

2021

Annual Air Quality Report Overview

**Austin-Round Rock-
Georgetown Region**



Prepared by the Capital Area Council
of Governments





Introduction

About this Report

The annual air quality report overview for the Austin-Round Rock-Georgetown Metropolitan Statistical Area (MSA) was prepared by the Capital Area Council of Governments (CAPCOG) for the members of the Central Texas Clean Air Coalition (CAC). This report serves as the region's annual "check-in" on Ozone (O_3) and fine particulate matter ($PM_{2.5}$) concentrations and activities. The report covers January 1, 2021, through December 31, 2021. The Austin-Round Rock-Georgetown MSA consists of Bastrop, Caldwell, Hays, Travis, and Williamson Counties, which are the same five counties that have participated in regional air quality planning efforts since the CAC formed in 2002.



Report Intent

- Provide an update to the Texas Commission on Environmental Quality (TCEQ), the U.S. Environmental Protection Agency (EPA), and local stakeholders on the status of air quality in the Austin-Round Rock-Georgetown MSA through the end of 2021.
- Provide an update on the latest understanding of what contributes to the region's emissions.
- Summarize the status of emission reduction measures implemented in the region.
- Detail ongoing planning activities in the region.
- Identify new issues affecting air quality planning efforts in 2021 and beyond.

Highlights

- The region's 2021 air pollution levels continued to **meet all federal air quality standards**.
- There were a total of **3 days** when monitored air pollution levels were considered "unhealthy for sensitive groups," and another **138 days** when air pollution levels were considered "moderate."
- Overall emissions of nitrogen oxides (NO_x) continued to **trend downward**.
 - Emissions from regional power plants were lower during the 2021 ozone season largely due to the shutdown of 1 of the 2 steam units at the Decker Power Plant.
- CAC members continued to take step to reduce ozone emissions and in 2021 started to track measures to reduce fine particulate emission.

