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

2017 Update Approved on September 27, 2017

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.

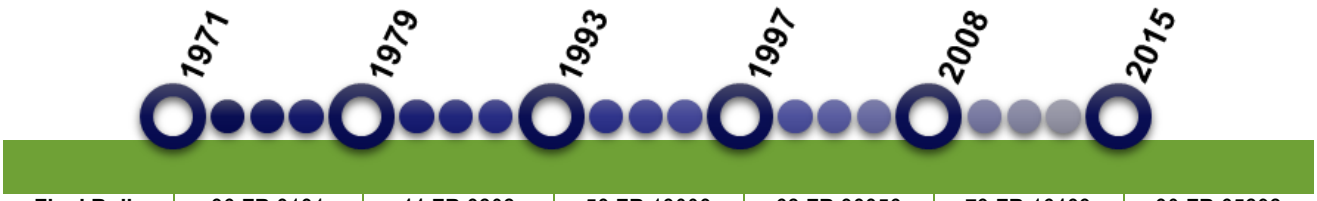
Ozone pollution forms when specific chemicals react in the atmosphere with sunlight. These chemicals are released from a range of processes including the burning of gasoline, diesel, and other fuels, and the evaporation of paints and solvents. Meteorological conditions also influence the formation and 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, and low wind speeds. These conditions are prevalent in the San Antonio area through much of the late spring 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	125 ppb		85 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.

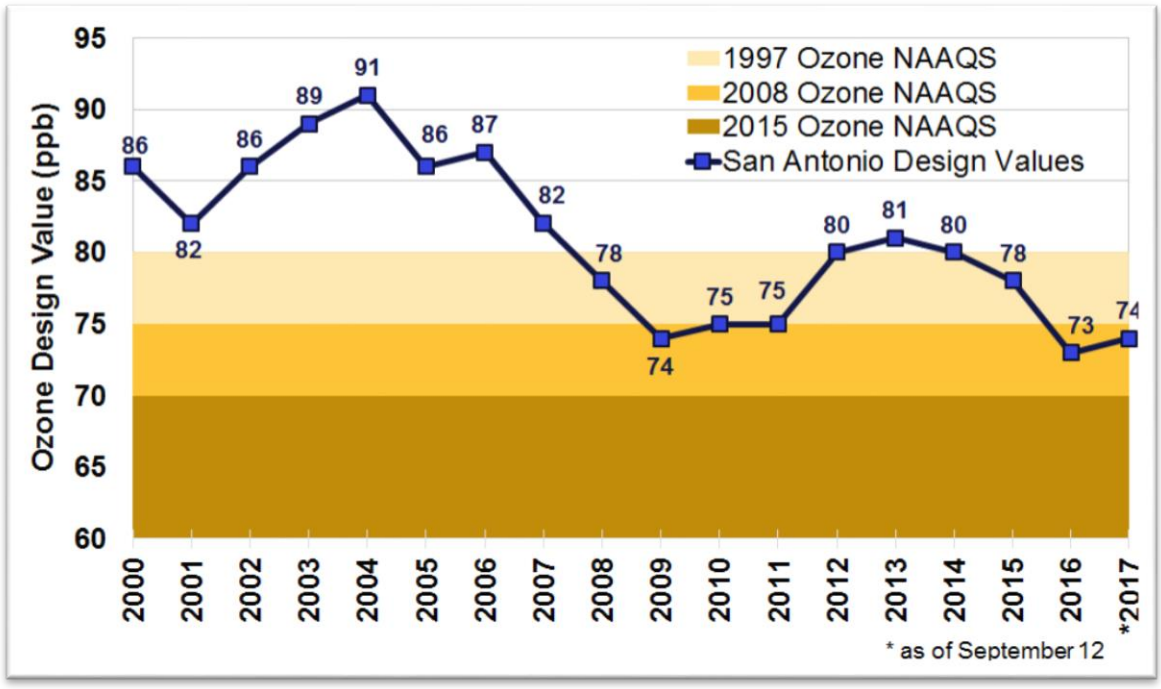


Figure 1-2: Annual design values (DV) for the San Antonio area relative to the thresholds established for the 1997, 2008, and 2015 ozone standards. The design values represent the 3-year average of the annual fourth-highest daily maximum 8-hour ozone average.

This document is the 2017 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 2016 and 2017 *Path Forward* include updated information in all chapters, providing a regional overview, local voluntary strategies, and education and outreach activities. This year's update includes information relating to the impact of a veto by Governor Greg Abbott which eliminates future funding for air quality planning through the long standing Rider 7 Program.

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 (MSA) includes Bexar and seven surrounding counties. The second-largest city in the MSA is New Braunfels, located in adjacent Comal County.

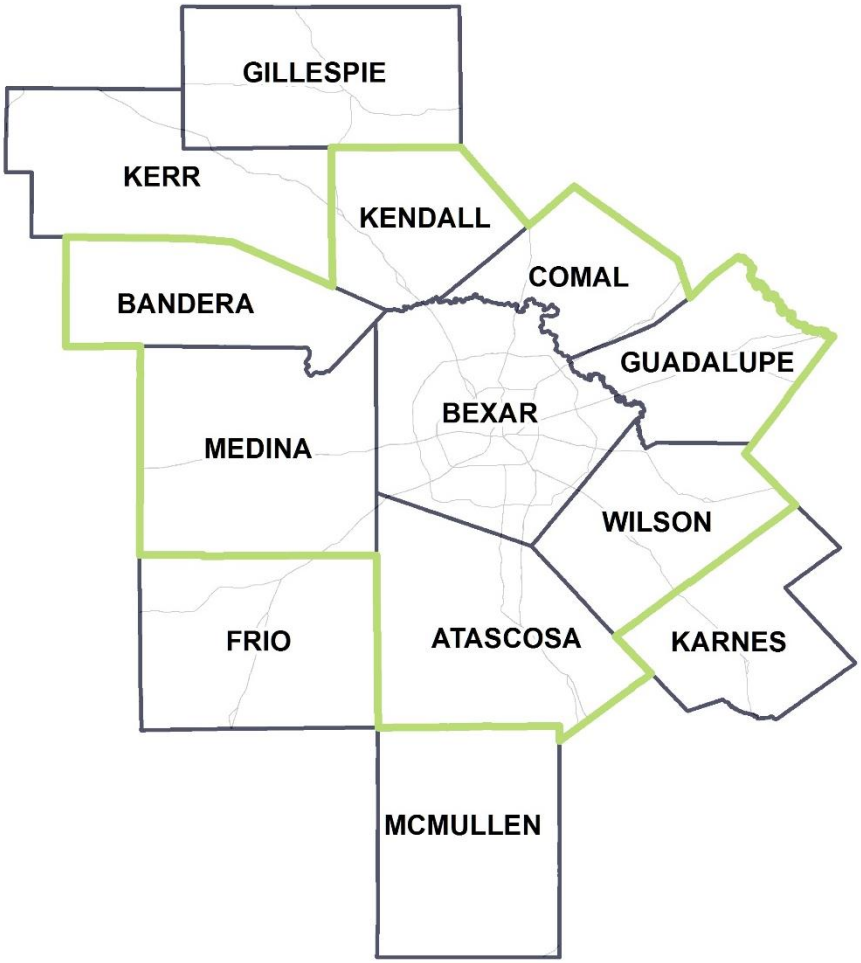


Figure 2-1: Map of the 13-county AACOG region and the 8-county San Antonio-New Braunfels MSA (heavy green outline)

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 2016, the San Antonio-New Braunfels MSA represented about 9% of the population in Texas. Between 2000 and 2016, the region's population grew by over 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). The Interstate 10 corridor, including Bexar and Kendall Counties, has also seen significant growth during this period.

MSA County	2000 Population	2016 Population	% Change
Atascosa	38,628	48,797	26.3%
Bandera	17,645	21,776	23.4%
Bexar	1,392,931	1,928,680	38.5%
Comal	78,021	134,788	72.8%
Guadalupe	89,023	155,265	74.4%
Kendall	23,743	42,540	79.2%
Medina	39,304	49,283	25.4%
Wilson	32,408	48,480	49.6%
MSA Total	1,711,703	2,429,609	41.9%
Texas	20,851,820	27,862,596	33.6%

Table 2-1: Population growth in the San Antonio-New Braunfels MSA, 2000-2016[2]

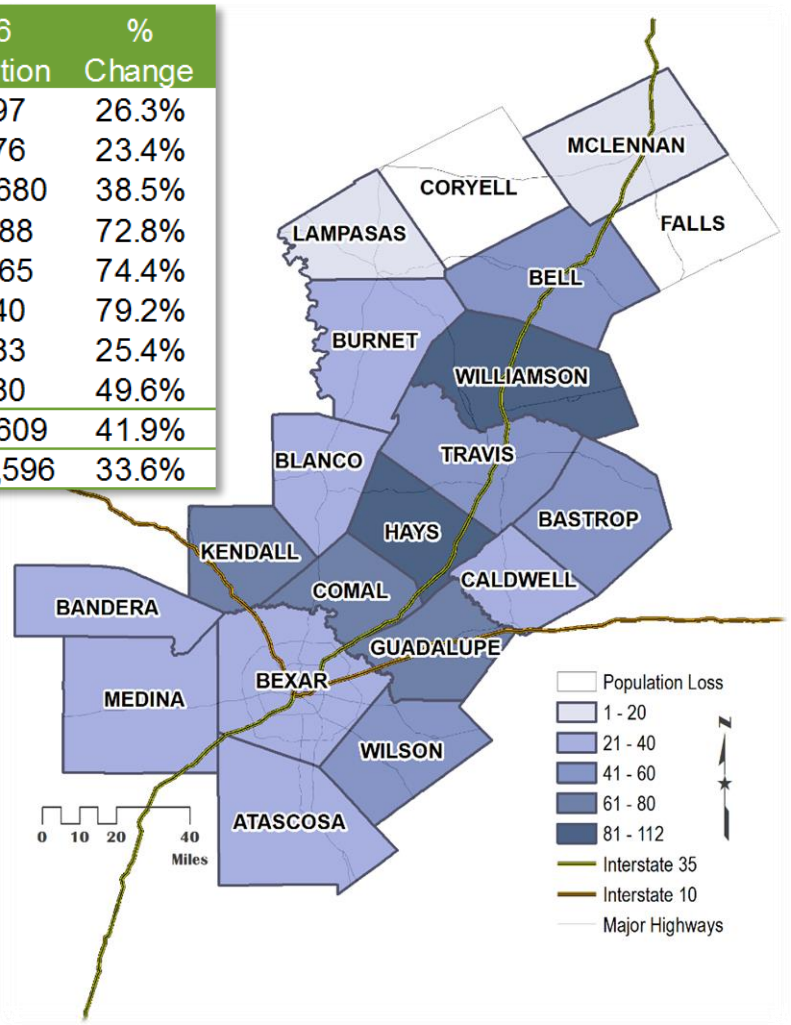


Figure 2-2: Percentage of population change between 2000 and 2016 in counties along Interstate 35

[2] U.S. Census Bureau. (2000). Decennial Census Data; U.S. Census Bureau (July 1, 2016). Population Estimates Program Data (PEP).

2.3 Ozone Monitoring

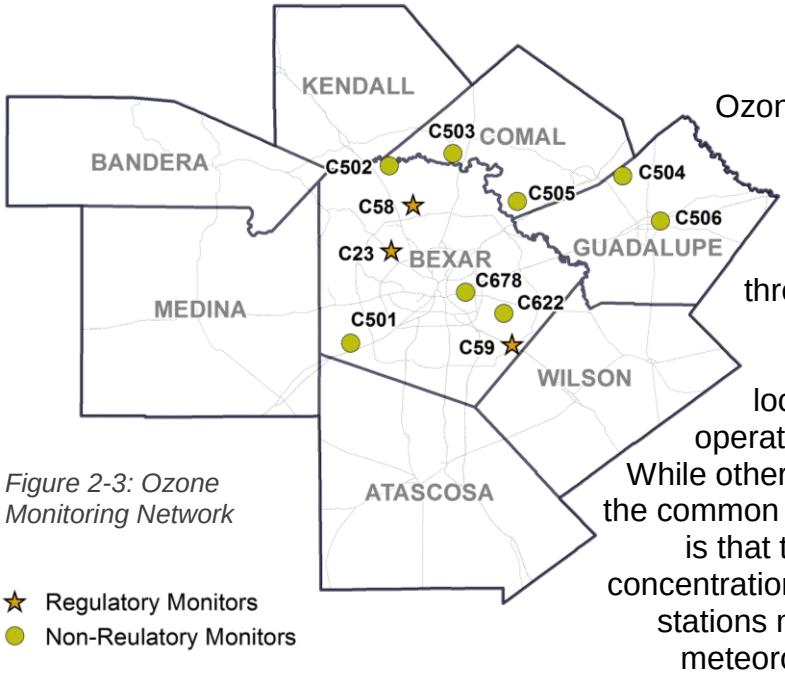


Figure 2-3: Ozone Monitoring Network

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 rolling three-year averages of annual fourth highest 8-hour average ozone or design values, upon which attainment calculations are based, are in exceedance of the 2015 ozone standard. Since coming out of a record drought in 2012, ozone levels have experienced a steady decline since 2014.

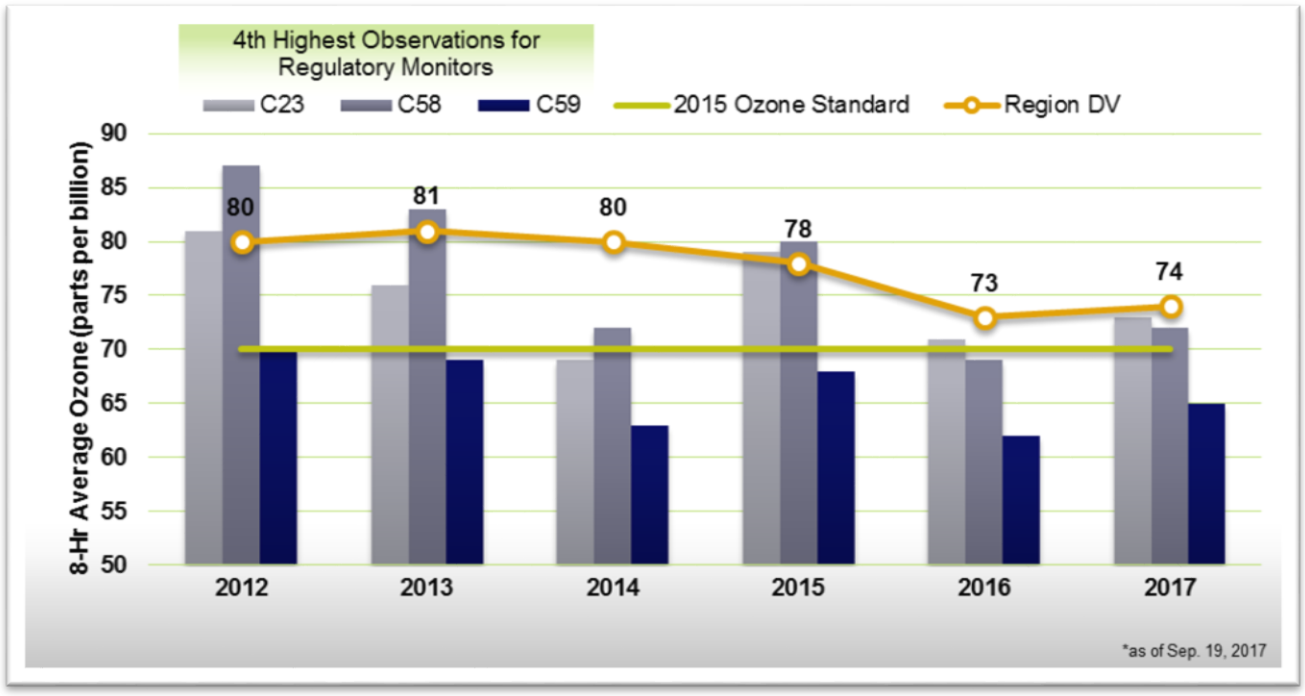


Figure 2-4: Annual 8-Hour Fourth Highest Ozone Observations and Design Values, 2002-2016

Table 2-3 lists design values for each regulatory monitor as of the end of 2015 and 2016, the design value for 2017 as of July 2017, 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 2017 that would have yielded a 2017 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	2013 4th Highest	2014 4th Highest	2015 4th Highest	2015 Design Value	2016 4th Highest	2016 Design Value	2017 4th Highest*	2017 Design Value*	TARGET 2017 4th Highest
CAMS 23	**76**	69	**79**	**74**	**71**	**73**	**73**	**74**	62
CAMS 58	**83**	**72**	**80**	**78**	69	**73**	**72**	**73**	63
CAMS 59	69	63	68	66	62	64	64	64	82

* as of Sep. 19, 2017

Table 2-3: Design Values for 2015 and 2016 with Targeted 4th Highest Observations for 2017

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 at regulatory monitors (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 exceedances over 70 ppb is slightly higher than the spring period.

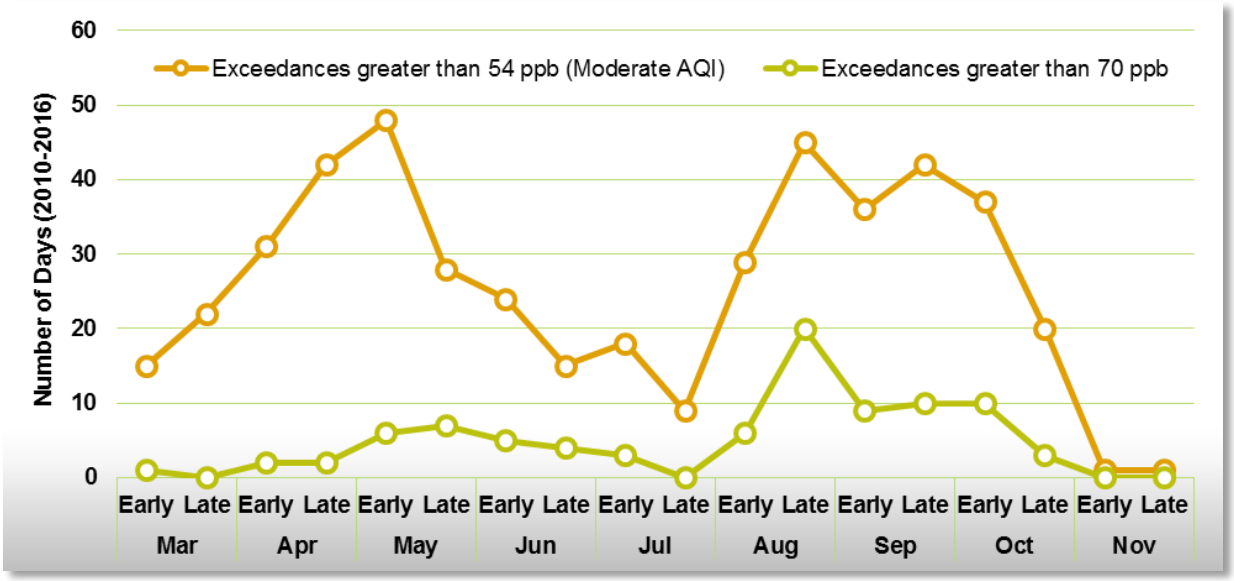


Figure 2-5: Number of days between 2010 and 2016 that the 8-hour average exceeded 54 and 70 parts per billion at any regulatory monitor

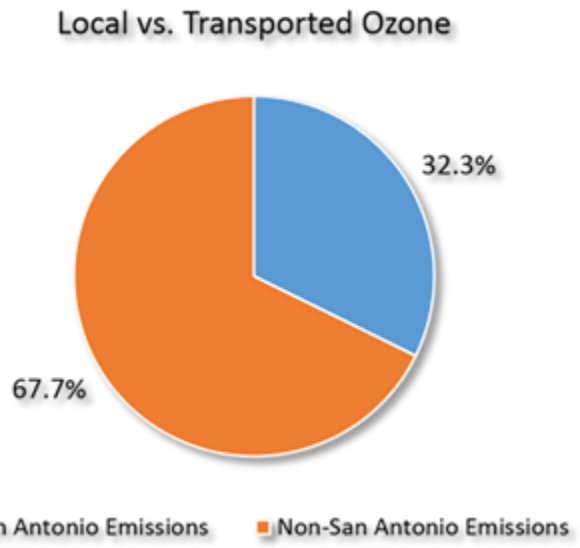


Figure 2-6: Local vs. Transported Ozone at CAMS 58 Camp Bullis

Ozone is both formed locally and transported in from other regions. Photochemical modeling projects have concluded that **while 32.3% of ozone is formed locally, 67.7% comes from outside the region** (Figure 2-6). Other areas that significantly contribute to ozone in San Antonio are other Texas cities, like Austin and Houston, other states, and as much as 29% of ozone at Camp Bullis (CAMS 58) originates from sources outside of the country.

