running of the model.

This information is available and can be supplied upon request in writing to the agency's SIP Modeling Section. Due to the very large amount of data, the request should be very specific in nature. This information is not routinely included in the SIP document or the appendices, due to the volume of the data. The modeling staff contact for additional information is Chris Kite, (512) 239-1959. The address is: Technical Analysis Division, P. O. Box 13087, MC 164, Austin TX 78711-3087.

AIChE indicated that the commission appears to be making every effort to interpret the data in the most advantageous manner.

The commission completes technical analysis of the data in an objective manner using accepted

peer review and quality assurance.

AICHE commented that it appears that modeling performed in 1994 was the driving force behind developing an overall strategy of reducing NO_x emissions drastically, and that VOC reductions were not given importance.

Extensive modeling was performed with the current episode to determine the effect of various control reductions. This modeling included various combinations of reductions of NO_x, VOC, and combinations of both pollutants. Additional model sensitivity analyses were performed with various combinations of source categories. The results of these analyses were reported in the 1998 SIP. In summary, the results show that VOC reductions can marginally reduce ozone, but that taken alone, even total elimination of anthropogenic VOC emissions will not provide for attainment of the standard. Conversely, significant reductions of NO_x can provide for attainment of the standard. For levels of NO_x reductions less than 50%, VOC reductions provide for a marginal additional reduction of ozone. But for the large reductions of NO_x required to reach the standard, VOC reductions do not provide significant additional benefit.

AICHE and City of Houston asked if there are any other atmospheric chemistry reactions that can be simulated in the model for further reduction of ozone levels.

The commission has contracted with the University of Texas at Austin to investigate the role of other chemical mechanisms that involve ozone formation. This research includes analyses of chlorine, sea salt, and aged air masses. The first analysis is complete, and indicates that chlorine plays a role in ozone formation. Future research depends upon additional funding. It is

anticipated that this will be a topic considered in the Texas 2000 Study. Results from this study will not be available for a number of years, perhaps no earlier than 2003.

AIChE asked if the SIP due in December 2000 will include modeling that shows the impact of the specific rules contained in the SIP package.

Modeling relating to the specific control strategies selected for the final attainment demonstration will be included in the December 2000 SIP package.

AIChE, Port of Houston Authority, Houston Contractors Association (HCA), and GHBA were concerned about the basis for analyses of construction equipment, and expressed the belief that further analyses are needed. AIChE and Port of Houston Authority asked if usage rates for equipment would be included in the construction equipment emissions. Port of Houston Authority indicated that they had collected .

If the commission is provided with the appropriate information, the emissions for any source can be placed at the proper location and time. This information can be used for the base case development, but it is difficult to estimate the location and time of all such events in the future case for 2007. For this modeling, some reasonable estimates must be developed based on the information provided in the base case. Local usage rates will be included in the revised emissions inventory for the December 2000 SIP by collecting local activity data for a selected number of projects over a range of business types, and determining its relationship to surrogate activity data known for the entire county.

AIChE asked if there is any value for modeling some days that do not meet the EPA performance criteria.

Placing weight on modeling such days is questionable, since the performance is not adequate to base regulatory decisions on. In these cases, it is not clear if the model can be depended upon to provide a proper response to the proposed reductions. Such days are not included in the analyses for evaluation of control strategies.

AICHe asked if both gasoline and diesel fuel were modeled with low sulfur assumptions in Scenario VIa.

In Scenario VIa, California diesel was assumed for both onroad and nonroad diesel engines. The sulfur content in California diesel is lower than the current federal standard.

AICHe indicated that in Chapter 6 of the SIP narrative, Required Control Strategy Elements, the indication of up to 56% reduction in onroad mobile sources looks low.

The commenter is correct. The NO_x emissions from onroad mobile sources in the future base case were 266 tons/day, as reported in Appendix B, Table 18. In Appendix B, Table 20B, emissions from onroad mobile source emissions for Scenarios VIc-VIf are reported as 80 tons/day. Thus, reductions of up to 70% were modeled in the onroad mobile source inventory. The SIP text has been modified to reflect this change.

AICHe believes that commercial marine vessels and point sources are located where their emissions will have a minimal impact on ozone formation, since they are emitted at locations that are distant from the location of the maximum ozone.

Modeling of various components of the emissions inventory shows that reductions in just one category or location of the emissions does not have a large impact on ozone maximum concentrations. However, it is the ensemble of a large number of emissions reductions that provide a significant reduction in ozone concentrations. Emission reductions in the ship channel area can be effective in reducing ozone in areas farther downwind, because of the time it takes for the photochemical reactions to form ozone.

AICHe asked if usage or emissions controls on railroad locomotives were under consideration.

The commission does not have authority to control locomotive standards, but is depending on federal standards to address them. However, the commission will consider any specific ideas for reducing emissions from locomotives, short of changing the locomotive engine standards.

The AICHe commented on the difference in emissions for various days of the week, and asked if these were considered in the modeling.

The commission used appropriate diurnal emission patterns for all sources for which information was available. The mobile source emissions were developed using data for four typical days of the week: Monday through Thursday, Friday, Saturday, and Sunday. The commission believes that its use of day of the week is appropriate since it was based on actual sampling for mobile sources, actual emissions for sources included in the special emissions inventory, or the *other sources' standardized diurnal emission patterns.

AICHe asked if the analysis of NO_x controls includes the impact on biogenic VOC emissions.

The modeling takes into account the impact of NO_x emission reductions on all forms of reactions that involve ozone, both spatially and temporally.

AICHe commented that, for the modeling conducted for September 10, 1993 where all emissions were removed (zeroed out), an ozone concentration of 123 ppb was predicted. The commenter suggested that more controls be considered that involve transport of NO_x and VOC from other areas.

An analysis was performed on the impact of reducing all emissions from a large area around the HGA area. High ozone on the zeroed-out run occurred at the extreme eastern edge of the modeled domain. This reduction was among other reduction runs including the following: 50% of point source NO_x, 30% of low-level NO_x, and 30% of anthropogenic VOC. These reductions were run coupled with a number of other reduction scenarios, and the results are shown in Figure 42 of the 1998 SIP. For the reductions of 85% of NO_x and 25% of VOC in the HGA area, these regional reductions lower the maximum ozone concentration by about 5 ppb.

AICHe suggested performing zero-out runs for the boundary conditions, using the proposed controls to establish the lowest achievable ozone level.

