ALAMO OZONE ADVANCE

Alamo Ozone Advance Program: Regional Sustainability Initiatives

Voluntary Measures for the
AACOG Ozone Advance Path Forward

As approved by the
Air Improvement Resources
Executive Committee
on July 24, 2013

2016 Update approved on July 27, 2016

Prepared by

AACOG
Alamo Area Council Of Governments

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CHAPTER 1: Introduction

In common with other large metropolitan areas, the San Antonio region occasionally experiences episodes when air pollution reaches concentrations that are unhealthy for sensitive populations. In particular, the region struggles to meet federal standards for one of the most pervasive air pollutants in the nation: ground-level ozone.

Ozone pollution forms when specific chemicals react in the atmosphere. These chemicals are released from a range of processes including the burning of gasoline, diesel, and other fuels, and the evaporation of paints and solvents. Meteorological conditions also influence the formation and dispersion of ozone and, as a consequence, impact the levels of ozone in the lower atmosphere. Atmospheric conditions that are conducive to the accumulation of ozone pollution include clear, sunny skies, low wind speeds, and warm temperatures. These conditions are prevalent in the San Antonio area through much of the late spring, summer, and early fall months.

The U.S. Environmental Protection Agency (EPA) bears primary responsibility for protecting the nation's air quality and for implementing and enforcing many of the programs established by the Clean Air Act (CAA). This responsibility extends to setting National Ambient Air Quality Standards (NAAQS) for six common pollutants, including ground-level ozone, that are harmful to public health and the environment. Periodically, the NAAQS are reviewed and, if scientific evidence warrants it, the standards are revised to ensure adequate protection of human health, as well as animals, crops, vegetation, buildings, and visibility.

As a result of the periodic review requirement, the NAAQS for ozone has been changed several times since first established in the 1970s (Figure 1-1). The most recent change was implemented in 2015 when the three-year average threshold on which attainment is based was lowered from 75 parts per

billion (ppb) to 70 ppb. This change places the San Antonio region at risk of a nonattainment designation as early as October 2017. A nonattainment designation is the official declaration by the EPA of a NAAQS violation and triggers air quality planning activities and control strategy implementation involving state and local governments, as well as local industries.

To address ozone values that often skirt NAAQS thresholds (Figure 1-2), local governmental and industry leadership in the San Antonio region support participation in programs that focus on air quality improvements. When EPA announced the Ozone Advance program in April 2012, area leaders and air quality planners readily approved submission of a participation letter. Ozone Advance planning updates have been submitted every year since in accordance with the program's requirements. The intent of the Ozone Advance program is to provide a structure for local emission reduction strategies, enhance an area's ability to meet the ozone NAAQS, and support state and local initiatives for air quality improvements.

	1971	1979	1993	1997	2008	2015
Final Ruling	36 FR 8181 30-Apr-71	44 FR 8202 8-Feb-79	58 FR 13008 9-Mar-93	62 FR 38856 18-Jul-97	73 FR 16483 27-Mar-08	80 FR 65292 26-Oct-15
Indicator	Total photochemical oxidants	O_3		O_3	O_3	O_3
Avg. Time	1 hour	1 hour		8 hours	8 hours	8 hours
Level	80 ppb	12 ppb		80 ppb	75 ppb	70 ppb
Form	Not to be exceeded more than one hour per year	Attainment is defined when the expected number of days per calendar year, with maximum hourly average concentration greater than 12 ppb, is equal to or less than 1	EPA decided that revisions to the standards were not needed at this time	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years

Figure 1-1: Historical Ozone NAAQS, 1971 - 2015[1]

[1] U.S. Environmental Protection Agency. (Mar 4, 2016). "Table of Historical Ozone National Ambient Air Quality Standards (NAAQS)," Available at https://www.epa.gov/ozone-pollution/table-historical-ozone-national-ambient-air-quality-standards-naaqs.

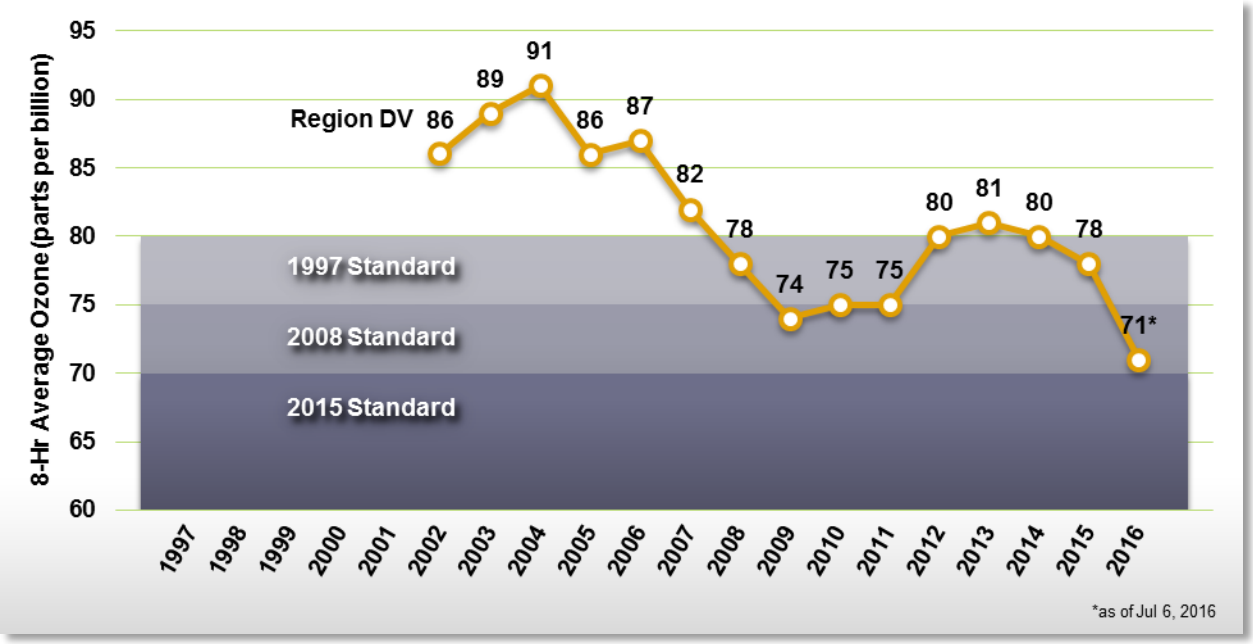


Figure 1-2: Annual design values (DV) for the San Antonio area relative to the thresholds established for the 1997, 2008, and 2015 ozone standards. The design values represent the 3-year average of the annual fourth-highest daily maximum 8-hour ozone average.

This document is the 2016 update to the Alamo Ozone Advance Plan and describes the region's *Path Forward* to program enhancements, and new and proposed strategies for improving air quality and community health in the San Antonio region. Differences between the 2015 and 2016 Path Forward include updated information in all chapters, addressing the region's background, local voluntary strategies, and education and outreach. This year's update also includes a chapter dedicated to regional planning, which includes the region's history of air quality planning, its current strategic plan, and ozone-related activities completed or planned.

Sources for photos from page 1-1: (1) San Antonio Skyline: City of San Antonio (2) Guadalupe River: Alamo City Title Company (3) Pumpjacks: Horizon Energy (4) Cattle Ranch: Karen Hightower (5) Pecan Orchard: The Texas Tribune (6) I-35 Corridor: San Marcos Mercury

CHAPTER 2: Background

2.1 Our Region

San Antonio, located in south-central Texas, is the second largest city in the state and the seventh largest in the nation. San Antonio is in Bexar County, which is centrally located in the 13-county AACOG region (Figure 2-1). The metropolitan statistical area includes Bexar and seven surrounding counties. The second largest city in the MSA is New Braunfels, located in adjacent Comal County.

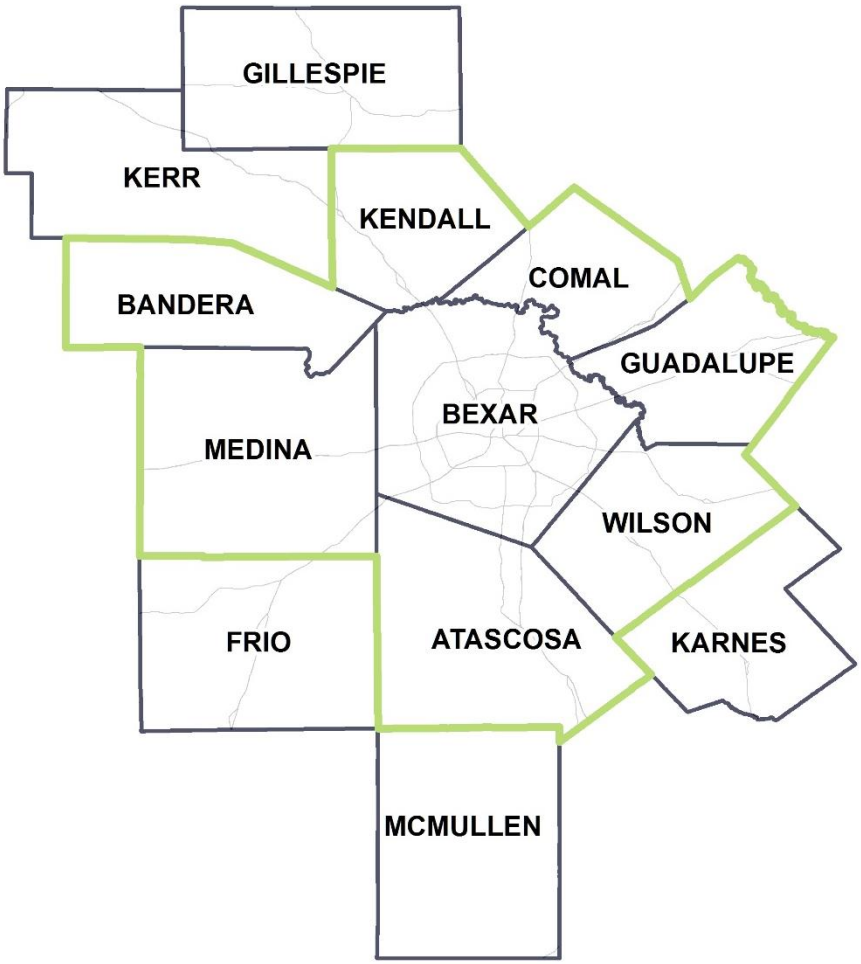


Figure 2-1: Map of the 13-county AACOG region and the 8-county San Antonio-New Braunfels Metropolitan Statistical Area (heavy outline)

This Path Forward plan covers the eight-county San Antonio-New Braunfels MSA, as this was the presumptive boundary for a nonattainment designation under the 2008 and prior ozone NAAQS.

2.2 Population Growth

In 2015, the San Antonio-New Braunfels MSA represented about 9% of the population in Texas. Between 2000 and 2015, the region's population grew by approximately 40%, which exceeds the State's growth by more than 8% during the same period (Table 2-1).

Geographically, the San Antonio-New Braunfels MSA has grown significantly northward along the Interstate 35 corridor. The Austin-Round Rock MSA, which includes Travis, Williamson, Hays, Bastrop, and Caldwell counties, has also experienced significant growth along the Interstate 35 corridor. As a result, the gap between the populous areas in both regions is diminishing (Figure 2-2).

MSA County	2000 Population	2015 Population	% Change
Atascosa	38,628	48,435	25.4%
Bandera	17,645	21,269	20.5%
Bexar	1,392,931	1,897,753	36.2%
Comal	78,021	129,048	65.4%
Guadalupe	89,023	151,249	69.9%
Kendall	23,743	40,384	70.1%
Medina	39,304	48,417	23.2%
Wilson	32,408	47,520	46.6%
MSA Total	1,711,703	2,384,075	39.3%
Texas	20,851,820	27,469,114	31.7%

Table 2-1: Population growth in the San Antonio-New Braunfels MSA, 2000-2015[2]

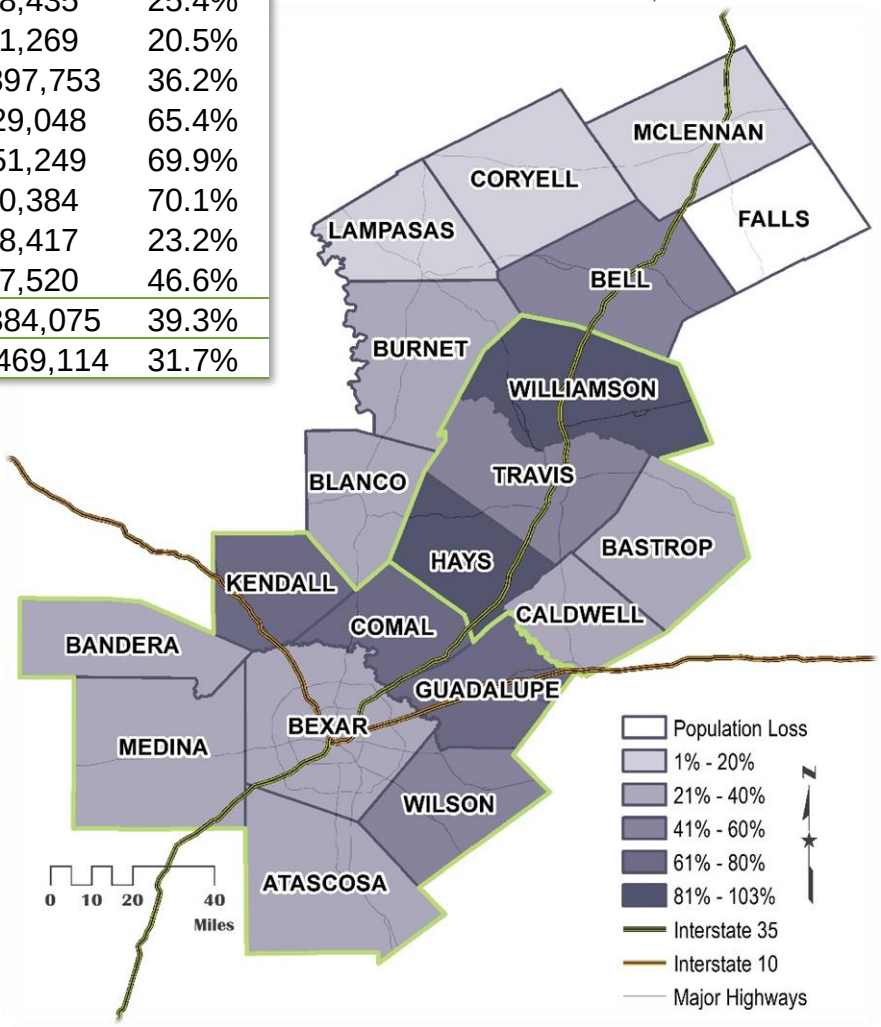


Figure 2-2: Percentage of population change between 2000 and 2015 in counties along Interstate 35

[2] U.S. Census Bureau. (2000). Decennial Census Data; U.S. Census Bureau (July 1, 2015). Population Estimates Program Data (PEP).

2.3 Ozone Monitoring

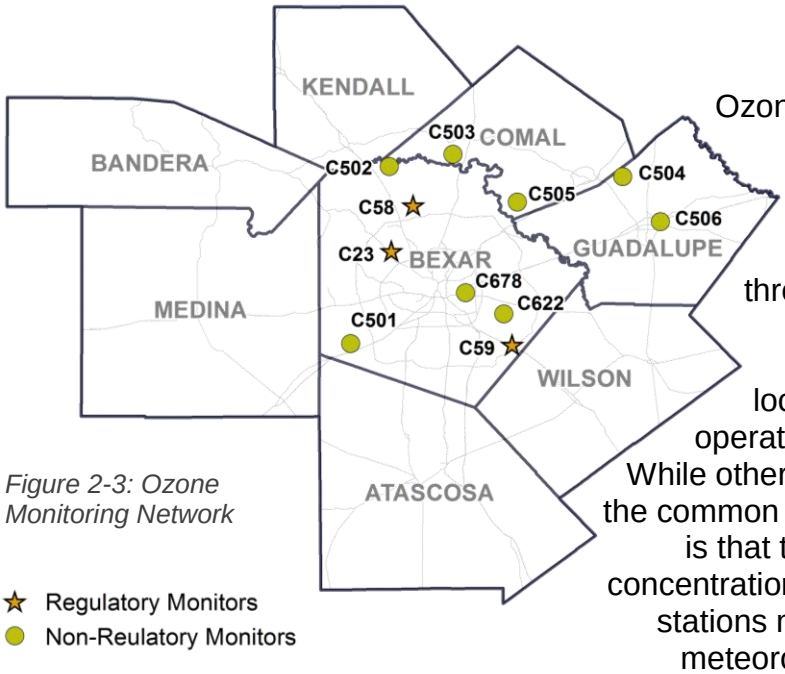


Figure 2-3: Ozone Monitoring Network

Ozone concentrations are measured by a network of continuous air monitoring stations in and surrounding Bexar County (Figure 2-3). TCEQ operates three regulatory monitors, AACOG operates six non-regulatory monitors, and CPS Energy, the local energy utility in San Antonio, operates two non-regulatory monitors. While other air monitors exist in the region, the common feature of the mapped monitors is that they all measure ambient ozone concentrations. In addition to ozone, several stations measure other chemicals and/or meteorological parameters (Table 2-2).

	Designation and Site Name	Location	Data Measured	In Operation Since	Operated and Maintained By (Owner)
Regulatory Monitors	CAMS 23 San Antonio NW	San Antonio, Bexar County	NO_X, Ozone, Meteorology, $PM_{2.5}$	Jul 1981	SA Metro Health District (TCEQ)
	CAMS 58 Camp Bullis	San Antonio, Bexar County	VOC, NO_X, Ozone, Meteorology	Aug 1998	Orsat and Technical Monitoring Services
	CAMS 59 Calaveras Lake	San Antonio, Bexar County	SO2, NO_X, Ozone, Meteorology, $PM_{2.5}$	May 1998	SA Metro Health District (TCEQ)
Non-Regulatory Monitors	CAMS 501 Elm Creek Elementary	Atascosa, Bexar County	Ozone, Meteorology	Jun 2002	Dios-Dado (AACOG)
	CAMS 502 Fair Oaks Ranch	Fair Oaks Ranch, Bexar County	Ozone, Meteorology	Jun 2002	Dios-Dado (AACOG)
	CAMS 678 CPS Pecan Valley	San Antonio, Bexar County	Ozone, Meteorology	Mar 1999	Dios-Dado (CPS)
	CAMS 622 Heritage Middle School	San Antonio, Bexar County	Ozone, Meteorology, $PM_{2.5}$	Jul 2004	Dios-Dado (CPS)
	CAMS 503 Bulverde Elementary	Bulverde, Comal County	Ozone	Aug 2002	Dios-Dado (AACOG)
	CAMS 505 Garden Ridge	Garden Ridge, Comal County	Ozone	Mar 2003	Dios-Dado (AACOG)
	CAMS 504 New Braunfels Airport	New Braunfels, Guadalupe	Ozone	Aug 2002	Dios-Dado (AACOG)
	CAMS 506 Seguin Outdoor Learn	Seguin, Guadalupe	Ozone	Mar 2003	Dios-Dado (AACOG)

Table 2-2: Ozone Monitoring Stations

2.4 Ozone Trends

Ground-level ozone is one of the most pervasive air pollutants in the country. Like many areas, San Antonio struggles to remain in compliance with the federal ozone standard. As shown in Figure 2-4, the annual fourth highest 8-hour average ozone values, upon which attainment calculations are based, have exceeded the 2015 standard's 70 ppb threshold at one or more San Antonio monitors every year between 2002 and 2015. The region experienced generally decreasing ozone levels between 2006 and 2009, based on the rolling three-year averages of annual fourth highest 8-hour average ozone or design values for that period. However, local design values began to increase in 2010 and continued that trend through 2013.

