2020 Air Quality Report for the Austin-Round Rock-Georgetown Metropolitan Statistical Area

Prepared by the Capital Area Council of Governments

July 31, 2021

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EXECUTIVE SUMMARY

This is the annual air quality report for the Austin-Round Rock-Georgetown Metropolitan Statistical Area (MSA) prepared by the Capital Area Council of Governments (CAPCOG) for the members of the Central Texas Clean Air Coalition (CAC), the Texas Commission on Environmental Quality (TCEQ), and the U.S. Environmental Protection Agency (EPA). This report serves as the region's annual "check-in" with EPA as part of the CAC's participation in the Ozone (O_3) Advance Program (OAP). The report covers January 1, 2020, through December 31, 2020. Under the most recent MSA definitions promulgated by the Office of Management and Budget (OMB) in March 2020, the Austin-Round Rock-Georgetown MSA consists of Bastrop, Caldwell, Hays, Travis, and Williamson Counties, which are the same five counties that have been participating in regional air quality planning efforts since 2002.

The report is intended to do the following:

- Provide an update to EPA, TCEQ, and local stakeholders on the status of air quality in the Austin-Round Rock-Georgetown MSA through the end of 2020 (Section 1);
- Provide an update on the latest understanding of the contribution of the region's emissions to high O_3 levels when they occur (Section 2);
- Summarize the status of emission reduction measures implemented in the region in 2020 (Section 3);
- Detail ongoing planning activities in the region (Section 4); and
- Identify new issues affecting air quality planning efforts in 2020 and beyond (Section 5).

Some of the highlights of the report are listed below:

- The region's 2020 air pollution levels continued to meet all federal air quality standards, although the region's primary O_3 monitor was offline for the majority of the year;
- There were a total of 3 days when monitored air pollution levels were considered "unhealthy for sensitive groups," 1 day when monitored air pollution levels were considered "unhealthy," and another 127 days when air pollution levels were considered "moderate," according to EPA's Air Quality Index (AQI);
- $PM_{2.5}$ levels measured within the region were high enough on one day to be considered "unhealthy" and another day when levels were high enough to be "unhealthy for sensitive groups;"
- Overall emissions of nitrogen oxides (NO_X) continued to trend downward, and emissions from regional power plants were slightly lower during the 2020 O_3 season than they were in 2019;
- Emission reduction measures implemented by the state and local partners in 2020 continued to help control regional O_3 levels; and
- The CAC approved the participation in EPA's Advance Program for particulate matter (PM) and update to the Regional Air Quality Plan to include PM.

This report includes information from twenty-three different CAC member organizations. However, nineteen CAC member organizations did not provide reports this year. CAPCOG will provide an addendum to this report to CAC members, TCEQ, and EPA, if these organizations provide reports or CAPCOG receives any updates from any other organization after this report has been submitted.

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LIST OF ACRONYMS

- AFFP: Alternative Fueling Facilities Program
- AQI: Air Quality Index
- CAC: Clean Air Coalition
- CACAC: Clean Air Coalition Advisory Committee
- CAMPO: Capital Area Metropolitan Planning Organization
- CAPCOG: Capital Area Council of Governments
- CapMetro: Capital Metropolitan Transit Authority
- CAMS: Continuous Air Monitoring Station
- CAPP: Clean Air Partners Program
- CO: Carbon Monoxide
- CTRMA: Central Texas Regional Mobility Authority
- CTT: Clean Transportation Triangle
- DACM: Drive a Clean Machine
- DERI: Diesel Emission Reduction Incentive
- DTIP: Drayage Truck Incentive Program
- EAC: Early Action Compact
- EE/RE: Energy efficiency and renewable energy
- EPA: U.S. Environmental Protection Agency
- ERIG: Emission Reduction Incentive Grant Program
- FEM: Federal Equivalent Method
- FRM: Federal Reference Method
- I/M: Inspection and maintenance
- ILA: Inter-Local Agreement
- kWh: Kilowatt-Hour
- LCRA: Lower Colorado River Authority
- LDPLIP: Light Duty Motor Vehicle Purchase or Lease Incentive Program
- LIRAP: Low-Income Vehicle Repair, Retrofit, and Accelerated Vehicle Retirement Program
- LSCFA: Lone Star Clean Fuels Alliance
- MDA8: Maximum Daily 8-Hour Average
- µg/m_3: Micrograms per cubic meter
- MOVES: Motor Vehicle Emissions Simulator
- MSA: Metropolitan Statistical Area
- NAAQS: National Ambient Air Quality Standards
- NO_X: Nitrogen oxides
- NO_2: Nitrogen dioxide
- NTIG: New Technology Implementation Grant
- O_3: Ozone
- OAD: Ozone Action Day
- OAP: Ozone Advance Program
- PACE: Property-Assessed Clean Energy
- Pb: Lead
- PM: Particulate matter
- $PM_{2.5}$: Particulate matter with a diameter of 2.5 microns or less
- PM_{10}: Particulate matter with a diameter of 10 microns or less
- ppb: Parts per billion
- ppm: Parts per million
- SIP: State Implementation Plan
- SO_2: Sulfur dioxide
- SPRYP: Seaport and Rail Yard Areas Grant
- TCAWG: Texas Clean Air Working Group
- TCEQ: Texas Commission on Environmental Quality
- TCFP: Texas Clean Fleet Program
- TCSB: Texas Clean School Bus Program
- TDM: Travel Demand Management
- TERP: Texas Emission Reduction Plan
- TexN: Texas NONROAD Model
- TNGVGP: Texas Natural Gas Vehicle Grant Program
- tpd: tons per day
- TWG: Texas Working Group for Mobile Source Emissions
- TxDOT: Texas Department of Transportation
- TxVEMP: Texas Volkswagen Environmental Mitigation Program
- VOC: Volatile Organic Compound

1 AIR QUALITY STATUS

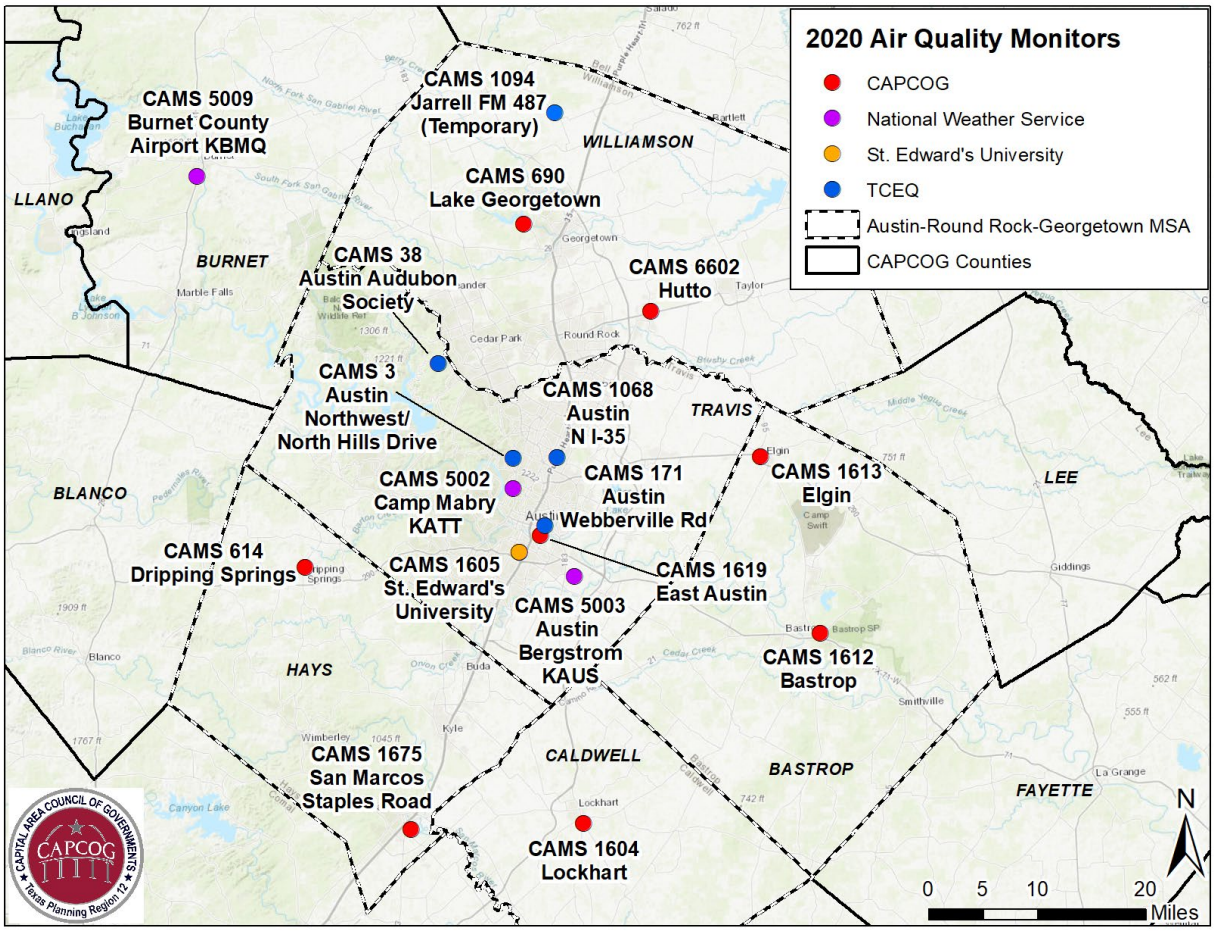
The following bullet points summarize the status of the Austin-Round Rock-Georgetown MSA's air quality status as of the end of 2020:

- Air pollution levels throughout the metro area remained in compliance with all National Ambient Air Quality Standards (NAAQS), although the region's 2018-2020 O_3 levels were just 7% below the 2015 O_3 NAAQS.
- Through the end of 2020, City of Austin is the 2nd-largest in the U.S. with air pollution levels in compliance with all NAAQS, and it is the largest city in the U.S. designated "attainment/unclassifiable" for all NAAQS (San Jose, which is the next-largest city, also attains all NAAQS, but Santa Clara County where it is located, is part of the San Francisco Bay O_3 nonattainment area).
- All five of the counties in the Austin-Round Rock-Georgetown MSA remain designated as "attainment/unclassifiable" for the 2015 O_3 NAAQS and all other NAAQS.
- The region recorded two days when O_3 levels were considered "unhealthy for sensitive groups," as well as an additional 127 days when either O_3 or $PM_{2.5}$ levels were considered "moderate," based on EPA's AQI.
- The region's cumulative seasonal O_3 levels were below the levels that EPA considers harmful to vegetation.
- TCEQ's review of air toxics data collected at CAMS 171 since 2017 found that all air toxics levels measured were below the levels that would be expected to cause adverse health or environmental impacts.
- Zero out of two TCEQ Ozone Action Day (OAD) forecasts correctly predicted O_3 levels > 70 ppb.
- Overall, TCEQ's daily AQI forecasts correctly predicted "moderate" or worse air quality 63% of the time, but TCEQ was able to predict 74% of all days when the AQI levels were "moderate" or worse within the region.
- There were a total of 153 odor complaints reported to the TCEQ from within the Austin-Round Rock-Georgetown MSA in 2020.

While the region was able to remain in compliance with the NAAQS through the end of 2020, there were a total of two days when air pollution levels within the region was considered "unhealthy for sensitive groups" for ground-level O_3.

The following map shows the locations of all of the Continuous Air Monitoring Stations (CAMS) that collect air pollution and meteorological data around the Austin-Round Rock-Georgetown MSA, including the monitors operated by TCEQ, CAPCOG, St. Edward's University, and the National Weather Service.

Figure 1-1. 2020 Air Quality Monitors in the Austin-Round Rock-Georgetown MSA and CAPCOG Counties Cited in the Report



1.1 Compliance with the NAAQS

The Austin-Round Rock-Georgetown MSA's 2020 design values for carbon monoxide (CO), nitrogen dioxide (NO_2), O_3, particulate matter with diameters of 2.5 micrometers or less ($PM_{2.5}$), particulate matter with diameters of 10 micrometers or less (PM_{10}), and sulfur dioxide (SO_2) were all in compliance with the applicable NAAQS. Lead (Pb) is not monitored within the region. Table 1-1 shows all of the NAAQS currently in effect.

Table 1-1. NAAQS Currently in Effect

Pollutant	Standard Type	Averaging Time	Level	Form	Impacts of Violating the NAAQS
CO	Primary	8 hours	9 parts per million (ppm)	Not to be exceeded more than once per year	Neurological and cardiovascular impacts, particularly for individuals who are exercising or under stress
	Primary	1 hour	35 ppm	Not to be exceeded more than once per year	
Pb	Primary and Secondary	Rolling 3-month average	0.15 micrograms per cubic meter ($\mu g/m^3$)	Not to be exceeded	Primarily neurological problems for children and cardiovascular problems for adults, but numerous other health impacts as well; ecological damage from deposition
NO_2	Primary	1 hour	100 parts per billion (ppb)	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years	Respiratory impacts to people with lung disease such as asthma, children and teens, older adults, and people who are active outdoors; contributes to acid rain, visibility impairment, and nutrient pollution in coastal waters
	Primary and Secondary	1 year	53 ppb	Annual mean	
O_3	Primary and Secondary	8 hours	0.070	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years	Respiratory impacts to people with lung disease such as asthma, children and teens, older adults, and people who are active outdoors; impacts on plant growth
$PM_{2.5}$	Primary	1 year	12.0 $\mu g/m^3$	Annual mean, averaged over 3 years	Respiratory and cardiovascular impacts on people with lung or heart disease (respectively), older adults, children, and teenagers; visibility impairment
	Secondary	1 year	15.0 $\mu g/m^3$	Annual mean, averaged over 3 years	
PM_{10}	Primary and Secondary	24 hours	150 $\mu g/m^3$	Not to be exceeded more than once per year on average over 3 years	
SO_2	Primary	1 hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years	Respiratory impacts to people with lung disease such as asthma, children and teens, older adults, and people who are active outdoors; impacts plant growth and contributes to acid rain
	Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year	

There are four "regulatory" monitoring stations in the Austin-Round Rock-Georgetown MSA, all located in Travis County, that reported data to EPA and were used for comparisons to the NAAQS. Table 1-2 summarizes the Federal Reference Method (FRM)/Federal Equivalent Method (FEM) monitors in the region and the years for which data are available from 2018-2020. CAMS 1068 is the region's designated "near-road" monitor.

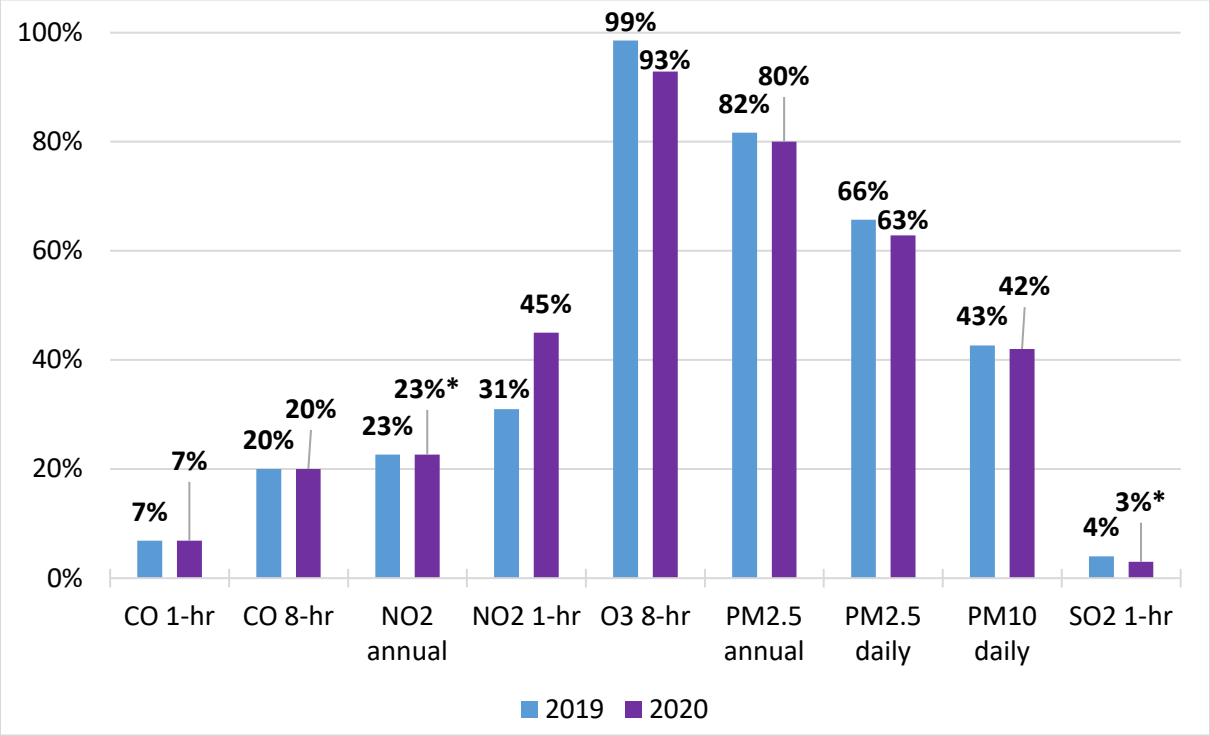
Table 1-2. Summary of Criteria Pollutant Measurement Periods at Federal Reference Method (FRM) Monitors in the Austin-Round Rock-Georgetown MSA, 1/1/2018 – 12/31/2020

Pollutant	Sampler Type	CAMS 3 (AQS Site Number 484530014)	CAMS 38 (AQS Site Number 484530020)	CAMS 171 (AQS Site Number 484530021)	CAMS 1068 (AQS Site Number 484531068)
CO	Continuous, regulatory	n/a	n/a	n/a	1/1/2018 – 12/31/2020
NO_2	Continuous, regulatory	1/1/2018 – 2/17/2020; 10/22/2020 – 12/31/2020	n/a	n/a	1/1/2018– 12/31/2020
O_3	Continuous, regulatory	1/1/2018 – 2/17/2020; 10/22/2020 – 12/31/2020	1/1/2018 – 12/31/2020	n/a	n/a
$PM_{2.5}$	Continuous, regulatory	1/1/2018 – 2/17/2020; 10/16/2020 – 12/31/2020	n/a	1/1/2018 – 12/31/2020	10/25/2018 – 12/31/2020
$PM_{2.5}$	Non-continuous, regulatory	n/a	n/a	1/1/2018 – 12/31/2020	1/7/2017 – 11/22/2018
PM_{10}	Non-continuous, regulatory	n/a	1/1/2017 – 12/31/2020	1/1/2017 – 12/31/2020	n/a
SO_2	Continuous, regulatory	1/1/2018 – 2/17/2020; 10/22/2020 – 12/31/2020	n/a	n/a	n/a

Figure 1-2 shows the metro area's 2019 and 2020 design values compared to each primary NAAQS. The 2020 design value for 8-hour O_3 was lower than 2019. However, this was due to the region's main O_3 monitor, CAMS 3, being offline for most of the year. See Section 1.2 for a detailed analysis of the 2020

O_3 design value. Additionally, the design values for $PM_{2.5}$ saw a decrease in 2020 compared to 2019, which also may be due to the issue with CAMS 3.[1]

Figure 1-2. Austin-Round Rock-Georgetown MSA Design Values as a Percentage of Primary NAAQS



The 2020 design value for NO_2 1-hour and SO_2 1-hour were listed "invalid design values for 2018-2020" on EPA's design value reports. This most likely is due to the lack of sufficient valid data samples during 2020. Therefore, these values are marked with an asterisk to note that they are invalid, but these values are still useful for the region to compare to the NAAQS.

As part of its 2019-2023 Regional Air Quality Plan, the CAC defined "near-nonattainment" as having a design value of at least 85% of any NAAQS. Based on this criteria, O_3 remains the only pollutant for which the MSA is classified as "near-nonattainment." Although, the annual $PM_{2.5}$ levels are close to that range.

1.1.1 Comparison of the MSA to Other Areas in the USA

One way to analyze air quality in the MSA is to compare region's design values to the design values for other counties in the USA. This allows the region to understand how local air quality levels compare to other areas. The region's design values for O_3 and $PM_{2.5}$ as they compare to the rest of the country are listed below.

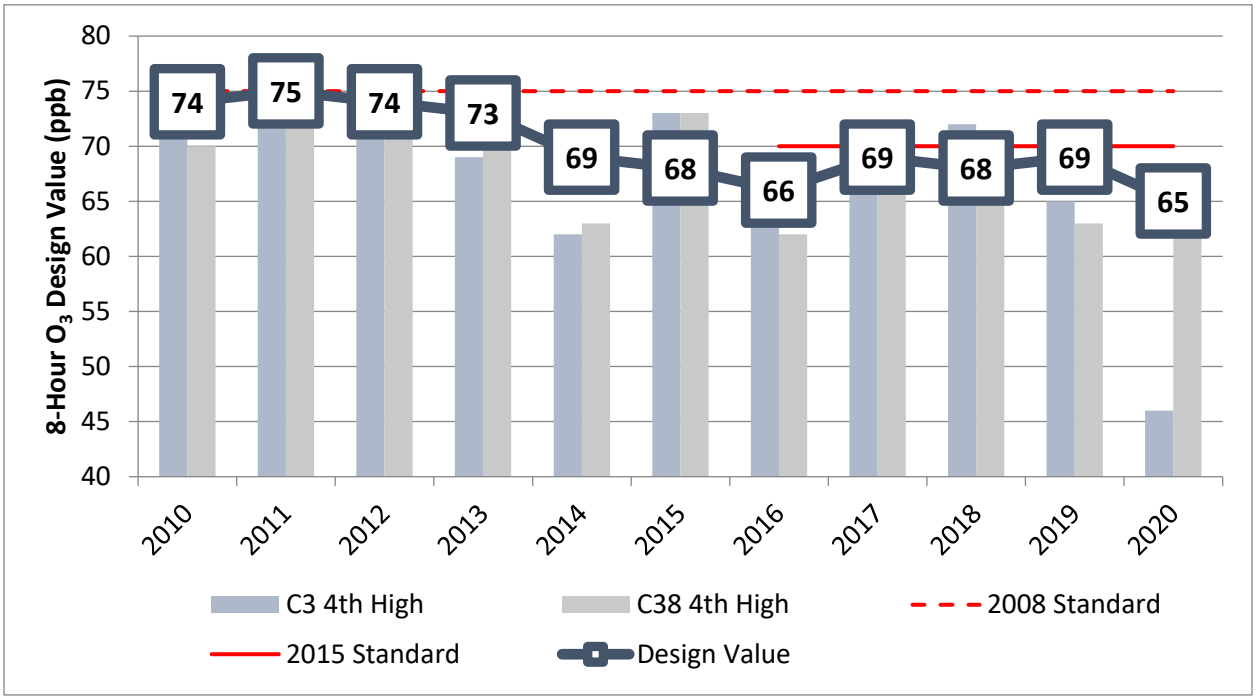
[1] Data for all pollutants other than PM_{10} obtained from EPA design value reports posted at: https://www.epa.gov/air-trends/air-quality-design-values. PM_{10} figure calculated as 4th-highest recorded 24-hour PM10 concentration over a 3-year period from data from TCEQ's website.