This sort of model run could be performed, but would not provide much information on practical control measures as it is not possible to lower ozone at the boundaries to zero. The results mentioned above address the issue of the impact of modifications of boundary conditions.

AICHe commented that the changes to NO_x and VOC emissions in Table 16 of Section 6.2 were not consistent.

The seeming disparity between the 8% reduction modeled for nonroad use of California diesel and the 1.5% modeled for onroad use stems from the fact that a large majority of the nonroad NO_x is generated by diesel engines, while onroad diesel NO_x emissions account for less than 30% of the future base case onroad NO_x emissions. Since the reduction factor was applied across-the-board to both the onroad and nonroad emissions, the reduction to nonroad sources is naturally much larger on a percentage basis. Similarly, California reformulated gasoline fuel will have only a minor effect on nonroad NO_x emissions, since it affects only a small fraction of the emissions to begin with. (While the fuel would provide some minor benefit, the commission was unable to quantify the effects in time to include them in the SIP.) Finally, the commission staff was unable to quantify the benefits from California recreational vehicle standards (although these are also likely to be minor). Additionally, the commission has engaged a contractor to evaluate any potential benefits of instituting the California vehicle program in the HGA area.

AICHe questioned the level of NO_x reductions attributed to Tier II and Tier III controls.

Once the proposed rules are written to implement these reductions, then it will be possible to better quantify the associated emission reductions. When these reductions are quantified, they will be modeled for the SIP to be submitted in December 2000.

AICHe asked if the reductions expected to result from Senate Bill (SB) 7 and SB 766 have been quantified correctly.

Under SB 7, enacted by the 76th Legislature, the commission was directed to adopt rules to reduce NO_x emissions from grandfathered utility units. Furthermore, under SB 766 of the 76th

Legislature, the commission was directed to adopt rules establishing a permitting program for grandfathered non-utility units. The rules are scheduled for adoption by the commission by December 1999 and March 2000, respectively. Since these rules had not been developed at the time modeling was being conducted, commission staff assumed a 50 % NO_x reduction from grandfathered utility units and a 30% NO_x reduction from grandfathered non-utility units located in the East and Central Texas region (outside the HGA, Dallas/Fort Worth, and Beaumont/Port Arthur ozone nonattainment areas). After the rules implementing SB 7 and SB 766 have been finalized, it will be possible to better quantify the emission reductions, and these reductions will be modeled for the SIP to be submitted in December 2000.

AICHe and HCA asked which activities were analyzed in the strategy to shift the construction operation schedule and other controls for construction equipment.

The analysis of construction schedule time shifting was limited to emissions from nonroad mobile sources.

AICHe suggested analyzing various options for time shifting of construction activities.

This sort of detailed analysis can be performed once it is decided to pursue such a control strategy. In order to continue these sorts of analyses, it will be necessary for the local area to agree to pursue this sort of strategy, and to provide information upon which to base the detailed analyses. This information could be used for developing any proposed rule.

AICHe questioned the findings under Meteorological Analysis, and suggested various modeling

sensitivity runs and control strategies that could be analyzed.

To establish potential causes for high ozone in an area, it is necessary to make multiple model runs with various modifications to the emissions. The commission's conclusions are based on extensive model sensitivity runs. AICHE is encouraged to work with RAQPC, which is developing sets of potential control strategies for analysis.

Port of Houston Authority was concerned about modeling 50% reductions in construction equipment. They agreed that refinements to the emissions would most probably reduce the amount of emissions, but had concerns about developing controls for these emissions.

Modeling of the 50% reduction in construction equipment NO_x emissions was performed solely to determine if such reductions would lower ozone concentrations. The commission staff has reviewed the construction equipment NO_x inventory for the South Coast Air Quality Management District (SCAQMD), the Los Angeles area, and found that HGA construction equipment NO_x emissions were roughly comparable to those in the SCAQMD. Considering that the SCAQMD area has a population about three times that of the HGA area, commission staff concluded that HGA construction equipment NO_x is most likely overestimated. For this reason, the HGA construction equipment NO_x inventory was reduced by 33% to correspond with the SCAQMD inventory. The commission, in cooperation with regional stakeholders and their consultant, will continue work to refine inventory estimates and examine control options for this category. The results will be included in the next round of modeling for the December 2000 SIP.

Port of Houston Authority stated that emissions from ships hotelling while in port have been

overestimated, which suggests that control strategies would not yield the desired results.

The emissions from commercial marine activity, including hotelling, were calculated using EPA-approved methodology and the best available information concerning activity levels. The commission is currently involved in a joint effort with the Port of Houston Authority to gather local activity information and calculate an updated emissions inventory for commercial marine activity in HGA. The current schedule for updating the commercial marine emissions inventory anticipates a draft project report to be delivered to the commission at the end of November 1999, and a final project report, incorporating the commission's quality assurance comments, to be completed in December 1999. The benefits from any possible controls on hotelling should be known at that time. If this schedule is met, the new inventory information can be incorporated into the December 2000 SIP.

Port of Houston Authority was concerned about the accuracy of the emission estimates from marine vessels and their spatial allocation.

The commission has worked to refine the emissions estimates from marine vessels, and has developed techniques to properly locate these emissions. If, after a review of these emissions, Port of Houston Authority has additional information that can be used, the commission will use it to refine the emissions inventory.

City of Houston commented that the weight of evidence test and monitored air quality data should be

used in the SIP.

Extensive weight of the evidence analyses were included in the 1998 SIP and were referenced in the 1999 SIP. These analyses will be updated and included in the December 2000 SIP.

TCC requested that the following quote from page 162 of the 1998 SIP be included on page 3-1 of the current SIP: “For the HGA nonattainment area, NO_x reductions from point sources alone are not sufficient for attainment, nor are they effective alone in reducing ozone. NO_x reductions from mobile and area sources are more effective than from point sources, but are not sufficient for attainment.”

The commission agrees that this conclusion is significant and worthy of inclusion in the current SIP. The text has been changed to include this conclusion.

TCC commented that page 3-10 of the SIP should either include the results of modeling variants of Scenarios IV and VIII, or explain the rationale for their exclusion.

Results for the variants of Scenarios IV and VIII were not included in the SIP for a number of reasons. The primary reason is that only a subset of the additional scenarios run as variants of Scenario VI were run for the other scenarios. Additionally, results from Scenarios VI and VIII, along with their respective variants, showed only very minor differences, so including both would have been redundant. Results of these additional model runs are available upon request in writing to the agency’s SIP Planning Section, or by calling Mr. Chris Kite at (512) 239-1959.