Ozone concentrations fluctuate by season depending on several factors including variations in transport, meteorology, chemical loss of ozone, and stratospheric ozone levels. Ozone transport can also be depicted by the minimum average 8-hour ozone in a given region, has experienced a general decline since 2010 as shown in Figure 2-7. 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 2-8.

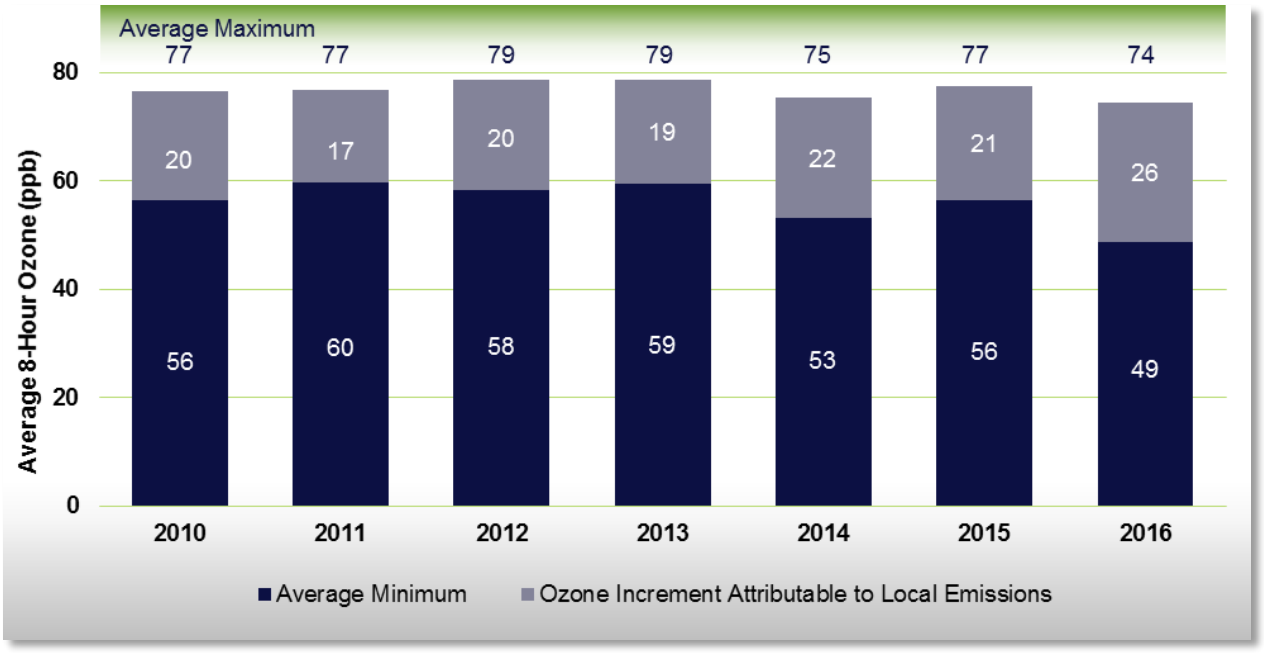


Figure 2-7: Annual Ozone Attributable to Local Emissions, average maximums and minimums derived using data from the monitor with the highest and lowest 8-hour average recorded in the region each day between 2006 and 2015 on days where ozone > 70 ppb.

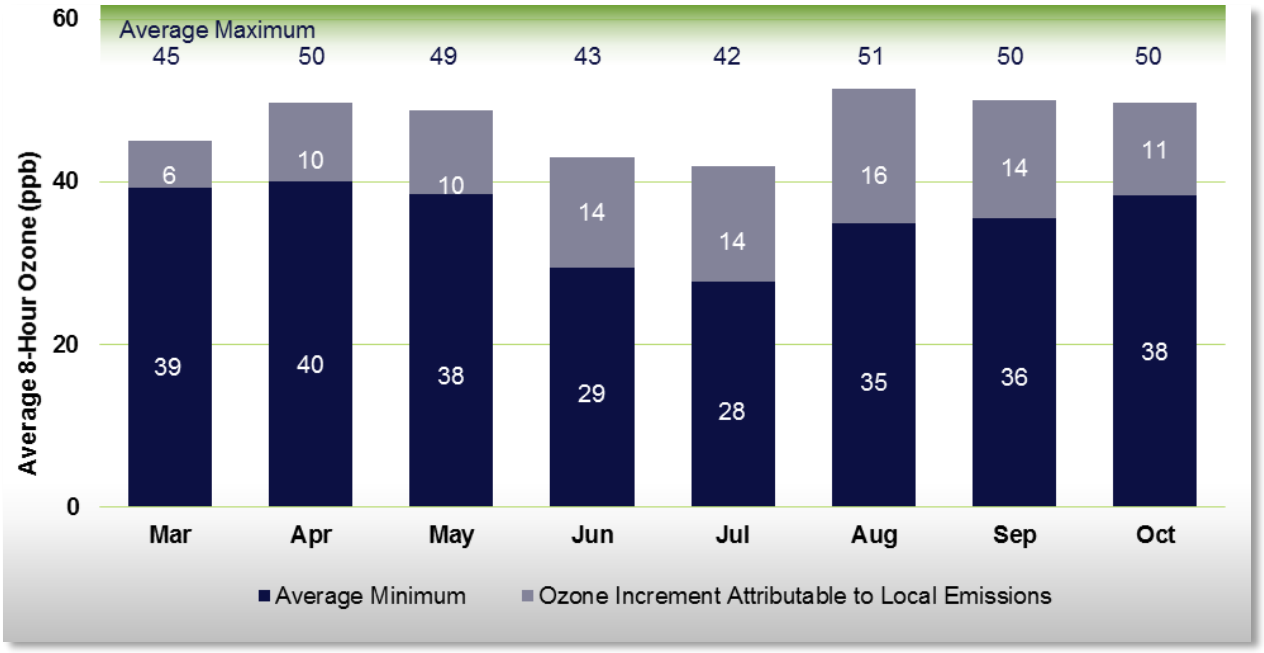


Figure 2-8: Annual Ozone Attributable to Local Emissions by Month, 2010-2016 Averages

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:

- **High ozone events often occur within days after the passage of a frontal boundary. Northerly winds behind the front transport relatively unclean continental air into the region, which elevates ozone to moderate levels. As winds begin to shift back to the southeast, there is often a double-dose of ozone and precursor emissions, which often results in an ozone exceedance (> 70 ppb).**

- **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 2-9) and wind roses (Figure 2-10, Figure 2-11, and Figure 2-12) 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.

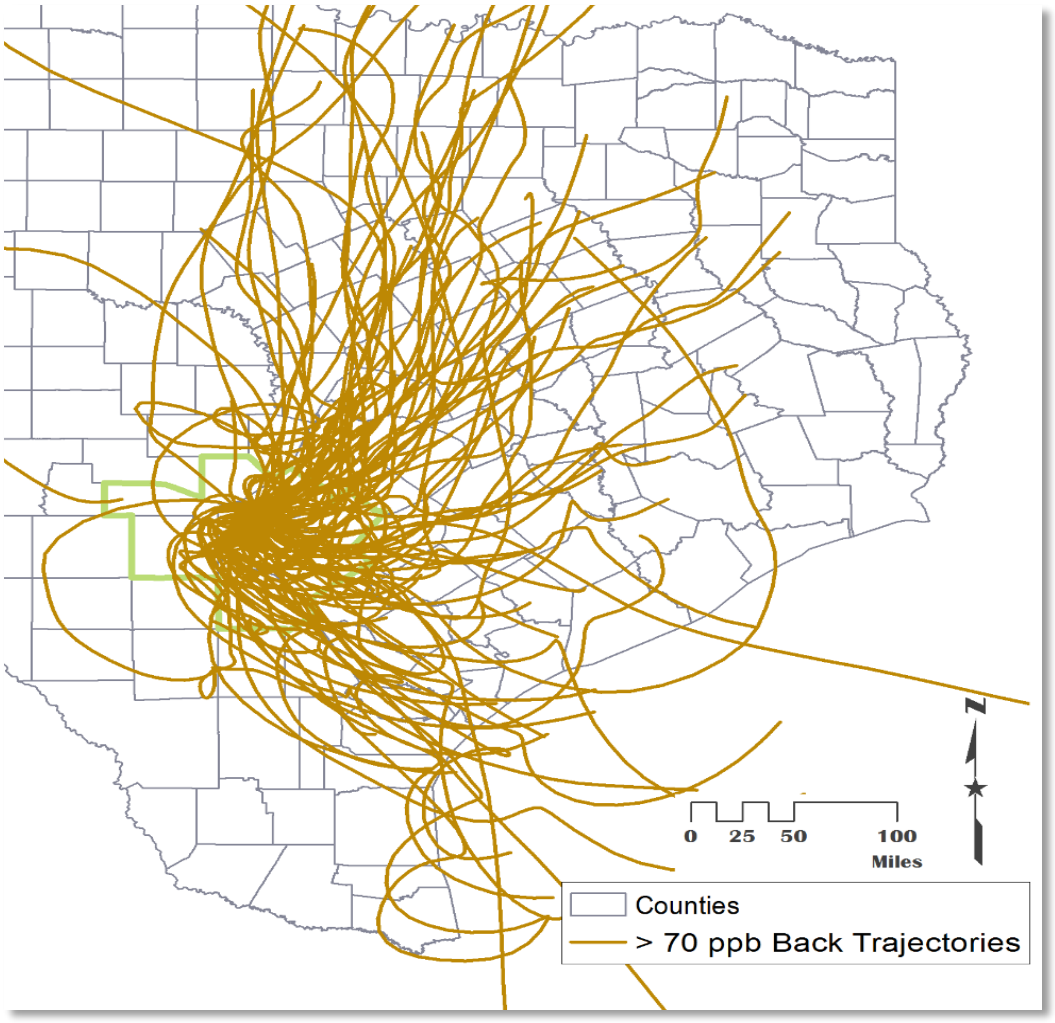


Figure 2-9: 48-Hour HYSPLIT Back Trajectories on Days with 8-Hour Ozone > 70 ppb, 2010-2016

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.

[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.

A review of data between 2010 and 2016 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 2-10 show the contrast between morning (6 a.m. to 9 a.m. local time) and afternoon (12 p.m. to 3 p.m. local time) resultant wind directions and speeds for high ozone days at C58. 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, approximately 70% of high ozone days had resultant wind vectors from the WNW, NW, or NNW, whereas in the afternoon on high ozone days, nearly 60% 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.

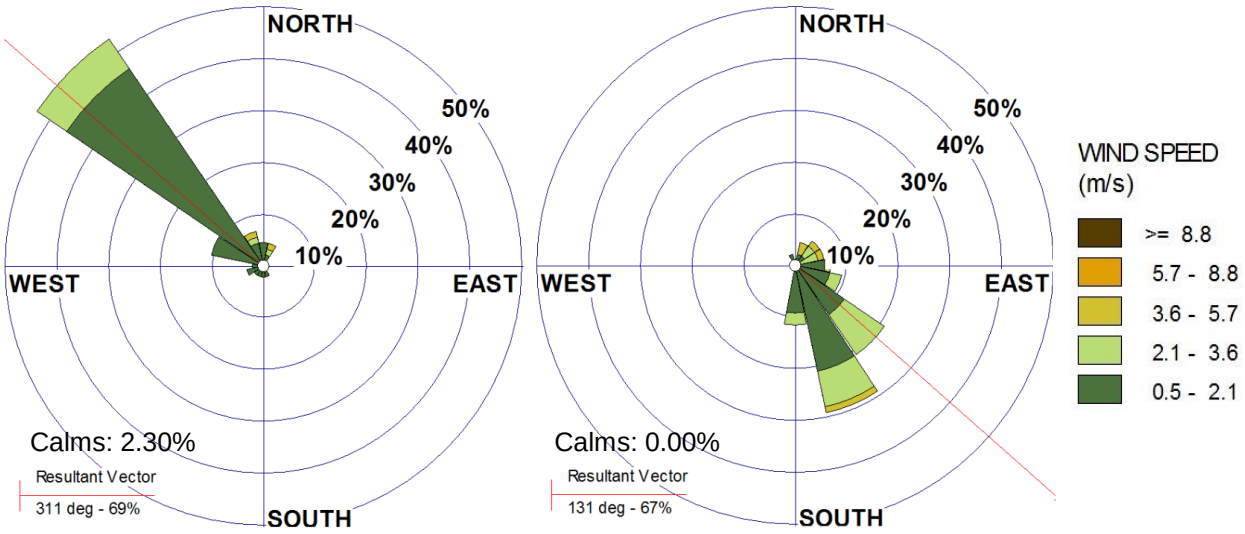


Figure 2-10: C58 AM (6 a.m. to 9 a.m.) and PM (12 p.m. to 3 p.m.) Wind Roses, 2010-2016

Figure 2-11 and Figure 2-12 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 46% 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 38.6% of high ozone days, while ESE, SE, and SSE afternoon wind directions at C59 accounted for 38.6% of high ozone days.

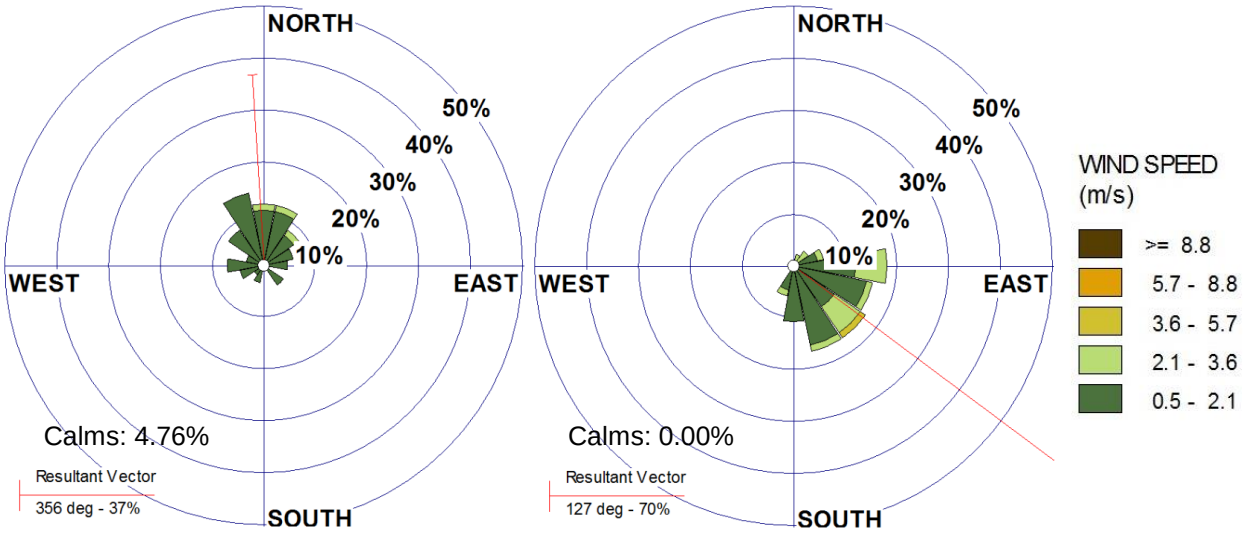


Figure 2-11: C23 AM (6 a.m. to 8 a.m.) and PM (12 p.m. to 2 p.m.) Wind Roses, 2005-2015

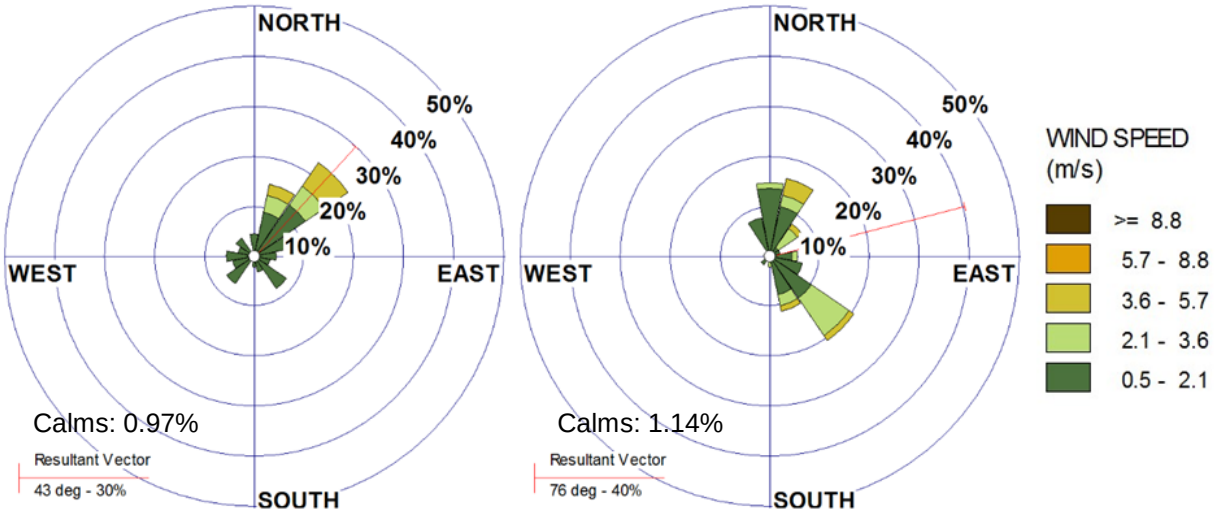


Figure 2-12: C59 AM (6 a.m. to 8 a.m.) and PM (12 p.m. to 2 p.m.) Wind Roses, 2005-2015

2.7 Emissions Sources

Projected Trends. AACOG develops periodic emissions inventories of non-road, off-road, oil and gas, and area sources in the region. Combining AACOG data with point source emissions from TCEQ and on-road emissions estimates calculated by the EPA's MOVES2014a model provides an indication of the ozone season weekday 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 will continue a downward trend, largely due to improvements in vehicle emission standards and point source emission

reductions. Local overall VOC emissions are expected to slowly decline too from 2012 to 2017 (Figure 2-13).

Weekday NO_X emissions for 2017 from point sources in the SA-NB MSA were estimated at 61 tons per day, followed by on-road sources at 44 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 and oil and gas sources. This trend is expected to continue through 2023, the last date for which emissions have been estimated.

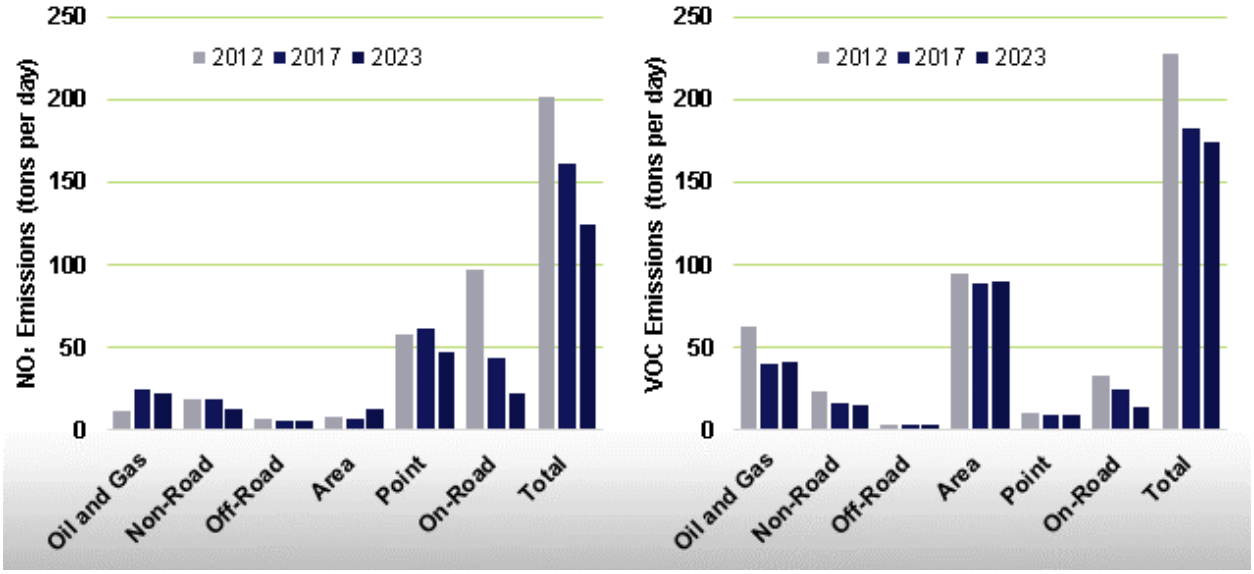


Figure 2-13: NO_X and VOC Emissions Estimates by Source in the San Antonio-New Braunfels MSA, 2012, 2017, and 2023

Table 2-4 lists total 2017 emissions by county, which include point, area, on-road, non-road, and biogenic sources. Emissions estimates are from the latest projections in the region photochemical model.