- The 2020 O_3 design value for the MSA is 55% higher than the rest of the country's 2020 O_3 design values.
- The 2020 annual $PM_{2.5}$ design value for the MSA is 86% higher than the rest of the country's 2020 annual $PM_{2.5}$ design values.
- The 2020 24-hour $PM_{2.5}$ design value for the MSA is 64% higher than the rest of the country's 2020 24-hour $PM_{2.5}$ design values.

1.2 O_3 Design Value Trend

Figure 1-3 below shows the trend in the Austin-Round Rock-Georgetown MSA's 8-hour O_3 design values from 2010-2020 compared to the 2008 and 2015 8-hour O_3 NAAQS, along with the 4th-highest Maximum Daily 8-Hour Average (MDA8) O_3 at each regulatory O_3 station. MDA8 is the daily maximum 8-hour concentration for a given calendar day that is the highest of the twenty-four possible 8-hour average concentrations computed for that day.

Figure 1-3. Austin-Round Rock-Georgetown MSA 8-Hour O_3 Design Value and 4th-Highest MDA O_3 Trend 2010-2020



The design value decreased 4 ppb from 2019 to 2020. This was not due to large improvements in air quality, rather it is due to the region's primary O_3 monitor, CAMS 3, being offline for the majority of the year. As displayed in Table 1-2 in the previous section, CAMS 3 was only operational for the first few months of 2020 and the last few months of 2020. Therefore, the 2020 design value for the MSA was calculated using CAMS 38 data which historically records lower concentrations than CAMS 3. Looking at CAMS 38 design value for 2017-2019, it was 66 ppb. Therefore, comparing the CAMS 38 2017-2019

design value of 66 ppb and the CAMS 38 2018-2020 design value of 65 ppb, it decreased by 1 ppb which is what would have been expected for the design value at CAMS 3 if it were operational for all of 2020.

1.2.1 CAMS 3 Re-Location and Effect on the O_3 Design Value

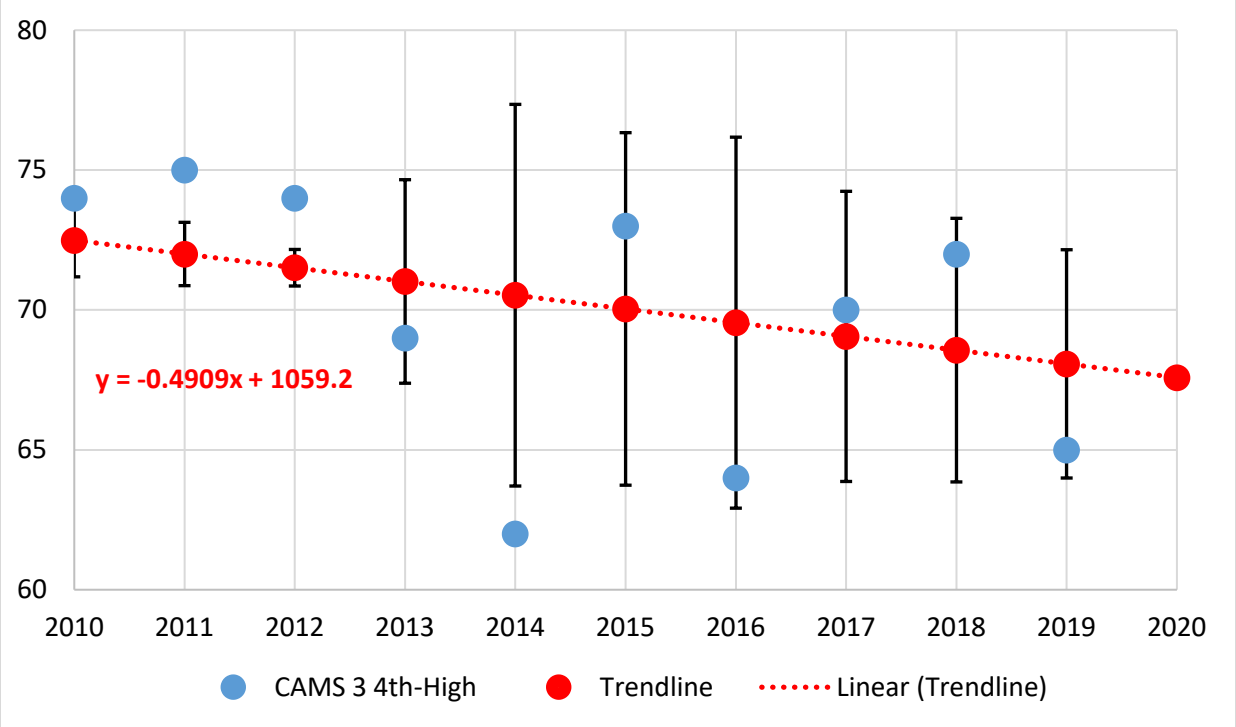
Due to construction at the area of the CAMS 3 monitoring site at Murchison Middle School, CAMS 3 was re-located to another location on the school property during 2020. CAMS 3 data collection was paused in February, and the data collection did not resume until October. Therefore, before CAMS 3 was re-located, it collected data from January 1, 2020 – February 17, 2020. After the re-location at the same property, CAMS 3 restarted data collection on October 16, 2020, for $PM_{2.5}$, and October 22, 2020, for the other pollutants. As a result of the CAMS 3 re-location, the primary O_3 monitor for the region was offline for 89% of the region's ozone season in 2020. Therefore, throughout this report, the data analysis results for CAMS 3 will be skewed lower than expected.

The image below shows the original location of CAMS 3, known as Austin Northwest, and the new location of CAMS 3, known as Austin North Hills Drive. The new location of CAMS 3 is 526 ft. to the west of the original location of CAMS 3.

Figure 1-3. CAMS 3 Old and New Location

Figure 1-4 below shows the 4th highest MDA8 O_3 values at CAMS 3 from 2010-2019, and it compares these values to the trendline and the 95% confidence range[2]. Using the trendline equation in Figure 1-4, the fourth highest MDA8 value at CAMS 3 would have been expected to be 67 ppb for 2020, if CAMS 3 had been collecting data for all of 2020. Therefore, the design value for 2018-2020 for CAMS 3 would have been expected to be 68 ppb. The difference between the 2017-2019 actual design value for CAMS 3 of 69 ppb and the 2018-2020 theoretical design value of 68 ppb for CAMS 3 is 1 ppb, which is in line with the decrease seen with the CAMS 38 design value. While the regional design value was expected to improve in 2020, it would have been expected that estimated design value for 2018-2020 would have decreased by 1 ppb instead of the 4 ppb decrease that actually occurred due to the lack of CAMS 3 data for 2020. Due to the lack of 2020 data at CAMS 3, the region's 2019-2021 and 2020-2022 O3 design values are expected to be similarly lower than they might have otherwise been if CAMS 3 had been in service during the 2020 O_3 season.

Figure 1-4. CAMS 3 4th-Highest MDA8 O_3 Values, Trendline, and 95% Confidence Intervals, 2010-2020



[2] 95% confidence interval range is based on the standard deviation for the 3-year design value period associated with that year. So, the standard deviation applicable to the 2019 data reflected 2017-2019 data.

1.3 Maximum Daily 8-Hour O_3 Averages in the Region

While compliance with the O_3 NAAQS is based on readings recorded at "regulatory" Federal Reference Method (FRM) or Federal Equivalent Method (FEM) O_3 samplers, there are also a number of non-regulatory O_3 monitoring stations in the region that are used to understand regional O_3 levels.

In addition to the two regulatory O_3 monitors that TCEQ operates, CAPCOG collected O_3 data at eight monitoring stations and St. Edward's University collected data at one additional O_3 monitoring station between 2018 and 2020. These monitoring stations use EPA-approved O_3 sampling methods and data collected during this period followed a Quality Assurance Project Plan (QAPP) approved by TCEQ. However, these monitors were not operated as FRM or FEM monitors, and they are not reported to EPA's Air Quality System (AQS).

Table 1-3 summarizes the fourth highest MDA8 O_3 measurements collected at each monitoring station in the CAPCOG region in 2018, 2019, and 2020, as well as the three-year average for each station. CAMS 3 and 38 are the "regulatory" monitoring stations operated by TCEQ, while CAMS 614, 690, 1604, 1612, 1613, 1619, 1675, and 6602 are research monitoring stations operated by CAPCOG. CAMS 1619 is a new site for CAPCOG in 2020. CAMS 1605 is owned and operated by St. Edward's University. Reports documenting the quality-checks performed at CAPCOG's sites can be found on CAPCOG's website at http://www.capcog.org/divisions/regional-services/aq-reports.

Table 1-3. Fourth Highest MDA8 Measurements at All O_3 Monitoring Stations in the CAPCOG Region, 2018-2020 (ppb)

CAMS	AQS Site Number	County	2018	2019	2020	2018-2020 Average	2018-2020 St. Dev.
3	484530014	Travis	72	65	46	61	13.5
38	484530020	Travis	70	63	63	65	4.0
614	482090614	Hays	69	64	66	66	2.5
690	484910690	Williamson	69	67	64	66	2.5
1604	480551604	Caldwell	66	61	59	62	3.6
1605	484531605	Travis	66	58	56	60	5.3
1612	480211612	Bastrop	n/a	59	59	59	0.0
1613	480211613	Bastrop	n/a	60	61	60	0.7
1619	484531619	Travis	n/a	n/a	63	63	n/a
1675	482091675	Hays	74	63	62	66	6.7
6602	484916602	Williamson	68	60	61	63	4.4

These data generally show that the 2018-2020 three-year average of the fourth-highest MDA8 values, in the region, ranged from 59 ppb – 66 ppb, with CAMS 614, CAMS 690, and CAMS 1675 recording the highest of that range. If CAMS 3 were not offline for the majority of 2020, CAMS 3 would have been expected to record the region's largest fourth-high MDA8 value, and thus, the highest three-year average.

1.4 Daily Pollution Levels Compared to EPA's AQI

While regulatory compliance is an important indicator of a region's air quality, it is possible for an area to experience numerous NAAQS exceedances multiple times in a given year and still have a compliant design value. A design value also does not directly indicate how frequently a region experienced high pollution levels. Another indicator that can be used to characterize a region's air quality is the number of days a region experiences air pollution levels that fall within each of the AQI categories established by EPA. Table 1-4 shows the concentrations of NO_2, O_3, and $PM_{2.5}$ that correspond to each AQI level.

Table 1-4. Summary of AQI for NO_2, O_3, $PM_{2.5}$, and PM_{10}

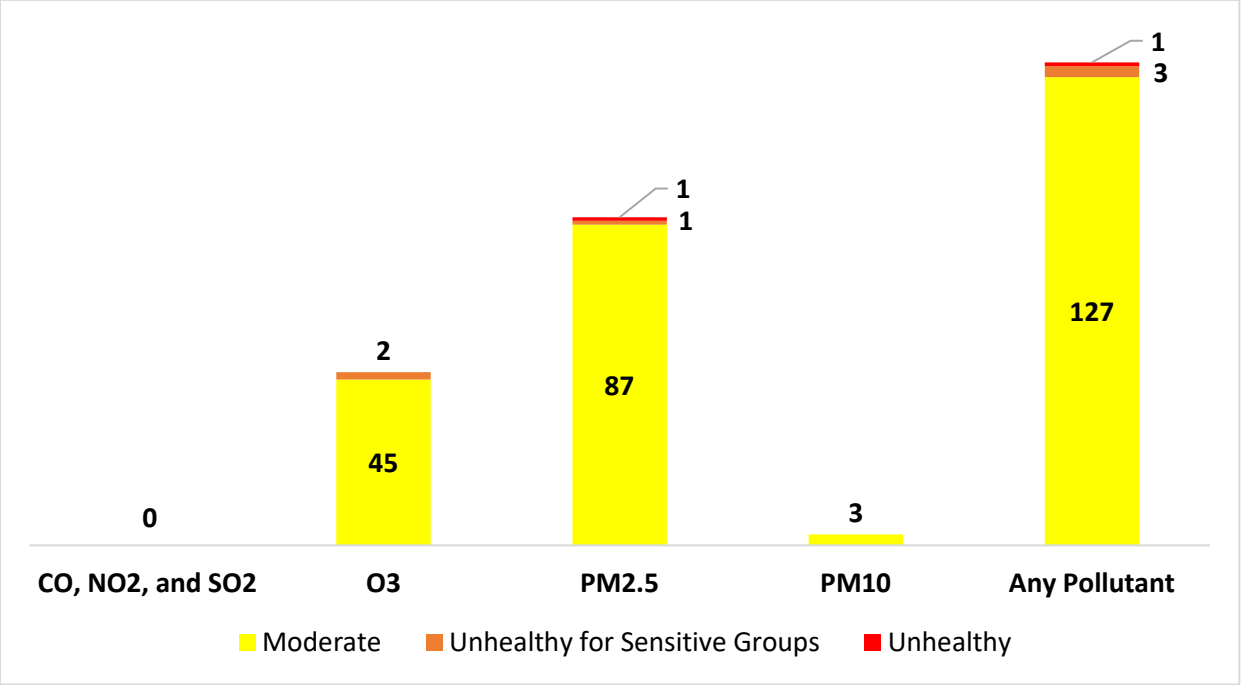
AQI Level	AQI Number	NO_2 (1-Hr., ppb)	O_3 (8-Hr., ppb)	$PM_{2.5}$ (24 hr., µg/m³)	PM_{10} (24 hr., µg/m³)
Good	0-50	0-53	0-54	0.0-12.0	0-54
Moderate	51-100	54-100	55-70	12.1-35.4	55-154
Unhealthy for Sensitive Groups	101-150	101-360	71-85	35.5-55.4	155-254
Unhealthy	151-200	361-649	86-105	55.5-150.4	255-354
Very Unhealthy	201-300	650-1249	106-200	150.5-250.4	355-424
Hazardous	301-500	1250-2049	201-600	250.5-500	425-604

This report includes data from all of the air pollution monitoring stations in the region, not just the TCEQ regulatory monitors. Therefore, the number of days in the "moderate" and "unhealthy for sensitive groups" categories described below are higher than if only the TCEQ regulatory monitors were used.

1.4.1 High AQI Days by Pollutant

The following figures show the number of days in 2020 when $PM_{2.5}$, PM_{10}, or O_3 concentrations measured in the CAPCOG region were high enough to be considered "moderate" or "unhealthy for sensitive groups." Monitored pollution levels for CO, NO_2, and SO_2 all remained in the "good" range throughout the year. In total, the region experienced moderate or worse air quality on 36% of days in 2020, with three of those days reaching "unhealthy for sensitive groups" levels and one day reaching "unhealthy" levels. It is important to note that PM_{10} sampling only occurs once every six days. While there were three recorded "moderate" PM_{10} days in 2020, there could have been more days that were "moderate" or "unhealthy for sensitive groups" that were not captured in the sampling window.

Figure 1-5. Number of "Moderate" or "Unhealthy for Sensitive Groups" Air Pollution Days in the MSA in 2020 by Pollutant



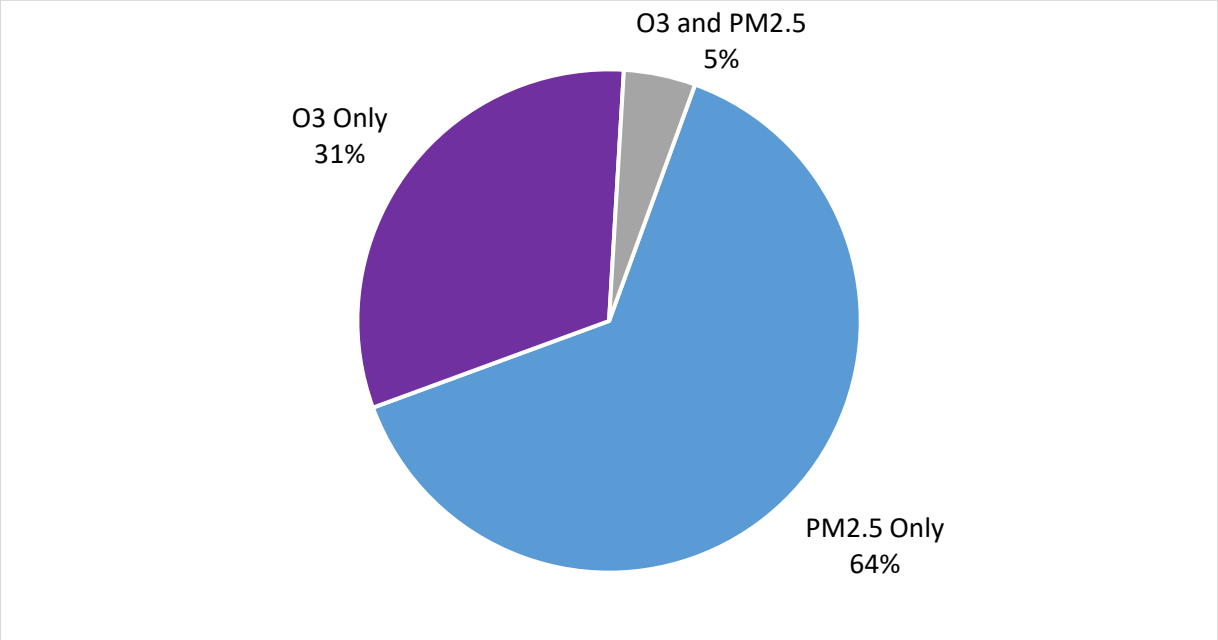
High levels of O_3 were responsible for the majority of the days when the region experienced air pollution levels considered "unhealthy for sensitive groups". However, high levels of $PM_{2.5}$ were responsible for a majority of the days when air pollution levels were considered "moderate." Additionally, the one "unhealthy" day was caused by elevated $PM_{2.5}$ due to the seasonal Saharan Dust event.[3] For the first time in a few years, "moderate" levels for PM_{10} were recorded. The elevated PM_{10} was associated with the Saharan Dust event for two of the days, while the other elevated PM_{10} day was caused by dust from the Texas Panhandle and Kansas that was carried on a cold front.[4]

Figure 1-6 shows the distribution of days when air pollution was considered at least "moderate" by pollutant.

[3] https://www.kvue.com/article/weather/saharan-dust-texas-austin-dust-storm-2020-cloud/269-1f2d3107-79dc-4971-983a-3cabce20925b

[4] https://www.statesman.com/story/news/local/2020/10/12/dust-creates-haze-over-central-texas-cooler-days-ahead-forecasters-say/42747039/

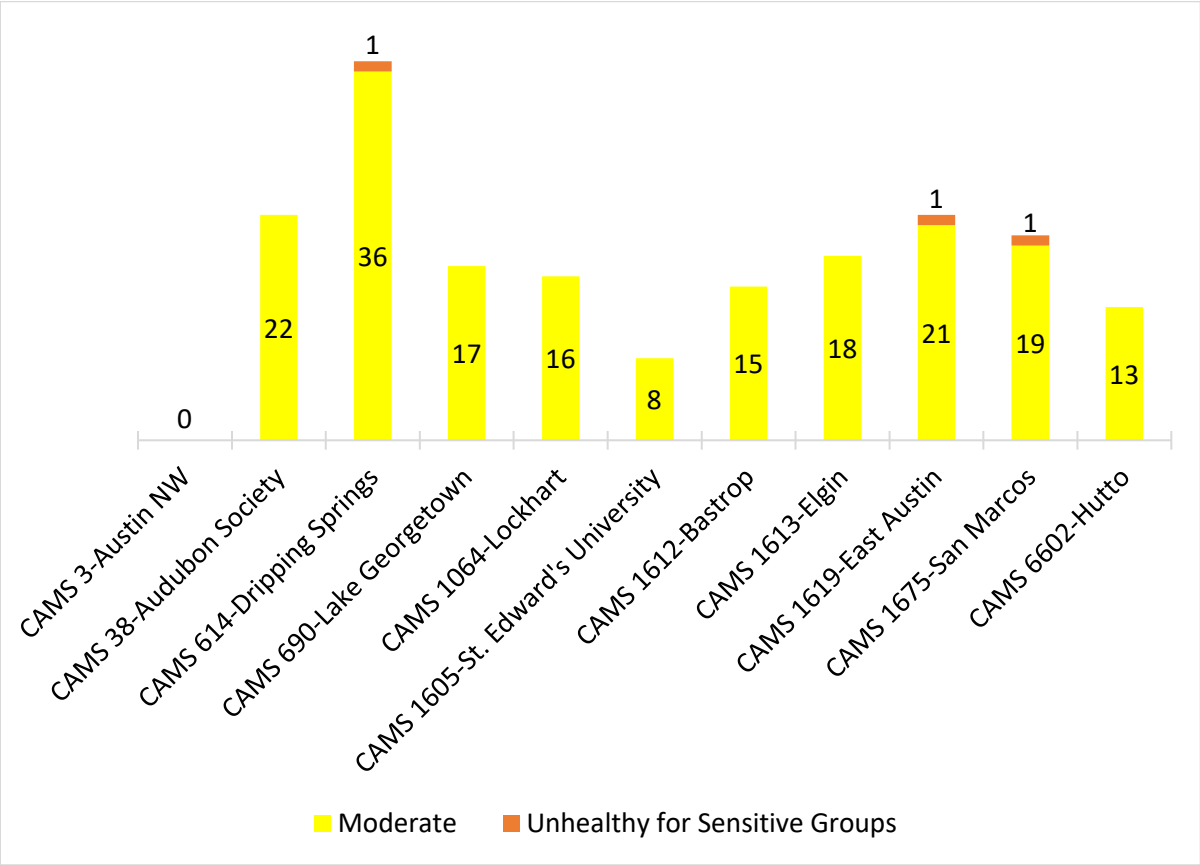
Figure 1-6. Days in 2020 When AQI Levels in the MSA Were "Moderate" or Worse



1.4.2 High O_3 AQI Days by Monitoring Station

The following figure shows the number of days when O_3 levels were considered “moderate” or “unhealthy for sensitive groups” at each O_3 monitoring station in the region in 2020. CAMS 614, CAMS 1619, and CAMS 1675 recorded ozone levels that were “unhealthy for sensitive groups” on two days in 2020. Since CAMS 3 was not active for the majority of the O_3 season, it did not record any high AQI days. The CAMS 3 data is not representative of the actual O_3 levels that have been observed at CAMS 3 in 2018 and 2019.

