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Special points of interest:

- Air pollution has health, environmental, and economic impacts (see page 4)
- A revised ozone pollution standard presents new challenges to the region (see page 5)
- Clean air measures save money at the pump and elsewhere (see page 7)

# for the San Antonio Region

## Our air...what's up with that?

Too many times during the summer months the answer to "what's up?" is ground-level ozone concentrations. Ozone pollution reduces lung function and is particularly harmful to children, people who are active outdoors, and people with respiratory diseases such as asthma.

The best ways to protect ourselves and our community from the harmful effects of ground-level ozone are to

- monitor the air quality forecast to know when pollution reaches unhealthy levels;
- avoid prolonged exposure outdoors when concentrations are

high; and

- adopt measures that reduce the amount of ozone-forming emissions released into the air we breathe.

In addition to health issues, air pollution can have economic consequences that impact our region's use of federal highway funds and our ability to attract new businesses to the area.

One of the keys to maintaining our quality of life in the San Antonio region is to ensure air quality information is available to the public so that residents can protect themselves and adopt measures to help reduce air



*Children are particularly sensitive to air pollution. Their growing lungs breathe 50% more air per pound of body weight than adults.*

pollution emissions. The Alamo Area Council of Governments (AACOG) collaborates with local governments, businesses and schools to promote these important clean air messages among the larger community.

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## “Good up high, bad nearby”

### Protective Ozone Layer Stratosphere



*Ozone in the stratosphere protects us from solar radiation. Ozone in the air we breathe (troposphere) harms humans and the environment.*

This catchphrase popularized by the U.S. Environmental Protection Agency (EPA) describes the dual nature of ozone. The good qualities of ozone refer to the chemical’s ability to absorb and reflect UV-B radiation from the sun. Without ozone in our atmosphere, life as we know it

could not exist.

The flip side: ozone is an air pollutant. The chemical impairs the respiratory system and harms the environment.

The difference between “good” and “bad” ozone is strictly a matter of location.

Ozone in the upper atmosphere — the ozone layer — protects us from solar radiation. Ozone in the lower atmosphere,

however, harms human health and the environment. Because ground-level ozone has such harmful impacts, the federal government set standards for ozone and five other pervasive air pollutants. Areas of the country that have unhealthy levels of one or more of these six “criteria” pollutants are designated as being in “non-attainment” of the standards by the EPA.

## What causes ground-level ozone?

### And why does ozone occasionally reach unhealthy levels in the San Antonio region?

Although San Antonio’s air quality is affected by pollution from other regions, the most significant improvements result from local pollution controls.

Ozone forms when certain chemicals in the atmosphere are exposed to sunlight. These chemicals generally fall into two categories: nitrogen oxides and volatile organic compounds.

Nitrogen oxides (NOx) are released into the air when fuels such as gasoline, diesel, and coal are burned. Volatile organic compounds (VOCs) typically enter the atmosphere by vaporization of products such as gasoline, paints, and solvents.

While man-made sources of NOx and VOCs predominate in the San Antonio area, natural sources of the chemicals also contribute to local ozone levels.

Vegetation is by far the largest natural source of

ozone-forming chemicals. Biogenic sources — primarily vegetation — contribute 59% of the VOCs and 5% of the NOx released into our air. The pie charts on page 3 display the source categories for VOCs and NOx and their relative share of the San Antonio region’s “emissions inventory.”

In addition to the contribution of local sources a significant portion of the ozone detected at San Antonio-area monitors originates elsewhere. Air pollution can travel great distances, crossing state, international, and even continental borders. Because air pollution is so mobile, regions must also rely on clean up measures implemented in other regions to improve air quality locally.

Just as we are affected by air pollution from other regions, pollutants emitted by activities in our region affect the air quality of other areas. Reducing local sources of NOx and VOCs not only improves San Antonio’s air quality, but also helps regions impacted by our actions.

Meteorological conditions also influence the formation and dispersion of ground-level ozone. Weather conditions that tend to increase ozone concentrations include sunny skies, warm temperatures, slow wind speeds, and high pressure systems. These are typical summer-time conditions in south Texas. Consequently, ozone season extends from April 1 to October 31 each year.



