

**HOUSTON/GALVESTON ATTAINMENT DEMONSTRATION
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CHAPTER 1: GENERAL

1.1 BACKGROUND

The HGA ozone nonattainment area is classified as Severe-17, and therefore it is required to attain the 1-hour ozone standard of 0.12 ppm by November 15, 2007. The HGA area has been working to develop a demonstration of attainment in accordance with the FCAA Amendments of 1990. On January 4, 1995, the state submitted the first of its Post-1996 SIP revisions for HGA.

The January 1995 SIP consisted of UAM modeling for 1988 and 1990 base case episodes, adopted rules to achieve a 9% ROP reduction in VOCs, and a commitment schedule for the remaining ROP and attainment demonstration elements. At the same time, but in a separate action, the State of Texas filed for the temporary NO_x waiver allowed by §182(f) of the FCAA. The January 1995 SIP and the NO_x waiver were based on early base case episodes which marginally exhibited model performance in accordance with EPA modeling performance standards, but which had a limited data set as inputs to the model. In 1993 and 1994, the commission was engaged in an intensive data-gathering exercise known as the COAST study. The state believed that the enhanced EI, expanded ambient air quality and meteorological monitoring, and other elements would provide a more robust data set for modeling and other analysis, which would lead to modeling results that the commission could use to better understand the nature of the ozone air quality problem in the HGA area. This modeling has been ongoing since that time.

Around the same time as the 1995 submittal, EPA policy regarding SIP elements and time lines went through changes. Two national programs in particular were affected by changing deadlines and requirements. The first of these programs was the OTAG. This group grew out of a March 2, 1995 memo from Mary Nichols, former EPA Assistant Administrator for Air and Radiation, that allowed states to postpone completion of their attainment demonstrations until an assessment of the role of transported ozone and precursors had been completed for the eastern half of the nation, including the eastern portion of Texas. Texas participated in this study, and it has been concluded that Texas does not significantly contribute to ozone exceedances in the Northeastern U.S. The other major national program that has undergone changes is the NAAQS program, in which the national ozone standard was revised. EPA promulgated a final rule on July 18, 1997 changing the ozone standard to an 8-hour standard of 0.08 ppm. In November 1996, concurrent with the proposal of the standards, EPA proposed an IIP that it believed would help areas like HGA transition from the old to the new standard. In an attempt to avoid a significant delay in planning activities, Texas began to follow this guidance, and readjusted its modeling and SIP development time lines accordingly. When the new standard was published, EPA decided not to publish the IIP, and instead stated that, for areas currently exceeding the 1-hour ozone standard, that standard would continue to apply until it is attained. The FCAA requires that HGA attain the standard by November 15, 2007.

EPA issued revised draft guidance for areas such as HGA that do not attain the 1-hour ozone standard. The commission adopted on May 6, 1998 and submitted to EPA on May 19, 1998 a revision to the HGA SIP which contained the following elements in response to EPA's guidance:

- ◆ UAM modeling based on emissions projected from a 1993 baseline out to the 2007 attainment date;
- ◆ An estimate of the level of VOC and NO_x reductions necessary to achieve the 1-hour ozone standard by 2007;

- ◆ A list of control strategies that the state could implement to attain the 1-hour ozone standard;
- ◆ A schedule for completing the other required elements of the attainment demonstration;
- ◆ A revision to the Post-1996 9% ROP SIP that remedied a deficiency that EPA believed made the previous version of that SIP unapprovable; and
- ◆ Evidence that all measures and regulations required by subpart 2 of Title I of the FCAA to control ozone and its precursors have been adopted and implemented, or are on an expeditious schedule to be adopted and implemented.

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. In a letter to EPA dated January 5, 1999, the state committed to model two strategies showing attainment.

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. These local strategies are described in Chapter 3 under Scenarios III and VI. Some of the scenarios for which the stakeholders requested evaluation include options such as California type fuel and vehicle programs as well as an ASM-equivalent I/M program. Other scenarios incorporate the estimated reductions in emissions that are expected to be achieved throughout the modeling domain as a result of the implementation of several voluntary and mandatory statewide programs adopted or planned independently of this SIP. It should be made clear that the commission did not propose that any of these strategies be included in the ultimate control strategy submitted to EPA in 2000. Decisions regarding the actual control strategy to be submitted to EPA will be the next step in an iterative process of evaluating potential control strategies, an effort which will continue through 2000. The need for and effectiveness of any controls which may be implemented outside the 8-county area will be evaluated on a county by county basis.