Figure 1-7. Number of Days when MDA8 O_3 Pollution was "Moderate" or Worse by Monitoring Station, 2020

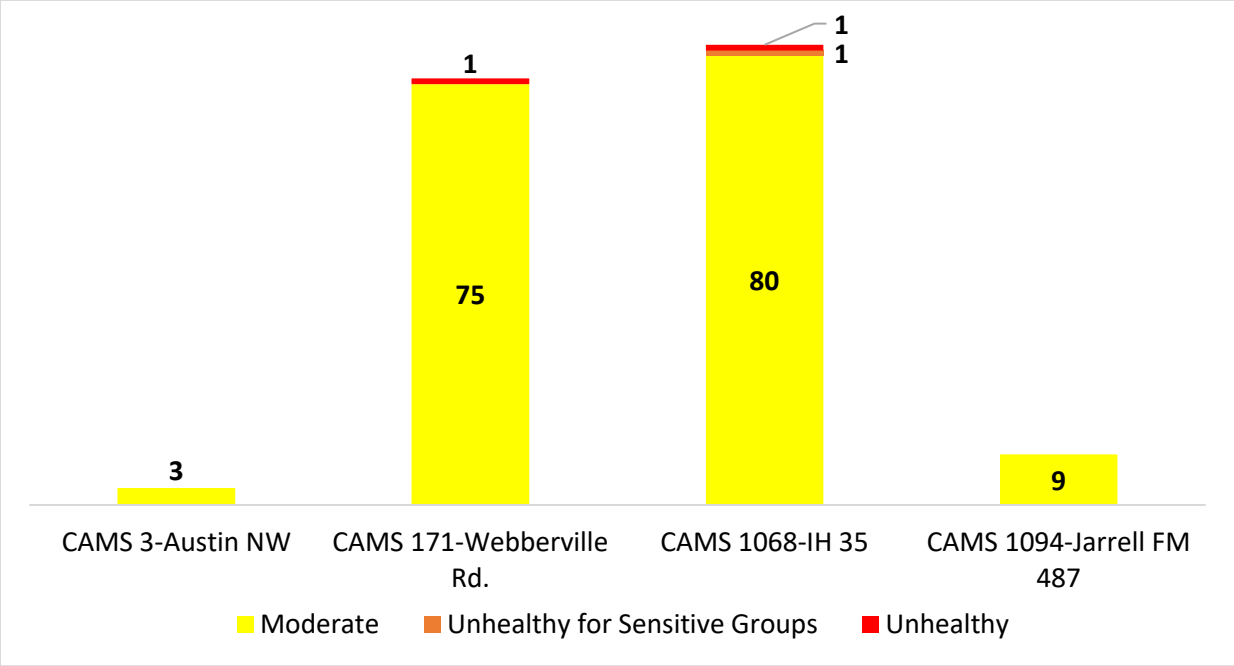


1.4.3 High PM AQI Days by Monitoring Station

1.4.3.1 $PM_{2.5}$ AQI Days

Figure 1-8 shows the number of days when $PM_{2.5}$ levels were considered “moderate”, “unhealthy for sensitive groups”, and “unhealthy” at each $PM_{2.5}$ monitoring station in the region in 2020. These data are based on daily average $PM_{2.5}$ levels collected from four continuous samplers. CAMS 3, CAMS 171, and CAMS 1068, are all located within the City of Austin, and CAMS 1094 is a temporary monitor that is located in the City of Jarrell in Williamson County. CAMS 1094 started data collection on July 23, 2020. According to the TCEQ from August 2020, “The continuous $PM_{2.5}$ monitor in Jarrell was deployed because the TCEQ is working on a complaint investigation. This is a temporary monitor that will be deployed for approximately 90 days. This monitor is a state-initiative monitor and is not part of TCEQ’s federal network of monitors.” However, CAMS 1094 collected data for the rest of the year, from July 23, 2020 – December 31, 2020, and it still is collecting data as of July 2021. As previously mentioned, CAMS 3 was inactive for the majority of the year, so the data at CAMS 3 is not representative of actual concentrations in 2020.

Figure 1-8. Number of Days when $PM_{2.5}$ Pollution was "Moderate" or Worse by Monitoring Station, 2020

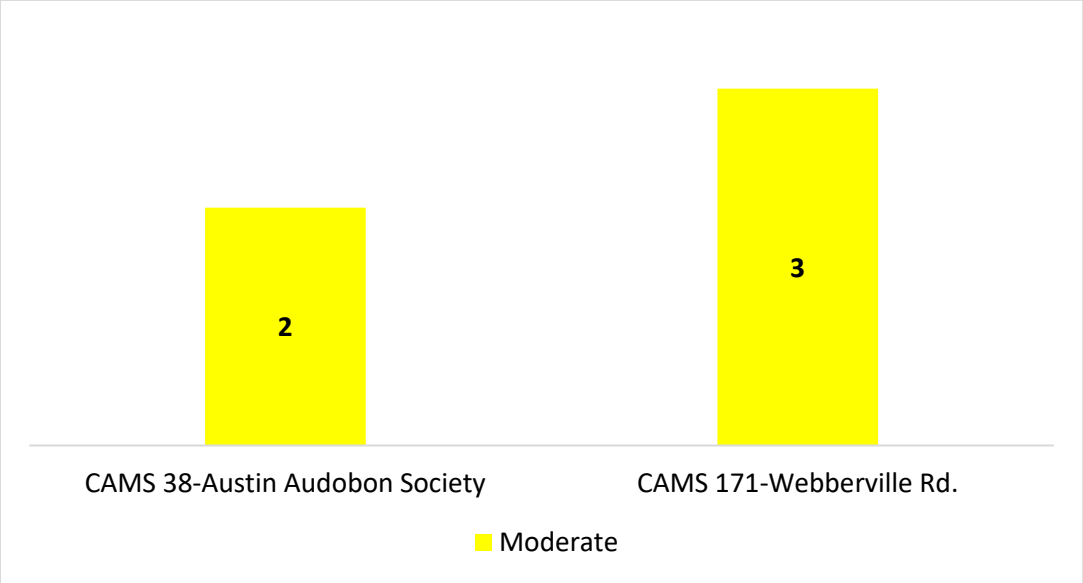


CAMS 1068 recorded the highest number of "moderate" days for $PM_{2.5}$ pollution. Additionally, CAMS 171 recorded a similar number of "moderate" days for $PM_{2.5}$ pollution. The Saharan Dust event in late June and early July, caused $PM_{2.5}$ levels at CAMS 171 and CAMS 1068 to be elevated. Both monitors recorded "unhealthy" levels on June 27, 2020. Additionally, CAMS 1068 recorded an "unhealthy for sensitive groups" day on July 2, 2020, with $PM_{2.5}$ concentrations at CAMS 171 almost reaching that level as well.

1.4.3.2 PM_{10} AQI Days

For the first time in years, the PM_{10} monitors recorded three days that were "moderate." The elevated PM_{10} was associated with the Saharan Dust event for two of the days - June 26, 2020 and July 2, 2020. While the other elevated PM_{10} day was caused by dust from the Texas Panhandle and Kansas that was carried on a cold front on October 12, 2020. It is important to note that PM_{10}, sampling only occurs once every six days. While there were three recorded "moderate" PM_{10} days in 2020, there could have been more days that were "moderate" or "unhealthy for sensitive groups" that were not captured in the sampling window. The figure below displays the number of "moderate" days by monitor for PM_{10}.

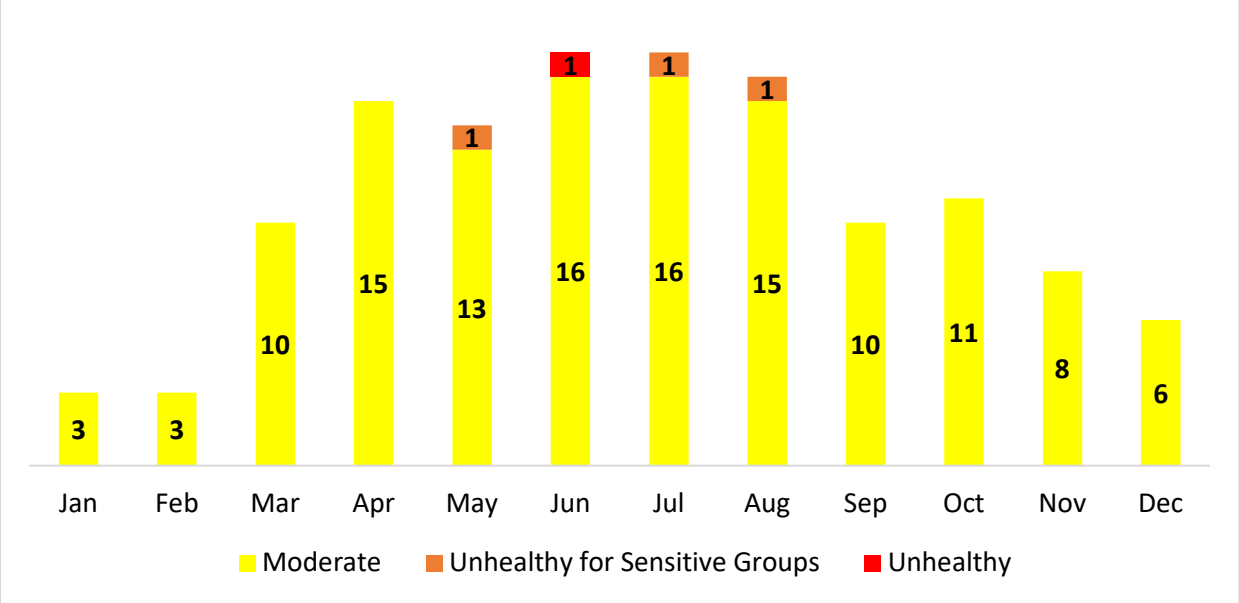
Figure 1-9. Number of Days when PM10 Pollution was "Moderate" by Monitoring Station, 2020



1.4.4 Distribution of "Moderate" or Worse AQI Days by Month

Air pollution levels vary significantly by month in the MSA. Figure 1-1010 shows the number of days when air pollution levels were "moderate", "unhealthy for sensitive groups", or "unhealthy" within the MSA by month.

Figure 1-10. Number of Days when Air Pollution was "Moderate" or Worse in the Austin-Round Rock-Georgetown MSA by Month, 2020



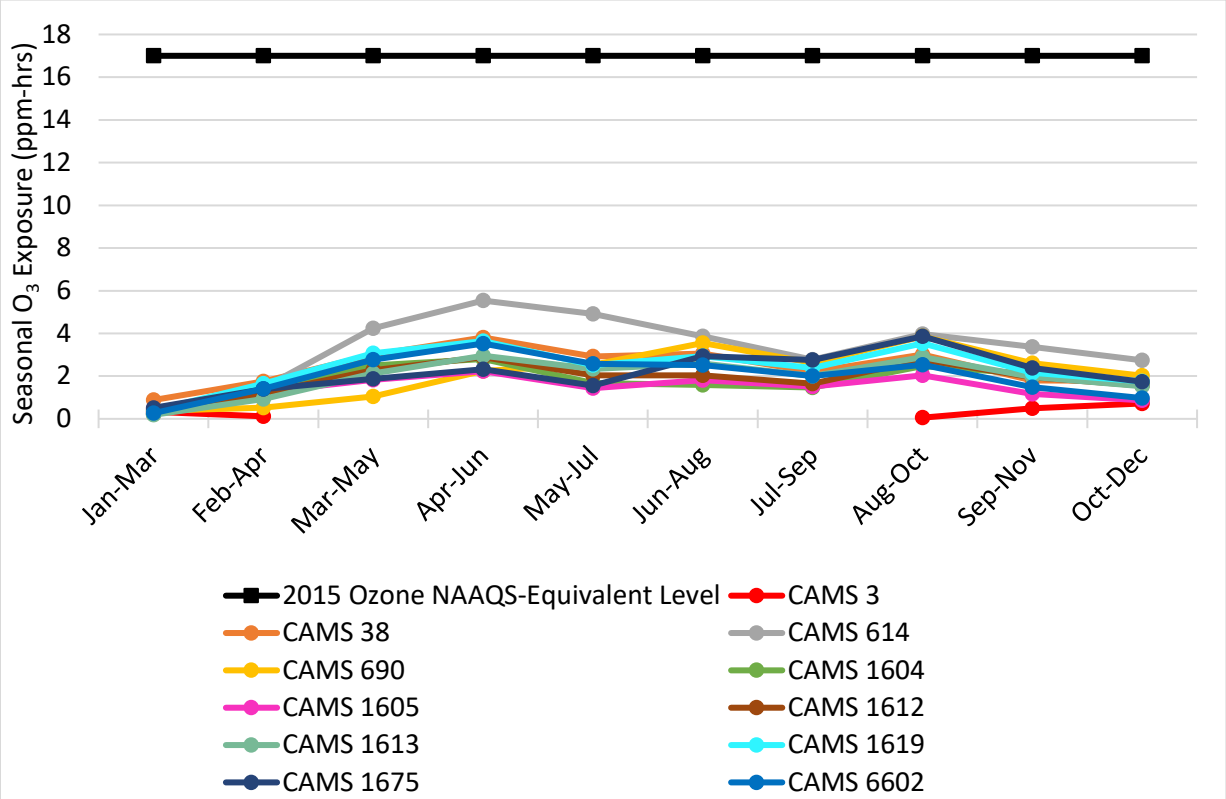
O_3 caused the "unhealthy for sensitive groups" days in May and August. Whereas, $PM_{2.5}$ caused the "unhealthy" day in June and the "unhealthy for sensitive groups" day in July.

1.4.5 Seasonal O_3 Exposure

While EPA set the 2015 secondary O_3 standard identical to the 2015 primary O_3 standard, the preamble to the rulemaking states that, "the requisite protection will be provided by a standard that generally limits cumulative seasonal exposure to 17 ppm-hours (ppm-hrs.) or lower, in terms of a 3-year W126 index."[5] EPA did not set a separate secondary standard set to protect public welfare, as opposed to public health, because, "such control of cumulative seasonal exposure will be achieved with a standard set at a level of 0.070 ppm, and the same indicator, averaging time, and form as the current standard."[6]

The region's seasonal O_3 exposure levels were 33%-99% below the 17 ppm-hr. levels EPA referenced in the final 2015 O_3 NAAQS rulemaking. Figure 1-11 shows the 3-month seasonal exposure levels at each monitoring station. Since CAMS 3 was not operational from mid-February to mid-October, there is a gap in the chart to reflect that issue. Additionally, the February to April data set and the August to October data set for CAMS 3 is not representative of actual conditions.

Figure 1-11. Weighted Seasonal O_3 Exposure by Monitoring Station and 3-Month Period, 2020 (W126 ppm-hrs.)



[5] 80 FR 65294

[6] Ibid.

1.5 Air Quality Forecasting

One of the factors that influences the risks associated with air pollution is the extent to which air pollution can be accurately and successfully predicted. For the MSA, there are two types of forecasting tools that can be used to help reduce the exposure of sensitive populations to high air pollution levels – Ozone Action Days (OADs) and daily Air Quality Forecasts.

1.5.1 Ozone Action Days

TCEQ issues OADs the afternoon before the next day when TCEQ believes that O_3 levels may exceed the level of the NAAQS.

There are two ways that CAPCOG measures the performance of OAD forecasting for the region:

1. Accuracy in correctly predicting an OAD; and
2. Success in predicting when actual monitored O_3 levels were high enough to be considered "unhealthy for sensitive groups."

Using the AQI for O_3, CAPCOG calculates these metrics as follows:

$$OAD\ Accuracy\ Rate = \frac{Days\ OAD\ Declared\ When\ Actual\ MDA8 > 70\ ppb}{Days\ OAD\ Declared}$$

$$OAD\ Success\ Rate = \frac{Days\ OAD\ Declared\ When\ Actual\ MDA8 > 70\ ppb}{Days\ When\ Actual\ MDA8 > 70\ ppb}$$

Using these formulas for accuracy and success, TCEQ's OAD forecasting efforts for the region were accurate and successful for 0% in 2020. The days used to determine this rate are presented in Table 1-5. These 2020 metrics only account for days when TCEQ issued an OAD or actual O_3 measured >70 ppb. It does not account for the other days when TCEQ correctly did not issue an OAD and O_3 did not exceed 70 ppb.

From 2018-2020, TCEQ issued 15 OAD alerts for the MSA – eight in 2018, five in 2019, and two in 2020. During this time frame, there were 14 days when O_3 levels exceeded the level of the relevant O_3 NAAQS: ten in 2018, two in 2019, and two in 2020. Table 1-5 lists each of these dates.

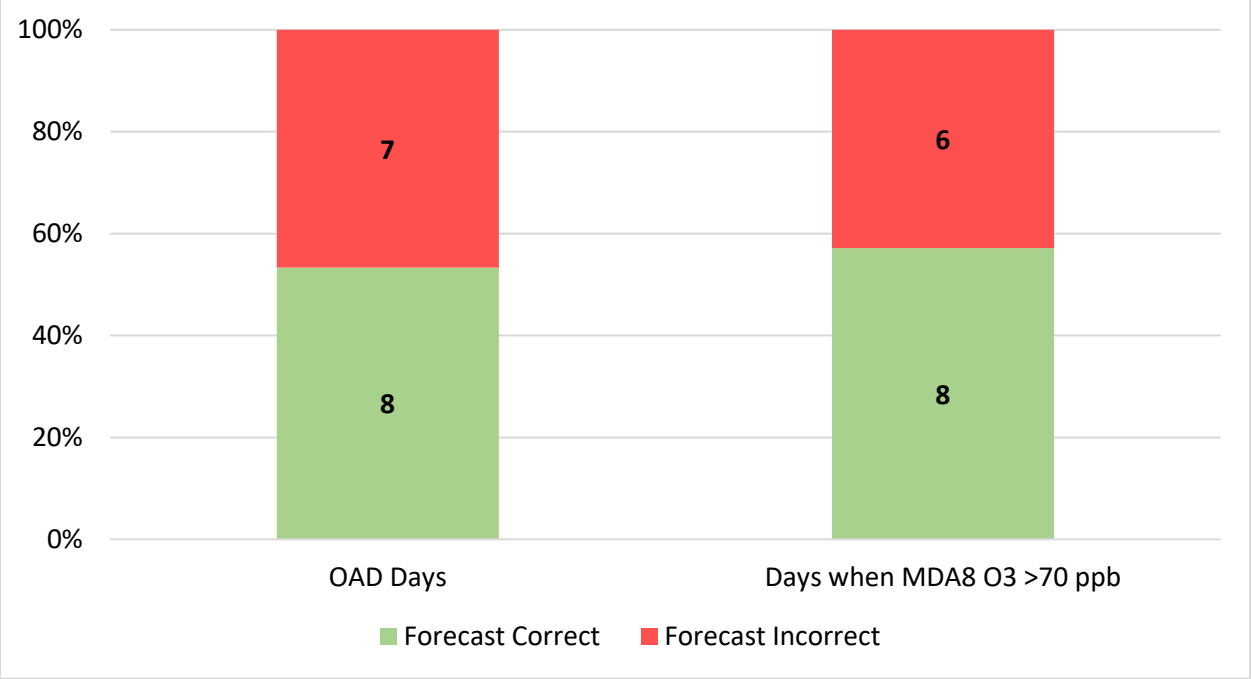
Table 1-5. OAD Dates and Dates when O_3 Exceeded Level of NAAQS, 2018-2020

Date	OAD Issued for this Date?	O_3 NAAQS Level in Effect	Highest O_3 MDA8 Value Recorded in MSA	Station where Highest O_3 MDA8 Value Recorded
4/28/2018	Yes	70 ppb	73 ppb	CAMS 690
5/7/2018	Yes	70 ppb	77 ppb	CAMS 690
5/28/2018	Yes	70 ppb	59 ppb	CAMS 1675
7/23/2018	No	70 ppb	72 ppb	CAMS 1675
7/25/2018	No	70 ppb	74 ppb	CAMS 3 & 1603
7/26/2018	Yes	70 ppb	74 ppb	CAMS 1675
7/27/2018	Yes	70 ppb	71 ppb	CAMS 3

Date	OAD Issued for this Date?	O_3 NAAQS Level in Effect	Highest O_3 MDA8 Value Recorded in MSA	Station where Highest O_3 MDA8 Value Recorded
7/31/2018	No	70 ppb	80 ppb	CAMS 1603
8/1/2018	Yes	70 ppb	84 ppb	CAMS 1675
8/2/2018	Yes	70 ppb	82 ppb	CAMS 1675
8/3/2018	Yes	70 ppb	75 ppb	CAMS 601
4/9/2019	Yes	70 ppb	67 ppb	CAMS 614 & 690
6/8/2019	Yes	70 ppb	63 ppb	CAMS 1613
7/25/2019	Yes	70 ppb	67 ppb	CAMS 614
7/26/2019	Yes	70 ppb	74 ppb	CAMS 614
7/27/2019	Yes	70 ppb	57 ppb	CAMS 1675
9/6/2019	No	70 ppb	74 ppb	CAMS 38
5/18/2020	No	70 ppb	72 ppb	CAMS 614
8/18/2020	No	70 ppb	78 ppb	CAMS 1619 & 1675
8/20/2020	Yes	70 ppb	62 ppb	CAMS 614
9/30/2020	Yes	70 ppb	58 ppb	CAMS 614

Over the three-year period, eight of the fifteen OAD forecasts correctly predicted O_3 levels over the applicable NAAQS – a 53% accuracy rate. Conversely, there was a 57% "success rate" in predicting actual MDA8 O_3 levels over the NAAQS from 2018-2020.