*On-road vehicles are the primary, man-made sources of air pollution locally.*



## Sources of ozone precursors

Ground-level ozone is not emitted directly into the atmosphere, but forms when VOCs and NOx, interact in the presence of sunlight.

AACOG staff identifies and quantifies sources of ozone precursors. This process includes developing an emissions inventory by calculating weekday, weekend, and annual emission rates from all precursor sources. Since precursors are emitted by hundreds of sources, they are often grouped by categories: on-road, non-road, point, airport/military, area, and biogenic.

**VOCs** are generated by natural and man-made sources. Examples of VOC sources, by category, include:

On-road: fuel evaporation from cars, trucks, buses, motorcycles

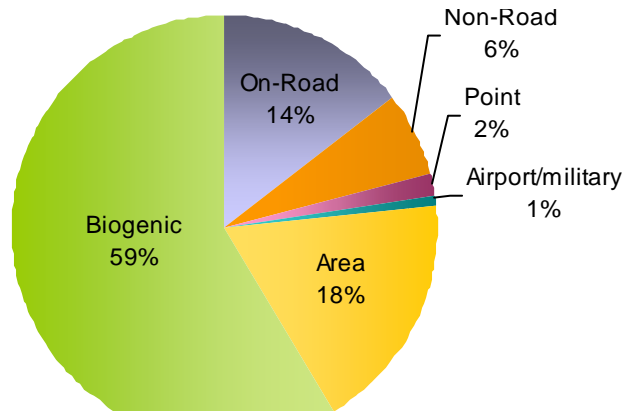
Non-road: fuel evaporation from construction equipment and gas-powered landscaping tools

Area: dry cleaning processes, refueling

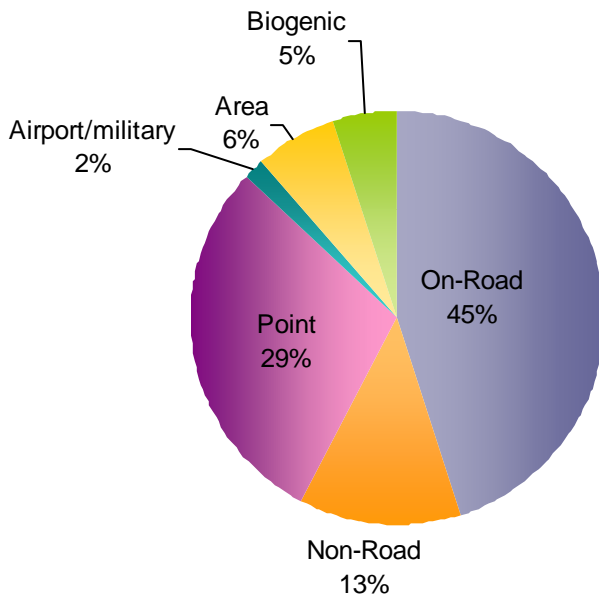
Airport/military: refueling operations

Point: large manufacturing facilities

Biogenic: vegetation, crops



**2005 San Antonio Area VOC Emissions Inventory**  
The pie chart above represents the VOC emissions inventory and displays the proportion of VOC emissions attributed to each of the six inventory categories for an average ozone season (summer) weekday



**2005 San Antonio Area NOx Emissions Inventory**  
The pie chart at left represents the NOx emissions inventory and displays the proportion of NOx emissions attributed to each of the six inventory categories for an average ozone season (summer) weekday

Many of the clean air measures that reduce ground-level ozone pollution also help to reduce greenhouse gas emissions.

**NOx** emissions are generated by natural and man-made sources. Examples of NOx sources include:

On-road: fuel burned by cars, trucks, motorcycles, and buses

Non-road: fuel burned by construction equipment and power landscaping tools

Area: fires, use of BBQs

Airport/military: fuel burned by ground-support equipment

Point: power plants, cement kilns

Biogenic: microbial activity in soil

"Health costs and lost productivity related to air pollution in Houston exceed \$3 billion annually."