TCC commented that Figures 3-1 and 3-4 show that mobile source reductions have a greater effect on

reducing ozone than point source reductions. They recommended that an explanation be included in Chapter 3.

From the 1993 base case to the 2007 future base, mobile source NO_x (onroad and nonroad) decreased approximately 154 tpod, and point source NO_x decreased approximately 131 tpod. Together, these reductions resulted in a decrease in modeled peak ozone of between 11 and 25 ppb. Scenario I reduced point source NO_x emissions by 471 tpod, and resulted in a change in peak modeled ozone of between +1 and -6 ppb. It is apparent that reductions in the future base were more effective in reducing peak modeled ozone than reductions in Scenario I. There are two possible explanations for this effect: either mobile source reductions are more effective in reducing peak ozone than point source reductions, or the combination of mobile and point source reductions is more effective than reductions to either source individually.

The commission agrees that the first explanation is likely correct, but without performing additional modeling, declines to make a definitive conclusion about the relative benefits of mobile source NO_x reductions versus point source NO_x reductions, beyond including the previously agreed-upon conclusion from the 1998 SIP. In any case, the point source reductions applied in Scenario I result in significant declines in modeled area of exceedance and exceedance area-hours, as seen in Figures 3-2 and 3-3.

Port Industries of Corpus Christi commented that their analysis of the 1993 episode, used for the 1999 SIP, did not show that emissions from Corpus Christi impacted the Houston/Galveston area.

The commission agrees that the sources from Corpus Christi did not make a direct contribution,

but data analyses show they may contribute to the overall background levels in air parcels that are eventually advected to the HGA area. The purpose of the HGA SIP modeling is not to single out particular areas or attribute ozone problems to them, but rather to account for all known factors and emissions influencing ozone formation. For this reason, boundary conditions need to reflect as accurately as possible the actual emissions predicted for 2007.

Port Industries of Corpus Christi requested that if additional episodes are modeled, the effectiveness of regional control strategies on the HGA area be evaluated for each area individually.

This will be done in ongoing regional modeling.

Reliant commented that modeled ozone levels do not appear to be sensitive to point source NO_x controls in perimeter counties outside the nonattainment areas. Significant control requirements for sources in perimeter counties should be incorporated only if they are demonstrated to have a commensurate benefit for air quality in the nonattainment area.

An analysis was performed on the impact of reducing all emissions from a large area around the HGA area. This reduction included the following reductions: 50% of point source NO_x, 30% of low-level NO_x, and 30% of anthropogenic VOC. These reductions were coupled with a number of other reduction scenarios. For the reductions of 85% of NO_x and 25% of VOC in the HGA area, these regional reductions lower the maximum ozone concentration by about 5 ppb. No single control strategy is adequate to demonstrate attainment of the standard, but rather it is the application of an ensemble of control strategies that will demonstrate attainment.

EPA commented that the model did not show much response to application of Stage I controls in certain areas in East and Central Texas.

The commission agrees with this comment. The main focus of this modeling was to demonstrate attainment in the HGA area. The response to controls in central Texas, and specifically Austin and San Antonio, will be addressed in SIPs for those areas, should they be required.

EPA indicated that a number of its comments submitted for the previous (May 1998) SIP are still relevant.

The commission is aware of these comments and has utilized these in developing the current modeling and the modeling for the December 2000 SIP.

EPA commented on differences between the model performance of UAM-V and CAMx. The EPA-preferred model for SIP development is UAM-IV.

The commission has shown with the information contained in the SIP and its appendices that in the HGA area, the performance of CAMx (and UAM-V) is superior to that of UAM-IV, the preferred model, so it has moved forward with the use of CAMx for development of this SIP. The comparisons with UAM-V were supplied in this SIP as a comparison with previous modeling. It is expected that different models would perform somewhat differently for certain time periods and at certain locations. Overall, the performance of both models is about the same, and both provide the same guidance for attainment of the standard. Even though it may be possible with significant expenditure of time and other resources to improve model performance, the current model

performance is adequate for developing a SIP to provide for attainment of the standard.

EPA and an individual commented that more sensitivity analyses need to be performed with CAMx to analyze the response of ozone to various source categories of NO_x and VOC.

More of these analyses were performed with UAM-V in the 1998 SIP than were performed in the 1999 SIP. Since both UAM-V and CAMx provide essentially the same results (although there may be minor differences for some analyses), it would not accomplish much to rerun the plethora of sensitivity analyses with CAMx. Furthermore, to meet the time requirements for the development of the 1999 SIP, it was not possible for the commission to rerun for the record all of these sensitivities. Since the commission is going to rely on CAMx analyses, and not on UAM-V analyses, it is not practical to continue to expend time and funds to compare results between the two models. This would become an academic exercise not needed for application of CAMx for SIP development.

EPA commented that when comparing responses from the base year to the future year, there was not much change, and that this may indicate lack of model performance.

The commission staff is not aware of a way to determine the expected response of the model to future emissions. Since there is no way to measure this model response, it is not proper to conclude that there is a need to improve model performance based on these comparisons.

EPA raised concerns that the biogenic emissions used in the model were overestimated.

The current biogenic emissions inventory was developed from field measurements of biomass and EPA-developed emission factors. This is probably the most accurate biogenic emissions inventory that has been developed in the country. Any inaccuracies in the emissions estimates can be attributed to EPA emission factors or emissions calculation methodology. EPA policy does not allow the state to alter these emission factors or calculation methods without extensive work to prove that a different factor or method is more appropriate. Although there is a small amount of evidence that indicates a difference between isoprene measurements and those predicted by the model using the current inventory, this is not a sufficiently robust data set to meet EPA's criteria for modification of methodology or emission factors. The state is committed to work in cooperation with EPA to make needed improvements in the biogenic emission factors and calculation methods.

EPA commented that it would like to have more information on the biogenic emissions in the urban area in Houston.

This information has been supplied.

An individual was concerned that trees are not the cause of ozone and should not be blamed as the cause of the ozone problem.

Trees emit isoprene, which is a very reactive VOC that combines with NO_x to quickly form ozone. Just because trees are an emission source does not mean that the commission is suggesting that they be included in control programs. However, there may be innovative approaches that could be used to encourage the planting of species of trees that are low-emitters of isoprene.

An individual indicated that accelerated fleet turnover for heavy-duty vehicles might be used but was not modeled. He also indicated that there were other control strategies that could be analyzed. The commenter expressed concern that the modeled results would be placed in the SIP with no opportunity for public review and comment.