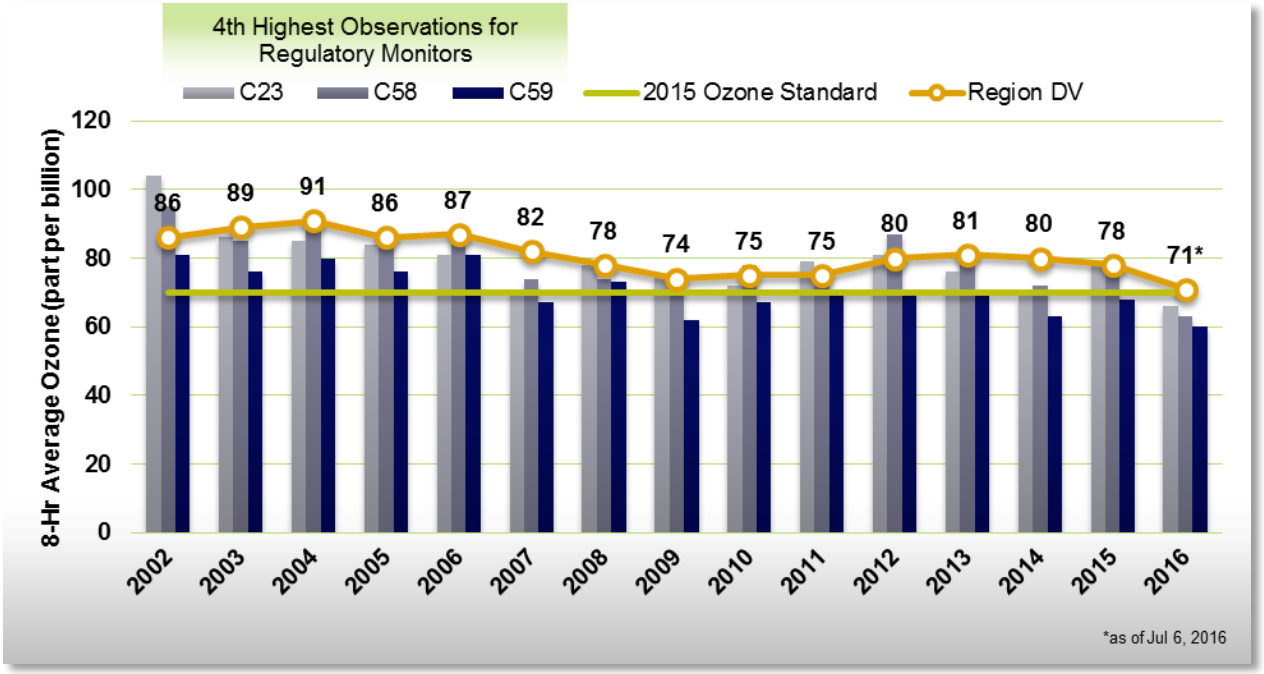


Figure 2-4: Annual 8-Hour Fourth Highest Ozone Observations and Design Values, 2002-2016

Table 2-3 lists design values for each regulatory monitor as of the end of 2014 and 2015, the design value for 2016 as of July 2016, and the annual fourth highest 8-hour average ozone concentrations that comprise each design value. Also listed is the maximum fourth highest 8-hour average ozone concentration for 2016 that would have yielded a 2016 design value of 70 ppb or less. Note that for CAMS 23 (C23) and CAMS 58 (C58), that maximum has already been exceeded for 2016.

Monitors C23 and C58 in northwest Bexar County typically record the highest ozone concentrations of the three regulatory monitors, as these are often "downwind" sites. Wind directions during the ozone season are more likely to originate from the northeast, east and southeast quadrants than other directions. Conversely, C59 located in

southeast Bexar County is an “upwind” monitor that typically provides data on background ozone concentrations before air parcels reach San Antonio’s urban core.

Station	2012 4th Highest	2013 4th Highest	2014 4th Highest	2014 Design Value	2015 4th Highest	2015 Design Value	2016 4th Highest*	2016 Design Value*	TARGET 2016 4th Highest
CAMS 23	**81**	**76**	69	**75**	**79**	**74**	66	**71**	64
CAMS 58	**87**	**83**	**72**	**80**	**80**	**78**	63	**71**	60
CAMS 59	70	69	63	67	68	66	60	63	81

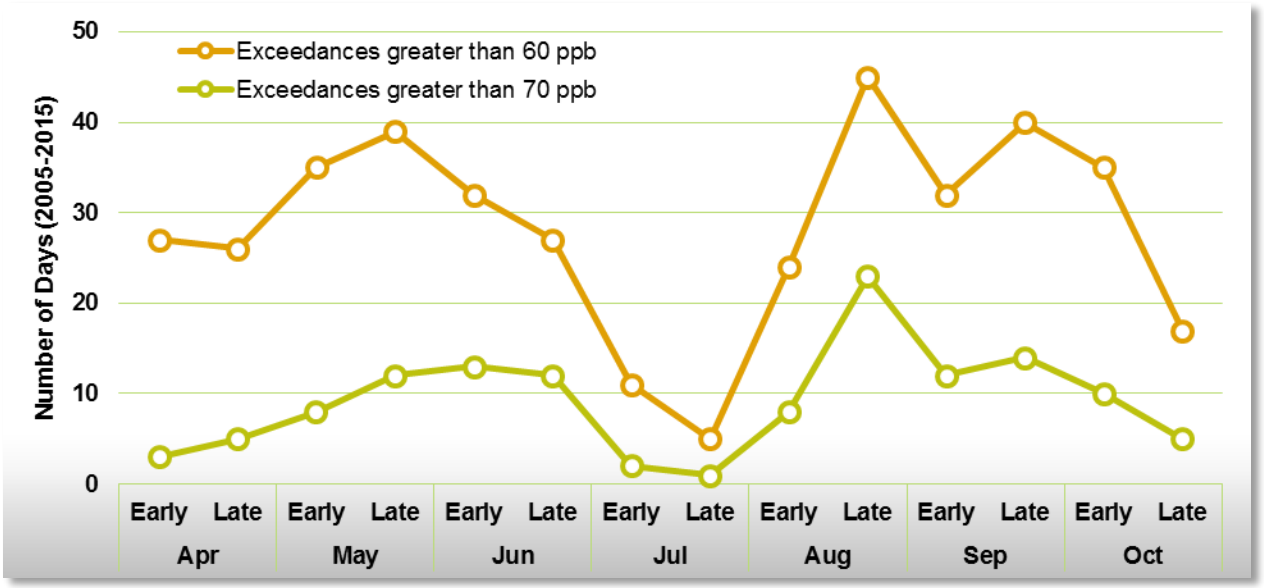
* as of Jul 6, 2016

Table 2-3: Design Values for 2014 and 2015 with Targeted 4th Highest Observations for 2016

2.5 Seasonality

In addition to annual trends, AACOG tracks seasonal ozone trends as part of the development of a conceptual model for the region. From April through June, there is a seasonal increase in the number of high ozone days in San Antonio (Figure 2-5). This period represents the first high ozone seasonal peak that San Antonio typically experiences. By early July, the number of high ozone days declines. The next seasonal peak begins in August and ends in late October, during which the frequency of high ozone days is slightly higher than the spring period.

Figure 2-5: Number of days between 2005 and 2015 that the 8-hour average exceeded 70 or 60 parts per billion at CAMS 58 (Note: In 2016, TCEQ changed the ozone-monitoring season to begin in March instead of April.)



Ozone concentrations fluctuate by season depending on several factors including variations in transport, meteorology, chemical loss of ozone, and stratospheric ozone levels. Ozone transport, depicted by the minimum average 8-hour ozone in a given region, has experienced a general decline since 2006 as shown in Figure 2-6. This is likely attributable to precursor emissions reductions in surrounding regions that have resulted in an overall decline in surrounding ozone concentrations. Ozone transport can also be assessed on an intra-seasonal basis. During the spring and fall ozone season peaks, for example, ozone transport is significant. Ozone transport is lowest in July before increasing again into the late summer and fall. The seasonality of ozone transport in the San Antonio area can be seen in Figure 2-7.

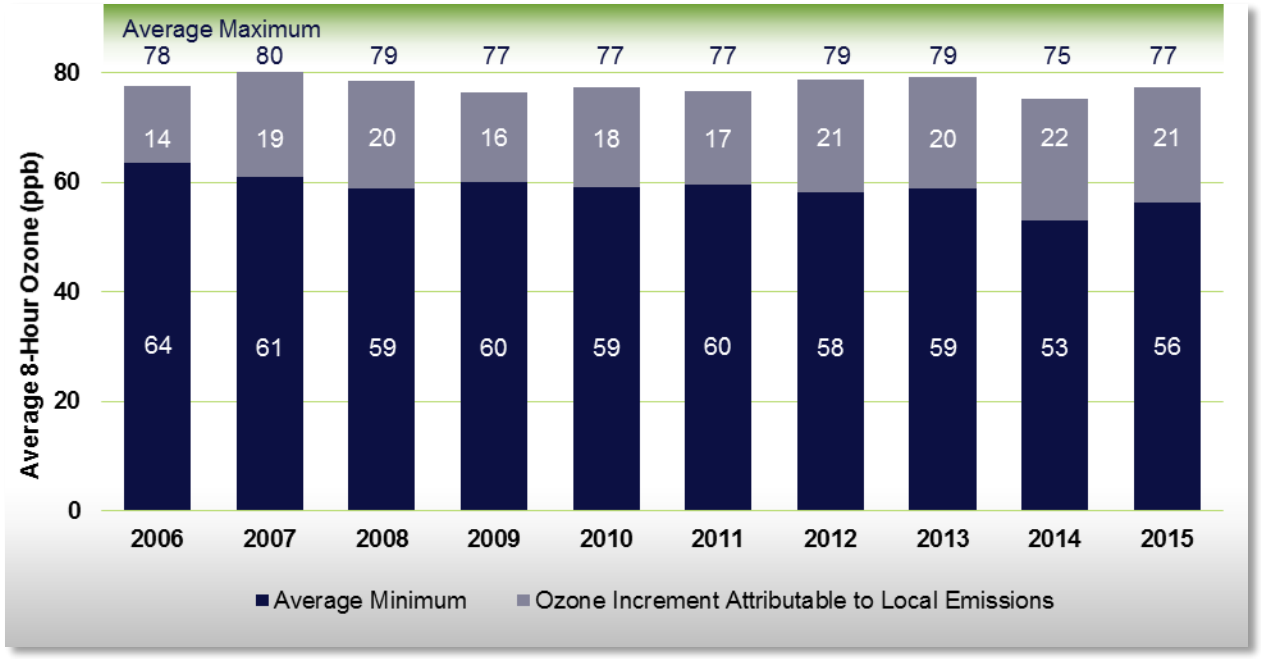


Figure 2-6: Annual Ozone Attributable to Local Emissions, average maximums and minimums derived using data from the monitor with the highest and lowest 8-hour average recorded in the region each day between 2006 and 2015 on days where ozone > 70 ppb.

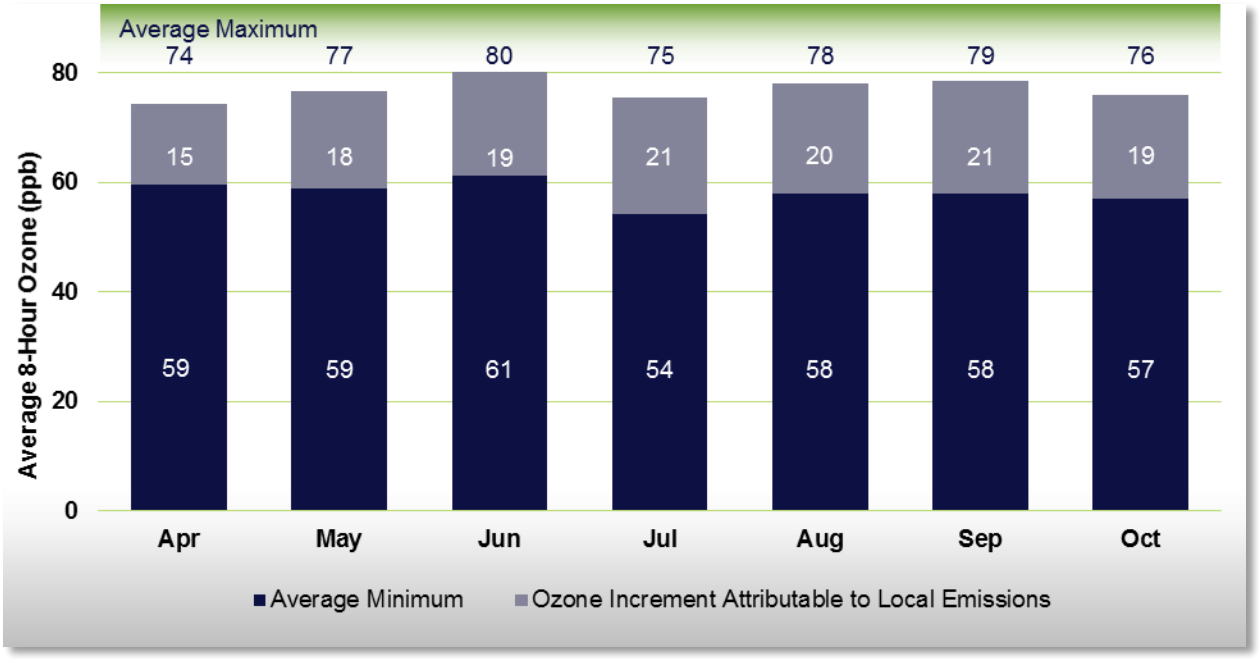


Figure 2-7: Annual Ozone Attributable to Local Emissions by Month, 2006-2015 Averages

2.6 Meteorology

Certain identifiable regional-scale meteorological pressure systems are associated with high ozone events. Prevailing wind directions, wind speeds, mixing, and dispersion conditions are influenced by high-pressure systems. High-pressure systems suppress vertical mixing of pollutants and influence wind direction, and are characterized by clear skies, relatively low wind speeds, and low humidity in San Antonio. These meteorological conditions typically increase ozone formation and transport of pollutants into the San Antonio Area and generate elevated concentrations of local ozone.

An analysis between meteorology and ambient ozone indicates a number of local meteorological factors that contribute to elevated ozone concentrations in the San Antonio region. The following summarize the relationship between local meteorology and ozone photochemistry:

- Meteorological conditions on days with elevated ozone typically include stagnated winds over Texas, limited frontal movement, low atmospheric moisture content, lack of precipitation, reduced mixing between layers, and clear skies.

- High ozone days are typically absent of strong synoptic weather systems.

- Wind vectors on high ozone days are more stagnated and often originate from the east and northeast. Back trajectories (Figure 2-8) and wind roses (Figure 2-9, Figure 2-10, and Figure 2-11) are some of the tools used to determine prevailing wind directions on high ozone days.

- Mixing heights are typically lower in the early morning hours and experience a rapid rise in the late morning through early afternoon on high ozone days. Low nighttime mixing heights can trap nocturnal pollutants from the local area as well as emissions from the previous day. When combined with a rapid rise in mixing height that allows downward mixing of transported pollutants from higher inversion layers, ozone can become significantly elevated.

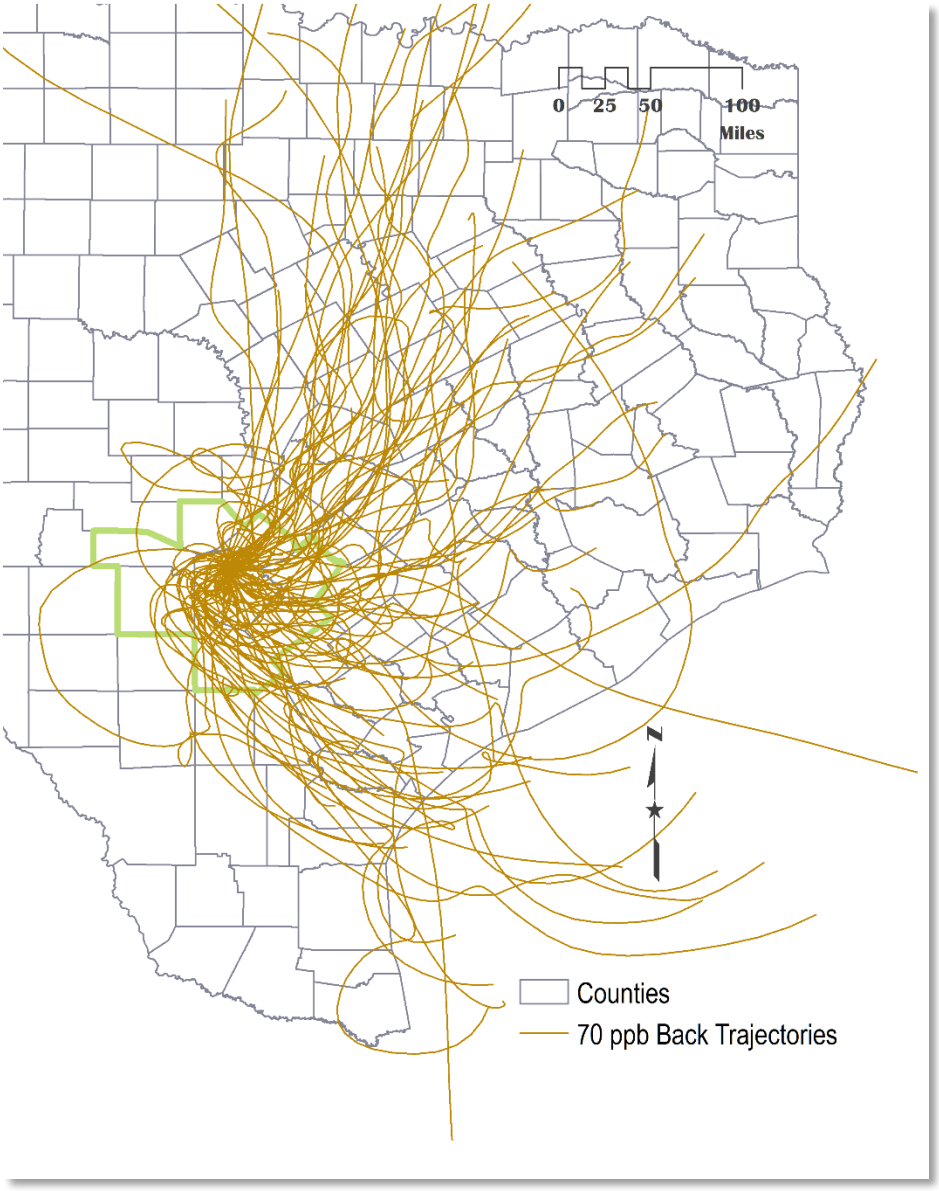


Figure 2-8: 48-Hour HYSPLIT Back Trajectories on Days with 8-Hour Ozone > 70 ppb, 2009-2015

Synoptic conditions typical of high ozone days include calm winds associated with a high pressure system over Texas, which often corresponds to lower humidity levels and therefore a wider diurnal temperature swing. It is also common for the passage of frontal boundaries to trigger high ozone events. These fronts have the potential to move through the San Antonio area at any time of year, although they may not always bring

cooler temperatures, but rather, drier air as high pressure builds in behind them. Research from the Ozone Conceptual Model for the Austin area suggests that as these fronts move through, northerly and northwesterly winds transport relatively "unclean" continental air from interior parts of the country.[3] This corresponds to an increase in background ozone levels that then move into the San Antonio region.

A review of data between 2005 and 2015 revealed a common wind flow characteristic at C58. On high ozone days, there is a reversal of winds from the morning into the afternoon. The wind rose graphs in Figure 2-9 show the contrast between morning (6 a.m. to 8 a.m. local time) and afternoon (12 p.m. to 2 p.m. local time) resultant wind directions and speeds for high ozone days. This monitor is the only one in the region to show such a marked difference between morning and afternoon wind directions. In the morning at C58, 64.6% of high ozone days had resultant wind vectors from the WNW, NW, and NNW, whereas in the afternoon, 53.3% had resultant wind vectors from the ESE, SE, and SSE. In addition, relatively calm winds were more likely to be observed in the morning hours than in the afternoon. The wind roses from C58 suggest that there is a recirculation of emissions over the monitor as winds switch from NW to SE during the day, which might explain why ozone concentrations are often highest at this location on high ozone days.