-Committee of Science, U.S. House of Representatives Field Hearing

"When siting new facilities, companies generally avoid areas with air quality problems; the effect makes it very onerous for a business."

-Dan Sieger

Toyota North American Spokesman

## Consequences of ozone concentrations that exceed government standards

### Human Health

Ozone pollution can cause a variety of health symptoms including coughing, sore/scratchy throat, pain with deep breath, fatigue, and reduced lung function. Ozone is linked with increases in hospital admissions and school absences. Sensitive groups — children, adults who are active outdoors, and people with respiratory ailments — are particularly vulnerable.

### Environment

High ozone levels not only affect human health but also have a negative impact on vegetation. Ozone reduces agricultural yields, reduces the survivability of tree seedlings,

and increases plants' susceptibility to disease and pests. When ozone-related damage is extensive, entire ecosystems are affected.

### Economic Impacts

The consequences of high ozone levels don't end with health and environmental issues; there are economic consequences as well. Ozone levels that are consistently high enough to trigger a "non-attainment" designation from the federal government may be costly in terms of planning, implementation, and enforcement of control measures. Furthermore, failure to plan adequately puts a region's federal highway funds at risk.

Economic growth may also suffer. New major stationary sources of air pollution in non-attainment areas are required by the federal government to offset their potential to emit pollutants by securing emission reductions from nearby facilities at a ratio of at least one-to-one. Likewise, established major sources of pollutants in non-attainment areas are required to offset increases in emissions when modifying existing facilities.

The offset requirements of the Clean Air Act's New Source Review Program can increase a facility's operational costs and may hinder a region's ability to attract new businesses.

## Determining compliance with the federal ozone standard



One of several air monitoring stations in the San Antonio region

In March 2008, the federal government revised the National Ambient Air Quality Standard (NAAQS) for ground-level ozone to make the standard more protective of human health and the environment.

Attainment under the revised standard is met when the three-year av-

erage of the annual fourth highest daily maximum eight-hour ozone concentration is no more than 75 parts per billion (ppb).

The EPA intends to make designations under the revised 8-hour standard in 2010 and requires states to submit recommendations in 2009 for non-attainment areas under the new 2008 federal ozone standards based on 2006-2008 ozone records. Ground-level ozone is

monitored by the Texas Commission on Environmental Quality (TCEQ) using Continuous Air Monitoring Stations (CAMS) placed strategically at locations surrounding the San Antonio area. Daily ozone measurements are posted on TCEQ's web site: <http://www.tceq.state.tx.us/>.

## Local air quality planning responsibility

The Air Improvement Resources (AIR) Committee of the Alamo Area Council of Governments is the local entity charged with coordination and oversight of air quality planning in the region. The committee directs air quality studies, planning activities, and emission reduction plans for attainment under the 8-hour ozone NAAQS in close cooperation with TCEQ and EPA.

The AIR Committee is led by the primary planning body, the AIR Executive Committee. Membership includes local elected officials

representing county and municipal governments in the San Antonio region. These officials direct analysis to develop air quality strategies and can create legislation within their local jurisdictions to implement region-wide strategies.

The AIR Executive Committee is supported by several subcommittees: the AIR Advisory Committee, the AIR Technical Committee, and the AIR Public Education Committee. Subcommittee membership includes representatives of businesses and

industries, environmental organizations, technical support providers, school districts, transportation planning organizations, and utilities, as well as the public. All AIR Committee meetings are open to the public.

The AIR Committee works closely with the TCEQ and the EPA to ensure compliance with air quality rules and regulations and to seek guidance for local planning and strategy implementation.



## How the area measures up

In 2002 local elected officials entered into an agreement with the state and federal governments that allowed the region to develop and implement local strategies to tackle regional air pollution problems. The agreement, called the Early Action Compact, ended in December 2007 with the region in full compliance of federal air quality standards.