Any further analyses used in SIP development will be contained in the December 2000 SIP, which will be available for public review and comment.

An individual commented that he does not believe that the commission has demonstrated attainment of the standard, and questions use of weight of evidence analyses.

EPA guidance allows weight of the evidence analyses to be used in cases where it appears that it will be difficult to show with modeling that the standard is attained. Model performance is judged based on existing emissions. If emissions are reduced by large amounts, for example over 80% total NO_x, there is no way to determine if the model is performing accurately with this level of emissions. Weight of the evidence analyses are other procedures that can be used to remove some of the uncertainty attached to the model performance, in cases where emissions are significantly less than those used to evaluate model performance.

An individual stated that the commission wasted time modeling scenarios that it knew would not meet attainment, and was concerned about the results of certain model runs.

A number of sensitivity analyses and alternate scenarios were modeled so that the relative response of ozone to various types of controls could be determined. This approach assists in developing a

SIP with an effective set of controls that can be reasonably expected to provide for attainment of the standard.

An individual indicated concern that land use data, used for development of biogenic emissions, are not recent.

The commission used the most recently available data for development of all emissions. However, there may be some data that were not used since the techniques for analysis have not been developed, would be too time-consuming to meet the deadlines, or would be too costly for the agency to fund.

An individual commented that the growth of future emissions was flawed.

The best available data were used to project growth to the future year. However, there may be some data that were not used since the techniques for analysis have not been developed, would be too time-consuming to meet the deadlines, or would be too costly for the agency to fund.

An individual was concerned that there is an over-counting of controls, so the emission reductions will not be as great as thought.

For the December 2000 SIP, all proposed controls will be written as rules, applied to the emissions inventory to determine the resulting emissions, and modeled to show attainment of the standard.

An individual indicated concern that in the weight of evidence analyses, it would be reasonable to assume

historical trends will continue for reductions of NO_x and VOC.

These analyses were based on monitoring data that indicate trends based on measurement of pollutants in the air. These analyses provide a measure of real reductions of precursors. However, it must be realized that reductions in precursors of ozone do not always provide an accurate indication of how the ozone will respond.

An individual expressed concern about the accuracy of the emissions inventory and why, after a number of years, it is not accurate.

Emissions inventories are based on estimates using the best data available at the time of development. As more detailed data become available or as better emissions estimating tools are developed, these refinements are incorporated in the emissions inventory. As the state-of-the-science improves, the emissions inventory will be improved.

An individual suggested that the commission set up a permanent set of comprehensive meteorological stations to collect data to calibrate the models.

The commission has a comprehensive monitoring network in the HGA area to collect information that can be used for model performance evaluation. The commission ran a comprehensive sampling program in 1993 to collect data for use in modeling and SIP development. The episode used in this SIP is based on that data set. There will be an additional comprehensive study in the HGA area in 2000.

Texas Contractors Equipment, Inc. stated that the shift in construction timing is really lengthening the work day of the entire community.

The commission agrees that for certain industries providing services and materials to the construction industry, the work day could become longer. This extension of the work day would not apply to the entire work force, however. In cooperation with the construction industry, the commission is working to improve the emissions inventory and identify reasonable control strategies for this sector.

Seven individuals mentioned that in the scenario that shifts the operation schedule of construction activity, emissions are not being decreased, just reallocated to different time periods.

The commission agrees with this assessment. This control strategy shifts the generation of construction emissions past the morning hours, when pollutant emissions are most conducive to ozone formation. Shifting construction activity to a later time in the day prevents these pollutants from reacting during the morning hours and increasing ozone levels.

TAS Construction (20 signatures) urged the commission to involve construction industry professionals in SIP development.

The commission attempted to involve the construction industry in developing the emissions inventory. When the ENVIRON survey was sent to the construction industry, however, only 15% of the surveys were returned. The commission, in conjunction with regional stakeholders, is currently pursuing a constructive dialogue with the industry, and is optimistic that this will result

in improved inventory data and modeling results. For more information on how to get involved, contact Ms. Lily Wells, H-GAC, at (713) 993-4537.

Houston Chapter Association of General Contractors urged the Commission to involve the public in its decisions. An individual requested that the commission continue to keep the public involved as the SIP is further developed.

The commission values public input, and considers both written comments and oral testimony from public hearings very carefully. The commission encourages all sectors of the public to become involved with in various local stakeholder groups. Another commission hearing will be conducted in Summer 2000 to gather input on the proposed rules to implement the attainment control strategy. For more information on how to get involved, contact Mike Magee of the commission's OEPA at (512) 239-1511.

The Association of General Contractors questioned the accuracy of the construction inventory, and stated that onroad diesels will not be controlled and can operate at any time of the day.

Emissions from onroad diesel engines are being evaluated separately in the SIP. Onroad diesel equipment is already regulated by federal emission standards, and these standards become more restrictive in future years. Additional control measures such as California diesel technology standards and California diesel fuel were included in the modeling.

The Houston Contractors Association asked if cranes will be covered in the construction schedule shift.

Cranes are included in the inventory of construction equipment, to which the time shift was applied.

The Houston Chapter Association of General Contractors emphasized that shifts in construction activity schedules may have impacts on the ability to complete all point source retrofits on time. The commenter asked if repairs or modifications to utilities, refineries, or chemical plants would be subjected to restricted hours. The commenter also asked if the shift in construction schedules is intended to apply to any business that uses construction-type equipment.

The entire inventory of construction equipment was included in the modeling, so the any company using construction equipment would be affected. However, more analysis still needs to be done to determine all the impacts from shifting the hours of construction activity. The commission will consider these comments during development of the December 2000 SIP, and will provide ample opportunity for input into this process.

The CIT Group provided information on current temporal restrictions on moving equipment. These restrictions, along with the shift in construction activity timing, would make it very difficult to move heavy equipment along roadways.

The commission will take this information into account when developing its final control strategy for the SIP to be submitted in December 2000.

The Houston Chapter Association of General Contractors, Pavers Supply Inc., ISI Inc., Southern Crushed Concrete, Champagne-Webber, Smith & Company Trucking, and Holes Inc. stated that shifts in

construction activity schedules will have a detrimental impact on pouring concrete.

The commission will take this information into account when developing its final control strategy for the SIP to be submitted in December 2000.