County	NO_X (tpd)	VOC (tpd)
Atascosa	23.2	30.9
Bandera	1.2	3.0
Bexar	89.1	103.8
Comal	20.5	10.7
Guadalupe	12.9	12.6
Kendall	1.6	3.6
Medina	7.5	6.3
Wilson	4.8	9.7

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

On-road Sources. On-road vehicles have traditionally represented the significant source of NO_X in the region. San Antonio is transected by a number of major highways, including Interstate 10, Interstate 35, Interstate 37, and US Highway 281 and its proximity to multiple land and ocean ports guarantees an abundance of heavy-duty vehicle traffic. Table 2-5 lists 2017 on-road emissions by county.

County	NO_X (tpd)	VOC (tpd)
Atascosa	2.4	0.7
Bandera	0.4	0.3
Bexar	30.3	18.5
Comal	3.8	1.8
Guadalupe	3.4	1.6
Kendall	1.1	0.6
Medina	1.5	0.6
Wilson	1.0	0.6

Table 2-5: On-road NO_X and VOC Emissions Estimates by County, 2017

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 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 100 tons per year (tpy) of NO_X or VOCs.

County	Point Source Name	NOx (tpy)	VOC (tpy)
Atascosa	San Miguel Electric Plant	2083	59
Bandera	Bandera Compressor Station	295	22
Bexar	CPS Calaveras Power Plant	4342	47
Bexar	Alamo Cement 1604 Plant	2449	28
Bexar	Capitol Aggregates	581	93
Bexar	CPS Braunig Power Plant	572	46
Bexar	Southwest Research Institute	248	59
Bexar	Toyota Vehicle Assembly Plant	20	430
Caldwell	Oasis Pipeline Compressor Station	140	24
Comal	Cemex Balcones Plant	2334	22
Comal	TXI Hunter Cement Plant	1411	76
Comal	Lhoist Lime Plant	558	5
Guadalupe	Guadalupe Generating Station	738	10
Guadalupe	CPS Rio Nogales Power Plant	359	5
Guadalupe	Structural Metals Steel Mill	106	33
Guadalupe	Republic Plastics Foam Plant	0	162
Hays	Texas Lehigh Cement Plant	2301	180
Hays	Hays Energy Power Plant	211	127
Karnes	Burda Golden Production Facility	170	200
Karnes	Gramm Production Facility	153	230
Karnes	Patton Trust N Production Facility	129	203
Karnes	Patton Trust S Production Facility	125	245
Karnes	McAlister Production Facility	123	236
Karnes	Love Crews Production Facility	123	173
Karnes	ETC Texas Pipeline Kenedy Plant	119	54
Karnes	Dickson Allen Production Facility	119	223
La Salle	Plains Pipeline North Terminal	0	252
Live Oak	Three Rivers Refinery	360	431
Live Oak	Live Oak Compressor Station	56	4315
Zavala	Paradigm Energy KM East	40	154

Table 2-6: Total Point Source NO_X and VOC Emissions for the SA-NB MSA and Outlying Counties, 2015

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 2015. Any point source of NO_X or VOCs in the SA-NB MSA was located using Google Earth and TCEQ permits. Figure 2-14 and Figure 2-15 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.

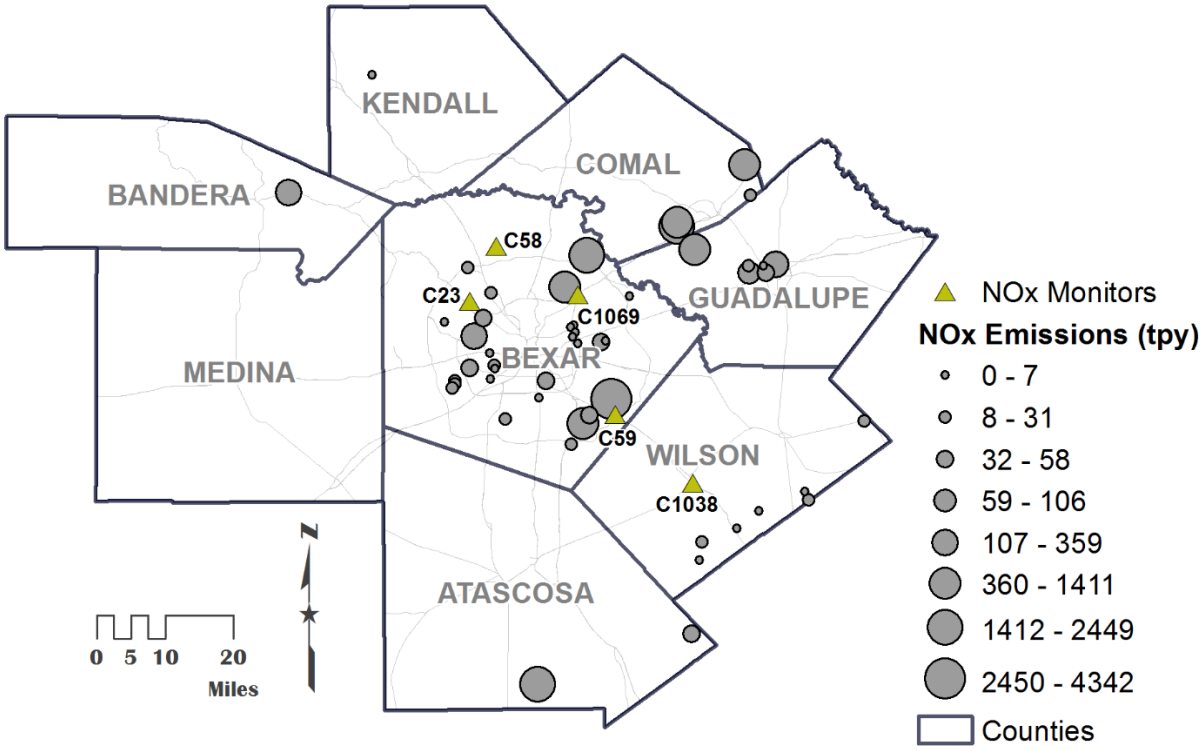


Figure 2-14: Major Point Sources of NO_X in the SA-NB MSA (2015)

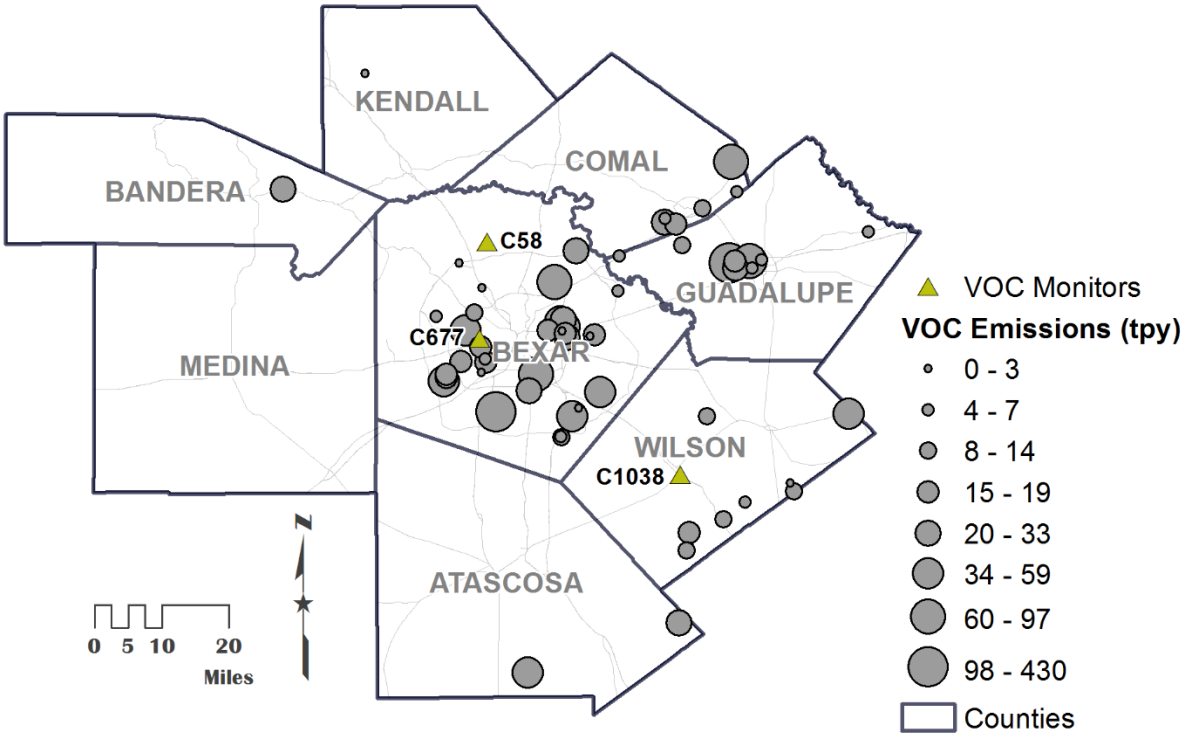


Figure 2-15: Major Point Sources of VOCs in the SA-NB MSA (2015)

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[4] was based on a May 24 – June 2, 2006 episode provided by TCEQ and refined by AACOG with regional emissions inputs.[5] 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 2-16.

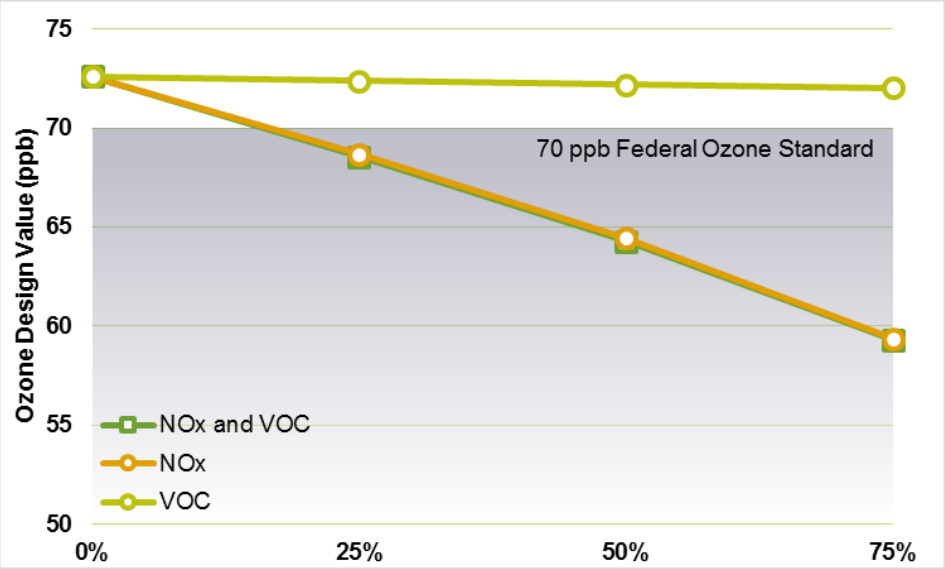


Figure 2-16: Predicted Ozone Design Value at C58 after Removing Local NO_X and VOC Emissions, 2018

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

[5] 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 the other regulatory ozone monitors in the region were similar to C58, indicating that the model was significantly more sensitive to changes in NO_X emissions reductions (verses 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 2-17) 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 2-18 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%.

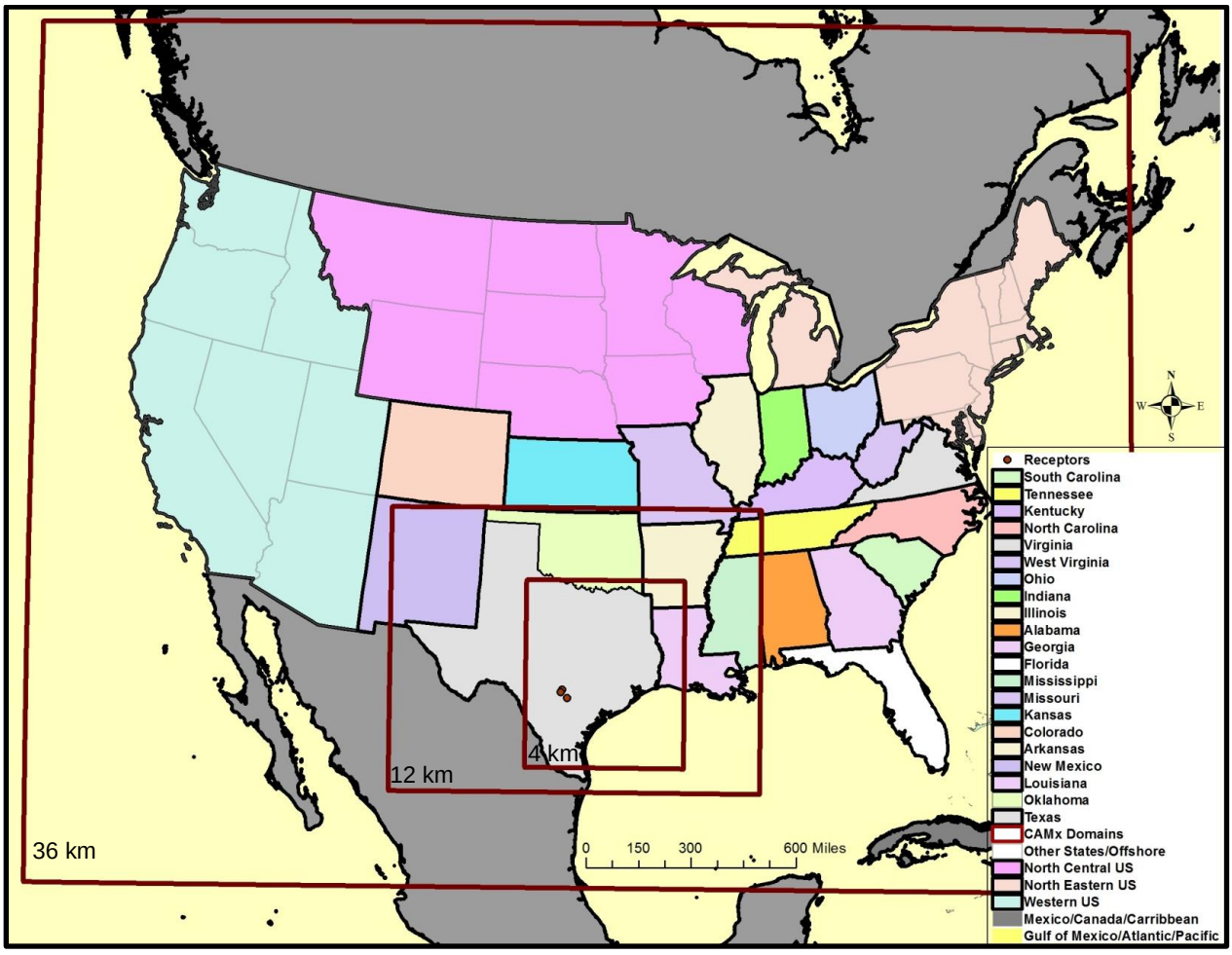


Figure 2-17: APCA modeling domain at 36 km, 12 km, and 4 km grid levels

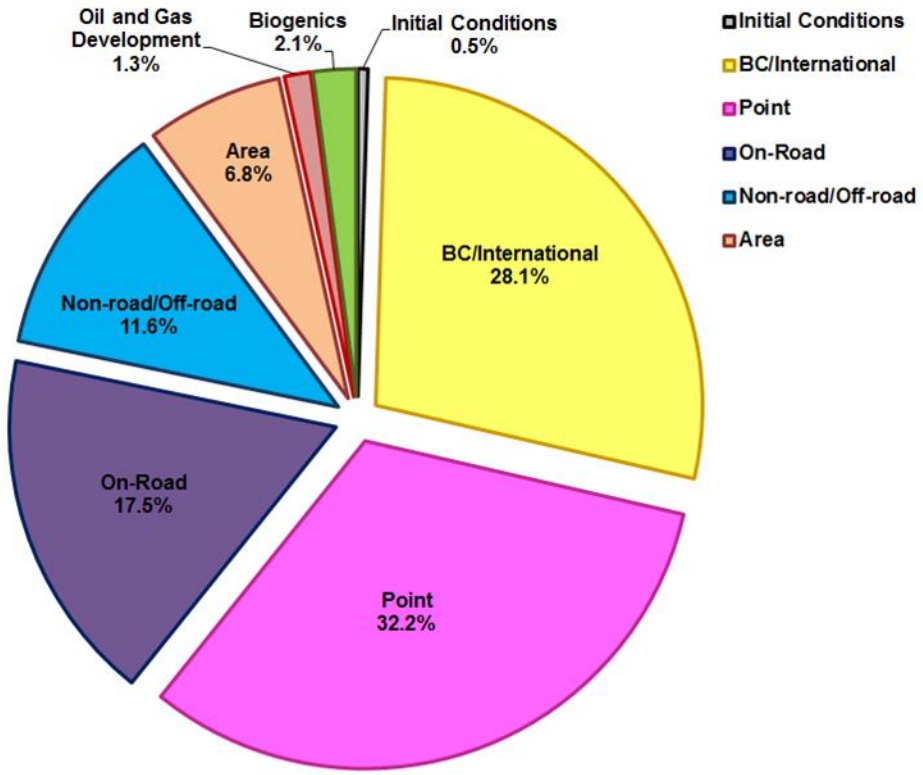


Figure 2-18: All Emissions Sources for Average Peak 1-Hour Ozone on Days > 70 ppb at C58, 2018

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 2-19). 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. **It is important to note the large share of ozone that comes from international sources.**

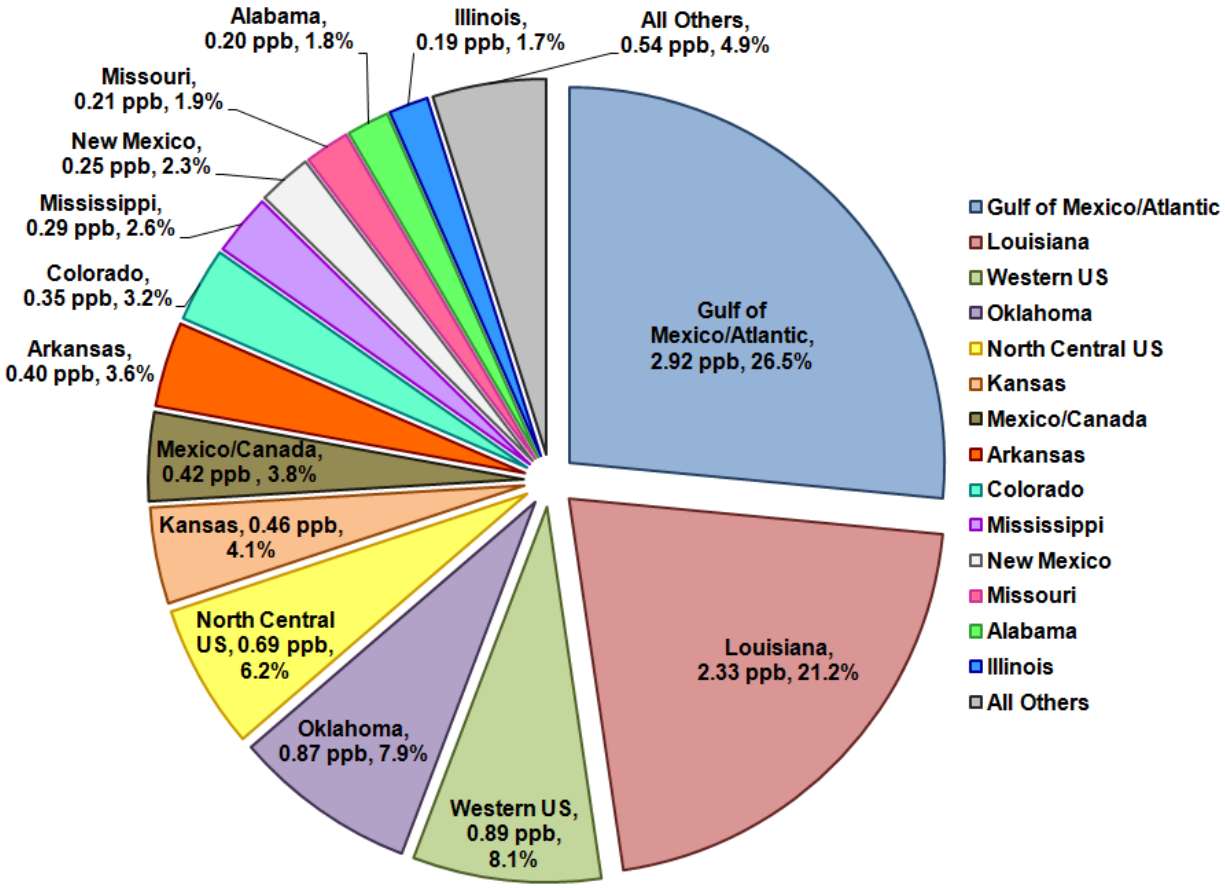


Figure 2-19: States/Other Regions besides Texas Sources for Average Peak 1-Hour Ozone on Days > 70 ppb, 2018

CHAPTER 3: Regional Planning

This section reflects updates to the Strategic Plan, Inter-regional Collaboration and impacts resulting from vetoed air quality planning funds.