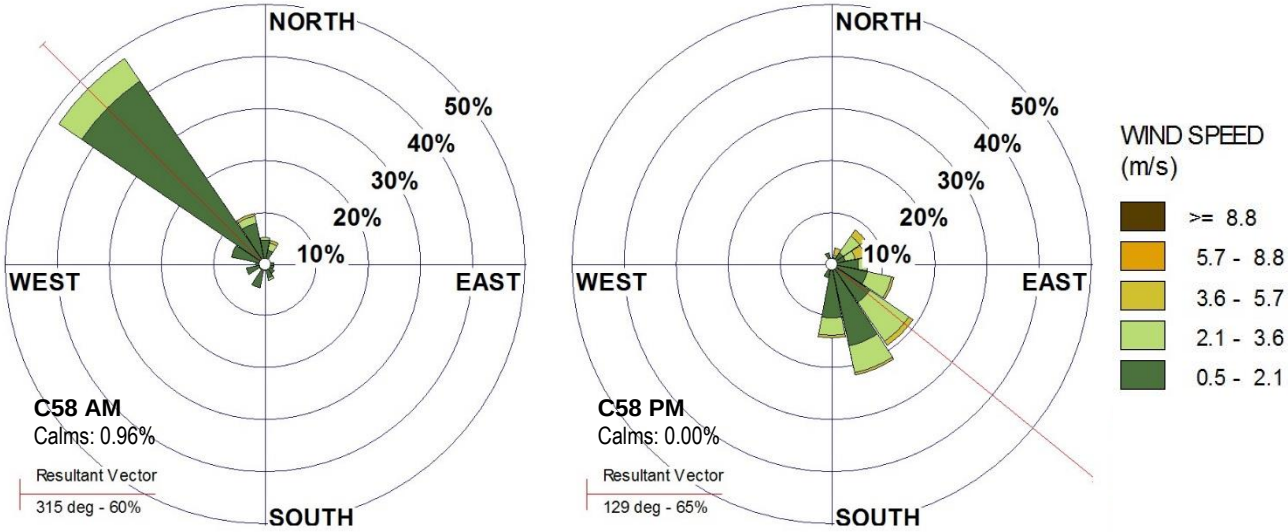


Figure 2-9: C58 AM (6 a.m. to 8 a.m.) and PM (12 p.m. to 2 p.m.) Wind Roses, 2005-2015

[3] Capital Area Council of Governments, 2015. "Conceptual Model for Ozone in the Austin-Round Rock Metropolitan Statistical Area." Austin, Texas. p. 133. Available online: http://www.capcog.org/documents/airquality/reports/2015/Ozone_Conceptual_Model_Final_-_10-1-15.pdf. Accessed July 22, 2016.

Figure 2-10 and Figure 2-11 provide morning and afternoon wind rose graphs for the region's other two regulatory ozone monitors, C23 and C59, on high ozone days. The wind roses from C23 suggest a directional wind shift from morning to afternoon, but the morning wind rose is more evenly distributed among each direction compared to C58. The morning and afternoon wind roses for C59 do not show an appreciable shift in wind direction on high ozone days. Just over 50% of high ozone days were characterized by morning winds out of the NNE, NE, or ENE. Afternoon wind directions on high ozone days tend to be split between generally northeast and generally southeast. N, NNE, and NE afternoon wind directions accounted for 41.3% of high ozone days, while ESE, SE, and SSE afternoon wind directions at C59 accounted for 33.0% of high ozone days.

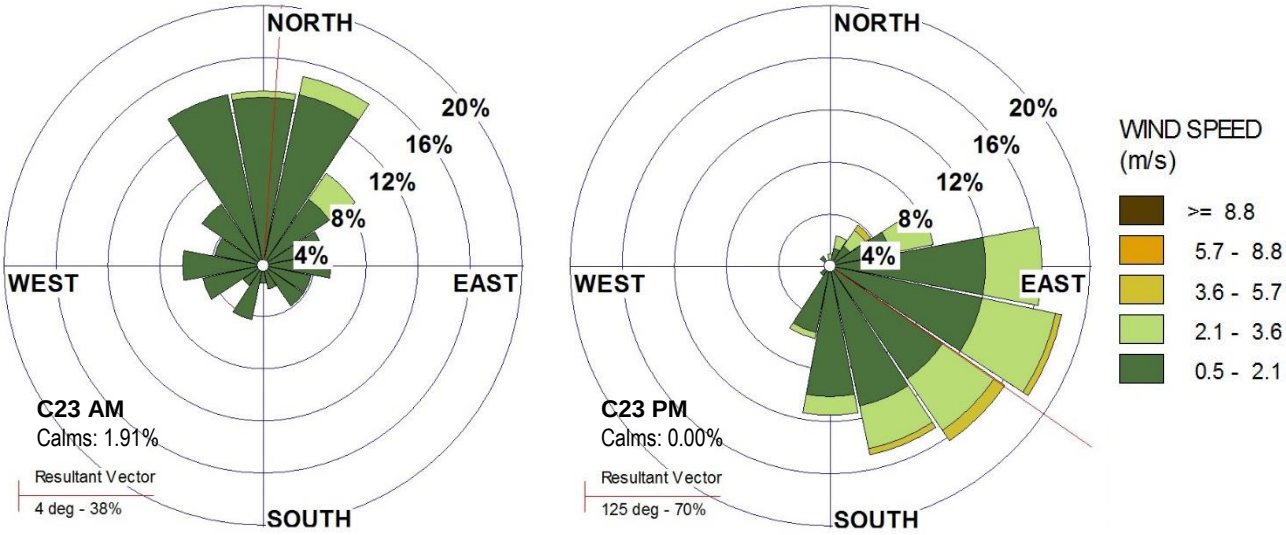


Figure 2-10: C23 AM (6 a.m. to 8 a.m.) and PM (12 p.m. to 2 p.m.) Wind Roses, 2005-2015

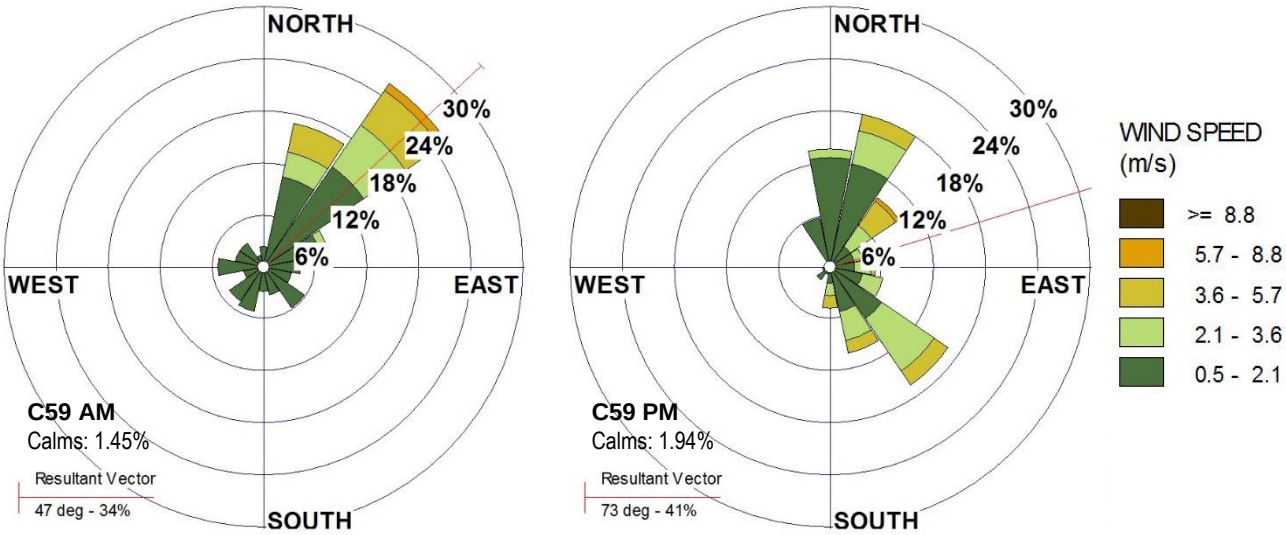


Figure 2-11: C59 AM (6 a.m. to 8 a.m.) and PM (12 p.m. to 2 p.m.) Wind Roses, 2005-2015

2.7 Emissions Sources

Projected Trends. AACOG develops periodic emissions inventories of non-road, off-road, and area sources in the region. Combining AACOG data with point source emissions from TCEQ and on-road emissions estimates calculated by the MOVES2014 model provides an indication of the daily and annual anthropogenic NO_X and VOC emissions generated in the region by sector.

Despite a consistently increasing population in the region, analyses of emissions trends indicated that regionally-generated NO_X emissions should continue a downward trend, largely due to improvements in vehicle emission standards. Local overall VOC emissions are expected to remain relatively static (Figure 2-12).

Weekday NO_X emissions for 2012 from on-road sources in the SA-NB MSA were estimated at 77 tons per day, followed by point sources at 66 tons per day. By 2018, that trend is expected to reverse, so that point sources are expected to be the largest source of NO_X, at 64 tons per day, and on-road sources fall to second largest at 43 tons per day.

In terms of anthropogenic emissions, most VOCs generated in the SA-NB MSA originate from the facilities and activities collectively categorized as area sources. This trend is expected to continue through 2023, the last date for which emissions have been estimated.

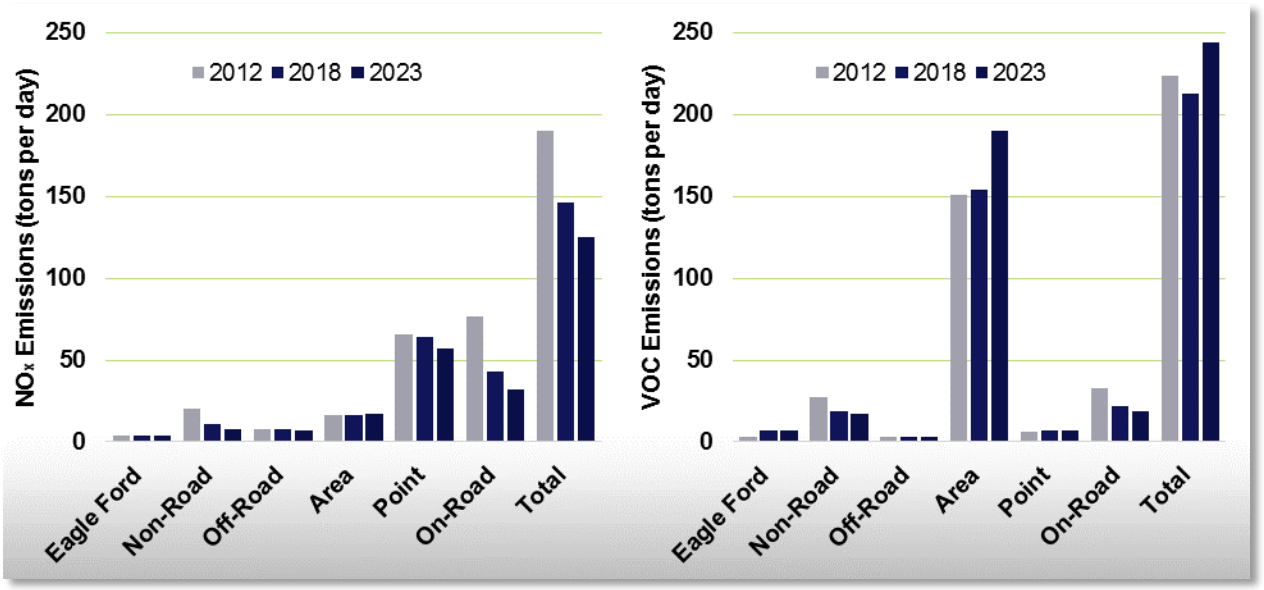


Figure 2-12: NO_X and VOC Emissions Estimates by Source in the San Antonio-New Braunfels MSA, 2012, 2018, and 2023

Table 2-4 lists total emissions by county, which include point, area, on-road, non-road, and biogenic sources. Point source emissions data is from 2014, non-road emissions data is from 2012, on-road and area emissions data are from 2011, and biogenic emissions data is from 1999.[4] These were the latest available data from the Texas Air Emissions Repository before that site went offline indefinitely for maintenance.

County	NO_X (tpd)	VOC (tpd)
Atascosa	12.3	15.7
Bandera	1.8	3.4
Bexar	107.8	112.5
Comal	6.6	2.5
Guadalupe	12.3	21.8
Kendall	2.9	3.9
Medina	4.6	9.0
Wilson	3.3	9.6

Table 2-4: Total NO_X and VOC Emissions Estimates by County

On-road Sources. On-road vehicles have traditionally represented the largest source of NO_X in the region. San Antonio is transected by a number of major highways and its proximity to multiple land and ocean ports guarantees an abundance of heavy-duty vehicle traffic. Development of the Eagle Ford Shale area has served to further increase the use of heavy-duty vehicles on the region's roadways. Table 2-5 lists 2011 on-road emissions by county.

County	NO_X (tpd)	VOC (tpd)
Atascosa	3.9	0.9
Bandera	0.9	0.4
Bexar	61.0	27.9
Comal	6.6	2.5
Guadalupe	6.5	2.3
Kendall	2.5	0.8
Medina	2.8	0.9
Wilson	1.8	0.8

Table 2-5: On-road NO_X and VOC Emissions Estimates by County, 2011

[4] Texas Commission on Environmental Quality. (2015). Texas Air Emissions Repository (TexAER). http://www.tceq.state.tx.us/airquality/areasource/TexAER.html. Accessed May 25, 2015.

Point Sources. The largest point sources for NO_X emissions in South Central Texas are coal-fired power plants and cement plants. Other point sources include military bases, research facilities, and manufacturing operations (Table 2-6). This table is not an exhaustive list of large sources in the region, but solely lists those that emit more than 0.27 tpd (100 tpy) of NO_X or VOCs.

County	Point Source Name	NO_X (tpd)	VOC (tpd)
Atascosa	San Miguel Electric Plant	6.45	0.14
Bandera	Bandera Compressor Station	0.53	0.08
Bexar	Alamo Cement 1604 Plant	6.81	0.09
Bexar	Calumet Petroleum Refinery	0.07	0.32
Bexar	Capitol Aggregates	1.71	0.30
Bexar	CPS Braunig Plant	1.20	0.11
Bexar	CPS Calaveras Plant	18.79	0.20
Bexar	Southwest Research Institute	0.58	0.15
Bexar	Toyota Vehicle Assembly Plant	0.06	1.20
Comal	Cemex Balcones Plant	6.37	0.06
Comal	Lhoist Lime Plant	1.31	0.01
Comal	TXI Hunter Cement Plant	3.83	0.25
Guadalupe	Guadalupe Generating Station	1.53	0.06
Guadalupe	Republic Plastics Foam Plant	0.00	0.40
Guadalupe	Rio Nogales Power Plant	0.83	0.01
Guadalupe	Structural Metals Steel Mill	0.30	0.10
Hays	Hays Energy Plant	0.33	0.04
Hays	Texas Lehigh Cement Plant	6.54	0.52
Karnes	Enterprise Products Area 71 GCP	0.28	0.39
Karnes	ETC Texas Pipeline Kenedy Plant	0.32	0.04
Karnes	Marathon Oil East Sugarloaf	0.22	0.28
Live Oak	Three Rivers Gas Plant	0.48	0.22
Live Oak	Three Rivers Refinery	1.00	0.67

Table 2-6: Total Point Source NO_X and VOC Emissions for the SA-NB MSA and Outlying Counties, 2014

The TCEQ maintains a database of major point sources across the state that is updated every year. The latest update to this Point Source Emissions Inventory was for 2014. Any point source of NO_X or VOCs in the SA-NB MSA was located using Google Earth and TCEQ permits. Figure 2-13 and Figure 2-14 show the locations of point sources of NO_X and VOCs, respectively. Also displayed is the amount of NO_X or VOC emissions that each point source generates. It is useful to geographically represent these major point sources so that, in conjunction with trajectory analyses, the transport of these emissions can be better understood.

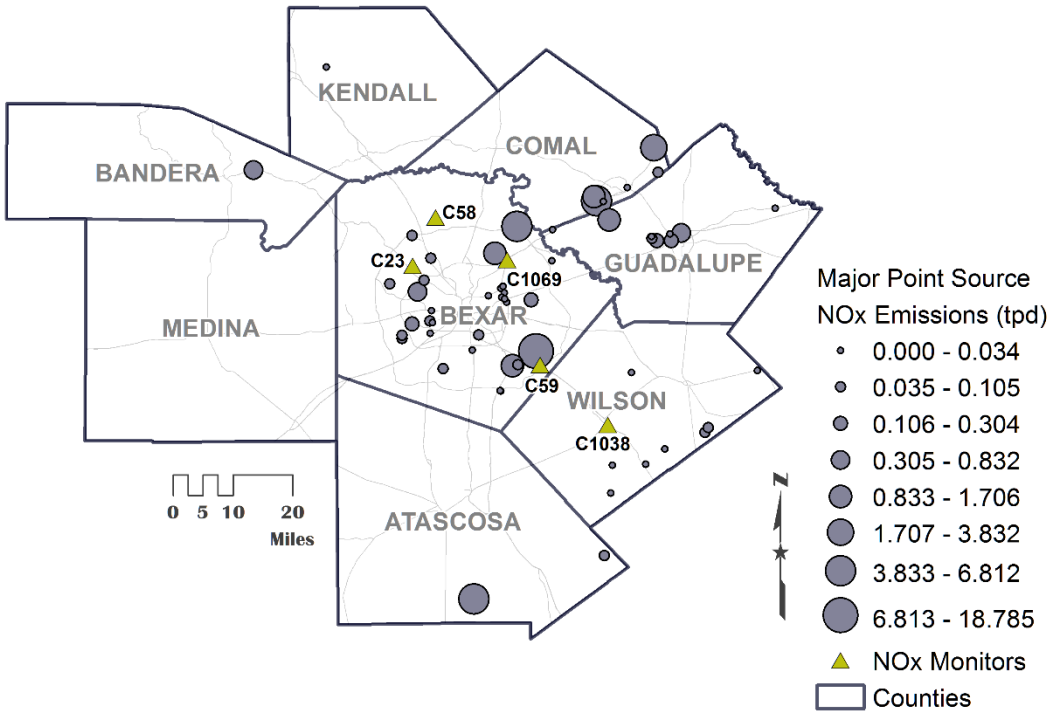


Figure 2-13: Major Point Sources of NO_X in the SA-NB MSA

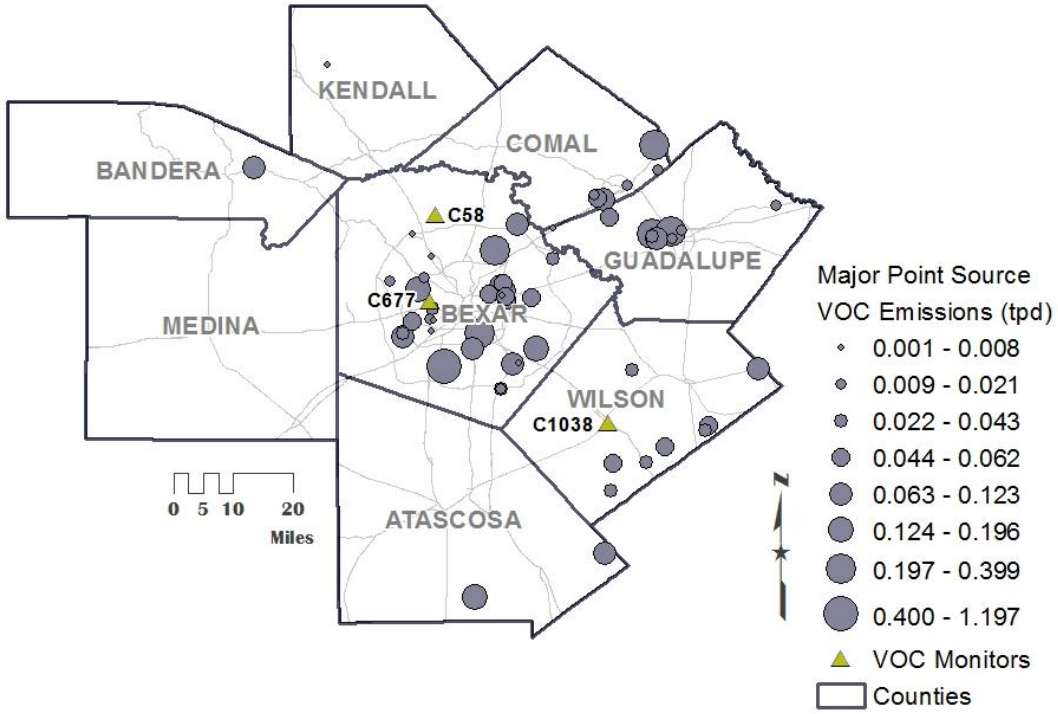


Figure 2-14: Major Point Sources of VOCs in the SA-NB MSA

2.8 Photochemical Modeling

AACOG conducts analysis of factors influencing local ozone concentrations using photochemical models that simulate actual high ozone episodes in the region. Since photochemical models simulate the atmospheric and meteorological conditions that helped produce high ozone values during a particular episode, an important advantage the models provide is the ability to test various scenarios, such as changes in emission rates, under the same set of meteorological conditions that favor high ozone concentrations.

The most recently completed photochemical modeling project[5] was based on a May 24 – June 2, 2006 episode provided by TCEQ and refined by AACOG with regional emissions inputs.[6] The June 2006 model was projected to 2018 using forecasted changes in anthropogenic emissions.

Incremental Emission Reductions Analysis. Increments of NO_X and VOC precursor emissions were removed from the 2018 projection to determine the percentage of reduction required for the MSA to meet attainment standards. Nine scenarios were analyzed at several ozone monitoring sites. The scenarios included reductions in NO_X, VOC, and NO_X and VOC at incremental reductions of 25%, 50%, and 75%. Results from C58, which is the regulatory monitor that typically records the highest ozone, are depicted in Figure 2-15.