The BCCA, Houston Contractors Association, Lanham Inc., BondPro, CIT Group, Durwood Green Construction, Flexicore, R. Hassell Builders, Alico Inc., C.E. Barker. Inc, Calco Contracting, Construction Design Consultants, Contractor Technology Inc., Excalibur Construction Inc., Hassell Construction Company, John G. Holland Construction Company, Industrial Contractors Inc. Industrial Tx Corp., JAH0 Inc., Jim Box-Consultant Inc. J. L. Cox Inc. JNS Inc., LEM Construction Inc., Lindsey Construction Inc., Listo Company, Lockton, NBG Constructors Inc., Park Constructors Inc., Pate & Pate Enterprises Inc., Pfeiffer & Son, Inc., Reddico Inc., R. Hassell & Company Inc., RWL Construction Inc., Earth Material Services, Silva Contracting Company Inc., T & C Construction Inc., Tidal Construction Inc., Tom-Mac Inc., Trifinery Inc., Western Summit Constructors Inc., William. H. Gray Construction Company Inc. and one individual commented that the shift in construction activity would have a negative impact on the social structure of the community. Evening work hours would prevent construction employees from being home with their families during the evening hours.

The commission is mindful of the social impacts of potential control strategies, and will consider these issues when developing rules to implement the final strategies.

The Houston Chapter Association of General Contractors, Pavers Supply Inc., Trantex, the Houston Contractors Association, Bay Concrete Products, Bearden Contracting Company, Beyer Construction, Inc., Affholder Inc, D&W Construction, DMM Contractors, Inc., Earth Materials Inc., Edgar Machinery

Corp., Elliott Contracting Inc., Safety Lights, and one individual and Smith and Company stated that longer construction times associated with shifts in construction schedules will negate benefits of the shift.

The commission concurs that the shift in construction activity schedules may increase the time needed to complete some projects. This may increase annual emissions but should not impact ozone levels. The goal of shifting construction activities is to remove ozone precursors during the morning hours. Emissions produced in the morning hours have a greater impact on ozone levels than emissions created later in the day.

BCCA, Lanham Inc., Association of General Contractors, Houston Chapter Association of General Contractors, T.A.S. Construction, Durwood Green Construction, Trantex, Traffic Control Devices, Joe Valencik, Inc., and an individual commented on difficulties in construction when using artificial lighting. The Association of General Contractors, and Safety Lights Inc. commented that the quality of work performed decreases at night due to difficulties in providing adequate lighting for visibility. The Houston Chapter Association of General Contractors, T.A.S. Construction and an individual commented that working in the increased heat from a shift in construction schedules creates a health problem.

The Houston Contractors Association, Lanham Inc., Martin Marietta, Association of General Contractors, BondPro, CIT Group, T.A.S. Construction, Durwood Green Construction, Flexicore, Holes Inc., Highway Pavement Specialities, McCarthy, Inc., Trantex, Inc., Smith and Company, Traffic Control Devices, Joe Valencik, Inc., R. Hassell Builders, A-1 Hydro-mulching, Alico, Inc., C.E. Barker. Inc., Bay Concrete Products, Bearden Contracting Company, Beyer Construction, Inc., Calco Contracting, Construction Design Consultants, Contractor Technology Inc., Affholder Inc., D&W Construction, DMM Contractors, Inc., Earth Materials Inc., Edgar Machinery Corp., Elliott Contracting

Inc., Excalibur Construction Inc., Hassell Construction Company, John G. Holland Construction Company, Industrial Contractors Inc. Industrial Tx Corp., JAHO Inc., Jim Box-Consultant Inc. J. L. Cox Inc. JNS Inc., LEM Construction Inc., Lindsey Construction Inc., Listo Company, Lockton(4), NBG Constructors Inc., Park Constructors Inc., Pate & Pate Enterprises Inc., Pfeiffer & Son, Inc.,(49), Reddico Inc., R. Hassell & Company Inc., RWL Construction Inc., Earth Material Services, Silva Contracting Company Inc., T & C Construction Inc., Tidal Construction Inc., Tom-Mac Inc., Trifinery Inc., Western Summit Constructors Inc., William. H. Gray Construction Company Inc. TAS Construction Inc., Safety Lights, and eight individuals commented on general safety issues associated with shifting construction times into the evening hours.

The commission is mindful of the health and safety impacts of any control strategy, and will give these issues careful consideration.

Durwood Green Construction and an individual stated that the shift in construction timing will result in increased construction costs since productivity will decrease during night time hours.

The commission has not received documentation on such cost increases, but will consider any such data in its determinations.

The Association of General Contractors, Pavers Supply Inc., ISI Inc., Southern Crushed Concrete, Champagne-Webber, Smith & Company Trucking, Highway Pavement Specialities, McCarthy, Inc., and an individual provided information on Texas Department of Transportation (TxDOT) policy restricting some construction activities during the morning traffic peaks.

The commission has reviewed the submitted materials, and will take this information into consideration.

BondPro Inc., Houston Chapter Association of General Contractors, and Flexicore, Inc. questioned the lack of statistics that ozone levels will be improved by shifting construction activity schedules.

The commission's modeling analysis showed that shifting construction activity schedules forward by five hours produced a decrease of several parts per billion in ozone levels.

The Houston Contractors Association and the Association of General Contractors stated that accelerated fleet turnover and the 50% cut in nonroad mobile emissions are too vague to comprehend and unreasonable. Three commenters mentioned that the SIP needs to list the potential nonroad control measures analyzed to achieve the 50% nonroad mobile NO_x reductions.

The assumptions for accelerated fleet turnover and the 50% cut in nonroad mobile emissions have been modified. The adopted SIP will contain normal fleet turnover assumptions. Nonroad emission reductions have been changed to a 33% reduction based on a comparison with Los Angeles data.

Durwood Green Construction stated that the commission must have an accurate emissions inventory, developed by the construction industry.

The commission concurs that an accurate emission inventory is essential. The commission will work with industry to improve the current inventory before the final attainment demonstrated is

completed in 2000.

Chevron Corporation expressed concern over the cost versus modeled emissions benefit of several onroad mobile source control strategies, and indicated that additional control strategies should be considered.

Multiple control strategy scenarios containing a variety of individual control strategies were modeled during the development of the attainment demonstration. No decision has been made on the specific control strategies that will be submitted to EPA in December 2000. The commission agrees with the importance of considering cost versus benefit during the evaluation of control strategies, and will take the comments regarding additional control strategies into consideration.

The City of Houston, Houston Metro, Mothers For Clean Air, and an individual commented on the need for cleaner burning fuels in the HGA nonattainment area.