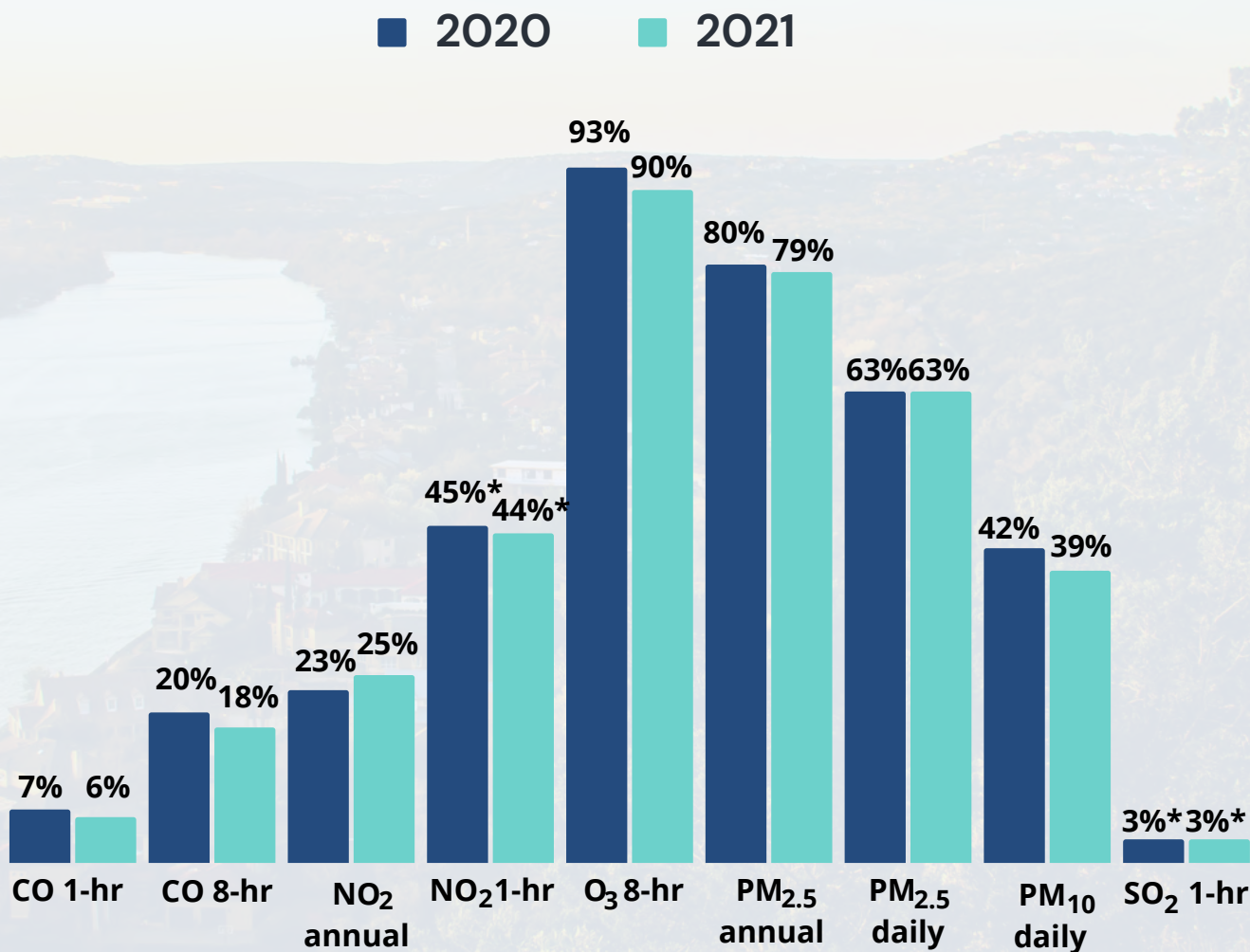
Future Considerations

- **Reconsideration of the current National Ambient Air Quality Standards (NAAQS)**
 - The ozone and PM NAAQS are being reviewed in 2022 and if lowered could place the region closer to nonattainment of federal requirements.
- **Opportunities from future Emission Inventory projects**
 - There will likely be continued or even increase funding from the state to study emissions in the region.
- **Expansion of the region's monitoring network**
 - As the region grows it will be important to increase the number of both ozone and fine particulate monitors.
- **2023 State Legislative Session**
 - In January 2023 the state will begin policy making and those policies could impact air quality planning in the region.

Compliance with Federal Air Quality Standards

The Clean Air Act requires EPA to set National Ambient Air Quality Standards (40 CFR part 50) for six principal pollutants ("criteria" air pollutants) which can be harmful to public health and the environment.

The region's 2021 air pollution levels continued to meet all federal air quality standards and there were slight improvements across key pollutants, namely 8-hour ozone, and annual fine particulate.



This graph shows pollutants regulated by the NAAQS in the metro area for 2020 and 2021 and how close the MSA was to exceeding these standards by percentage. The region saw slight improvement regarding the 2021 8-hour ozone and annual fine particulate levels compared to 2020. These are the pollutants that are closest to exceeding the federal limits.

