Austin/Round Rock MSA Clean Air Action Plan For the Early Action Compact

The Clean Air Action Plan and complete appendices are online at
http://www.capco.state.tx.us/Clean_Air/CAPCOairquality/news.htm

For more information go to
www.cleanairforce.org or www.capco.state.tx.us
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Prepared for the Central Texas Clean Air Coalition
By the EAC Task Force, the CLEAN AIR Force and CAPCO
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LIST OF FREQUENTLY USED ACRONYMS

A/RR MSA or MSA: Austin/Round Rock Metropolitan Statistical Area
CAAP: Clean Air Action Plan
CAF: CLEAN AIR Force of Central Texas
CAMPO: Capital Area Metropolitan Planning Organization
CAPCO: Capital Area Planning Council
CO: carbon monoxide
EAC: Early Action Compact
EI: Emissions Inventory
EPA: U. S. Environmental Protection Agency
MPO: Metropolitan Planning Organization
NOx: oxides of nitrogen
ppb: parts per billion
RRF: relative reduction factors
SIP: State Implementation Plan
TCEQ: Texas Commission on Environmental Quality
TERP: Texas Emission Reduction Program
TNRCC: Texas Natural Resource Conservation Commission
tpd: tons per day
tpy: tons per year
TTI: Texas Transportation Institute
TxDOT: Texas Department of Transportation
VOC: volatile organic compounds
VMT: vehicle miles travel

CHAPTER 1: GENERAL INFORMATION

1.1 Background

Local governments, community and business leaders, environmental groups, and concerned citizens in Bastrop, Caldwell, Hays, Travis and Williamson Counties (ARR/MSA) are committed to improving regional air quality. The MSA is acting now to assure attainment and maintenance of the federal 8-hour standard for ground-level ozone. Using the Early Action Compact (EAC) Protocol, the MSA has prepared a Clean Air Action Plan (CAAP) that provides clean air sooner, maintains local flexibility and can defer the effective date of nonattainment designation.

1.1.1 Previous Work

Central Texas has a history of proactive air quality initiatives. Since 1996, the Texas Legislature has provided near-nonattainment area funding to the area for use in performing planning functions related to the reduction of ozone concentrations in the area. The region was among the first in the nation to adopt an O_3 Flex Agreement. Designed to help the region maintain compliance with the 1-hour standard, implementation of the O_3 Flex emission reduction measures started in the 2002 ozone season.

The region has conducted ambient air monitoring, following U.S. Environmental Protection Agency (EPA) guidelines, that is beyond that performed by the Texas Commission on Environmental Quality (TCEQ). The region developed emissions inventories, following EPA guidance, for 1996 and 1999. They also developed photochemical modeling episodes for July 1995 and September 1999. Results from the 1995 episode have been used for air quality planning. The 1999 episode has been used to develop the CAAP. Both episodes meet EPA photochemical model performance criteria.

Since 1993 the CLEAN AIR Force of Central Texas (CAF), a coalition of business, government, environmental and community leaders, has coordinated public awareness and education campaigns. Ten years of CAF outreach has provided a solid base of public understanding of air quality issues.

1.1.2 The Early Action Compact

EPA issued the *Protocol for Early Action Compacts Designed to Achieve and Maintain the 8-Hour Ozone Standard* (the Protocol) on June 1, 2002 and revised it in November 2002. The Protocol provides the framework for a voluntary commitment to develop and implement an emission reduction plan that assures attainment of the 8-hour ozone standard by 2007 and maintenance at least through 2012. Please see Appendix 1-1 for the full text of the Protocol.

A key point of the EAC is the flexibility it affords areas in selecting emission reduction measures. Based on State Implementation Plan (SIP)-quality science, signatories choose the combination of measures that meet both local needs and emission reduction targets. The EAC recognizes that not every entity will implement every measure. Please see Appendix 1-2 for the full text of the Central Texas EAC document.

On December 18, 2002, the cities of Austin, Bastrop, Elgin, Lockhart, Luling, Round Rock, and San Marcos; the counties of Bastrop, Caldwell, Hays, Travis, and Williamson;

TCEQ and EPA, entered into an EAC for the MSA. This compact commits the region to developing and implementing a CAAP in accordance with the following milestones:

EAC/CAAP Milestones	
June 16, 2003	Potential local emission reduction strategies identified and described
November 30, 2003	Initial modeling emissions inventory completed
	Conceptual modeling completed
	Base case modeling completed
December 31, 2003	Future year emissions inventory modeling completed
	Emissions inventory comparison and analysis completed
	Future case modeling completed
January 31, 2004	Attainment maintenance analysis completed
	Schedule for development of further episodes completed
	One or more modeled control cases completed
	Local emission reduction strategies selected
	Submission of preliminary CAAP to TCEQ and EPA
March 31, 2004	Final revisions to modeled control cases completed
	Final revisions to local emission reduction strategies completed
	Final revisions to attainment maintenance analysis completed
	Submission of final CAAP to TCEQ and EPA
December 31, 2004	CAAP incorporated into the SIP; SIP adopted by TCEQ
December 31, 2005	Local emission reduction strategies implemented no later than this date
December 31, 2007	Attainment of the 8-hour standard

All milestone documents may be found at:
http://www.capco.state.tx.us/Clean_Air/CAPCOairquality/news.htm

1.1.3 How the EAC Applies to the A/RR MSA

Participation in an EAC is available for areas that are in attainment of the 1-hour ozone standard but approach or monitor exceedances of the 8-hour ozone standard.

The MSA is designated attainment for the 1-hour ozone standard and continues to monitor attainment of that standard. The region has not exceeded the 1-hour standard since 1985. The MSA has intermittently monitored violations of the 8-hour ozone standard from 1998 through 2002 and is currently in attainment. (In order to comply with the 8-hour standard, each monitor's three-year average of the annual fourth-highest 8-hour ozone reading must be less than 85 ppb.) As such, the region meets the criteria for participation in an EAC.

Elected officials in the MSA entered into the EAC with EPA and TCEQ because monitored exceedances of the 8-hour standard indicate concentrations of ground-level ozone inconsistent with protecting public health and the environment.

1.1.4 Geographic Coverage of the CAAP

The CAAP applies to the five counties included in the MSA. These counties are Bastrop, Caldwell, Hays, Travis, and Williamson. The U.S. Office of Management and Budget

decides the MSA based on data generated by the U.S. Census Office. EPA typically uses MSA boundaries to define nonattainment areas; hence their use for the CAAP. Sources of regional anthropogenic, or man-made, emissions reflect the growing urbanization of the area (e.g., population densities, urban/suburban growth, commuting patterns).

1.2 Public Involvement Program

1.2.1 Local Programs

In January 2003 the CAF launched an extensive program to ensure widespread public and stakeholder participation in developing the region's CAAP. CAF contracted with an established local opinion research company, NuStats Partners, to assist. Additional information on the CAF is found in Appendix 1-3.

The involvement project had two goals: (1) to provide venues for participation by interested parties; and (2) to provide air quality information to the general public. Stakeholder involvement activities included those aspects of the project directly related to gathering input on the emission reduction strategies. Public involvement activities, while also soliciting input, focused on increasing public understanding of air quality issues and the EAC process.

The local EAC signatory jurisdictions played a key role. They facilitated public participation by hosting public meetings. They also reviewed and selected CAAP strategies. The Clean Air Coalition, composed of one elected-official representative from each of the local EAC signatory jurisdictions, bore primary responsibility for CAAP development decisions. The EAC Task Force, composed of staff from local signatory jurisdictions, participating agencies, business and environmental groups, developed and recommended the initial CAAP for CAC and signatory consideration. The CAC met at least quarterly throughout the CAAP development process and continues to meet regularly. The EAC Task Force met twice monthly during CAAP development and continues to meet regularly. Both CAC and EAC Task Force meetings are open to the public. Additional information on the CAC and EAC Task Force is found in Appendices 1-4 and 1-5, respectively.

1.2.2 Stakeholder Involvement Activities

The kickoff stakeholder meeting was on January 31, 2003. Advertisements for the event ran for two weeks in the region's major daily newspaper, the Austin American-Statesman, and in 15 community newspapers in the five counties. Ninety people attended. They represented a broad spectrum of interests and perspectives. They included environmental groups, community activists, manufacturing companies, real estate companies, elected officials and transportation planners. Meeting facilitators lead four stakeholder work groups to develop emission reduction strategies for each emission source—on-road, non-road, area, and point.

These work groups continued to meet regularly throughout 2003. Each work group drafted a list of strategies to be considered for inclusion in the CAAP. Their work is the backbone of the plan development. Additional information on stakeholder involvement activities is found in Appendices 1-6 and 1-7.

1.2.3 Public Involvement Activities

In addition to the public meetings held throughout the MSA, NuStats staff provided the work plan for general public involvement. Outreach avenues included a website, hotline, presentations to organizations and community groups, distribution of comment cards at meetings and events, publishing the comment cards in the region's daily newspaper and in over 15 community newspapers, and information kiosks in public areas (libraries, shopping malls, etc.). NuStats maintained a database of participating stakeholders and groups/individuals. They coded and recorded responses to allow real-time evaluation of opinion trends and to identify segments of the region that were under responding and in need of additional efforts. Please see Appendices 1-6 and 1-7 for details of outreach activities and comment card survey results. Appendix 1-8 contains documentation of all public comments. It also includes resolutions of support from area jurisdictions that, while not signatories, support the air quality goals of the EAC.

1.3 Policy Statements

The following statements reflect the positions of the local EAC signatories.

1.3.1 Fair Share

The local EAC signatories support air quality improvement initiatives that are based on a fair share approach; the amount of man-made emissions reduced by any source, geographic area or jurisdiction should be proportional to the amount of emissions contributed. No source, area or jurisdiction should be required to bear more than its fair share of the emission reduction burden. The CAAP emission reduction measures address all man-made emission sources in proportion to their levels of contribution. Also, it comparably burdens the general public, businesses and the public sector.

1.3.2 Regional Emission Reduction Measures and Implementation Barriers

The EAC is intended to allow for increased local control of air quality planning. The nature of air pollution, however, requires that emission reduction measures be implemented on a regional basis in order to be effective.

Typically, one city or county cannot tackle the issue alone. Indeed, “local” in this case covers a five-county region in Texas and 12 local governmental jurisdictions. It is important to note that the latter represent only a handful of the total number of governmental jurisdictions in the region. For example, while the City of Austin and Travis County are the only two EAC signatories from the county, there are more than 20 other municipalities with jurisdiction in Travis County alone. Each has authority over adoption of ordinances and regulations. Note that the State of Texas does not grant ordinance authority to counties. Consequently, it is almost impossible to implement regional emission reduction measures in the absence of state regulations; hence the need for the State Assisted Measures outlined in Chapter 5. The only alternatives to this approach require substantial legislative actions. These have been introduced in past legislative sessions and routinely defeated.

1.3.3 The Role of Transport in the CAAP

The EAC signatories ask that state and federal partners act with diligence to ensure that assumptions about emission reduction measures implemented outside the MSA, and consequently assumptions about the associated transport to our region, hold true.

The 2007 Base Case assumes substantial emission reduction measures will be implemented by federal, state, other local and private entities located outside the five-county A/RR MSA. For example, the model assumes the Houston/Galveston SIP will be successful in 2007 and that the ALCOA Consent Decree will be implemented no later than March 2007. While these assumptions are reasonable and necessary, their validity remains uncertain.

1.3.4 Texas Low Emission Diesel (Tx LED)

The EAC signatories urge TCEQ and, if applicable, EPA to work with the MSA to correct a "Catch-22" in TCEQ's interpretation of the Tx LED rule. Current policy penalizes the MSA and hinders our air quality improvement efforts. Because TCEQ approved an Alternative Emission Reduction Plan for Flint Hills Resources (FHR), the MSA will receive no Tx LED via the traditional pipeline distribution system. At the same time, TCEQ staff has concluded that TERP funds are not available for importation and distribution of Tx LED into the region after 2005. Without Tx LED, our region will lose over 1.7 tons per day of creditable NOx emissions reductions in 2007. Consequently, the EAC signatories request that the TCEQ reconsider its approval of FHR's Alternative Emission Reduction Plan or, alternatively, allow the MSA to use TERP funds for procuring Tx LED.

1.3.5 Proposed Mitigation Measures

The EAC signatories are committed to supporting policy initiatives that lead to distinct regional air quality improvements. To that end, signatories urge TCEQ and EPA to ensure a clear nexus between all proposed mitigation measures and alleged violations of the Clean Air Act. All aspects of future Supplemental Environmental Projects and Beneficial Environmental Projects, when related to air quality violations, should have a direct air quality benefit.

1.3.6 Periodic Review

Throughout the EAC's duration the signatories will initiate periodic program evaluations. These will determine the necessity for revision or modification and will be addressed accordingly.

1.3.7 Modeling of Major New Sources

The EAC signatories, to facilitate planning, request that TCEQ notify CAPCO of anticipated new major sources within its boundaries, or within 25 miles of its boundaries. This allows the region to model effects and modify the CAAP if necessary. The signatories also encourage TCEQ to model effects of all large new NOx sources in the eastern half of the state as a permanent part of its review process.

CHAPTER 2: EMISSIONS INVENTORY

2.1 Overview

An emissions inventory (EI) is a list of the air pollutants emitted by all types of sources. Typically an EI is divided into five types of sources: point sources, area sources, on-road mobile sources, non-road mobile sources and biogenic sources. Each category is further divided into source categories. Because ozone is formed in the atmosphere, not emitted directly, the EI quantifies emissions from ozone precursors. Pollutants covered are carbon monoxide (CO), volatile organic compounds (VOC) and oxides of nitrogen (NOx).

Details for the development of the 1999 and 2007 EIs, developed per EPA and EAC guidance, are found in Appendices 2-1 and 2-2.

2.2 Point Sources

Point sources in attainment areas are stationary commercial or industrial operations that have actual emissions of more than 100 tons per year (tpy) of any criteria pollutant. Typically these are individual stacks or points that emit pollutants directly into the atmosphere. These are usually readily identifiable as emission sources. Modeling requires data from several parameters for the stacks: emission rate, stack diameter, stack height, stack velocity, stack temperature and composition of VOC. Modeling also requires data on the type of manufacturing facility and air pollution control devices. TCEQ collects this data through a required emissions inventory questionnaire. After quality assurance review, TCEQ stores the data in its Point Source Data Base.

2.3 Area Sources

Area sources are those emission points that are not easily separated into individual stacks because of the large number of sources or the lack of discrete identifiable sources. They are commercial, small-scale industrial, or residential users of materials or processes that generate emissions. Hydrocarbon evaporation and fuel combustion are the typical causes of area source emissions. Examples of evaporative emissions include printing, industrial coatings, degreasing solvents, house paints, leaking underground storage tanks, gasoline service station underground tank filling and vehicle fueling operations. Examples of fuel combustion sources include fossil fuel use at residences and businesses, and also outdoor burning, structural fires and wildfires.

These emissions fall below point source reporting levels and are too numerous or too small to identify individually. Emissions-estimate calculations use an established emission factor (emissions per unit of activity) multiplied by the incidence of the relevant activity or activity surrogate. Population is the most common activity surrogate. Others include gasoline sales, employment by industry type and acres of cropland. Bottom-up approaches estimate activity factors from surveys. Top-down approaches use generic activity factors based on national, state or county data. Emission factors can be a category-specific generic estimate or can be developed locally (e.g., based on product usage).

2.4 On-Road Mobile Sources

On-road sources are automobiles, trucks, motorcycles, and other motor vehicles operating on roadways in the MSA. Emissions estimates account for vehicle engine exhaust and associated evaporative emissions. These emissions are calculated with an activity factor, such as vehicle miles traveled (VMT), and an emissions factor. The road network is divided into roadway links. For detailed photochemical modeling, hourly day-specific emissions are calculated for each roadway link by developing link-specific activity data and emissions data. For each link the emissions factor is calculated with a version of the EPA MOBILE model.