The SIP modeling includes application of cleaner fuels, namely California reformulated gasoline (RFG) and diesel fuels. The commission has conducted no additional modeling for the SIP in response to this comment. The commission acknowledges that the use of low sulfur gasoline/diesel fuels could contribute to reducing vehicular emissions and has encouraged EPA in the development and implementation of the EPA's proposed federal low sulfur gasoline and diesel regulations. The commission is continuing to investigate cleaner fuel strategies, and will consider any new information for incorporation into the December 2000 SIP.

The City of Houston and an individual commented on the need for provisions requiring the increased use of natural gas for fleet vehicles.

The commission has made no change to the SIP in response to this comment. The requirements of the Texas Clean Fleet program, being implemented in the HGA nonattainment area, are based on the purchase and use of vehicles certified to the low emission vehicle standards. Fleets affected by this program can comply with the program's requirements by using any fuel they choose, including natural gas, as long as the resulting vehicle/fuel configuration is certified by the EPA to meet the low emission vehicle standards.

An individual commented that 30 TAC Section 114.151, regarding Requirements for Local Government and Private Entities, should be changed to require low emission vehicles for fleets that have 10 or more fleet vehicles.

The commission has made no change to the SIP in response to this comment. The minimum fleet size for mandatory participation in the Texas Clean Fleet program has been established by the Texas Legislature. The Texas Health and Safety Code, Section 382.134, as amended by the 74th Texas Legislature, specifies that the low emission vehicle requirements apply only to local government fleets with more than 15 vehicles, and to private fleets with more than 25 fleet vehicles. Four individuals commented that California emission standards should be adopted for all onroad vehicles.

The commission has made no change to the SIP in response to this comment. The commission agrees with the importance of implementing stricter vehicle emission standards to reduce emissions, and therefore has encouraged the EPA in the development and implementation of the proposed federal Tier II vehicle emission standards.

An individual commented that the state should require an employer trip reduction program for every

employer of 50 or more.

The commission has made no change to the SIP in response to this comment. Historically, state-mandated employer trip reduction programs have not met trip reduction goals nationwide. The most effective programs are those that are customized for an individual area/organization, and that provide voluntary opportunities for employees to participate in alternative commuting options. The H-GAC, in partnership with Houston Metro, is currently implementing a voluntary vanpool/rideshare program in the Houston area.

An individual commented that there is little encouragement for employers to offer alternative commuting options, such as carpooling or telecommuting, to employees.

The commission has made no change to the SIP in response to this comment. The commission agrees with the importance of both incentives and public outreach towards encouraging the use of alternative commute options. Nationally, recent changes in the federal tax code as it relates to commute benefit options provide increased incentives for Commuter Choice programs—specifically for transit, vanpooling, and parking benefits. In addition, local organizations such as the H-GAC and Houston Metro continue to encourage vanpooling, transit, and other alternative commuting options through a variety of public outreach efforts.

The City of Houston commented that the commission should include Voluntary Mobile Source Emission Reduction Program (VMEP) initiatives in the HGA SIP. This would allow the area to achieve the 3% maximum reduction for implementing voluntary programs in the areas SIP.

The commission has updated the modeling to reflect VMEP credits of 24 tpod, obtained by multiplying 3% by the total reductions of 803 tpod modeled for attainment. Additional guidance, still forthcoming from EPA, is necessary before the full benefits of this program can be realized.

County Judge Robert Eckels and two individuals commented that the commission should work with local governments, businesses, and regional stakeholders to develop specific vehicle recycling programs or other incentive programs which would speed up the implementation of new federal onroad and nonroad engines.

Vehicle recycling programs, both nationally and within Texas, have met with varied success. The commission remains supportive of any efforts that local areas take to develop their own incentive programs, such as vehicle recycling programs. The commission plans to revise the mobile source emission reduction credit rule in Spring of 2000 to allow areas to bank credits from their vehicle recycling programs.

An individual questioned the success of H-GAC's voluntary regional initiative to reduce vehicle trips.

The commission has made no change in response to this comment. The H-GAC's Regional Commute Alternatives Program, in partnership with Houston Metro, has implemented a vanpool/rideshare program. The vanpool program, currently in its third year, has 244 vans with over 3000 riders participating in the eight-county HGA nonattainment area. Ridership averages slightly over 12 persons per van and has had a small impact at reducing area-wide vehicle miles traveled (VMT).

An individual commented that the VMEP program should not be allowed to count as actual emissions reduced, because these programs are not enforceable and the actual emission reductions cannot be predicted.

The commission disagrees with this comment. The VMEP program would be implemented in accordance with EPA guidance. This guidance requires the state to provide modeling documentation for all emission reductions attributed to the program, and to commit in the SIP to correct any emission reduction shortfalls.

An individual stated that the commission does not discuss the efforts, successes, or failures of H-GAC transportation control measures and vehicle emission estimates.

The commission concurs that the SIP does not contain information on transportation control measures and vehicle emission estimates prepared by the H-GAC. TCMs included in the 15% and 9% Rate of Progress SIPs were predicted to produce about 0.5 tons per day of VOC reductions. H-GAC estimates indicate that these predictions were slightly exceeded. Vehicle emission estimates prepared by H-GAC are based on valid modeling approaches and have been adjusted to Highway Performance Monitoring System data as required in EPA guidance.

An individual stated that there is no mention of the Transportation Improvement Program (TIP) and its effect on emissions.

The H-GAC prepared a transportation conformity determination on the current TIP. This determination indicated that the VOC emissions of the TIP and the Metropolitan Transportation

Plan (MTP) were below the motor vehicle emissions budget established in the 15% Rate of Progress SIP. A new TIP, MTP, and conformity determination are being developed at this time. This work in progress will demonstrate conformity to VOC and NO_x motor vehicle emission budgets from the May 1998 SIP. Public hearings are scheduled on the TIP and transportation conformity. Mr. Alan Clark of H-GAC can be contacted at (713) 993-4585 to obtain information on public hearing dates.

Two individuals mentioned that nothing is said about expansion of freeways, building of new freeways, and other road projects, and what their long-term impacts will be.

Transportation conformity determinations examine the long-term impacts of new roadways and roadway expansions. The current conformity determination estimated impacts of these projects to the year 2020, and indicated that onroad VOCs will be below the 1996 motor vehicle emissions budget. A new determination being prepared at this time must indicate that VOC and NO_x emissions are below the 1999 motor vehicle emissions budget.