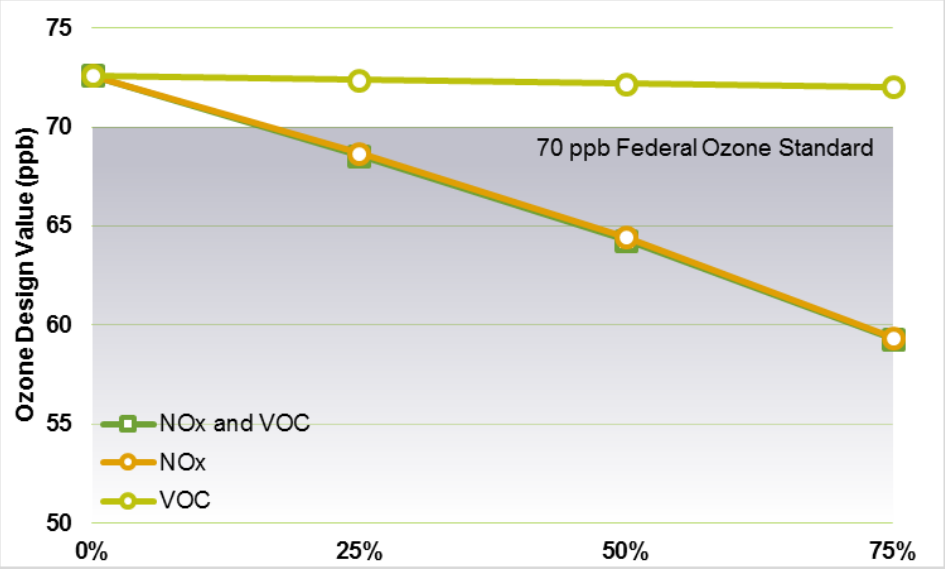


Figure 2-15: Predicted Ozone Design Value at C58 after Removing Local NO_X and VOC Emissions, 2018

[5] Alamo Area Metropolitan Planning Organization. (October 2015). "Ozone Analysis June 2006 Photochemical Modeling Episode Technical Report," prepared by AAACOG.

[6] The photochemical model used for this analysis was CAMx version 5.40. Three-dimensional hourly meteorological fields were generated by WRF via the WRF2CAMx interface tool. A complete description of the model's configurations is provided in AACOG's report *Development of the Extended June 2006 Photochemical Modeling Episode,* developed with funding from the Alamo Area MPO.

Overall results from all monitors were similar to C58, indicating that the model was significantly more sensitive to changes in NO_X emissions reductions (verses VOC or NO_X and VOC), which means that strategic controls that are designed to reduce NO_X emissions would likely be more effective at reducing ozone. Results also indicate that in order to meet the 70 part per billion (ppb) threshold established by the 2015 ozone NAAQS, the region would have to reduce NO_X emissions by approximately 25%.

Transport Analysis. AACOG also conducted an Anthropogenic Precursor Culpability Assessment (APCA) to determine sources of emissions transport. One of the categories AACOG reviewed was emissions source groupings for all regions in the modeling domain (Figure 2-16) to determine their impact at the regulatory monitors in the San Antonio-New Braunfels MSA. At 32 percent, the largest emission source contributor to ozone readings at C58 on days > 70 ppb was point sources. As Figure 2-17 shows, the second largest source contributor was boundary conditions at 28%, followed by on-road emissions at 17% and non-road/off-road equipment at 12%.

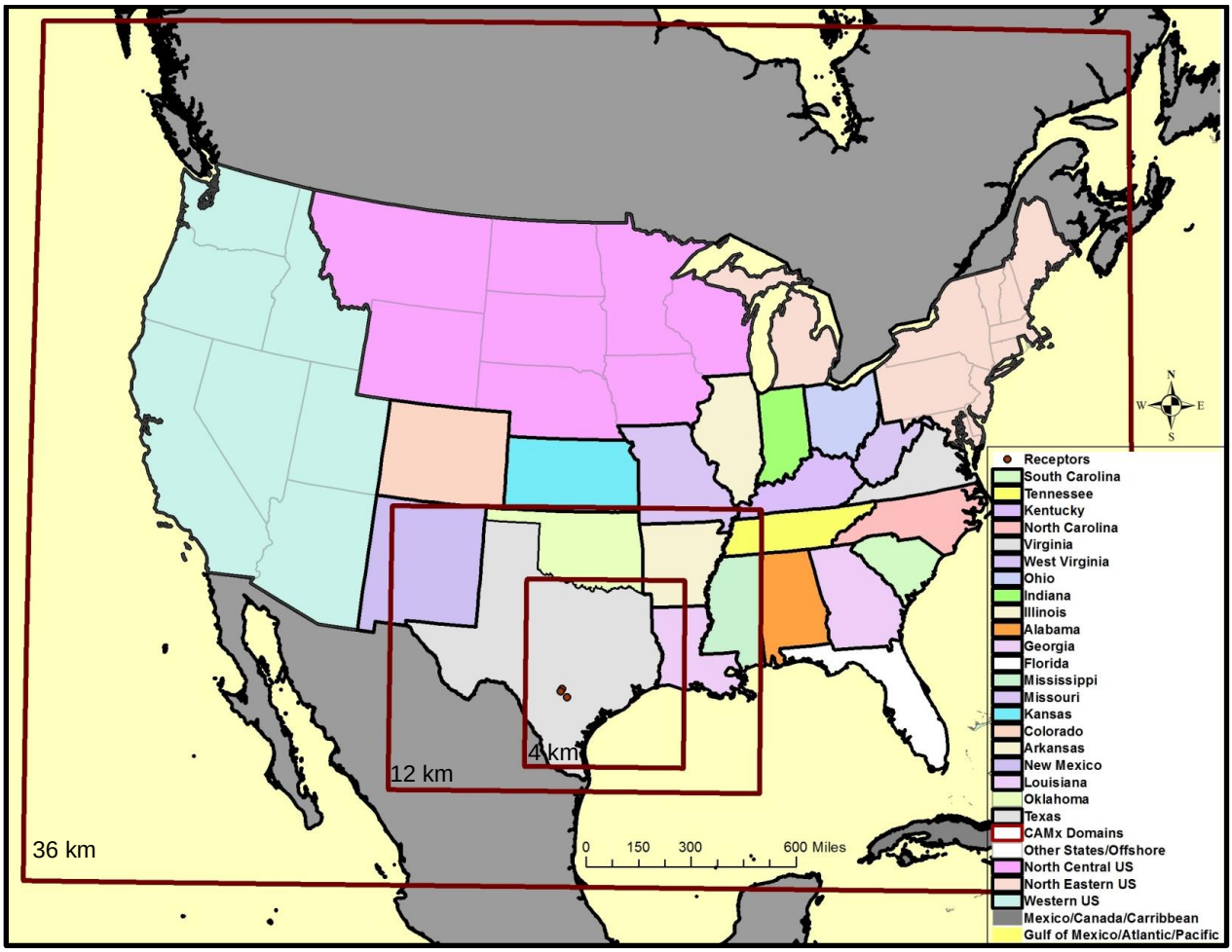


Figure 2-16: APCA modeling domain at 36 km, 12 km, and 4 km grid levels

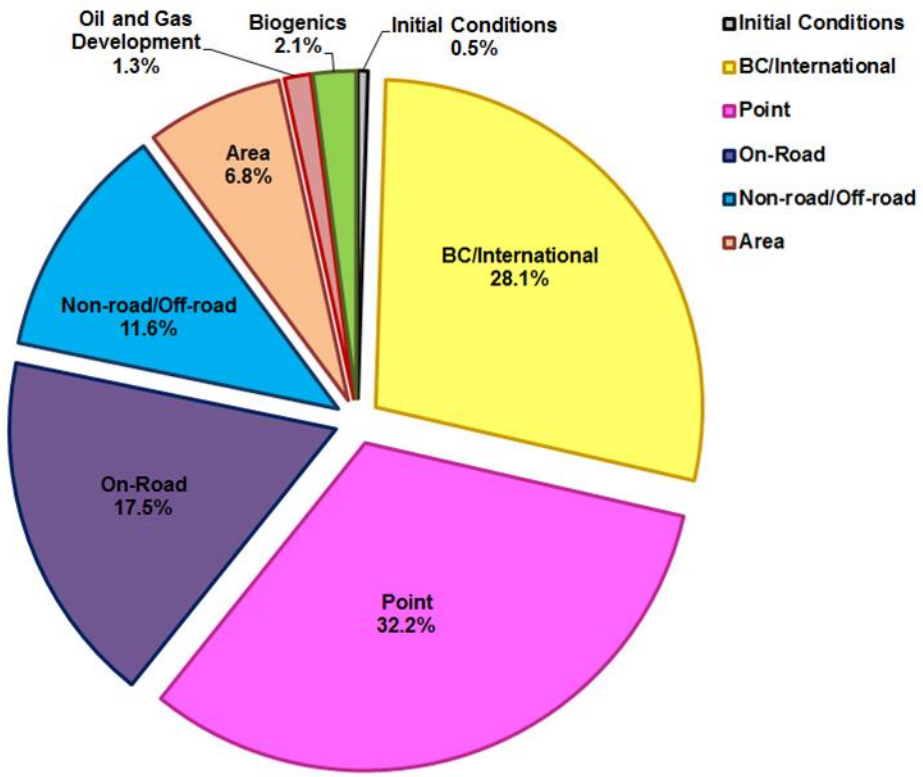


Figure 2-17: All Emissions Sources for Average Peak 1-Hour Ozone on Days > 70 ppb at C58, 2018

For runs conducted to determine the geographic regions with the greatest impact on ozone concentrations in the San Antonio area, results indicated that Texas was the largest contributor, ranging from 52% to 62% of peak hourly ozone on design value days at the regulatory monitors. When looking at other-than-Texas sources, the Gulf of Mexico, Atlantic, and Pacific Ocean regions contributed 25%-27%, and Louisiana contributed 17%-21% (Figure 2-18). Other larger contributors included the western portion of the U.S., Oklahoma, North Central U.S., and Kansas. Refer to Figure 2-16 for geographic representation of the various regions and states.

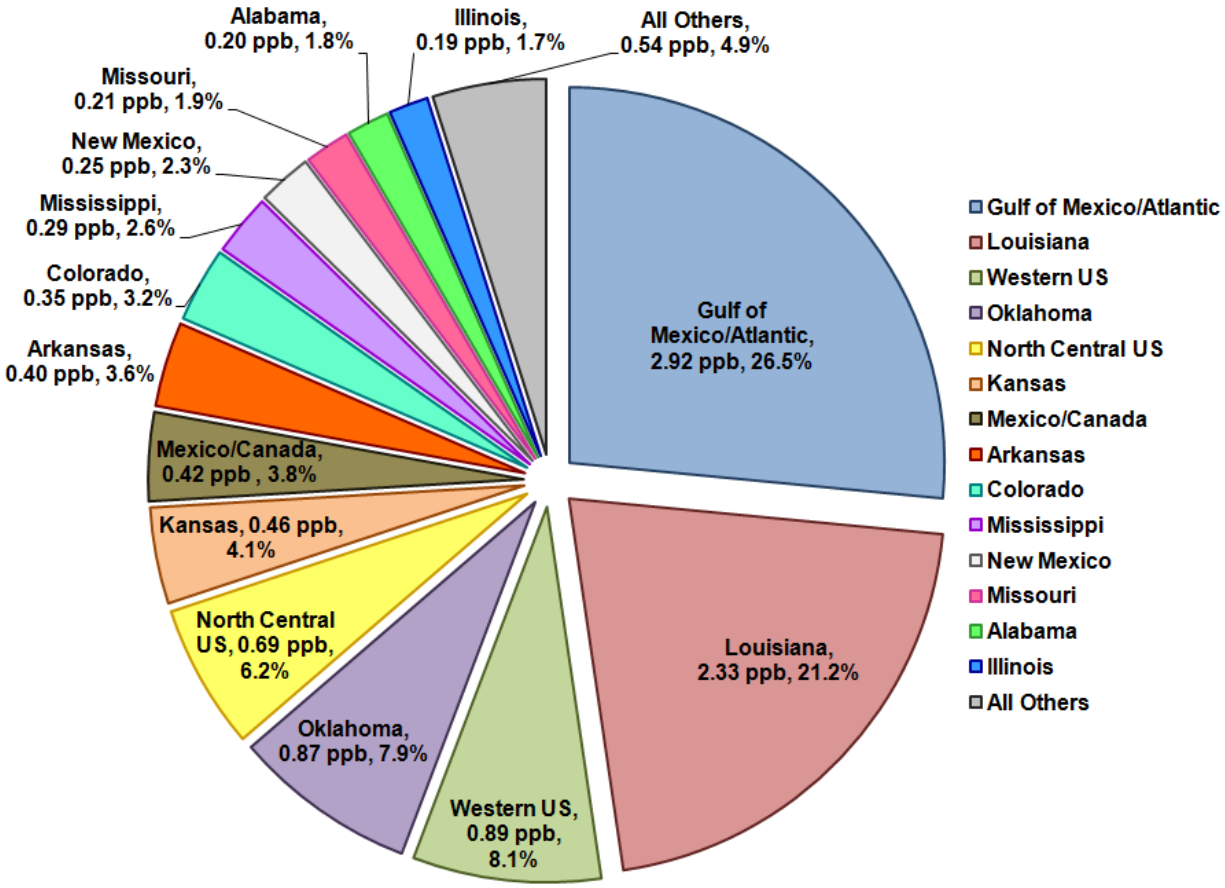


Figure 2-18: States/Other Regions besides Texas Sources for Average Peak 1-Hour Ozone on Days > 70 ppb, 2018

CHAPTER 3: Regional Planning

3.1 Formation of the Air Improvement Resources (AIR) Committee

As a “near-nonattainment” area for ozone, the San Antonio region has a history of air quality planning and voluntary control implementation aimed at keeping the region’s air quality within the thresholds established by the NAAQS. As early as 1995, the first air committee was formed by the Alamo Area Council of Governments to address air quality issues. This committee requested the first emissions inventory for the region, for inventory year 1994.

In January 1996, the San Antonio Mayor's Blue Ribbon Committee on Air Quality merged with the Air Quality Committee of the Alamo Area Council of Governments (AACOG) to form the Air Quality Task Force (AQTF). The charge of the AQTF was to develop public education and provide advice to elected officials on air quality issues. One of the accomplishments of the AQTF, was the establishment of an Ozone Action Day program in the region.

In response to EPA’s proposed eight-hour ozone NAAQS in the summer of 1996, the AQTF shifted its focus to providing comments and guidance on the impact of the new eight-hour ozone NAAQS. Data collected at regional monitors indicated that on high ozone level days, background levels arriving in the area were at or near ozone NAAQS threshold levels. Later that year when EPA finalized the eight-hour NAAQS it became apparent that, based on historical data, the San Antonio Metropolitan Statistical Area (SA/MSA) could well be designated non-attainment when the EPA made the first eight-hour non-attainment designations initially scheduled for July 2000.

During July 1998, the City of San Antonio (COSA), San Antonio-Bexar County Metropolitan Planning Organization (MPO), Bexar County, and AACOG staff recommended to elected officials that the AQTF be revised to fit the structure advised by the Texas Natural Resource Conservation Commission (TNRCC). During January - February 1999, AACOG’s Boards of Directors and other responsible parties representing COSA, Bexar County, and the MPO approved the formation of the Air Improvement Resources (AIR) Committee consortium including the Executive/Advisory, Technical, and Public Education Committees and member appointments. The AIR Committee conducted their first official meeting during April 1999 with the goal to establish an organized, comprehensive, and aggressive plan of action to keep the SA/MSA from slipping into nonattainment of the ozone standard.

3.2 Early Action Compact

In 2002, EPA announced the Early Action Compact (EAC) protocol for helping regions achieve and maintain the 8-hour ozone NAAQS by facilitating early, voluntary ozone reduction plans in a manner consistent with applicable local, state, and federal air quality policies. The protocol outlined specific deliverables and reporting requirements

for participation. Later that year, the elected officials serving on the AIR Executive Committee, with the approval of the local municipalities and counties they represented, signed an EAC in partnership with the Chairman of the TNRCC and the Regional Administrator for the EPA.

Although EPA designated the San Antonio region as being nonattainment deferred due to a recorded design value of 89 parts per billion (ppb) during the 2001-2003 averaging period, the EAC agreement allowed the region time to implement voluntary strategies that helped to reduce ozone precursor emissions. By the end of the effective term of the EAC on December 31, 2007, regulatory monitors were again showing compliance with the ozone standard. Under the terms of the EAC, the region was re-designated as being in attainment, that is, as being in compliance with the federal ozone standard.

With the promulgation of a revised 8-hour average ozone standard in 2008, however, the San Antonio region again faced the possibility of a nonattainment designation. In April 2012, EPA designated 46 areas as nonattainment of the 75 ppb threshold established by the 2008 standard. Although the San Antonio region's ozone values met the standard at the time, within a few months, the three-year average on which attainment is based had climbed above the health-based standard.

3.3 Ozone Advance Program

The on-going challenge the region faces in meeting the 2008 standard as well as past successes with the EAC program provided local leaders the incentive to participate in EPA's Ozone Advance program. Although the program does not shield an area from a nonattainment designation, it does facilitate efforts aimed at reducing ozone pollution and maintaining healthy air quality. Therefore, the program has the potential for helping a region avoid a nonattainment designation and the requirements associated with such a designation.

In July 2012, the AIR Executive Committee submitted to EPA a letter of participation in the Ozone Advance program. In 2013, 2014, and 2015 the Committee submitted Path Forward plans for the region that described activities implemented by multiple regional government agencies, industries, and organizations to reduce NOx and VOC emissions.

3.4 Strategic Plan

On September 30, 2015, the AIR Executive Committee formally adopted the Air Quality Strategic Plan for the Alamo Region, which outlines specific steps the region will implement to reduce ground-level ozone. This plan supports the work of the AIR Committees and complements the Ozone Advance by establishing planning and outreach goals and describing specific actions necessary to address local ozone issues. In addition, the strategic plan is considered a perpetual document and will continue to guide local efforts in the event EPA concludes the Ozone Advance program or the region's eligibility changes. The Alamo Region's Strategic Plan describes four focus areas that represent key local actions for improving air quality and enhancing public health. These key actions include:

- Defining the ozone challenge by identifying the factors that contribute to local elevated ozone concentrations and developing a list of appropriate strategies based on this comprehensive evaluation.

- Building support among local leaders and influencers for the regional air quality planning process by encouraging greater participation from governments, businesses, and industries in our AIR Committees and increased coverage of ozone issues by the media.

- Developing an effective outreach and education campaign by partnering with local governments, schools, organizations, media, and businesses to expand available resources and build an informed populace.

- Implementing a program to encourage voluntary adoption of appropriate control strategies by businesses, governments, industries, schools and individuals.

The AIR Committees are regularly updated on the status of plan elements and progress towards the goals of the plan. The following examples demonstrate the range of measures AACOG, local governments, and other stakeholders have implemented to meet the goals of the strategic plan since its implementation in September 2015.

OZONE ASSESSMENT FOCUS

Define the region's ozone challenge in order to identify the most effective voluntary strategies for the region.

With financial support from the State, AACOG staff maintains a Conceptual Model of the region that identifies and characterizes meteorological and atmospheric conditions associated with high ozone concentrations. The model is frequently updated with new data to facilitate analysis of the relationships between ozone concentrations (e.g., upwind and downwind measurements and seasonal variations), and wind speed, humidity, diurnal temperature changes, solar radiation levels, back trajectories, precursor emissions, and many other variables.

Local stakeholders are exploring the possibility of conducting a comprehensive study of local meteorology and emissions sources to better understand the connection between these factors and high ozone episodes. Encouraged by the success of similar studies in other areas, stakeholders are collecting data and gathering input on research methodologies.

Identify key local sources of precursor emissions that contribute to elevated ozone concentrations.

AACOG maintains a list of the largest NOx and VOC sources in the region through the State's permit database. In addition, the San Antonio city council passed an ordinance in November 2015 "requiring business facilities with air pollution emissions to register with Metro Health. This registration process will help identify local sources of ozone

components and develop steps to lower emissions and improve air quality for residents." These efforts should enable development of a database of emissions sources and emission rates that can be compared with local NOx and VOC emission inventories and assist analysts in determining the impact of these emissions on ambient ozone levels.

COMMUNITY SUPPORT FOCUS

Encourage and build support from the community for air improvement efforts and identify those willing to take a leadership role in promoting air quality improvements.