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 adoption of appropriate control strategies by businesses, governments, industries, schools and individuals.

The AIR Committees have been 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 developed an updated Conceptual Model in 2017. This regional model 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. An executive summary of the conceptual model is attached as Appendix B.

The strategic location of ozone monitors provides a better understanding of the spatial extent of San Antonio's ozone problem. An ozone monitoring network assessment was completed early in 2017, which identified areas where additional ozone monitors were needed within Bexar County. Results from the study concluded that a new ozone monitor was needed in northwestern Bexar County. In response to this need, our

regional utility, CPS Energy, acquired a monitor for the Government Canyon State Natural Area, which was selected as the site to meet this need. This monitor Cost of commenced operation in late August 2017.

Cost of Nonattainment Study

At the direction of the AIR Executive Committee, AACOG contracted for a 2016 study of the potential cost of nonattainment to our region once a designation has been issued. The report summarized the potential costs to the metropolitan economy that could be anticipated under a marginal or moderate nonattainment determination. In sum, the report concluded that the metropolitan economy could experience losses of up to $1 billion per year upon official designation by the EPA. As mentioned in the report, much of the impact would be attributed to economic opportunity costs as businesses choose to expand or relocate to regions deemed as being in attainment. However, the losses would also result from a variety of costs, including:

- Lost Manufacturing Company Expansion/Relocation
- Cost of Additional Permitting
- Cost of Project Delays
- Costs of Mandated Program Operations
    - Texas Emission Reduction Plan (TERP)
    - Commute Solutions
- GRP Losses Due to Additional Inspection Fees
- GRP Losses Due to Road Construction Delays
- Costs to Reduce Point Source NOx Emissions

Further, the costs are expected to impact the eight-county region according to economic productivity. Bexar, Comal, and Guadalupe Counties would experience the brunt of these costs. The impacts to the average residents of the region would be primarily attributed to delays in transportation projects which would need to adhere to conformity requirements mandated by a nonattainment designation. Conformity requirements ensure that projects will not exacerbate current air quality levels. These determinations would result in delays for transportation projects until conformity requirements are met. At higher levels of nonattainment, industry offsets would be mandated, which essentially cap emissions and disallow any significant added emissions from new business or manufacturing processes.

While the 2016 nonattainment study did not incorporate region-wide health impacts, data collected for our region indicate that NOx emissions have been trending downward despite significant population growth. One consideration is that costs in complying with nonattainment regulations may indirectly affect funding available to address public health needs arising from higher ozone levels.

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

In 2017, a photochemical modeling project for TCEQ and the Alamo Area MPO is nearing completion. This project includes important emissions inventories, which are critical inputs to the model. Results from the photochemical model will help estimate ozone reductions associated with the implementation of various local control strategies. Also included in the photochemical modeling results will be Anthropogenic Precursor Culpability Assessment (APCA) runs, which will identify contributions to San Antonio's ozone from multiple source areas[6], categories, and pollutant types. The contributors include on-road, point, non-road, off-road, oil and gas, and area emission sources.

AACOG maintains a list of the largest NOx and VOC sources in the region through the State's permit database. In 2015, the San Antonio city council adopted an ordinance which will enhance this information by requiring business facilities with air pollution emissions to register with the San Antonio Metropolitan Health District (SAMHD), the public health agency charged with the responsibility for providing public health programs in San Antonio and unincorporated areas of Bexar County. The intent of registering these facilities is to identify local ozone sources and develop steps to mitigate emissions. During 2017, more than 1,000 business facilities registered with the program. Education was provided on the City's idling restrictions, prohibited use of coal based tar sealant products, emission reduction and the registration program during each site visit. 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 in determining the impact of these emissions on ambient ozone levels.

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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.

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[6]Multiple source areas include counties within the San Antonio-New Braunfels MSA, other large urban areas in Texas, and other states.

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.

AACOG and regional partners have diligently worked to increase public awareness of air quality through the region's media outlets. In 2017, AACOG staff conducted meetings with area news outlets including KSAT, WOAI, Fox, Univision, and Spectrum News. These efforts resulted in three on-air segments discussing the ozone season and recommendations for reducing ozone pollution.

The uncertainty in predicting and communicating ozone exceedances has led to additional efforts to encourage the expansion of critical air quality information beyond the state-issued alert notification system. AACOG continues to encourage local television stations to incorporate air quality reports in their weather broadcasts. One obstacle that has been identified to achieving this is the need for a consistent source of sponsors.

Additionally in 2017, the City of San Antonio developed and implemented an air quality outreach campaign called, "Breathe Today. SA Tomorrow." This campaign focused on the economic and public health costs of the city potentially being designated as nonattainment according to NAAQS standards. This effort included paid radio and television spots as well as digital media ads promoting campaign.

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

In 2016 and 2017, Commute Solutions and Clean Cities staff conducted numerous meetings, outreach events, and air quality presentations with schools and local universities. In July 2016, the Commute Solutions program initiated school outreach by offering free Ozone Action Day banners and "No Idle Zone" signs to 11 school districts in Bexar County for their 400+ campuses. In October, the program followed up with area principals by sharing information about Commute Solutions for Schools, which included promotions for the Walking School Bus, Bike Buddies, SchoolPool, Green

Patrol, and Ozone Action Day alerts. Staff also conducted a major presentation at the Northside Council of PTA's General Assembly in November 2016. Northside Independent School District is among the largest school districts in Texas. In January 2017, AACOG also promoted air quality programming at the San Antonio Independent School District's Professional Development Training for Parent and Family Liaisons.

In June 2017, Commute Solutions initiated efforts to mitigate personal vehicle use by promoting the NuRide program with universities having large commuter populations. As a result of these efforts, the University of Texas at San Antonio agreed to endorse and adopt the NuRide concept as a benefit for their students, faculty, and staff.

Efforts to engage the medical community included information provided through the Bexar County Medical Society's electronic newsletter. To initiate this, the AIR Executive Committee sent a letter to area physicians requesting assistance in educating patients about the health risks of ground-level ozone and services available to notify them of predicted and current levels of ozone. The letter included a link to an informative brochure that the physicians could download and make available in their offices or waiting rooms.

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.

Commute Solutions and Clean Cities coordinated efforts to encourage businesses to support sustainable transportation programs, including carpool, subsidized bus passes and green fleets. Commute Solutions staff presented to area chambers of commerce, including the Northside Chamber, Southside Chamber, Greater San Antonio Chamber and regional chambers, such as the New Braunfels Chamber, Seguin Chamber, and Bulverde Spring Branch Chamber. Clean Cities staff met with multiple fleet managers at school districts and municipalities to consult on alternative fuel vehicles and provide information regarding funding from the Volkswagen Environmental Mitigation Trust settlement.

In 2015, AIR Executive Committee Chairman Ron Nirenberg launched a series of roundtable meetings with industries and local agencies to gather their input on appropriate voluntary ozone strategies for the San Antonio region and to identify

barriers to strategy adoption. The effort resulted in a list of widely applicable voluntary measures that may be implemented by virtually any employer and corresponding commitments to them. In 2016, AACOG continued to promote voluntary commitments to these measures.

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

Joint air quality planning efforts between AACOG's Air Improvement Resources (AIR) Executive Committee and the Capital Area Planning Council of Governments' Clean Air Coalition (CAC) continued with meetings in November 2016 and March 2017. For these meetings, the CAC was chaired by Travis County Judge Sarah Eckhardt and the AIR Executive Committee was chaired by Councilman Ron Nirenberg[7]. The CAC represents local governments in the Austin-Round Rock MSA. Key agenda items from these meetings included a joint resolution outlining air quality priorities for the 85th Texas Legislature; a policy position letter on active state legislation; the creation of a joint CAC-AIR Executive Committee Legislative Action and Policy Subcommittee; and a review and recommendations resulting from a regional air quality public opinion survey. Although the committees have mutually agreed to continue holding joint meetings in order to identify opportunities for collaboration on a larger regional scale, the elimination of air quality planning funding from the Rider 7 program will result in the discontinuation of these meetings until new sources of funding can be identified.

3.6 Regional Impacts of Statewide Funding Elimination for Air Quality Planning

In an unanticipated action at the end of the 85th Texas legislative session, Governor Greg Abbott vetoed 2018-19 biennial funding from what has been known as the Rider 7 Air Quality Planning Program. The veto statement is attached as Appendix A. This long-standing program originated in 1995 for the specific purpose of assisting near nonattainment areas across the state with air quality planning, including the Alamo Area region. The governor's action in June 2017 impacts ten near-nonattainment regions across Texas by removing $6 million in statewide funding. Among the regions affected by this action, the Alamo region is the largest by population and funding. The resulting loss of $1.4 million over the 2018-19 biennium for air quality programming in the region represents an estimated reduction of 70 percent of AACOG's Natural Resources Department funding. In addition to program revisions, the funding impact will require a modification to our community's strategic plan in order to continue the coordination of regional efforts for air quality planning.

AACOG Program Transition

In response to this action, TCEQ recommended that all affected areas submit requests to revise current 2016-17 work plans to focus on the most critical activities, including extensions of time through no longer than June 2018. AACOG staff developed a revised work plan which adhered to the following principles:

- Complete work on deliverables with significant completion
- Preserve sufficient funding to continue essential activities through June 2018

[7]Councilman Ron Nirenberg was elected Mayor of San Antonio in June 2017.

- Prioritize technical activities related to photochemical modeling
- Discontinue development of a 2018-19 TCEQ work plan
- Discontinue work on deliverables which have not achieved significant completion

While AACOG had successfully completed many committed deliverables, a number of activities will be discontinued, including:

- Ambient Air Monitoring
- Additional Monitor Purchases
- Industrial, Truck Idling, and Construction Equipment Emissions Inventories
- Development of Voluntary Control Measures
- Public Education and Outreach Activities
- Clean School Bus Program
- AIR Committee Support (except AIR Executive Committee)

The discontinued activities and prioritized continuation of technical activities resulted in the immediate elimination of 4 positions.

Activities that are prioritized and recommended for continuation with remaining TCEQ funding include:

- Development of the Conceptual Model
- Eagle Ford Shale, Commercial, Residential Emissions Inventories
- Photochemical Modeling
- Data Inputs
- Local Control Strategies

These recommendations have been submitted to TCEQ for approval.

Stakeholder Support

Once the impacts to our region were assessed, the AIR Executive Committee and the AACOG Board of Directors supported efforts by Executive Director, Diane Rath, to work with community air quality stakeholders to identify funding opportunities to continue essential technical activities. As a result of these efforts, a significant portion of funding and in-kind services have been identified to extend technical activities which were originally slated for discontinuation.

Our sincere appreciation is offered to the following entities for their contributions and commitment toward air quality planning activities:

Table 3.2: Stakeholder Contributions

Entity	Activity	Commitment
CPS Energy	Ambient Air Quality Monitoring	To continueing management of 6 AACOG-owned air quality monitors to continue the collection of air quality data for the foreseeable future as well as the addition of a new monitor at Government Canyon Natural Area
City of San Antonio (COSA)	Photochemical modeling, emissions inventory, local control strategy	$125,000 to continue technical air quality planning activities through 2018
Bexar County	Photochemical modeling, emissions inventory, local control strategy	$125,000 to continue technical air quality planning activities through 2018

In addition, the following organizations representing the oil/gas and cement industries committed a total of $57,500 in funding to continue air quality planning activities through 2018.

- South Texas Energy and Economic Roundtable (STEER)
- Texas Aggregates and Concrete Association (TACA)
- Capitol Aggregates
- Martin Marietta
- Cemex
- Alamo Cement

CHAPTER 4: Voluntary Strategies

The following is a summary of voluntary ozone reduction strategies carried out by AACOG's air quality partners. Updates and additions were provided in 2017 by CPS Energy, San Antonio Water System (SAWS), Bexar County, the City of San Antonio, the City of Leon Valley, Texas Department of Transportation, the Alamo Area Metropolitan Planning Organization, VIA Metropolitan Transit, the Local Cement Industry Companies, the Oil and Gas Industry (STEER), Build San Antonio Green, and the SA 2030 District.

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 2016 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, 2017, CPS Energy has reduced demand by 522 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 customers to conserve energy during periods of high energy demand.
- Commercial and Industrial Demand Response program offers rewards to commercial and industrial customers for reducing energy use on peak demand days. Customers are notified two hours before initiating energy reductions are initiated, or they may 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 San Antonio have increased lighting energy efficiency. On average, LED streetlights are 42% more energy efficient than traditional high pressure sodium (HPS) lighting. CPS Energy has standardized LED streetlights for all new installations and replacements. Currently, there are approximately 64,000 LED streetlights in service (55% of streetlights in the San Antonio metropolitan area). CPS Energy is working with COSA to convert 30,000 high pressure sodium streetlights to LEDs by 2019.

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 2017. As of Sept. 1, 2017, CPS Energy has 1,519 MW of renewable-generated electricity in commercial operation, which includes 1,059 MW of wind, 446 MW of utility-scale solar, and 14 MW of landfill gas. CPS Energy plans to increase capacity of utility-scale solar power by about 100 MW by mid-2018. As of July 2017, CPS Energy customers contribute 80 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 more than $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 78% from 1997 to 2015.

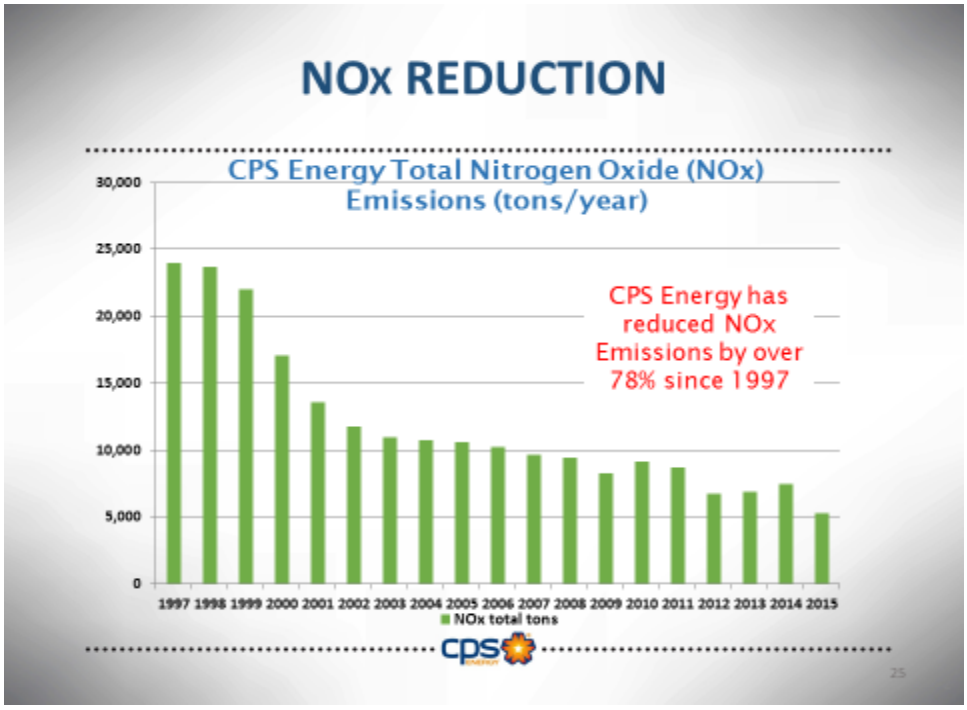


Table 4-1: CPS Energy NOx Reduction

- Decommission J.T. Deely Coal-Powered Plant. CPS Energy plans to decommission the J.T. Deely coal-fired power plant by the end of 2018. Replacement generation

capacity will be provided by the natural gas-fired power generation facilities and renewable energy.

- Selective Catalytic Reduction Technology. The installation of selective catalytic reduction technology to reduce NOx emissions on the J.K. Spruce 1 Unit is on hold.

Other Programs.

- Mow Down Smog Rebates program provides customer rebates for purchasing electric instead of gasoline-powered lawn equipment. In 2016, CPS Energy issued 1,039 rebates for electric lawn equipment. Since 1998, CPS Energy has issued over 9,800 rebates.

- Green Shade Tree Rebates are provided to customers to create shade, which keeps homes cooler and reduces energy use. As of June 2017, as many as 8,600 trees have been planted through this program since 2009. In addition, nearly 2,000 trees are distributed to customers each year. An additional 100 trees are planted at Habitat for Humanity homes each year.

New/Proposed Strategies

Reduce My Use is a new program launched in summer 2017. The pilot will target 100,000 residential customers and ask them to reduce energy use on peak days using gamification. On peak days, customers will receive an email and/or phone call with tips on how to trim energy use. The next day, customers get feedback on how well they did. The program is expected to save 11 MW on a peak day.

Simply Solar. In addition to their rebate for homeowners who purchase solar panels, CPS Energy has piloted two new programs to help drive the adoption of clean energy since the last update. 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.

CPS Energy customers contribute 80 MW of rooftop solar capacity. Simply Solar programs offer greater opportunities for customers to take advantage of renewable energy.

Battery Storage. CPS Energy has been awarded a New Technology Implementation Grant by the Texas Commission on Environmental Quality (TCEQ) and Texas Emissions Reduction Plan, supporting the implementation of new technologies that will reduce the emissions from facilities and other stationary sources in Texas. The Solar+Storage project will help achieve a cleaner energy portfolio by implementing technology to reduce harmful emissions. The project integrates the most economically and technically viable blend of energy storage using a 5 MW, 2-Hour Lithium-ion system in conjunction with solar energy.

The Solar+Storage project will be the largest energy storage system in Texas that shifts clean energy peak demand periods. The project will be completed before the 2018 deadline, and will be located within the CPS Energy service territory. The innovative Solar+Storage business model will incorporate multiple storage services for integrating renewable resources to achieve maximum emission reduction, while providing the greatest economic and operational benefits to our community, customers, and the ERCOT grid.

4.2 San Antonio Water System (SAWS)

The San Antonio Water System (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. 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 2016 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

Reuse and Water Management.

- The nation's largest (110 miles) direct recycled water delivery system 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.

Participation in the CPS Energy Commercial Energy Efficiency Program providing incentives for:

- DOS Rios LED Street Lighting Retrofit with approximate savings of 200,000 kWh/year
- SAWS Headquarters HVAC Retrofit with approximate savings of 145,000 kWh/year
- Dos Rios Laboratory HVAC Retrofit with approximate savings of 14,000 kWh/year
- Leon Creek Pump Station Lighting Retrofit with approximate savings of 20,000 kWh/year

- 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 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

Facility Management.

- North Side and the West Side Service Centers have been placed in strategic locations to accommodate SAWS' shifting geographical customer base-reducing drive times and mileage on SAWS fleet
- Preliminary Energy Assessments of lighting retrofits
- Preliminary Energy Assessments of new roofing
- Preliminary Energy Assessments of Hydropower at Dos Rios Wastewater treatment facility

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.

Ongoing Strategies – Updated since 2016 Update

Vehicle Idling Limitations. Bexar County has regularly participated in AACOG's air quality activities. On May 3, 2016, the county's leaders increased its air quality planning a step further by adopting court order for Vehicle Idling Limitations, 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 Bexar County.

Bexar County's outreach efforts related to the anti-idling rule have targeted trucking companies, truck maintenance facilities, and truck stops. Their strategy began with distributing informational flyers, providing consultations, and encouraging compliance with the anti-idling court order. In the past year, routine scans of local truck stops have been implemented to educate people (mostly truck drivers) about idling. Informational signage has been put up in several local truck parking areas as an additional effort to educate our truck driving population.