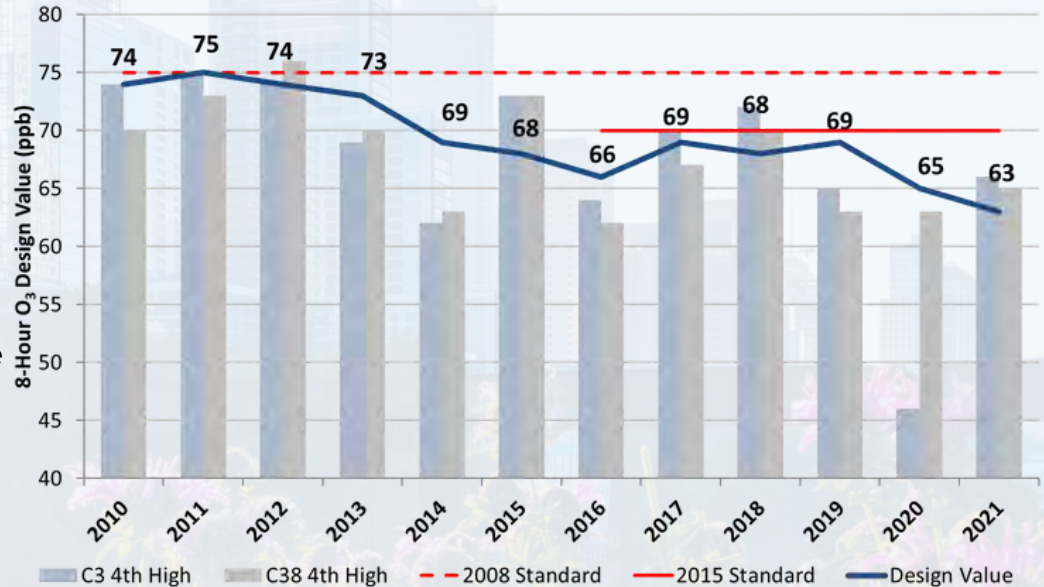
The asterisks next to the 1-hour NO₂ and SO₂ NAAQS signify that the 2020 and 2021 values for these NAAQS are considered invalid due to insufficient data being collected for the region; the region's monitor for these pollutants was down a significant portion of 2020.

Federal Standard Trends

Taking a closer look at the 8-hour ozone and fine particulate matter values over a longer period of time allows one to better understand how the trends and how things have improved or deteriorated.

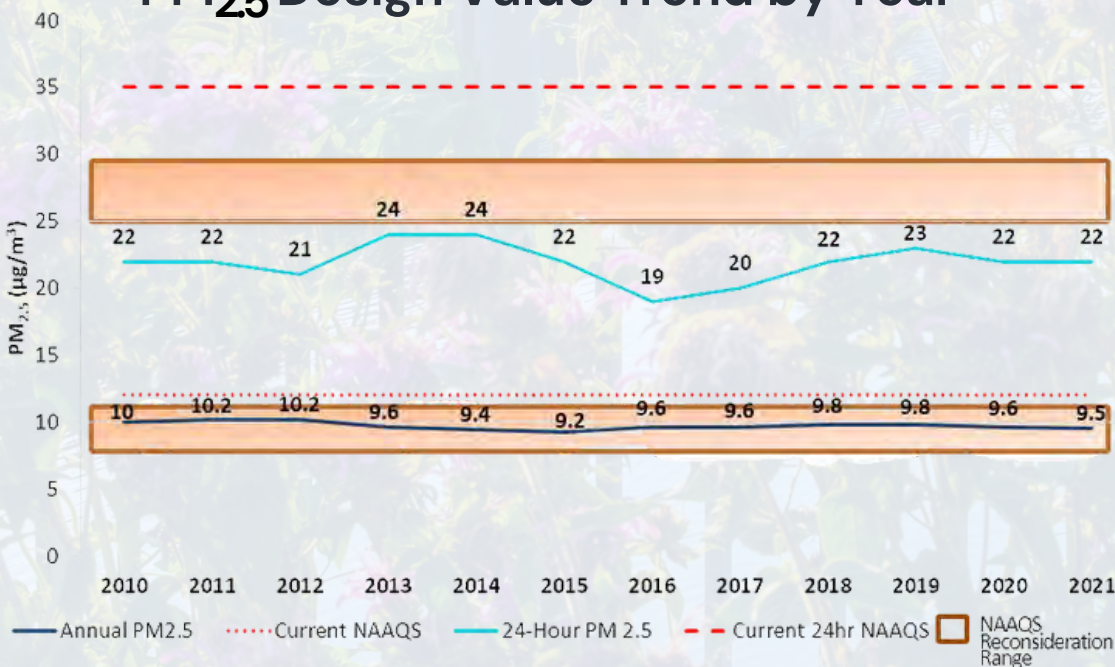
8-Hour Ozone Value Trend

The ozone design value (a statistic calculated by averaging the fourth highest ozone reading each year over three years) decreased 2 ppb from 2020 to 2021. This likely was not due to large improvements in air quality from 2020 to 2021 but rather 2018 being removed from the 3-year average.