The SIP revision was adopted by the commission on October 27, 1999 and submitted to EPA by November 15, 1999, and contained the following elements:

- ◆ Photochemical modeling of potential specific control strategies for attainment of the 1-hour ozone standard in the HGA area by the attainment date of November 15, 2007;
- ◆ An analysis of seven specific modeling scenarios reflecting various combinations of federal, state, and local controls in HGA. Additional scenarios H1 and H2 build upon Scenario VI;
- ◆ Identification of the level of reductions of VOC and NO_x necessary to attain the 1-hour ozone standard by 2007;
- ◆ A 2007 mobile source budget for transportation conformity;
- ◆ Identification of specific source categories which, if controlled, could result in sufficient VOC and/or NO_x reductions to attain the standard;

- ◆ A schedule committing to submit by April 2000 an enforceable commitment to conduct a mid-course review; and
- ◆ A schedule committing to submit modeling and adopted rules in support of the attainment demonstration by December 2000.

The current SIP revision for HGA contains the following enforceable commitments by the state:

- ◆ To quantify the shortfall of NO_x reductions needed for attainment;
- ◆ To list and quantify potential control measures to meet the shortfall of NO_x reductions needed for attainment;
- ◆ To adopt the majority of the necessary rules for the HGA attainment demonstration by December 31, 2000, and to adopt the rest of the shortfall rules as expeditiously as practical, but no later than July 31, 2001;
- ◆ To submit a Post-99 ROP plan by December 31, 2000;
- ◆ To perform a mid-course review by May 1, 2004; and
- ◆ To perform modeling of mobile source emissions using MOBILE6, to revise the on-road mobile source budget as needed, and to submit the revised budget within 24 months of the model's release. In addition, if a conformity analysis is to be performed between 12 months and 24 months after the MOBILE6 release, the state will revise the MVEB so that the conformity analysis and the SIP MVEB are calculated on the same basis.

1.2 PUBLIC HEARING INFORMATION

The commission held public hearings at the following times and locations:

CITY	DATE	TIME	LOCATION
El Paso	January 24, 2000	2:00 p.m.	City of El Paso Council Chambers 2 Civic Center Plaza, 2nd floor
Austin	January 25, 2000	10:00 a.m.	TNRCC 12100 N. I-35, Building E, Room 201S
Longview	January 26, 2000	10:00 a.m.	Longview City Hall Council Chambers 300 West Cotton Street
Irving	January 26, 2000	7:00 p.m.	City of Irving Central Library Auditorium 801 West Irving Blvd.
Dallas	January 27, 2000	10:00 a.m.	Dallas Public Library Auditorium 1515 Young Street
Lewisville	January 27, 2000	7:00 p.m.	Lewisville City Council Chambers Municipal Center
Fort Worth	January 28, 2000	10:00 a.m.	Council Chambers, 2 nd Floor Fort Worth City Hall 1000 Throckmorton
Beaumont	January 31, 2000	1:30 p.m.	John Gray Institute 855 Florida Avenue
Houston	January 31, 2000	7:00 p.m.	Houston-Galveston Area Council 3555 Timmons Lane
Denton	February 9, 2000	7:00 p.m.	University of North Texas 400 Avenue A

Written comments were also accepted via mail and fax through February 14, 2000.

1.3 SOCIAL AND ECONOMIC CONSIDERATIONS (No change.)

1.4 FISCAL AND MANPOWER RESOURCES

The state has determined that its fiscal and manpower resources are adequate and will not be adversely affected through implementation of this plan.

CHAPTER 2: EMISSIONS INVENTORY

(No updates or revisions.)

CHAPTER 3: PHOTOCHEMICAL MODELING

Although weight of the evidence arguments were presented with the modeling for the HGA SIP, EPA has required the states that have modeling that does not show attainment of the 1-hour ozone standard to identify additional reductions that will provide for attainment of the standard. To quantify this reduction, EPA has recommended two approaches that do not require additional modeling.