AACOG staff has been working to obtain greater representation on the AIR committees to ensure vacancies are filled and to ensure a wide range of interests are represented. Additional representation to the AIR Committees includes the San Antonio Chamber of Commerce, VIA Metropolitan Transit, Air and Health Collaborative of San Antonio, Joint Base San Antonio, and Comal County.

OUTREACH/EDUCATION FOCUS

Develop an effective outreach and education program that facilitates building an informed community and encourages individual actions.

AACOG, City of San Antonio, and other partners conducted two very successful meetings in the fall of 2015 to gather ideas from regional governments and businesses on an air quality logo and tagline for branding ozone pollution messages. Recommendations from the stakeholders prompted organizers to expand the purpose of the effort to develop a more comprehensive, regional marketing campaign. Subsequent activities included identifying possible funding mechanisms for campaign development and holding conference calls with other regions that had developed successful air quality campaigns.

Encourage media coverage of ozone issues and support for relaying information that is important to public welfare including the promotion of individual clean air actions.

In fall 2015, several members of the AIR Advisory Committee met with television meteorologists to encourage coverage of ozone action day alerts and related information. Per a request by meteorologists during a September 2015 meeting, AACOG developed an ozone AQI gauge that can be used by all visual media so that the public is presented with a consistent, identifiable image for the index.

Work with schools, universities, and the medical community to increase knowledge of ground-level ozone.

Through the Bexar County Medical Society's electronic newsletter, the AIR Executive Committee sent a letter to area physicians, requesting their assistance in informing their patients of the health risks of ground-level ozone and the services available to notify them of predicted and current levels of ozone, which would assist them to act accordingly. The letter included a link to an informative brochure that the physicians could download and make available in their offices or waiting rooms. It also invited them to be placed on AACOG's email notification system for Ozone Action Days. The letter was distributed through the electronic newsletter to 6,500 physicians during October, 2015.

CONTROL STRATEGY FOCUS

Assist local governments with policy implementation and outreach.

Between March and June 2016, three local governments in the AACOG region implemented anti-idling ordinances: City of Leon Valley, Bexar County and the City of San Antonio. The anti-idling policies limit heavy-duty vehicles (>14,000 tons gvw) from idling for more than five minutes. Exemptions exist for certain applications, such as emergency vehicles, vehicles that must be run in order to perform work, and those required to idle per manufacturer's operational guidelines. More information about these and other local voluntary controls are provided in Chapter 4.

Encourage voluntary adoption of ozone control strategies among the region's local governments, businesses, industries, schools, and other organizations.

AIR Executive Committee Chair Ron Nirenberg launched a series of roundtable meetings in the fall of 2015 with industries and local agencies to gather their input on appropriate voluntary ozone strategies for the San Antonio region and identify barriers to strategy adoption.

In conjunction with the City of San Antonio, AACOG developed a list of voluntary measures for distribution at the roundtable sessions. The list includes measures that are widely applicable because they can be implemented by virtually any employer. Measures listed on the form include employee commuting programs, energy conservation, fleet maintenance, and air quality education (e.g., notifying staff of ozone action day alerts). The forms were also distributed to representatives of local governments, businesses, and industries attending the Greater Bexar County Council of Cities meeting in November 2015 and the AIR Technical Committee meeting in January 2016. Completed commitment forms have been received from Bexar County, CPS Energy, City of Garden Ridge, City of Leon Valley, City of Live Oak, City of Marion, City of San Antonio, Southwest Research Institute, South Texas Energy and Economic Roundtable (STEER), TxDOT, City of Universal City, and VIA Metropolitan Transit. Table 3-1 indicates the commitments made by each of these participants.

Table 3-1: Commitments to Air Quality by Local Stakeholders

	Bexar County	CPS	Garden Ridge	Hill Country Village	Leon Valley	Live Oak	Marion	San Antonio	SWRI	STEER	TxDOT SA District	Universal City	VIA	AACOG
Fleet Operations, Maintenance, and Vehicle Options														
Provide regular maintenance on fleet vehicles	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ensure tires on fleet vehicles are properly inflated	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ensure no extra weight is carried in fleet vehicles	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Right-size fleet vehicles for appropriate tasks	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Implement company no-idle policy for fleet vehicles	✓	✓	✓		✓	✓	✓	✓	✓				✓	
Incoproate EV or high MPG vehicles into fleet	✓	✓	✓		✓			✓	✓	✓	✓		✓	
Provide EV charging for employees and guests	✓	✓						✓	✓	✓				✓[1]
Energy Efficiency and Resource Conservation														
Purchase environmentally friendly equipment (Energy Star) and vehicles	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Provide recycling options for employees	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Install programmable thermostats in workplace	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	
Adopt alternative energy (solar panels, Windtricity, Solar Choice Program)	✓	✓	✓		✓			✓		✓		✓	✓	
Install motion sensing light fixtures/switches	✓	✓			✓		✓	✓	✓	✓			✓	
Install water-saving faucets, showerheads, toilets and sprinklers	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	
Employee Commuter Benefits														
Provide space for employees to store food and eat at work	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
Participate in a carpool subsidy program for employees								✓					✓	
Participate in a bicycle subsidy program for employees								✓						
Implement a telework program								✓	✓	✓	✓[2]		✓	✓
Offer compressed and alternative work schedules	✓	✓		✓	✓			✓		✓	✓		✓	✓
Offer pre-tax benefits to employees		✓							✓		✓[3]			
Provide preferred parking space for carpool vehicles	✓		✓					✓	✓				✓	
Promote employer-specific carpool matching service (NuRide.com)		✓			✓			✓	✓		✓		✓	✓
Participate in the guaranteed ride home program (AACOG's C.A.R.E.)	✓	✓						✓	✓		✓		✓	✓
Provide secure, on-site bicycle parking	✓		✓		✓	✓		✓	✓	✓			✓	
Provide showers and lockers for employees who bike or walk	✓	✓	✓	✓	✓	✓		✓		✓	✓		✓	
Participate in commuting awards program (AACOG's Walk & Roll Challenge)	✓	✓						✓	✓		✓[4]		✓	✓
Provide lunchtime shuttle options									✓[5]				✓	
Provide transit subsidy (VIA bus passes)	✓	✓						✓	✓				✓	✓
Install a public traffic notification system	✓							✓	✓		✓			
Other														
Communicate Ozone Action Day notices to employees	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓

NOTES
1 AACOG obtained information on charging stations and has requested building manager consider installing the charging equipment
2 TxDOT conducted a pilot program in Austin, which is under review for possible state-wide adoption
3 TxDOT employees are eligible for commuter benefit spending accounts (tax free account), however there is no subsidy program with the State
4 TxDOT maintains a CAP program which allows employees to earn points for 2, 4 or 8 hours off for logging clean commute habits
5 SWRI maintains an employee cafeteria on site

3.5 Inter-Regional Collaboration

The first joint air quality meeting between AACOG's Air Improvement Resources (AIR) Executive Committee and the Capital Area Planning Council of Governments' (CAPCOG) Clean Air Coalition was held on April 29 in San Marcos. The Clean Air Coalition represents local governments in the Austin-Round Rock MSA. Elected officials from the two committees approved a joint resolution requesting EPA consider specific actions during the 2015 ozone standard designation and implementation process that would provide nonattainment regions with more flexibility in meeting the new NAAQS. In addition, staff from both regions discussed potential control strategy coordination, legislative initiatives, and outreach activities.

The committees agreed to continue holding joint meetings in order to identify opportunities for collaboration on a larger regional scale. In addition, the AIR Executive Committee and Clean Air Coalition determined that holding combined meetings twice a year is optimal. The next joint meeting is scheduled for Friday, November 4, 2016 in San Marcos.

Central Texas Clean Air Coalition Chair, Travis County Judge Sara Eckhardt, and Air Improvement Resources Committee Chair, City of San Antonio Councilman Ron Nirenberg, colead a joint meeting held in San Marcos[7]

[7] Photo source: San Antonio Express News, Available: http://www.expressnews.com/news/local/article/San-Antonio-Austin-governments-ask-for-break-on-7384585.php#photo-9920470.

3.6 AACOG Projects

The following are some of the projects AACOG has planned during the September 2015 - October 2017 biennium. These projects are funded through grants or contracts with the Texas Commission on Environmental Quality, the Texas Department of Transportation, and the Alamo Area Metropolitan Planning Organization and may be mentioned in other parts of this report:

Network Design Analysis. Using geospatial analysis techniques, photochemical modeling results, statistical methods, back trajectories, and other tools, the current ozone and ozone precursor monitoring network will be assessed and recommendations will be provided on how to improve the network. Emphasis will be placed on expanding the monitoring network within Bexar County.

Development of Public Education Campaign. This is a plan that will include outreach program goals, messaging strategy, and promotion of cost-efficient options to reduce ozone in the region.

Cost of Nonattainment for the San Antonio Region Technical Report. This report will quantify the economic costs associated with a nonattainment designation. Assuming either a marginal or moderate classification, economic costs associated with mandatory regulations and additional voluntary controls to bring the region into attainment will be assessed in terms of gross regional product. Economic costs will be evaluated on a county-by-county basis for the SA-NB MSA.

Ozone Conceptual Model: Updates through 2016. This is a comprehensive analysis of the conditions associated with high ozone measurements in the region. Emissions inventory summaries, photochemical model results, wind rose and back trajectory analysis, and ozone precursor behaviors will be evaluated.

Update of Eagle Ford Emissions Inventory. The update will include the latest production data and oil and gas emission calculations. A survey of compressor engine use will be included. Emissions shall be calculated for 2015 and projected to 2020 and 2023.

Update of Commercial Fuel Combustion Emissions Inventory. This project will rely on the most recent state-level fuel consumption data and projections from the Energy Information Administration (EIA) and county-level employment data for NAICS codes 42 – 99. Fuel consumption will be estimated separately for each county in the AACOG region.

Update of Residential Fuel Combustion Emissions Inventory. Data used in this study will include information from existing studies, industry specific fuel consumption activity factors derived from EIA, and emissions factors provided by EPA. Fuel consumption will be estimated separately for each county in the AACOG region.

Update of Industrial Equipment Emissions Inventory. The update will include equipment population estimates and engine parameters for aerial lifts, forklifts,

sweepers/scrubbers, refrigeration units, terminal tractors, and other equipment. Emissions will be estimated separately for each county in the AACOG region.

Photochemical Modeling to Determine Efficiency of Local Control Strategies. AACOG will perform modeling sensitivities and conduct evaluations to determine whether to develop 2020 or 2023 photochemical model runs.

CHAPTER 4: Voluntary Strategies

4.1 CPS Energy

CPS Energy is owned by the City of San Antonio and provides energy services to the City and the surrounding areas using multiple energy sources, including natural gas, coal, nuclear, solar, wind, and landfill gas.

Ongoing Strategies – Updated since 2015 Update

Save for Tomorrow Energy Plan (STEP). The Save for Tomorrow Energy Plan (STEP) aims at reducing the growth in our community's demand for electricity by 771 megawatts (MW) of electricity between 2009 and 2020, which is equivalent to the capacity of a large power plant. As of February 1, 2016, CPS Energy has reduced demand by 463 MW. CPS Energy has created a series of consumer-based reduction programs to achieve STEP goals:

- Solar Photovoltaic (PV) Rebates are provided to residential and commercial customers.

- My Thermostat Rewards offers customers programmable thermostats that help to conserve energy during periods of high energy demand.

Duke Energy Blue Wing Solar Project supplies electricity to CPS Energy under the terms of a 30-year power purchase agreement.

- Commercial and Industrial Demand Response program offers rewards to commercial and industrial customers for reducing energy use on peak demand days. Customers receive a two-hour notification of when to initiate energy reductions or receive a signal that automatically triggers load-shedding measures. The automated option opens the door for smaller commercial customers to participate in the program.

- LED Street Light Installations in the City of San Antonio have increased lighting energy efficiency. So far, 25,000 lights have been installed and another 30,000 are planned to be installed over the next few years.

Energy Generation Management. CPS Energy is further reducing emissions through technology and through the management and expansion of a diverse generation portfolio.

- Renewable Energy. CPS Energy's goal is to achieve 1,500 MW of renewable energy capacity by 2020, approximately 20% of generation capacity. The goal is on track to be achieved in early 2017. As of June 30, 2016, CPS Energy has 1,302 MW of renewable-generated electricity in commercial operation, which includes 1,059 MW of wind, 229 MW of utility-scale solar, and 14 MW of landfill gas. CPS plans to increase capacity of utility-scale solar power by about 221 MW by early 2017. As of May 2016, CPS Energy customers contribute to 38.4 MW of rooftop solar capacity.

- "Rebalanced" Generation Portfolio. CPS Energy has reduced emissions by "rebalancing" their generation portfolio. This strategy included acquiring additional renewable energy and purchasing a natural gas plant in 2012.

- Emissions Control Technology for Coal Units. CPS Energy has invested over $253 million in emission control technologies at its coal units since 1997, which included the installation of a separated overfire air (SOFA) system, bag houses, NO_X combustion controls, selective catalytic reduction (SCR) technology, and mercury controls. As a result, NO_X emissions were reduced over 70% from 1997 to 2012.

- Decommission J.T. Deely Coal-Powered Plant. CPS Energy plans to decommission the J.T. Deely coal-fired power plant by 2018. Replacement generation capacity will be provided by the natural gas-fired power generation facilities and renewable energy.

Other Programs.

- Mow Down Smog Rebates program provides customer rebates for purchasing electric instead of gasoline-powered lawn equipment. In 2015, CPS Energy issued 311 rebates for electric lawn equipment and has issued over 8,800 rebates since 1998.

- Green Shade Tree Rebates are provided to customers to create shade which keeps homes cooler and reduces energy use. About 8,000 trees have been planted since 2009, and nearly 2,000 trees are distributed to customers each year.

New/Proposed Strategies

Selective Catalytic Reduction Technology. CPS Energy is installing selective catalytic reduction technology to its J.K. Spruce 1 Unit to further reduce NO_X emissions, and it will be operational by 2020.

Simply Solar. In addition to their rebate for homeowners who purchase solar panels, CPS energy piloted two new programs to help drive the adoption of clean energy. The first is Roofless Solar, a community solar project, and the second is SolarHostSA, a program where the CPS Energy customer hosts panels on their roof at no cost. Together, these two programs are trademarked as Simply Solar, and are designed to increase access to solar power to a greater number of customers.

SolarHostSA allows CPS energy customers to rent their roof space to a developer who installs and maintains the solar system at no cost to the consumer. CPS Energy buys the power produced and the customer receives a credit on their utility bill for the use of their rooftop. The pilot program is capped at 5MW of additional capacity, or about 500 customers.

The Roofless Solar community solar project allows those unable (or unwilling) to install solar on their own home to participate in CPS Energy's renewable energy programs, including renters. The first Roofless Solar project in San Antonio, is the 1.2MW farm developed by Clean Energy Collective. This pilot allows residential, commercial, and non-profit customers within the CPS Energy service area to buy solar panels located in the solar farm and have their bill credited with the energy created from those panels. The solar farm is expected to begin commercial operation in August 2016, and is already fully subscribed with a wait list.

4.2 San Antonio Water System (SAWS)

SAWS is a public utility owned by the City of San Antonio that is responsible for water, wastewater, storm water and reuse in Bexar County. The San Antonio Water System (SAWS) has implemented numerous activities that impact air quality through water conservation, which reduces the energy needed to pump and deliver water for daily use, and has implemented other strategies that reduce energy use, such as participating in energy-demand programs and building and managing their facilities responsibly.

Ongoing Strategies – Updated since 2015 Update

Commercial and Residential Water Conservation Programs.

- Total annual water savings of approximately 2,188 acre-feet with 1,116 acre-feet of peak savings achieved through:

    - 12 Commercial Custom Rebate projects for business customers
    - 192 Commercial and Residential irrigation and landscape rebate projects
    - 782 Low-Income plumbing assistance visits
    - 5,623 WaterSaver Patio and Landscape Coupons Redeemed
        - 1,130,600 sq /ft or 25.95 acres of turf grass converted
    - 2,412 Commercial and Residential consultations for customers
- 2015 Drought regulations in place throughout most of 2015:
    - Savings associated with water waste citations and warnings added 274 acre-feet of savings
    - Savings from general compliance with drought regulations saved between 5,000 and 15,000 acre-feet of water in 2015.

Recycle and Reuse.

- The nation's largest (110 miles) direct recycled water delivery system in the nation for use by golf courses, parks, commercial and industrial customers, as well as San Antonio's famous River Walk.
- The nation's second largest Aquifer Storage and Recovery Facility.
- The only U.S. city in which all three products of wastewater treatment (gas, solids and water) are commercially sold or recycled.

Energy Management.

- All Administrative/Service Center lighting converted from T12- to more efficient LED, T-8 and T-5.
- Biogas capture and sale of over 1.2 MMCF/d at Dos Rios Treatment Plant.
- Participated in CPS Demand Response program reducing seasonal demand by 3,700 kW.
- Leon Wastewater Treatment Plant blowers replaced with more efficient blowers reducing seasonal load.
- Dos Rios Water Treatment newly installed diffusers saved approximately 5,000,000 kWh.
- Implementation of the 20 Mw William Sinkin Solar Farm at Dos Rios Treatment Plant.

Facility Management.

- Newly Constructed North Side and the West Side Operations Centers designed to LEED-Silver equivalent. Features include:
    - Low impact Development (LID)
    - Construction Pollution Prevention
    - Water use reduction by using rain catchment for irrigation and water efficient landscaping (no potable irrigation)
    - Fundamental Commissioning of the Building Energy systems
    - Storage and collection of recyclables
    - Indoor Air quality addressed by low emitting materials (no VOCs) and no smoking corporate policy

4.3 Bexar County

Bexar County is the fourth largest County in Texas and the 17th largest County nationally. Bexar's population is rapidly approaching two million.

New/Proposed Strategies – this participant has been added to the 2016 Update

Vehicle Idling Limitations. Bexar County has regularly participated in AACOG's air quality activities; however, on May 3, 2016, they took air quality planning a step further. Bexar County passed a court order for Vehicle Idling Limitations (Appendix A), a state rule enforceable by local governments through a memorandum of agreement with the TCEQ (Appendix B). The anti-idling rule restricts heavy-duty vehicles with a gross vehicle weight of greater than 14,000 pounds from idling for more than five minutes within Bexar County.

Bexar County has begun outreach efforts at trucking companies, truck maintenance facilities, and truck stops. Their strategy is to pass out informational flyers, answer questions, and encourage compliance with the anti-idling court order.

Outreach Partnership. In full support of the City of San Antonio air quality programs, Bexar County intends to partner with the City and do similar public outreach concerning San Antonio's recently enacted anti-idling ordinance.

Bexar County is also exploring other control strategies, such as vehicle use policies aimed at further reducing emissions.

4.4 City of San Antonio (CoSA)

Ongoing Strategies – Updated since 2015 Update

4.4.1 Operations

Emissions Testing. The Building Services and Equipment Department implemented a modified Inspection and maintenance (I/M) program. All City vehicles are tested using a four-gas emissions analyzer during an annual safety inspection. Any identified problems are corrected and the vehicle is re-tested.

Ozone Action Day Plan. The City updated its Ozone Action Day Plan, which establishes operating guidelines and procedures for reducing emissions of ozone-forming compounds into the atmosphere on Ozone Action Days and throughout the ozone season.

Solar Trash Compactors. The City of San Antonio has installed 25 solar trash compactors in city parks to reduce the number of driving trips needed to empty the trash bins.

Solar Energy. The City operates 363,072 kWhs of photovoltaic panels affixed to municipally-owned building rooftops and to solar shades in parking facilities.

City Fleet Alternative Fuel Composition. The City's fleet includes 27 CNG refuse trucks, 77 light-duty pickups and vans, and 391 light-duty hybrid electric sedans.

River Barges. All 44 San Antonio river barges used for Riverwalk tours and taxis operate using compressed natural gas.

4.4.2 Facility Improvements

Revolving Energy Efficiency Fund. Rebates and energy savings from Municipal Retrofits are being allocated into a revolving Energy Efficiency Fund, which provides a mechanism to finance future energy efficiency projects. This resulted in the creation of a permanent Energy Management program to continue targeting efficiency opportunities throughout City facilities as an alternative to relying on performance contracts. COSA remains the only major municipality in the State of Texas with this type of dedicated revolving energy fund.

Energy Efficiency Projects. Energy efficiency facility projects between 2011 and 2016 will result in estimated 49.8 million kWhs of electricity savings per year (Table 4-1).