The MSA EI uses EPA's mobile emissions factor model, MOBILE6. Model inputs simulate vehicle fleet driving and include vehicle speeds by roadway type, vehicle registration by type and age, percentage of vehicles in cold and hot start and stabilized modes, percentage of miles traveled by vehicle type and age, and use of a vehicle Inspection and Maintenance Program (I/M), where applicable. Model inputs also include gasoline parameters such as sulfur content and Reid vapor pressure, temperature and humidity. Input parameters reflect local conditions to the extent possible. The MOBILE model emission factors multiplied by VMT estimates complete the emissions estimate.

Future VMT estimates use the Capital Area Metropolitan Planning Organization (CAMPO) travel demand model for Hays, Travis and Williamson Counties. Future VMT estimates for Bastrop and Caldwell Counties use a GIS-based highway performance monitoring system methodology developed by Texas Transportation Institute (TTI). The CAMPO travel model inputs include future population and employment estimates spatially allocated by traffic serial zone. Model inputs also include a roadway network of all regionally significant roads expected to be open and operational in the timeframe modeled. The spatial allocation of the population and employment estimates takes into account all new roads that will be open and operational in the timeframe modeled. This addresses development and induced demand created by new roads. The travel model estimates VMT associated with the transportation system as a whole. Because a change in one part of the transportation system often affects another part of the system (e.g., adding a new road may reduce VMT on another road), a system-wide analysis produces the best estimate of emissions associated with vehicles using existing and new roadways.

2.5 Non-Road Mobile Sources

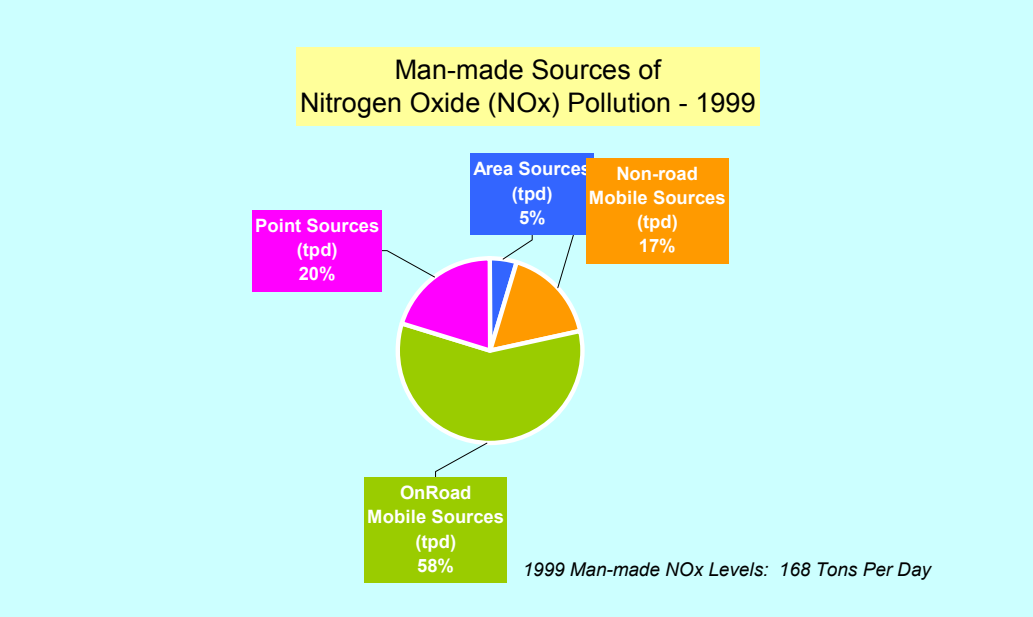
Non-road mobile sources are mobile sources that typically do not operate on roads. Examples include lawn and garden equipment, aircraft, recreational boats, commercial marine equipment and railroad locomotives. The category also covers a broad range of off-road equipment, typically for construction, landscaping or farm use. Calculations of emissions from non-road engine sources use estimates from EPA's NONROAD and EDMS emissions models, along with additional procedures specified by EPA's Office of Transportation and Air Quality. They consider equipment population, engine horsepower, load factor, emission factors, and annual usage. Calculations for aircraft emissions use an EPA-developed multiplier and airport landing/takeoff data.

2.6 Biogenic Sources

Biogenic sources include hydrocarbon emissions from vegetation and small amounts of NOx emissions from soils. Plants are sources of the VOCs isoprene, monoterpene, and alpha-pinene. Biogenic emissions are important in determining the overall emissions profile and are required for regional air quality photochemical modeling. Emissions calculations normally use the density or number of species, land use data, species specific emissions factor, light intensity and temperature. Field surveys determine the species population and land use data for a large area of Texas. The MSA EI used the biogenic model GLOBEIS to estimate emissions. Because emissions from biogenic sources are largely beyond the scope of reasonable emission reduction measures, the CAAP does not include biogenic emission reduction measures.

2.7 Emissions Summary

Figure 2.7-1

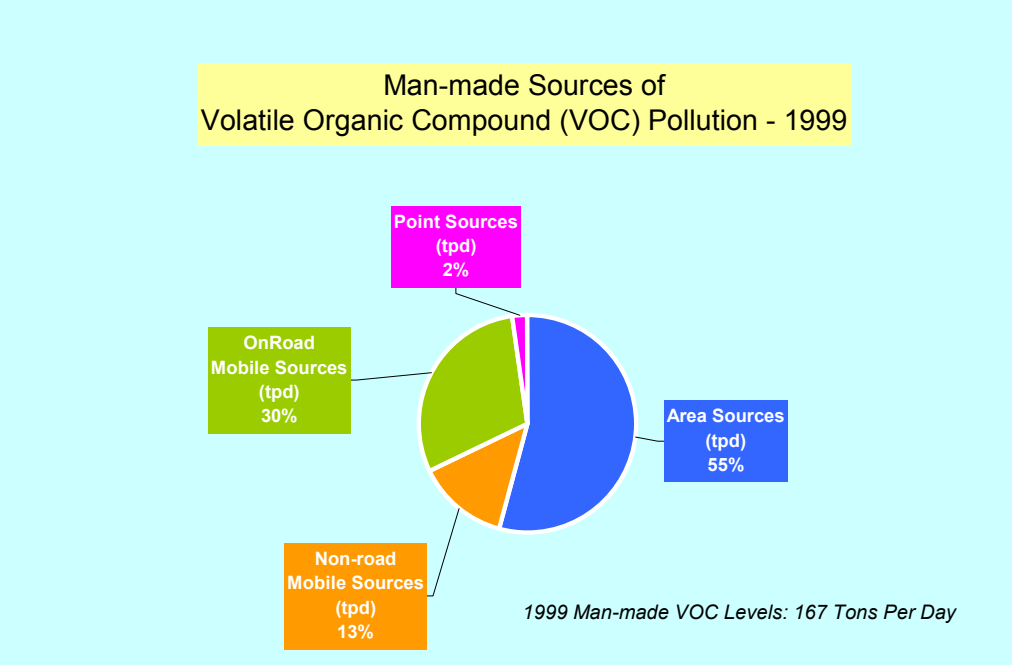


Sources of man-made NOx for the 1999 base case EI comprise 58% on-road, 20% point, 17% non-road and 5% area.

Table 2.7-1. Total daily (weekday) NOx emissions in 1999 from anthropogenic sources in the MSA

	Area Sources (tpd)	Non-road Mobile Sources (tpd)	OnRoad Mobile Sources (tpd)	Point Sources (tpd)	**TOTAL (tpd)**
Bastrop	0.60	1.72	3.95	7.25	**13.52**
Caldwell	0.54	1.42	2.32	3.55	**7.82**
Hays	0.54	1.88	11.44	7.28	**21.14**
Travis	3.17	16.69	63.06	15.34	**98.27**
Williamson	2.97	6.73	17.09	0.56	**27.35**
TOTAL (tpd)	**7.82**	**28.44**	**97.86**	**33.98**	**168.10**

Figure 2.7-2

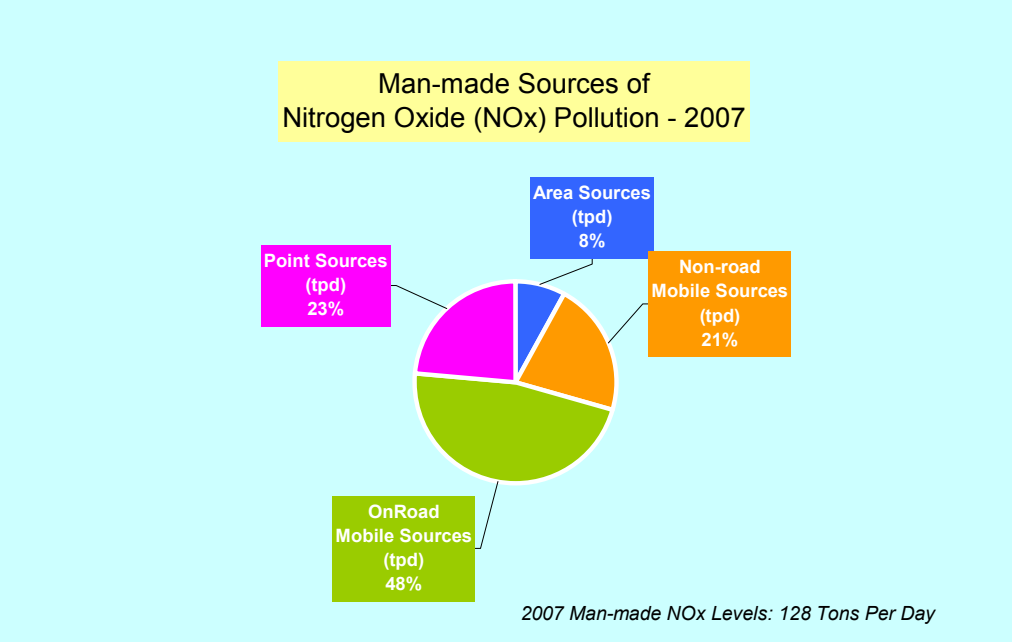


Sources of man-made VOC for the 1999 EI comprise 55% area, 30% on-road, 13% non-road and 2% point.

Table 2.7-2. Total daily (weekday) VOC emissions in 1999 from anthropogenic sources in the MSA

	Area Sources (tpd)	Non-road Mobile Sources (tpd)	OnRoad Mobile Sources (tpd)	Point Sources (tpd)	**TOTAL (tpd)**
Bastrop	4.52	0.92	2.54	0.42	**8.40**
Caldwell	15.29	0.61	1.30	0.47	**17.67**
Hays	5.47	1.53	4.85	0.34	**12.19**
Travis	50.60	15.59	32.61	2.13	**100.93**
Williamson	14.68	3.84	8.89	0.34	**27.75**
TOTAL (tpd)	**90.56**	**22.49**	**50.19**	**3.70**	**166.93**

Figure 2.7-3

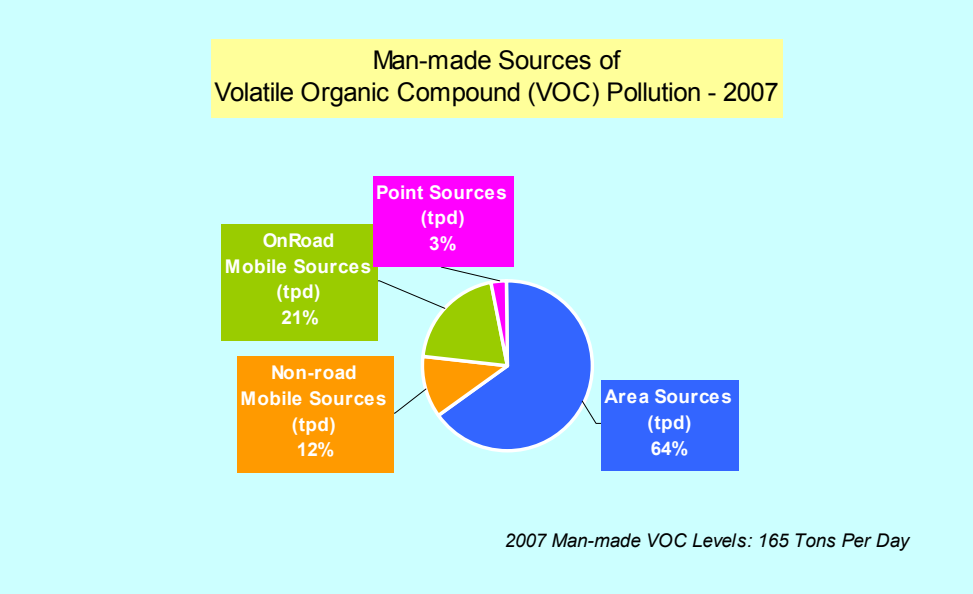


Sources of man-made NOx for the 2007 base case EI comprise 48% on-road, 21% non-road, 23% point and 8% area.

Table 2.7-3. Total daily (weekday) NOx emissions in 2007 from anthropogenic sources in MSA

	Area Sources (tpd)	Non-road Mobile Sources (tpd)	OnRoad Mobile Sources (tpd)	Point Sources (tpd)	**TOTAL (tpd)**
Bastrop	0.76	1.66	2.45	7.65	**12.52**
Caldwell	0.67	1.39	1.31	2.51	**5.88**
Hays	0.78	1.84	5.86	8.94	**17.42**
Travis	4.22	16.21	38.23	11.04	**69.70**
Williamson	3.81	6.36	12.68	0.00	**22.85**
TOTAL (tpd)	**10.24**	**27.46**	**60.53**	**30.15**	**128.38**

Figure 2.7-4



Sources of man-made VOC for the 2007 base case EI comprise 64% area, 21% on-road, 12% non-road and 3% point.

Table 2.7-4. Total daily (weekday) VOC emissions in 2007 from anthropogenic sources in the MSA

	Area Sources (tpd)	Non-road Mobile Sources (tpd)	OnRoad Mobile Sources (tpd)	Point Sources (tpd)	**TOTAL (tpd)**
Bastrop	5.53	0.99	1.50	0.56	**8.58**
Caldwell	15.75	0.68	0.73	0.07	**17.23**
Hays	7.67	1.77	2.78	1.65	**13.87**
Travis	57.04	12.70	21.95	2.18	**93.87**
Williamson	20.44	3.73	6.83	0.18	**31.17**
TOTAL (tpd)	**106.42**	**19.88**	**33.79**	**4.63**	**164.72**

CHAPTER 3: PHOTOCHEMICAL MODELING

3.1 Introduction

Photochemical grid models take data on meteorology and emissions, couple the data with mathematical descriptions of atmospheric physical and chemical processes and process the information to yield predictions of air pollutant concentrations as a function of time and location. Model predictions are calculated over a three dimensional grid that is placed over the area being modeled. Typically large grid cells (12 km to 16 km) are used for regional scale modeling and smaller grid cells (4 km) are used for urban scale modeling. The MSA uses the Comprehensive Air Quality Model with Extensions (CAMx) for its CAAP work.

With near-nonattainment area funding from the Texas legislature, the Capital Area Planning Council (CAPCO) coordinated development of three photochemical model base cases, including a 1999 South and Central Texas high ozone episode. These provide a means of projecting air quality conditions to the year 2007 and test emission reduction measure efficacy in the anticipated attainment year. The year 2007 coincides with the expected attainment dates for Dallas-Fort Worth and Houston. Because ambient ozone levels in the MSA are affected by transport, selecting a date in which emission reduction strategies are in place for other large urban areas is an important modeling consideration.

The meteorological model processes meteorological data for each day in the episode. The episode being modeled uses its own, day-specific, EI. The base case comprises the set of meteorological data and the episode's EI. The photochemical model is run and evaluated. If model performance, as evaluated by comparing model prediction to observed air pollution concentrations, is not acceptable, the meteorological modeling results and the EI are evaluated to determine if these data can be refined. Once the model performance is acceptable, precursor sensitivity modeling can be performed. For future years, the base case emissions are replaced with emissions projections for the future year. The model is rerun with the future emissions to establish the future ozone patterns and to determine adequate emission reduction strategies.

3.2 Episode Selection

The first step in episode selection is the development of a conceptual model. It describes local meteorological conditions and associated large-scale weather patterns experienced during periods of high ozone. The MSA's conceptual model is based on 1993-2002 ozone and meteorological data.

The conceptual model allowed staff to identify candidate episodes for modeling. The MSA has identified and modeled two episodes, July 7-12, 1995 and September 13-20, 1999. In response to TCEQ and EPA guidance, the CAAP is based on the September 1999 episode.