The basic approach is to estimate the 2007 design value based on monitored values for the three-year period that spans the episode being modeled, using either model predictions or emissions trends. If this 2007 design value is greater than 124 ppb, then additional reductions are needed. There are two methods for determining the additional reductions. Method 1 is based on the response of modeled ozone to reductions in emissions. Method 2 is based on the response of measured ozone to reductions in emissions quantified in the 1990 and 1996 base year emissions inventories. If there was an increase in the emissions from 1990 to 1996, then method 2 may not be used.

Future Design Value

The first step is to estimate the 2007 design value. For each day modeled, the maximum concentration predicted for the base case and strategy H2 is indicated in Table 3-1. The average concentration for the base case is 181.5 ppb while the average concentration after applying strategy H2 is 144.8 ppb.

Table 3-1. Predicted 1-hour Ozone Concentrations in ppb

Date	9/8	9/9	9/10	9/11	Average
Base Case	182	180	178	186	181.5
Strategy H2	152	141	146	140	144.8

The average that results from applying strategy H2 is divided by the average from the base case, which gives an RRF of 0.798.

$$\begin{aligned} \text{RRF} &= 144.8/181.5 \\ &= 0.798 \end{aligned}$$

At each monitoring station, the 1-hour design value for a year is determined by the fourth highest value monitored over the three-year period ending in that year. The design value for the area is the largest design value from all monitoring stations in the area. The design value for 1992 is based on monitoring for 1990, 1991 and 1992. The average design value used in this evaluation is determined from the design values obtained for the years 1993, 1994 and 1995. Table 3-2 shows these values and the average

Table 3-2. 1-hour Ozone Design Values, ppb

Year	1993	1994	1995	Average
Design Value	180	173	184	179

The estimated future design value DV(f) is the product of the DV(f) and the RRF:

$$\begin{aligned} \text{DV(f)} &= 179 * 0.798 \\ &= 143 \text{ ppb} \end{aligned}$$

Since the estimate future design value exceeds 124 ppb, additional reductions must be quantified.

Additional Reductions Using Method 1

The response of model predictions is compared to emission reductions. Based on this response, the amount of additional reductions to reach 124 ppb is estimated. By applying strategy H2, the 1-hour future design value was reduced from 179 ppb to 143 ppb, for a reduction of 36 ppb. the emission reduction factor is determined for strategy H2 by dividing the decrease in emissions by the reduction in ozone. Table 3-3 summarizes the data used to perform these calculations to determine the reduction factors.

Table 3-3. Emission Reduction Factors

	VOC	NO _x
Base case emissions*	928 tpod	1337 tpod
Strategy H2 emissions*	579 tpod	407 tpod
Reduction	349 tpod	930 tpod
Percent reduction	37.6 %	69.6 %
Emission reduction factor	1.04	1.93

*Anthropogenic emissions over the 8-county nonattainment area.

Emission reduction factor for VOC is 37.6%/36 = 1.04

Emission reduction factor for NO_x is 69.6%/36 = 1.93

These factors represent the percent change in NO_x and VOC required to effect a 1 ppb change in the predicted 2007 ozone design value. It is required that the future design value be reduced to the standard, 124 ppb. The additional reduction required is the difference between 143 ppb and 124 ppb, which is 19 ppb. The additional emissions reduction to reach the standard is the product of the emission reduction factor and the additional reduction requirement:

For VOC, $1.04 * 19 = 19.8\%$

$$19.8\% * 928 = 184 \text{ tpod}$$

For NO_x, $1.93 * 19 = 36.7\%$

$$36.7\% * 1337 = 491 \text{ tpod}$$

However, for NO_x the remaining emissions are 407 tpd so it would not be possible to obtain an additional reduction of 491 tpd. Thus, the method can not be used.

Additional Reductions Using Method 2

The 1990 emissions for VOC were 1060 t/y and for NO_x they were 1259 tpd. The 1996 VOC emissions were 1119 tpd and for NO_x they were 1491 tpd. Since there was an increase for both VOC and NO_x, this method cannot be used.

Additional Reductions Using Method 3

Since neither method 1 or method 2 could be used the EPA Region 6 office developed an alternate method for use in the current HGA SIP revision. This method develops a nonlinear response for ozone to reductions of NO_x. Scenario VI was used as a basis for the nonlinear portion of this approach. The relationships between maximum 1-hour ozone predicted by the model in response to NO_x for three versions of Scenario VI are shown in Table 3-4.