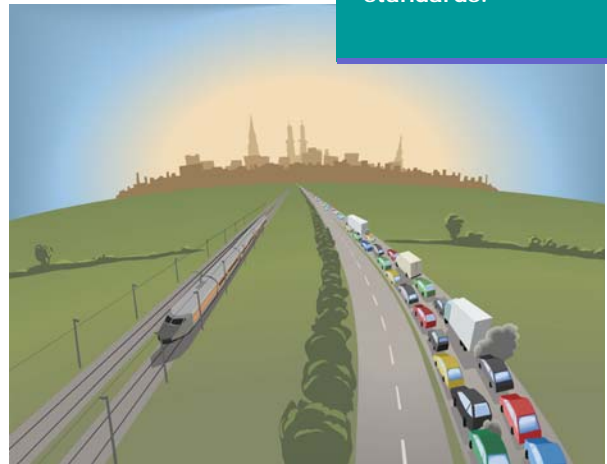
The success of the Early Action Compact agreement demonstrates the benefits of planning and implementing proactive clean air measures, locally. With a new, stricter standard now in place,

clean air efforts take on even greater importance in the post-compact years.

Comparing historic ozone data with the new standard indicates the San Antonio region would have failed to meet the federally-mandated threshold of 75 ppb or less based on any three-year period in the past. Consequently, ozone concentrations must remain very low in 2009 for the region to receive an "attainment" designation in 2010.

The charts on page 6 compare historic ozone data with the previous, 85 ppb standard (top graph) and the revised, 75 ppb standard (bottom graph).

If EPA based attainment of the 2008 ozone standard using the most recent three-year averaging period (2006-2008 ozone levels), the San Antonio region would fail to meet federal air quality standards.