The September 13-20, 1999 modeling episode fulfills the requirements of both EPA draft guidance and the EAC Protocol. The episode is a good example of the predominant type of high ozone episode described in the conceptual model for the Austin area. The episode covers, for both Austin and San Antonio, one cycle for ozone with two initialization days and six high ozone days. The episode includes two weekend days

(September 18th and 19th) so emission reduction strategies can be evaluated with different emission characteristics.

An important consideration in selecting this episode was the high ozone concentrations observed throughout South and Central Texas. Thus, Austin, San Antonio, Corpus Christi, and Victoria, along with TCEQ, could combine resources to develop a new episode focusing specifically on conditions associated with high ozone in South and Central Texas.

3.3 1999 Meteorological Model

Meteorological models use a set of measurements taken at limited times and at a limited number of sites, along with models of physical processes, to predict the physical behavior of the atmosphere. The model develops a three dimensional simulation of wind speed, wind direction and other parameters for every hour being modeled.

Meteorological inputs to the September 1999 episode used the Fifth Generation Pennsylvania State University/National Center for Atmospheric Research Mesoscale Model (MM5). The final MM5 application for the September 13-20,1999, modeling episode, known as Run5g, was the culmination of individual simulations and sensitivity studies performed during 2001-2003. Both Austin and San Antonio use this model for their EAC work. Details may be found in Appendix 3-1.

3.4 1999 Modeling Emissions Inventory

The Base Case modeling EI must be day-specific for each hour, of each day, being modeled. A daily profile for on-road mobile emissions estimates hourly variation, accounting for weekend/weekday differences. Specific point source emissions may vary during the day, or from day to day. The ozone season EI is a starting point for developing an episode-specific EI. Details are found in Appendix 2-1.

3.5 1999 Base Case Development

The base case model used meteorological inputs developed from the MM5 meteorological modeling and the 1999 modeling EI. Extensive sensitivity analyses established the initial and boundary conditions for the model. The base case initial and boundary conditions are consistent with those used by TCEQ for modeling in 1-hour nonattainment areas. Details on the development of the base case may be found in Appendix 3-1.

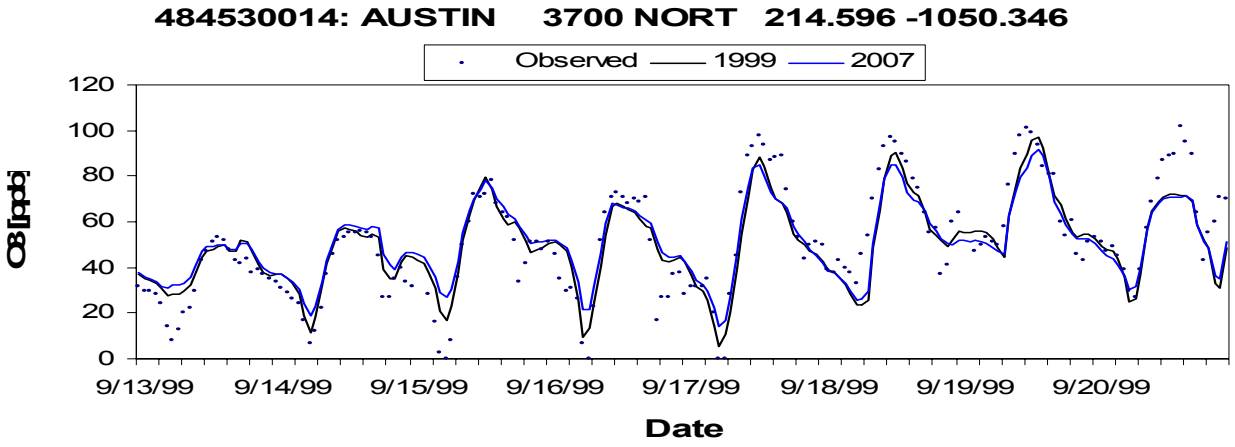
3.6 1999 Photochemical Model Base Case and Performance Evaluation

Model performance evaluation used statistical and graphical metrics in accordance with EPA guidance for both 1-hour and 8-hour attainment demonstrations. This evaluation measures the differences between model predictions and their paired observations. Details are found in Appendix 3-1.

Performance for both 1-hour and 8-hour predicted ozone concentrations used the seven monitors in the San Antonio, Austin, San Marcos, and Fayette County networks. Because the monitoring network in Central Texas is not dense, analysts evaluated performance based on data from all stations rather than on monitors grouped by cities.

Statistical evaluation of the 1-hour model performance uses the following metrics: unpaired peak accuracy, average paired peak accuracy, bias in peak timing, normalized bias and normalized error. EPA has performance criteria for the unpaired peak accuracy, normalized bias and normalized error statistics. The 1-hour modeling for the seven Central Texas monitors meets all of these criteria. Figure 3.6.1 illustrates the comparison between observed and modeled concentrations at the Audubon monitor.

Figure 3.6.1 Time series of observed concentrations compared to modeled concentrations for 1999.



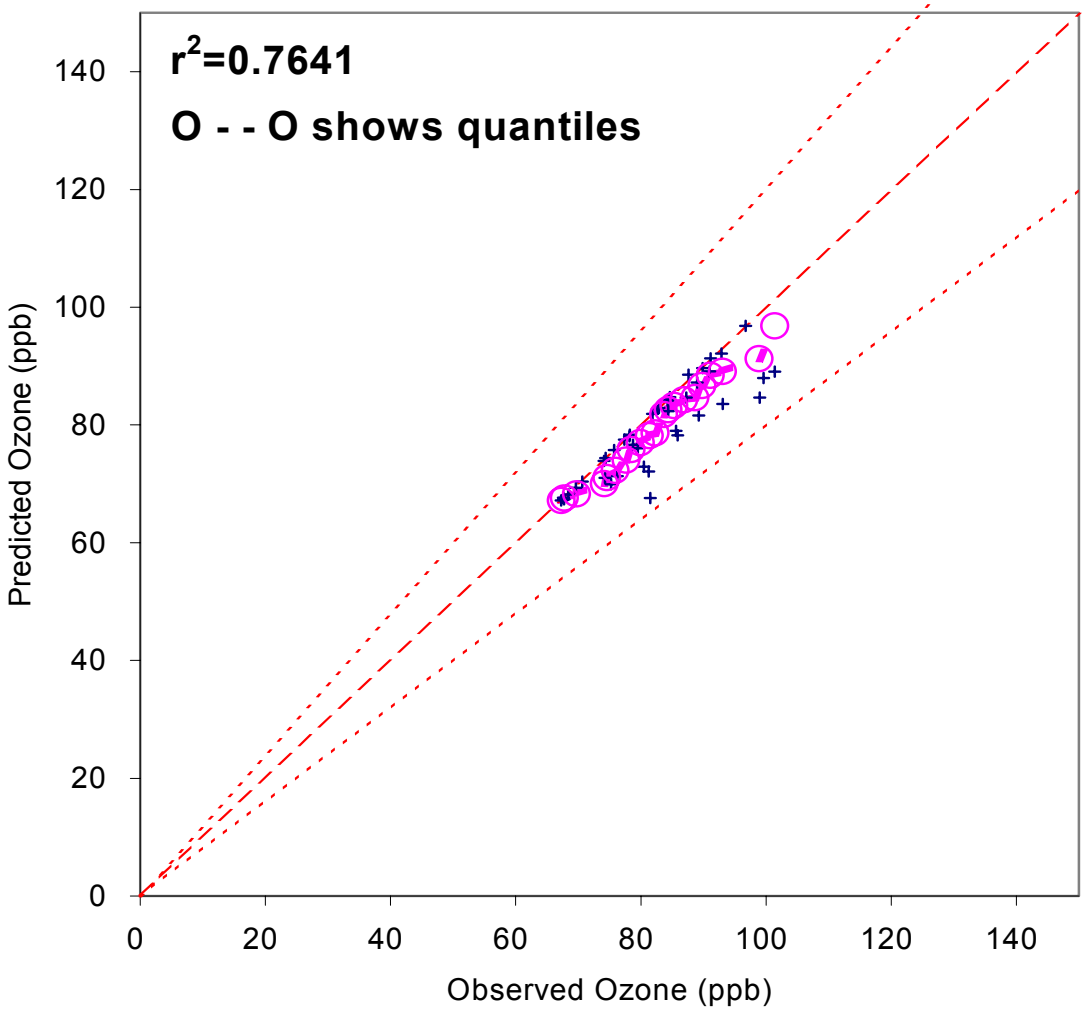
The evaluation of model performance for 8-hour averaged ozone attainment demonstrations is being applied for the first time in many areas and could be subject to future modifications. In recognition of this, analysts used the following three different methodologies in selecting predicted ozone concentrations to compare to observed value:

1. The predicted daily maximum ozone concentration within grid cells 'near' a monitor, as defined by U.S. EPA guidance (1999);
2. The predicted daily maximum ozone concentration within grid cells 'near' a monitor that is closest in magnitude to the observed daily maximum at the monitor; and
3. A bilinear interpolation of predicted daily maximum ozone concentration around the monitor location.

EPA recommends that the normalized bias and fractional bias be less than 20% of mean observed 8-hour daily maximum concentrations. Regardless of the approach used to

select the predicted maximum concentration, both metrics for the Austin September 13-20 CAMx model fall well within these criteria. Figure 3.6.2 illustrates these results.

Figure 3.6.2 Statistical Model Performance Metrics for Central Texas, 8-hour



3.7 Future Case Modeling

Future Case modeling used projected 2007 emission inventories with the meteorological data and CAMx configuration developed for the successful Base Case. Inputs followed EPA's *Draft Guidance on the Use of Models and Other Analyses in Attainment Demonstrations for the 8-Hour Ozone NAAQS* (1999) and their *Protocol for Early Action Compacts* (2003). Photochemical modeling is an iterative process. The emissions inventories used in the model are often refined to better predict emissions. The

modeling for the future case has been performed with seven versions of the 2007 emissions inventory, each with minor modifications or improvements. This modeling provides results that are close to the standard of 85 ppb, but in five cases the design value has been slightly below the standard (84.37 ppb, 84.5 ppb, 84.55, 84.8 ppb and 84.91) and in two cases the design value has been slightly above the standard (85.6 ppb and 85.08 ppb). This indicates that in 2007 the area will be on the cusp of attainment or nonattainment of the 8-hour ozone standard. It is likely that the 2007 emissions inventory for the Houston/Galveston area will be modified by TCEQ in the near future, which may affect future case model values. Results of future case modeling are too close to the standard to provide meaningful conclusions about the area's likelihood of demonstrating attainment by 2007 without local emission reduction measures.

3.8 Calculation Methodology for Relative Reduction Factors and Future Design Values

The EPA methodology calls for multiplying "current" year design values by relative reduction factors (RRF) from a photochemical model in order to estimate future design values. The calculation is carried out for each monitor site that measured ozone during the current year. In addition, a screening calculation identifies grid cells with consistently high ozone and estimates scaled design values for these screening cells. The screening cells account for any areas where modeled ozone is consistently high, but not captured by the monitoring network. The attainment test passes if all the future year scaled design values are less than 85 ppb (the results are truncated to the nearest integer). Additional information on the RRF is included in Appendix 3-2.
Various sensitivity model runs were made using the 1999 base case. Sensitivity runs for the 2007 future case will be completed in February 2004. These include across-the-board precursor reductions to indicate the sensitivity to reductions of VOC, NOx and combinations of both. Also, zero-out modeling was performed using the 1999 base case. Zero-out runs using the 2007 future case will be completed in February 2004. Zero-out runs remove the anthropogenic emissions from certain source areas to evaluate transport from other areas and to establish the impact of local emissions.

The "current" year is determined by comparing two design values; one for the years that straddle the year for which the latest emission inventory was developed (1999) and the other for the year for which attainment of the standard was determined (2002). The current year is the year that has the higher design value. A current year is determined for each monitor site. The current year for the EAC CAAP is 1999 as shown in Table 3.1

Table 3.1 Current Year for Austin EAC

Monitor Site	Design Value for 1999 (a)	Design Value for 2002 (b)	Current year	Design value for current year
Audubon	89 ppb	80 ppb	1999	89 ppb
Murchison	87 ppb	84 ppb	1999	87 ppb

a. Design value for 1998, 1999 and 2000
b. Design value for 2001,2002 and 2003

3.9 Base 2007 Model Results

The final results for the base 2007 EI for Austin are shown in Table 3.2. For the EAC CAAP the current year was 1999.

Table 3.2 Model results for base 2007 modeling with the September 1999 Episode

Monitor site	1999 design value	Relative reduction factor	Estimated design value for 2007 *	Attainment of the 8-hour standard?
Audubon	89 ppb	0.948	84.37	Yes
Murchison	87 ppb	0.948	82.48	Yes

* Truncate this number to the nearest integer to compare to the standard of 85 ppb. Any design value less than 85 ppb indicates attainment of the 8-hour ozone standard.

3.10 Emission Reduction Measure Modeling Results

The modeling used various combinations of emission reduction measures or strategies. Each strategy was applied to the base 2007 EI; the resulting EI was modeled. Then the RRF for each control strategy at each monitor site was determined. It was multiplied by the appropriate current year design value to estimate the corresponding design value for 2007. The list of modeled emission reduction measures is in Table 3.3 (see Chapter 5 for a discussion of each measure), the summary of the measures is in Table 3.4 and the modeling results for each measure are shown in Table 3.5.

Table 3.3 List of Modeled Emission Reduction Measures in MSA

Emission Reduction Measure	NOx Reductions tpd	VOC Reductions tpd
I/M	2.89	3.84
Heavy Duty Vehicle Idling Restrictions	0.19	0
Commute Emission Reduction Program	0.27	0.30
Low Emission Gas Cans	0	2.60
Stage I Vapor Recovery	0	4.88
Degreasing Controls	0	6.39
Autobody Refinishing	0	0.05
Cut Back Asphalt	0	1.03
Low Reid Vapor Pressure Gas	0	2.87
TERP	2.0	0
Power Plant Reductions	7.08	0
TERMs	0.72	0.83

Table 3.4 List of Emission Reduction Measures Modeled for Each Strategy

Strategy Model Run	Emission Reduction Measure
1	I/M (three counties) only
2 **Final**	All State Assisted Measures (with TERMs) but without I/M in Hays County, without low Reid Vapor Pressure gasoline and without commute reductions.
3	TERP only (modeled at 2 tpd reduction)
4	All measures with VOC reductions and no NOx reductions
	Low Emission Gas Cans
	Stage I Vapor Recovery
	Degreasing Controls
	Autobody Refinishing
	Cut Back Asphalt
	Low Reid Vapor Pressure Gasoline
5	Point Sources Only

Table 3.5 Model Results for Emission Reduction Measures Applied to Base 2007 EI with the September 1999 Episode

Control Strategy Run	Monitor site	1999 design value	Relative reduction factor	Estimated design value for 2007 *	Attainment of the 8-hour standard?
1	Audubon	89 ppb	0.944	84.02	Yes
	Murchison	87 ppb	0.944	83.13	Yes
2 **Final**	Audubon	89 ppb	0.937	83.39	Yes
	Murchison	87 ppb	0.934	81.26	Yes
3	Audubon	89 ppb	0.946	84.19	Yes
	Murchison	87 ppb	0.947	82.39	Yes
4	Audubon	89 ppb	0.946	84.19	Yes
	Murchison	87 ppb	0.945	82.22	Yes
5	Audubon	89 ppb	0.944	84.02	Yes
	Murchison	87 ppb	0.943	82.04	Yes

* Truncate this number to the nearest integer to compare to the standard of 85 ppb. Any design value less than 85 ppb indicates attainment of the 8-hour ozone standard.

CHAPTER 4: DATA ANALYSIS

The design values for the years that straddle 1999 were used as the "current" year to estimate the design value for 2007. These design values were the highest measured in the Austin area at both monitors. More recent monitoring provides lower design values and the latest design values for the years straddling 2002 do not exceed the standard. Since the worst-case design values were used in this CAAP, it is important to put these values into perspective.