Table 3-4. Response of Ozone to NO_x Emissions

	Maximum Ozone, ppb	NO _x , tpd	% NO _x reduction
2007 Base	171	1052	0.0
Scenario VI	168	456	56.7
Scenario VIb	155	330	68.6
Scenario VIc	143	249	76.3

A quadratic equation was used to relate the ozone to percent of NO_x reduction. The equation is as follows:

$$\text{Equation 1: } \% \text{ NO}_x = -0.010949 * (\text{OC}) + 2.62 * (\text{OC}) - 74.62$$

where OC is the ozone concentration.

For Strategy H2 the maximum ozone concentration was 152 with 407 tpd of NO_x, which is a 61.3% reduction of NO_x emissions. Applying Equation 1 to Strategy H2, we have:

$$\begin{aligned} \% \text{NO}_x &= -0.010949 * (152)^2 + 2.62 * (152) - 74.62 \\ &= 70.8\% \end{aligned}$$

The difference between this derived value and the value from modeling strategy H2 is:

$$70.8 \% - 61.3\% = 9.5\%$$

The relatively large deviation is due to adjustments made to nonroad mobile emissions in strategy H2. Then, making a linear adjustment to equation 1, we have Equation 2:

$$\text{Equation 2: } \%NO_x = -0.010949*(OC)**2 + 2.62*(OC) - 84.12$$

Equation 2 is used to determine the amount of reduction in NO_x needed to reach 124 ppb:

$$\begin{aligned} \%NO_x &= -0.010949*(124)**2 + 2.62*(124) - 84.12 \\ &= 72.5\% \end{aligned}$$

Thus, the NO_x reduction needed to attain the standard is:

$$0.725 * 1052 \text{ tpod} = 763 \text{ tpod.}$$

$$1052 \text{ tpod} - 763 \text{ tpod} = 289 \text{ tpod}$$

$$407 \text{ tpod} - 289 \text{ tpod} = 118 \text{ tpod}$$

The amount of NO_x in the inventory after a 72.5% reduction is 289 tpod. Strategy H2 has 407 tpod NO_x, so that by using this method, an additional reduction of 118 tpod is needed to reach a future design value of 124 ppb.

CHAPTER 4: DATA ANALYSIS

(No updates or revisions.)

CHAPTER 5: RATE OF PROGRESS

(No updates or revisions.)

CHAPTER 6: REQUIRED CONTROL STRATEGY ELEMENTS

(No updates or revisions.)

CHAPTER 7: FUTURE ATTAINMENT PLANS

The commission recognizes that there are many innovative technologies and measures that are in development and that may be necessary to achieve the ozone standard in HGA, or to make achievement of that standard more cost-effective or feasible. Currently, EPA has the responsibility to certify new emission reduction technologies to determine technical feasibility of the new product or measure, and to determine if claimed reductions are achieved in-use. However, this process can be time-consuming and burdensome to inventors and small businesses, and may not occur in time for many effective innovations to be used to help HGA achieve the standard. Therefore, the commission solicited comments on how a process could be established to allow inventors and developers of innovative technologies and measures to partner with other stakeholders to test products or measures to determine if they are technologically feasible, and, if so, how much SIP credit they should receive. This concept could also be used to allow interested stakeholders to partner with developers of innovative technologies or measures to assist in implementation of those technologies that are proven to be effective. If the commission decides to implement this process, it would be developed as part of a future SIP revision.

The work described in this SIP revision concerning control strategy development will continue during 2000, up to the commission's adoption of the final attainment demonstration SIP in late December 2000. Commission staff will continue to work closely with the coalition of HGA regional stakeholders and EPA to identify further sources of reductions to support the attainment demonstration. The current SIP revision ensures that all requirements are met for the HGA attainment demonstration, specifically, that the state's May 1998 and November 1999 SIP submittals, as well as the transportation conformity budgets contained in the November 1999 SIP submittal, are approvable by EPA. To this end, the current SIP revision for HGA contains the following enforceable commitments by the state:

1. Quantify Shortfall of NO_x Reductions Needed for Attainment

As discussed in Chapter 3, the state has used an EPA calculation method to estimate the gap of NO_x reductions needed for HGA to attain the 1-hour ozone standard. This method gives an estimate of a 118 tpod shortfall, taking into account the level of NO_x reductions already modeled for the November 1999 SIP. In April 2000, the commission submitted this shortfall estimate as part of the SIP revision.