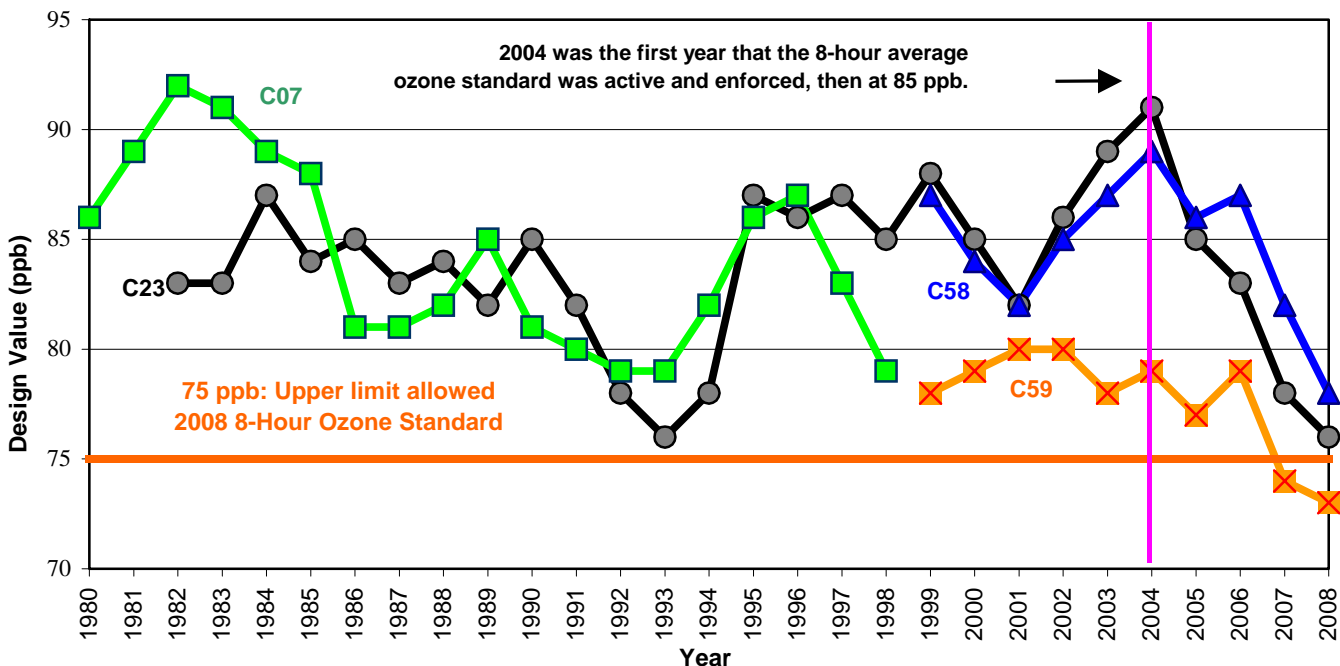
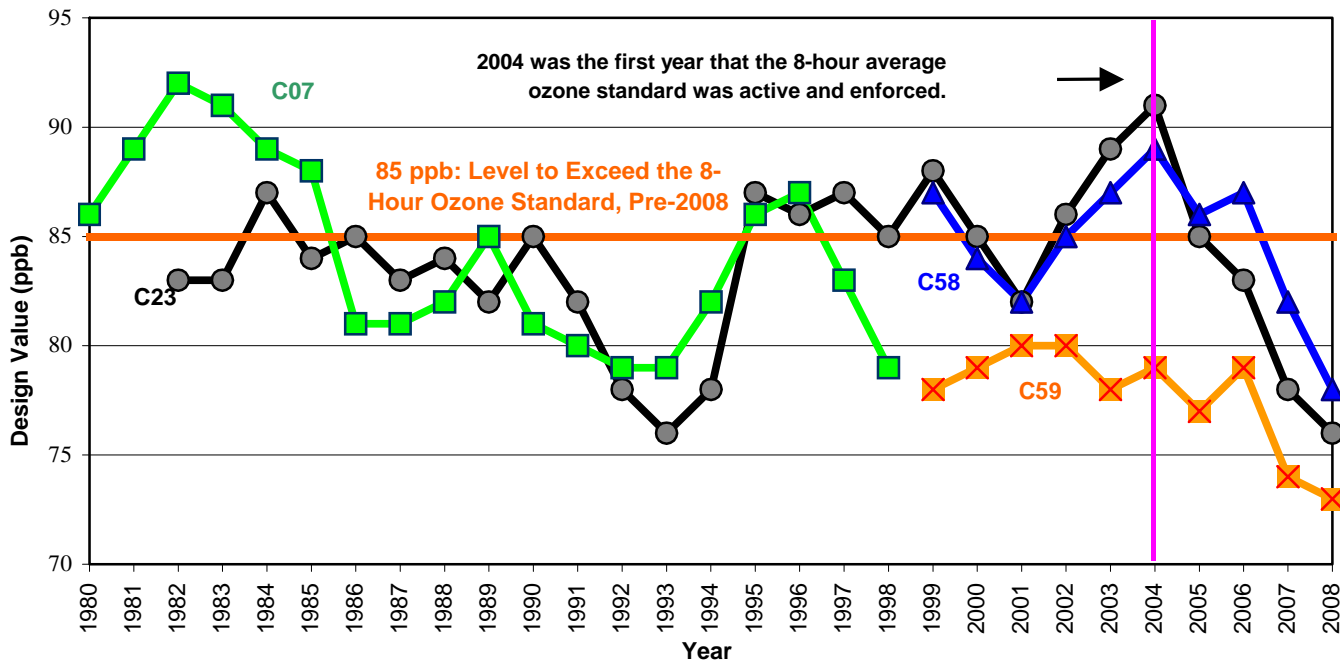


## Air Quality Trends

The straight orange line in the top graph (below) represents the 8-hour standard of 85 ppb which was in place prior to the

March 2008 revision. The fourth highest 8-hour averages recorded at each of four regional monitors between 1980 and 2007 are

shown in relation to the 85 ppb threshold. Under the previous 8-hour standard, a region could (cont. on page 7)



C07—North SA (deactivated in '98)  
C23—Marshall High School

C58—Camp Bullis  
C59—Calaveras Lake

## Air Quality Trends

(continued from page 6)  
be designated “non-attainment” of the clean air standard when the three-year average of the fourth highest eight-hour ozone average at one or more monitors was 85 ppb or greater.

The three-year average between 2006 and 2008 at the San Antonio region monitor recording the highest ozone levels in the region was 78 ppb.

The graph at the bottom of page 6 displays the same 1980–2008 monitoring data in relation to the revised eight-hour ozone standard.