An analysis of historical trends of monitoring in the Austin area indicates that a design value of 89 ppb is the highest ever measured. Analysis of potential 8-hour ozone design values in Austin, based on historical monitoring data, indicated that the most likely 2003 design value (i.e., for the years 2002-2004) is 87 ppb. Analysis of the various metrics related to the meteorological conditions indicates that the conditions favorable to formation of high ozone occurred more often than normal during 1999 and less often than normal in 2001. The selection of the "current" year is based on the date of the most recent emissions inventory. If an emissions inventory were prepared for 2002, then the current year would be 2002, which has a maximum design value of 84 ppb.

4.1 Trends in Ozone Monitoring Data in Austin

TCEQ (previously the Texas Natural Resource Conservation Commission and prior to that the Texas Air Control Board) has monitored ozone concentrations at two sites in Austin since 1983. The site at Murchison has not moved, but the other site was moved in 1997 to the current site named Audubon. To be consistent, these analyses will be limited to the time period beginning in 1997 when ozone concentrations were measured at both the Murchison and Audubon sites.

Since the EAC addresses 8-hour ozone concentrations, these analyses will be performed for 8-hour time periods. A number of analysis metrics can be used to evaluate trends in ozone concentrations. Among these are the highest concentration, the second highest concentration, the third highest concentration and the fourth highest concentration. At each monitor the annual 8-hour ozone design value is calculated over three consecutive years. It is the average of the fourth highest daily 8-hour ozone concentration measured over each of the three consecutive years. The area-wide design value is the highest of the design values for all of the monitors in the area. The average for the design value is truncated and if that value is greater than or equal to 85 ppb, the standard is exceeded.

Figure 4.1 shows the four highest 8-hour ozone concentrations and the design values at the Audubon monitoring site from 1997 to 2003. Figure 4.2 shows those same values for the Murchison monitoring site. Figure 4.3 shows the design values for Audubon and Murchison and the area design values from 1997 to 2002.

Figure 4.1. Four Highest 8-hour Ozone Concentrations and Design Values (ppb) at the Audubon monitoring station for the 1997 through 2003 period.

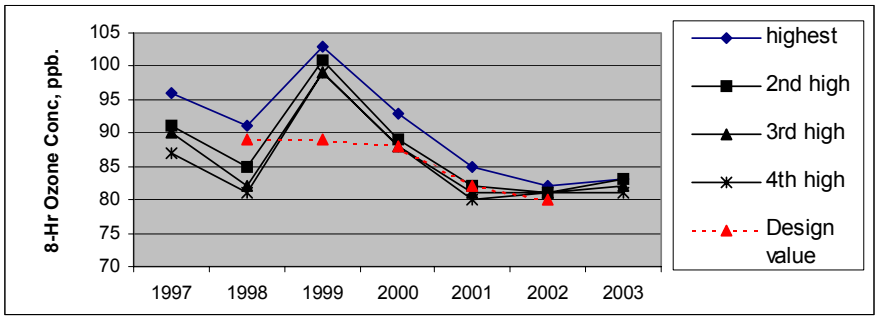


Figure 4.2. Four Highest 8-hour Ozone Concentrations and Design Values (ppb) at the Murchison monitoring station for the 1997 through 2003 period.

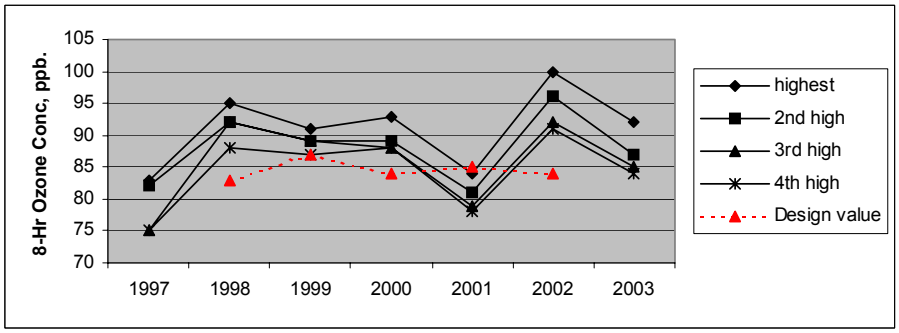
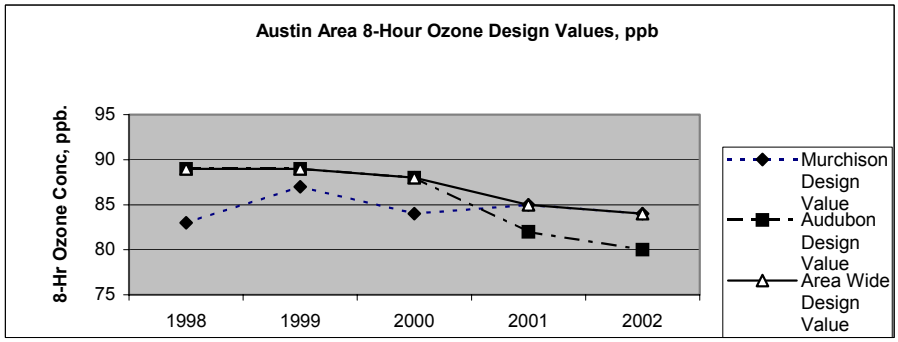


Figure 4.3. Design Values for Austin Area



4.2 Analysis of Potential 8-Hour Ozone Design Values for 2003 in Austin Based on Historical Monitoring Data

The ozone concentration measured at a monitoring site depends on a number of factors, including local emission of ozone precursors, regional transport of ozone and meteorological conditions. A conceptual model developed for the Austin area correlates periods of high ozone with the local meteorological conditions and associated large-scale weather patterns. But this conceptual model cannot be used to predict the meteorology that will be correlated with high ozone in future years, nor does it provide a forecast component to predict the frequency of meteorological conditions associated with high ozone in the past.

Ozone formation is also correlated with emissions of ozone precursors. It is sensitive to the daily temporal and spatial variation of these emissions. It is not possible to predict the future daily emissions that may cause high ozone. In general, it is appropriate to assume that the average daily emissions for the next year will be similar to those of the previous year, but it is not possible to predict future daily emissions with much precision.

Because it is difficult to predict ozone concentrations in future years based on monitored concentrations in past years, we cannot use trend analysis to predict the fourth highest concentration for 2004. However, we can assume that ozone concentrations for 2004 are likely to be similar to those measured in a previous year. In fact, we can ask the question, if 2004 were similar to each year during the 1997 through 2003 period, what would the 2003 design value be?

Historical data collected at the Audubon and Murchison monitoring stations during the 1997 through 2003 monitoring period have been used to estimate the 2003 8-hour design value for the Austin area. This analysis assumes that 2004 is equally likely to be similar to any year between the 1997 through 2003 period. At Audubon the 2003 design value is likely to be below the 85 ppb standard and between 80 ppb and 87 ppb. Using the average of the fourth highest values, the design value for 2003 would be 82 ppb. In only one case of the seven cases would the design value exceed 83 ppb. Similarly, at Murchison the 2003 design value is likely to be above the 85 ppb standard and between 83 ppb and 88 ppb. Using the average of the fourth highest values between 1997 and 2003 the design value for 2003 would be 87 ppb. Five of the seven cases would have a design value of 85 or higher. However, the reader is cautioned that this is a rather simplistic analysis guided by the available historical ozone monitoring data. In 2004, the emissions, and/or the large-scale weather patterns that determine the frequency of occurrence of daily local meteorological conditions that favor high ozone concentrations, could be quite different from any previous year.

4.3 Meteorological Conditions for the 1999 Episode

A conceptual model describes the local meteorological conditions and associated large-scale weather patterns that are associated with periods of high ozone. Once the meteorological conditions that are most frequently associated with high ozone days are identified, then representative periods can be selected and modeled with a photochemical model. A synoptic cycle is a period of a number of consecutive days for which the meteorological conditions fit into a pattern that is repeated. A set of days that

are typical of high ozone and that cover a synoptic cycle is called an episode. Typically an episode has two or more days when the measured ozone is high and close in magnitude to the design value for the area. In order to minimize the impacts of the initial conditions for the model, the episode will include two or three initialization days prior to the first day when high ozone was measured. A conceptual model for the Austin area has been prepared and it indicates that the period from September 13 to 20, 1999 is a representative episode to use for photochemical modeling and includes a complete synoptic ozone cycle. This episode is representative of approximately 80 % of the days when 8-hour ozone concentrations exceed the standard.

On page eight of EPAs "Frequently Asked Questions on Implementing the DRAFT 8-Hour Ozone Modeling Guidance to Support Attainment Demonstrations for Early Action Compact (EAC)" there is a reference to EPA's "Recommended Approach for Performing Mid-course Review of SIP's To Meet the 1-Hour NAAQS For Ozone." The referenced document provides guidance on approaches that can be used to evaluate the meteorological conditions that occurred in 2001, 2002 and 2003 compared to those that occurred in the past. The following metrics that relate to 8-hour ozone measurements were recommended:

- annual number of exceedances of the standard,
- highest daily concentration for each year,
- second highest daily concentration for each year,
- fourth highest daily concentration for each year and
- design value for each three year period.

The values for each of these metrics from 1997 to 2003 are shown in Table 4.1

Table 4.1. Values for Meteorological Monitoring Metrics in the Austin Area.

	1997	1998	1999	2000	2001	2002	2003	Average 2001,2002, 2003
Number of days ≥85 ppb*	6	6	19	11	1	5	6	4
High ozone, ppb*	96	95	103	93	85	100	92	92.3
2nd High ozone, ppb*	91	92	101	89	82	96	87	88.3
4th High ozone, ppb**	87	88	99	88	80	91	84	85.0
Design value, ppb**		89	89	88	85	84		

*All monitors
** Murchison and Audubon only

The seven-year average for the annual high, second high and fourth high is about 3 ppb higher than the corresponding averages for 2001, 2002 and 2003. The average design value is 87 ppb compared to the 2002 design value of 84 ppb. It is clear from these data that the values for the above metrics for 2001, 2002 and 2003 are lower than normally observed over the period from 1997 to 2003. In 2001 the values for each of these metrics was the lowest during the period from 1997 to 2003, indicating that the meteorology or other conditions this year were not as conducive for ozone formation as for other years during the analysis period. Using a design value including data from the year 2001 may yield an estimated design value for 2007 that would be lower than normally observed in the area. To compensate for this difference in meteorology for 2001, all of these metrics indicate that the 2002 design value of 84 ppb should be increased to 87 ppb for an appropriate design value for estimating the design value for 2007.

Furthermore, these data suggest that 1999 was a year when the meteorology was conducive to ozone formation more often than in any of the other years during the analysis period. Thus, it would follow that use of a design value using the data from 1999 would yield an estimated design value for 2007 that would be much higher than normally observed in the area.

4.4 Selection of Current Year for Estimating Future Year Design Values

The emissions from 2007 and from the "current year" are modeled to develop a relative reduction factor. The RRF is the relative response of the model to the changes in the emission inventory between the current year and 2007. To estimate the design value for 2007, the RRF is multiplied by the current year's design value.

Based upon the EPA guidance and the data shown in figure 4.3, the current year is 1999 with design values at Audubon of 89 ppb and at Murchison of 87 ppb. If Austin were to prepare an emissions inventory for 2002, then the current year would be 2002 with design values at Audubon of 80 ppb and at Murchison of 84 ppb.

4.5 Transport

A zero-out modeling simulation is one in which emissions from a region of interest are eliminated (or "zeroed-out") in order to evaluate the impact of regional transport from one urban area to another. A zero-out modeling run was performed for each of the eight ozone nonattainment and near-nonattainment areas in eastern Texas. The nonattainment areas include Houston/Galveston, Beaumont/Port Arthur, and Dallas/Fort Worth. The near-nonattainment areas include Austin, Victoria, San Antonio, Corpus Christi, and Tyler/Longview/Marshall. In each zero-out run, anthropogenic emissions of VOC, NO_x and CO were eliminated from one of the eight urban sub-regions, referred to as the source area, and then the impacts were evaluated within the sub-region itself, as well as within the remaining seven analysis areas. Two additional zero-out modeling runs were performed to evaluate the impact of transport from selected point sources within the state of Texas, as well as from all sources located outside of the state of Texas. In the first of these runs, all anthropogenic point source emissions occurring outside of the eight source areas, but within the state of Texas, were zeroed-out. In the second, all anthropogenic emissions within the state of Texas were eliminated.

Peak ozone concentrations for the Austin area from the Base Case with the interim 2007 projected emission inventory ranged from 88 ppb to 98 ppb for the 8-hour average. Peak zero-out concentrations ranged from 58 ppb to 72 ppb for the 8-hour average.

Similar zero out modeling was performed with the September 13-20, 1999 episode with the 2007 emissions inventory used for the EAC. The peak 8-hour ozone values ranged from 77 ppb to 92 ppb. Peak zero-out concentrations ranged from 70 ppb to 85 ppb for the 8-hour average. Additional similar zero out modeling was performed using a much older 2007 emissions inventory. The episodes modeled were September 5-11, 1993, June 18-22, 1995 and June 30-July 4, 1996.

Table 4.2 shows the number of days each area made a significant impact (difference of greater than or equal to 2 ppb) on the Austin area for each of these episodes. This indicates that there is a significant amount of transport from these areas into the Austin area.

Table 4.2 Summary of Number of Days that Emissions from Other Areas are Transported into the Austin Area

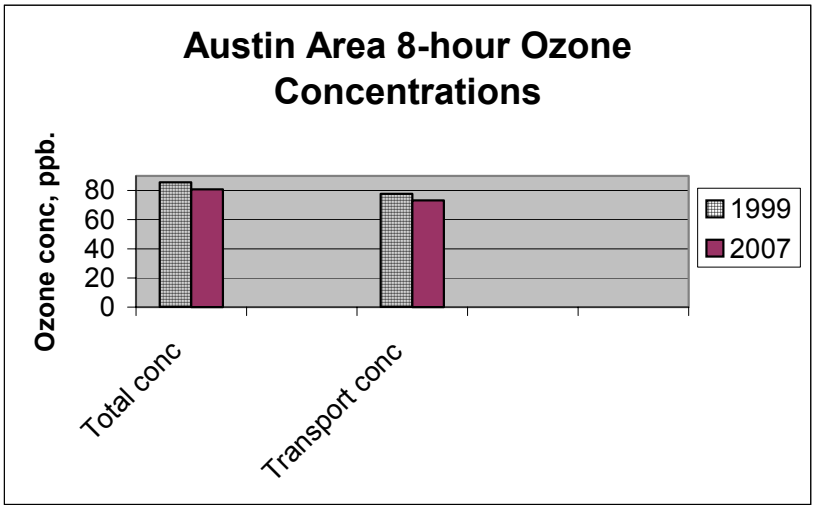
Source Area	Number of days significant impact on Austin		
	Sep 13-20, 1999	Jul 9-12, 1995	1993, 1995 and 1996
Number of days modeled	6	4	11
Houston/Galveston	5	3	10
Beaumont/Port Arthur	5	1	5
Dallas/Fort Worth	0	0	3
Tyler/Longview/Marshal	3	0	4
Victoria	2	4	5
San Antonio	3	4	6
Corpus Christi	2	2	0

Another analysis that can be performed with the zero-out modeling is to determine the maximum concentration before the zero-out, and the maximum concentration after the zero-out, of local emissions. This quantifies the difference in maximums that the local emissions make and also provides insight into the magnitude of the ozone in the area that is due to transport. A summary of these data for the September 13-20, 1999 episode is shown in Table 4.3

Table 4.3. Impact of zero-out of Austin anthropogenic emissions on the Austin Area.

Episode day	Maximum Concentration before zero of Austin Emissions, ppb	Maximum Concentration after zero of Austin Emissions, ppb
9/15/99	77	70
9/16/99	75	70
9/17/99	82	79
9/18/99	80	72
9/19/99	83	78
9/20/99	88	70

Figure 4.4 shows average result for the September 1999 episode.



CHAPTER 5: EMISSION REDUCTION STRATEGIES

5.1 Introduction

Various emission reduction techniques can effectively reduce ozone precursors. Emission reduction methods employed nationally (e.g., automotive emission reductions), statewide and regionally (emission reductions from EGUs) benefit the Austin area, but more reductions are needed to ensure clean air for the region. The EAC provides the mechanism for implementation of local emission reduction techniques.