Figure 1-12. OAD Forecast Accuracy and Success, 2018-2020



1.5.2 Daily Air Quality Forecasts

TCEQ issues OADs when TCEQ believes that O_3 will reach levels considered "unhealthy for sensitive groups." However, the TCEQ issues daily AQI forecasts for O_3, $PM_{2.5}$ and, rarely, PM_{10}. The performance of these forecasts can be measured using the same type of metrics that were used for OADs – accuracy

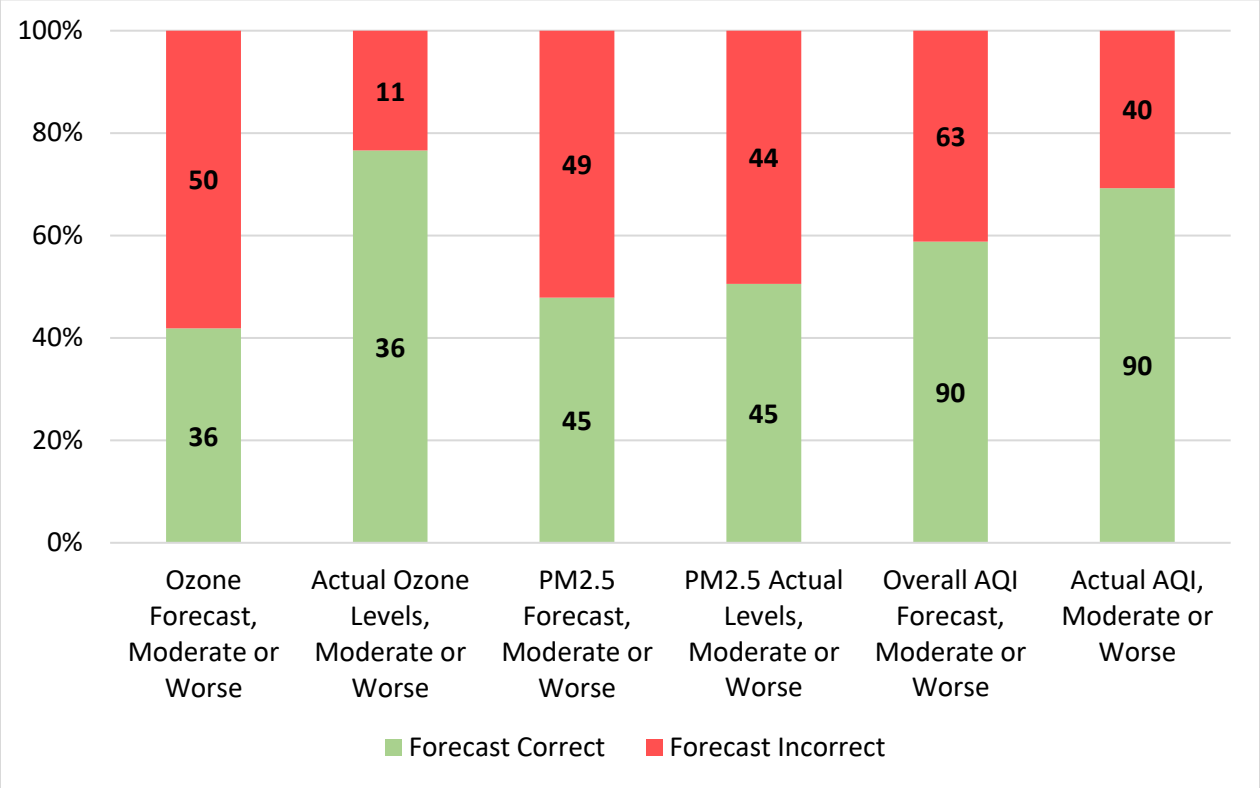
and success. In this case, CAPCOG evaluated the accuracy and success rate in terms of the number of days when air quality was forecast to be "moderate" or worse. The equations below explain these terms in terms of the daily AQI forecast.

$$AQI\ Forecast\ Accuracy\ Rate = \frac{Days\ When\ AQI\ Forecast\ to\ be\ Moderate\ or\ Worse\ and\ was\ Actually\ Moderate\ or\ Worse}{Days\ Forecast\ to\ be\ Moderate\ or\ Worse}$$

$$AQI\ Forecast\ Success\ Rate = \frac{Days\ When\ AQI\ Forecast\ to\ be\ Moderate\ or\ Worse\ and\ was\ Actually\ Moderate\ or\ Worse}{Days\ When\ Actual\ AQI\ Was\ Moderate\ or\ Worse}$$

Since the daily AQI forecasts for the region included forecasts for both O_3 and $PM_{2.5}$, it is possible to analyze these accuracy and success rates by pollutant, as well as for the overall AQI. Figure 1-13 presents the results of this AQI forecast analysis for 2020.

Figure 1-13. Accuracy and Success of AQI Forecasts for 2020



In summary, TCEQ's forecasts for "moderate" or higher O_3 levels were 47% accurate and 85% successful. Whereas, forecasts for "moderate" or higher $PM_{2.5}$ levels were 50% accurate and 53% successful. Overall AQI forecasts were 63% accurate and 74% successful.

1.6 Odor Complaints

The 2019-2023 Regional Air Quality Plan is intended to be a comprehensive Regional Air Quality Plan. Therefore, it includes a section on nuisance odors, and data on the number of odor complaints reported to TCEQ. This section of the annual report summarizes the odor compliant data from the region in 2020 county-by-county.

The table below summarizes the number of odor complaints filed from each county in 2020, along with each county's population, and the number of odor complaints per 10,000 residents.

Table 1-6. 2020 Odor Complaints and Number of Complaints Per 10,000 Residents by County

County	Odor Complaints[7]	Population[8]	Odor Complaints Per 10,000 Residents
Bastrop	40	91,601	4.37
Caldwell	2	43,979	0.45
Hays	1	241,365	0.04
Travis	99	1,300,503	0.76
Williamson	11	617,855	0.18
TOTAL	**153**	**2,295,303**	**0.67**

As evident in Table 1-6, Bastrop County had the highest number of odor complaints per 10,000 residents. This issue with odor is a recurring issue for Bastrop County.

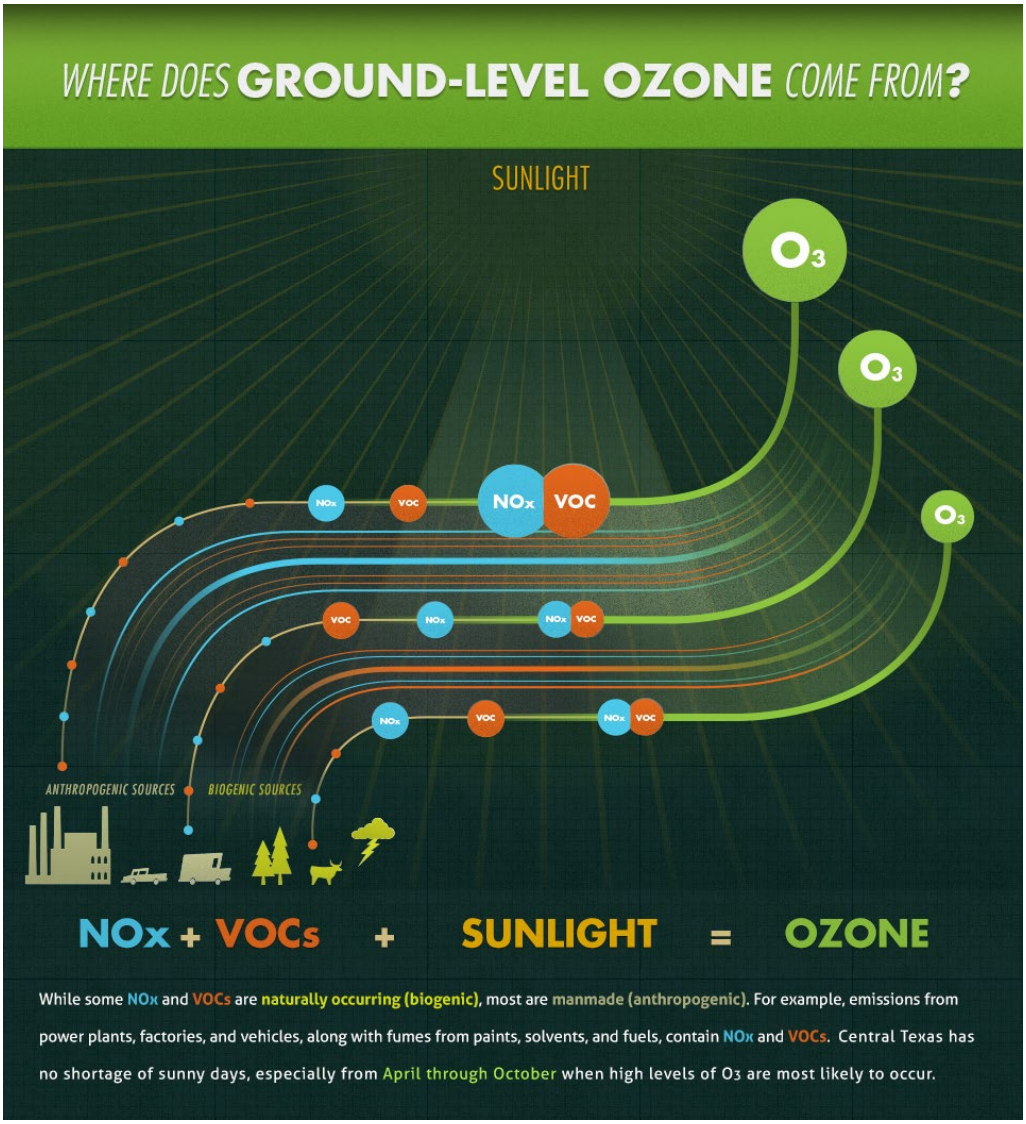
2 2020 Regional Ozone Season Weekday NO_X Emissions Profile

NO_X emissions react with volatile organic compounds (VOC) in the presence of sunlight to form ground-level O_3. Depending on local conditions, an area's O_3 problems can be influenced more by NO_X emissions or VOC emissions. In the MSA, NO_X emissions account for about 99% of all locally generated O_3. Therefore, an understanding of the contribution of different sources of NO_X emissions to the region's overall daily NO_X emissions during Ozone Season will elucidate the relative importance of these sources to O_3 formation.

[7] Obtained by querying TCEQ's complaint tracking website at: https://www2.tceq.texas.gov/oce/waci/index.cfm

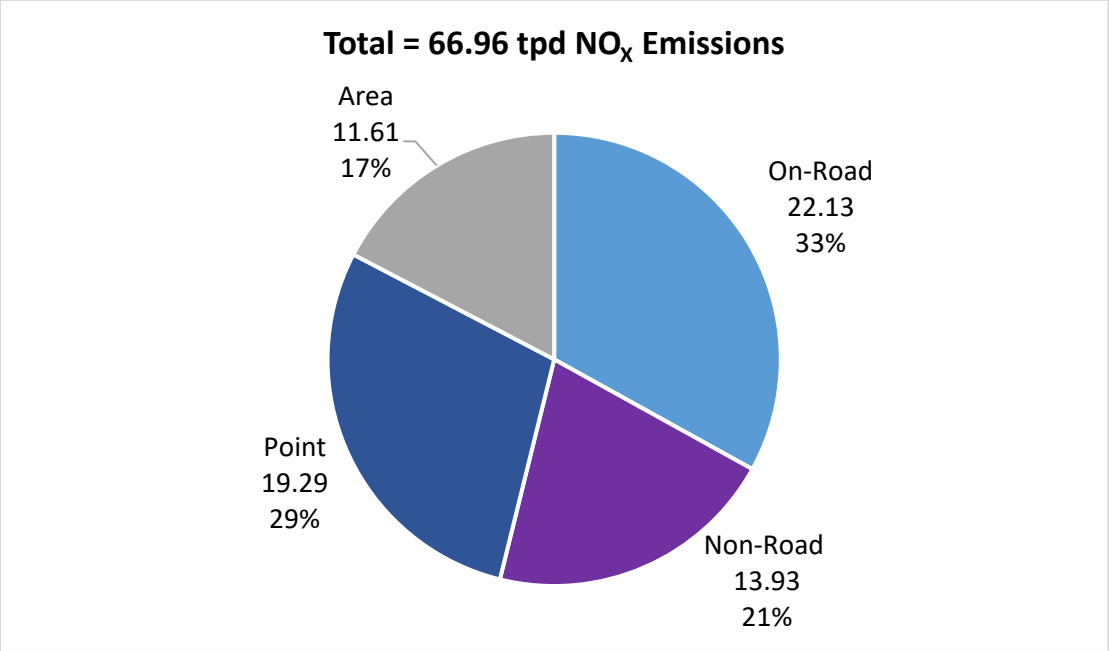
[8] U.S. Census Bureau, County Population Totals: 2010-2020, https://www.census.gov/programs-surveys/popest/technical-documentation/research/evaluation-estimates/2020-evaluation-estimates/2010s-counties-total.html

Figure 2-1. Ozone Formation



The following pie chart shows the estimated average 2020 O_3 season weekday anthropogenic NO_X emissions in the region by major source type – on-road mobile, non-road mobile, point source, and area source emissions.

Figure 2-2. 2020 O_3 Season Weekday NO_X Emissions for the Austin-Round Rock-Georgetown MSA (tpd)



2.1 NO_X Emissions by Source Type by County

Table 2-1 shows the break-down of the region's ozone season day (OSD) weekday NO_X emissions by county and source type.

Table 2-1. 2020 OSD Weekday NO_X Emissions by Source Type and County (tons per day)

County	On-Road	Non-Road	Point	Area	Total
Bastrop	1.38	1.11	3.94	0.46	**6.89**
Caldwell	0.77	0.92	1.32	1.89	**4.90**
Hays	3.10	1.09	6.65	0.80	**11.64**
Travis	11.86	7.59	7.23	6.47	**33.15**
Williamson	5.02	3.22	0.15	1.99	**10.38**
TOTAL	**22.13**	**13.93**	**19.29**	**11.61**	**66.96**

2.2 On-Road Sources

The on-road sector includes mobile sources that are registered to operate on public roads. On-road vehicles remain the largest source of NO_X emissions within the region, accounting for 22.13 tons per day (tpd) of NO_X emissions on a typical 2020 OSD weekday, based on TCEQ's most recent "trends" emissions

inventories.[9] Table 2-2 shows the typical 2020 O_3 season weekday NO_X emissions for the region by source use type.

Table 2-2. Regional 2020 OSD Weekday On-Road NO_X Emissions by Source Use Type (tpd)

Source Use Type	NO_X
Motorcycle	0.03
Passenger Car	6.44
Passenger Truck	4.53
Light Commercial Truck	1.33
Intercity Bus	0.12
Transit Bus	0.18
School Bus	0.37
Refuse Truck	0.29
Single-Unit Short-Haul Truck	1.40
Single-Unit Long-Haul Truck	0.15
Motor Home	0.15
Combination Short-Haul Truck	2.68
Combination Long-Haul Truck	4.46
TOTAL	**22.13**

Passenger cars and passenger trucks combined to account for 10.97 tpd of NO_X emissions, while heavy-duty commercial trucking accounted for 8.99 tpd NO_X emissions. The remaining sources accounted for 2.17 tpd NO_X emissions, most of which come from light commercial trucks.

2.2.1 TCEQ 2020 Summer Fuel Field Study

In summer 2020, TCEQ performed a summer fuel study that consisted of data collection and analysis of samples of gasoline and diesel fuel collected from retail stations across Texas[10]. The data from this study are used to develop the physical properties and speciation profiles of gasoline and diesel fuel that are used in the development of mobile source plans, emissions inventories, trend analysis, and control strategy analysis. In the past fuel studies, the Austin area has measured higher fuel sulfur levels than other areas of the state. High sulfur levels in fuels increase the vehicle's NO_x emissions by reducing the efficiency of the catalytic converter. Therefore, higher fuel sulfur levels can skew the NO_x emission assumptions for the Austin area. However, the recent 2020 study measured lower fuel sulfur levels for the Austin area than in the past, which placed sulfur levels similar to statewide levels. The graphs below display results from TCEQ's fuel studies and displays how fuel sulfur levels effect NO_x emissions.

[9] Produced by TTI in August 2015. Available online at: ftp://amdaftp.tceq.texas.gov/pub/EI/onroad/mvs14_trends/.

[10] TCEQ 2020 Summer Fuel study report and data, https://www.tceq.texas.gov/airquality/airmod/project/pj_report_mob.html

Figure 2-3. TCEQ Fuel Sulfur Study Results

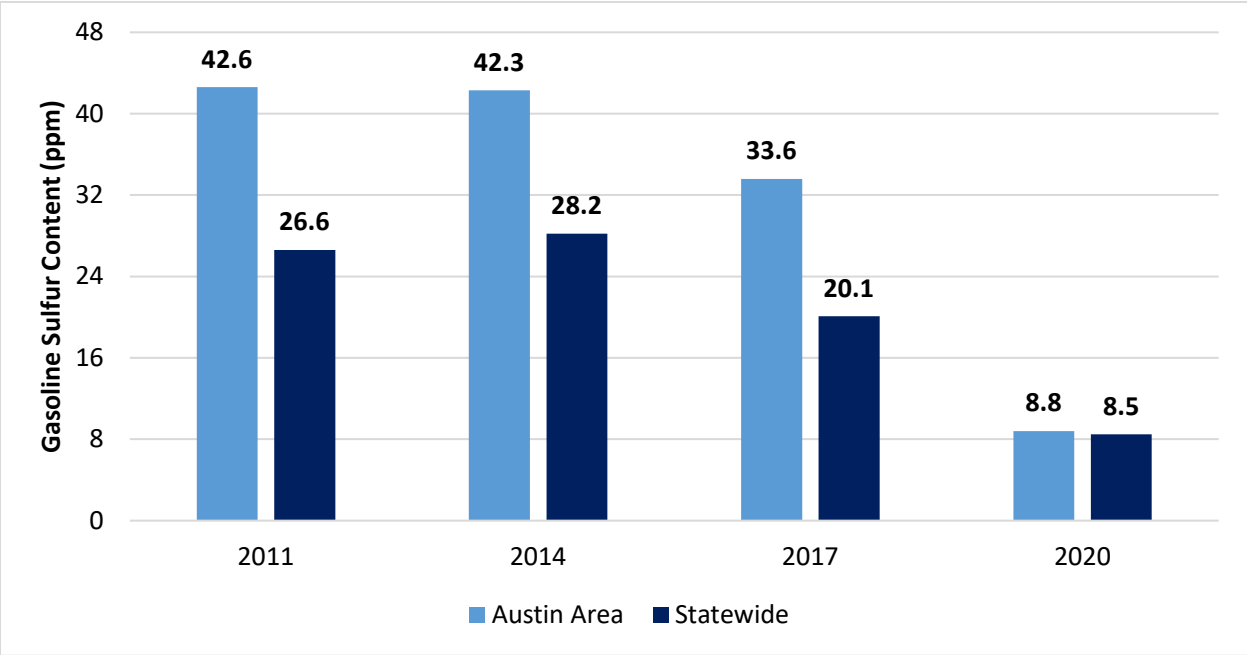
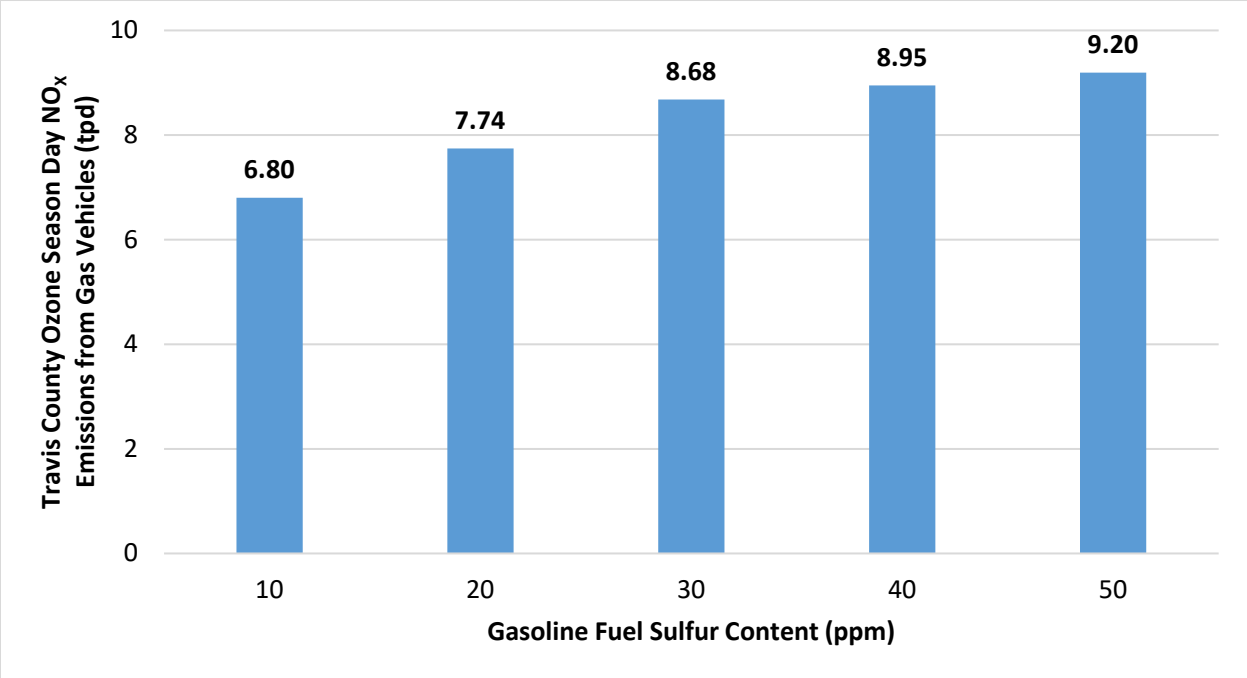


Figure 2-4. Sulfur's Effect on NO_X Emissions for Travis County OSD from Gasoline Vehicles, 2020



2.3 Non-Road Sources

The non-road sector consists of any mobile source that is not registered to be operated on a public road, including sources such as agricultural equipment, construction and mining equipment, locomotives, aircraft, and drill rigs. Non-road sources made up the 3rd-largest source of NO_X emissions within the region in 2020, accounting for 13.93 tpd of NO_X emissions on a typical O_3 season weekday. There are four different types of non-road data sets: equipment modeled in the MOVES2014b and TexNv2 models, locomotives/rail equipment, aircraft (including ground support equipment), and drill rigs.