A region can be designated non-attainment under the revised 2008 eight-hour standard when the three-year average of the annual fourth highest daily maximum eight-hour ozone values is greater than 75 ppb. At no time

since 1980 has the three-year average of the annual fourth highest eight-hour ozone values been below 76 ppb in our region.



## Clean Air Control Measures

Since many ozone precursors enter the air through the use of fuels—gasoline, diesel, coal, and others—clean air measures often target sources that use these fuels.

Numerous local governments, industries, and other organizations have voluntarily implemented measures to improve air quality in the San Antonio region. Examples of these clean air measures include the hybrid taxi program and natural gas-powered refuse truck project adopted by the City of San Antonio, the energy reduction programs adopted by Bexar County and the City of Seguin, and the pollution controls implemented by CPS Energy and Capitol Cement.

The Alamo Area Council of Governments assists regional organizations with their clean air measures by providing expertise in fuel-use conservation measures, assisting with efforts to find funding for retrofit projects, and conducting energy workshops for facility maintenance personnel, among other efforts.

In addition, AACOG conducts outreach at schools, businesses, and public events to encourage widespread adoption of clean air measures. Outreach is conducted through a number of programs including Clean Cities, the Alamo Clean Air Partnership, Commute Solutions, the Air Quality Health Alert Notification system, and

the air quality educational curriculum (described in more detail on page 8).

### It Pay\$ to be Green

Because much of our air pollution is generated from the use of fuels, measures that help clean our air often save us a significant amount of money at the pump and on our utility bill.



FIND A CARPOOL PARTNER AT  
RCRIDE.COM

## AACOG's outreach programs

*The Alamo Area Council of Governments conducts multiple air quality education and outreach programs. The following list provides short descriptions of each.*

### Clean Cities

The Alamo Area Clean Cities Program, created in coordination with the US Department of Energy, is a locally-based government and industry partnership. The goals of the program are to expand the use of alternative fuels and technologies, advance clean air measures, support energy security, expand refueling infrastructure, and promote fuel economy.

### Commute Solutions

The Alamo Area Council of Government's Commute Solutions Program helps businesses, schools, and organizations implement commuter programs for their employees or students. Since no single commute solution fits every commuter, AACOG offers assistance for establishing a wide range of corporate commuter pro-

grams. These include carpooling, vanpooling, telecommuting, flexible work scheduling, and other options. AACOG staff is available to provide presentations and materials on Commute Solutions programs, conduct a matching service for employees or students interested in participating in a carpool/vanpool, and discussing tax-related benefits and other financial benefits of commuter programs.

### Alamo Clean Air Partnership

The Alamo Clean Air Partnership is a voluntary association of businesses, government agencies, schools, and organizations in the San Antonio area that demonstrate environmental leadership by adopting measures to improve our quality of life. The program primarily focuses on and promotes measures that reduce air pollution emissions. Participating organizations

may adopt any number of measures including participation in the Air Quality Health Alert program (see description below), establishing an alternative-commuting program, practicing energy conservation, operating cleaner-burning fleet vehicles, xeriscaping, and a variety of other strategies. AACOG hosts a series of workshops and seminars (such as the periodic "Greening Your Business" series) to assist involved community leaders in wise environmental decision-making.

### Air Quality Health Alert (AQHA)

The Air Quality Health Alert program was established to alert area residents about potential air pollution risks. AACOG receives notification from the TCEQ the day before air pollution is forecast to reach unhealthy levels. Staff immediately forwards the alert to schools,

the media, businesses, government agencies, and any other organizations or individuals requesting to be placed on the notification list. The alert from AACOG is accompanied by information on sensitive groups, guidelines for reducing health risks from exposure to air pollution, and methods to reduce air pollution emissions.

Remember when it was fun  
and cheap  
to take your wheels for a spin?



**Take back the fun by carpooling.**

The Alamo Area Council of Governments and its Austin partners offer a FREE carpool matching service to commuters living in the San Antonio and Austin areas. Carpooling is a good way to de-stress your commute and save money. Log onto [rcride.com](http://rcride.com) to be matched with other drivers whose commutes are similar to yours and start sharing your ride.

**Share the Ride**

**Good for the environment, good for your wallet, good for you.**