5.2 Federal Reduction Strategies

The CAAP projects emission reductions from the following federal initiatives:

Federal Area Source Measures:

- Reformulated Architectural and Industrial Maintenance Coatings
  - 40 CFR Part 59 Subpart D *National Volatile Organic Compound Emission Standards for Architectural Coatings*
- Auto Body Refinishing
  - 40 CFR Part 59 Subpart B *National Volatile Organic Compound Emission Standards for Automobile Refinish Coatings*

Federal On-Road Measures:

- Tier 2 Vehicle Emission Standard
  - 40 CFR Parts 80, 85, and 86 *Air Pollution; Tier 2 Motor Vehicle Emission Standards and Gasoline Sulphur Control Requirements; Diesel Fuel Quality Controls*
- Heavy-duty Diesel Engine Rule
  - 40 CFR Parts 85 and 86 *Emissions Control, Air Pollution from 2004 and Later Model Year Heavy-Duty Highway Engines and Vehicles; Light-Duty On-Board Diagnostics Requirements*
- National Low Emission Vehicle Standards
  - 40 CFR Parts 9, 85, and 86 *Control of Air Pollution form New Motor Vehicles and New Motor Vehicle Engines: State Commitments to National Low Emission Vehicle Program*

Federal Non-Road Measures:

- Small Spark-Ignition Handheld Engines
  - 40 CFR Parts 90 and 91 *Phase 2 Emission Standards for New Nonroad Spark-Ignition Handheld Engines at or Below 19 Kilowatts and Minor Amendments to Emission Requirements Applicable to Small Spark-Ignition Engines and Marine Spark-Ignition Engines.* (FR 24268, Vol.65, No.80, April 25, 2000)
- Tier 3 heavy-duty diesel equipment
  - 40 CFR Part 89 *Control of Emissions from New and In-Use Non-Road Compression-Ignition Engines* (FR 56968, Vol.63, No.205, October 23, 1998)
- Locomotives
  - 40 CFR Parts 85, 89, and 92 *Emission Standards for Locomotives and Locomotive Engines* (FR 18978, Vol.63, No.73, April 16, 1998)
- Compression ignition standards
  - 40 CFR Part 89 *Control of Emissions from New and In-Use Non-Road Compression-Ignition Engines*
- Emissions from Non-Road Large Spark-Ignition Engines and Recreational Engines
  - CFR Part 89 *Control of Emissions from New and In-Use Non-Road Compression-Ignition Engines (Marine and Land-Based); Final Rule* (FR 68242, Vol.57, No.217, November 8, 2002)
- Recreational Marine standard
  - CFR Part 89 *Control of Emissions from New and In-Use Non-Road Compression-Ignition Engines*

Federal Point Source Measures:

- Alcoa Inc. Consent Decree

5.3 State and Regional Reduction Strategies

The CAAP projects emission reductions from the following statewide initiatives:

State Area Source Measures:

Non-Road Large Spark-Ignition Engines

- 30 TAC 114, Subchapter I, Division 3 *Non-Road Large Spark-Ignition Engines*

HB2914 - Grandfathered Pipeline Facilities

- 30 TAC 116, Chapter H, Division 2 *Small Business Stationary Source Permits, Pipeline Facilities Permits, And Existing Facility Permits*

Gas-fired Water Heaters, Small Boilers and Process Heaters

- 30 TAC 117, Chapter D, Division 1 *Water Heaters, Small Boilers, And Process Heaters*

State On-Road Source Measures:

Clean Gasoline

- 30 TAC 114, Subchapter H, Division 1 *Gasoline Volatility*

Stage 1 Vapor Recovery

- 30 TAC 115, Subchapter C, Division 2 *Filling Of Gasoline Storage Vessels (Stage I) For Motor Vehicle Fuel Dispensing Facilities*

State Non-Road Source Measures:

Texas Low Emission Diesel

- 30 TAC 114, Subchapter H, Division 2 *Low Emission Diesel*

State Point Source Measures:

Cement Kiln NOx limits

- 30 TAC 117, Subchapter B, Division 4 *Cement Kiln*

SB5 – TERP

- 30 TAC 114 Subchapter K, Division 3 *Diesel Emissions Reduction Incentive program for On-Road and Non-Road Vehicles*

SB7 - Electric Utility Deregulation

- 30 TAC 116 Subchapter I, Division *Electric Generating Facility Permits*

SB766 - VERP & MPP for Grand fathered Facilities

- 30 TAC 116 Subchapter H, Division 4 *Voluntary Emission Reduction Permits*

HB2912 - Grandfathered Permitting Requirements

- 30 TAC 116 *Control Of Air Pollution By Permits For New Construction Or Modification*

Electric Generating Facilities NOx Emission Rules for boilers & gas turbines (EASTNOx)

- 30 TAC 117, Subchapter B, Division 2 *Utility Electric Generation In East And Central Texas*

5.4 Local Strategies

5.4.1 Introduction

The June EAC milestone identified and described potential local emission reduction measures. The milestone report, and subsequent revisions, organizes the measure into two groups. The State Assisted Measures would apply to all or most jurisdictions in the A/RR MSA.[1] The Locally Implemented Measures were self-selected by the EAC signatories, with each encouraged to implement at least three in addition to continuing O_3 Flex commitments. Jurisdictions could choose to enhance an existing O_3 Flex measure.

[1] Per the Early Action Compact document, signed December 18, 2002, "All control measures will be incorporated by the state into the State Implementation Plan and submitted to the EPA for review and approval."

5.4.2 State Assisted Measures

State Assisted Measures require state regulations or actions for implementation and/or enforcement. A chart summarizing these measures appears below, with full descriptions following the chart. They will be implemented no later than December 31, 2005, unless otherwise indicated. The semi-annual review will track and document all State Assisted Measures. In accordance with the EAC agreement, these emission reduction measures are specific, quantified, permanent and enforceable. All emission reduction estimates provided below are specific to the 2007 evaluation year. The TCEQ rules listed in this section can be found at http://www.tnrcc.state.tx.us/oprd/rules/indxpdf2.html.

Chart 5.4.2 CAC Approved State Assisted Measures

Emission Reduction Measures		Comments
A1	Inspection and Maintenance (I&M)	Gets the biggest reductions in on-road emissions, our major emissions source. Reduces both NOx and VOC. Also reduces toxics, some of which are known carcinogens. Well -defined state program with a high degree of certainty regarding quantified reductions, implementation and enforcement. Spreads the cost of reductions to the entire vehicle owning public, which results in a reasonable per capita cost (expected additional $20 added to safety inspection). Counties may elect t o participate in the Low Income Repair Assistance Program (LIRAP). Specific purpose waivers are also available. Cost of inspection equipment reimbursed through fees.
A2	Idling Restrictions on Heavy-Duty Diesels (14,000 lbs or more)	Reduces on-road NOx emissions, as well as PM and toxic emissions, some of which are known carcinogens. Results in fuel savings. Addresses citizens concerns re extended idling in residential areas. Most preferred measure in CAF Public Opinion Survey. Would be enforced by local law enforcement, if TCEQ grants the authority to do so.
A3	Commute Emission Reduction Program	Reduces on-road NOx and VOC emissions. Designed to allow employers choice and flexibility in meeting requirements. May help reduce peak hour weekday congestion and encourage business practices that improve air quality.
A4	Low Emission Gas Cans	Reduces area source VOC emissions. TCEQ is working on a state rule that would require all gas cans sold or for sale, in all or part of the state, (including the MSA) to be low emission cans.
A5	Stage I Vapor Recovery Requirement Change	Reduces area source VOC emissions. Would lower the exemption in the current TCEQ rule from under 125,000 gallons a month to under 25,000 gallons a month. Local information indicates that many stations already have the equipment in place.
A6	Degreasing Controls	Reduces area source VOC emissions. Would revise TCEQ rule that applies to selected nonattainment and other counties to apply in the MSA.
A7	Autobody Refinishing Controls	Reduces area source VOC emissions. Would revise TCEQ rule that applies to selected nonattainment and other counties to apply in the MSA.
A8	Cut Back Asphalt	Reduces area source VOC emissions. Would revise TCEQ rule that applies to selected nonattainment and other counties to apply in the MSA. TCEQ rule includes an exemption for patching

A9	Low Reid Vapor Gas	Reduces on-road VOC emissions. Flint Hills, the region's primary fuel supplier has expressed concerns with this measure in light of recent fuel improvements that they have made. We continue to work with Flint Hills to define a mutually acceptable measure.
A10	BACT and Point Source Emissions Balancing	Will manage future point source growth. Maintains current BACT requirements and adds emissions balancing (offset) requirements. Modified defined as per TCEQ New Source Review (NSR) rules.
A11	Petroleum Dry Cleaning	Mitigates growth in petroleum dry cleaning emissions. Would revise TCEQ rule that applies to selected nonattainment and other counties to apply in the MSA.
A12	Texas Emission Reduction Program (TERP)	A state Emission Reduction Incentive Grants Program which reduces on and off road NOx. Requires local participation through grant applications and project implementation. TCEQ has suggested that a 2 ton per day NOx reduction would be a reasonable commitment for this measure.
A13	Power Plant Reductions	Reduces local power plant NOx emissions below state and federal mandated levels. Austin Energy, LCRA and UT have indicated a willingness to proceed with these reductions.

The CAC approved these recommendations by vote on January 14, 2004.

5.4.2.A1 Inspection and Maintenance (I/M) Program

Program Summary/Explanation

NOTE: [This I/M program was designed for use in the MSA's three urbanized counties (Hays, Travis and Williamson), with implementation contingent upon approval from the commissioners' court of each county and from the city council of the largest city in each county. The commissioners' courts in Hays, Travis and Williamson Countiesapproved; the city councils in Austin and Round Rock approved. The City of San Marcos voted (four to two, with one council member absent) to delete I/M from the draft list of recommended measures. The CAC requested that the City of San Marcos commit to alternative measures for on-road emissions reductions. In a letter dated March 9, 2004, Mayor Habingreither indicated San Marcos would implement an alternative plan involving propane fuel and propane-fueled vehicles. These measures would replace the reductions lost to Hays County because of the decision by the San Marcos City Council. The plan will be revised when the alternative measures are finalized. The following summary describes the amended, two-county program for Travis and Williamson Counties.

The I/M program requires all subject gasoline vehicles 2 to 24 years old registered and primarily operated in the I/M program counties (Travis and Williamson) to undergo an annual emissions inspection test in conjunction with the annual safety inspection. Emissions inspection tests are conducted at all safety inspection stations. The entire vehicle safety and emissions inspection should be completed in about 20 minutes from the time the vehicle is driven into the inspection bay. If a vehicle fails the emissions inspection test, the items of failure will be indicated on the *Vehicle Inspection Report*. The vehicle should be repaired and returned to the same inspection station with 15 days for a free re-test. A passing emission inspection test (or test waiver) is required in order to renew vehicle registration or to receive a safety inspection sticker.

The program does not apply to motorcycles or slow moving vehicles, as defined by Section 547.001, Transportation Code. Test on resale is required for all vehicles from

non-I/M program counties that are sold and registered in the I/M program counties. Per state statute, vehicles belonging to students at public universities, but registered in non-I/M program counties, must participate to receive campus parking privileges.

The emissions test fee (set by TCEQ) is expected to be no more than $20 in Hays, Travis and Williamson Counties. The safety inspection fee is $12.50, so the combined inspection cost is not expected to exceed $32.50. Testing equipment costs (estimated at $15,000 per station) are recouped through fee. The equipment includes the Two-Speed Idle (TSI), the On-Board Diagnostic (OBD) analyzer testing system, gas cap tester and 2-D Bar Code scanner.

The OBDII testing program will be used to test 1996 model year and newer vehicles. All 1996 and newer vehicles less than 14,000 pounds (passenger cars, pickup trucks, sport utility vehicles) are equipped with OBD systems. The OBD system monitors emission performance components to ensure that the vehicle runs as cleanly as possible. The system also assists repair technicians in diagnosing and fixing emission-related problems. If a problem is detected, the OBD system illuminates a “Check Engine” or “Service Engine Soon” warning lamp on the vehicle instrument panel to alert the driver. The system will store information about the detected malfunction so that a repair technician can accurately find and fix the problem

Model year 1996 and newer vehicles are required to meet EPA specifications for collection and transfer of emissions control data during each driving cycle. The Diagnostic Link Connector (DLC) cable on the emissions test analyzer is hooked up to the DLC located in the vehicle. When the vehicle’s OBD system has checked the emissions control systems and detected a problem with the vehicle, this information is stored in the vehicle’s on-board computer. The OBD test transmits this data to the analyzer and the vehicle will fail the inspection. The inspection report will indicate which emissions control systems were checked and display the description of the fault codes retrieved from the vehicle.

The Two-Speed Idle testing program will be used to test 1995 model year and older vehicles. The TSI test uses a tailpipe probe exhaust gas analyzer to measure VOC and CO while the vehicle is idling at a low and a high rate.

The I/M program includes a high emitter program to identify vehicles that are significantly exceeding federal vehicle emission standards. On-road remote sensing equipment will be used to identify high-emitting vehicles in the three I/M program counties or those commuting from contiguous counties. The van-installed on-road testing equipment is strategically placed to capture auto emissions from single-lane traffic in an acceleration mode. Vehicles identified as high emitters must be tested using the age-appropriate OBDII or TSI test within 30 days of notification and be repaired, if necessary. A passing test result (or test waiver) will be needed to renew vehicle registration.

The following waivers and extensions will be available to all qualifying vehicle owners through the Texas Department of Public Safety (DPS):

- Individual Vehicle Waiver– In order to address unusual cases where a vehicle cannot meet emissions standards, an *Individual Vehicle Waiver* may be issued to a vehicle owner whose vehicle has failed its initial emissions inspection and re-inspection, and in which at least $600 in emissions related repairs have been performed by a registered repair facility.

- Low Mileage Waiver – A *Low Mileage Waiver* may be issued to a vehicle owner whose vehicle has failed both its initial emissions inspection and the re-inspection, and in which at least $100 in emissions related repairs have been performed. The vehicle should have been driven less than 5,000 miles in the previous inspection cycle and anticipate being driven fewer than 5,000 miles before the next required safety inspection.

- Parts Availability Time Extension – A *Parts Availability Extension* may be issued for 30, 60 or 90 days to a vehicle owner whose vehicle fails the initial emission inspection and needs time to locate necessary vehicle emissions control parts.

  Low Income Time Extension- A *Low Income Time Extension* may be issued to a vehicle owner whose vehicle has failed its initial inspection and re-inspection, and the applicant's adjusted gross income is at or below the federal poverty level.

Counties that implement a vehicle emissions inspection program may elect to implement the Low Income Repair Assistance, Retrofit, and Accelerated Vehicle Retirement Program (LIRAP). Vehicle owners whose vehicles fail the emissions inspection and who meet eligibility requirements may receive assistance through this program. The assistance can pay for emissions related repairs or be used toward a replacement vehicle if they choose to retire the vehicle. The assistance program is funded through a portion of the emissions inspection fee. The program is administered through a grant contract between TCEQ and each participating county. Only 5% of the grant contract funds may be used for the administrative costs of the program. Assistance is limited to no more than $600 for repairs or $1,000 toward replacement of the vehicle.

In order to be eligible for LIRAP, the vehicle owner's total family income must be less than or equal to twice the amount of the Federal Poverty Guidelines for designated family units. (At this writing, $24,240 for a family of two and $36,800 for a family of four). A vehicle is eligible for repair assistance if it failed the emissions inspection within 30 days of application, is currently registered, and has been registered in the program area for the two years preceding application, and it passes the safety inspection portion of the test. Repairs must be performed at a DPS-recognized repair facility. Vehicle retirement eligibility requirements are the same as for vehicle repairs, except the vehicle must have passed a safety inspection within 15 months of the application.

The I/M program will be applied in Travis and Williamson Counties.
NOTE: Periodic program evaluations will determine if any revisions or modifications are needed. If the I/M Program, as implemented, does not achieve the desired effects or is determined to be unnecessary, any participating jurisdiction can petition TCEQ to terminate the program.

Implementation Considerations
To implement this measure, the I/M Program counties exercise the flexibility offered to EAC areas in Senate Bill 1159 and request that TCEQ adopt a rule including the MSA's I/M Program in the state program.