Table 2-3. 2020 OSD Weekday Non-Road NO_X Emissions by County (tpd)

County	MOVES2014b	Rail	Aircraft	Drill Rigs	Total
Bastrop	0.69	0.42	0.00	0.00	1.11
Caldwell	0.44	0.44	0.02	0.02	0.92
Hays	0.68	0.41	0.00	0.00	1.09
Travis	4.67	0.42	2.49	0.00	7.59
Williamson	2.68	0.51	0.02	0.00	3.22
TOTAL	**9.16**	**2.21**	**2.54**	**0.02**	**13.93**

- For MOVES2014b sources, CAPCOG used the 2017 OSD estimates prepared by TCEQ for the AERR,[11] then adjusted the totals for each SCC and county based on the ratios between the 2020 "Trends" inventory and the 2017 "Trends" inventory.[12]
- For aircraft, CAPCOG used ERG's estimated O_3 season daily 2020 NO_X emissions.[13]
- For rail and drill rigs, CAPCOG used TCEQ's existing 2020 trends inventories.[14]

2.4 Point Sources

The point source sector consists of any stationary source that reports its emissions to TCEQ. The most recent point source data that is publicly available from TCEQ is for 2019. In that year, there were 28 facilities in the Austin-Round Rock-Georgetown MSA that reported emissions to TCEQ.[15] Emissions data specific to 2020 are available for each electric generating unit (EGU) that reports to EPA, Austin White Lime, and Texas Lehigh Cement Company. CAPCOG estimated an average of 19.29 tpd NO_X emissions from point sources in the MSA in 2020:

[11] Available online here: ftp://amdaftp.tceq.texas.gov/pub/EI/nonroad/aerr/2017/for_EPA/

[12] Available online here: ftp://amdaftp.tceq.texas.gov/pub/EI/nonroad/trends/

[13] E-mail from Roger Chang, ERG, to Andrew Hoekzema, CAPCOG, on July 26, 2019.

[14] Available online here: ftp://amdaftp.tceq.texas.gov/pub/EI/offroad/locomotive/trends/ and ftp://amdaftp.tceq.texas.gov/pub/EI/oil_gas/drilling/.

[15] "State Summary" file available online here: https://www.tceq.texas.gov/assets/public/implementation/air/ie/pseisums/2014_2019statesum.xlsx

- Except for the turbines at Decker Creek Power Plant, CAPCOG used the average daily NO_X emissions reported to EPA for May 1, 2020 – September 30, 2020 for all EGUs that report emissions to EPA,[16] (8.08 tpd);
- For the eight turbine units at Decker Creek Power Plant, CAPCOG used the average daily NO_X emissions reported to EPA for May 1, 2020 – September 30, 2020, adjusted to reflect the ratio between the average OSD NO_X emissions reported in TCEQ's EIQ for 2019 to the average OSD (May 1 – September 30) NO_X emissions reported to EPA for 2019[17] (1.47 tpd);
- For Austin White Lime and Texas Lehigh Cement company, CAPCOG used the average 2019 OSD NO_X emissions reported to CAPCOG for this report (7.53 tpd);
- For all other sources of NO_X emissions, including sources at EGU facilities, CAPCOG used the OSD NO_X emissions reported in the facility's 2019 EIQ (2.21 tpd).

Table 2-4 shows the estimated OSD NO_X emissions by county for EGU and non-EGU sources.

Table 2-4. Estimated 2020 Point Source OSD NO_X Emissions by County (tpd)

County	EGU[18]	Non-EGU	TOTAL
Bastrop	3.82	0.12	3.94
Caldwell	0.00	1.32	1.32
Hays	0.51	6.14	6.65
Travis	5.21	2.02	7.23
Williamson	0.00	0.15	0.15
TOTAL	**9.55**	**9.75**	**19.29**

Error! Reference source not found. shows the facility-level OSD NO_X emissions estimates.

Table 2-5. Estimated Average 2020 OSD Point Source Emissions in the Austin-Round Rock-Georgetown MSA (tpd)

RN	COMPANY	SITE	COUNTY	NO_X
RN101056851	Bastrop Energy Partners LP	Bastrop Energy Center	Bastrop	0.89
RN100723915	Gentex Power Corporation	Lost Pines 1 Power Plant	Bastrop	0.63
RN102038486	Lower Colorado River Authority	Sim Gideon Power Plant	Bastrop	2.30
RN100225846	Acme Brick Company	Elgin Plant	Bastrop	0.05
RN100212034	Meridian Brick LLC	Elgin Facility	Bastrop	0.07

[16] Accessible online here: https://ampd.epa.gov/ampd/

[17] The adjustment for the Decker Turbines is due to a known issue with data substitution required for reporting data to EPA that does not apply to the annual EIQs.

[18] Includes all sources at these facilities, including sources that do not report to AMPD.

RN	COMPANY	SITE	COUNTY	NO_X
RN105366934	Flint Hills Resources Corpus Christi LLC	Mustang Ridge Terminal	Caldwell	0.00
RN100220177	Oasis Pipeline Co Texas LP	Prairie Lea Compressor Station	Caldwell	1.32
RN100211689	Hays Energy LLC	Hays Energy Facility	Hays	0.51
RN102597846	Texas Lehigh Cement Company LP	Texas Lehigh Cement	Hays	6.14
RN100219872	City of Austin Electric Utility Department Dba Austin Energy	Decker Creek Power Plant	Travis	4.05
RN102533510	University of Texas At Austin	Hal C Weaver Power Plant	Travis	0.91
RN100215052	City of Austin Electric Utility Department Dba Austin Energy	Sand Hill Energy Center	Travis	0.25
RN100214337	Austin White Lime Company	McNeil Plant & Quarry	Travis	1.39
RN100542752	BFI Waste Systems of North America Inc	BFI Sunset Farms Landfill	Travis	0.05
RN101059673	Flint Hills Resources Corpus Christi LLC	Austin Terminal	Travis	0.00
RN100843747	NXP USA Inc	Ed Bluestein Site	Travis	0.03
RN102752763	NXP USA Inc	Integrated Circuit MFG Oak Hill Fab	Travis	0.02
RN100518026	Samsung Austin Semiconductor LLC	Austin Fabrication Facility	Travis	0.27
RN100218692	Silicon Hills Campus LLC	Silicon Hills Campus	Travis	0.07
RN100723741	Spansion LLC	Spansion Austin Facility	Travis	0.02
RN102016698	Texas Disposal Systems Landfill Inc	Texas Disposal Systems Landfill	Travis	0.03
RN105074561	Texas Materials Group Inc	Austin Hot Mix	Travis	0.01
RN100215938	Waste Management of Texas Inc	Austin Community Landfill	Travis	0.12
RN102611365	CPI Products Intl Inc	CPI Products Intl	Williamson	0.00
RN100728179	Durcon Laboratory Tops Incorporated	Durcon Laboratory Tops	Williamson	0.01
RN100725712	Seminole Pipeline Company LLC	Coupland Pump Station	Williamson	0.11

RN	COMPANY	SITE	COUNTY	NO_X
RN109992479	Valero Terminaling And Distribution Company	Truck Loading Terminal	Williamson	0.00
RN100225754	Waste Management of Texas Inc	Williamson County Recycling and Disposal Facility	Williamson	0.04
TOTAL				**19.29**

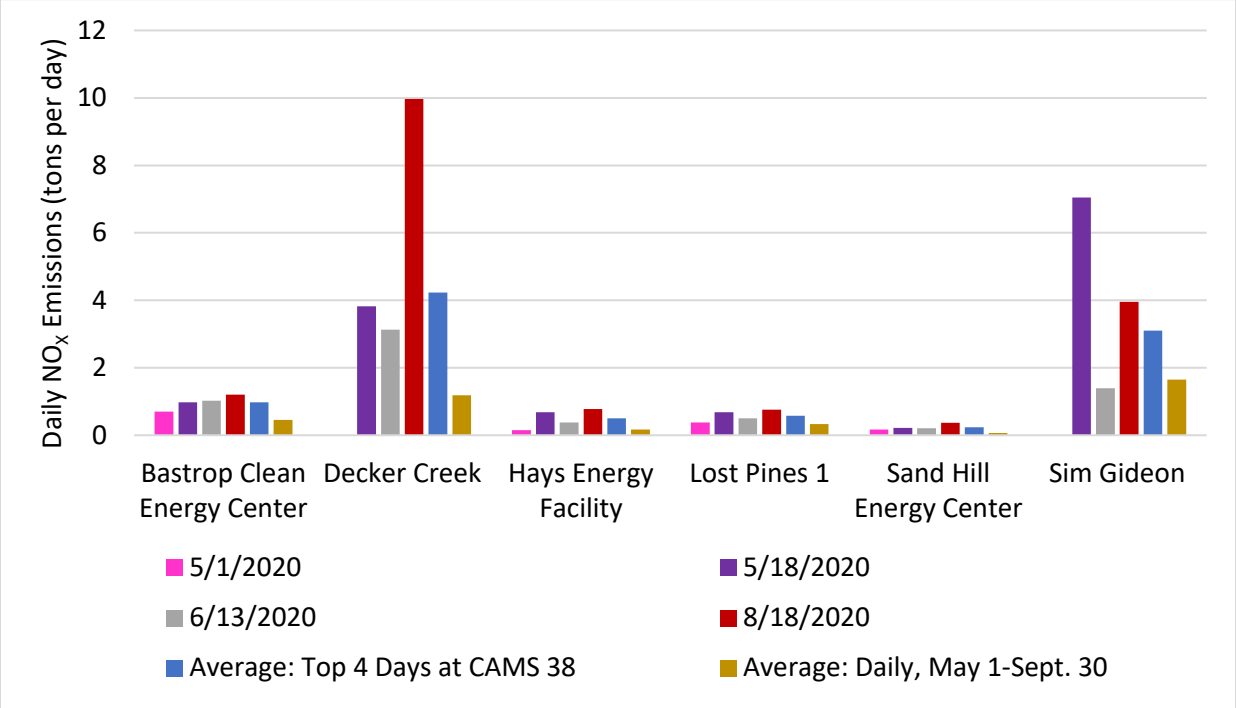
2.4.1 EGU NO_x Emissions Analysis

Since EPA data for EGUs are available at the daily level, CAPCOG analyzed the NO_X emissions on the top four days at CAMS 38 with the highest 8-hour O_3 averages for 2020, since these four days affect NAAQS compliance:

- 5/1/2020: 63 ppb
- 5/18/2020: 64 ppb
- 6/13/2020: 63 ppb
- 8/18/2020: 65 ppb

On these days, EGU NO_X emissions averaged 9.63 tpd, which is 16% higher than the May 1st – September 30th daily average. As the chart below shows, there was a high degree of variation in emissions among these days. However, the EGUs with the highest emissions are the older, "dirtier" power plants, Decker Creek and Sim Gideon, that are used when electricity demand is high. Therefore, these data suggest that EGUs contributed more to O_3 formation on those top four days than the use of the average OSD estimate would suggest.

Figure 2-5. Comparison of EGU NO_X Emissions on Top 4 O_3 Days at CAMS 38 Compared to Average Daily NO_X Emissions May 1 – September 30, 2020

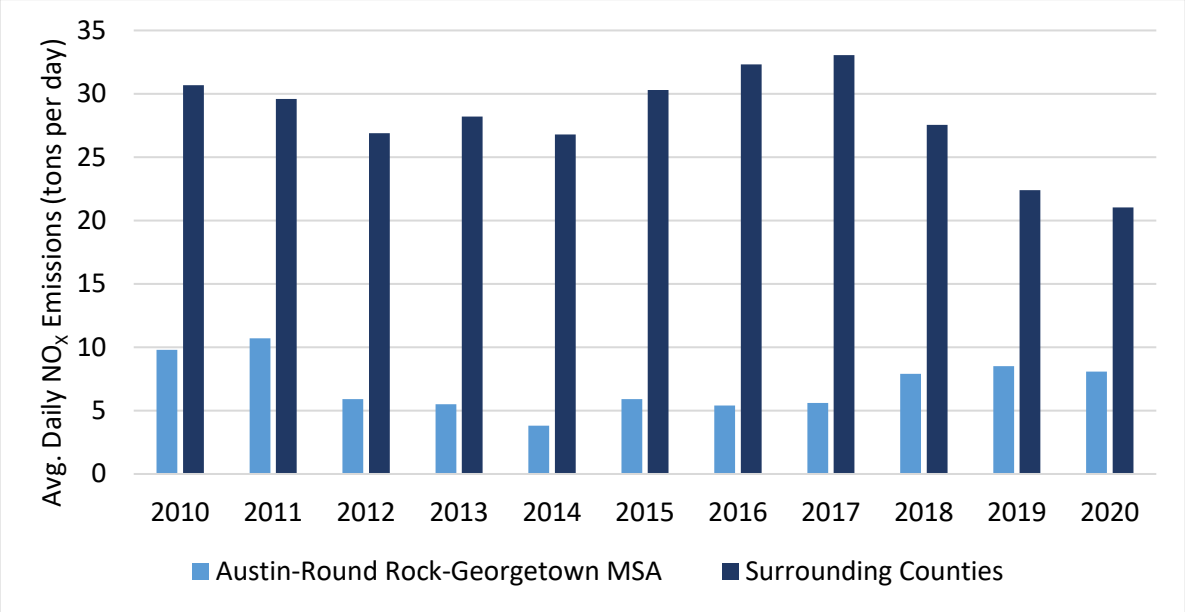


Looking at the 2020 data compared to previous years, average OSD emissions from EGUs were similar in 2020 to 2019. Over the past 3 years, emissions from regional EGUs have increased while emissions from EGUs in surrounding counties have decreased. This is to be expected as two power plants in surrounding counties ceased operations and closed in between 2017 and 2019. The Sandow Power Plant in Milam County closed in 2018[19]. Also, the Gibbons Creek Power Plant in Grimes County was not used in 2019[20], and its closure was announced in late June 2019. With these two power plants no longer supplying electricity to the electric grid, it appears that local power plants picked up some of the load. Figure 2-6 compares the OSD NO_x emissions from EGUs within the MSA and EGUs in surrounding counties. Note that the figure does not include the emissions from the Decker Creek turbine units.

[19] https://www.bizjournals.com/austin/news/2017/10/16/central-texas-energy-plant-to-shut-down-as-part-of.html

[20] https://www.kallanishenergy.com/2019/07/05/coal-fired-texas-power-plant-to-close-oct-23/

Figure 2-6. Average Daily May – September NO_X Emissions from EGU Point Sources in Austin-Round Rock-Georgetown MSA and Surrounding Counties, 2010-2020



2.5 Area Sources

CAPCOG estimated the 2020 area sources using TCEQ's 2017 summer weekday NO_X emissions from its 2017 National Emissions Inventory submission.[21]

Table 2-6. Area Source OSD Weekday NO_X Emissions by County and Source Type (tpd)

County	Industrial Combustion	Commercial & Institutional Combustion	Residential Combustion	Oil & Gas	Other	TOTAL
Bastrop	0.10	0.10	0.00	0.16	0.09	0.46
Caldwell	0.09	0.04	0.00	1.73	0.02	1.89
Hays	0.31	0.35	0.00	0.00	0.13	0.80
Travis	2.34	4.04	0.02	0.01	0.05	6.47
Williamson	0.89	1.03	0.01	0.03	0.03	1.99
TOTAL	**3.74**	**5.57**	**0.04**	**1.94**	**0.33**	**11.61**

[21] E-mailed from Matthew Southard, TCEQ, to Andrew Hoekzema, CAPCOG, on July 26, 2019.

3 IMPLEMENTATION OF 2019-2023 REGIONAL AIR QUALITY PLAN AND OTHER MEASURES

This section provides details on emission reduction measures implemented within the Austin-Round Rock-Georgetown MSA in 2020. This includes both measures that had been included in the 2019-2023 Regional Air Quality Plan and other measures that were not explicitly committed to in that plan.

3.1 REGIONAL AND STATE-SUPPORTED MEASURES

Regional and state-supported measures involve multi-jurisdictional programs or state involvement in an emission reduction measure within the region. These include:

- The vehicle emissions inspection and maintenance (I/M) program
- The Drive a Clean Machine program
- Texas Emission Reduction Plan (TERP) grants
- Volkswagen Environmental Mitigation Trust Beneficiary Mitigation Plan for Texas
- The Commute Solutions Program
- The Clean Air Partners Program
- The Clean Cities Program
- Outreach and Education Measures
- Property-Assessed Clean Energy (PACE)

3.1.1 Vehicle Emissions Inspection and Maintenance Program

The Austin-Round Rock-Georgetown MSA is home to Travis and Williamson Counties – the two largest "attainment" counties in the country that have a vehicle emissions inspection and maintenance (I/M) program. The I/M program has been in place since September 1, 2005, and it was implemented as part of the region's participation in the Early Action Compact (EAC) program. The program's rules are found in Title 30, Part 1, Texas Administrative Code (TAC) Chapter 114, Subchapter C, Division 3: Early Action Compact Counties. Under the program, all gasoline-powered vehicles (including heavy-duty vehicles but excluding motorcycles) that are 2-24 years old are required to undergo an annual emissions inspection along with their annual safety inspection. Vehicles model year 1995 and older are required to pass a "two-speed idle" (TSI) test, and vehicles model year 1996 and newer are required to pass an "on-board diagnostic" (OBD) test. 2019 was the last year in which TSI tests will be conducted for the I/M program due to the model year coverage. Up until the end of state fiscal year 2020, the inspection cost $18.50 per test:

- The station may retain $11.50
- $4.50 is remitted to the state and deposited into the Clean Air Account (Fund 151):
    - $2.50 is for state administration of the I/M program

If a vehicle fails an emissions inspection, the owner is required to fix the vehicle as a condition of registration. As described in 37 TAC § 23.52(a), "an emissions testing waiver defers the need for full

compliance with vehicle emissions standards of the vehicle emissions inspection and maintenance (I/M) program for a specified period of time after a vehicle fails an emissions test." The following waivers are available in certain circumstances:

- A "low-mileage" waiver if a motorist has paid at least $100 for emissions-related repairs and is driven less than 5,000 per year
- An "individual vehicle" waiver if a motorist has paid at least $600 in emissions-related repairs

Under 37 TAC § 23.53(a), time extensions are also available:

- A "low-income time extension" is available if the motorist has income at or below the federal poverty level and the motorist hadn't previously received a time extension in the same cycle
- A "parts-availability time extension" is available if an applicant can show problems in obtaining the needed parts for repair

Some of the key metrics for the I/M program year-to-year are the number of emissions inspections and the failure rates. Table 3-1 summarizes the number and disposition of emissions inspections in 2020:

Table 3-1. I-M Program Statistics for 2020[22]

Metric	Travis County	Williamson County	Combined
Total Emission Tests	791,524	391,643	1,183,167
Initial Emission Tests	745,244	369,062	1,114,306
Initial Emission Test Failures	46,618	23,440	70,058
Initial Emission Test Failure Rate	6.30%	6.40%	6.29%
Initial Emission Retests	40,966	20,384	61,350
Initial Emission Retest Failures	4,692	1,940	6,632
Initial Emission Retest Failure Rate	11.50%	9.50%	10.81%
Other Emission Retests	5,314	2,197	7,511
Other Emission Retest Failures	1,418	537	1,955
Other Emission Retest Failure Rate	26.70%	24.40%	26.03%

In general, there have been year-over-year increases in the number of emissions inspections tracking with population increases, except for 2015 and 2020. The difference in 2015 was due to a transition period in the state's move from a two-sticker (registration and inspection) system to a one-sticker system, some vehicles were able to skip a cycle of inspections if they had a January 2015 or February 2015 registration renewal deadline. By March 1, 2016, however, all vehicles should have "caught up."