While efforts are constrained due to staffing limitations, Bexar County plans to expand resources for these efforts by 2018. In full support of COSA's air quality programs, Bexar County intends to partner with the City and conduct similar public outreach activities corresponding to San Antonio's recently enacted anti-idling ordinance.

New/Proposed Strategies

Bexar County has formally made Air Quality part of the Storm Water Quality program and, along with the City of San Antonio anticipates assisting AACOG to address its air quality funding gap for activities that have been discontinued as a result of the Rider 7 Air Quality Planning veto.

Since the elimination of air quality planning funds also impacted AACOG's ability to administer the region's air quality stakeholder committees (Air Technical, Air Advisory, and AIR Public Education), the County and City are working together with local citizens and citizens' groups to establish complementary stakeholder committee/advisory groups to assist the Air Executive Committee in its decisions.

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 2016 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. CoSA 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. CoSA 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. An additional 293 kilowatts will be installed on four city facilities on December 31, 2017 through the CPS Energy SolarHost SA Program.

City Fleet Alternative Fuel Composition. The City's fleet includes 14 CNG refuse trucks, 77 light-duty pickups and vans, and 456 light-duty hybrid electric sedans.

River Barges. In 2018, San Antonio turns 300. To celebrate its Tricentennial and commitment to a sustainable future, the city is reimagining its fleet of water taxi, tour

and charter barges that service its world-famous River Walk. Each of the 43 boats will be powered by quiet, emission-free Torqeedo Cruise 10.0 motors and high-capacity lithium batteries, the most advanced, fully electric propulsion system available. They'll provide passengers and those shoreside a clean, enjoyable experience that's odor-free and environmentally friendly.

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 have resulted in estimated 37.3 million kWhs of electricity savings per year (Table 4-2).

Table 4-2: Energy Efficiency Projects, 2011-2016

Project	Annual Avoided Electricity Use (kWh)
Interior Lighting Retrofits*	5,716,834
Exterior Lighting Retrofits*	2,727,513
Interior/Exterior Retrofits*	1,340,984
Retrocommissioning/Re-Commissioning*	1,528,374
Chiller System Replacement*	1,212,499
HVAC Replacement*	776,455
Solar Window Film Installation*	871,633
Pool Pump Retrofits*	737,143
Programmable Thermostats*	212,998
Roof Top Unit VFD's*	262,772
Circulation Fan and Programmable Thermostats*	181,698
Chiller Control Upgrades*	8,732
High Efficiency Washing Machine Retrofits*	468
CPS Energy LED Street Lighting Retrofit for 25,000 Street Lights**	21,698,000
Total	**37,276,103**

*Projects funded from Energy Efficiency and Conservation Block Grant (EECBG) Programs

**From a separate funding mechanism

Facility Design Guidelines & Standards for new city projects was published in March 2017. This interdepartmental collaboration, led by the Transportation and Capital

Improvements Department in collaboration with Building and Equipment Services and the Office of Sustainability, includes SA Tomorrow Sustainability Plan Goals and includes a Sustainability Checklist that will be required to be filled out as part of the project development process. The purpose of the City of San Antonio (COSA) Facilities Design Guidelines & Standards (FDGS) is to provide guidance to architects and engineers designing new and renovated facilities for the City of San Antonio. It is intended to summarize information on what is minimally expected by the City. The Guidelines state that the energy performance of a building should strive to exceed code requirements, with a goal to meet the CPS Energy's new construction prescriptive or performance incentive where feasible, based on building type. For projects with a construction budget over $3 million dollars, energy efficiency will be determined through the use of an energy model. A review of possible on-site renewable energy systems including solar PV, solar thermal, wind power, fuel cells, or other sources is encouraged.

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.

4.4.3 Planning and Development

The 2030 Challenge Adoption. CoSA 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.

Tree Ordinance. On May 6, 2010, San Antonio's City Council amended Chapter 35 of CoSA'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, San Antonio 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. CoSA 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 65 miles of developed greenway trails are 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 59 locations, provides opportunities to enhance personal health and provides active transportation choices to residents and visitors. According to program data, riders logged over 500,000 B-Cycle trips, burning over 60 million calories and offsetting over 1,530,000 pounds of carbon since the program launched in 2011.

Congestion Mitigation. CoSA 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. On May 6, 2017, voters passed an $850 million General Obligation Bond Program. The City of San Antonio is authorized to issue $445M in to make permanent public improvements to reduce improve traffic flow thereby reducing vehicle congestion. Streets, bridges and sidewalks, as well as other improvements necessary or related to the following, including, but not limited to: bicycle lanes, landscaping, relocation of utilities, street lighting, technology improvements and signage. This proposition will also provide acquisition of lands and rights-of-way necessary for such purposes.

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.

NuRide Program. City employees are encouraged to participate in the NuRide to track their alternative commute miles and reap rewards from local retailers and restaurants.

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.

Anti-Idling Administrative Directive. This anti-idling directive for city employees was approved by the City Manager on August 16, 2016. The purpose of the directive is to provide uniform and consistent direction regarding idling to City departments and personnel on operating all city-owned vehicles and equipment in a safe and economical manner while supporting the City's clean air initiatives.

4.4.6 Policies and Ordinances

Anti-Idling Administrative Directive. 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 ordinance went into effect on January 1, 2017. To date, City staff has responded to three complaints resulting in one warning issued with zero citations.

Air Pollution Registration Program. In 2015 the San Antonio City Council passed ordinance #2015-11-19-0967 requiring business facilities with air pollution emissions to register with Metro Health and pay an annual registration fee of $200.00 per facility. This registration process will help identify local sources of ozone components and develop steps to lower emissions and improve air quality for residents. During fiscal year 2017 1,000 businesses registered with the program.

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. CoSA 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. 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 went into effect on January 1, 2017. City staff has responded to two complaints resulting in zero violations issued.

San Antonio Bikes Program. The San Antonio Bikes program continues to provide community outreach on bike safety relating to the proper use of bike lights and helmets, and it distributed over 700 helmets this year. It also coordinated a "Street Skills" program with the Alamo Area Metropolitan Planning Organization to educate the bicycling public on their rights and responsibilities as road users. Administration of the "Street Skills" bicycle education curriculum is intended to educate adults and mature teens who are interested in bicycling and understanding rules of the road as they apply to bicyclists and motorists. CoSA provides the Alamo Area Metropolitan Planning Organization (AAMPO) annual funding for the purchase of safety equipment including bike helmets and bike lights as part of the course curriculum. Accordingly, the AAMPO agrees to offer the classroom services and safety equipment free for a minimum of 400 participants each year the office has funded the program (participants must attend the class and receive instruction before receiving safety equipment). San Antonio Bikes additionally supplies the area's Regional Bike Maps, as well as a variety of educational guides related to bicycling safety, to all of San Antonio's libraries, police stations, and the San Antonio Airport.

- **60,000 regional bike maps** have been printed through grant funding and continue to be disseminated throughout the community
- **20,000 Greenway Trail Companion Guides** (focused on trail safety and etiquette) continue to be distributed with Parks and Recreation

New/Proposed Strategies

Public Health Cost of Nonattainment Study. CoSA's Office of Sustainability and the Health department collaborated on an air quality public health study to assess the public health impact of ozone non-attainment. The goal of this work is to estimate the health impacts of ambient ozone pollution to Bexar County residents and to estimate the direct and indirect costs of asthma and other ozone-related illnesses on the general public. The study has just completed the peer-review process and is in the final draft stages. A final draft will be issued to the public in fall 2017.

Air Quality Regional Community Education and Outreach for Nonattainment of Air Quality Standards The "Breathe Today. SA Tomorrow" campaign, initiated in May 2017, works to create community awareness and educate the business community and the general public about the need for clean air, and how to help San Antonio to continue to be the largest "Clean Air City" in the nation. The long-term goal is to make San Antonians as literate on air quality as they are about water conservation. The program will focus on social and print media, public meetings, and industry roundtables. On March 30, 2016,

City Council approved a contract award to minority woman owned aMAEzing Marketing Group. aMAEzing secured a campaign spokesperson Missions Baseball pitcher, Brett Kennedy. The campaign has focused on stakeholder roundtables, air quality messaging to residents and businesses via television, radio, print, social media and online blogs, and has yielded over 2.3M impressions to date. City Council members have been involved in the campaign by taking part in our "Breathe Today.SA Tomorrow" Blog Talk Radio Campaign to discuss why air quality is important to them and to share their vision for San Antonio's air quality future.

San Antonio Mayor Nirenberg provided his support for the campaign. In the public service announcement, Mayor Nirenberg is seen boarding a VIA bus and asks the community to "keep San Antonio the largest, clean air city in the nation," while Brett Kennedy is shown with Kaitlyn Muñoz, "Daytime@Nine" correspondent and CW Crew spokesperson, at Missions Stadium, where he reminds individuals that "it's all about keeping San Antonio's air quality as clean as we can." "Air quality is among the biggest challenges facing our region — impacting our economy, our health, and the quality of life of our residents," Mayor Nirenberg said. "This campaign helps us remind residents about ways that they can contribute to cleaner air."

The San Antonio Business Journal has extended their support for the campaign by sponsoring an "Air Quality Summit" on October 6, 2017 to address the potential impacts of non-attainment on business and the San Antonio community. San Antonio Mayor, Ron Nirenberg will share the City of San Antonio's vision on air quality and the role of the business community. Small to midsize business leaders are encouraged to attend so they can learn how they can play a role in helping to improve San Antonio's air quality.

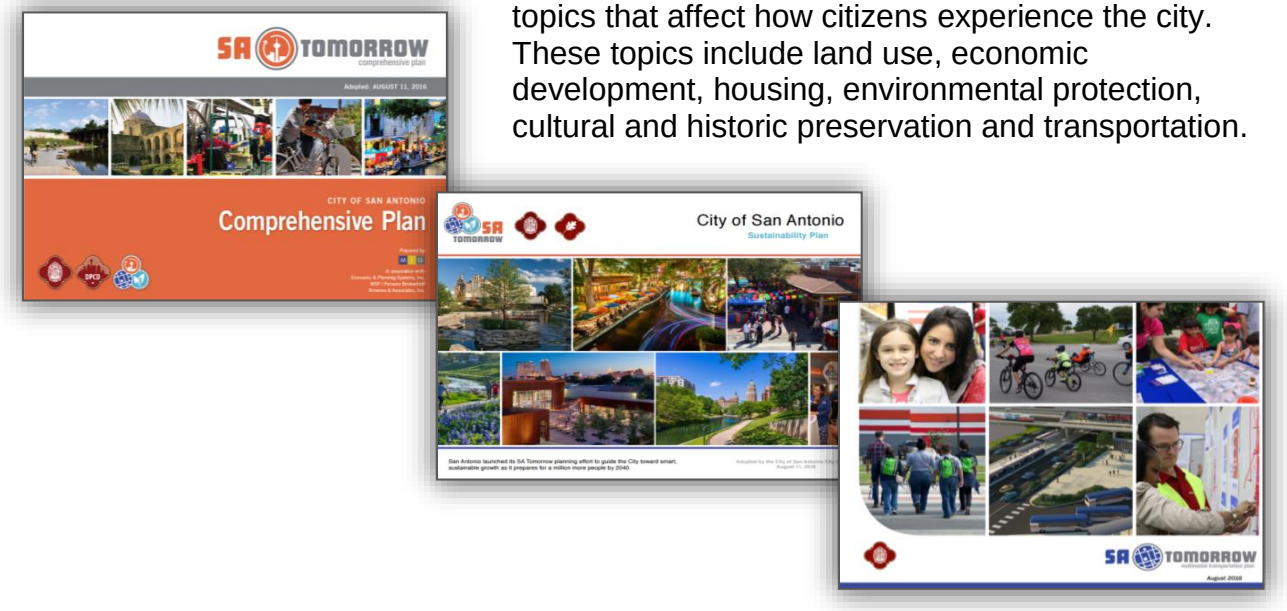
The campaign will extend through October 2017.

Campaign Objectives:

- To take action now and not waiting for federal regulation, as the health of the community is what is important
- To inform the community of simple steps they can take, including:

- Choose a cleaner commute — car pool, use public transportation, bike or walk when possible
- Make sure vehicle's tires are inflated properly
- Refrain from unnecessarily vehicle idling
- Participate in CPS Energy's energy conservation and rebate programs. Look for the ENERGY STAR label when buying home or office equipment
- Consider a push, electric or energy efficient gas mower
- Refuel vehicle in the early morning or evening during ozone action days

SA Tomorrow Initiative. On August 16, 2016, City Council approved three plans, the Comprehensive Plan, Multi-Modal Plan and Sustainability Plan. "SA Tomorrow Initiative" is a tri-plan is a 25-year framework that guides future growth and development. These plans address a wide range of topics that affect how citizens experience the city. These topics include land use, economic development, housing, environmental protection, cultural and historic preservation and transportation.



Bexar County is expected to add up to 1.1 million new residents, with 500,000 new jobs, and 500,000 new dwelling units by 2040. If not properly prepared for this growth, the impacts could have significant consequences. For example, traffic congestion and commute times could increase which would in turn affect our air quality and overall quality of life.

To ensure that the identified strategies of SA Tomorrow are specific to the needs of San Antonio, five cross cutting themes were identified through the Sustainability Plan process that address high priority issues for the community. The cross cutting themes are important to every aspect of the SA Tomorrow planning efforts, including each of the Plan's major components and elements. The cross cutting themes include economic vitality, equity, resilience, water resources and air quality. Continuously finding opportunities to improve air quality is a priority for CoSA, as air quality impacts health and the local economy.

The City of San Antonio is cognizant that it will require a shift in the way things are done now, and the public and private investments necessary to accommodate 1.1 million additional residents can be leveraged to improve livability, sustainability and inclusivity across the entire community. The building blocks within the City's Comprehensive Plan are: complete neighborhoods, safe and attractive multimodal corridors, compact and walkable urban centers, and the growth of its 13 existing mixed-use regional centers.

Under One Roof Program. The "One Roof" program replaces worn and damaged roofs and installs a light colored shingle along with a radiant barrier underlayment to obtain a Solar Reflectance Index (SRI) of .65. The installation of light colored roofs is provided at no cost to the homeowner. The Program maintains home's structure and stability, improves indoor comfort, reduces overall attic temperature, decreases roof maintenance, and yields potential energy savings for the homeowner.

The City's Department of Planning and Community Development (DPCD) has contracted with the University of Texas at San Antonio (UTSA) to conduct the monitoring and evaluations of the light colored roofs. The impact of new light colored roofs will be monitored for a one-year period to test the benefits of this technology. UTSA will conduct pre and post onsite visits to each home and confirm eligibility of each home. UTSA staff will also document existing conditions of each home, obtain twelve-month utility data for pre and post retrofit (electricity and natural gas) from CPS Energy. The attic and roof temperature also will be collected pre and post retrofit for each home through the installation of a temperature logger monitor by UTSA. UTSA has installed data loggers in 27 out of 28 homes completed. These 27 homes comprise the 11 homes completed as part of the FY2016 Program and 16 homes completed to date as part of the FY2017 Program.

The roof repair and replacement work for the eight homes began on November 16, 2016 and was completed by on December 22, 2016. Construction resumed for the second quarter on January 4, 2017 and 9 additional homes were completed, resulting in a total of 17 homes completed to date. The City utilized a private sector construction contractor to repair and install the new roofs. DPCD staff is working to qualify 8 additional homeowners and anticipates all 25 roofs to be completed no later than Summer 2017.

Other Planned Initiatives. As air quality continues to be a priority and as CoSA further develops its plan to reduce ozone emissions, it recognizes the importance of evaluating its shift to a more supportive electric vehicle environment. CoSA and CPS Energy will collaborate on a study to evaluate the cost-benefit of electrifying the city's light-duty fleet and what infrastructure will be needed to support it. The study will also evaluate the community's electric vehicle potential and where and what type of vehicle charging infrastructure will be needed.

COSA's FY18 air quality work plan will identify current and planned projects that have air quality impact, as well as identify new pilot projects and evaluate potential policies, such as a commuter benefits program, that would require or incentivize employers to provide their employees with more efficient commuting options. City staff is continuing to examine programs and policies to foster commuters to utilize alternative transportation by establishing a carshare program and a commuter benefits ordinance. City staff is evaluating a commuter benefits policy to require employers of a certain size to offer employees benefits to encourage alternative commuting.

In addition, CoSA will be targeting 26 city facilities for Energy Efficiency projects to include LED lighting retrofits, Efficient HVAC System upgrades, and Retro-commissioning, which is fine-tuning buildings to make sure they are operating at maximum efficiency. Included in that process will be the development of a formal CoSA Energy Policy that outlines specific requirements related to city-owned facilities, such as thermostat set points and a personal electrical equipment usage policy.

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.

Ongoing Strategies

Pollution Registration Ordinance. CoSA'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 revising the state law references and requiring that businesses with sources of air pollution register with 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. A position in the program was created in 2016 to work with businesses to create a list of air emissions "point sources" located within the city limits of San Antonio. The program works 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 surrounded by San Antonio's northwest quadrant. It is home to 11,000 plus residents.

Ongoing Strategies –Updated since 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 2017, the Tree Advisory Board gave away 650 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.

- Enacting 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.

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.

Solar Panels. The City of Leon Valley recently installed solar panels on City Hall and the Fire Station, and has scheduled solar panels to be installed on our library. Solar panels had already been installed on its Community Center.

Land Acquisition. The City recently acquired over 8 acres of vacant land in various neighborhoods to be developed as pocket parks. These parks were planned to not have parking spaces, other than those for ADA accessibility, but will have bicycle racks and walking paths. By locating parks inside the neighborhoods, city residents do not have to take a car to get to recreational facilities. The City of Leon Valley will be purchasing two more large parcels of land contiguous to a large central park, which will be developed as additional park space. This will not only help to preserve existing tree canopy, but also further encourages citizens to walk and not drive, reducing vehicle emissions and air pollution.

Sidewalk Rehabilitation Program. The City actively rehabilitates dilapidated and broken sidewalks, and has been programming $20,000 per year for this purpose and to install sidewalks where there are gaps in older neighborhoods sidewalk systems. Over the past three years, the City programmed an additional $150,000 per year to completely rehabilitate the sidewalks along one of the major arterial streets that connects several large neighborhoods to the central park, library, community and conference centers, and a school. This will improve connectivity, provide ADA accessibility, and encourage people to walk, which will reduce air pollution from vehicle emissions.

4.7 Texas Department of Transportation (San Antonio District)

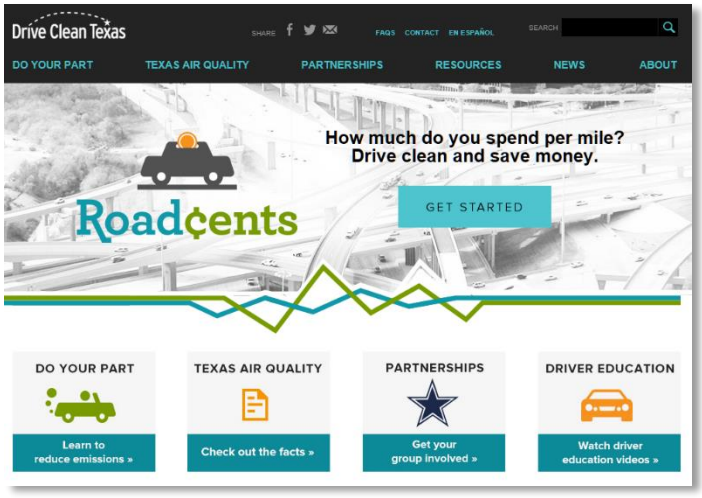
Ongoing Strategies – Updated since 2016 Update

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 bulb;
- 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

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/.



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

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.