Project	Annual Avoided Electricity Use (kWh)*
Energy Efficiency and Conservation Block Grant (EECBG) Programs	
- Municipal facility retrofit	8,110,693
- 3 parking garage lighting retrofits	888,000
- 24 facilities lighting retrofits	874,000
Alamodome and Convention Center performance contract	11,987,000
Phase 6 exterior lighting	1,670,000
Phase 7 lighting	750,337
CPS Energy LED street lighting retrofit for 25,000 lights	21,698,000
Pool pump retrofits	827,631
Retrocommission of 5 large facilities	1,678,900
Programmable thermostats for 6 Facilities	212,998
High-efficiency washing machines for 2 fire stations	468
Solar window film on 4 facilities	73,193
Interior and exterior lighting retrofit for 9 facilities**	840,230
Programmable thermostats and circulation fans in 1 facility**	181,700
A/C unit variable frequency drive installation in 6 facilities**	155,740
Retrocommission 8 facilities**	775,950
Total	49,767,190

* Avoided electricty is calculated for fiscal year Oct - Sep.

** These projects are in the process of being implemented, so avoided electricity is an estimate.

Table 4-1: Energy Efficiency Projects, 2011-2016

Energy Star Certified Buildings. Energy Star Certifications were awarded in 2014 to the Municipal Plaza Building, built in 1925, and the Public Safety Headquarters, built in 2012.

The 2030 Challenge Adoption. The City of San Antonio adopted a Sustainable Buildings Ordinance in March of 2009, which set a goal to achieve net-zero carbon for all new construction by 2030 and established interim incentives and minimum building energy codes to help achieve this target.

4.4.3 Planning

Infill. CoSA's measures to regulate development within the inner city were established by the "Inner City Reinvestment and Infill Policy." This policy establishes priority areas of the City targeted for development to coordinate public incentives in these areas. The incentives include financial assistance, such as fee waivers and tax abatements for eligible projects, and staff support to expedite regulatory and procedural obstacles that sometimes serve as a hindrance to infill development.

Tree Ordinance. On May 6, 2010, San Antonio's City Council amended Chapter 35 of the City of San Antonio's Unified Development Code relating to tree preservation and adequate canopy coverage (Ordinance 2010-05-06-0376). The goal of the ordinance is to increase the canopy coverage of the City and its ETJ within residential and commercial development.

Tree Canopy Preservation. The City's Development Services, Parks and Recreation, and Transportation and Capital Improvements departments have an annual estimated combined budget of $3.4 million dedicated to the preservation and maintenance of trees in the city. This investment by the city includes community outreach programs to raise public awareness about the value and benefits provided by a healthy and diverse tree canopy.

In April 2016, the City of San Antonio (COSA) officially became a Tree City USA. This program offers direction, assistance and national recognition for our community and a framework for sustainable tree programs, initiatives, and ordinances. Recognition as a Tree City USA provides San Antonio with a great opportunity to celebrate the importance of having a healthy and well maintained tree canopy throughout our community.

Increase Tree Canopy. The City of San Antonio and CPS Energy are partnering to encourage tree planting to save on cooling costs. Each year from October to April, CPS Energy customers can get up to five rebates by planting trees on their property. Customers can earn up to a $50 rebate on their utility bills for each tree purchased and planted, for a maximum of $250 with five trees.

Trees planted on the west, south and east sides of a home or business provide shade from the sun during the hottest times of the day. According to the U.S. Department of Energy, carefully positioned trees can potentially reduce a household's energy

consumption for heating and cooling by 25 percent. Beautiful and shaded landscaping also can add to the property value.

4.4.4 Transportation Planning

Bicycle and Trail Network. The Howard W. Peak Greenway trails is an ever growing network of multi-use trails that wind through natural landscapes along San Antonio creeks. Currently 52.6 miles of developed greenway trails are now open for use. These linear parks consist of approximately 1,400 acres of creek-side open space. The Linear Creekway Parks Development Program, which provides sales tax funding for the land purchases and trails development, was approved by voters in 2000, 2005, 2010 and 2015. Trails are now either built or planned for many of San Antonio's creeks, including the Salado, Leon, Huebner, Huesta, Culebra, Alazan, Apache, Martinez, San Pedro and Medina River.

Bike Share Program. San Antonio's B-Cycle bike share program, with a total of 55 locations, provides opportunities to enhance personal health and provides active transportation choices to residents and visitors. According to program data, riders logged over 424,600 B-Cycle trips, burning 53.5 million calories and offsetting over 1,200,000 pounds of carbon since the program launched in 2011.

Congestion Mitigation. The City of San Antonio has allocated funds through its City Wide Bond Program from 2012-2017 to complete approximately $337M in congestion mitigation measures for streets, bridges and sidewalks. The 41 projects include improved access management and traffic signalization along with the addition of bike lanes and sidewalks.

Currently in Bexar County, there are 446 lane miles of bike facilities (paths, trails, routes).

4.4.5 Employee Programs

Bus Passes. CoSA's Employee Bus Pass Program encourages employees to ride the bus, the City participates in VIA Metro's EZ Ride Program. City employees have access through the City's intranet system to conveniently click for VIA rider tools to plan their trips.

B-Cycle Membership Subsidies. City employees are offered a sixty percent subsidy to purchase a B-Cycle Annual Membership during the ozone season. All city employees who participate in the subsidy program are highly encouraged to track their miles through NuRide.

New/Proposed Strategies - Updated since 2015 Update

Anti-Idling Measures. In June of 2015, the San Antonio City Council unanimously voted to enact an anti-idling ordinance. The anti-idling ordinance restricts heavy-duty vehicles with a gross vehicle weight of > 14,000 pounds from idling for more than five

minutes within the City of San Antonio and Bexar County. While certain vehicles are excluded regardless of weight (such as emergency vehicles), most vehicle operators will need to adhere to idling restrictions.

The City's anti-idling administrative directive for city employees is in the approval process. The purpose of the directive is to provide uniform and consistent direction to City departments and personnel on operating city vehicles and equipment in a safe and economical manner while supporting the City's clean air initiatives.

Coal Tar Sealant Ban. In June of 2016, San Antonio became the largest city in the country to ban coal tar sealants. The San Antonio City Council voted 9-2 in favor of a ban on the application of coal tar sealants. The City of San Antonio identifies coal tar pavement sealant products used in the construction of paved commercial lots as emitting specific environmental/health-hazardous chemical components whose long-term exposure via storm water runoff conveyance has been scientifically linked to increased incidence of certain adverse health impacts in human beings and aquatic invertebrates (insects and other small creatures that live in stream and lakes who are particularly susceptible to contamination). Invertebrates are an important part to the food chain and are often monitored as indicators of stream quality. Pavement construction product retailers, applicators and paved property owners are strongly urged to learn more about the use and environmental/health impacts of these products in order to make conscious decisions to help reduce and prevent their application during construction of new or rehabilitated paved lots. The ordinance goes into effect on January 1, 2017.

Modeling Control Measures. Regional public agency partners contracted with the Alamo Area Council of Governments to evaluate the effectiveness of selected pollution control measures using a photochemical model. The modeling results were compiled into a technical report for public review. The report is anticipated to be released to the public in September 2016.

Alternative Commute/Flex Schedule. The City's Alternative Commute/Flex Schedule Administrative Directive for city employees will be approved in the fall of 2016.

Employee Commuter Benefits. City staff is examining the adoption of an employee commuter benefits ordinance requiring employers of a certain size to offer employees benefits to encourage alternative commuting.

4.5 San Antonio Metro Health (Metro Health)

San Antonio Metropolitan Health District (Metro Health) is concerned with the high rates of asthma in the city as well as other adverse health effects of high levels of ozone and other air pollutants.

New/Proposed Strategies - Updated since 2015 Update

Pollution Registration Ordinance. The City of San Antonio's City Council passed ordinance 2015-11-19-0967 on November 19, 2015. This ordinance updated the language of Chapter 26, "Pollution Control," Article II "Air Pollution," by updating the state law references, and requiring that businesses with sources of air pollution register with the San Antonio Metropolitan Health District (Metro Health). Registration provides information that Metro Health will use in determining strategies to lower ozone levels and other air pollutants so that it can continue to develop its air pollution program and work with businesses in San Antonio to lower emissions and take innovative and proactive steps to lower ozone levels.

New Employee. One position in the program has been created to work with businesses to create a list of air emissions "point sources" located within the city limits of San Antonio. The program will work with businesses to lower air emissions through outreach efforts. It is believed that many of these businesses are not aware of operational changes that could be made to improve their businesses and also air quality. There are many small businesses located within San Antonio that individually are considered minor sources of air pollution but when added together they become a much larger source of air pollution.

4.6 City of Leon Valley

The City of Leon Valley is located within the City of San Antonio's northwest quadrant. It is home to 11,000 plus residents.

Ongoing Strategies – this participant has been added to the 2016 Update

Leon Valley is committed to improving air quality by:

- Participating in the regional NuRide program, which incentivizes pollution reduction by offering rewards for carpooling, biking, busing, and telecommuting.
- Taking the Monarch Butterfly Pledge, which reduces air contamination by minimizing the use of harmful pesticides.
- Planting trees or giving away trees, which helps to filter pollutants and particulates from the air. In 2015, the Tree Advisory Board gave away 600 trees.
- Using water based (non-pollutant type) fire extinguishers.

- Reducing the use of fuel in the City's fleet vehicles, such as purchasing eco-friendly hybrid vehicles, providing electric charging stations, regular fleet maintenance, proper tire inflation, and reducing excess weight in fleet vehicles.

- Encouraging employees to reduce the use of fuel, such as providing places to store food and eat at work, facilitating showers and lockers for employees who bike or walk to work, and allowing compressed or alternate work schedules and telecommuting.

- Minimizing the use of electricity by installing programmable thermostats and setting them to cool primarily during work hours and by using motion sensor light fixtures. In addition, the City of Leon Valley has a recycling program and has installed water-saving faucets.

New/Proposed Strategies

Vehicle Idling Limitations. In concert with Bexar County and San Antonio, Leon Valley passed an ordinance for Vehicle Idling Limitations on April 5, 2016. The Vehicle Idling Limitation is a state rule enforceable by local governments through a memorandum of agreement with the TCEQ. The anti-idling rule restricts heavy-duty vehicles with a gross vehicle weight of greater than 14,000 pounds from idling for more than five minutes within Leon Valley.

4.7 Texas Department of Transportation

Ongoing Strategies – Updated since 2015 Update

Since 2005, TxDOT has sponsored an agency-wide Clean Air Program that encourages employees to practice commute reduction activities such as ridesharing, biking, walking, public transportation, as well as reducing other trips during the work day by encouraging employees to brown-bag their lunches. Employees are reminded and encouraged to perform regular maintenance on their vehicles to help reduce vehicle emissions. Employees earn points for participating in these activities from May through September and leave time is granted once enough points are earned, up to 8 hours.

To the extent practical, the district office uses clean business practices such as:

- Using low-emission diesel fuel;
- Avoiding refueling between the hours of 6-10 am;
- Limiting the idling of vehicles;
- Sending ozone action day notifications to district employees;
- Avoid mowing on TxDOT properties on Ozone Action Days;
- Encouraging contractors to use efficient equipment as well as properly maintaining equipment to mow right-of-ways;
- Continuing to purchase solar-powered light and sign boards;
- Continuing to install LED signal bulbs;
- Purchasing Energy Star products;

- Encouraging contractors to apply for grants such as TERP for highway equipment;
- Continuing to allow flexible work schedules and compressed work schedules.

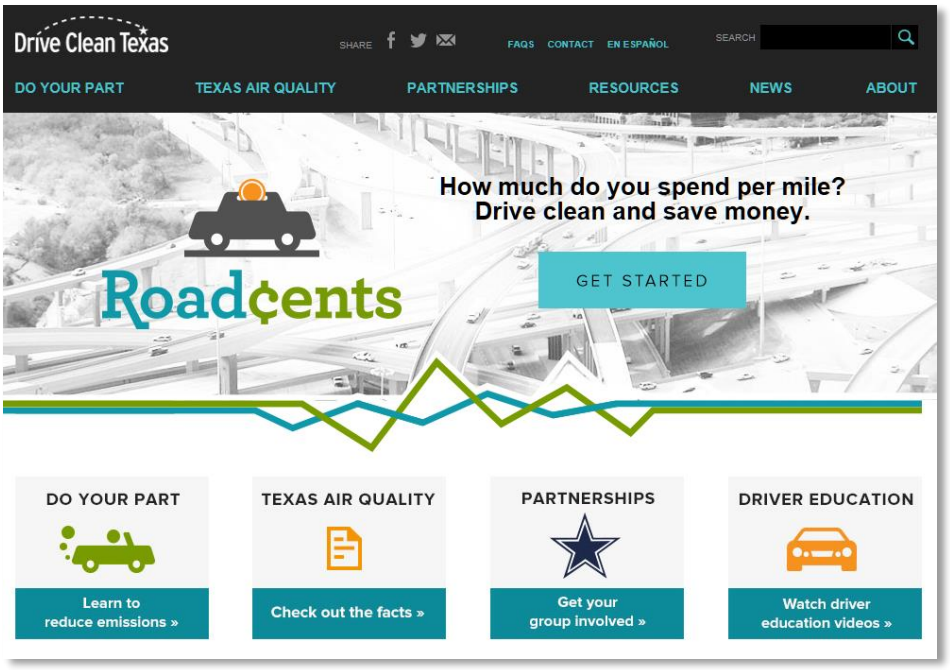


Figure 4-1: TxDOT educates the public about the impact of car emissions on air quality as a partner in the "Drive Clean Texas" Campaign

TxDOT also sponsors the "Drive Clean Texas" partnership program between TxDOT, TCEQ, and EPA to educate the public about the impact of car emissions on air quality. The program helps to educate the public on ways they can reduce emissions. The program includes educational material for school curriculum, provides vehicle replacement assistance, and information on how to report a smoking vehicle. The program's website is http://drivecleantexas.org/.

Government Code Chapter 2158 and the Texas Clean Air Act required that state agencies operating more than 15 vehicles must acquire and operate alternative fuel vehicles. TxDOT's current goal is 50% of the vehicle fleet.

The department also supports an anti-idling policy when vehicles are left unattended. The department did this through a video and employee awareness campaign.

In addition to these statewide measures, TxDOT-San Antonio District sponsored a Travel Demand Management Study that aimed to assist the region in managing traffic flow by influencing travel behavior. This study introduced 9 major San Antonio employers to traditional TDM programs and provided them with strategies that emphasize livability, sustainability, transit, walking and biking, transportation and land use planning, systems operations, economic development and improved air quality. This study was completed in late 2015 and detailed summary reports of survey data were provided to each participating employer in January 2016. An overall summary report was completed as well.

New/Proposed Strategies

In August of 2015, TXDOT completed its study of Enhanced Regional Incident Management Program for the San Antonio Region. This study looked primarily at congestion management and made numerous recommendations to improve incident management. There were a total of 16 recommendations. These improvements will also have measurable benefits to regional air quality. TxDOT is working with regional partners to implement a rapid tow program, safety service patrol and improve motorist notification through ITS technology.

4.8 Alamo Area Metropolitan Planning Organization (AAMPO)

Ongoing Strategies – Updated since 2015 Update

As the region's multi-modal transportation planning agency, the Alamo Area Metropolitan Planning Organization (AAMPO) is responsible for leading a cooperative, comprehensive and continuous planning process for Bexar, Comal, Guadalupe and, a portion of, Kendall Counties. If the region is designated non-attainment for ozone in 2017, AAMPO will be responsible for ensuring the region meets new requirements concerning transportation projects. In December 2015, Alamo Area MPO staff began monthly meetings with TxDOT, the Texas A&M Transportation Institute and other transportation stakeholders to ensure that the region is line with the 2018 timeline for transportation conformity.

20th Anniversary Walk & Roll Rally at Main Plaza

AAMPO promotes alternative modes of transportation among its staff, providing employee transit passes and offering flexible scheduling and telecommuting, and the public. The MPO produces regular informational newsletters, brochures, and maps that share transportation news and options and leads robust educational programs to explain the benefits of walkable communities and alternative commute modes in both the Walkable Community and Walk & Roll Programs. AAMPO held its 20th Anniversary Walk & Roll Rally on May 6th, 2016 to promote walking, biking and taking transit to work. In 2015, the League of American Bicyclists named AAMPO a Bicycle Friendly Business, recognizing its internal and external efforts to make bicycling a comfortable transportation option.

In addition to the short-range Transportation Improvement Program and the long-range Metropolitan Transportation Plan, AAMPO produces other plans in conjunction with its transportation partners to inform and guide transportation policy. AAMPO's Regional Bicycle/Pedestrian Planning Study, approved in June 2016, established a regional vision to build a safe, accessible, comprehensive, and seamless bicycle and pedestrian network. It assesses current bicycle and pedestrian conditions in the cities of Boerne, New Braunfels, Seguin and San Antonio and recommends future facilities necessary to create comprehensive and connected active transportation networks. Previously, AAMPO has produced Pedestrian Safety Action Plan (2012).

Alamo Area MPO facilitated a walkable community workshop for residents of Castle Hills, TX in June 2016

4.9 VIA Metropolitan Transit

Ongoing Strategies – Updated since 2015 Update

VIA has implemented a series of projects that have/will affect a significant reduction in emissions. These projects include:

- Implementation of an automated idle limitation program for buses.
- Commitment to replace current diesel buses with alternative fuel buses.
- Implementation of an ISO 14001:2004-certified Environmental Management System.

VIA's continued diversification of its fleet will result in the implementation of up to 500 compressed natural gas (CNG) powered buses over the next five year period. The 500 new CNG buses will add to VIA's current alternative-fueled vehicles:

- 38 CNG buses
- 124 propane-powered paratransit vans
- 30 diesel-electric hybrid buses
- 3 fully electric buses

4.10 SA Manufacturers Association

Ongoing Strategies – this participant has been added to the 2016 Update

The San Antonio Manufacturers Association Environmental Advisory Committee exists to empower the San Antonio manufacturing community by improving its environmental performance and provide input into the local, state and federal environmental rulemaking process from the perspective of the San Antonio manufacturing community. The Environmental Advisory Committee meets once-monthly and is updated on air, water, and energy matters by the Air, Water, and Energy Subcommittees. The president of the San Antonio Manufacturers Association has a seat on the AIR Advisory Committee. The Environmental Advisory Committee was crucial in providing industry feedback on proposed air quality mitigation steps. AACOG's Clean Cities Coordinator is a member on the San Antonio Manufacturers Association Environmental Advisory Committee and the Air Subcommittee, and updates the committee with pertinent air quality information.

4.11 Local Cement Industry

Ongoing Strategies – Updated since 2015 Update

Programs. In the past, AACOG worked with industrial consultants to gauge effectiveness and reduction totals achievable through implementation of reduction technologies. Strategies implemented voluntarily in 2007 lowered NOx pollution by about 4.5 tons/day, and are likely to have been one of the reasons for our recent history of success.

The cement manufacturing industry in the San Antonio-New Braunfels Metropolitan Statistical Area (SA-NB MSA) consists of four facilities. Alamo Cement, Capitol Aggregates, Inc./Capitol Cement, Cemex Construction Materials South LLC and Martin Marietta Hunter Cement. To date these facilities have made significant investments in technology and modifications to operational practices which have resulted in emissions reductions.

This group continues to be committed to working proactively to solve the challenges facing this region with regard to air quality and ground level ozone, and has demonstrated this commitment through their actions. Over the past several years, these facilities have invested multiple millions of dollars in emission control technology and process and equipment upgrades which benefit the region's air quality.

Nitrogen Oxide (NO_X) Control – Selective Non-Catalytic Reduction. Each of the facilities has installed SNCR, which represents the most modern and efficient control technology available for the cement industry for this ozone precursor. Typical reductions can range widely, between 10-50%, based on a variety of test data, but site-specific factors at each plant must be considered. The addition of SNCR represents a significant capital and operational investment for these facilities, which will cumulatively approach $9.5 million in the next 12 months.

Improvements to Efficiency in Manufacturing Processes. Each of the facilities has made improvements to manufacturing technology to lower emissions and reduce energy consumption in recent years. These plants utilize the most modern dry-process technology available for manufacture of cement, referred to as preheater-precalciner. In addition, equipment used in the process includes modern low-NO_X firing systems as well as use of feed materials that require significantly lower energy amounts to process. According to the U.S. Portland Cement Association, since 1972 energy consumption has been reduced industry-wide by 37.5% per unit produced, and the producers in the SA-NB MSA region reflect this continued improvement, which ultimately results in lowered emissions and improvements to ground level ozone. The facilities continue to work on establishing optimum combustion in the kiln and precalciner firing systems to improve fuel efficiency. They take care in maintaining key equipment during the major kiln outage to ensure reliability of the equipment and providing stable kiln operations which also helps in lowering emissions. Ongoing projects, such as equipment upgrades to reduce electricity consumption, are evaluated by each of these facilities on a regular basis. In addition, some operators shift processing loads to use electricity during non-peak times, which improves energy efficiency in the region and lowers overall emissions.