2. List and Quantify Potential Control Measures to Meet Shortfall of NO_x Reductions Needed for Attainment

In April 2000, the commission submitted a list of potential control measures that could be applied to meet the attainment shortfall, and that quantified the reductions that could be obtained from implementing the measures. With regard to on-road mobile source control measures, the state understands from EPA that only technology-related measures, such as I/M, cleaner fuels, and use restrictions/incentives may be included. Measures that could limit future highway construction, such as growth restrictions, may not be included. The list of potential control measures is given in Table 7-1.

These listed measures represent a supplement to, and not a replacement of, the control measures modeled for the November 1999 HGA SIP. A brief description of each listed strategy, including documentation, assumptions, etc., is contained in Appendix A.

As discussed in item 3 below, the state will continue to develop and refine the control strategies for the HGA attainment demonstration. This effort may result in changes to the attainment target, as well as revisions to the control strategies ultimately selected for the attainment demonstration. For this reason, the

list of potential control measures, to be submitted in April 2000, is considered as preliminary. As long as an approvable attainment demonstration for HGA is submitted to EPA within the specified time frame, the state reserves flexibility in exploring and implementing other control strategy options not specifically identified in the April 2000 SIP.

The commission commits to submit, as expeditiously as practical but no later than July 31, 2001, additional adopted rules necessary to address the attainment shortfall identified in the April 2000 SIP.

3. Adopt Rules for the Attainment Demonstration

The commission will submit a revision to the SIP by December 31, 2000, with the first phase of adopted rules for attainment of the 1-hour ozone standard in the HGA area. As discussed in Item 2 above, the state will submit additional adopted rules no later than July 31, 2001 to address the remaining shortfall. The following tasks will be performed to accomplish the goal of submitting adopted rules by December 31, 2000:

- ◆ Maintain frequent contact with EPA and HGA stakeholders, through telephone conferences and periodic meetings, to develop and refine control strategies;

Table 7-1. List of Potential Control Measures to Meet Shortfall of NO_x Reductions Needed for Attainment

Sector	Source	Category	Control	Basis	NOx reduction, tpod
Area	Comm./res. A/C	All	Ozone-scavenging catalyst	EPA	13.00
Area			Energy conservation for buildings		2.00
Area	Water heaters/ small boilers, process heaters	All	Limit NOx emissions		0.50
				AREA SUBTOTAL	15.50
Nonroad mobile	HDDV	All	Accelerated purchase of Tier III off-highway equipment		25.50
Nonroad mobile	Equipment	>175 hp	NOx catalyst retrofits		14.19
Nonroad mobile	Equipment	Construction, industrial, commercial, agricultural	Diesel emulsions		12.16
Nonroad mobile	Equipment	Airports	Electrify ground service equipment		8.26
Nonroad mobile	Large Spark Ignition Engines and Equipment	All >25 hp No construction and agriculture <175 hp	California spark ignition standard	To be scaled to modeling inventory by ERG	2.80
Nonroad mobile	Commercial marine	Ships	Ship hotelling (estimate of improved inventory)		2.44
Nonroad mobile	Use Restrictions/ Incentives	Construction	Economic incentives		***
Nonroad mobile	Use Restrictions/ Incentives	Commercial marine	Low-emission fuel incentives		***
Nonroad mobile	Fuels	All	Diesel fuel additives (cetane)		***
Nonroad mobile	Use Restrictions/ Incentives	Commercial marine	Regulate activity levels of tug/tow vessels		***
Nonroad mobile	Equipment	Port of Houston	Combustion controls on existing equipment	Rich to lean ratio	***
Nonroad mobile	Equipment	Port of Houston	Preventive maintenance		***
Nonroad mobile	Equipment	Construction	LDDV standards		***
Nonroad mobile	Equipment	Construction	Generator standards		***
Nonroad mobile	Commercial Marine	Ship	Restrict start-up/shutdown of engines		***
Nonroad mobile	Commercial Marine	Ships, Barges, etc.	Bunker fuel improvements		***
Nonroad mobile	Equipment	Airports	Preventive maintenance		***
Nonroad mobile	Equipment	Commercial Marine	Require only diesel powered tugs		***
Nonroad mobile		Locomotives	Require low NOx fuel for local locomotives		***