HWY	County	% Complete	Cost*	From	To	Description
BS 123B	GUAD	27%	$5.3	N OF US 90	IH 10	Construct CLTL, Bike and Ped & drainage improvements
IH 10	BEXAR	54%	$7.6	At Fair Oaks Pkwy	.	New bridge with Ped and Bike Accommodation
FM 306	COMAL	59%	$6.90	River Chase Way	Hoffman Lane	2 TO 4 lanes with CLTL, Ped & Bike Accommodations
BS 46-C	COMAL	97%	$0.80		.	Landa Street Ped & Bike Accommodations
VA	BEXAR	51%	$5.20		US 281, LOOP 345, 78, FM 1516, I 35, LP 368, and FM 2252	Bus Stop and Pedestrian Related Infrastructure
US 90	BEXAR	25%	$2.30	IH 410	LP 13	Pedestrian Bridge over US 90
FM 1516	BEXAR	2%	$5.70	FM 78	FM 1976	2 TO 4 lanes with CLTL, Ped & Bike Accommodations

Table 4.3: TxDOT educates the public about the impact of car emissions on air quality as a partner in the "Drive Clean Texas" Campaign

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

TxDOT continues to design and construct projects that improve congestion; thereby improving air quality. U.S. Highway 281 and IH-10 are under construction to add the first High Occupancy Vehicle Lanes; this will increase the number of persons per vehicle, and preserve the person –movement capacity of the roadway, and reduce congestion and enhance bus operations thereby improving air quality. In a majority of our added capacity projects we are also incorporating bicycle and pedestrian accommodations which provide clean air options to the traveling public; making connections to buses more accessible and improving ridership. These are just a few of the bike and pedestrian projects that are under construction.

4.8 Alamo Area Metropolitan Planning Organization (AAMPO)

Ongoing Strategies – Updated since 2016 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 planning and programming of 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's deliverables are in line with the 2018 timeline for transportation conformity.

AAMPO promotes alternative modes of transportation among its staff by offering flexible scheduling and telecommuting options. AAMPO employees can also ride the bus for free using their employee ID. AAMPO also promotes the use of alternative transportation among 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 Street Skills Class.

As part of its Walkable Community Program and in partnership with the City of San Antonio Office of Sustainability, AAMPO hosts free "Street Skills" classes to teach the rules of the road for people on bikes, convey helpful safety information, and distribute bicycle helmets and bike lights. In 2016, nearly 400 people benefited from these classes and left feeling more confident using their bike as a form of transportation.

As part of its Walk & Roll Program, AAMPO held its 21st Annual Walk & Roll Rally on May 12th 2017 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 2016, AAMPO formed a subcommittee of Bicycle Mobility Advisory Committee members to expand information about the Bicycle Friendly Business model to grow the number of bike-friendly businesses in the Alamo Area.

2017 Annual Walk & Roll Rally

New/Proposed Strategies

In addition to the short-range Transportation Improvement Program (TIP) and the long-range Metropolitan Transportation Plan (MTP), AAMPO produces other plans in conjunction with its transportation partners to inform and guide transportation policy. AAMPO kicked off a Bike Share Master Plan Study in July 2017 that will determine where and how San Antonio B-cycle could expand and assesses the feasibility of bike share in other parts of the region. Previously, AAMPO has produced a Regional Bicycle & Pedestrian Planning Study (2016) and a Pedestrian Safety Action Plan (2012).

In October 2016, AAMPO issued a call for bicycle and pedestrian projects under the Transportation Alternatives Program. Approximately $15 million was available, and nine projects were submitted totaling $19 million in funding requests. Projects were technically score based on a variety of factors, including the potential to improve safety and enhance mobility and access for people walking and biking. After a robust public input process consisting of an online public opinion tool and public workshop, six projects were awarded totaling approximately $14.5 million.

Transportation Alternatives Public Workshop

In 2017, AAMPO began an update of its Congestion Management Process (CMP) to more distinctly tie the CMP to AAMPO's TIP, MTP and project selection. An online survey in February 2017 and a workshop for the MPO's Technical Advisory Committee in March 2017 have played a role in shaping the objectives and performance measures that are part of the CMP update.

4.9 VIA Metropolitan Transit

Ongoing Strategies –Updated since 2016 Update

VIA has implemented a series of projects that contribute to a significant reduction in emissions. These projects include:

- Implementation of an automated idle limitation program for buses
- Implementation of an ISO 14001:2004-certified Environmental Management System
- 100 percent participation in the CPS Energy Windtricity program

- Installation of solar panels at bus shelters and transit facilities

In 2017, VIA began to replace the agency's fleet of clean-diesel-powered buses with vehicles that are fueled by Compressed Natural Gas (CNG). At least half of the fleet will be replaced with the lower-emission vehicles by the end of 2017, with the entire fleet converted by 2020. VIA has diversified its fleet further by integrating new, alternative power sources such as propane, electricity, and hybrid technology. VIA continues to monitor fuel and propulsion technologies that help reduce local air pollution.

VIA's fleet of alternative-fueled vehicles currently includes:

- 308 CNG buses (as of 9/30/17)
- 124 propane-powered paratransit vans
- 14 propane-powered streetcar buses
- 30 diesel-electric hybrid buses
- 3 fully electric buses (purchasing 8 more in 2018

New/Proposed Strategies

To facilitate the transition to an entire fleet of CNG buses numbering 474 by 2020, VIA contracted with Trillium CNG in July 2016 to build a 10-lane CNG fueling station at its vehicle maintenance facility. CPS Energy is supplying the natural gas to the station, which became operational in May 2017. **VIA's CNG fueling station is the largest in the United States.**

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 2016 Update*

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 cumulatively has exceeded $9.5 million with significant ongoing operational costs. .

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 pyroprocessing systems. In addition, equipment used in the process includes modern low-NO_X firing systems and the use of feed materials that require significantly lower energy requirements to process. According to the U.S. Portland Cement Association (SOURCE: PCA 2015 U.S. Labor-Energy Input Survey, Portland Cement Association Market Research, Skokie, IL 2016), between 1972 and 2015 energy consumption has been reduced industry-wide by 42.3%per unit produced. 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 (including Tier 4) 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. Changes include the replacement the smaller plant vehicles with a fleet of electric vehicles. 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 voluntary 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

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

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 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.

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 2016 Update

Build Build San Antonio Green (BSAG) is San Antonio's official green building program. As a voluntary, third party certification program, BSAG works with the building community to help create buildings and single family homes with increased efficiency, comfort, and durability. Since its inception in 2001, the program has certified 6,081 single-family new construction homes, 58 retrofitted homes, and 13 multifamily projects.

These certifications have resulted in 10 MW of peak demand reduction. This results in over 132 million lbs. CO2 and 100,357 lbs. of NOX being prevented. Annually, the energy saving is equivalent to powering 8,317 homes for one year, and the emissions reduced are equivalent to 10,876 cars being removed from the road for one year. Through their work in the solar space they have helped to facilitate the addition of 77 MW (AC) of renewable solar energy in the Greater San Antonio area.

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. In 2016, San Antonio 2030 District benchmarked buildings saved 22% in energy use compared to the baseline, reducing 10,263 metric tons of CO2. Since this time last year, SA 2030 has added over 20 new committed member buildings, and an additional 3 MSF of committed space. (Total committed square footage is now over 8 MSF.)

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.

Several new members new added during the past year and now include Alamo Architects, Alterniverst, AREA Real Estate, Bexar County, Brisco Western Art Museaum, City of San Antonio, Cleary Zimmerman, Crockett Urban Ventures, General Services Administration, Lake|Flato Architects, LPA, Inc., MWM & Associates, Overland, Pelton Commercial Real Estate, San Antonio Housing Authority, San Antonio Museum of Art, San Antonio River Authority, The Brooklynite, The DoSeum, The Historic Pearl Brewery, The Lifshutz Companies, Tobin Center for the Performing Arts, University Health System, USAA Real Estate Company, WestDRon Properties, LC, and Zurich International Properties.

The San Antonio 2030 District participated in the CATEE conference in 2016, and will be participating in the San Antonio Business Journal / City of San Antonio Air Quality Forum on October 6, 2017.

CHAPTER 5: Outreach and Education

5.1 Commute Solutions

AACOG has administered a Commute Solutions program for more than 18 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, which includes carpool matching and emergency ride home from work services. 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 from vehicle idling around their campuses by adopting one or more of Commute Solutions school programs.

5.1.1 Fresh Air Friday

Ongoing Strategy – Updated since 2016 Update

In addition to promoting Commute Solutions to employers, schools, and the general public at health and environmental events organized by its partners each year, the Commute Solutions program hosts an annual ozone season kickoff referred to as "Fresh Air Friday." The event is conducted at lunchtime as an environmental fair in a central plaza in the heart of San Antonio. This event is open to the public and strongly encourages the thousands of downtown employees to bring a brown bag or carryout lunch from nearby restaurants instead of driving out to eat. Photochemical models developed in the past by AACOG predict that reduced vehicle trips during the late morning to early afternoon hours are associated with greater reductions in peak ozone concentrations than trip reductions in the early morning or late afternoon time periods. For these reasons, the event is also used to educate the public about alternative transportation choices for lunchtime 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 being represented at information booths, each of the partner organizations display signs that briefly describe ways in which their organization promotes or contributes to cleaner air. In 2017, an estimated 500 people attended Fresh Air Friday. Plans are underway for another successful Fresh Air Friday event in 2018.

TxDOT's Drive Clean Texas Program interacts with visitors at the 2017 Fresh Air Friday in San Antonio.

5.1.2 Walk & Roll Challenge

Ongoing Strategy – Updated since 2016 Update

One of the ways that the Commute Solutions program has been working with employers is through the annual Walk & Roll Challenge, 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. The 12th annual challenge was conducted in May 2017. 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 the 2017 event, 20 employers and 2,707 individuals participated, recording over 102 thousand trips that month, reducing 1.48 million vehicle miles traveled and keeping over 2 tons of ozone precursors from the air. Winning organizations included Southwest Research Institute, the City of Leon Valley, and Linebarger, Goggan, Blair & Sampson. These entities were presented with their respective awards at AACOG's Board of Directors meeting in June 2017. Due to the ongoing success of this program in engaging employers, planning for the next Walk & Roll Challenge is underway for 2018.

5.1.3 Air Quality Stewardship Awards

Ongoing Strategy – Updated since 2016 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 2017 were Alamo Heights Independent School District, City of Leon Valley, Patrick Heath Public Library of Boerne, Resolute Health Hospital of New Braunfels, and YMCA of Greater San Antonio. Another round of Air Quality Stewardship awards is in the plans for 2018.

Air Quality Steward Award Recipients pose with AACOG's Executive Director, Diane Rath, and Natural Resources Director, Roger Arriaga.

5.1.4 Ozone Action Day Alert Program

Ongoing Strategy – Updated since 2016 Update

Since its inception, the Commute Solutions program has actively recruited and maintained 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 recommendations on how to best respond to avoid associated health risks and reduce the likelihood that an exceedance will actually occur. During the past year,

ozone action day alert registrations increased from 2,066 from 2016 to 2,223 in June 2017.

As a result of the loss of statewide air quality planning funds from the Rider 7 program, AACOG will no longer offer a separate notification service and will discontinue it in 2018. As an alternative, AACOG will transition subscribing registrants to receive alerts directly from the TCEQ. Beginning in the fall of 2017, the Commute Solutions program will begin promoting direct alerts from TCEQ. Other Ozone Action Day educational efforts will continue as described below.

As a reflection of a key component of the region's air quality strategic plan for outreach, AACOG surveys have determined that a majority of people in the region learn of Ozone Action Days through television meteorologists. Television meteorologists are considered a wide-reaching resource for informing the public about Ozone Action Day alerts, providing education about the nature and status of air quality, recommending steps to avoid health risks associated with ozone pollution, and promoting ways everyone can choose to reduce the amount of ground level ozone. As described in the strategic plan update, Commute Solutions staff have communicated with area television meteorologists to promote information about the beginning of the ozone season and to encourage regular information segments while on-air. Over the past three ozone seasons, staff have met directly with several meteorologists to discuss the promotion of air quality information and how they may assist in encouraging the public to take appropriate actions to improve it. AACOG efforts to engage with meteorologists will continue into the foreseeable future. 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 in Figure 5-1.

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

Commute Solutions' Ozone Action Day 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 schools across the city. These

banners are placed in a prominent campus location when an Air Quality Health Alert (AQHA) is issued. Since the program's inception, the program has continued by distributing banners to new schools and replacing them upon request. The banner program has also expanded to all schools within the Greater San Antonio area as well as to businesses and agencies. As in previous years, the 2017 program has been promoted in messages to all area school nurses with an announcement about the

commencement of the Ozone Season. It is intended that these banners will continue to be offered to schools, agencies, and businesses as long as funding and supplies last.

Figure 5.2: Ozone Action Day Banner

5.1.5 NuRide Carpool Matching and Emissions Reduction Tracking System

Ongoing Strategy – Updated since 2015 Update

NuRide is a free, NuRide is a free, online carpool matching system, contracted to operate in the Greater San Antonio area by AACOG. AACOG contracts this service with NuRide, Incorporated. An added benefit of this service is that it provides rewards for participants who record trips they take by walking, biking, busing, carpooling, or vanpooling. The program also rewards participants for trips saved through telecommuting or working compressed schedules. Over 100 participating businesses provide rewards to the program. Information recorded by participants allows the program to track overall emissions savings through these alternative modes of transportation. From July 1, 2016 - June 30, 2017, the number of individuals registered on this site who live within or commute to the San Antonio-New Braunfels MSA rose from 11,908 to 12,615, gaining 735 new participants. Over the last year, members recorded 1,122,045 trips resulting in a savings of over 20.6 million vehicle miles traveled, and a reduction of over 29 tons of ozone-forming chemicals. While its goal of recruiting 800 new participants within the past year was not quite met, the Commute Solutions program is confident that it can reach a goal of 800 in the year ahead.

5.1.6 CARE Program

Ongoing Strategy – Updated since 2016 Update

A primary deterrent to greater adoption of commuting to work by alternative means is that unanticipated situations may arise (e.g., late work hours, sick children) which result in losing a ride

home for the day. In order to remove this obstacle, AACOG offers the Certified Auto Ride in case of Emergency (CARE) program. Participants of the NuRide program who live and work within the MSA, regularly commute by alternative means, and record their trips are qualified to receive up to a $50 per ride reimbursement for up to 4 cab rides home from work per year. 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 sense of security and helps maintain emissions reductions reported through NuRide. AACOG plans more promotion of the program as a way to encourage new users of alternative transportation.

Proposed Strategy

Website and Social Media Campaign

As a proposed amendment to the Commute Solutions scope of work, beginning October 1, 2017, AACOG will begin development of a website and corresponding social media campaign dedicated specifically to improve awareness of and access to the Commute Solutions program. The website launch and social media campaign will focus on the branding and promotion of Commute Solutions services including carpool matching and emergency ride home services. The proposed website structure will refresh, streamline and provide a higher profile for these services.

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 air quality in the Alamo Area region, AACOG established the Alamo Area Clean Cities Coalition (AACCC) within the agency. On November 10, 1999, AACCC was officially designated by the U.S. Department of Energy (DOE), making San Antonio the 77th Clean City Coalition in the country. Clean Cities is a DOE program that focuses on measures to reduce reliance on petroleum-based fuels. In June 2016, the AACCC was approved for redesignation for three more years.

The mission of the AACCC is to displace petroleum use by developing public and private partnerships that promote 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.

At full development, the AACCC is the South Texas resource for education, technical assistance, access to grant funds and other services aimed at reducing petroleum use in transportation. The 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 2016, the coalition focused on strengthening its relationships with the public, outreach to educational institutions and encouraging more fleet conversions to alternative fuels.


Tesla Model X at Drive Electric Day, 2016

On September 17, 2016, the AACCC conducted the second annual Drive Electric Day – San Antonio at the Pearl Brewery's Farmers Market. The purpose of the event is to provide information, education, and promotion for electric plug-in vehicles. Electric vehicle (EV) owners volunteer personal vehicles for test drives, including the Tesla Model X and electric motorcycles. Hundreds of attendees were educated on the advantages of driving electric and given information about the various makes and models available. The event received media attention from multiple outlets and led to follow-up stories that increased attention on electric vehicles and charging stations within the San Antonio area.

The AACCC hosted multiple workshops in 2016 and 2017, including a grant workshop for the Texas Commission on Environmental Quality's (TCEQ) Emissions Reduction Incentive Grant (ERIG) Program on November 10, 2016, and an informational session on Volkswagen settlement funding for public fleets. ERIG is a grant program provided by the TCEQ's Texas Emissions Reduction Plan (TERP) and Diesel Emissions Reduction Incentive (DERI) Program. Among the most effective programs funded by the state, ERIG provides grant funding for private and public sector fleets interested in replacing, repowering, or retrofitting their heavy duty vehicles. On June 27, 2017, the coalition hosted a workshop for public fleets on the Volkswagen settlement. These anticipated funds result from a lawsuit against Volkswagen emissions test cheating. The corresponding fines of up to nearly $15 billion includes funding for an Environmental Mitigation Trust at $2.7 billion; a Zero Emission Vehicle Technology commitment of $2.0 billion; and $10 billion for affected Volkswagen vehicle owners. Upon acceptance by the state and approval of a distribution methodology, AACOG region may receive an estimated $20 million, which would be primarily applied to repowering or replacing outdated vehicles. Over 30 public sector representatives attended the workshop and learned about the coalition, alternative fuels, and how to apply for Volkswagen funding.

In July, the AACCC was awarded a DOE grant under the Clean Cities University Workforce Development Program (CCUWDP) to hire a fall intern to support the coalition's outreach activities to schools and businesses. The intern will work for approximately 3 months between September and December 2017. The intern and coordinator will work together to conduct employer outreach, plan and execute events and workshops, and provide technical assistance to fleet managers and the public.

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5.2.2 Alternative Fuel and Advanced Vehicle Technology Market Analysis

Natural Gas. As of 2017, there are six public CNG fueling stations in the San Antonio area and two private, owned by the City of San Antonio and VIA Metropolitan Transit. The addition of this natural gas infrastructure has already given fleets additional confidence to convert their vehicles. In February 2016, Houston-based Nat G CNG Solutions installed the first public CNG fueling station in north San Antonio.

Electric Vehicles. In 2016, data from the Texas Department of Motor Vehicles indicated that registered electric vehicles in Bexar County have increased to 624. There are 797 registered within the AACOG region. Data from the Alternative Fuels Data Center indicates that San Antonio has over 150 public EV charging stations (level 2). Most of these are owned and operated by CPS Energy, the Alamo region's primary electric utility.

Propane. There are over twenty propane autogas filling stations in Bexar County – four private and nineteen public. As of July 2016, there are approximately thirteen public propane filling stations in San Antonio; nine stations are owned and operated by U-Haul.

E85. The number of E85 stations in the AACOG region has grown to twenty. 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 may 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 fueling infrastructure in this region. In 2018, AACCC will work to establish an alternative fuel corridor analysis which will assist in identifying the demand for this fuel.

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
- 2 public LNG stations (Travel Centers of America, Flying J)
- 5 public CNG stations (Love's, Nat-G, Trillium, Questar, Central Freight Lines)
- 5 public biodiesel stations
- 20+ fueling locations for LPG (Propane)
- 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 Compressed Natural Gas (CNG) refuse trucks, 700 Light Duty flex-fuel vehicles, 35 Neighborhood Electric Vehicles (NEVs), 40 Heavy Duty Liquefied Petroleum Gas (LPG) Vehicles, 75 Light Duty LPG Vehicles, 379 Hybrid Electric Vehicles (HEVs), 5 Plug-in Hybrid Electric Vehicles (PHEVs), 1 all Electric-Vehicle (EV) owned
- Central Freight – 38 CNG fleet vehicles
- CPS Energy - 4 CNG vehicles, 14 light duty EVs, 2 HEV's, 199 E85 light duty vehicles, 33 LPG forklifts
- Matera Paper Company – 23 CNG fleet vehicles
- 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
- Northside ISD - 430 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
- Sea World - 25 NEVs, 3 propane forklifts, 1 propane vehicle
- Seguin ISD - 28 LPG buses and an anti-idling policy
- Southwest ISD - 26 LPG buses and an anti-idling policy
- USAA - 9 HEVs
- VIA Metropolitan Transit - 30 New Flyer diesel-electric hybrid buses, 3 Proterra electric buses, 400+ CNG buses, 20 LPG trucks, 138 LPG shuttle buses

CHAPTER 6: Public/Stakeholder Involvement

6.1 AACOG's Community Survey

Updated since 2016 Update

AACOG encourages public and stakeholder involvement at Air Improvement Resources 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 were not comprehensive and have been limited in scope. In May 2016, AACOG hired ETC Institute to develop a community project that included surveying a representative sample of residents in the San Antonio-New Braunfels 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. The goal of obtaining this information was to assist decision makers in developing specific strategies to effectively pursue:

- Building community awareness and knowledge of air quality issues in the Greater San Antonio area;
- Providing a channel for public input to create a greater sense of ownership of air quality issues and the desire to work toward possible community solutions;
- Gathering knowledge of public sentiments that may influence community leaders to select, support, and act upon particular strategies to reduce emissions; and
- Removing obstacles to public acceptance and encouraging the region to collectively move forward with initiatives to effectively reduce ozone pollution.