Upgrades to Mobile Fleets. Upgrades have been ongoing at all facilities to incorporate use of lower-emitting engines for mobile equipment at the plants. Some facilities have applied for grants under the Texas Emissions Reduction Program (TERP) to improve their fleets while others have voluntarily upgraded fleets to further enhance efficiency. Cement manufactures in this region have invested over $8 million in upgrades to mobile equipment.

General Operating Practices. Local cement producers utilize a variety of other methods to assist in lowering emissions that impact ground level ozone formation, especially during ozone season. Examples of these practices include managing quarrying operations and material deliveries, notifying employees of ozone action days, and curtailing other activities, such as painting, parts cleaning, refueling, and mowing. Some companies provide education and information to employees to make them aware of activities that contribute to ozone formation.

4.12 Oil and Gas Industry

Ongoing Strategies

4.12.1 Operations

As the oil and gas industry in the Eagle Ford continues to mature, improvements in infrastructure, operations, and technology benefit regional air quality. These improvements occur through the following practices:

Pad Drilling. Companies are moving to a "pad drilling model" wherein multiple wells are drilled and completed sequentially from a single pad at a single time, eliminating the emissions associated with multiple rig up/rig down activities and the transportation between those events.

Efficiency through Technology. As technology improves and knowledge of the characteristics of the resource increases, well drilling efficiencies are realized. In general, longer laterals are being drilled in 2/3 the time and with less energy required of an Eagle Ford well just two years previously.

Gas Capture. Industry continues to focus on long-term advanced planning to ensure timely construction of the required infrastructure, such as processing facilities for initial separation of water, oil, and gas before sending it to pipelines. They rely heavily on pipeline infrastructure as part of the development of this asset, which keeps the product in the pipeline and reduces the volume of gas flared. To date, almost $1 billion has been invested in approximately 1,000 miles of pipeline infrastructure to ensure gas is captured and transported to market. The industry continues to increase this investment to further minimize the incidents of flaring in the Eagle Ford shale play.

Supply-Chain Coordination. Industry contracts and coordinates with third party midstream (transportation) companies to ensure downstream assets are in place and operational to support production without flaring. Oil and gas production companies depend on pipeline and terminal companies to receive their product and transport to market.

Central Processing. As the play matures, more and more operators in the Eagle Ford are choosing to utilize a central processing facility concept, which enables products from numerous wells to be routed to one facility for processing. This minimizes flaring by ensuring equipment is in place to handle multi-well oil and gas production as opposed to the need for processing equipment at every wellhead. At gas gathering facilities, atmospheric storage tanks are being replaced with pressurized tanks to reduce gas flashing of volatile liquids, thereby eliminating the need for flaring. Additionally, vapor recovery units are being installed at central processing facilities at the last stage of separation to maximize the recovery of gas and direct it to sales, as opposed to flaring the last stage low pressure gas.

Condensate Pipelines. Companies are improving engineering design and operation to allow production directly from the facility separation equipment to gas (high and low pressure) and liquid pipelines. This improvement reduces the air emissions associated with the storage of condensate in tanks, the use of flares as a control device, and the loading of trucks and subsequent transportation on roadways. The storage tanks, flares, and truck loading are only used during times of maintenance or downtime on the production collection equipment or pipelines.

Multi-stage Separation Technology. The use of multi stage separation technology (i.e. HLP separators or VRTs) helps to reduce the amount of potential flash gas at the tanks, which in turn reduces the amount of gas flared.

4.12.2 Partnerships with the Oil and Gas Industry

The growing development of the Eagle Ford shale play represents an important economic generator in south central Texas, as well as a potentially large source of emissions. AACOG staff is working to address these emissions concerns in three programs.

1. Because the rate of ozone precursors from the Eagle Ford shale play development is very poorly understood, with the support of the TCEQ, AACOG staff and many important stakeholders in the Eagle Ford, these organizations have developed a partnership to develop an ozone precursor emissions inventory of play activities. This information is a critical component of the modeling analysis conducted that helps ozone impacts from the development by including them in AACOG's photochemical modeling analysis.

2. AACOG and the Alamo Area Development Corporation[8] supported the creation of the South Central Texas Natural Gas Vehicle Consortium.

    - The purpose of the South Central Texas Natural Gas Vehicle Consortium is to focus on expanding natural gas transportation markets and refueling infrastructure in the Central and South Texas regions (Austin, Corpus Christi, Laredo, San Antonio, and surrounding counties). The Consortium plays a role in addressing emissions from the Eagle Ford shale development since every older diesel-powered vehicle or engine that can be replaced with a cleaner compressed natural gas, liquefied natural gas, or clean diesel vehicle or engine represents an advance in air quality.

    - In addition, Ryder, known for transportation and supply chain management products and its fleet of rental trucks, is now integrating natural gas into their 160,000 truck fleet. They are joining the effort in Texas to increase natural gas fueled transportation by promoting natural

[8] The consortium is described on AACOG's web site at http://www.aacog.com/index.aspx?nid=404

gas vehicles, building more fueling stations, and adding maintenance capabilities for natural gas vehicles.

3. Established in 2001 by the State of Texas, the Texas Emissions Reduction Plan (TERP) provides a series of programs to reduce NOx, including grants to upgrade or replace on-road vehicles, non-road equipment and other mobile sources in the Emissions Reduction Incentive Grants (ERIG) program (see http://www.terpgrants.org/). This provides another avenue of support for making reductions in the nearby Eagle Ford shale play. AACOG staff is pursuing this possibility by working with industry to understand how this program might best be used.

New/Proposed Strategies – Updated since 2015 Update

Multiple companies in the oil and gas industry proactively seek measures that will help reduce emissions from their activities and operations. While the number of participants is unknown, the following example describes one such project by a company operating in the Eagle Ford Shale (EFS).

Purpose. The purpose of the project is to apply creative use of technology to reduce the amount of methane and VOC emissions released from pneumatic controllers at the partner company's oil and gas facilities.

To accomplish this, the company's Eagle Ford operations team proactively analyzed and improved the common industry practice of using natural gas in pneumatically operated level control valves on production separators - resulting in a measurable emissions reduction from the pneumatic level controllers.

Background. The company operates approximately 100 production facilities in the Eagle Ford shale. A production facility is a centralized collection point for multiple drilling locations.

All production facilities have separators that separate natural gas, oil and water into the appropriate flow lines. Both the oil and water levels are automated with level control valves. There are roughly 500 separators at the various productions facilities and there are two level controller valves on each separator.

Common industry practice is to use natural gas as the medium to open these valves, while spring tension closes them. When the fluids exit the separator the gas used to open the valves is vented to the atmosphere.

Problem. Each time the level controllers are actuated, a small amount of natural gas is vented to the atmosphere. Based on the U.S. EPA emission factor (Greenhouse Gas Reporting Program, Subpart W) of 0.324 thousand cubic feet per day (MCFD) per controller, an estimate of approximately 264 MCFD of natural gas, including volatile organic compounds (VOCs) is released to the atmosphere from the 1,000 separator level controllers.

Solution: Innovative use of technology. The company's engineers evaluated several potential options to reduce emissions and determined that using compressed air in place of natural gas is the best solution at these facilities. To further eliminate emissions, electric compressors were chosen as the optimal solution for implementation.

Engineers conducted a pilot project to test the effectiveness of using compressed air as a supply medium to operate the level control valves. By using compressed air to operate the pneumatic controllers, all natural gas releases associated with pneumatic level controllers were eliminated. Due to the initial success of the project, additional production facilities were selected based on the feasibility and proximity of electric power to the production facilities.

Timeline. In 2014, two production facilities were chosen and the company installed electric compressors for compressed air. In 2015, an additional 14 facilities were converted to using compressed air for separator level controllers. Once the grid power installations are complete and the facilities are online, the company anticipates, approximately 30% of all production separators will be using compressed air, as they are focusing on the facilities with the highest number of gas actuated separators. As each of these locations grow with continued drilling, this percentage will continue to rise without any additional installations.

4.13 Build San Antonio Green

Ongoing Strategies – Updated since 2015 Update

Build San Antonio Green (BSAG) is San Antonio's residential green building program. As a voluntary, third party certification program, BSAG works with the homebuilding community to help create homes with increased efficiency, comfort, and durability. Since its inception in 2008, the program has certified 5,073 single-family new construction homes, 55 retrofitted homes, and 5 multifamily homes.

These certifications saved over 78.3 million kWh, with a reduction of 9,280 kW for peak demand. This results in over 72,024 lbs of NO_X prevented. Annually, the energy saving is equivalent to 4,904 homes, and the emissions reduced are equivalent to 7,826 cars.

4.14 SA 2030 District

Ongoing Strategies – this participant has been added to the 2016 Update

The SA 2030 District is a strategic initiative of the non-profit organization South-central Partnership for Energy Efficiency as a Resource (SPEER). SPEER's goal is to accelerate the adoption of advanced building systems and energy efficient products and services in Texas and Oklahoma. Through private-public partnership these districts establish goals to reduce their consumption of energy, water, and transportation fuels by the year 2030.

The San Antonio 2030 District is a private-sector-led initiative intended to transform San Antonio's urban core by supporting building owners and occupants in their efforts to reduce waste and increase building performance. By making a no-nonsense business case for efficient operations, the district is driving innovation through collaboration, leveraged financing, and shared resources. The district model includes a non-competitive collaborative environment where building owners, community organizations and industry professionals come together to share best practices, and drive innovation in San Antonio's built environment. This groundbreaking project will keep San Antonio competitive and ensure a healthy and livable city in 2030.

The SA2030 District does this by providing a roadmap that will assist owners and managers in meeting aggressive goals that are based on an existing building's operational costs and maintenance needs. This support includes training sessions regarding best practices for increasing building performance, networking events with industry leaders, as well as various member benefit programs. Property owners and managers are voluntarily committing their properties to San Antonio 2030 District goals; which is achieved through collaboration and group effort. This commitment represents a significant investment in San Antonio's future and reflects the collaborative nature of the region.

Achieving the 2030 Challenge goals at a district scale, and focusing on existing medium to large buildings that are privately owned, will provide a working model that other cities and regions can use to reduce emissions and impacts. While specific opportunities for energy reductions exist for individual buildings, a district approach will provide the opportunity for district-wide heat recovery, distributed generation, and other district energy efficiencies that can reduce the demand for resources. The 2030 District will provide members a roadmap to own, manage, and develop high performance buildings by leveraging existing market resources and by creating new tools and partnerships to overcome current market barriers. This type of collaborative action is a strategic undertaking to help the City of San Antonio meet its goal of carbon neutrality by 2030 and represents a major investment in San Antonio's future.

Members include Alamo Architects, Alterniverst, AREA Real Estate, Cleary Zimmerman, GSA, Lake|Flato Architects, MWM & Associates, Pelton Commercial Real Estate, San Antonio Housing Authority, San Antonio Museum of Art, San Antonio River Authority, The Brooklynite, The DoSeum, The Lifshutz Companies, USAA Real Estate Company, Weston Properties, LC, Zurich International Properties.

CHAPTER 5: Outreach and Education

5.1 Commute Solutions

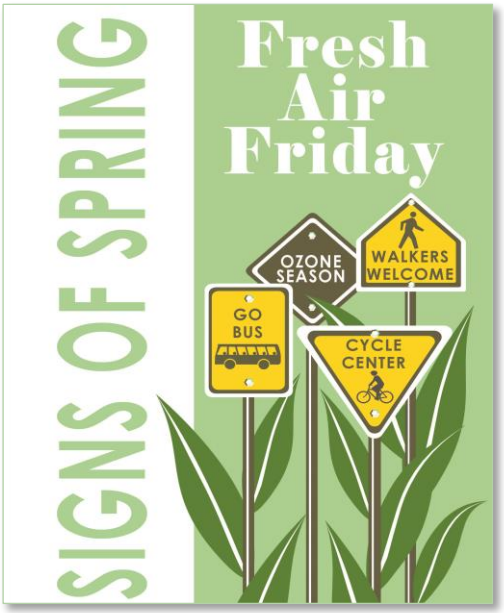
AACOG has administered a Commute Solutions program for more than 17 years. The program focuses on educating people about the connection between air quality and transportation, informing them of what they could do differently to use less gas, and offering them viable alternatives to driving as a single occupant in a vehicle.

Those who commute to work or school may help reduce traffic and save fuel costs through AACOG's rideshare program. For short commutes, people in the Alamo Region are encouraged to burn calories rather than gasoline by walking or biking instead of driving. Commuters may also consider participating in an alternative work schedule. Employers can help make their workplace commuter-friendly by considering Commute Solutions employer options. Schools can help reduce traffic congestion and harmful pollution around their campuses by adopting one or more of Commute Solutions school programs.

5.1.1 Fresh Air Friday

Ongoing Strategy – Updated since 2015 Update

In addition to promoting Commute Solutions at dozens of health and environmental events organized by its partners each year, the Commute Solutions program hosts an ozone season kickoff at the beginning of April, referred to as "Fresh Air Friday." The event is conducted at lunchtime as an environmental fair on a plaza in the heart of San Antonio. Although open to the public, downtown employees are encouraged to bring a brown bag or carry out from a nearby restaurant instead of driving out to eat—which is emphasized as a way to help improve air quality. Photochemical models developed in the past by AACOG predicted that reduced vehicle trips during the late morning – early afternoon timeframe were associated with greater reductions in peak ozone concentrations than trip reductions in the early morning or late afternoon. Consequently, the event is used to emphasize alternative transportation choices for noon time activities.



Since the program's first ozone kickoff event in 2006 that included exhibits by a handful of partner organizations, the event has grown to include approximately 25. Along with AACOG's clean air programs table, each of the partner organizations' tables display a sign that briefly describes a way in which their organization promotes or contributes to

cleaner air. In recent years, about 500 people have typically attended Fresh Air Friday. The 2016 Fresh Air Friday had a smaller turnout than usual; however, it was due to high winds on the day of the event.

AACOG's Resource Recovery and Air Quality programs interact with visitors at the 2016 Fresh Air Friday event in San Antonio.

5.1.2 Make Every Friday a Fresh Air Friday Campaign

New Strategy

During 2015 AACOG's air quality staff has extended the Fresh Air Friday concept throughout the ozone season, by asking the public to collectively focus on one way to help keep the air clean each Friday, such as asking everyone to check their tire pressure that day, or to substitute a short vehicle trip – a mile or less – with walking or biking. This campaign was carried out largely through social media, but also through the use of digital billboards strategically placed along San Antonio's major commuting routes.

Over the past several years, Commute Solutions messages has found that fuel economy messages seem to appeal to a broader audience than those that link vehicle emission reduction strategies to cleaner air and health benefits. Nevertheless, because the saturation level necessary for advertising messages to sink in is relatively costly and the funds to do advertising is limited, it has been determined that, for this particular

program, strategies other than advertising should be more strongly pursued. Particularly, working more closely with employers to establish commuter friendly workplaces will be a stronger program emphasis than it has been in recent years.

5.1.3 Walk & Roll Challenge

Ongoing Strategy – Updated since 2015 Update

One of the ways that the program has been working with employers is through the Walk & Roll Challenge. This annual challenge which was conducted for the 11th time during May 2016, is a month-long competition in which businesses, agencies, and other employers vie with one another to see whose employees can record the most trips taken by walking, biking, carpooling, or busing, as well as trips saved through telecommuting and compressed work schedules, which are referred to as “smart” trips. Organizations with the most

alternative trips recorded per employee are the winners. Regardless of whether their employers are officially participating, individuals can also participate in the Walk & Roll Challenge simply by recording the trips they take by alternative means at NuRide.com. During 2016, 19 employers and 2,484 individuals participated, recording over 94 thousand trips that month, reducing 1.2 million vehicle miles traveled and keeping over 3.5 tons of ozone precursors from the air. Winning organizations, including USAA, the City of San Antonio, San Antonio Water System, and the Alamo Area Metropolitan Planning Organization, were awarded at AACOG's Board of Directors June meeting.

5.1.4 Air Quality Stewardship Awards

Ongoing Strategy – Updated since 2015 Update

Another way that the Commute Solutions program provides outreach to businesses, schools, and other organizations is by annually recognizing those in the region that have made significant voluntary efforts to reduce air pollution through commuter assistance programs, fleet management, energy efficiency, air quality education, and other means. These awards provide an opportunity to acknowledge and showcase the efforts of air quality stewards in the Greater San Antonio area and to inspire others to greater action. Honored for their air quality actions in 2016 were Brundage Management Company, for the replacement of three data centers with a single, more energy efficient one; the DoSeum, for their various commuter assistance and sustainable building features; Joint Base San Antonio, for the rideshare program they have implemented on military bases; University Health System, for the energy efficient features of their new hospital; and VIA Metropolitan Transit, for their efforts to attract more choice transit riders through their Cento Plaza transfer station..

Air Quality Steward Award Recipients pose with AIR Executive Committee Chair Councilman Ron Nirenberg

5.1.5 Ozone Action Day Alert Program

Ongoing Strategy – Updated since 2015 Update

The Commute Solutions program actively recruits and maintains a list of businesses, schools, agencies, media representatives, and individuals who would like to be notified when there is an Ozone Action Day. When an Ozone Action Alert has been issued by the TCEQ, AACOG's Air Quality staff sends an email or a text message to those who are registered for this service. The message announces the alert, what it means, and how one best responds to avoid associated health risks and help reduce the likelihood that an exceedance will actually occur. During the past year, the program surpassed its goal of raising the number of registered recipients by 200 when it increased its number of 1,716 on July 1, 2015 to 2,066 in June 30, 2016.

Surveys conducted by Air Quality staff of the public in recent years have found that a majority of people in the AACOG region learn of Ozone Action Days through television meteorologists. However, television meteorologists are considered a great resource not only for informing the public when there is an Ozone Action Day, but also for educating them about the nature and status of air quality, what they can do to avoid the health risks associated with ozone pollution, and the steps they can take to help reduce the amount of ozone at ground level. Because of this, Commute Solutions staff has sent emails to area television meteorologists to remind them of the beginning of each ozone season and suggest what they may tell the public about air quality when time allows. During the fall of 2015, with the assistance of AIR Advisory Committee members, staff met directly with several meteorologists to discuss air quality and how the meteorologists might further assist in informing the public in taking appropriate actions to improve it.

To complement the goals of the email/text alert program, the AQHA banner program provides a visual reminder to the public that an alert is in effect. The program received a substantial boost in 2006 when the City of San Antonio funded banners for all 353 schools in San Antonio, to be placed in a prominent campus location when an AQHA was issued. Since then, banners have also been distributed to new schools in San Antonio upon request and provided, for a replacement fee, new banners to those schools that have lost or misplaced their banners. In addition, banners have been made available to schools in the Greater San Antonio Area as well as to businesses and agencies. As in previous years, the program was promoted in an email message to all area school nurses during May 2016, with a reminder that the Ozone Season had begun.

New/Proposed Strategy

In 2016, the Commute Solutions program contacted all municipalities in the greater San Antonio area to inform them of the alert program, invite them to participate, and offer them alert banners. In the coming year, the program plans to build on its efforts to work with meteorologists as allies in assisting to build awareness of the Ozone Action Day Alert service and further increase the number of notification recipients, with a goal of at least 300 new recipients within the next year. To help meteorologists educate the public about air quality in general, staff is developing a series of graphics for their use that will visually display air quality concepts, such as those pictures in Figure 5-1

Figure 5-1: Ozone Air Quality Index graphics intended for meteorologists to help educate the public about air quality

5.1.6 Media Interaction

Ongoing Strategy – Updated since 2015 Update

The Commute Solutions program submits monthly news releases, requests for coverage, or public service announcements to area media outlets to educate the public about the nature and status of air quality, and what may be done both reactively, to avoid the health risks of ozone pollution, and proactively, to try to reduce the amount of ozone at ground level. The 10 such releases distributed between July 2015 and June 2016 resulted in no fewer than 34 printed or online articles, blog entries, and radio or television mentions or interviews, from such outlets as San Antonio Business Journal, San Antonio Express-News, Bandera Courier, Wilson County News, San Antonio Current, Rivard Report, Time Warner Cable News, KGNB Radio, KTSA Radio, KXTX Radio, WOAI Radio, WOAI TV, KENS TV, and KSAT TV.