Sector	Source	Category	Control	Basis	NOx reduction, tpod
Nonroad mobile	Equipment		Restrict landscaping activities (ban from 6-10 am)		***
Nonroad mobile		Airports	On-ground operational measures such as single engine taxiing to and from takeoffs		***
Nonroad mobile		Airports	In-air operational measures such as reduced landing flap, optimum flap retraction		***
Nonroad mobile	Diesel engines	All	Vehicle scrappage		***
Nonroad mobile	Equipment	All	Provide electric power to construction sites		***
Nonroad mobile	Small equipment	Lawn and garden	Replacement with electric-powered equipment		***
				NONROAD SUBTOTAL	65.35
Onroad mobile	Use Restrictions/ Incentives	All	20% time/area driving restrictions	20% reduction from SIP baseline with CA Fuels, ASM/OBD	35.14
Onroad mobile	Vehicles	All	Reduce speed limit to 55 mph	Does not account for interactions between VMT reduction and speeds	12.18
Onroad mobile	HDDV	Locally registered trucks	NOx catalyst retrofits		8.78
Onroad mobile	Vehicles	All	Gasoline additives	Test protocol for New Hampshire	5.00
Onroad mobile	Use Restrictions/ Incentives	All	Telecommuting	1000 people	3.00
Onroad mobile	Supply	Transit	Light rail	100,000 riders	2.04
Onroad mobile	Fuels	All	15 ppm sulfur		1.17
Onroad mobile	Vehicles	All	Vehicle scrappage	13,000 vehicles/ year	1.02
Onroad mobile	Supply	Misc.	Signalization (RCTSS, light rail)		1.00
Onroad mobile	Medium-duty fleets, gasoline-powered	School buses, parcel carriers, etc. (pre-1990 MY)	Retrofit to 3-way catalyst		0.68
Onroad mobile	Use Restrictions/ Incentives	All	Fleet idling restrictions	Based on NCTCOG proposed program, with HGA VMT figures	0.62
Onroad mobile	Vehicle standards	Light-duty vehicles	Commercial vehicles	Local fleet rules	0.59
Onroad mobile	HDDV	Locally registered trucks	Diesel emulsions		0.50
Onroad mobile	Supply	Other modes	Expand bikeway network	100 miles	0.41
Onroad mobile	Supply	Transit	Expand service area	10,000 new riders	0.40

Sector	Source	Category	Control	Basis	NOx reduction, tpod
Onroad mobile	Supply	Transit	New or expanded bus service	10,000 new riders	0.40
Onroad mobile	Supply	Other modes	School pool programs	100 carpools	0.14
Onroad mobile	Supply	Transit	Expanded RideShare program	100 vanpools	0.14
Onroad mobile	Use Restrictions/ Incentives	All	Flex-time (school)	100 carpools	0.14
Onroad mobile	Use Restrictions/ Incentives	All	Truck stop idling restrictions	1000 hours HDDV	0.13
Onroad mobile	Vehicle standards	Autos	California LEV		0.13
Onroad mobile	Use Restrictions/ Incentives	All	Episodic controls	VMT decrease of 5,000,000	0.09
Onroad mobile	Use Restrictions/ Incentives	All	Ozone Action Days	VMT decrease of 5,000,000	0.09
Onroad mobile	Supply	Transit	Bus fare promotions	Increase in daily ridership by 20,000	0.08
Onroad mobile	Supply	Transit	New or expanded carpools/vanpools	1000 carpools	0.08
Onroad mobile	Use Restrictions/ Incentives	Transit	Ozone Action Days: transit fare incentives		0.08
Onroad mobile	Diesel transit	Metro	Hybrid buses		0.03
Onroad mobile	Use Restrictions/ Incentives	All	Flex-time (work)	10,000 trips	0.02
Onroad mobile	Supply	Transit	TRANSTAR expansion	20 miles	0.02
Onroad mobile	Use Restrictions/ Incentives	All	Drive-through restrictions	100 drivethroughs	0.02
Onroad mobile	Vehicle stds.	Heavy-duty vehicles	Commercial vehicles	Local fleet rules	***
Onroad mobile	Use Restrictions/ Incentives	All	Transit-oriented development		***
Onroad mobile	Use Restrictions/ Incentives	All	Market-based value (congestion) pricing		***
Onroad mobile	Equipment	All	Cetane enhancers		***
Onroad mobile	Supply	Other modes	Shuttle for hire (clean-fueled)		***
Onroad mobile	Use Restrictions/ Incentives	All	Emission-based registration fees		***
Onroad mobile	Supply	Other modes	New sidewalks/crosswalks		***
Onroad mobile	Supply	Transit	New or expanded park & rides		***