In addition, both the 2020 and 2021 design values are likely about 1-2 ppb lower than what they would have been if CAMS 3 had been in operation in 2020. Since it was not, the region's only valid design value for the 2018-2020 and 2019-2021 periods is from CAMS 38.

PM_{2.5} Design Value Trend by Year



The 2021 design value for 24-hour fine particulate matter was 22 µg/m³, which was well below the current standard. However, as the top orange box shows, the EPA is currently reconsidering this standard and the region could be much closer to exceeding the standard in the future.

The 2021 design value for annual fine particulate matter was 9.5 µg/m³, which is below the 12 µg/m³ standard. However, the region's current DV is within the NAAQS reconsideration range. This means there is a possibility the region could be out of compliance in the future.

Air Quality Index Trends

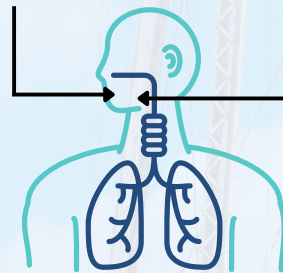
The Air Quality Index (AQI) is a color-coded guide to air quality. It helps us understand how polluted air is, along with associated health effects that may be of concern, check out the guide below:

<p>Code: Green</p> <p>Good</p> <p>Air quality is considered satisfactory, and air pollution poses little or no risk</p>	<p>Code: Yellow</p> <p>Moderate</p> <p>Air quality is acceptable; however, for some who are unusually sensitive to air pollution there may be a some health concerns</p>	<p>Code: Orange</p> <p>Unhealthy for Some</p> <p>Kids, teens, older adults, and anyone with lung or heart disease are at risk and should reduce prolonged or heavy exertion outdoors</p>	<p>Code: Red</p> <p>Unhealthy</p> <p>Everyone may begin to experience health effects, all should reduce prolonged or heavy exertion outdoors</p>	<p>Code: Purple</p> <p>Very Unhealthy</p> <p>Health warnings of emergency conditions. The entire population is likely to be affected</p>	<p>Code: Maroon</p> <p>Hazardous</p> <p>Health alert: all may experience serious health effects</p>
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AIR POLLUTION HEALTH EFFECTS

Ground-level Ozone can cause:

- Difficulty breathing deeply
- Shortness of Breath
- Chest Pain
- Wheezing
- Coughing
- Sore Throat
- Fatigue

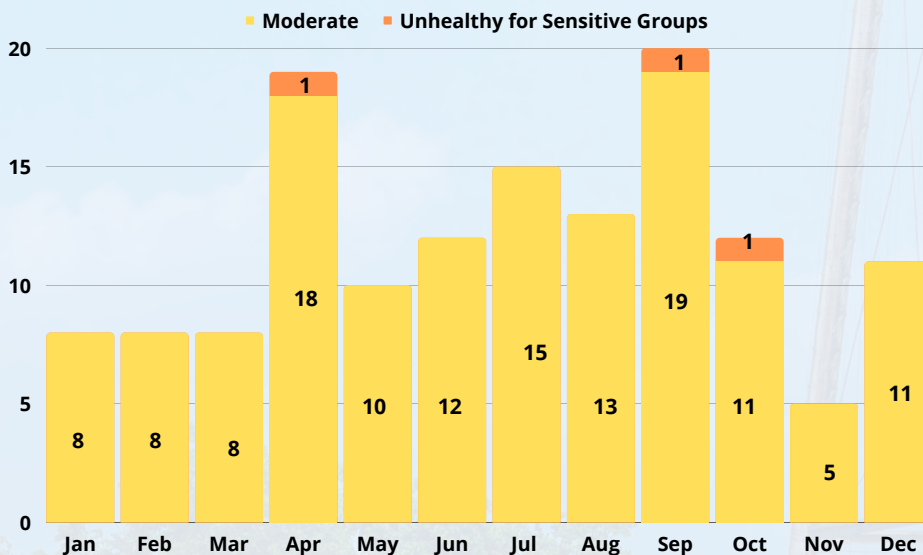


Fine Particle Matter can cause:

- Eye, Nose, Throat, and Lung Irritation
- Shortness of Breath
- Wheezing
- Coughing
- Chest Pain
- Fatigue

High levels of ozone were responsible for all of the days when the region experienced air pollution levels considered “unhealthy for some” and 35% of moderate days. However, high levels of fine PM were responsible for a majority of days (65%) when air pollution levels were considered “moderate.”