However due to the COVID-19 pandemic in 2020, there were less emissions inspections than in 2019. This decrease in inspections was most likely due to the statewide vehicle registration renewal waiver.[23] The waiver allowed vehicle owners to avoid penalties for failure to timely register a vehicle. The waiver began on March 16, 2020, and it was in place until April 14, 2021.[24] In 2020, there were approximately

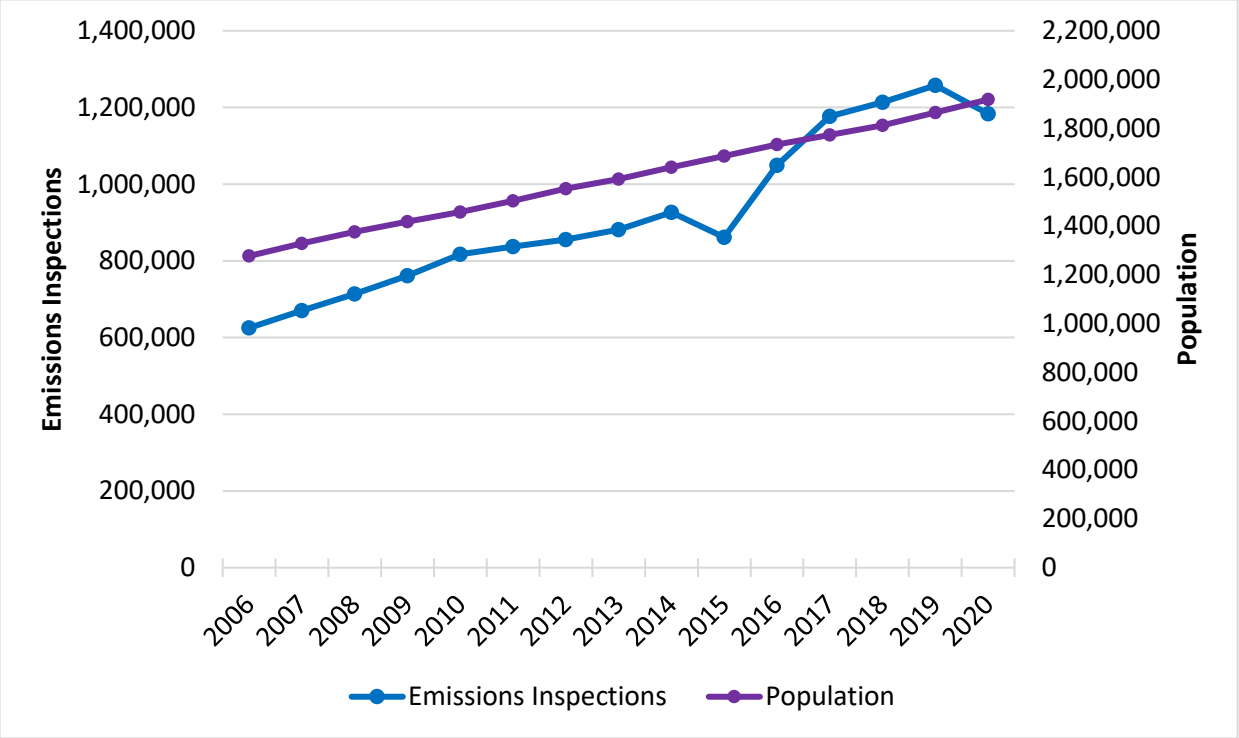
[22] Data e-mailed from David Serrins, TCEQ, to Christiane Alepuz, CAPCOG, 6/15/2021.

[23] https://gov.texas.gov/news/post/governor-abbott-waives-certain-vehicle-registration-titling-and-parking-placard-regulations-in-texas

[24] http://ftp.txdmv.gov/pub/txdmv-info/media/2021/02_12_21-End_of_Vehicle_Title_Registration_Waiver.pdf

0.62 emissions inspections per capita in Travis and Williamson Counties which is slightly lower than the 0.67 emissions inspections per capita in 2019.

Figure 3-1. Trend in Emissions Inspections Compared to Population in Travis and Williamson Counties 2006-2020



2020 saw an increase in the initial failure rate that was out of line with failure rates seen since 2006. This increase in the failure rate could be attributed to people's hesitancy to visit mechanics for vehicle repairs or maintenance during the COVID-19 pandemic.

Figure 3-2. Initial Emissions Inspection Failure Rate Trend 2006-2020

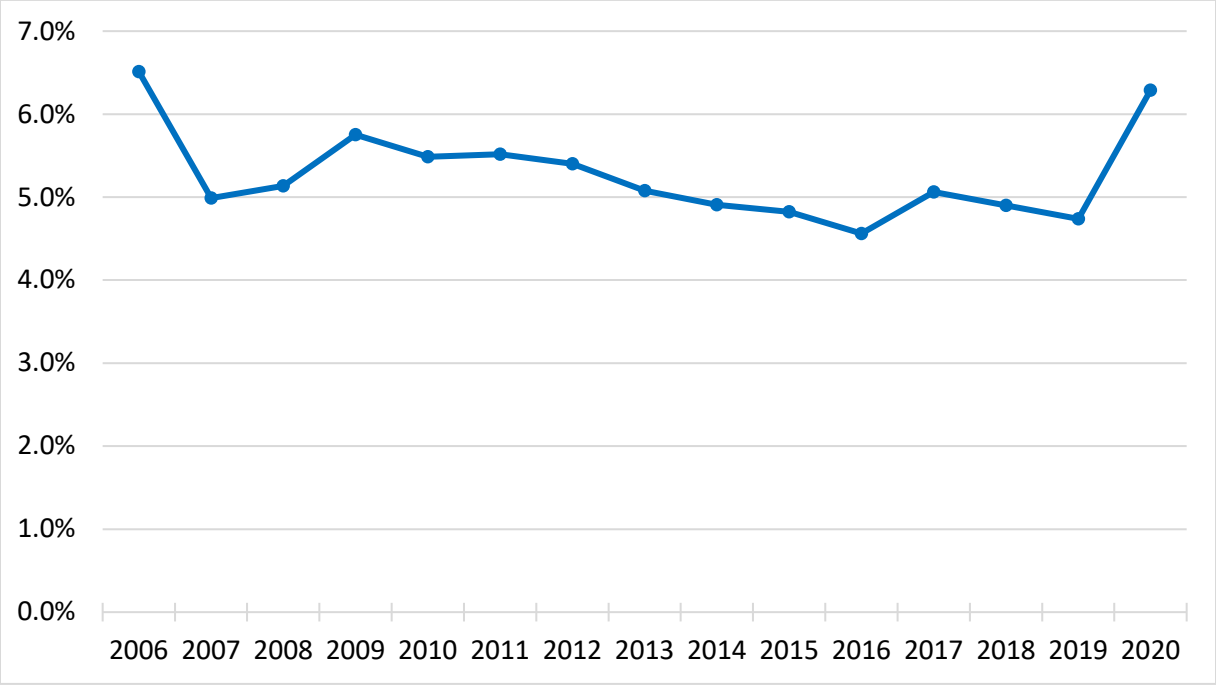
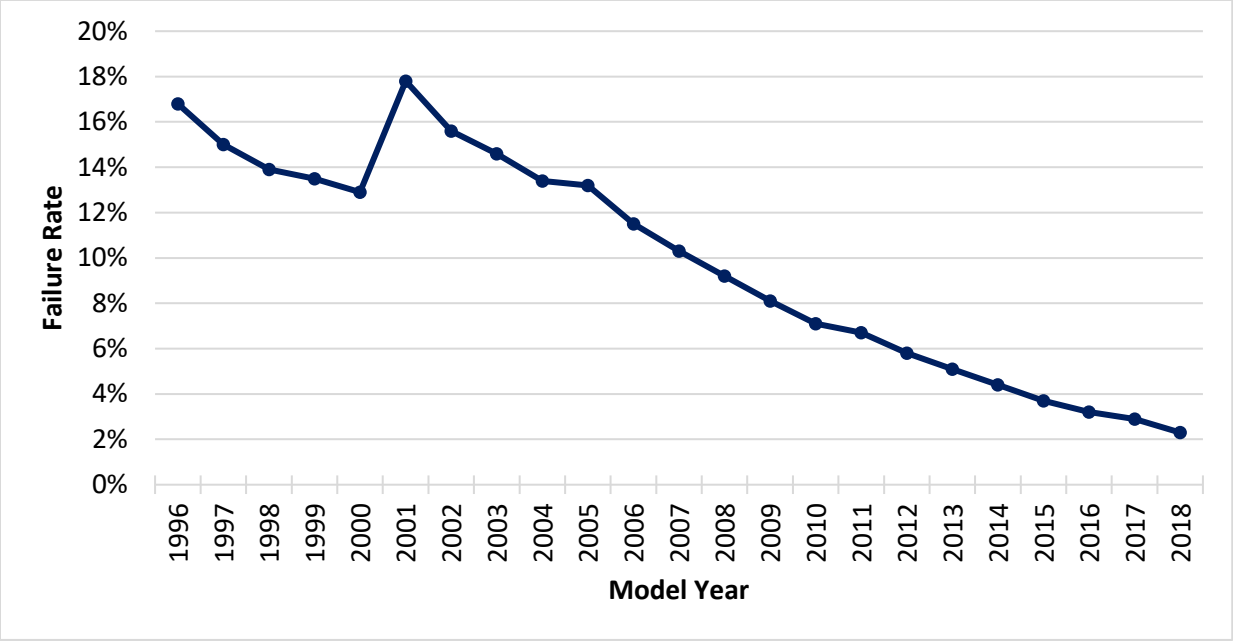


Figure 3-3 shows the emissions test failure rates of each model year based on tests conducted in 2020. As the figure below shows, the chances of older model-year vehicles failing an emissions test are significantly higher than a newer model-year vehicle failing a test. In 2020, for example, 2018 model year vehicles had a rate of only about 2.3%, whereas the rate for model year 2001 vehicles was 17.8%.

Figure 3-3. 2020 Emission Test Failure Rate by Model Year



As described above, under certain circumstances, a vehicle subject to annual testing requirements is allowed to continue operating under an I/M program waiver. Table 3-2 summarizes the waivers issued in 2019 and 2020.

Table 3-2. 2019 and 2020 I-M Program Waivers

Waiver Type	2019	2020
Total Tests	1,172,669	1,114,305
Failing Vehicles	55,461	50,274
Total Waivers	81	31
Total Waiver Rate	0.15%	0.06%
Individual Waivers	29	11
Low Mileage Waivers	21	8
Low Income Time Extensions	31	12
Parts Availability Time Extensions	0	0
Other (Special Test)	0	0

3.1.2 Texas Emission Reduction Plan Grants

Texas Emission Reduction Plan (TERP) grants provide funding for a variety of types of projects designed to reduce emissions, particularly NO_X. These include:

- The Diesel Emissions Reduction Incentive (DERI) program, designed to achieve emission reductions by incentivizing the early replacement or repowering of older diesel-powered engines with newer engines:
    - The Emission Reduction Incentive Grant (ERIG) program is a competitive grant program based on the cost/ton of NO_X reduced;
    - The Rebate Grant program is a first-come, first-served grant program based on fixed rebate dollar amounts based on fixed cost/ton of NO_X reduced assumptions;
- The Texas Natural Gas Vehicle Grant Program (TNGVGP) incentivizes the replacement of diesel-powered trucks with natural gas vehicle-powered trucks, with the newer engine needing to achieve at least a 25% reduction in emissions compared to the diesel power it is replacing;
- The Texas Clean Fleet Program (TCFP) incentivizes owners of large fleets to replace a significant portion of their conventionally-fueled vehicles with alternative-fueled vehicles, achieving emission reductions by replacing the older, dirtier engines with newer, cleaner engines;
- The Texas Clean School Bus (TCSB) program provides funding for the retrofit and replacement of older school buses;
- The Light Duty Motor Vehicle Purchase or Lease Incentive Program (LDPLIP) provides rebate incentives statewide to purchase or lease an eligible new light-duty motor vehicle powered by natural gas, propane, hydrogen fuel cell, or electric drive;
- The New Technology Implementation Grants (NTIG) program provides funding for new/innovative technology to reduce emissions from stationary sources; and
- The Alternative Fueling Facilities Program (AFFP) provides funding for the construction of a variety of types of alternative fuel infrastructure in nonattainment areas;

- The Seaport and Rail Yard Areas Emission Reduction (SPRY) Program provides funding for the early replacement of drayage trucks and equipment at eligible in ports and class I railyards in nonattainment areas (this program was formerly known as the Drayage Truck Incentive Program or DTIP). The Austin area is not eligible for this program.

Notable program changes adopted by the 2021 Texas legislative session included:

- A 3% shift of TERP funding from the Texas Clean Fleet Program (TCFP) to the New Technology Implementation Grant (NTIG) program and expands the eligible activities of NTIG to include flare reduction and rental of equipment.
- A requirement that at least 35% of TERP revenue be sent to TxDOT for congestion mitigation and air quality projects rather than for direct provision of emission reduction grants. This is expected to result in at least $182 million in funds to be redirected from the new TERP trust fund. Although, the total amount available for TERP grants will still be substantially higher for 2022-2023 than for 2020-2021 due to the transition from these funds being subject to appropriation to being deposited into a new TERP trust fund.
- Both items above will need to be reconciled since they have conflicting percentages of funding for the TCFP and NTIG programs.

In November 2020, TCEQ posted a series of reports on their program website that summarizes the estimated OSD weekday NO_X emission reductions achieved by each program for 2020 – 2023, based on grants awarded through August 31, 2020. **Error! Reference source not found.** summarizes these data for the Austin area.[25]

Table 3-3. Quantified OSD Weekday NOX Emissions from TERP Grants by Program from Grants Awarded through August 31, 2020 (tpd).

Program	2020	2021	2022	2023
DERI[26]	2.26	2.26	2.05	1.87
TCFP[27]	0.01	0.01	0.01	0.01
TNGVGP[28]	0.04	0.03	0.03	0.03

[25] TCEQ develops OSD weekday NO_X emission reduction estimates by dividing the annual NO_X reductions by 260, which corresponds roughly to the number of weekdays in a year.

[26] TCEQ. "Diesel Emission Reduction Incentive (DERI) Program Projects by Area 2001 through August 2020" Prepared by Air Grants Division, 11/1/2020. Available online at: https://www.tceq.texas.gov/assets/public/implementation/air/terp/leg/Projects-by-Area-DERI.pdf, Accessed 5/24/2021.

[27] TCEQ. "Texas Clean Fleet Program Projects by Area 2010 through August 2020." Prepared by Air Grants Division, 11/1/2020. Available online at: https://www.tceq.texas.gov/assets/public/implementation/air/terp/leg/Projects-by-Area-TCFP.pdf. Accessed 5/24/2021.

[28] TCEQ. "Texas Natural Gas Vehicle Grant Program (TNGVGP) Projects by Area 2012 through August 2020." Prepared by Air Grants Division, 11/1/2020. Available online at: https://www.tceq.texas.gov/assets/public/implementation/air/terp/leg/Projects-by-Area-TNGVGP.pdf. Accessed 5/24/2021.

Program	2020	2021	2022	2023
TCSB[29]	0.01	0.01	0.01	0.01
TOTAL	**2.32**	**2.31**	**2.10**	**1.92**

Table 3-4 shows the TERP funding awarded to the Austin-Round Rock-Georgetown MSA in FY 2020, along with any quantified NO_X emissions reductions from those grants. TCEQ does not provide NO_X estimates for funding awarded for the NTIG, AFFP, or LDPLIP grant programs.

Table 3-4. TERP Grants Awarded in the Austin Area in FY 2020[30]

Grant Program	Total Funding Awarded[31]	Funding Awarded to the Austin Area	Percent of Funding Going to MSA	Austin Area NO_X Emissions Reductions (tons)	Cost Per Ton of NO_X Emissions Reductions in Austin Area
AFFP	n/a	n/a	n/a	n/a	n/a
DERI-Rebate	n/a	n/a	n/a	n/a	n/a
DERI-ERIG	n/a	n/a	n/a	n/a	n/a
LDPLIP	$1,788,315	$677,495	38%	n/a	n/a
NTIG	n/a	n/a	n/a	n/a	n/a
SPRYP	$4,588,420	$0	n/a	n/a	n/a
TCFP	n/a	n/a	n/a	n/a	n/a
TCSB	$8,336,865	$968,625	12%	7.72	$121,552
TNGVGP	$829,427	$0	n/a	n/a	n/a
TOTAL	**$15,543,027**	**$1,646,120**	**11%**	**7.72**	**$121,552**

3.1.3 Texas Volkswagen Environmental Mitigation Program (TxVEMP)

In 2018, the TCEQ released the final version of their Beneficiary Mitigation Plan which identified the Austin metro area as a "priority" area and allocated $16,297,602 of the $169,548,522 total available funds to the Austin-Round Rock-Georgetown MSA. The funds are for the replacement or repower of diesel vehicles and equipment to new diesel, alternative fuel (compressed natural gas, propane, or hybrid electric), or all-electric vehicles and equipment. In spring 2019, TCEQ began opening their grant rounds for the Texas Volkswagen Environmental Mitigation Program (TxVEMP). The table below shows the vehicle types for each grant found, the grant amount available for the MSA, and total grant amount requested as of 7/20/2021. At the time of this report, the NO_X reduction information was not available

[29] TCEQ. "Texas Clean School Bus (TCSB) Program Replacement Projects by Area 2018 through August 2020." Prepared by Air Grants Division, 10/1/2019. Available online at: https://www.tceq.texas.gov/assets/public/implementation/air/terp/leg/Replacement-Projects-by-Area-TCSB.pdf. Accessed 5/24/2021.

[30] Based on information provided by Nate Hickman, TCEQ, on 6/9/2021, by e-mail to Christiane Alepuz.

[31] For the purposes of this table, the fiscal year award is identified as the fiscal year in which a grant contract was executed, rather than the fiscal year in which an award announcement was made or the fiscal year in which funding was awarded.

from TCEQ. The Beneficiary Mitigation Plan for Texas and information about the grants can be found at www.TexasVWFund.org.

Table 3-5. TxVEMP Grant Funding for Austin Area as of 7/20/2021[32]

Vehicle Grants	Grant Amount Available for Austin Area	Grant Amount Awarded in Austin Area as of 7/20/2021
School Buses, Shuttle Buses, and Transit Buses	$5,704,161	$5,704,161
Refuse Vehicles including Garbage Trucks, Recycling Trucks, Dump Trucks, Chipper Trucks, Street Sweepers, and Roll-Off Trucks	$4,074,401	$1,225,993
Local Class 4-8 Freight and Drayage Trucks	$3,259,521	$304,146
Zero Emission Vehicle Supply Equipment Grants	$10,465,958 (Available statewide)	$67,500
Total	**$23,504,041**	**$7,301,800**

3.1.4 Clean Air Partners Program

CLEAN AIR Force (CAF) of Central Texas' Clean Air Partners Program includes organizations outside of the CAC. The Clean Air Partners is a way to encourage businesses to act and make an impact on air quality. The CAF Clean Air Partners include:

1. Applied Materials, Inc.
2. Ascension Seton
3. Austin Community College
4. Austin Independent School District
5. Chemical Logic
6. Environmental Defense Fund
7. Emerson Automation Solutions
8. ICU Medical
9. NXP Semiconductors
10. Power Engineers
11. R&R Limousine and Bus
12. Samsung Austin Semiconductor
13. St. David's Health Care Partnership
14. Tokyo Electron (TEL)
15. University of Texas at Austin

[32] Includes projects pending execution

In addition, there are several CAC members who also participate in the Clean Air Partners Program:

1. CAPCOG
2. City of Austin
3. Central Texas Regional Mobility Authority (CTRMA)
4. Lone Star Clean Fuels Alliance (LSCFA)
5. Lower Colorado River Authority (LCRA)
6. Travis County

3.1.5 Outreach and Education Measures

Continued outreach and education is essential to achieving CAC goals. The 2020 outreach and education activities are organized into six tasks:

1. Electronic Outreach;
2. In-person Outreach (The COVID-19 pandemic cancelled planned in-person outreach);
3. Development of Air Quality Educational Materials;
4. Air Quality Outreach and Education Coordination and Collaboration;
5. Air Quality Outreach Activities Milestones; and
6. Commute Solutions Outreach Program.

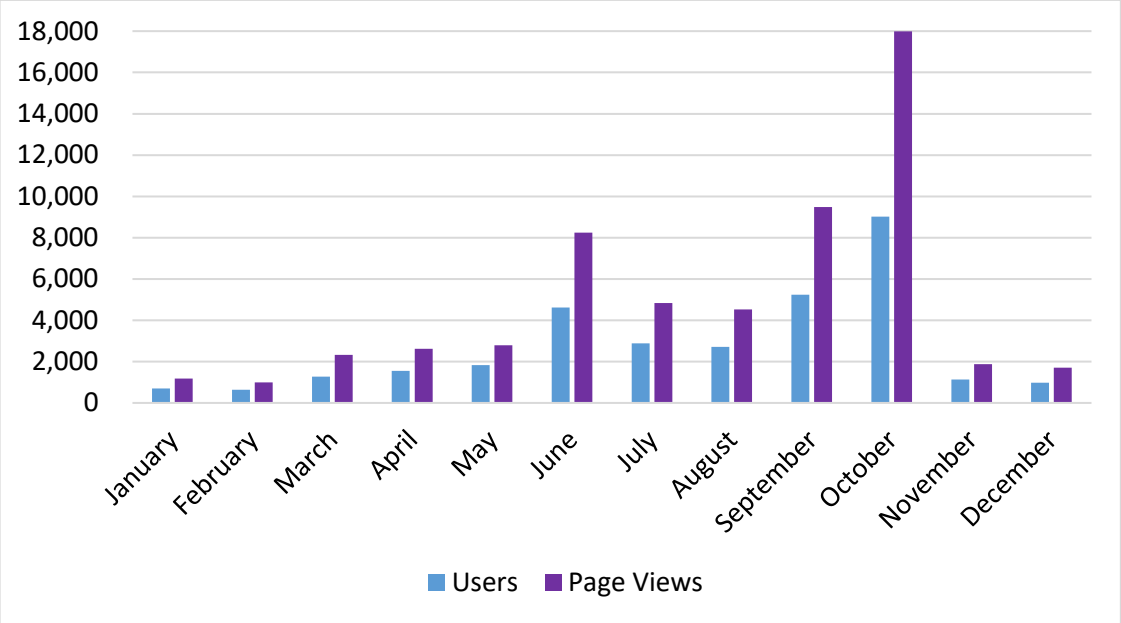
3.1.5.1 Electronic Outreach and Education

One of the primary ways CAPCOG staff accomplished outreach goals during this period was through electronic outreach. Electronic outreach allows the program to provide air quality information to a large audience with limited resources. Electronic outreach completed during this period was carried out through the Air Central Texas (ACT) website, social media accounts, digital advertising, and ACT newsletters.

3.1.5.1.1 Air Central Texas Website

The ACT website (www.aircentraltexas.org) provides the public with information about Central Texas air quality, supports existing air quality programs, and promotes activities to protect local air quality. The goal is to motivate everyone to make decisions that are “Air Aware.” In 2020, CAPCOG continued to maintain and update the ACT website. Figure 3-4 shows the number of users and page views for each month.