An individual stated that there is no discussion of the Environmental Defense Fund (EDF) court ruling, which determined that regionally significant non-federally funded projects cannot proceed in the absence of a conforming SIP and TIP, that grandfathered transportation projects cannot proceed in the absence of a conformity SIP and TIP, and that EPA rules allowing conformity to be demonstrated using emission budgets in SIPs not approved are not in conformity with conformity criteria.

The commission developed this SIP as an attainment demonstration, not as a document on transportation conformity issues. Transportation conformity and associated lawsuits represent only one of many issues involved in demonstrating attainment in the Houston area. Houston has a

conforming TIP and MTP which will expire in November 1999. The EPA has found the May 1998 SIP to be adequate for determining a motor vehicle emissions budget. A conformity determination to this budget is being prepared by H-GAC at this time. This conformity determination will include all changes as a result of the EDF lawsuit.

AICHe and two individuals requested that the agency implement stricter enforcement of speed limits and reduce speed limit within Harris County to 55 miles per hour (mph). TCC requested that Scenario VII, which introduced the control strategy of a 55 mph maximum speed limit, not be dropped until after cost and benefits from all controls have been analyzed.

The commission has decided to drop Scenario VIII from further consideration at this time. The primary reason that the 55 mph speed limit has little effect on modeled ozone is that the average speeds on major roads is already well below 55 mph during rush hours, especially in the urban core. Thus, reducing the speed limit would not have much effect on the emissions which are most important to ozone formation, specifically early morning emissions located in the center of the urban area.

Enforcement of speed limits is the responsibility of the Department of Public Safety and local law enforcement agencies. TxDOT is responsible for any changes in freeway speed limits. This SIP was modeled with maximum speeds of 65 mph, the highest speeds which can modeled with the EPA mobile source emission factor model, MOBILE5a-h. Emissions from high speed vehicles may be underestimated. MOBILE6, due to be released in December 1999, will allow modeling of speeds up to 75 mph.

An individual suggested that freeway expansions be analyzed before they are built, and that real data be used in transportation and grid modeling.

Transportation conformity and travel demand modeling predict changes in VMT and vehicle speeds before projects are built. Real data for future years is not available for transportation and grid modeling.

An individual recommended that the commission require all high occupancy vehicle (HOV) lanes to have

Occupancy requirements on high occupancy vehicle lanes are established locally and not by the commission. The use of HOV lanes as toll roads is also a TxDOT and Federal Highway Administration program.

The City of Houston and three individuals urged the implementation of light rail as quickly as possible.

Light rail was not included in the analysis for this SIP. The impacts of such a system can be included in future analysis scenarios.

The City of Houston stated that the commission should adopt regulations that would clearly require major developments that are not stationary sources to meet general conformity requirements that are in accordance with the demonstration of attainment SIP provisions. Such regulations should include a form of lowest achievable emissions control technology for nonroad mobile sources.

The federal general conformity rule, which is fully implemented by commission rule 30 Texas

Administrative Code §101.30, requires that actions which are funded or permitted by the federal government must conform to the SIP. The general conformity rule establishes de minimus impact levels of 25 tons per year for either VOC or NO_x. Individual projects that exceed the de minimus threshold must make reductions or obtain emission credits to offset the proposed increase. The nominal project increases resulting from application of the de minimus emissions threshold are accounted for in the SIP growth projections. This is in contrast to the transportation conformity rule, which requires the establishment of VOC and NO_x budgets which cannot be exceeded. The commission may decide to adopt rules regulating certain nonroad mobile sources, regardless of whether such sources are governed by general conformity.

The EPA and an individual stated that TCMs must be listed in the SIP.

TCMs will be listed in the final SIP to be submitted in December 2000. Due to time constraints with the modeling scenarios, a specific list of TCMs was not available for inclusion in this SIP. The reductions modeled represent a placeholder for projects to be selected by the local area.

One individual urged the area to stop construction and widening of new roads and freeways.

Air quality impacts of transportation projects have been included in this SIP and in the transportation conformity determination by H-GAC. Previous transportation conformity determinations have compared the impact of build and no-build transportation networks, and have demonstrated that the build networks result in slightly lower VMT and lower emissions.

Greater Houston Partnership, Houston Metro, H-GAC, City of Houston and two individuals expressed

concerns that the motor vehicle emission budget is not adequately defined.

The motor vehicle emissions budget included in this SIP does not provide detailed input data for transportation conformity purposes. The final attainment demonstration SIP will be submitted in December 2000 and will contain controls which can be modeled for a transportation conformity analysis. A transportation conformity determination is being prepared by H-GAC which will be valid until the final attainment demonstration is submitted.

Mothers for Clean Air and an individual expressed concerns about the increased emissions from the Bayport project.

The proposed Bayport project was not specifically included in the modeling for this SIP. However, default growth estimates were applied to the HGA onroad and nonroad mobile source categories to obtain the 2007 inventory. The Port of Houston Authority is developing an inventory for the Bayport project, which will be included in the final attainment demonstration modeling. It should be noted that the primary emission sources from this project will not be in operation until after the 2007 attainment date.

An individual expressed concern about excessive freeway congestion.

The scenarios which were modeled contained all projects scheduled to be completed before 2007, and show a modest increase in freeway speeds. Decisions on additional projects to relieve freeway congestion are the responsibility of TxDOT and Houston Metro.

An individual recommended improvements in traffic synchronization.

Congestion from traffic signals does create additional emissions. Houston Metro has modeled a traffic synchronization program as a transportation control measure which will improve some, but not all, of the traffic synchronization problems in Houston.

An individual noted that vehicle registration data presented in RAQPC meetings with commission modeling staff differed from actual Harris County data.

Modeling episodes in this SIP estimated that light trucks (less than 6,000 lbs) accounted for 17.1% of the daily VMT in the eight-county HGA nonattainment area. These data were based on traffic counts conducted in 1998 along several different roadway types. Cars accounted for 69% of the total VMT. The commission concurs that the best available data should be used, and will review vehicle registration data.

An individual stated that six to ten years are needed for onroad mobile source fleet turnover.

The commission concurs that a minimum of six to 10 years will be needed for the NLEV and Tier 2 vehicles to replace the existing fleet. Vehicle age distribution data will be reviewed before final modeling is performed for the HGA attainment demonstration.

The Coalition for Free Streets, Houston Property Rights Association, and an individual urged the removal of speed humps.

Speed humps on local streets are a local issue. Air quality effects from use of these traffic calming devices have not been included in the SIP modeling due to difficulties in determining any impacts they have on mobile source emissions.