The random survey of over 800 greater San Antonio area residents (with roughly half living in the highly populated Bexar County and half living in the sparsely populated surrounding counties of the MSA) was completed in September 2016. Overall results of the survey were viable, with a 95% level of confidence with a plus or minus 3% margin of error. The survey findings were presented to the AIR Executive Committee, the San Antonio City Council, and other stakeholders in December 2016. Among the key findings were levels of public support for various ozone reduction strategies, as shown in Table 6.1, below:

Table 6.1 Public Support for Ozone Reduction Measures

Reduction Measure	Bexar County	Rural Counties
Vehicle Emissions Testing	69%	63%
HOV Lanes	63%	70%
Safe, Multimodal Streets	82%	79%
Improved Public Transportation Options	81%	76%
General Anti-Idling Ordinance	47%	43%
Lower Hwy/Expy Speed Limits	28%	25%
Requiring Large Employers to have Commute Reduction Programs	68%	64%
Increased Industrial Regulation	78%	70%
Efficiency Standards, Homes/Bldgs	82%	76%
Open Burning Ban on Ozone Days	82%	74%
Greater Use of Renewable Energy	89%	83%

An executive summary for this report may be found in Appendix C and a full report of the 2016 Alamo Area Ozone Action Public Input Survey findings may be found at: http://www.aacog.com/DocumentCenter/View/41180.

6.2 Public Education Media Campaign

New Strategy

Towards the end of 2016, a media campaign was developed by AACOG staff with the assistance of a multi-agency steering committee and the AIR Public Education Committee to influence idling reduction of personal vehicles in the MSA. The campaign plan, which was approved and funded by TCEQ, targeted drivers aged 18 to 64 within a 50 mile radius of San Antonio, encompassing an estimated 1.6 million people, primarily through Facebook ads and spots on popular music radio stations. The objectives were to build a better understanding of the term “idling,” inform the public of its various economic and health costs, and convince individuals to reduce idling their vehicles.

The most effective use of the funding for this campaign was to concentrate on a single reduction strategy to maximize absorption of the message. Prior to the campaign, only eight percent of MSA drivers were making a conscious effort to limit unnecessary vehicle idling. According to the survey, reducing vehicle idling is an easily understandable action that applies to a large driver population which has a limited understanding of its corresponding impacts. Further, an anti-idling campaign directed at the public complimented the local anti-idling ordinances recently adopted by Bexar County and the cities of San Antonio and Leon Valley.

The campaign was launched at the beginning of the 2017 Ozone Season and lasted 13 weeks. Social media impressions were seen by 1,590,718 area residents, and individuals clicked on a link to a landing page 25,894 times to learn more. A follow up survey was planned to evaluate, in part, whether the campaign had an impact on the percentage of MSA residents making a conscious effort to limit unnecessary idling. However, the loss of air quality planning funding from TCEQ has resulted in a discontinuation of this activity. Sample messages are illustrated in Figure 6-1.

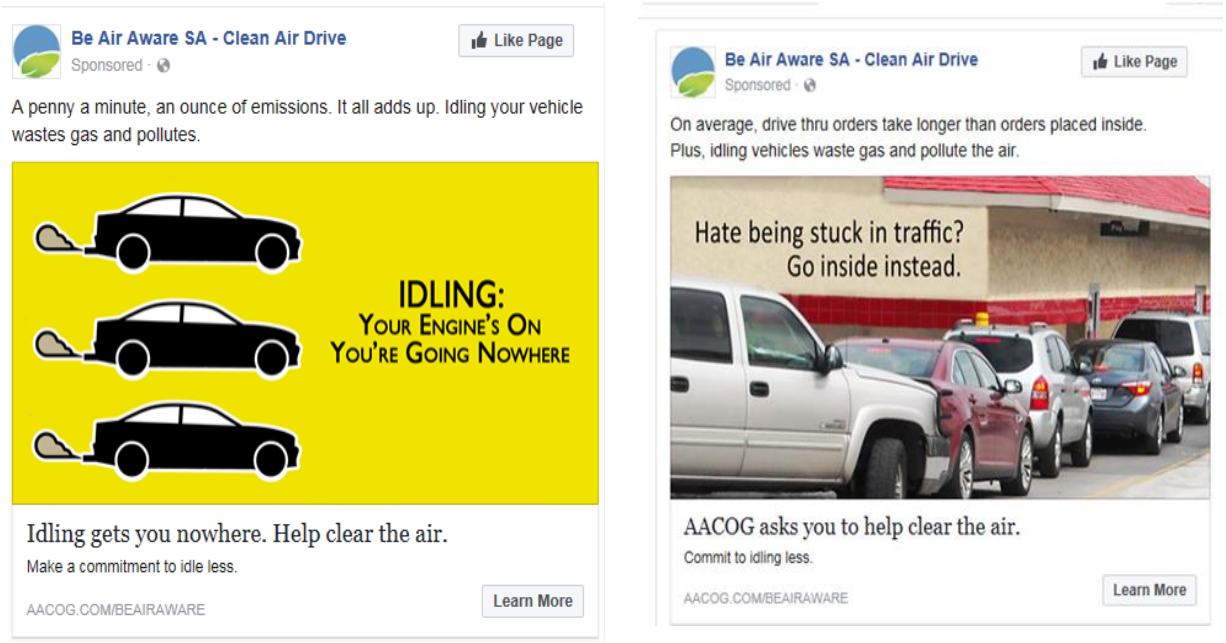


Figure 6-1: Two of the Facebook ads used as part of AACOG's 2017 idling reduction media education campaign.

APPENDIX A: Governor Abbott's Budget and Line Item Veto of Funding for 2018-19 Air Quality Planning

GOVERNOR GREG ABBOTT

June 12, 2017

FILED IN THE OFFICE OF THE
SECRETARY OF STATE
2:15 PM O'CLOCK
JUN 12 2017
Secretary of State

The Honorable Rolando B. Pablos
Secretary of State
State Capitol Room 1E.8
Austin, Texas 78701

Dear Mr. Secretary:

Pursuant to his constitutional powers as governor and chief executive officer of the State of Texas, Governor Greg Abbott, has reviewed the following legislation from the 85th Texas Legislature. Accordingly, under Article IV, Section 14 of the Texas Constitution, the governor has signed the following legislation while disapproving certain sections which have been marked and struck in the original:

Senate Bill No. 1 by Nelson which is effective immediately in part.

Since the 85th Legislature by its adjournment of the Regular Session has prevented the return of this bill, I am filing this bill and the governor's objections in your office and giving notice thereof by this public proclamation according to the aforementioned constitutional provision.

The original enrolled copy of the legislation referenced above is attached to this letter of transmittal.

Respectfully submitted,

Gregory S. Davidson
Executive Clerk to the Governor

GSD/gsd
Attachments

POST OFFICE BOX 12428 AUSTIN, TEXAS 78711 512-463-2000 (VOICE) DIAL 7-1-1 FOR RELAY SERVICES

PROCLAMATION

BY THE

Governor of the State of Texas

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Senate Bill No. 1, the General Appropriations Act, having been duly certified by the Comptroller of Public Accounts pursuant to Article III, Section 49a of the Texas Constitution, has been presented to me for action.

I am once again signing a budget that addresses the most pressing challenges faced by our state. This budget funds a life-saving overhaul of Child Protective Services, ensuring children in Texas' foster care receive the protection they deserve.

Even in a tight budget climate, this budget prioritizes the safety and well-being of all Texans. It continues to fund our state's role in securing the border, adding an additional 250 troopers to keep our communities safe. It funds the state's natural disaster response costs to provide state resources when disaster strikes. And it better protects our law enforcement officers across the state by funding grants for bulletproof vests.

This budget ensures the workforce of today and tomorrow have the resources they need to keep Texas' economy growing and thriving. Under Senate Bill No. 1, all eligible prekindergarten students will receive a high-quality education by increasing standards statewide. And the state will remain competitive on the job creation front with funds to help Texas remain the best state in the nation for doing business.

This budget achieves all of these goals while restraining state-controlled spending below the growth in the state's estimated population and inflation. During the upcoming special session of the 85th Legislature, passage of legislation or a constitutional amendment to ensure the state continues to budget within responsible spending limitations will remain a top priority.

In order to further restrain the growth of government and reduce the expenditure of taxpayer funds, this veto proclamation includes approximately $120 million in reductions. I hereby object to and veto the following items from Senate Bill No. 1 and include a statement of my objections to each of those items.

Article I - General Government
Secretary of State

	2018	2019
C. 1.2. Strategy: ~~Colonias Initiatives~~	~~$ 429,856~~	~~$ 429,235~~

Services to help improve the lives of Texans living in colonias are funded across numerous other state agencies, including the Office of the Attorney General, the Department of State Health Services, the Health and Human Services Commission, the Department of Housing and Community Affairs, and the Department of Transportation. Each of these agencies provides direct client services to Texans living in colonias, while the Secretary of State primarily serves in a liaison and reporting role. I therefore object to and disapprove of this appropriation.

FILED IN THE OFFICE OF THE
SECRETARY OF STATE
2:15 PM O'CLOCK
JUN 12 2017

Article III – Education
Texas Education Agency

70. Collaborative Dual Credit Program Evaluation. ~~Out of funds appropriated above in Strategy B.3.2, Agency Operations, $72,131 in each fiscal year of the biennium in General Revenue shall be used to dedicate one Full-Time Equivalent (FTE) to collaboratively, along with the Texas Higher Education Coordinating Board:~~

~~a. identify existing capabilities, limitations, and costs to comprehensively evaluate dual credit opportunities, including an assessment of the adequacy of information on dual credit costs and local funding structures and the ability to identify ineffective and inefficient dual credit programs;~~

~~b. develop a plan to create a cross agency, statewide dual credit student outcome reporting and evaluation tool to measure acceleration, tuition saved, and efficient and effective practices for offering dual credit. The agencies shall consider the role both Preschool to Grade 16 (P 16) Councils and Education Research Centers could have in this evaluation strategy;~~

~~c. report their joint findings regarding the comprehensive evaluation of dual credit to the Governor, Legislative Budget Board, and Legislative committees responsible for oversight of public and higher education no later than August 31, 2018; and~~

~~d. issue guidance, using existing data on all dual credit programs, regarding the best and most effective practices for school districts and dual credit partners to continue or initiate dual credit offerings.~~

Neither participating state agency requested funding for this item in their 2018–19 Legislative Appropriations Request. This new rider is duplicative of an existing dual credit study currently being commissioned by the Texas Higher Education Coordinating Board. To keep Texas fiscally strong, we must limit unnecessary state spending. I therefore object to and disapprove of this appropriation.

Higher Education Coordinating Board

55. Collaborative Dual Credit Program Evaluation. ~~Out of funds appropriated above in Strategy B.1.1, Central Administration, $72,131 in each fiscal year of the biennium in General Revenue shall be used to dedicate one Full-Time Employee (FTE) to collaboratively, along with the Texas Education Agency:~~

~~a) identify existing capabilities, limitations, and costs to comprehensively evaluate dual credit opportunities, including an assessment of the adequacy of information on dual credit costs and local funding structures and the ability to identify ineffective and inefficient dual credit programs;~~

~~b) develop a plan to create a cross agency, statewide dual credit student outcome reporting and evaluation tool to measure acceleration, tuition saved, and efficient and effective practices for offering dual credit. The agencies shall consider the role both Preschool to Grade 16 (P 16) Councils and Education Research Centers could have in this evaluation strategy;~~

~~c) report their joint findings regarding the comprehensive evaluation of dual credit to the Governor, Legislative Budget Board, and Legislative~~

~~committees responsible for oversight of public and higher education no later than August 31, 2018; and~~

~~d) issue guidance, using existing data on all dual credit programs, regarding the best and most effective practices for school districts and dual credit partners to continue or initiate dual credit offerings.~~

Neither participating state agency requested funding for this item in their 2018–19 Legislative Appropriations Request. This new rider is duplicative of an existing dual credit study currently being commissioned by the Texas Higher Education Coordinating Board. To keep Texas fiscally strong, we must limit unnecessary state spending. I therefore object to and disapprove of this appropriation.

UT Austin

5. Legislative Law Clinic. ~~Out of the funds appropriated above, up to $75,000 in each year of the biennium shall be used for the continuation of the Legislative Lawyering Clinic in the School of Law. These funds shall be used to pay for clinic academic and administrative personnel, research, surveys, and other expenses associated with the clinic~~

The University of Texas at Austin did not request funding for this item in its 2018–19 Legislative Appropriation Request. If the Legislative Law Clinic is a priority, the University may continue to use other resources to maintain this program. I therefore object to and disapprove of this appropriation.

Article IV – The Judiciary

Office of Court Administration, Texas Judicial Council

15. Guardianship Compliance Project. ~~Amounts appropriated above from the General Revenue Fund include $2,407,967 in each fiscal year in Strategy A.1.1, Court Administration, and $140,650 in fiscal year 2018 and $60,150 in fiscal year 2019 in Strategy A.1.2, Information Technology, as well as 31.0 FTEs each fiscal year, for the Guardianship Compliance Project.~~

This rider creates a new state level compliance structure for guardians. This would result in a permanent increase both in government spending and employment. While I signed multiple bills to reform the guardianship process, a new state compliance and reporting structure for guardians is unnecessary bureaucracy and unnecessary spending. That is why I will veto Senate Bill 667. I therefore object to and disapprove of this appropriation.

Article V – Public Safety and Criminal Justice

Department of Public Safety

		2018	2019
F. 1.2. Strategy:	Safety Education	$ 4,741,451	$ ~~4,741,451~~

This appropriation exceeds the amount requested by the Department of Public Safety to fund this new strategy. If it is determined by the Department of Public Safety that improving the safety on our roads is contingent on an increased appropriation of tax funds for this campaign effort, then the Department of Public Safety can identify those needs and present them to the legislature at that time. Until that time, I object to and disapprove of one year of this appropriation.

FILED IN THE OFFICE OF
SECRETARY OF STATE
2:15 pm O'CLOCK
JUN 12 2017

56. Public Safety Grant for the Greater Houston Area. ~~Out of General Revenue Funds appropriated above in Strategy C.2.1, Public Safety Communications, the Department of Public Safety shall grant $4,000,000 in fiscal year 2018 to a non-profit entity in Houston that is dedicated to preventing and solving crime in the Greater Houston Area through programs emphasizing crime information reporting, student and parent education, and community empowerment.~~

The Department of Public Safety's core mission is to serve and protect citizens of Texas as the state's primary law enforcement agency. Over recent years, efforts have been made to help the agency concentrate on its core mission and to transfer grant-making activities to other state agencies. This appropriation, for which the Department did not request funding in its 2018-19 Legislative Appropriation Request, would return the Department to being a grant-making entity. This veto will not prevent Houston Crime Stoppers from being able to receive grant funding from the Office of the Governor's Criminal Justice Division—or encumber Houston Crime Stoppers' ability to provide awards to appropriate recipients. I therefore object to and disapprove of this appropriation.

Article VI – Natural Resources

Texas Commission on Environmental Quality

7. Air Quality Planning. ~~Amounts appropriated above include $6,000,500 for the biennium out of the Clean Air Account No. 151 in Strategy A.1.1, Air Quality Assessment and Planning, for air quality planning activities to reduce ozone in areas not designated as nonattainment areas during the 2016-17 biennium and as approved by the Texas Commission on Environmental Quality (TCEQ). These areas may include Waco, El Paso, Beaumont, Austin, Corpus Christi, Granbury, Killeen-Temple, Longview-Tyler-Marshall, San Antonio, and Victoria. These activities may be carried out through interlocal agreements and may include: identifying, inventorying, and monitoring of pollution levels; modeling pollution levels; and the identification, quantification, implementation of appropriate locally enforceable pollution reduction controls; and the submission of work plans to be submitted to the TCEQ. The TCEQ shall allocate $350,000 to each area and the remaining funds to each area based on population in excess of 350,000. The grant recipients shall channel the funds to those projects most useful for the State Implementation Plan (SIP).~~

This program funds, among other items, bicycle use programs, carpooling awareness, environmental awareness campaigns, and locally enforceable pollution reduction programs in near non-attainment areas, which can be funded at the local government level. Resources in the Clean Air Account should be prioritized to directly address problems in our non-attainment areas of the state so that we are better positioned to combat the business-stifling regulations imposed on these areas by the Environmental Protection Agency. I therefore object to and disapprove of this appropriation.

24. Low-Income Vehicle Repair Assistance, Retrofit, and Accelerated Vehicle Retirement Program (LIRAP). ~~Amounts appropriated above out of the Clean Air Account No. 151 in Strategy A.1.1, Air Quality Assessment and Planning, include $43,468,055 in each fiscal year of the 2018-19 biennium in estimated fee revenues from vehicle inspection and maintenance fees generated pursuant to Health and Safety Code, §§382.202 and 382.302, to fund the Low-income Vehicle Repair Assistance, Retrofit, and Accelerated Vehicle Retirement Program (LIRAP). Out of these amounts, not more than $253,893 in each fiscal year shall~~

~~be used by the Texas Commission on Environmental Quality (TCEQ) for costs associated with administering the LIRAP as authorized in Health and Safety Code, §382.202, and all remaining funds shall be used as LIRAP grants to local governments.~~

~~Amounts appropriated above in Strategy A.1.1, Air Quality Assessment and Planning, also include $4,829,673 in each fiscal year of the 2018-19 biennium out of the Clean Air Account No. 151 to be used only for purposes authorized in Chapter 382 of the Health and Safety Code for county implemented local initiatives projects to reduce air emissions.~~

~~Amounts appropriated above for LIRAP grants and local initiative projects also include an estimated $1,196,172 each fiscal year in estimated fee revenue generated from Travis County and $483,736 each fiscal year in estimated LIRAP fee revenue generated from Williamson County. The TCEQ shall allocate, at a minimum, the estimated revenue amounts collected in each of the counties during the 2018-19 biennium to provide LIRAP grants and local initiatives projects in those counties.~~

~~In addition to the amounts appropriated above, any additional revenues from vehicle inspection and maintenance fees generated from additional counties participating in the LIRAP beginning on or after September 1, 2017 are appropriated to the TCEQ for the biennium. Such funds shall be used to provide grants to local governments and to cover administrative costs of the TCEQ in administering the LIRAP.~~

The Low-Income Vehicle Repair Assistance Program (LIRAP) has done little to provide measureable improvements to air quality in our state's non-attainment areas. Additionally, previously approved appropriations for this program have yet to be fully spent by the local entities who administer this program. The LIRAP program is similar to the ill-conceived and dubious Cash for Clunkers program and should be abolished. A veto of this appropriation will not only allow local entities to spend previously approved allocations, but will also allow counties an opportunity to reassess if they should continue to charge an optional local fee for this program. I therefore object to and disapprove of this appropriation.

Soil and Water Conservation Board

7. **Water Supply Enhancement.** Included in amounts appropriated above in Strategy C.1.1, Water Conservation and Enhancement, is $2,495,575 in fiscal year 2018 ~~and $2,495,575 in fiscal year 2019~~ out of the General Revenue Fund for the water supply enhancement program. These funds shall be used for supporting existing and implementing new water supply enhancement projects designated by the Soil and Water Conservation Board. Any unobligated and unexpended balances from this appropriation as of August 31, 2018 are appropriated for the same purpose for the fiscal year beginning September 1, 2018.

This program primarily funds efforts to remove brush from private land. Texas landowners have a rich history of improving the value of their land through various self-funded measures. As a general concept, government should abstain as much as possible from inserting itself into private property matters unless a greater public need commands otherwise. For transition purposes, the first year of the program will be funded in the amount of $2.495 million. Any amount of funding for this program can be carried forward as unexpended balances to the second year. Except for any potential unexpended balance, I therefore object to and disapprove of the second year of this appropriation.

Water Development Board

26. Appropriation: Study of Aquifers and Brackish Groundwater. ~~Amounts appropriated above in Strategy A.2.2, Water Resources Planning, include $1,849,233 in fiscal year 2018 and $150,767 in fiscal year 2019 out of the General Revenue Fund for contract costs for studies related to designating priority zones for the production of brackish groundwater in aquifers throughout the state as identified. The amounts of $167,787 in fiscal year 2018 and $150,767 in fiscal year 2019 shall be used for administrative costs in implementing the studies. The Board shall report to the Legislature on its progress relating to the studies not later than December 1 of each year.~~

The Texas Water Development Board has already completed several studies on brackish groundwater in various regions of the state. I therefore object to and disapprove of this appropriation.