Program Participants
Program participants are owners of 2 to 24 year old gasoline vehicles <8,500 lbs. Gross vehicle weight, safety inspection station owners and operators, vehicle repair facilities,

TCEQ, DPS and counties that choose to administer (or contract with another entity to administer) a LIRAP program.

Expected Reductions
The I/M program is expected to reduce NOx emissions by 2.89 tons per day and VOC emissions by 3.84 tons per day.

Additional Benefits
The I/M program will also reduce toxic emissions, some of which are known carcinogens. It will encourage proper vehicle maintenance, which may result in fuel savings for some vehicle owners.

5.4.2.A2 Idling Restrictions on Heavy-Duty Diesel Engines

Program Summary/Explanation
This measure restricts engine idling of vehicles with a gross vehicle weight rating of more than 14,000 pounds to five consecutive minutes.

Exemptions are allowed for vehicles with a gross vehicle weight rating of 14,000 pounds or less; that are forced to remain motionless because of traffic conditions over which the operator has no control; are being used as an emergency or law enforcement vehicle; when the engine operation is providing power for a mechanical operation other than propulsion; when engine operation is providing power for multiple passenger heating or air conditioning; when the engine is being operated for maintenance or diagnostic purposes, or when the engine is being operated solely to defrost a windshield.

Alternative methods of providing power to the vehicle are currently available. Truck stop electrification allows the vehicle operator to access electricity as a power source. Small generators, which emit less and are commercially available, can be used as auxiliary power sources.

Area of Application
This measure will apply throughout the MSA.

Implementation Considerations
To implement this measure, the MSA requests TCEQ adopt the measure through rulemaking applicable in the MSA and authorize MSA county and municipality law enforcement agencies, or other county and municipality entities, to enforce the measure.

Program Participants
Owners and operators of heavy duty diesel vehicles, MSA county and municipality law enforcement agencies or designees

Expected Reductions
NOx reductions of 0.19 tpd

Additional Benefits

The measure will reduce both NOx and particulate matter (PM) emissions. It also reduces exposure to toxic compounds associated with diesel fuel use. In addition, the measure will result in fuel savings.

5.4.2.A3 Commute Emission Reduction Program

Program Summary/Explanation

The Commute Emission Reduction Program requires every existing or future employer, public or private sector, with 200 or more employees per location to submit a detailed plan to TCEQ or local designee that demonstrates how the employer will reduce the equivalent of their NOx and VOC commute related emissions by 10% within three years. Employers will set interim goals to ensure they reach the 10% goal within the time frame. Employers may choose to reduce commute or any other business related emissions that occur at the location with 200 or more employees as long as the aggregate emissions reductions are equivalent to 10% of their commute related emissions for both NOx and VOC.

The plan will include details on how the commute related emissions were calculated, how and when the 10% total emissions reductions (in any combination of VOC and/or NOx) will be achieved, as well as how the reductions will be maintained over time. Alternative plans that detail how the employer will achieve and maintain a verifiable employee commuter average vehicle occupancy (AVO) of 1.2 will be accepted. Verifiable participation in the CLEAN AIR Force's Clean Air Partners Program at a 10% reduction level will also be accepted.

Commute related emissions may be calculated for locations with 200 or more employees using a baseline of the annual average number of employees at that location in 2003, 2004 or the expected annual average number of employees for a new employer location and assuming all employees drove to work alone. For Clean Air Partners, the emissions baseline for new participants is either the year they joined or a baseline that is defined by the Partners program.

The annual average number of employees multiplied by the average round trip commute (22.6 miles) equals the number of employee miles traveled. Employee miles traveled multiplied by the MSA's commute MOBILE6 emission factors for VOC and NOx equals the VOC and NOx commute emissions. The MOBILE6 emission factors may be for the analysis year, 2007 or any other year deemed appropriate by the TCEQ. The MSA average round trip commute mileage may be used or an employer may choose to use employee specific round trip commute mileage. A calculation guidance packet, including emission factors will be developed and made available to employers.

All employers with 200 or more employees at a single location will register with TCEQ or local designee by December 31, 2004 or within 60 days of beginning operations for new locations. All plans must be submitted to TCEQ or local designee by March 31, 2005 or within 120 days of beginning operations for new locations. TCEQ or local designee will approve all plans, or inform the employer of any plan deficiencies by July 31, 2005 or within 4 months of plan submittal for new locations. In the event that plan deficiencies occur, employers will have 60 days from the date of notification of such deficiencies to

revise and resubmit their plans. TCEQ or local designee will approve or reject the revised plan within 30 days from the date of re-submittal. Plans must be implemented no later than December 31, 2005 or within 1 year from the date of registration for new locations.

Employers will report on the plan's implementation and results semi-annually in conjunction with the MSA's EAC semi-annual report. Reporting periods are May 1 through October 31 and November 1 through April 30. Copies of the Commute Emission Reduction Program report are due to TCEQ or local designee and CAPCO by November 30th and May 31st respectively. In the event that the semi-annual reports indicate that the planned emission reductions are not being achieved and maintained, TCEQ or local designee may request that the employer revise their plan accordingly.

In the event TCEQ designates program responsibility to a local entity, the TCEQ and EPA will make every reasonable effort to provide adequate funding for program administration. Both the Clean Air Partners Program and the CAMPO Commute Solutions Program provide free tools and information that may be useful in complying with this measure. The Commute Solutions Program provides employee transportation coordinator training and Commute Solutions Fairs for alternatives to drive-alone commutes, while Clean Air Partners provides tools, expertise and experiences of member employers. Information on the Commute Solutions and Clean Air Partners programs can be found at www.commutesolutions.com and www.cleanairpartnerstx.org .

Area of Application
This measure will apply throughout the MSA.

Implementation Considerations
To implement this measure the MSA requests that TCEQ adopt a rule applying this measure in the MSA. TCEQ or their local designee will be responsible for implementation and enforcement of the program.

Program Participants
All employers with 200 or more employees per location, TCEQ (or its designated local agent), Clean Air Partners Program, CAMPO Commute Solutions Program, CAPCO

Expected Reductions
Emission reductions from this measure will not be included in final modeling.

Additional Benefits
Some workday rush hour congestion may be reduced if employers select and implement commute emission reduction measures. The measure will also encourage business practices that improve air quality.

5.4.2.A4 Low Emission Gas Cans

Program Summary/Explanation
The TCEQ is drafting a statewide rule to lower the emission of VOCs from portable fuel containers that spill, leak, and/or allow permeation. A Portable Fuel Container Rule will reduce both the frequency and quantity of fuel that is spilled or that leaks from portable fuel containers. The rule mirrors California Air Resources Board regulations and will add

provisions to 30 TAC Chapter 115 (Control of Air Pollution from Volatile Organic Compounds), Subchapter G (Consumer-Related Sources). It will apply to all portable fuel containers and spouts manufactured for sale or sold in Texas. The rules will set standards for design requirements to prevent overfills of receiving tanks and spills during transit. The rules will prohibit separate vent holes.

Area of Application
This measure will apply statewide

Implementation Considerations
The MSA does not need to initiate action for implementation if the TCEQ proceeds with rulemaking.

Program Participants
Consumers and sellers of portable fuel containers in Texas

Implementation Date
No later than December 31, 2005

Expected Reductions
Implementation of these rules solely in the A/RR MSA reduces regional VOC emissions by 2.6 tpd. Given transport patterns, statewide implementation of the rule should bring additional reductions.

Additional Benefits
Because the improved gas cans decrease spills, they are safer for consumers and can reduce water pollution.

5.4.2.A5 Stage 1 Vapor Recovery Requirement Change

Program Summary/Explanation
This measure would require additional gas stations and fuel dispensing facilities in the MSA to comply with TCEQ Stage 1 Vapor Recovery rules (Chapter 115, Subchapter C, Division 2, §§115.221 - 115.227, 115.229**)** by lowering the exemption threshold defined in §115.227(3) from 125,000 gallons a month to 25,000 gallons a month in the MSA counties. According to the TCEQ Petroleum Storage Tank database, over 60% of existing tanks in the area are already Stage 1 equipped, so implementation costs should be reduced substantially.

Area of Application
This measure will apply throughout the MSA

Implementation Considerations
To implement this measure, the MSA requests that TCEQ revise the rule to include the above-mentioned change to the existing Stage 1 Vapor Recovery rule. The MSA encourages TCEQ to expand implementation of this measure to the eastern half of the state.

Program Participants
Program participants are gas stations and fuel dispensing facilities in the MSA.

Expected Reductions
Expected emission reductions in the MSA are 4.88 tons per day VOC.

Additional Benefits
Stage 1 Vapor Recovery reduces emissions of toxics, some known to be carcinogens.

5.4.2.A6 Degreasing Controls

Program Summary/Explanation
This measure regulates cold solvent degreasing operations by revising TCEQ rules (Chapter 115, Subchapter E, Division 1, §§115.412 (1), 115.413, 115.415 - 115.417, 115.419) to apply to the MSA counties. Degreasing uses a solvent to remove grease, oil, or dirt from the surface of a part prior to surface coating or welding.

Area of Application
This measure will apply throughout the MSA.

Implementation Considerations
To implement this measure, the MSA requests that TCEQ's existing rule be revised to apply in the MSA.

Program Participants
Program participants are facility owners and operators that conduct degreasing operations in the MSA.

Expected Reductions
The expected emission reductions from this measure are 6.38 tons per day VOC.

Additional Benefits
Cost saving due to less rapid evaporation of solvents.

5.4.2.A7 Autobody Refinishing Controls

Program Summary/Explanation
This measure regulates autobody refinishing by revising TCEQ rules (Chapter 115, Subchapter E, Division 2, §§115.420 - 115.427, 115.429) so that the requirements of §115.421(a)(8)(B) and §115.422(1) and (2) apply in the MSA counties. These requirements set limits on the VOC content in paint and address spray gun cleaner and transfer efficiency.

Area of Application
This measure will apply throughout the MSA.

Implementation Considerations
To implement this measure, the MSA requests that TCEQ's existing rule be revised to apply in the MSA.

Program Participants
The program participants are autobody refinishing facility owners and operators in the MSA.

Expected Reductions
The expected emission reductions from this measure are 0.05 tons per day VOC.

Additional Benefits
No additional benefits are noted at this time.

5.4.2.A8 Cut Back Asphalt

Program Summary/Explanation
This measure would restrict the use of cut-back asphalt in the MSA through a TCEQ rule revision (Chapter 115, Subchapter F, Division 1, §§115.510, 115.512, 115.513, 115.515 - 115.517, 115.519) to include the MSA counties in the requirements of these sections.

The use of conventional cutback asphalt containing VOC solvents for the paving of roadways, driveways, or parking lots is restricted to no more than 7.0% of the total annual volume averaged over a two-year period of asphalt used by or specified by any state, municipal, or county agency who uses or specifies the type of asphalt application.

When asphalt emulsion is used or produced, the maximum VOC content shall not exceed 12% by weight or the following limitations, whichever is more stringent:

A. 0.5% by weight for seal coats;
B. 3.0% by weight for chip seals when dusty or dirty aggregate is used;
C. 8.0% by weight for mixing with open graded aggregate with less than 1.0% by weight of dust or clay-like materials adhering to the coarse aggregate fraction (1/4 inch in diameter or greater); and
D. 12% by weight for mixing with dense graded aggregate when used to produce a mix designed to have 10% or less voids when fully compacted.

Exemptions:

1. asphalt concrete made with cutback asphalt, used for patching, which is stored in a long-life stockpile (longer than one-month storage); and
2. cutback asphalt used solely as a penetrating prime coat.

Area of Application
This measure will apply throughout the MSA.

Implementation Considerations
To implement this measure, the MSA requests that TCEQ's existing rule be revised to apply in the MSA.

Program Participants
Users and suppliers of cut-back asphalt in the MSA are program participants.

Expected reductions
The expected emission reductions from this measure are 1.03 tons per day VOC.

Additional Benefits
This measure results in water quality benefits.

5.4.2.A9 Low Reid Vapor Gas

(Note: This measure will not be included in the final modeling.)
Program Summary/Explanation
This measure lowers the gasoline Reid vapor pressure requirement in TCEQ rules (Chapter 114 Subchapter H, Division 1, §§114.301, 114.304 - 114.307, 114.309) from 7.8 to 7.0 in all counties in the MSA from May 1 to October 31 and retains all other requirements of these sections, unless they are contradictory to the 7.0 Reid vapor requirement.

Area of Application
This measure will apply throughout the MSA.

Implementation Considerations
To implement this measure, the MSA requests that TCEQ's existing rule be revised as stated in the program summary/explanation. The MSA encourages TCEQ to expand implementation of this measure to the eastern half of the state.

Program Participants
Gasoline producers, importers, suppliers, dispensers and users within the MSA

Expected Reductions
The expected emission reductions are 2.87 tons per day VOC.

Additional Benefits
No additional benefits noted at this time.

5.4.2.A10 BACT and Point Source Emissions Balancing

Program Summary/Explanation
Maintain Best Available Control Technology (BACT) and add emissions balancing 1:1 offsets for all new or modified point sources that will emit 100 tons per year or more of NOx. Emissions balancing offsets for VOC will be considered when, during the course of the continuing planning process, a review of the emissions inventory indicates a doubling of actual VOC emissions from the base year of 1999 (as indicated by TCEQ annual point source emissions inventory program).

Area of Application
This measure will apply throughout the MSA.

Implementation Considerations
To implement this measure, the MSA requests TCEQ adopt the measure through rulemaking applicable in the MSA.

Program Participants
Owners or operators of any new or modified (as defined by TCEQ rule) point sources in the MSA

Implementation Date
Spring 2005

Expected Reductions
N/A (see additional benefits)

Additional Benefits
Measure would be a core piece of the region's plan to manage to emissions growth.

5.4.2.A11 Petroleum Dry Cleaning

Program Summary/Explanation
This measure extends the TCEQ rules regulating petroleum dry cleaning (Chapter 115, Subchapter F, Division 4, §§115.552, 115.553, 115.555 - 115.557, 115.559) to include the MSA counties.

Area of Application
This measure will apply throughout the MSA.

Implementation Considerations
To implement this measure, the MSA requests that TCEQ's existing rule be revised to apply in the MSA.

Program Participants
Program participants are owners and operators of petroleum dry cleaning facilities in the MSA.

Expected Reductions
The expected emission reductions from this measure range from 0 to 1.0 tons per day VOC, depending on the amount of actual and expected petroleum dry cleaning occurring in the MSA. Emission reductions from this measure are not currently included in the CAAP. The measure is included to mitigate possible future growth in dry cleaning emissions.

Additional Benefits
No additional benefits noted at this time.

5.4.2.A12 Texas Emission Reduction Program (TERP)

Program Summary/Explanation
The 77th Texas Legislature established the Texas Emissions Reduction Plan (TERP) in 2001, through enactment of Senate Bill 5. The program was not fully funded, however, until the 78th Legislature enacted HB 1365 in 2003. TCEQ expects to have about $115-120 million in revenue in FY 2004, of which approximately $104 million will be available for the Emissions Reduction Incentive Grants Program (see below). Those figures are

expected to increase in each of the subsequent fiscal years through FY2008, averaging a total of $150 million each year.

The primary purpose of the TERP is to replace, through voluntary incentive programs, the reductions in emissions of NOx that would have been achieved through mandatory measures that the Legislature directed the TCEQ to remove from the SIP for the Dallas/Fort Worth (DFW) and Houston/Galveston (HGA) ozone nonattainment areas. TERP funding is also expected to be available to help achieve reductions in counties located in the state's other two nonattainment areas and in designated near-nonattainment areas, where air quality is approaching nonattainment levels.

The TERP includes the following financial incentive and assistance programs intended to address the goals of the plan:

The Emissions Reduction Incentive Grants Program is administered by the TCEQ. The program provides grants to eligible projects in "affected counties," as delineated in HB 1365, to offset the incremental cost associated with activities to reduce emissions of NOx from high-emitting mobile diesel sources.