The Port of Houston Authority expressed concern that controls could jeopardize the port's ability to compete with other ports regionally and nationally. The commenter also stated that Title II of the FCAA restricts options for states and local governments in regulating nonroad vehicles and equipment.

The commission is charged with developing control strategies to bring the Houston area into attainment by 2007. It is not the goal of the commission to require controls which place any business or organization in the Houston area at a competitive disadvantage. Hopefully, any controls imposed will lead to increased operating efficiencies while bringing the area into attainment. With regard to FCAA restrictions on state and local control of certain nonroad mobile sources, it is true that establishment of emission standards is preempted by the federal government. However, the commission plans to focus its efforts, along with the regional stakeholders, on control options involving fuel and operational changes for nonroad mobile sources.

The Port of Houston Authority urged that controls should not exceed California standards. The Port believes that nonroad controls should logically not exceed California controls, since California has a greater ozone problem than Houston.

The commission notes that the differences between the Houston and Southern California areas have been decreasing in recent years, as Southern California has made greater improvements in its air quality. States have been given the task and opportunities to develop air quality implementation

plans for their nonattainment areas based on local conditions. This opportunity allows each area to tailor controls to its specific air quality challenges, without relying solely on federal controls or controls adopted in other states.

EDF recommended a number of onroad controls, including commuter choice incentives, smart growth incentives, and travel demand management and transit service development. The People's Action Coalition recommended controls to reduce long commutes. Mothers for Clean Air favored alternative work days as a control measure. An individual asked about the possibility of hauling trash at night. Houston Metro stated its support of cleaner fuels and engines, and urged the identification of more effective and creative TCMs. An individual recommended controls to encourage people to drive less. An individual stated support of zero emitting vehicles. An individual suggested that vanpooling, if required, include students and teachers; another individual suggested that students not be allowed to make single-occupant trips to classes.

The commission appreciates these suggestions for additional control measures. Due to time constraints, incomplete data, and difficulties in quantifying the reduction benefits from some of the strategies, these measures were not included in the present SIP modeling. However, the process of identifying and developing control strategies will continue through the year 2000, so these and other control measures may be considered in more detail during that process.

An individual stated that the SIP does not include the added emissions from expansions at Houston Intercontinental Airport, expansion of Houston Metro bus fleet and service facilities, Bayport, full development of Grand Parkway, full capacity of new highway projects, new stadiums, and planned Medical Center expansions.

The transportation projects, or projects which attract vehicle trips, should already be accounted for in a conforming transportation plan. The H-GAC prepares onroad mobile source inventories for transportation plans. The airport and Bayport container port projects, on the other hand, will be evaluated under general conformity.

Mothers for Clean Air, EDF, and two individuals mentioned that the SIP does not show attainment.

This SIP does not show modeled ozone concentrations down to the attainment level of 125 ppb. The commission applied the most stringent control scenarios that were reasonably available in the modeling for this attainment demonstration. The magnitude of reductions necessary for attainment, however, was greater than could be identified in the control strategies identified to date, and in the time available. The commission will continue to refine the emissions inventory, identify control strategies, and perform modeling for the December 2000 SIP, which is the final submission for the attainment demonstration.

An individual asked if the commission had considered that the loss of some highway funds might result in a road not being built, which would result in less driving and less pollution.

Added roadway capacity may encourage additional VMT and pollution. Conversely, the loss of federal highway and transit funding would impact the potential to build constructive projects such as light rail or high occupancy vehicle lanes.

An individual stated that voters support mass transit, but not a “toy train” between downtown and the Astrodome.

Decisions on mass transit projects are made at the local level and not by the commission. The Downtown to Astrodome light rail link will represent a starter system for a light rail network if Houston Metro decides to build such a system.

H-GAC and AIChE expressed their support for continuing efforts by the commission to demonstrate that the region can attain the ozone standard by the date mandated in the FCAA.

The commission appreciates support of the efforts to bring the Houston area into attainment by 2007..

EDF and H-GAC concurred with SIP statements that the commission needs to continue to refine the emissions inventory, particularly for nonroad mobile emissions, to assure that it provides the most accurate representation possible of emissions contributing to ozone episodes.

The commission will continue efforts to refine all aspects of the emission inventory, and concurs that modeling and control strategy decisions should be based on the most accurate inventory which can be assembled.

H-GAC requested that the commission continue to evaluate a range of vehicle speed limits as a potential emission control strategy. H-GAC stated that current mobile emission models do not fully consider speed impacts on emissions.

The commission concurs that the existing EPA mobile source emission factor model, MOBILE5a-h, does not fully consider speed impacts. This model cannot predict speeds in excess of 65 mph and

may underestimate freeway emissions during non-peak travel periods. EPA has indicated that MOBILE6 will be released in December 1999, and that this model will have capabilities to model speeds up to 75 mph. If this model is released on schedule, the commission will evaluate speed limit changes with the new model.

A firm submitted information on new products to break down and encapsulate hydrocarbons.

The commission does not endorse commercial products, but will forward the submitted information to the agency's Innovative Technology program.

H-GAC encouraged the commission, as it refines control strategy options, to develop and distribute information on the cost/benefit of control options.

A cost/benefit analysis should be included in the final control strategy evaluation. For such an analysis to be accurate, local data on costs will be needed. The commission looks forward to working with local stakeholders on cost/benefit analysis issues.

AICHe noted that a number of the proposals for future reductions in emissions for non-point sources may be legislatively and/or politically beyond reach.

The commission acknowledges that the attainment demonstration for HGA faces technical, economic, and political hurdles, but believes that these challenges can be met by the area.

BCCA commented that Tier II controls may not achieve the level of reductions assumed by the

commission. BCCA also commented that application of Tier III point source controls may not be technically achievable, or may be extremely expensive.

The current SIP provides only modeling of control strategies for attainment of the ozone standard in the HGA area. Work will continue to develop rules to implement the identified control strategies for the December 2000 SIP. The commission will consider the technical and economic issues raised by the commenter during the rule development process, which will take place during the first half of 2000.

BCCA commented on project timing, engineering, and implementation considerations, as well as adverse effects of increased ammonia emissions, associated with implementation of Tier II and Tier III controls. TCC, Exxon, BP Amoco, and Lyondell commented that emission controls for NO_x may increase other emissions, and requested that these emissions be evaluated as a part of the SIP.

The commission will consider these issues during rule development for the next SIP revision, to be submitted to EPA in December 2000.