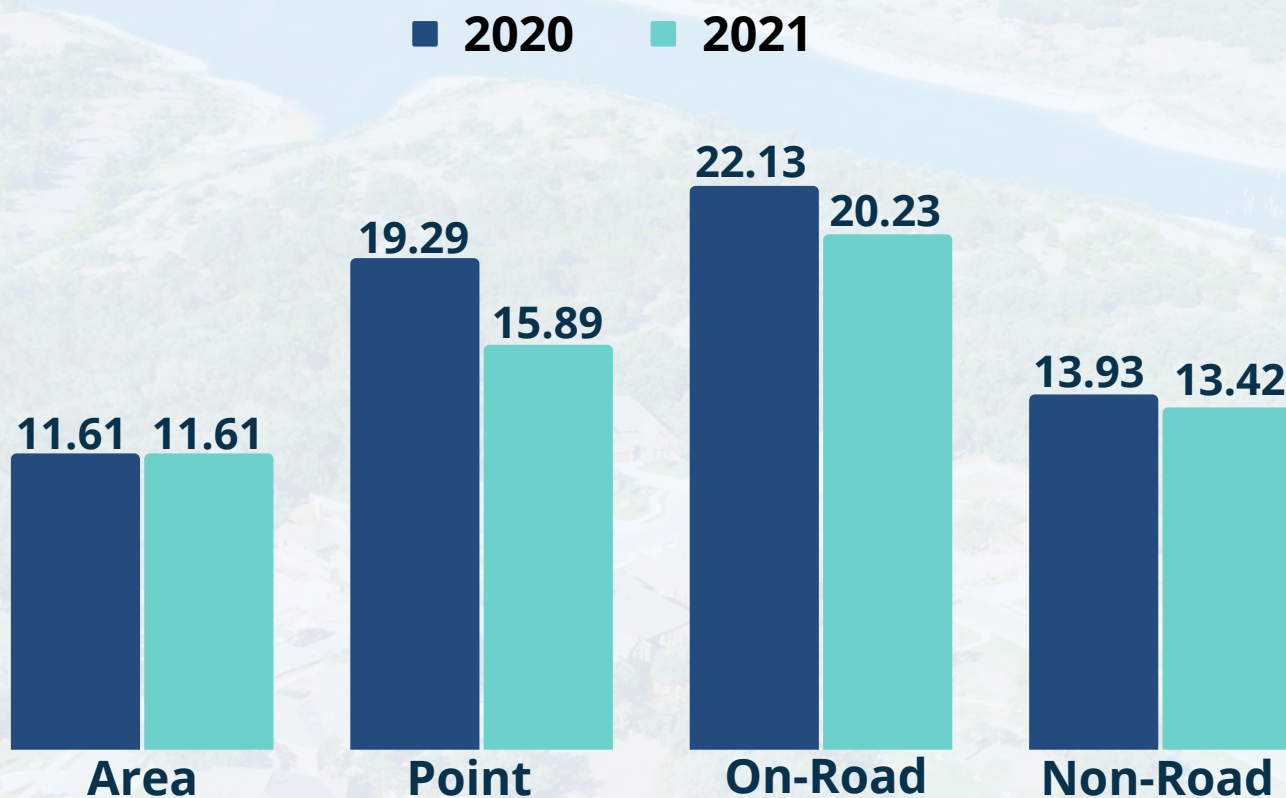
2021 AQI Days by Month



Air pollution levels vary significantly by month. April, September and October had those 3 “unhealthy for some days.” Moreover, September, April, and July had the highest count of moderate days. This likely had to do with the weather conditions during those months.