The types of projects that may be eligible for these grants include:

- ✓ On-Road Heavy-Duty Vehicles (8,500 lb or more)
  - Purchase or lease
  - Replacement
  - Re-power
  - Retrofit or add-on of emission-reduction technology
- ✓ Non-Road Equipment
  - Purchase or lease
  - Replacement
  - Re-power
  - Retrofit or add-on of emission-reduction technology
- ✓ Marine Vessels
  - Purchase or lease
  - Replacement
  - Re-power
  - Retrofit or add-on of emission-reduction technology
- ✓ Locomotives
  - Purchase or lease
  - Replacement
  - Re-power
  - Retrofit or add-on of emission-reduction technology
- ✓ Stationary Equipment
  - Purchase or lease
  - Replacement
  - Re-power
  - Retrofit or add-on of emission-reduction technology infrastructure
  - Oil and Gas Compressors
- ✓ On-Site Electrification and Idle Reduction Infrastructure
- ✓ Refueling Infrastructure (for qualifying fuel)
- ✓ On-Vehicle Electrification and Idle Reduction Infrastructure
- ✓ Use of Qualifying Fuel
- ✓ Demonstration of New Technology

The Heavy-Duty Motor Vehicle Purchase or Lease Incentive Program is a statewide program also administered by the TCEQ. Under this program, the TCEQ may reimburse a purchaser or lessee of a new on-road heavy-duty (over 10,000 lb) vehicle for incremental costs of purchasing or leasing the vehicle in lieu of a higher-emitting diesel-powered vehicle. The vehicle being purchased or leased must be EPA-certified to meet certain designated lower emissions standards for NOx. This program has yet to be implemented and available funds have been allocated to the Emissions Reduction Incentive Grants Program.

The Light-Duty Motor Vehicle Purchase or Lease Incentive Program is similar to the Heavy-Duty Program, and provides incentives statewide for the purchase or lease of light-duty (less than 10,000 lb) motor vehicles that are certified by the EPA to meet a lower emissions standard for NOx. The incentive program will be administered by the Texas Comptroller of Public Accounts but is currently unfunded.

Area of Application
HB 1365 designated all five counties in the A/RR MSA as “affected counties” and therefore eligible for participation.

Implementation Considerations
N/a

Program Participants
This voluntary program is available to all public and private fleet operators that operate qualifying equipment in any of the five counties. For new purchases, not less than 75 percent of the annual usage of the vehicle projected for the 5 years following the purchase must be projected to take place in one or more of the eligible counties. Leases must be for at least one year, and 75 percent of the annual usage over the lease period must be projected to take place in one or more of the eligible counties. Annual usage will be measured by either miles of operation or by fuel consumption.

Implementation Date
Immediately. Subsequent to the passage of HB 1365 in June 2003, TCEQ issued an initial Request for Applications under the original SB 5 rules in August 2003, and a second RFA under the new HB 1365 rules on December 31, 2003.

Expected Reductions
Because TERP was initially designed to address deficiencies in the HGA and DFW ozone nonattainment areas, our region assumes a majority of TERP funding will be necessary to address those continuing concerns. Nevertheless, the signatories to the A/RR MSA EAC intend to pursue TERP grants and to work with other public and private sector entities operating in the region to pursue grants that will result in total NOx reductions of at least 2 tons per day.

Additional Benefits
Changes in fleet operations required by TERP retrofits, re-powers, replacements, etc. usually contribute to a reduction in other harmful toxics. They typically increase fuel efficiencies and lower fuel costs.

5.4.2.A13 Power Plant Reductions

Program Summary

Reduce NOx emissions from local power plants below state and federal mandates as follows:

Austin Energy –AE has committed to:

- Lower the cap on the total SB-7 NOx emissions from the original 1750 tons to 1500 tons per year. This will be accomplished by AE permanently retiring 241 SB-7 allowances per year.
- Voluntarily offset the emissions from all other AE-owned non-SB-7 units by reducing emissions from the Holly and Decker units. This effectively includes these units into the 1500-ton emission cap. This cap would be in effect at least through the year 2012.
- As new units are brought online, they will be included in this effective cap and their emissions will be offset by additional emission reductions from the Holly and Decker facilities.
- AE will achieve this cap through a combination of installing NOx reduction technologies at the Holly and Decker facilities as well as the retirement of their older generating units. AE has committed to permanently shut down Holly Units 1 and 2 by 31 December 2004 and Holly Units 3 and 4 by 31 December 2007.
- In order to comply with this effective cap, in addition to the emission rate reductions produced at the Holly and Decker facilities, additional emission reductions will be produced by the increased utilization of renewable energy resources as well as increased use of energy efficiency measures.

Lower Colorado River Authority

LCRA plans to contribute to the A/RR MSA Early Action Compact by taking the following voluntary actions:

- Reduce the NOx allowance allocation (as provided under SB7) to the Sim Gideon Power Plant, located in Bastrop County, by 300 tons. By reducing the Sim Gideon NOx allowance allocation from 1,344 tons per year to 1,044 tons per year, LCRA will offset the maximum expected NOx emissions from the Lost Pines 1 Power Plant, as previously committed to, plus an additional 100 tons. This action will be formalized in an enforceable regulatory mechanism, such as an agreed order or permit alteration, to be effective by December 31, 2005.
- Commit to offset NOx emissions associated with any new fossil fuel facility sited in the five-county EAC region with equivalent NOx reductions in the same five counties.

In addition, LCRA and Austin Energy, as partners in the Fayette Power Project (FPP), located in Fayette County agree to:

- Accelerate the FPP Flexible Air Permit final NOx plant-wide emission cap from an effective date of 2012 to December 31, 2006. The early replacement of the interim cap of 10,494 tons with the final cap of 9,522 tons will reduce the allowable plant-wide NOx emissions by 972 tons.

Although these facilities have not been identified as significant contributors to high ozone levels in the Austin Area, LCRA is taking the above voluntary actions in support of the

Austin/Round Rock Early Action Compact and to further demonstrate our commitment to air quality protection.

The University of Texas at Austin - UT will reduce the allowable annual NOx emissions from its grandfathered units by 75%.

- Under a Voluntary Emission Reduction Permit with the TCEQ, the University will limit NOx emissions from grandfathered units to 341 tons per year; the historical potential NOx emissions from these units are 1,388 tons per year.
- The University will meet these reduced emissions levels by limiting operating hours on certain equipment and by installing 10-year BACT controls on other equipment. Controls are proposed for Boiler #7 in 2004 and Boiler #3 in 2005.
- The University will continue to operate its permitted unit (Gas turbine/boiler #8) as usual; this unit has average NOx emissions of 394 tons per year.

Area of Application
For Austin Energy and UT, commitments cover all units within the five counties. Additionally, Austin Energy's and LCRA's Fayette Power Project (Sam Seymour) in Fayette County is covered. The Lost Pines 1 facility, operated by LCRA's subsidiary Gentex, will be governed by the existing TCEQ permit.

Implementation Considerations
The power plant reductions will be implemented by the specified entities through agreed orders or permits.

Program Participants
Austin Energy, LCRA, Gentex, UT

Implementation Date
Austin Energy – April 1, 2005
LCRA – Sim Gideon Dec.31, 2005 FFP Dec. 31, 2006

Expected Reductions
Austin Energy – 627 tpy from 1999 actual emissions; 250 tpy from 2007 allowables
LCRA – 300 tpy from 2007 allowables at Sim Gideon
LCRA and Austin Energy (Fayette Power Project) – 9,600 tpy from 1999 actual emissions; 972 tpy from 2007 allowables
Estimated daily NOx reductions in the MSA are 7.08 tpd.

Additional Benefits
Austin Energy and LCRA – commitment to offset all new NOx emissions in the five counties

5.4.3 Locally Implemented Emission Reduction Measures

Locally Implemented EAC measures build on those in the O_3 Flex Agreement. Appendix 5-1 (comprising the ERG February 17, 2004 Report *Technical Support Documentation: Emission Control Strategy Evaluation for the Austin/Round Rock MSA EAC Clean Air Action Plan* and the CAPCO *Austin/Round Rock MSA Emission Reduction Strategy Technical Report*); more detailed descriptions, and commitments

from participating agencies, appear in Appendix 5-2. Chart 5.1 lists each signatory's commitments. Signatories interpret and implement these measures according to their needs and abilities. With the exception of the Transportation Emission Reduction Measures (TERMs), the CAAP neither quantifies these reductions nor includes them in its modeling.

In addition to the self-selected measures, the region started Ultra Low Sulfur Gasoline in May 2004. It is used throughout the MSA.

Chart 5.1 – Locally Implemented EAC and O3 Flex Emission Reduction Measures

Emission Reduction Measure	City of Austin	Travis County	City of Round Rock	Williamson County	City of San Marcos	Hays County	City of Bastrop	City of Elgin	Bastrop County	City of Lockhart	City of Luling	Caldwell County
Texas Emission Reduction Program (TERP)	E	E		E	E	E						
Texas Low Emission Diesel (TxLED) for Fleets	E	E		E								
Transportation Emission Reduction Measures (TERMs)	O, E+	O, E+	O, E+	O, E+	O, E+		E	E				
Access Management							E	E		E		
Alternative Commute Infrastructure Requirements	E						E	E				
Drive-Through Facilities on Ozone Action Days	E									E		
Expedited permitting for mixed use, transit oriented or in-fill development							E	E				
Airport Clean Air Plan, includes:	O											
• Use of electric or alternative fuels for airport GSE	O, E											
• ABIA Airside Incentives for GSE use reduction	O, E											
• Integrate alternative fuels into City's aviation fleet	O, E											
• Operate alternative fueled ABIA surface parking lot shuttle buses	O, E											

Emission Reduction Measure	City of Austin	Travis County	City of Round Rock	Williamson County	City of San Marcos	Hays County	City of Bastrop	City of Elgin	Bastrop County	City of Lockhart	City of Luling	Caldwell County
• Use existing ABIA alternative fuel infrastructure for off-site parking shuttle buses	O, E											
Low VOC Striping Material	O, E	O	O	O	E	O	E	E		O, E		
Landfill Controls												
Open Burning Restrictions			E		E		E	E				
Tree Planting	O, E	O	O	O, E+	O, E	E	E	E		O, E		
Extend energy efficiency requirements beyond SB5 and SB7	E											
Shift the electric load profile	E											
Environmental dispatch of power plants	E											
Clean Fuel Incentives												
Low Emission Vehicles	O, E	O	O	O						O, E		O
Adopt-a-School-Bus Program										E		
Police Department Ticketing										E		
EPA Smart Way Transport Program												
Business Evaluation of Fleet Useage, Including Operations and Right Sizing	E	E		E	E							
Parking Incentives for Alt Fuel or SULEV vehicles												
Commute Solutions Programs, may include	O, E									E		
• Compressed Work Week	O, E	O	O						O		O	
• Flexible Work Schedule	O, E	O	O									
• Carpool or Alternative Transportation Incentives	O, E											

Emission Reduction Measure	City of Austin	Travis County	City of Round Rock	Williamson County	City of San Marcos	Hays County	City of Bastrop	City of Elgin	Bastrop County	City of Lockhart	City of Luling	Caldwell County
• Employer Subsidized Transit	O, E											
• Teleworking (full time)	O, E											
• Teleworking (part time)	O, E		O									
Direct Deposit	O, E	O	O	O	O, E	O, E+	E		O	E		O
e-Government and/or Available Locations	O, E	O	E	O, E+	O, E	O, E+						
Voluntary use of APUs for locomotives operating in Central Texas												
Fueling of Vehicles in the Evening	O, E	O	O	O	E	O, E+			O,E	O, E	O	O
Urban Heat Island/Cool Cities Program	E											
Resource Conservation	O, E+	O	O	O	O, E	O, E+					O	
Increase investments by Central Texas electric utility providers in energy demand management programs	E											
Alter production processes and fuel choices												
Contract provisions addressing construction related emissions on high ozone days	E											
Ensure emission reductions in SEPs, BEPs and similar agreements							E	E		E		
Ozone Action Day Education Program, includes:	O, E	O	O	O	O, E	O, E+	O, E	O, E	O	O, E	O	O
Employee Education Program	O	O	O	O	O	O	O	O	O	O	O	O
Public Education Program	O	O	O	O	O	O	O	O	O	O	O	O
Ozone Action Day Notification Program	O	O	O	O	O	O	O	O	O	O	O	O

Emission Reduction Measure	City of Austin	Travis County	City of Round Rock	Williamson County	City of San Marcos	Hays County	City of Bastrop	City of Elgin	Bastrop County	City of Lockhart	City of Luling	Caldwell County
Ozone Action Day Response Program	O, E	E	O	E	E	E			E			O
Alternative Fuel Vehicles	O	O	O									
Right Sizing	O	O	O									
5-minute Limit on Diesel Idling	O		O	O						O	O	O
Cleaner Diesel	O	O	O	O		O	O	O	O			
Vehicle Maintenance	O	O	O	O	O	O			O			O
Vapor Recovery on Pumps			O									O
Low VOC Asphalt		O	O	O								
Low-Emission Gas Cans	O		O	O		O	O	O		O	O	
Transit-Oriented Development	O											
Shaded Parking	O	O										
Landscaping voluntary start at noon on high ozone days (education program)										E		

O = O_3 Flex commitment
E = EAC commitment
E+ = increased EAC commitment from original O_3 Flex commitment
O, E = jurisdiction confirmed O_3 Flex commitment when selecting Locally Implemented EAC measures

The geographic area of the Locally Implemented commitments is the area covered by the jurisdiction making the commitment.
O_3 Flex measures have generally already been implemented, although the TERMs include phased implementation dates through 2007.
EAC measures will generally be implemented no later than December 31, 2005, although the TERMs include phased implementation dates through 2007. TERP projects may also have phased implementation dates. Many Locally Implemented EAC measures may be implemented by ozone season 2004.

Estimated emission reductions from Locally Implemented measures are at least 1 tpd NOx and 1 tpd VOC. The CAAP includes modeled reductions from the TERMs only.

5.4.4 Transportation Emission Reduction Measures (TERMs)

TERMs are transportation projects designed to reduce vehicle use, improve traffic flow or reduce congested conditions. A transportation project that adds single-occupancy vehicle (SOV) roadway capacity is not considered a TERM. General categories of TERMs include intersection improvements, traffic signal synchronization improvements, bicycle and pedestrian facilities, high-occupancy vehicle lanes, major traffic flow improvements, park and ride lots, intelligent transportation system (ITS) and transit projects.

TERMs are similar to transportation control measures (TCMs), except that TCMs apply to nonattainment areas. TCMs are included in the SIP and subject to transportation conformity requirements. The A/RR MSA O_3 Flex and EAC CAAP TERMs are not subject to nonattainment SIP or transportation conformity requirements.

Various jurisdictions and implementing agencies committed to numerous TERMs in the MSA's O_3 Flex Agreement. Additional TERM commitments have been made for the EAC CAAP. A total of 467 TERM projects have been, or will be, implemented. The listed O_3 Flex and EAC CAAP TERMs have various implementation dates. All TERMS will reduce emissions in 2007, while some will contribute to continued attainment past 2007. A project-specific list of O_3 Flex, EAC CAAP and continued attainment TERMs is found in Appendix 5-3. The list provides locations, project limits, implementation dates, and emission reductions for all TERMs. A summary table of the O_3 Flex and EAC CAAP TERMs, and the expected emission reductions, is below.

TERMs by Project Type	**2007 VOC Reductions (lbs/day)**	**2007 NOx Reductions (lbs/day)**
Intersection Improvements	448.82	374.95
Signal Improvements	797.30	705.14
Bicycle/Pedestrian Facilities	69.88	62.54
Grade Separations	5.94	5.28
Park and Ride Lots	98.26	87.99
Traffic Flow Improvements	159.43	145.98
ITS	41.32	41.32
Transit	35.10	14.51
Total (lbs/day)	**1656.05**	**1437.71**
Total (tons/day)	**0.83**	**0.72**

Area of Application
The TERMs are in various locations in the MSA. See Appendix 5-3 for specific locations.

Program Participants
Participants in the TERMs program are local jurisdictions and implementing agencies in the MSA and CAMPO.

Expected Reductions
The expected 2007 emission reductions are 0.83 tons per day VOC and 0.72 tons per day NOx.

Additional Benefits
TERMs help reduce roadway congestion and provide opportunities for alternatives to single occupant vehicle travel. They encourage people to travel (and exercise) by biking and walking.