5.1.7 NuRide Carpool Matching and Emissions Reduction Tracking System

Ongoing Strategy – Updated since 2015 Update

NuRide is a free, online carpool matching system, contracted to operate in Greater San Antonio by AACOG, through which members who do not have carpool partners can search for them. This service also rewards people who record, at Nuride.com, the trips they take by walking, biking, busing, carpooling, or vanpooling, along with the trips they save through telecommuting and working a compressed schedule, so that we may track emissions savings through these modes of transportation. Over 100 participating businesses are providing those rewards. From July 1, 2015 - June 30, 2016, the number of individuals registered on this site who live within or commute to the San Antonio-New Braunfels MSA rose from 11,090 to 11,908, gaining over 800 new

participants. Within that year, members recorded 1,046,795 trips resulting in a savings of over 18.8 million vehicle miles traveled, and a reduction of over 26 tons of ozone-forming chemicals, NO_X and VOCs.

A drop in recorded VMTs and corresponding drop in ozone precursor reduction in 2013 is attributable in part to a corrective measure taken by NuRide beginning that year to ensure greater accuracy in reported numbers (Figure 5-2). In 2013, NuRide began to contact users who had set up the automatic recording feature for their regular commutes and asked them to change their settings if the trips had discontinued. It is likely that the number of the VMTs saved before such adjustments were requested are somewhat inflated. In addition, the drop in recorded trips and resulting VMTs in 2015 may have been due in part by the fact that the Commute Solutions program did not host its annual Walk & Roll Challenge during 2015 in favor of the Make Every Friday a Fresh Air Friday Campaign. With the heavy promotion of Nuride during the 2016 Walk & Roll Challenge, the numbers of trips and VMTs are on their way back up this year

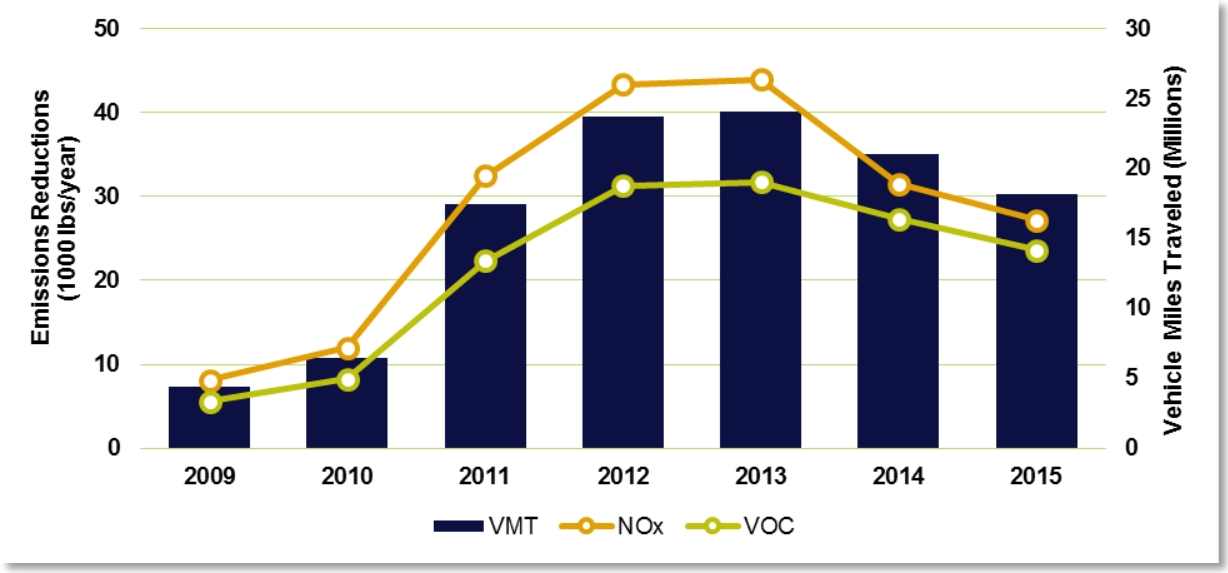


Figure 5-2: NuRide Equivalent Vehicle Miles Traveled and Emissions Reductions

5.1.8 CARE Program

Ongoing Strategy – Updated since 2015 Update

To alleviate a concern that acts as a deterrent to commuting to work by alternative transportation, namely, that an emergency will arise while at work and the commuter will have no immediate way home, AAGOG offers the Certified Auto Ride in case of Emergency (CARE) program. Those who live and work within the MSA, regularly commute by alternative means, and record their trips on NuRide.com are qualified, and

are offered reimbursement for up to 4 cab rides home from work per year, of up to $50 each, when an emergency arises for which they must go home. During any given week, approximately 1,500 area NuRide members qualify and have access to this service. While a very small portion of that number actually uses the offer for a ride in the case of an emergency, knowing that it's there provides a certain sense of security to others, and helps to maintain the emissions reductions reported through NuRide. More promotion of the existence of the program as a way to encourage new users of alternative transportation is needed, however, and more outreach, especially through the Joint Base San Antonio Rideshare Program which will better inform 80,000 commuters of this program, is in the plan for the coming year.

5.2 Alamo Area Clean Cities Coalition

Ongoing Strategies – this section has been added to the 2016 Update

5.2.1 Background

As an effort to improve the air quality in the Alamo Area region, the Alamo Area Council of Governments (AACOG) established the Alamo Area Clean Cities Coalition (AACCC) within the agency. On November 10, 1999, AACCC was designated, making San Antonio the 77th Clean City Coalition in the country. Clean Cities is a U.S. Department of Energy program that focuses on measures to reduce reliance on petroleum-based fuels.

The mission of AACCC is to displace petroleum use by developing public and private partnerships that promote the national Clean Cities initiatives aimed at securing national economic, environmental, and energy security. The Coalition provides support for local decisions to adopt practices that contribute to the reduction of petroleum consumption by promoting alternative fuels and vehicles, fuel blends, fuel economy, hybrid vehicles, commuting options, and idle reduction.

The Alamo Area Clean Cities Coalition (AACCC) is the South Texas resource for education, technical assistance, access to grant funds and other services in reducing petroleum use in transportation. AACCC provides technical support to public and private fleet operators that are interested in replacing gasoline- or diesel-powered vehicles and equipment with domestically produced fuels including natural gas, propane, electricity, hydrogen, biofuels, and biogas. In 2015 the coalition focused on strengthening its relationships with the public, outreach to educational institutions and encouraging more fleet conversions to alternative fuels. A major roadblock to fleet conversion was the lack of public natural gas fueling stations; however, in 2015 the number of natural gas stations increased four-fold.

In March 2015, AACCC was awarded a grant under the Clean Cities University Workforce Development Program by Argonne National Laboratory and the American Society for Engineering Education which allowed the coalition to hire a summer intern to support many of the coalitions' outreach activities to schools and businesses. In August, the coalition partnered with Plug In America, Sierra Club, and the Electric Auto

Association to host the third annual Drive Electric Day, which educated citizens on the benefits of electric vehicles and the different models currently available. Due to attendance at the event and increased interest in electric vehicles in South Texas, the event organizers decided to re-establish the Alamo City Electric Auto Association, a chapter of the national Electric Auto Association, which had been inactive the last few years. The most recent data shows that the coalition helped its partners avoid the consumption of nearly 4.5 million gallons of gasoline in 2014, representing a 54% increase in the use of alternative fuels over the previous year.

In June 2015, the AACCC hosted the Texas Workplace Charging Workshop Roadshow in conjunction with three other Clean Cities Coalitions across Texas. Each workshop educated business owners and building managers about the benefits of installing electric vehicle charging stations at their businesses and buildings. This included presentations on the basics of electric and hybrid vehicles, a charging station demonstration and a ride-and-drive opportunity. The workshop was attended by small businesses, educational institutions, governments and large businesses. As a result, San Antonio secured its first Department of Energy Workplace Charging Challenge Partner (the Law Office of Karen Dalglish Seal) and a number of other businesses are working on installing charging stations to become partners themselves. The event also received media attention from multiple outlets, and led to follow up stories that increased attention on electric cars and charging stations in the San Antonio Area.

5.2.2 Alternative Fuel and Advanced Vehicle Technology Market Analysis

Natural Gas. In 2013, the first LCNG station was operational in San Antonio and is used by fleets such as Central Freight and UPS. In 2015, 4 additional public natural gas facilities were installed and operational, bringing the total number of public natural gas facilities to 5. Some stations were public/private and installed near fleets that run on natural gas. The addition of this natural gas infrastructure has already given fleets additional confidence to convert their vehicles.

Electric Vehicles. San Antonio has over 150 electric vehicle charging stations. One of the issues the local utility, CPS Energy, has is that property owners do not need to go through them when building a station, making it hard to know the actual number of charging stations. They want to improve the system so that they have a more accurate count of stations in the region.

Propane. There are over 20 propane autogas filling stations in the region, mostly located at U-Haul offices.

E85. The number of E85 stations in the AACOG region has grown to 17. However, fleet managers don't necessarily have accurate records of the use of E85 because drivers may fill Flex Fuel vehicle tanks with E85 or E10. Consequently, many fleet managers report low use of E85 fuel.

Biodiesel. There are five biodiesel stations in San Antonio, which are primarily located near truck stations and highways. Several local fleets prefer to use biodiesel.

Hydrogen. There is no hydrogen infrastructure in this region.

Regionwide Infrastructure includes:

- 1 private City of San Antonio fast fill CNG station with 30 time fill pumps
- 1 privately owned VIA Metropolitan Transit fast fill CNG station 1 public LCNG station
- 1 public LNG Station (Travel Centers of America)
- 4 public CNG stations (Love's, Nat-G, Trillium, Questar)
- 5 public biodiesel stations
- 20+ fueling locations for LPG
- 17 fueling stations for E85
- 150+ public EVSE locations across Bexar County.
- 1 public level II EVSE located at Mission San Jose
- 1 private level I EVSE located at the San Antonio Missions National Historical Park headquarters

Major fleets and fuel/advanced technology users in our area include:

- City of San Antonio. 30 CNG refuse trucks, 700 Light Duty flex-fuel vehicles, 35 NEVs, 40 Heavy Duty LPG Vehicles, 75 Light Duty LPG Vehicles, 379 HEVs, 5 PHEVs, 1 all electric vehicle owned
- VIA Metropolitan Transit. 30 New Flyer diesel-electric hybrid buses, 3 Proterra electric buses, 23 CNG buses, 20 LPG trucks, 138 LPG shuttle buses
- CPS Energy**.** 4 CNG vehicles, 14 light duty EVs, 2 HEV's, 199 E85 light duty vehicles, 33 LPG forklifts
- Sea World. 25 NEVs, 3 propane forklifts, 1 propane vehicle
- Northside ISD**.** 430 LPG buses and an anti-idling policy
- Southwest ISD. 26 LPG buses and an anti-idling policy
- Seguin ISD. 28 LPG buses and an anti-idling policy
- San Antonio Water System. 29 light duty LPG vehicles, 65 E85 light-duty vehicles, 12 EV light duty vehicles, 45 HEV light duty vehicles, 13 LPG forklifts, 4 electric ATVs
- National Park Service. 3 hybrid SUVs, 1 electric vehicle, 1 propane truck, 1 electric truck, 2 propane forklifts, 3 electric utility carts, 4 LPG mowers
- USAA. 9 HEVs

Additional Fleet Adoptions for FY 2015:

- VIA Metropolitan Transit. RFP released for 400+ CNG buses
- Matera Paper. 30 CNG delivery vans

CHAPTER 6: Public/Stakeholder Involvement

6.1 AACOG's Community Survey

AACOG encourages public and stakeholder involvement at the various AIR Committee meetings and ensures a wide representation of public and private organizations on the committee membership lists. In addition, the meetings are open to the public and public comments are welcome. Public opinion is obtained by other means as well, such as through periodic surveys. While AACOG's Natural Resources staff conduct annual public surveys on air quality topics, these surveys represent a very small sample size and limited geographic scope. Neither are the surveys diverse from a demographic standpoint, as the surveys tend to be distributed at similar types of events, typically with a health or environmental focus. In May 2016, AACOG hired ETC Institute to develop a community project that includes surveying a representative sample of residents in the SA-NB MSA regarding some of their underlying assumptions about air quality, their support for selected ozone emissions strategies, and their willingness to take individual action to help improve air quality, with the ultimate goals of:

- building community awareness and knowledge of air quality issues in the Greater San Antonio area,
- providing a channel for public input that may lead to a greater sense of ownership of air quality issues and the desire to help work toward possible solutions,
- gathering knowledge of public sentiments that may influence community leaders to select, support, and act upon particular strategies to reduce emissions; and
- Avoiding public resistance that has put other local plans, such as transportation projects, on indefinite hold, and allowing the region to collectively move forward in confidence to effectively reduce ozone pollution.

Timeline.

June 2016

- Initial meeting between ETC, AACOG and AIR Committee members
- Approval of methodology and survey instrument

July 2016

- Field testing of survey and adjustments, if necessary
- Begin survey administration
- Weekly updates provided to AACOG

August 2016

- Weekly updates (continued)
- Completion of survey administration

September 2016

- Data entry and verification
- Data analysis/preliminary presentation to AACOG and AIR Committee members

October 2016

- Submission of draft report
- Submission of final report

November 2016

- Stakeholder presentation to AACOG and AIR Committee

APPENDIX A: Bexar County Vehicle Idling Limitations Court Order

BEXAR COUNTY COMMISSIONERS COURT

PUBLIC WORKS DEPARTMENT
Environmental Services

COURT ORDER

ORDER authorizing the approval of:

a) A Memorandum of Agreement between Bexar County and the Texas Commission on Environmental Quality (TCEQ) for Vehicle Idling Limitations

b) A Court Order for Vehicle Idling Limitations in Bexar County

PASSED THIS 3rd DAY OF May, 2016.

ORIGINAL

Commissioners Court Order

AN ORDER ESTABLISHING VEHICLE IDLING LIMITATION WITHIN THE UNINCORPORATED AREAS OF BEXAR COUNTY

March 2016

WHEREAS, The policy and purpose of the Texas Clean Air Act, as set out in TEX. HEALTH & SAFETY CODE CHAPTER 382, is to safeguard the state's air resources from pollution by controlling or abating air pollution and contaminants in the interest of protecting the public health, general welfare and physical property and enjoyment of air resources by the public and the maintenance of adequate visibility; and

WHEREAS, the Texas Commission on Environmental Quality is authorized to enter into agreements with local governments for the enforcement of the TCAA; and

WHEREAS, Title 30 of the Texas Administrative Code §114.510 through §114.517 allow a local government entity to regulate motor vehicle idling; and

WHEREAS, Bexar County wishes to reduce the Ozone production in Bexar and surrounding Counties below 70 Parts Per Billion (PPB) in support of the policy of the Texas Clean Air Act; and

WHEREAS, Bexar County has partnered Alamo Area Council of Governments (AACOG), City of San Antonio, and the suburban cities within Bexar County to reduce Ozone production

NOW THEREFORE, it is ordered by the Commissioners Court of Bexar County that Bexar County hereby adopts Texas Administrative Code Title 30, Part 1, Chapter 114, Subchapter J, Division 2, Rules §114.510 through §114.517 (Locally Enforced Motor Vehicle Idling Limitations), as appended hereto in Exhibit A and incorporated for all purposes. Any subsequent amendments shall be automatically incorporated.

EFFECTIVE DATE

SIGNED and ENTERED on this 3 day of May, 2016.

NELSON W. WOLFF
County Judge

SERGIO "CHICO" RODRIGUEZ
Commissioner, Precinct No. 1

PAUL ELIZONDO
Commissioner, Precinct No. 2

KEVIN WOLFF
Commissioner, Precinct No. 3

TOMMY CALVERT
Commissioner, Precinct No. 4

APPROVED AS TO LEGAL CONTENT:

BY: KATHERINE RAMOS
Assistant Bexar County Criminal District Attorney
Civil Section

APPENDIX B: Bexar County Memorandum of Agreement (MOU) with TCEQ for Vehicle Idling Limitations

BEXAR COUNTY COMMISSIONERS COURT

PUBLIC WORKS DEPARTMENT
Environmental Services

COURT ORDER

ORDER authorizing the approval of:

a) A Memorandum of Agreement between Bexar County and the Texas Commission on Environmental Quality (TCEQ) for Vehicle Idling Limitations

b) A Court Order for Vehicle Idling Limitations in Bexar County

PASSED THIS 3rd DAY OF May, 2016.

ORIGINAL

MEMORANDUM OF AGREEMENT
BETWEEN
BEXAR COUNTY AND TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
FOR
VEHICLE IDLING LIMITATIONS

I. PARTIES

This Memorandum of Agreement (MOA) is entered into between the Texas Commission on Environmental Quality (TCEQ) and the County of Bexar, State of Texas (Local Government), collectively the "Parties."

1. The Parties represent that they have the authority to enter into this MOA, including the authority granted in the Texas Government Code Chapter 791 Interlocal Cooperation Contracts.
2. The TCEQ has authority under Section 5.229 of the Texas Water Code and Section 382.033 of the Texas Health and Safety Code to enter into this MOA.
3. The Local Government has authority under Section 382.115 of the Texas Health and Safety Code to enter into this MOA.

II. INTENT AND PURPOSE

The intent of this MOA is to memorialize the agreement between the Parties to implement the following rules aimed at the control of air pollution from motor vehicles: 30 Texas Administrative Code (TAC) Chapter 114, Control of Air Pollution from Motor Vehicles, Subchapter J, Operation Controls for Motor Vehicles, Division 2, Locally Enforced Motor Vehicle Idling Limitations, Sections 114.510 – 114.512 and 114.517.

The parties enter into this MOA for the purpose of delegating rule enforcement from the TCEQ to the Local Government and potentially incorporating the emission reductions resulting from the implementation and enforcement of the above-referenced rules into the State Implementation Plan (SIP).

III. DEFINITIONS

As used in this MOA the following terms have the meanings given below:

1. EPA shall mean the United States Environmental Protection Agency.
2. TCEQ shall mean the Texas Commission on Environmental Quality.
3. Local Government has the meaning assigned by 30 TAC Section 114.510.
4. SIP shall refer to the Texas State Implementation Plan.

IV. BACKGROUND

On November 17, 2004, the TCEQ adopted rules concerning locally enforced motor vehicle idling limitations, which are applicable only within the jurisdiction of a Local Government that has signed an MOA with the TCEQ delegating enforcement of

the rules. The EPA approved the rules in the April 11, 2005, *Federal Register* (70 FR 18308). The rules became effective June 10, 2005.

V. OBLIGATIONS OF PARTIES

(A) The Local Government agrees as follows:

1. In accordance with the terms of this MOA the Local Government agrees to implement the following TCEQ Rule:
    a. 30 TAC Chapter 114, Control of Air Pollution from Motor Vehicles, Subchapter J, Operation Controls for Motor Vehicles, Division 2, Locally Enforced Motor Vehicle Idling Limitations, Sections 114.510 - 114.512 and 114.517. Changes to these TCEQ Rules shall be incorporated into this Agreement without requiring amendment of this Agreement.
2. The Local Government agrees to submit the following information to the TCEQ for the rules listed above not later than forty-five (45) calendar days after the effective date of this MOA:
    a. detailed description of the plan for implementation of these rules;
    b. copies of local ordinances or resolutions adopted by each Local Government to implement these rules; and
    c. copies of agreements entered into between any Local Government and other units of Local Government for the purpose of implementing these rules.
3. The Local Government agrees to submit copies of any requisite resolutions under Section 7.352 of the Texas Water Code to the TCEQ forty-five (45) calendar days after the effective date of this MOA or within fourteen (14) calendar days after passage by the local governing body, whichever is later.

(B) The TCEQ agrees to consider this MOA for submission to the EPA for inclusion in the SIP.

VI. TERM AND TERMINATION

This MOA will become effective upon signature by both Parties and shall expire on December 31, 2018, unless renewed in writing by mutual agreement of the Parties. A Party may withdraw from this MOA at any time upon thirty (30) calendar days written notice to the other Party. This MOA may be terminated at any time by mutual written consent of the Parties.

VII. MISCELLANEOUS

This MOA represents the entire agreement between the TCEQ and the Local Government and supersedes all other agreements, understandings or commitments, written or oral, relative to the intent of this MOA. This MOA may not be amended or

modified except pursuant to a mutual written agreement executed by each of the Parties.

This MOA shall be governed by and interpreted in accordance with the laws of the State of Texas.

In Witness Thereof, Texas Commission on Environmental Quality and the Local Government, by their authorized officers, have made and executed this MOA in multiple copies, each of which is deemed an original.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

By: _____ 6/10/2016
Name: David Brymer Date
Title: Director, Air Quality Division

COUNTY OF BEXAR

By: _____ 5/03/2016
Name: Nelson Wolff Date
Title: County Judge

ATTEST:

Gerard C. Rickhoff
County Clerk

APPROVED AS TO FORM:

Katherine Ramos
Asst. Criminal District Attorney
Civil Division

APPROVED AS TO FINANCIAL CONTENT

Susan Yeatts
County Auditor

David Smith
County Manager