Sector	Source	Category	Control	Basis	NOx reduction, tpod
Onroad mobile	Supply	Transit	New technology (guided bus)		***
Onroad mobile	Use Restrictions/ Incentives	All	Gas tax increases		***
Onroad mobile	Use Restrictions/ Incentives	All	Parking restrictions/pricing		***
Onroad mobile	Vehicle Operations	All	Driving cycle/traffic calming		***
Onroad mobile	Vehicle Operations	All	A/C use		***
Onroad mobile	Vehicle Operations	All	Deterioration rate		***
Onroad mobile	All	All	Higher registration fees for ownership of multiple vehicles		***
Onroad mobile	All	All	Higher registration fees for vehicles with more annual VMT		***
Onroad mobile	All	All	Higher registration fees for older vehicles		***
Onroad mobile			Sustainable development Pedestrian-oriented development		***
Onroad mobile	Alternative fuels	All	LNG	Cannot model with MOBILE	***
Onroad mobile	Alternative fuels	All	CNG	Cannot model with MOBILE	***
Onroad mobile	Vehicle operations	All	Employer on-road vehicle emission reduction program (SCAQMD Rule 2202)		***
Onroad mobile	All	All	Accelerated fleet turnover		***
Onroad mobile	All	All	Operation-based vehicle insurance premiums		***
Onroad mobile	All	All	Pay-at-the-pump liability insurance		***
Onroad mobile	All	All	Vehicle registration fee rebates		***
Onroad mobile	All	All	Parking cash-out		***
Onroad mobile	HDDV	All	Intermodal freight efficiency for heavy-duty diesel vehicles		***
Onroad mobile	All	All	Improved airport access options		***
Onroad mobile	Supply	All	Intelligent vehicle highway systems		***
Onroad mobile	HDDV	All	Truck stop electrification for in-truck services		***
Onroad mobile	Supply	All	Proximate commute programs		***
Onroad mobile	Supply	All	Station cars		***
Onroad mobile	Supply	Misc.	Database sharing/traffic management		***
Onroad mobile	Vehicles	All	Remote sensing to identify high-emitting vehicles		***

Sector	Source	Category	Control	Basis	NOx reduction, tpod
Onroad mobile	Vehicles	All	Repair assistance (I/M)		***
Onroad mobile	Vehicles	Airports	Use of alternate fuels or electric power by airport buses		***
Onroad mobile	Use Restrictions/ Incentives	All	Toll reductions for high-occupancy vehicles		***
Onroad mobile	Supply	All	Car rental service for single tasks		***
Onroad mobile	I/M	All	Expand I/M beyond 8-county area		***
Onroad mobile	Supply	Transit	Suburb to suburb transit service (could include high capacity transit)		***
Onroad mobile	Supply	All	"Unbundling" of parking from commercial leases (level the playing field for SOV alternatives)		***
Onroad mobile	Supply	Trucks	Ban on trucks from certain areas		***
Onroad mobile	Vehicle standards	All	Performance standards in contracts		***
Onroad mobile	Supply	Transit	Incubator for development of privatization of transit (to grow opportunities for transit in underserved areas)		***
Onroad mobile	Supply	Misc.	Improved coordination of off-duty police officers at parking garages/lots to minimize congestion		***
				ONROAD SUBTOTAL	73.44
				TOTAL	154.29
				TARGET TO CLOSE GAP	118.00
				EXCESS (SHORTFALL)	36.29

***These reductions have not yet been quantified.

- ◆ Hold meetings with affected stakeholders in the point, area, on-road mobile and non-road mobile source categories to gather input and plan future rule requirements;
- ◆ Propose rule requirements, conduct public hearings, and respond to comments

Major milestones associated with these tasks are summarized in Table 7-2.