5.4.5 Participating Organizations
Both the O_3 Flex Agreement and the EAC have benefited from the ongoing participation of various agencies and organizations. Their descriptions or contributions are found in the Appendices as noted. Participants include:

- Capital Metropolitan Transit Authority (Appendix 5-4)
- Clean Air Partners (Appendix 5-5)
- Clean Cities (Appendix 5-6)
- TxDOT (Austin District)
- TxDOT (State)
- TCEQ

5.4.6 Additional Considerations
Additional programs (not included in the modeling) that area organizations have initiated, used periodically or are considering, include:

- Electric lawnmower exchange program (residential) – The program offers incentives to the trade-in of gas-powered lawnmowers for electric lawnmower models at participating retail stores. The program was operated in 1997, 2002 and 2003 with quantifiable reductions of VOC and carbon monoxide emissions.

- Adopt-a- School-Bus – Implemented under the auspices of the CLEAN AIR Force.

In 2003, the CLEAN AIR Force of Central Texas brought the Adopt-A-School Bus Program to the Central Texas region. This program is an EPA initiative to partner with communities, businesses, educational leaders, and heath care professionals to reduce children's exposure to diesel exhaust and to improve air quality in our communities. The program operates as a private/public nonprofit grant program—making funds available to local school districts to replace and retrofit their aging, diesel bus fleets with new cleaner technology buses and fuels. This program will also support anti-idling guidelines in school districts. The Adopt-A-School Bus Program grant opportunity is open to all school districts in the five county region of Travis, Hays, Williamson, Caldwell and Bastrop. A projected replacement of 200 school buses over the course of three years could realize a reduction of approximately 80 tons/year of NOx.

Another component of the Adopt-A-School Bus Program is a supplemental environmental project in which funds will be used to retrofit or replace aging school buses in Milam, Lee and Bastrop Counties. With these two programs combined, both PM and NOx emissions from older school buses will be reduced in our region.

- Tree Planting Guide – This initiative involves specifying low VOC emitting trees in local lists of regionally appropriate plantings.

A collection of initiatives compiled for further study appears in Appendix 5-7.

CHAPTER 6: MAINTENANCE FOR GROWTH AND THE CONTINUING PLANNING PROCESS

Staff has evaluated the anticipated future growth of the region to ensure that the area will remain in attainment of the 8-hour standard for the time period 2007 through 2012 and 2015. This evaluation included analysis of population growth and its effect on on-road mobile emissions and area sources, and new and planned new point sources. This chapter is a summary of the analysis.

Area Sources

The emissions associated with area sources are directly related to population and economic activity. These two data sources are typically used to estimate area source emissions.

The population of the region has been growing for the past 60 years and is expected to continue to grow through 2012.

Table 6.1 Population Growth (CAPCO Regional Forecast 2000 to 2030, REMI, 2003)

	Population (thousands)				
County	**1999**	**2002**	**2005**	**2007**	**2012**
Bastrop	55.68	62.78	74.41	76.77	96.49
Caldwell	31.49	34.71	37.31	40.09	46.52
Hays	93.62	109.48	128.14	144.51	184.50
Travis	788.50	851.59	931.17	985.47	1095.30
Williamson	236.61	289.85	328.62	358.66	428.30
TOTAL	1205.90	1348.41	1499.66	1605.50	1851.11

As the population increases, so will the economic activity in the region. Though the economy of the region has slowed in recent years, the overall trend from 1999 through 2012 continues to show an increase.

Table 6.2 Total manufacturing employment forecast (CAPCO Regional Forecast, REMI, 2003)

	Employment as Manufacturing Total (thousands)				
County	**1999**	**2002**	**2005**	**2007**	**2012**
Bastrop	0.93	0.96	1.02	1.06	1.12
Caldwell	0.43	0.41	0.43	0.44	0.46
Hays	3.86	3.61	3.89	4.11	4.61
Travis	68.90	65.13	64.39	66.08	68.53
Williamson	9.10	9.09	9.36	9.68	10.11
TOTAL	83.23	79.21	79.10	81.36	84.83

With this increase in population and economic growth in the region, emissions from area sources are expected to increase only 14.2% from 1999 to 2012.

Table 6.3 Area Source Emission Trends Break Down (Tons per Day), CAPCO

Area Sources Emission Trend			
	1999	**2007**	**2012**
BASTROP			
NOx	0.60	0.76	0.82
VOC	4.52	5.53	6.16
CALDWELL			
NOx	0.54	0.67	0.68
VOC	15.29	15.75	17.17
HAYS			
NOx	0.58	0.79	0.85
VOC	5.47	7.67	8.21
TRAVIS			
NOx	3.21	4.05	4.28
VOC	50.60	57.04	57.58
WILLIAMSON			
NOx	3.00	3.84	3.86
VOC	14.68	20.44	21.25
MSA			
NOx	7.93	10.12	10.50
VOC	90.56	106.42	110.37

For more details, please see the report, *Emissions Inventory Comparison and Trend Analysis for the Austin-Round Rock MSA: 1999, 2002, 2005, 2007, & 2012* in Appendix 6-1.

On-Road Mobile Sources

The Protocol calls for an evaluation of the current long-range transportation plan. By definition, the long-range plan covers the geographical area of the MPO, which for the Austin Metropolitan area includes only Hays, Travis and Williamson Counties. The MSA and the region covered by this CAAP also include Bastrop and Caldwell Counties. Therefore, the analysis of the region's on-road emissions will be of VMT from three different sources, CAMPO, TxDOT, and TTI. Please refer to Appendix 6-2 a & b for details.

VMT Screen: Because on-road mobile emissions account for a significant amount of the region's ozone forming emissions, the region has focused much of its attention on growth in that area. It was, therefore, reasonable to perform a test to determine if the future planned transportation system will contribute increasing or decreasing amounts of NOx and VOC. One test that uses readily available data is a review of the relative change in VMT, also referred to as a VMT "screen". Staff has chosen to use the VMT screen that EPA originally developed for its proposed transitional ozone classification.

The VMT screen tests if any expected increase in VMT in a future year will be offset by technology and control measures. That is, that the expected associated emissions in a future year will not exceed the associated emissions of the base year.

The current CAMPO long-range transportation plan is based on VMT for the years 1997, 2007, 2015 and 2025. TxDOT supplied the1999 VMT. The "VMT Screen" for years 2007 and 2015 of the plan, *Mobility 2025* (Appendix 6-3), gave the following results.

Table 6.4 Emission Reductions in VMT from 1999 to 2015, with and without I/M

	NOx		**VOC**	
	Three-County		Three-County	
	CAMPO LRP		CAMPO LRP	
Year	No Controls	With I&M	No Controls	With I&M
1999	29,002,000		29,002,000	
2007	19,815,722	18,801,663	20,413,830	17,869,330
2015	9,162,901	7,316,813	15,036,818	11,943,306

VMT in the three-county region is expected to increase 40% from 1999 to 2007 and 90% from 2007 to 2015. The associated NOx will decrease by so much during those years that it will be as though there were a 31.7% decrease in VMT from 1999 to 2007 and a 68.4% decrease from 1999 to 2015. Additional, though less substantial, decreases will be realized from the region's implementation of an I/M program in Travis, Williamson and Hays Counties in 2005 (35.2% and 74.8%). Also, VOC will be reduced by 29.6% from 1999 until 2007 and 48.2% from 1999 to 2015. Reductions of VOC will also be greater with the I/M program (38.4% and 58.8%). The expected increases in population and the planned expansion of the roadway system will contribute to an increase in VMT, but will not cause on-road emissions to exceed 1999 levels.

Because Bastrop and Caldwell Counties are outside the CAMPO boundaries, and because they will not participate in the I/M program, a separate VMT screen was conducted for the aggregate 5-county region. The results are similar to those realized for the CAMPO area.

Table 6.5 Emission Reductions in VMT from 1999 to 2015

	NOx	**VOC**
	Five-County MSA	Five-County MSA
	TTI VMT	TTI VMT
Year	No Control Measures	No Control Measures
1999	32,506,000	32,506,000
2007	27,677,756	22,332,084
2015	9,796,164	15,907,780

VMT is expected to increase in the five-county region by 36% from 1999 to 2007 and 79.3% from 1999 to 2015. Without I/M in the five-county region, NOx from VMT is expected to decline by 33.3% from 1999 to 2007 and 69.9% from 1999 to 2015. The VOC will also decline (31.3% and 51.1%). Again, the expected increases in population and the planned roadway system that will contribute to an increase in VMT will not contribute to emissions exceeding the amount of 1999 on-road emissions.

One conclusion from this analysis is that the currently planned roadway system will not exacerbate the production of ozone in the MSA through 2015. The details of all calculations are included in Appendix 6-2b.

Emissions Comparisons: Another way to evaluate VMT and associated emissions is to compare the estimated emissions for future years to the base year emissions. Multiplying the emission factor by the VMT results in an estimate of the daily emissions associated with on-road travel. This evaluation shows a decrease in both NOx and VOC emissions, despite an increase in VMT.

Emission factors for each year were calculated by CAMPO staff using MOBILE6 and included appropriate local data where available. Emissions factors are typically expressed in grams/mile. Multiplying the emissions factor times the VMT results in the grams of emissions, either NOx or VOC. Because the emissions inventory is expressed in tons per day, the resultant grams of on-road emissions were converted to tons by dividing the number of grams by 454 grams/lb and then by 2000 lbs/ton. Please refer to Appendix 6-2 a & b for more details.

Table 6.6 Emission Reductions from 1999 to 2015

TTI, Five-County, No Controls							
NOx				**VOC**			
Year	**VMT (miles)**	**EF (g/mi)**	**VMT X EF (tons)**	**Year**	**VMT (miles)**	**EF (g/mi)**	**VMT X EF (tons)**
1999	32,506,000	2.433	87	1999	32,506,000	1.425	51
2007	44,508,000	1.185	58	2007	44,508,000	0.715	35
2015	58,274,000	0.409	26	2015	58,274,000	0.389	25

Both evaluation techniques, the VMT screen and comparison of emissions, show large enough decreases in on-road emissions to more than offset the anticipated growth in VMT through 2015. These decreases in emissions will be even greater once the I/M program is implemented.

Point Sources

TCEQ provided emission data for point sources in the CAPCO region for the 1999 EI. In the 1999 EI, the point source was sub-categorized into major point source and minor point source. CAPCO developed the following point source information for 1999 and 2007.

Table 6.4 Point Source Emissions from EGU, A/ RR MSA and Surrounding Area

EGUs Point Source Emissions (tpd) A/RR MSA and Surrounding Area					
		1999		**2007**	
County	**Facility Name**	**NOx**	**VOC**	**NOx**	**VOC**
Bastrop	Sim Gideon Electric Power Plant	7.10	0.33	3.94	0.11
Bastrop	Lost Pines 1 Power Plant	n/a	n/a	1.50	0.23
Bastrop	Bastrop Clean Energy Center	n/a	n/a	2.21	0.12
Fayette	Fayette Power Project	60.82	0.55	28.12	0.78
Hays	Hays Energy Facility	n/a	n/a	3.70	0.96
Milam	Sandow Steam Electric	24.20	0.33	13.19	0.32
Travis	Decker Lake Power Plant	8.15	0.44	3.80	0.12
Travis	Holly Street Power Plant	2.88	0.12	2.98	0.01
Travis	Sand Hills	n/a	n/a	1.03	0.20
Travis	Hal C Weaver Power Plant	1.99	0.03	1.86	0.05
Total		**105.14**	**1.80**	**62.32**	**2.91**
Total MSA		**20.12**	**0.92**	**21.01**	**1.81**

A uniform change for 2002 and 2005 was assumed and 2012 is expected to stay unchanged based on feedback from power plant stakeholders.

Table 6.5 Point Source Emissions from NEGU

NEGUs Point Source Emissions (tpd)
A/RR MSA and Sourranding Area

		1999		2007	
County	**Facility Name**	**NOx**	**VOC**	**NOx**	**VOC**
Caldwell	Durol Western Manufacturing, Inc.	0.00	0.01	0.00	0.00
Caldwell	Luling Gas Plant	0.89	0.26	0.29	0.04
Caldwell	Maxwell Facility	0.00	0.15	0.00	0.06
Caldwell	Prairie Lea Compressor Station	2.66	0.04	2.23	0.03
Caldwell	Teppco Crude Oil LLC, Luling Station	0.00	0.01	n/a	n/a
Comal	APG Lime Corp	1.15	0.00	1.15	0.00
Comal	Sunbelt Cemebt of Texas LP	7.61	0.12	3.79	0.13
Comal	TXI Operations LP	3.34	0.14	3.43	0.15
Hays	Parkview Metal Products, Inc.	0.00	0.10	0.00	0.03
Hays	Southern Post Co. Commercial Metal	0.00	0.06	0.00	0.01
Hays	Southwest Solvents and Chemicals	0.00	0.00	0.00	0.00
Hays	Texas LeHigh Cement	7.20	0.18	5.24	0.55
Milam	Aluminum Company of America	54.26	4.25	4.64	0.38
Travis	RIN3M Austin Center	0.15	0.03	0.15	0.03
Travis	Advanced Micro Devices, Inc.	0.00	0.00	0.23	0.17
Travis	Austin White Lime Co.	0.89	0.00	0.94	0.02
Travis	IBM Corporation	0.09	0.04	0.01	0.04
Travis	Lithoprint Co., Inc.	0.00	0.05	n/a	n/a
Travis	Motorola-Ed Bluestein	0.46	0.17	0.01	0.04
Travis	Motorola Integrated Circuit Division	0.09	0.08	0.02	0.02
Travis	Multilayer TEK, L.P.	0.00	0.18	0.01	0.21
Travis	Raytheon Systems, Co.	0.02	0.02	0.01	0.00
Travis	Twomey Welch Aerocorp, Inc.	0.00	0.00	0.00	0.00
Williamson	Aquatic Industries, Inc.	0.00	0.11	0.00	0.04
Total		**78.82**	**6.02**	**22.14**	**1.95**
Total MSA		**12.46**	**1.50**	**9.13**	**1.28**

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Backup documentation for the above may be found in Appendix 6-4.

THE CONTINUING PLANNING PROCESS

CAPCO and CAMPO staff will analyze air quality and related data and perform necessary modeling updates annually. In addition to the data sources used for the above analyses, staff may add information from The Central Texas Sustainability Indicators Project (CTSIP). The CTSIP is a nonprofit organization that tracks 40 key indicators (e.g., water pollution, air quality, density of new development) that show the economic, environmental and social health of our

MSA. The results of all these analyses will be reported in the June semi-annual reports beginning in June 2005.

Using similar methods as for the above maintenance for growth analysis, staff will evaluate:

1. future transportation patterns;
2. all relevant actual new point sources; and
3. impacts from potential new source growth.

Future Transportation Patterns: As part of the *Mobility 2030* plan development process CAMPO staff will perform the VMT screen for years 2007 and 2017. The screen will test to be sure that any expected increase in VMT over the planning horizons will be offset by technology and control measures, that is, that the expected associated emissions will not exceed the associated emissions of the base year (1999).

As part of this analysis, the emission factors will be reviewed and updated as necessary. Review of the emission factors includes checking and updating the fleet mix.

This test will also be performed prior to adoption of any CAMPO long-range transportation plan update or amendment that significantly increases VMT.

New Point Sources and Potential New Point Sources: In addition to the VMT screen and review of area sources, staff will include a list and impact analysis of the relevant new and potential new point sources. Staff will obtain data on these relevant new and potential new point sources from TCEQ.

The annual analysis will determine the adequacy of the selected control measures. After review by the appropriate elected officials, these measures will be adjusted if necessary.

CHAPTER 7: TRACKING AND REPORTING

All signatories and implementing agencies will review EAC activities twice yearly. The semi-annual review will track and document, at a minimum, control strategy implementation and results, monitoring data and future plans. CAPCO, or its designee, will file reports with TCEQ and EPA by June 30 and December 31 of each reporting year. Reporting periods will be May 1 to October 31, and November 1 to April 30, to allow for adequate public notice and comment. CAPCO has primary responsibility for report generation.

CAPCO will provide appropriately detailed technical analysis for all semi-annual review reporting. The metrics detailed in Appendix 7-1 provide an example, but their use is subject to staffing and funding constraints.