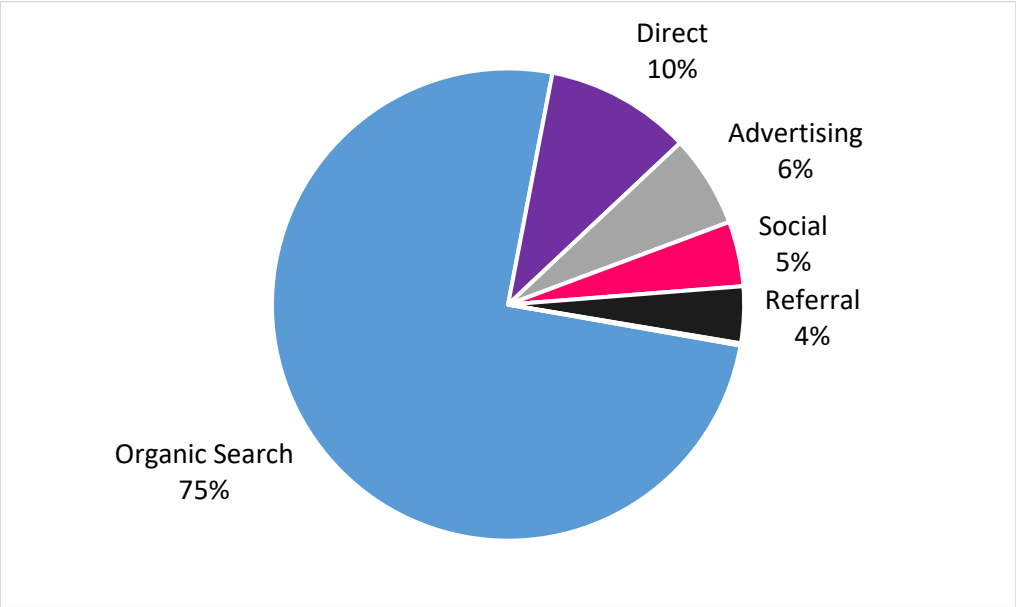
Figure 3-4. Air Central Texas Website Traffic, 2020



The increase in website visits during the summer is a combination of an increased number of OADs, paid advertising which directed to the ACT website, and hazy days caused by dust storms. It is interesting to note that in June and October when website traffic was highest was due to organic searches about hazy days. This indicates that people want to understand why air quality is poor when it is noticeable. Therefore, it is important to maintain ACT updated with local information about upcoming air quality concerns.

Figure 3-5 shows how website visitors found the site. 75% of all visitors found the website from an organic search of air quality terms in a search engine (e.g., Google or Bing). 17% of visitors used a direct web search in which the users typed in an ACT URL or were directed from an email or newsletter. Also, visitors found the site through paid advertising, social media links, and referrals from other websites – mainly the City of Austin and CAPCOG websites.

Figure 3-5. Air Central Texas Website Acquisition Method, 2020



The top ACT Webpages viewed in 2020 are listed below. The page with the highest views was a news entry about the Saharan Dust storm. This suggests that visitors are searching for specific information on air quality, especially when the air quality is visibly poor. It is notable that one of the top pages, page #4, is in Spanish.

Table 3-6. Top Air Central Texas Website Pages by Page Views, 2020

Page Rank	Page Title	Page Views
1	Hazy skies expected in Austin this weekend as African dust cloud looms	27,360
2	Air Central Texas Home Page	7,439
3	What is Ground-Level Ozone?	5,957
4	El Ozono Troposférico	2,409
5	Drive Cleaner	2,111
6	How is the Air in Central Texas?	877
7	5 things to know about African dust in the air over Austin this week	845
8	2020 Air Quality Awareness Week (link unavailable)	667

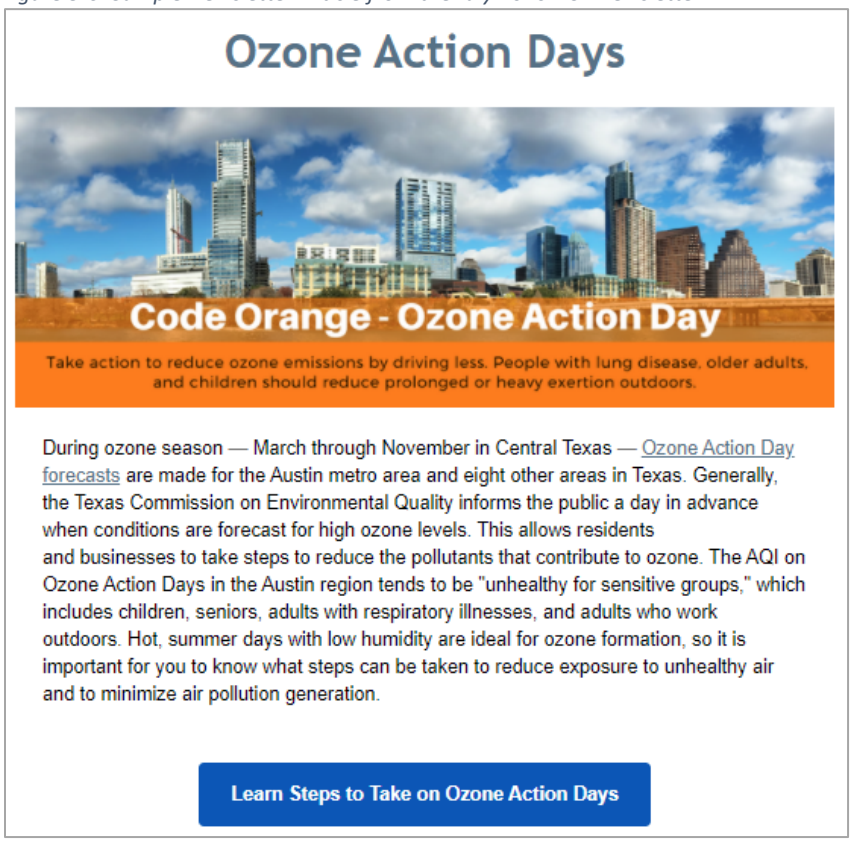
The ACT newsletter is CAPCOG's public facing air quality newsletter. It provides the public with relevant air quality news, events, tips, and AQI data. Table 3-10 shows the data associated with each newsletter. Figure 3-6 displays an example of an ACT newsletter article.

Table 3-10. Air Central Texas Monthly Newsletters Campaign Summary, 2020

Campaign Name	Send Date	Recipients	Opens	Clicks
March Air Central Texas Newsletter	3/11/2020	172	19.5%	21.9%

Campaign Name	Send Date	Recipients	Opens	Clicks
April Air Central Texas Newsletter	4/7/2020	111[33]	24.8%	22.2%
May Air Central Texas Newsletter	5/4/2020	115	19.1%	14.3%
June Air Central Texas Newsletter	6/1/2020	139	22.1%	20%
July Air Central Texas Newsletter	7/7/2020	141	23.4%	21.9%
August Air Central Texas Newsletter	8/3/2020	140	27%	40.5%
September Air Central Texas Newsletter	9/1/2020	142	23.9%	24.2%
October Air Central Texas Newsletter	10/1/2020	140	28.7%	7.7%
November Air Central Texas Newsletter	11/2/2020	143	23.8%	17.6%

Figure 3-6. Sample Newsletter Article from the July 2020 ACT Newsletter



3.1.5.1.2 Social Media

CAPCOG maintains an ACT Facebook account with 382 followers and a Twitter account with 150 followers. Figure 3-7 shows an example of a social media post. For 2020, the total impressions – the number of times a user saw a post – was 408,792 for social media.

[33] The difference in recipients between March and April 2020 was due to the removal of spam email addresses in the recipient list.

Figure 3-7. Air Central Texas Facebook Post Example

3.1.5.1.3 Advertising

Radio and digital ads were run in 2020 to promote ACT and air quality awareness. These ads are useful to reach people who are not active on social media or the internet. Radio ads were run on 4-5 radio stations per month, including one Spanish station (KLZT-FM). The ads were run from May through September, when air quality is expected to be the worst in the MSA. Table 3-7 displays the relevant ad data for the radio ads.

Table 3-7. 2020 ACT Radio Ad Results

Ad Theme	Radio Station	Commercials	Reach[34]	Frequency[35]	Impressions[36]
Air Quality Awareness Week	KLBJ-AM	20	58,800	1.9	110,500
	KBPA-FM	20	106,900	1.4	147,000
	KLZT-FM	20	44,600	1.7	78,000
	KUT-FM	12	86,000	1.4	122,400
	KUTX-FM	12	21,300	1.2	26,400
	KLBJ-AM	40	92,500	2.4	218,000

[34] Reach is the number of unique users that see or hear the ad.

[35] Frequency is the average number of times a user sees or hears the ad.

[36] Impressions are the total number of times a user saw or heard the ad.

Ad Theme	Radio Station	Commercials	Reach[34]	Frequency[35]	Impressions[36]
Vehicle Maintenance	KBPA-FM	20	103,500	1.4	143,000
	KLZT-FM	20	43,400	1.7	74,000
	KUT-FM	12	76,000	1.4	105,000
	KUTX-FM	12	19,700	1.3	25,200
Air Quality Index	KLBJ-AM	20	57,400	1.9	106,500
	KBPA-FM	40	181,100	1.6	284,000
	KLZT-FM	20	44,400	1.7	74,000
	KUT-FM	12	74,700	1.4	103,200
	KUTX-FM	12	20,100	1.3	26,400
Idling	KLBJ-AM	20	57,400	1.9	106,500
	KBPA-FM	5	32,300	1.1	34,800
	KLZT-FM	27	52,400	1.9	101,000
	KUT-FM	15	94,600	1.6	151,500
	KUTX-FM	15	24,900	1.5	37,500
General Air Quality	KLBJ-AM	0	0	0	0
	KBPA-FM	9	61,600	1.2	73,000
	KLZT-FM	13	33,000	1.4	34,600
	KUT-FM	6	51,600	1.2	43,900
	KUTX-FM	0	0	0	0
	Total	**402**	**1,438,200**	**1.42**	**2,226,400**

Additionally, ACT ran digital ads, which are ads on websites and Pandora. Pandora is a music streaming service that contains advertisements between songs. Table 3-8 displays the relevant ad data for the digital ads. Figure 3-8 displays an example of a digital ad for ACT.

Table 3-8. 2020 ACT Digital Ad Results

Ad Theme	Ad Display	Impressions
Air Quality Awareness Week	Website	84,298
Vehicle Maintenance	Website	323,991
Air Quality Index	Website	324,028
Idling	Website	187,006
General Air Quality	Website	159,388
Contest	Website	89,387
Vehicle Maintenance	Pandora	409,606
Idling	Pandora	270,394
Total	**n/a**	**1,848,098**

Figure 3-8. 2020 ACT Digital Ad Example

3.1.5.2 In-Person Outreach and Education and ACT Awards

In addition to electronic outreach, CAPCOG staff usually engages the public in-person at community events. However, due to the COVID-19 pandemic and stay-at-home orders, all planned in-person events were cancelled for 2020.

Despite in-person event cancellations, CAPCOG did recognize the annual Air Central Texas Awards. The 2020 ACT Awards were awarded at the CAC's virtual meeting on November 4, 2020.

Figure 3-9. 2020 ACT Awards Graphic

The winners of the 2020 Air Central Texas Awards were:

- Bill Gill Central Texas Air Quality Leadership Award - Travis County Judge Samuel Biscoe
    - Travis County Judge Samuel Biscoe received the 2020 Bill Gill Central Texas Air Quality Leadership Award for his long and distinguished record of leadership and advocacy for protecting Central Texas' air quality as a county judge and former CAC chair. Biscoe played a key role in ensuring that Travis County supported the region's air quality plans in order to maintain attainment of federal air quality standards. When the region came close to violating the federal air quality standards for ozone in 2009, Travis County, under Biscoe's leadership, developed "The Big Push" to educate the community and

ensure the county used the most effective measures to change daily activities contributing to high ozone days. Biscoe served as a served as CAC representative for more than 10 years in order to support the regional effort toward the improvement of air quality.

- The Air Central Texas Outstanding Organization Award – City of Austin's Transportation Demand Management (TDM) Program
    - Austin's Transportation Demand Management (TDM) Program received the 2020 Air Central Texas Outstanding Organization Award for its commitment to decreasing the drive alone rate within Austin to reduce the impact of transportation emissions on regional air quality. In 2020, the TDM program's public-facing Smart Trips Austin initiative expanded services city-wide to serve all Austinites by providing transportation information and personalized support in planning sustainable trips. Additionally, Smart Trips Austin launched a TDM resource website, GetThereATX.com. The site provides residents, employers, schools, and visitors with information about using sustainable modes of transportation to travel throughout Austin. For its own staff, the TDM program promotes the initiative, Commute Connections. In 2020, the program piloted the deployment of an electric bicycle (e-bike) fleet that allows employees to bike for mid-day trips instead of driving. The e-bikes have averaged 100 miles per month since the launch, and the pilot program inspired other Austin city departments to create their own e-bike fleet for employees. When the COVID-19 shut-downs occurred, the TDM program loaned the e-bikes to essential city workers who were still required to commute to work but had lost their sustainable commute option. The TDM Program demonstrates a continued and long-lasting commitment to improve environmental outcomes in the region.

3.1.6 Commute Solutions Program

The Commute Solutions program is the region-wide Travel Demand Management (TDM) program that promotes activities to increase the efficiency and use of existing roadways. This goal encouraging shifts from less efficient travel behaviors like, single occupant vehicle use, vehicle use during peak congestion hours, and travel on high-congestion roadways, to more efficient behaviors like, the use of public transit, carpools, vanpools, walking, biking, teleworking, alterative work schedules, and travel on less congested roadways. Due to the importance of these types of activities as part of the region's air quality plan, CAPCOG supported this program with funding by the Capital Area Metropolitan Planning Organization (CAMPO) in 2020. Apart from air quality, other benefits of the program and other TDM activities include:

- Improved regional mobility;
- Improved safety outcomes;
- Reduced fuel consumption;
- Reduced time wasted in traffic;
- Improved workforce and economic development outcomes;
- Improved public quality of life; and
- Reduced space needed to service the transportation system

The Commute Solutions website provides the public with information about Central Texas mobility options and encourages the public to shift from single occupant vehicle use to a more efficient mode. Additionally, the Commute Solutions program offers an Emergency Ride Home (ERH) Program to the entire CAPCOG region. The ERH Program provides sustainable commuters a free or reduced-cost emergency ride home from work.

In 2020, CAPCOG maintained the Commute Solutions website. The following graphs summarize the key statistics during this period. Due to the COVID-19 pandemic and stay-at-home orders, the Commute Solutions saw less visitors due to more people working from home.

Figure 3-10. Commute Solutions Website Traffic, 2020

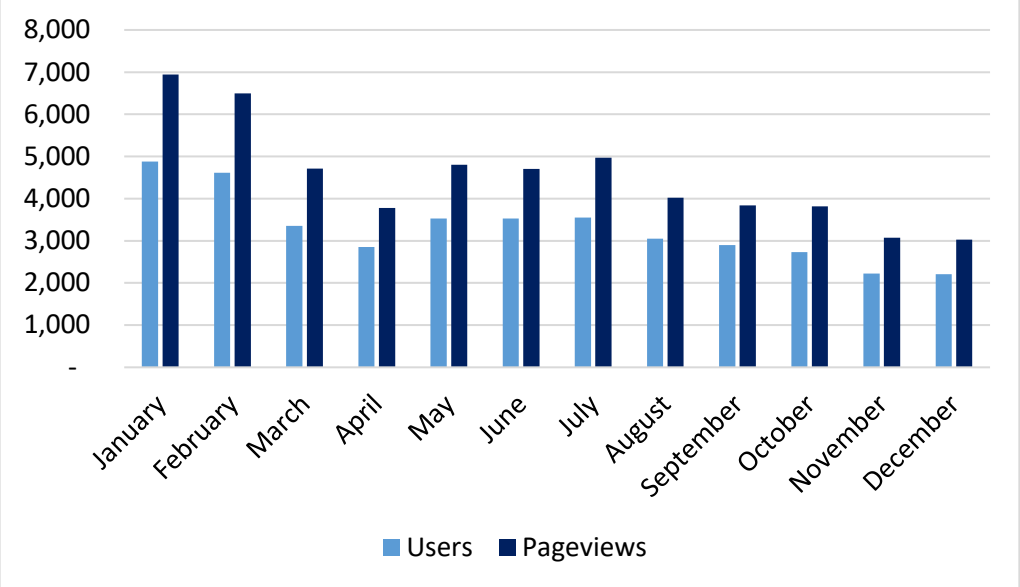
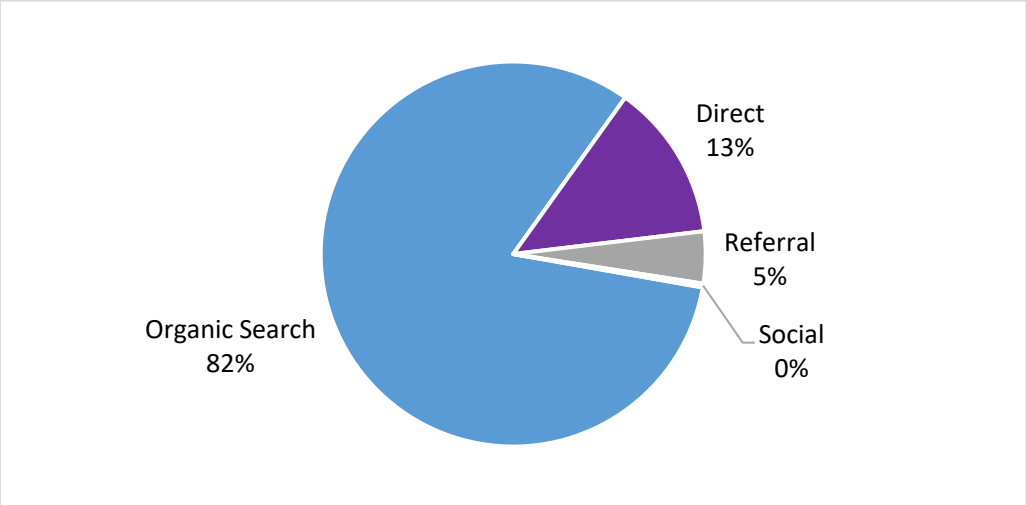


Figure 3-11. Commute Solutions Website Acquisition Method, 2020



The top Commute Solutions webpages viewed in 2020 are listed below.

Table 3-9. Top Commute Solutions Website Pages by Page Views, 2020

Page Rank	Page Title	Page Views
1	Commute Cost Calculator	39,826
2	Home Page	3,233
3	Flexible Work	1,875
4	Carpool	1,767
5	Seniors & Disabilities	1,767
6	Emergency Ride Home	1,059
7	Vanpool	980
8	Ride Guide	532
9	Telework	439

In addition to Commute Solutions, CAPCOG also maintained the myCommute Solutions platform which is a tool that allows users to log their commutes, find carpool to join, and look for commute options. The table below shows the program participation from the myCommuteSolutions.com platform over the 2020 calendar year. Due to the COVID-19 pandemic and stay-at-home orders, the teleworking mode dominated the trip entries for 2020 as more people worked from home than usual.

Table 3-10. myCommuteSolutions Data, 2020

Mode	Entries	Miles	NO_X Savings (grams/mile)	CO_2 Savings (grams/mile)	Dollar Savings
Bicycle	7,664	33,731	7,940	12,119,483	$19,091.64
Bus	17,583	225,049	52,976	80,859,976	$26,105.64
Carpool	12,495	247,197	29,095	44,421,251	$69,956.67
Compressed Schedule	2,552	45,697	10,757	16,418,863	$25,864.39
Drove Alone	7,041	123,561	0	0	$0.00
Stayed in the Office for Lunch	2,105	34,263	8,065	12,310,660	$19,392.80
Scooter Share	14	49	12	17,606	$27.73
Telework	93,840	1,453,986	342,268	522,417,190	$822,956.11
Train	2,761	45,816	10,785	16,461,769	$5,314.68
Vanpool	4,459	165,068	15,995	13,964,737	$77,746.94
Walk	4,577	4,251	1,001	1,527,238	$2,405.84
Total	**155,091**	**2,378,667**	**478,895**	**720,518,773**	**$1,068,862.45**

3.1.7 PACE Program

The PACE program provides an innovative mechanism for financing renewable energy and energy-efficiency improvements to industrial, commercial, multi-family residential, and non-profit buildings in participating jurisdictions. In order to address pay-back periods for energy efficiency and renewable energy (EE/RE) projects that may not align properly with a private property owner, the PACE program enables jurisdictions to put a property tax lien on a piece of property where an EE/RE improvement is

made using private financing until the loan for the project has been paid back. PACE is authorized under state law in Section 399 of the Texas Local Government Code Chapter 399.37 Projects include:

- HVAC modification or replacement;
- Light fixture modifications such as LED;
- Solar panels;
- High-efficiency windows or doors;
- Automated energy control systems;
- Insulation, caulking, weather-stripping or air sealing;
- Water-use efficiency improvements;
- Energy- or water-efficient manufacturing processes and/or equipment;
- Solar hot water;
- Gray water reuse; and
- Rainwater collection systems.

In 2020, Bastrop, Hays, Travis, and Williamson Counties participated in PACE. Travis County and Williamson County adopted PACE in 2016. Hays County adopted it in 2017. Lastly, Bastrop County adopted PACE on September 24, 2018. Therefore, Caldwell County is the only county in the MSA that does not participate in PACE.

As of June 8, 2021, nine of the thirty-three completed PACE projects in the state were in Bastrop, Hays, Travis, and Williamson Counties. Table 3-12 summarizes key data from the projects for each county[38]. For more information on PACE, visit http://www.texaspaceauthority.org/.