**Table 7-2.
Schedule for Submitting HGA
SIP and Adopted Rules**

Action	Completion Date
Rule proposal developed	June 1, 2000
SIP and rules proposal filed with Chief Clerk	June 30, 2000
Proposal presented at commission agenda	July 19, 2000
Hearing notice published in newspapers	July 28, 2000
Proposal published in Texas Register	August 4, 2000
Public hearing	August 28, 2000
Close of 30-day comment period	September 4, 2000
Analysis of testimony	October 31, 2000
SIP and rules filed with Chief Clerk	November 22, 2000
Adoption by commission	December 6, 2000
Rule effective date	December 27, 2000
SIP and adopted rules submitted to EPA	December 29, 2000

4. Post-99 ROP Plan

The commission submitted in April 2000 an enforceable commitment to submit the Post-99 ROP plan by December 31, 2000.

5. Mid-Course Review

The commission will perform a mid-course review and submit the results to EPA by May 1, 2004. This effort will involve a thorough evaluation of all modeling, inventory data, and other tools and assumptions used to develop the attainment demonstration. However, the mid-course review will not relate monitored ambient ozone measurements to the effectiveness of the overall control strategy, since the key strategies crucial to attainment probably will not have been implemented by that time. Although NO_x emissions will begin to decrease in the 2001/2002 time frame, these reductions may not result in lowered monitored ozone

levels until the 2005/2006 time frame, considering the time needed to implement point, on-road mobile, and non-road mobile source controls.

One aspect of the mid-course review involves an intensive field study planned for the summer of 2000, which will improve understanding of the physical processes leading to high ozone concentrations in East Texas and particularly along the Gulf Coast. Together with improvements to the emissions inventory, the results of this study will provide part of the scientific basis for reassessing the ozone problem in the HGA ozone nonattainment area. The commission plans to perform new modeling after the appropriate quality assurance and analysis of the field study and inventory data are completed. New modeling results may be expected in 2003, at which time the commission would be able to re-evaluate the control strategies for the area. Completing the mid-course review in late 2003 and taking it through the proposal, hearing, and adoption process in early 2004 would allow the mid-course review SIP revision to be submitted to EPA by May 1, 2004.

The commission commits to continue working with EPA and the HGA regional stakeholders in an open, public consultative process to ensure that the mid-course review is a comprehensive and thorough evaluation.

Since a public hearing is required to meet FCAA requirements to make these commitments enforceable, the SIP also contains a schedule reflecting that a public hearing on these issues was conducted on January 31, 2000, and the SIP revision was submitted to EPA by April 28, 2000. This schedule is presented in Table 7-3.

**Table 7-3.
Schedule for Submitting Enforceable
Commitments for the HGA SIP**

Action	Completion Date
SIP proposal filed with Chief Clerk	December 10, 1999
Proposal presented at commission agenda	December 16, 1999
Hearing notice published in newspapers	December 24, 1999
Proposal published in Texas Register	December 31, 1999
Public hearing	January 31, 2000
Close of 30-day comment period	February 14, 2000
Analysis of testimony	February 25, 2000
SIP filed with Chief Clerk	March 31, 2000
SIP adopted by commission	April 19, 2000
SIP submitted to EPA	April 28, 2000

6. Revise On-road Mobile Source Budget

EPA is expected to release MOBILE6, an enhanced version of its mobile source model, by Fall 2000. Application of MOBILE6 to the HGA inventory will likely change the on-road mobile source emissions inventory, and hence the motor vehicle emissions budget (MVEB) used for transportation conformity purposes.

The commission commits to perform new mobile source modeling, using MOBILE6, within 24 months of the model's release. In addition, if a transportation conformity analysis is to be performed between 12 months and 24 months after the MOBILE 6 release, transportation conformity will not be determined until Texas submits an MVEB which is developed using MOBILE 6 and which the EPA finds adequate. Finally, if any of the measures adopted in the SIP pertain to motor vehicles, the commission commits to recalculate and resubmit a MVEB by December 31, 2000. The H-GAC and TxDOT have been informed of these commitments.