Emission Sources & Reductions

The largest contributor to ground-level ozone in the region is nitrogen oxides (NOx). NOx reacts with volatile organic compounds in the presence of sunlight to form ozone, which is associated with human health and ecological effects. In this section, we report on NOx emission for the region.



The graph above shows the estimated daily sources of NOx emissions in the region by source type.

- **Area sources** - small-scale industrial, commercial, and residential sources that generate emissions like laundry mats, restaurants, and lawn equipment.
- **Point sources** - large facilities like fossil fuel-fired power plants, industrial boilers, petroleum refineries, and manufacturing sites.
- **On-road sources** - automobiles, trucks, motorcycles, and other motor vehicles traveling on public roadways.
- **Non-road sources** - vehicles that do not typically operate on roads or highways like construction equipment, agricultural equipment, and aircraft and airport equipment.

The decrease in the point source category can be attributed to the retirement of equipment at Austin Energy's Decker Creek Plant.

The decreases in the on-road and non-road categories are due to yearly improvements in vehicle efficiencies and the retirement of older vehicles.

CAC Reporting

CAC reporting is done through a survey in which all members input the ozone and final particulate matter reduction measures that were implemented in 2021 by that organization. There were a total of 27 organizations that submitted reports.

Emission Reductions

Tier 1 measures are low-cost and easy to implement such as encouraging sustainable transportation options, conserving energy, or promoting air quality awareness.

Tier 2 measures are a higher cost investment and strategies, such as purchasing higher grade gasoline (premium), using 'green' contracting policies, or purchasing low NOx vehicles and equipment.

Tier 1

- Bastrop County
- Travis County
- Williamson County
- City of Austin
- City of Bastrop
- City of Bee Cave
- City of Buda
- City of Cedar Park
- City of Kyle
- City of Lago Vista
- City of Lockhart
- City of Pflugerville
- City of San Marcos
- City of San Marcos
- CAPCOG
- LCRA
- TCEQ
- TPWD
- TxDOT
- CLEAN Air Force
- Huston-Tillotson University
- Lone Star Clean Fuels Alliance
- Movability
- St. Edward's University

Tier 2

- Bastrop County
- Caldwell County
- Travis County
- City of Austin
- City of Bastrop
- City of Cedar Park
- City of Kyle
- City of Lockhart
- City of Pflugerville
- City of Round Rock
- City of San Marcos
- CAPCOG
- TPWD
- Texas Lehigh Cement Co.
- CLEAN Air Force
- Huston-Tillotson University
- Movability
- St. Edward's University

Fine particulate measures are broken out into three categories and members are able to report actions within all three categories. Examples of actions include reducing burning, monitoring mines and quarries, and promoting greater awareness.

Encourage or Require 3rd Party Organization's to Implement

- Bastrop County
- Caldwell County
- Travis County
- Williamson County
- City of Austin
- City of Bastrop
- City of Buda
- City of Cedar Park
- City of Kyle
- City of Pflugerville
- City of San Marco
- CAPCOG
- LCRA
- TPWD
- Huston-Tillotson University
- St. Edward's University

Educate and Encourage the Public at Large to Implement

- Bastrop County
- Williamson County
- City of Austin
- City of Buda
- City of Cedar Park
- City of Kyle
- City of San Marco
- Lone Star Clean Fuels Alliance
- St. Edward's University

Implement within Own Organization's Operations

- Bastrop County
- Travis County
- Williamson County
- City of Austin
- City of Bastrop
- City of Buda
- City of Kyle
- City of Lago Vista
- City of San Marco
- CAPCOG
- TCEQ
- Texas Lehigh Cement Co.
- CLEAN Air Force
- Movability
- St. Edward's University

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This report was prepared by the Capital Area Council of Governments (CAPCOG). Formed in 1970, CAPCOG serves as an advocate, planner, and coordinator on important regional issues in the 10-county encompassing Austin MSA.

CAPCOG and its members' mission is to continue to strengthen the Capital of Texas' 10-county region by supporting urban and rural local governments through coordination, collaboration, and sharing of ideas and resources.



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