Article VII – Business and Economic Development

Texas Lottery Commission

		2018	2019
A. 1.11. Strategy:	Retailer Bonus	$ 4,200,000	~~$ 4,200,000~~

Lottery retailers already receive a commission based on the volume of tickets sold at that location. This bonus, which is in addition to the commission, is intended to be an incentive for retailers to sell lottery tickets. The bonus was created in 1993 to help jumpstart the rollout of the lottery, but the lottery is now well established in the state. I therefore object to and disapprove of one year of this appropriation.

Article X – The Legislature

House of Representatives

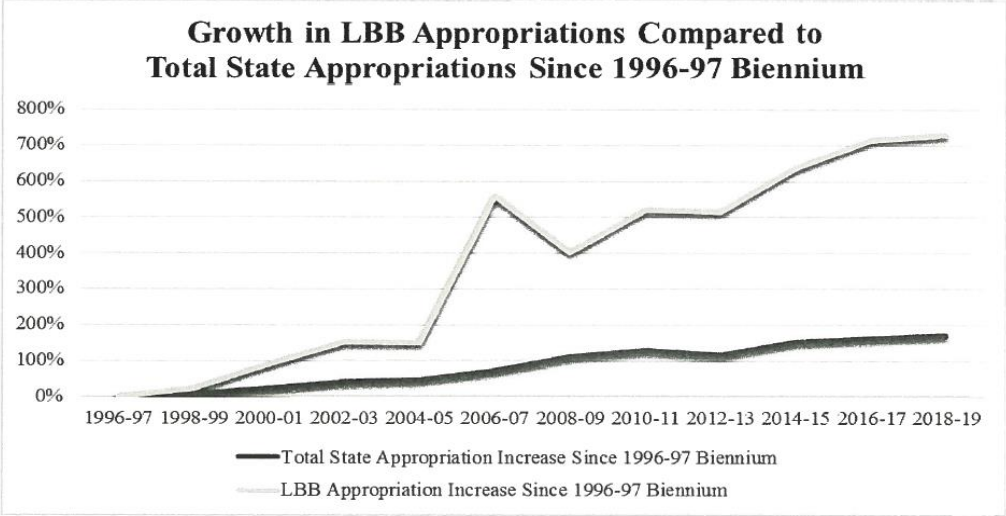
5. Unexpended Balances: Legislative Budget Board.

~~a. Any unobligated and unexpended balances remaining as of August 31, 2017, from appropriations made to the Legislative Budget Board are appropriated to the Legislative Budget Board for the biennium beginning September 1, 2017.~~

b. Any unobligated and unexpended balances remaining as of August 31, 2018, from appropriations made to the Legislative Budget Board are appropriated for the same purposes for the fiscal year beginning September 1, 2018.

Since the 1996–1997 biennium, direct appropriations to the Legislative Budget Board (LBB) have skyrocketed by more than 700 percent compared to just 171 percent for the entire state. This growth has corresponded with greater government authority being delegated to unelected bureaucrats rather than being undertaken by elected officials directly accountable to the voters. To begin the process of restoring the LBB to its intended limited purpose, I therefore object to and disapprove of this appropriation.

FILED IN THE OFFICE OF THE
SECRETARY OF STATE
2:15 PM O'CLOCK
JUN 12 2017



I have signed Senate Bill No. 1 together with this proclamation stating my objections in accordance with Article IV, Section 14 of the Texas Constitution.

Since this Legislature by its adjournment of the Regular Session has prevented the return of this bill, I am filing this bill and these objections in the office of the Secretary of State and giving notice thereof by this public proclamation according to the aforementioned constitutional provision.

IN TESTIMONY WHEREOF, I have signed my name officially and caused the Seal of the State to be affixed hereto at Austin, this 12th day of June, 2017.

GREG ABBOTT
Governor of Texas

ATTESTED BY:

ROLANDO B. PABLOS
Secretary of State

FILED IN THE OFFICE OF THE SECRETARY OF STATE
2:15 PM O'CLOCK
JUN 12 2017

S.B. No. 1

President of the Senate

Speaker of the House

I hereby certify that S.B. No. 1 passed the Senate on March 28, 2017, by the following vote: Yeas 31, Nays 0; April 18, 2017, Senate refused to concur in House amendments and requested appointment of Conference Committee; April 20, 2017, House granted request of the Senate; May 27, 2017, Senate adopted Conference Committee Report by the following vote: Yeas 30, Nays 1; passed subject to the provisions of Article III, Section 49a, of the Constitution of Texas.

Secretary of the Senate

I hereby certify that S.B. No. 1 passed the House, with amendments, on April 6, 2017, by the following vote: Yeas 131, Nays 16, zero present not voting; April 20, 2017, House granted request of the Senate for appointment of Conference Committee; May 27, 2017, House adopted Conference Committee Report by the following vote: Yeas 135, Nays 14, zero present not voting; passed subject to the provisions of Article III, Section 49a, of the Constitution of Texas.

Chief Clerk of the House

Approved:

6-12-2017

Date

Governor

FILED IN THE OFFICE OF THE SECRETARY OF STATE
2:15 PM O'CLOCK
JUN 12 2017
Secretary of State

I, Glenn Hegar, Comptroller of Public Accounts, do hereby certify that the amounts appropriated in the herein S.B. No. 1, Regular Session, 85th Legislature, are within the amount estimated to be available in the affected fund.

Certified June 1, 2017.

Comptroller of Public Accounts

APPENDIX B: Executive Summary of Conceptual Model

EXECUTIVE SUMMARY

The ozone conceptual model presented in this report builds on the previous conceptual model for San Antonio in 2014 and incorporates data collected for the years 2015 and 2016. This conceptual model documents the temporal and spatial variability of high ozone concentrations and includes a description of the regional weather patterns and associated local meteorological conditions typically experienced during high ozone episodes in the San Antonio – New Braunfels Metropolitan Statistical Area (MSA) 8-county area, in particular, those episodes that are used to set the design values for the region. The conceptual model attempts to detect the sources of the region's transported ozone and estimates locally-formed ozone using available monitoring data. The analysis helps identify most suitable high ozone events to evaluate the effects of ozone control measures within the photochemical modeling process.

San Antonio Air Quality Status

The Texas Commission on Environmental Quality (TCEQ) operates three regulatory ozone monitors in the San Antonio area: CAMS 23, CAMS 58, and CAMS 59. A region is in violation of the 2015 ozone National Ambient Air Quality Standards (NAAQS) when the design value, which is the average of three consecutive years' fourth-highest monitored ozone data for any given regulatory monitor, exceeds 70 parts per billion (ppb). Table ES-1 indicates two regulatory monitors measuring ozone concentrations in violation of the 2015 ozone NAAQS in the San Antonio region: CAMS 23 and CAMS 58. It also shows that in recent years, the annual fourth-highest eight-hour average ozone concentrations have fallen from 87 ppb in 2012 to 69 ppb in 2016 at CAMS 58. However, this trend has not been continuous, with 2015 seeing an increase in the fourth-highest eight-hour ozone levels at each regulatory monitor. Only the Calaveras Lake monitor, CAMS 59, falls within the NAAQS.

Table ES-1: Compliance with 2015 ozone NAAQS, 2012 – 2016 (Red represents an exceedance of the NAAQS)

CAMS	2012 4th-Highest (ppb)	2013 4th-Highest (ppb)	2014 4th-Highest (ppb)	2015 4th-Highest (ppb)	2016 4th-Highest (ppb)	2014-2016 Design Value
San Antonio Northwest CAMS 23	**81**	**76**	69	**79**	**71**	**73**
Camp Bullis CAMS 58	**87**	**83**	**72**	**80**	69	**73**
Calaveras Lake CAMS 59	70	69	63	68	62	64

Annual Frequency of High Ozone Days

Figure ES-1 depicts the total number of high ozone days recorded at regulatory monitors for ozone thresholds of 60, 65, 70, and 75 ppb. According to the historical data, the area has experienced a slightly decreasing ozone trend from 2010 through 2016, with some fluctuation year-to-year based on meteorology.

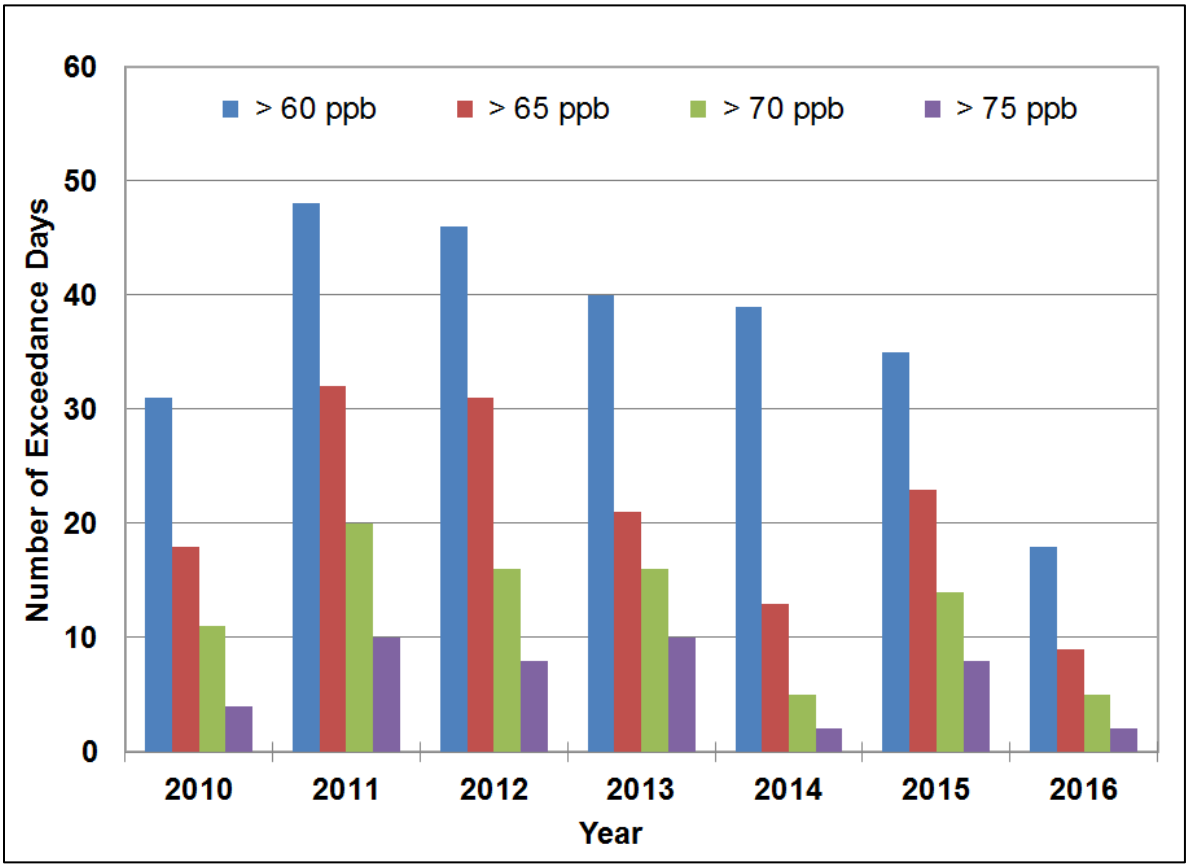


Figure ES-6-1: Total Number of High Ozone Days at San Antonio Area Regulatory Monitors

Extensive data sets were analyzed to develop an updated conceptual model for the San Antonio region including meteorology, emissions, ozone, and spatial observations. Chapter 1 defines the elements and usage of a conceptual model. This chapter describes the determining criteria desirable for modeling high ozone events as outlined in EPA's modeling guidelines.[9] Chapter 2 contains the analysis of air quality trends in San Antonio. The 2014 – 2016 design values at all

[9] U.S. Environmental Protection Agency Office of Air Quality Planning and Standards Air Quality Analysis Division Air Quality Modeling Group, October 2005. "Guidance on the Use of Models and Other Analyses in Attainment Demonstrations for the 8-hour Ozone NAAQS", Research Triangle Park, North Carolina. EPA-454/R-05-002. p. 46. Available online: http://www.epa.gov/scram001/guidance/guide/final-03-pm-rh-guidance.pdf. Accessed 02/16/2017.

regulatory-sited monitors are above the 2015 ozone NAAQS, but lower than they were in 2010, and have been declining since 2011, as have the number of exceedance days.

Estimates of Background and Locally-Formed Ozone

Chapter 3 assesses typical local meteorological conditions that are conducive to ozone formation including days with stagnant air or variable wind directions, no precipitation, low atmospheric moisture content in the afternoon, a large diurnal temperature change, and clear skies. 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. Timing, location, and intensity of ozone events are influenced by the interaction between local and regional wind patterns. At CAMS 23, winds slowly change direction at the monitor anti-cyclonically from north to east during the day. The directions of the wind vectors indicate that transported emissions from the north and northeast on high ozone days combine with local emissions to produce elevated ozone conditions. CAMS 58 wind vectors show there is a reversal of winds arriving at the monitors from the northwest in the morning before 7:00 a.m. These winds can re-circulate local ozone precursor emissions and ozone from the previous day, which combine with local and transported emissions resulting in elevated ozone levels.

The impact of background ozone and ozone-precursor transport is considered in Chapter 5. There are currently six active NO_X monitors in the AACOG region, all of which typically indicate low NO_X levels with the exception of CAMS 1069, which often records moderate NO_X concentrations due to its proximity to Interstate-35 as a near-road NO_X monitor. Although CAMS 1069 has the highest recorded NO_X in the region, it only began operation in January 2014. Annual hourly maximum NO_X concentrations at CAMS 678 have significantly decreased since 2010, but the monitor ceased operation in April 2016. Decreases in recorded NO_X are attributed to controls put on major NO_X sources including power plants and cement kilns, and significant reductions of NO_X emissions from on-road and off-road vehicles. Local NO_X emissions should continue a downward trend, in large part due to improvements in vehicle emission standards, while local VOC emissions are expected to remain steady. CAMS 59 is an upwind monitor site on most high ozone days and NO_X measurements from 2010 to 2016 were low at that monitor, indicating there was not a significant amount of NO_X being transported into San Antonio from the southeast.

Large-Scale Weather Patterns and Transport Conditions during High Ozone Events

Since the majority of ozone recorded at local monitors is the result of transport from other areas, it is difficult for the San Antonio region to demonstrate attainment with only local emission controls. Months with higher ozone levels typically have small shares of

ambient ozone that are the result of local processes. Easterly to northeasterly winds bring high levels of background ozone into San Antonio from the Midwest U.S, Dallas, Austin and other regions. Sampling of industrial point sources and urban ozone plumes by aircraft increases the knowledge of regional ozone development.

Variations in both local ozone levels and transported ozone throughout the ozone season are addressed in Chapter 5, as it has become more apparent that seasonal meteorological trends have an important role in monitored ozone readings in San Antonio. In May and June, there is a seasonal peak in the frequency of high ozone days in most Texas cities. This period represents the first high ozone seasonal peak that San Antonio typically experiences, and corresponds to the yearly beginning of intermittent high pressure systems which result in the light winds, clear skies, and high solar radiation that drive high ozone production.

A significant amount of transport occurs during the spring and fall ozone season peaks. A combination of greater tropospheric-stratospheric air exchange combined with higher North American upper troposphere/stratospheric ozone levels during the early months of the ozone season are contributing factors. Likewise, the lack of frontal movements moving through the region transporting air from the northeast could explain the decrease in ground level ozone in July. The second seasonal peak covers a period from August through October. Resulting wind vectors during the May – June ozone season peak tend to be from the east and southeast on high ozone days, while the late August to early October ozone season peak wind vectors are dominated by winds from the northeast.

APPENDIX C: Executive Summary, 2017 Ozone Action Public Input Survey

Contract 582-16-60180,
PGA 582-16-60849-01
Task 6.7

EXECUTIVE SUMMARY

Ozone Action Public Input Survey

Submitted to the

Alamo Area Council of Governments

Submitted by

ETC Institute

November 14, 2016

PREPARED UNDER A GRANT FROM THE TEXAS COMMISSION ON ENVIROMENTAL QUALITY

The preparation of this report was financed through grants from the State of Texas through the Texas Commission on Environmental Quality. The content, findings, opinions and conclusions are the work of the authors and do not necessarily represent findings, opinions or conclusions of TCEQ.

EXECUTIVE SUMMARY

Overview

During the summer of 2016, the Alamo Area Council of Governments (AACOG) conducted an Ozone Action Public Input Survey of residents in the eight-county Greater San Antonio Area. The objective of the survey was to ascertain, from a representative sample of residents living in the San Antonio-New Braunfels Metropolitan Statistical Area (SA-NB MSA), underlying assumptions about air quality, support for selected ozone precursor reduction strategies, and willingness to take individual actions to help improve air quality.

To accomplish this objective, the survey was administered to randomly sampled residents of the San Antonio metropolitan area. The project goal was to obtain a minimum goal of 800 complete and usable surveys from residents age 18 or older. This goal was met, with 866 surveys having been completed. Data collection was completed in seven weeks, from late July through mid-September 2016. The survey was conducted in English and Spanish, with data collection goals focused on the number of completed surveys by county. The survey was administered using a combination of mail, email, and telephone to maximize participation rates.

NOTE: All percentages given throughout this report, excluding Appendix B, are based on weighted data. Details regarding weighting procedures are provided on page 7.

Major Findings

- Eighty-one percent (81%) of the residents surveyed were either “very concerned” or “somewhat concerned” about air pollution in the Greater San Antonio area. When comparing urban and rural areas, 48% of urban and 33% of rural respondents were “very concerned” about air pollution in the area.

- More than one-third (37%) of the residents surveyed indicated they or someone in their household has a breathing or respiratory problem. Thirty-nine percent (39%) of urban and 34% of rural respondents indicated they or someone in their household has a breathing or respiratory problem.

- Sixty-nine percent (69%) of the residents surveyed believe air pollution in the Greater San Antonio area is either “getting somewhat worse” or “getting much worse.” Just over one- fourth (26%) believe air pollution in the area is “staying the same.” Nineteen percent (19%) of urban and 18% of rural residents believe air pollution in the Greater San Antonio area is “getting much worse.”

- Just over half (57%) of the residents surveyed remembered hearing about any "Ozone Action Days" during the past year. Fifty-seven percent (57%) of urban and 54% of rural respondents remembered hearing about "Ozone Action Days" during the past year.

- When residents were asked, "What do you think an "Ozone Action Day" means?" top three responses given were: 1) the air is dirty/polluted, 2) people should drive less, and 3) there is a high amount of ozone in the air (multiple responses could be made to this question). Eleven percent (11%) responded, "I don't know what "Ozone Action Day" means."

- Thirty-seven percent (37%) of residents surveyed indicated they prefer to receive information about air quality through TV news/weather. Other preferred sources included email (18%) and Internet (15%) (multiple responses could be made to this question).

- When residents were asked, *"To what degree would you support or oppose the adoption of the following vehicle emissions reduction measures to improve air quality?"* 81% indicated they would "strongly support" or "somewhat support" streets that allow safer travel for cyclists, pedestrians, and transit users as well as motorists. Additionally, 80% would "strongly support" or "somewhat support" the improvement of public transportation options. The measure residents would support the least is the lowering of highway and expressway speed limits (31% would "strongly oppose").

- Most residents (88%) would "strongly support" or "somewhat support" greater use of clean energy from renewable sources such as wind and sun as a way to improve air quality. Eighty-one percent (81%) of residents would "strongly support" or "somewhat support" standards that require homes and buildings to be more energy efficient.

- When asked for their level of agreement with various statements regarding air quality, 91% of residents "strongly agreed" or "somewhat agreed" that improving air quality in the Greater San Antonio Area is the responsibility of every citizen living in the area. Eighty-seven percent (87%) of residents "strongly agreed" or "somewhat agreed" that improving air quality in the region is the responsibility of those businesses that are the greatest polluters.

- Ninety-two percent (92%) of residents surveyed indicated they drive a vehicle at least twice per week. When comparing urban and rural areas, 91% of urban and 97% of rural respondents drive a vehicle at least twice a week. Of all residents who do drive a vehicle at least twice a week, 76% currently drive the speed limit or below or are willing to do so. Two-thirds (67%) of residents currently avoid or are willing to avoid using drive-through lanes at businesses in favor of parking and going inside, especially on Ozone Action Days. The activity residents are least willing to do to

improve air quality is taking public transportation, especially on Ozone Action Days (34% are not willing).

Nearly three-fourths (74%) of residents who use gasoline-powered mowers or blowers indicated they currently or are willing to postpone using them on Ozone Action Days. Nearly two-thirds (65%) of residents surveyed indicated they currently or are willing to set the thermostat higher or use less electricity on Ozone Action Days (8% are not willing).