[37] http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.399.htm

[38] https://pace.harcresearch.org/

Table 3-12. PACE Project Summary for Austin-Round Rock-Georgetown MSA as of June 8, 2021

County	Projects	Investments	Jobs Created	CO_2 Reduced (tons/yr.)	SO_2 Reduced (tons/yr.)	NO_X Reduced (tons/yr.)	Water Saved (gallons/yr.)	Energy Saved (kWh/yr.)
Bastrop	1	$120,000	2	49	0.08	0.03	n/a	94,081
Hays	1	$1,800,000	10	429	0.23	0.72	3,139,000	824,903
Travis	5	$3,723,018	41	1,219	1.12	1.44	658,000	2,314,740
Williamson	2	$1,767,982	14	1,018	0.54	0.96	1,780,000	1,956,657
TOTAL	**9**	**$7,411,000**	**67**	**2,715**	**1.97**	**3.15**	**5,577,000**	**5,190,381**

3.2 Organization-Specific Measures and Updates

This section provides updates on measures implemented by CAC members. Supplemental electronic files provide detailed, measure-by-measure, organization-by-organization details. This section of the report provides an overview of these measures and a stand-alone section for Texas Lehigh Cement Company's NO_X emission reduction program. These measures are based on reports collected from CAC members in May and June 2021.

Organizations that provided a report to CAPCOG included:

1. Austin White Lime Company;
2. Bastrop County;
3. Caldwell County;
4. CAPCOG;
5. City of Austin;
6. City of Buda;
7. City of Cedar Park;
8. City of Kyle;
9. City of Lago Vista;
10. City of Lakeway;
11. City of Pflugerville;
12. City of Round Rock;
13. CLEAN Air Force;
14. Movability;
15. Lone Star Clean Fuels Alliance (LSCFA);
16. Lower Colorado River Authority (LCRA);
17. St. Edward's University;
18. TCEQ;
19. Texas Department of Transportation (TxDOT);
20. Texas Lehigh Cement Company;
21. Texas Parks and Wildlife Department (TPWD);
22. Travis County; and
23. Williamson County.

Organizations that did not report as of the date of this report included:

1. CAMPO;
2. CapMetro;
3. Central Texas Regional Mobility Authority (CTRMA);
4. City of Bastrop;
5. City of Bee Cave;
6. City of Elgin;

7. City of Hutto;
8. City of Georgetown;
9. City of Leander;
10. City of Lockhart;
11. City of Luling;
12. City of San Marcos;
13. City of Sunset Valley;
14. City of Taylor;
15. Hays County;
16. Huston-Tillotson University;
17. Federal Highway Administration;
18. Lone Star Chapter of the Sierra Club; and
19. Public Citizen

3.2.1 Emission Reduction Measures

CAC members reported on their implementation of Tier 1 and 2 emissions reduction measures in 2020. A summary of the number of organizations that implemented each measure is listed below. Organization-specific information is available in the Appendix.

- Tier 1
    - Educating employees about regional air quality and encouraging them to sign up for daily air quality forecasts and Ozone Action Day alerts = 10 organizations
    - Where feasible, encourage employees to telecommute at least once a week and on all Ozone Action Days = 15 organizations
    - When employees are not telecommuting, encourage them to take low-emission modes of transportation, such as carpooling, vanpooling, transit, biking, and walking = 12 organizations
    - Where flexible schedules are allowed, encourage employees to consider work schedules with start times earlier than 8 am rather than later in the morning due to the higher impact of emissions on O_3 levels later in the morning = 14 organizations
    - Conserve energy, particularly on Ozone Action Days = 14 organizations
    - Establish and enforce idling restriction policies for use of organization's vehicles, equipment, and property = 8 organizations
    - Establish fleet management policies that prioritize the use of vehicles and equipment with low NO_X rates = 7 organizations
    - Educate fleet users on driving and equipment operation practices that can reduce NO_X emissions = 8 organizations
    - Reschedule discretionary emission-generating activities such as engine testing and refueling to late afternoon rather than the morning, particularly on Ozone Action Days = 7 organizations

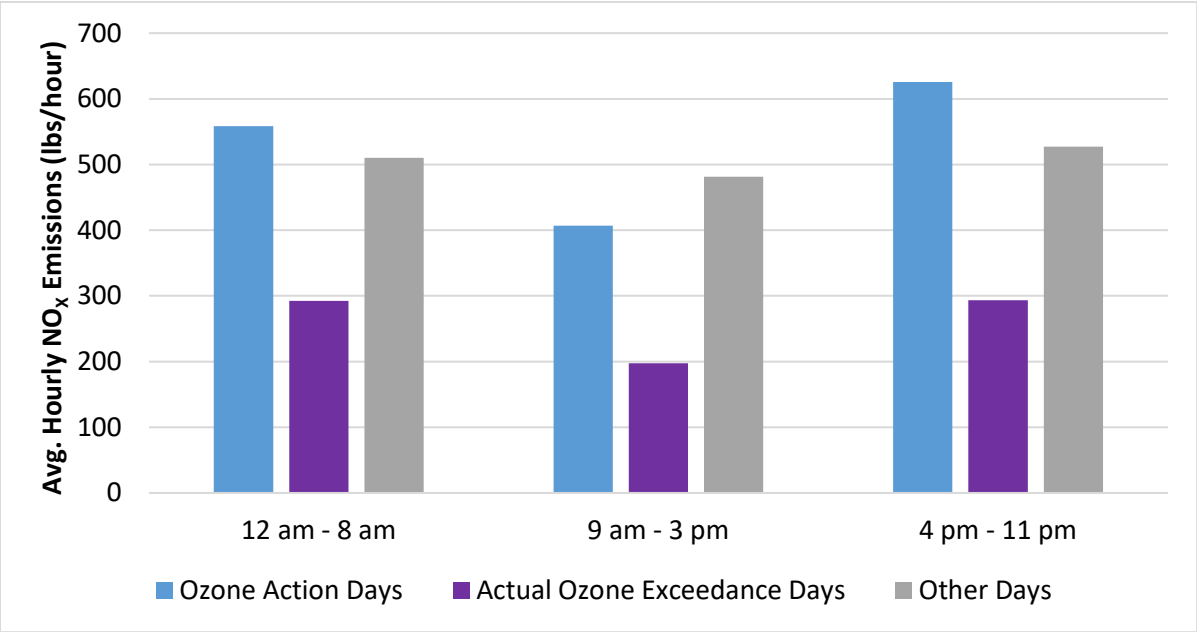
    - Seek funding to accelerate replacement of older, higher-emitting vehicles and equipment with newer, cleaner vehicles and equipment, such as Texas Emission Reduction Plan (TERP) grants = 7 organizations
- Tier 2
    - Establish low-NO_X purchasing policies for new on-road vehicles, non-road equipment, and stationary equipment = 4 organizations
    - Establish "green" contracting policies to encourage the use of low-NO_X vehicles and equipment and avoid the use of engines during the morning on Ozone Action Days = 0 organizations
    - Purchase higher-grade gasoline with lower sulfur content in August and September = 2 organizations
    - Provide incentives to employees to avoid single-occupancy vehicle commuting, particularly on Ozone Action Days = 2 organizations
    - Optimize combustion and pollution controls for NO_X reductions, particularly on Ozone Action Days = 1 organizations
    - Enforce vehicle idling restrictions within the community [either through an ordinance if a city or a memorandum of agreement with TCEQ if a county] = 4 organizations
    - Educating the public about regional air quality and encouraging them to sign up for daily air quality forecasts and Ozone Action day alerts = 14 organizations

If these organizations provide data subsequent to this report, CAPCOG will provide an updated version of this report.

3.2.2 Texas Lehigh Cement Company

The Texas Lehigh Cement Company in Buda (Hays County) voluntarily implements a NO_X emission reduction program on days when TCEQ forecasts "moderate" or higher O_3 levels in the region. The facility, which is the largest point source of NO_X emissions within the Austin-Round Rock-Georgetown MSA, is equipped with a selective non-catalytic reduction system that it operates as needed to maintain compliance with permit requirements. On days when TCEQ predicts that O_3 levels in the region will be "moderate" or higher, Texas Lehigh will increase the NO_X reduction efficiency of the system between the key hours of 9 am – 3 pm. Prior modeling has shown that 9 am – 3 pm are the most important hours for the facility to reduce NO_X emissions in order to reduce its contribution to high O_3 levels within the region. Previous annual reports illustrate the NO_x reductions that can be achieved on high forecasted O_3 days. Also, a 2015 report by CAPCOG showed that this measure could reduce peak 8-hour O_3 concentrations at regional O_3 monitors by as much as 0.7-0.8 ppb in some locations. Texas Lehigh provided their hourly NO_x data for 2020. The Texas Lehigh data for OADs and O_3 exceedances indicates that this NO_x reduction measure was implemented on these key days, as the average NO_x emissions are lower than the "other" days. The average for the "other" days also includes days with a "moderate" O_3 forecast, which explains why the average hourly emissions from 9 am – 3 pm was lower than the other hours for that category.

Figure 3-12. Hourly NO_X Emissions at Texas Lehigh on OADs and Actual O_3 Exceedance Days Compared to Other Days, 2020



3.2.3 Idling Restrictions

The following jurisdictions implement idling restrictions, either with a local ordinance, through a memorandum of agreement (MOA) with TCEQ, or both. In 2018, a number of the TCEQ MOA's expired, and the following jurisdictions chose not to renew the MOA – City of Austin, City of Buda, and City of Georgetown.

Table 3-13. Jurisdictions Implementing Idling Restrictions in the Austin-Round Rock-Georgetown MSA, 2020

Jurisdiction	Local Ordinance	TCEQ MOA
City of Austin	☒	☐
City of Bastrop	☒	☐
City of Elgin	☒	☐
City of Georgetown	☒	☐
City of Hutto	☒	☐
City of Lockhart	☒	☐
City of Round Rock	☒	☐
City of San Marcos	☒	☐
Bastrop County	☐	☒
Travis County	☐	☒

These idling restrictions are "passive" controls in that the jurisdictions will respond to complaints when they are made, but they don't devote dedicated resources to idling restriction enforcement.

3.2.4 CapMetro Bus Electrification Initiative

As part of its long-term planning efforts, CapMetro has begun the process of converting significant portions of its fleet from diesel to electric. In 2020, CapMetro deployed the first twelve battery electric

buses, that source their electricity from clean solar and wind energy. More buses are planned for deployment in the next few years. Additionally, CapMetro is constructing a new bus yard in North Austin that will have the capacity to accommodate 214 buses and support charging for 187 battery electric buses. Beginning 2022, CapMetro exclusively will purchase electric buses for fleet replacement.[39]

3.2.5 2020 Update to Austin Energy's Generation Plan

Austin Energy periodically updates is Resource, Generation, and Climate Protection Plan, and completed its most recent update on March 9, 2020.[40] Since Austin Energy both owns generating assets and serves as a retail provider of electricity, its generation plan is a significant part of the region's efforts to control air pollution. Highlights of the 2020 update include the following:

- **Continuation of Plan to Shut Down Decker Steam Units in in 2020 and 2021**: Austin Energy reiterated in its plan to shut down Decker Power Plant's gas-powered steam unit 1 after the 2020 summer peak and steam unit 2 after the 2021 summer peak. Due to its location and high NO_X emissions on high O_3 days (see Section 2.4), despite load-shifting that would be expected to occur that would result in higher output at other fossil-fuel plants in the Electric Reliability Council of Texas (ERCOT) grid, these actions would be expected to significantly reduce peak O_3 concentrations in the next few years.
- **Continuation of target to Shut Down of Austin Energy Share of Fayette Power Project by end of 2022**: Austin Energy also reiterated its target to cease operation of Austin Energy's portion of the Fayette Power Project (FPP) coal plant by the end of 2022 and is recommending that City Council establishes cash reserves that would be necessary to provide for that schedule. Austin Energy owns a 50% stake in two of the three units at FPP, with LCRA owning the other 50% stakes in those units and a 100% stake in the third unit. While FPP is outside of the Austin-Round Rock-Georgetown MSA, such an action would be expected to reduce background O_3 concentrations coming into the region when winds blow from that direction.
- **"REACH" for Carbon-Free by 2035**: Austin Energy will adopt a new market-based approach to accelerate reduction of carbon emissions by its legacy generators in the most economic manner available. This approach, known as "Reduce Emissions Affordably for Climate Change" (REACH) will incorporate a cost of carbon in the generation dispatch price, thereby allowing Austin Energy to reduce generation output during low-margin periods but keep the resources available for high-margin periods. Since this approach will be expected to have the effect of reducing the dispatch of Austin Energy's fossil fuel generating assets within the region, it should also reduce emissions of all other pollutants from these facilities as well.
- **Local Solar Resources**: Austin Energy plants to achieve a total of 375 megawatts (MW) of local solar capacity by the end of 2030, of which 200 MW will be customer-sited. They will also continue a shared solar pilot program for multi-family housing and, upon development of an automated electronic billing system, allow for expansion of the program.

[39] https://capmetro.org/electricbus

[40] https://austinenergy.com/wcm/connect/6dd1c1c7-77e4-43e4-8789-838eb9f0790d/gen-res-climate-prot-plan-2030.pdf?MOD=AJPERES&CVID=n85G1po

- **Energy Efficiency and Demand Response**: Austin Energy will continue to sponsor energy efficiency and demand response initiatives aimed at reducing overall system load and peak demand as follows:
    - Achieve energy efficiency savings equal to at least 1% per year of retail sales, targeting at least 1,200 MW of demand-side management capacity by 2030, including a target of 225 MW of economic peak demand response capacity by 2030;
    - Target serving at least 25,000 residential and business customer participants per year for all programs (Energy Efficiency, Austin Energy Green Building, Demand Response, and Solar) with at least 25% of those customers being limited-income customers.
    - Commit to achieving 30 MW of local thermal storage by 2027 and 40 MW of local thermal storage by 2030.
    - Allow near-real time access to hourly energy use data for Austin Energy customers via automated meter infrastructure, including compatibility with Green Button products and services.
    - Continue to move forward on energy code and green building development, including assessing the 2021 International Energy Conservation code, and specific solar-ready, EV-ready, electric building-ready and net-zero requirements for commercial and residential construction for possible adoption in future codes.
- **Support Electric Transportation**: Austin Energy will be supporting the transition to increased electric vehicle usage within the region, including supporting public-private partnerships that promote, market, and provide electric vehicle support; support the City of Austin's Fleet Services electrification plan; and evaluate equitable growth of public and private charging station deployments by offering rebates, operational support, outreach, and special public charging rates that include support for limited-income populations.
- **Transmission Study**: Starting in 2020, Austin Energy will conduct a transmission study to assess the costs, benefits, technical and asset requirements of upgrading transmission resources to allow for the retirement of Austin Energy's existing natural gas generators as early as 2027, 2030, or as per the schedule set forth in the 2030 plan. Austin Energy will also consider the viability of large-scale energy storage units and local solar installations within the Austin Energy load-zone to mitigate transmission requirements and exposure to peak electric market risks.

3.2.6 Other Notable Distinctions for Local Communities

This section identifies a number of other distinctions that local communities have received for air quality, climate change, and energy efficiency.

- American Council for an Energy-Efficient Economy (ACEEE) City Clean Energy Scorecard:
    - ACEEE scores 75 US cities on their efforts to achieve a clean energy future by improving energy efficiency and scaling up renewable energy.
    - In 2020, the City of Austin ranked 12th out of all the national cities that were evaluated: https://www.aceee.org/local-policy/city-scorecard
- Bloomberg American Cities Climate Challenge

  - The Bloomberg American Cities Climate Challenge is a $70 million-dollar program that accelerates 25 cities' efforts to tackle climate change and promote a sustainable future for residents.
  - In 2019, the City of Austin won the challenge. Over two years, Austin will be provided with powerful new resources and access to cutting-edge support to help meet or beat its near-term carbon reduction goals: https://www.bloomberg.org/program/environment/climatechallenge/#overview
- STAR Communities:
  - The STAR Community Rating System provides a comprehensive framework and certification program for evaluating local sustainability, encompassing economic, environmental, and social performance measures since its release in 2012.
  - City of Austin is a 4-Star Certified Community, the highest rating of any city in Texas, receiving this designation in 2014: https://reporting.starcommunities.org/communities/5-austin-texas
- SolSmart:
  - Recognizes cities, counties, and regional organizations for making it faster, easier, and more affordable to go solar.
  - The City of Austin is designated as a "Gold"-level designee and the City of Smithville (in Bastrop County) is designated as a "Bronze"-level designate: http://www.solsmart.org/our-communities/designee-map/
- Climate Mayors:
  - A bipartisan, peer-to-peer network of U.S. mayors working to demonstrate leadership on climate change through meaningful actions in their communities.
  - City of Austin, City of San Marcos, City of Manor, and City of Smithville are all members: http://climatemayors.org/about/members/
  - City of Austin also participates in a collaborative electric vehicle purchasing initiative through the Climate Mayors: https://driveevfleets.org/what-is-the-collaborative/

4 Ongoing Planning Activities

This section documents notable air quality planning milestones and activities completed in 2020.

4.1 Clean Air Coalition Meetings

During 2020, there were a total of four Clean Air Coalition meetings:

- February 12, 2020
- June 24, 2020
- August 12, 2020
- November 4, 2020

Significant policy-related actions taken by the CAC in 2020 included:

- A comment letter to TCEQ regarding TCEQ's 2019 5-Year Monitoring Network Assessment

- Formal participation in EPA's Advance Program for $PM_{2.5}$
- A comment letter on EPA's proposed revisions to the Cross-State Air Pollution Rule (CSAPR)

The Clean Air Coalition Advisory Committee (CACAC) met four times:

- January 30, 2020
- June 10, 2020
- July 30, 2020
- October 26, 2020

The CACAC Outreach and Education Subcommittee met twice in 2020:

- July 9, 2020
- September 8, 2020

4.2 Participation in EPA's Advance Program for PM

At the CAC's August 12, 2020 meeting, the CAC voted to participate in EPA's Particulate Matter (PM) Advance Program. EPA's Advance Program promotes local actions in "attainment" areas to reduce O_3 and/or $PM_{2.5}$ to help these areas continue to maintain the NAAQS by encouraging and supporting states, tribes, and local governments that want to take proactive steps to keep their air clean.[41] While the CAC has participated in the O_3 Advance Program for years, the CAC decided also to participate in the PM Advance Program due to the region's PM levels. As a result of the PM Advance Participation, CAPCOG held multiple CACAC PM Subcommittee meetings to guide the incorporation of PM into the Regional Air Quality Plan. This work continued into 2021. The CACAC PM Subcommittee met on:

- September 8, 2020
- October 8, 2020
- December 15, 2020
- January 19, 2021

4.3 LSCFA

The LSCFA held a number of meetings and workshops throughout 2020.
Board Meetings:

- January 8, 2020
- April 8, 2020
- July 8, 2020
- October 14, 2020

Workshops:

- The Next Big Thing for your Fleet - Electric Shuttles & Trucks Webinar Series held on June 17, 2020, June 24, 2020, July 1, 2020, and July 8, 2020
- Virtual Site Visit to Hyliion on September 24, 2020

[41] For more information, go to: https://www.epa.gov/advance/basic-information-about-advance

- Virtual Visit to Georgetown ISD and Propane School Bus Roundtable on October 7, 2020

4.4 Statewide Collaborative Initiatives

CAPCOG participates in several statewide air quality-related initiatives in 2020, which are listed below.

4.4.1 Texas Clean Air Working Group

CAPCOG participated in Texas Clean Air Working Group (TCAWG) meetings in 2020, as well as a TCAWG Near-Nonattainment Criteria Subcommittee and a TCAWG Idle Reduction Subcommittee.

- General TCAWG Meetings:
  - January 22, 2020
  - April 28, 2020
- TCAWG Near-Nonattainment Criteria Subcommittee Meetings:
  - January 31, 2020
  - March 9, 2020
- TCAWG Idling Subcommittee Meeting:
  - March 5, 2020

4.4.2 Technical Working Group for Mobile Source Emissions

CAPCOG participated in the Technical Working Group for Mobile Source Emissions (TWG) meetings in 2020. The TWG meets to discuss Texas transportation issues regarding on-road mobile source emission inventories and transportation policy. CAPCOG attended the meetings on the following dates:

- June 4, 2020
- September 3, 2020

4.5 Regional Air Quality Technical Research Activities

CAPCOG completed a number of air quality technical research activities in 2020 including:

- 2019 Austin-Round Rock-Georgetown MSA Air Quality Report
- Monitoring projects:
  - Continued O_3 and meteorological data collection at eight CAPCOG-owned monitoring stations in the region to supplement the two TCEQ O_3 monitors in the region
  - Installation of a $PM_{2.5}$ PurpleAir sensor at the Bastrop monitoring site (CAMS 1612)
  - 2020 Air Quality Monitoring Report
- Modeling and data analysis projects:
  - 2019 Air Quality Monitoring Data Analysis
  - Analysis of Potential Impacts of COVID-19 Crisis on Regional Air Quality

Reports and data from these projects can be found at https://www.capcog.org/documents/.

5 PLANNING FOR THE FUTURE

This section details some important issues to note for the region's air quality plan moving forward, including new issues that have arisen between the end of 2020 and the completion of this report.

5.1 EPA RETAINS EXISTING NAAQS FOR O_3 AND $PM_{2.5}$ AND FUTURE RECONSIDERATIONS

On December 7, 2020, EPA decided to retain the existing primary and secondary PM NAAQS[42], and on December 23, 2020, the EPA decided to retain the existing primary and secondary O_3 NAAQS[43].

EPA's Integrated Science Assessments for O_3 and PM resulted in a downgrading of the health effects associated with O_3 (particularly mortality), and an upgrading of the health effects associated with PM (particularly cancer). In both cases, the lack of a clear threshold below which there are no health effects suggests that the Austin-Round Rock-Georgetown MSA will continue to benefit from ongoing emission reductions even with the area's design value in attainment of the O_3 and PM NAAQS.

Despite the retainment of the PM and O_3 NAAQS in 2020, on January 20, 2021, the Biden administration tasked the EPA to review the NAAQS decisions for PM and O_3[44]. As a result, on June 10, 2021, EPA announced that it will reconsider the previous administration's decision to retain the PM NAAQS. According to EPA, "available scientific evidence and technical information indicate that the current standards may not be adequate to protect public health and welfare, as required by the Clean Air Act."[45] EPA is aiming to make a proposal in Summer 2022 with finalization in 2023. Assuming EPA revises the PM NAAQS, the designation process would go from 2023 – 2025.

During the PM NAAQS review in 2019, EPA staff recommended consideration of a more stringent annual $PM_{2.5}$ NAAQS in the range of 8.0 – 11.9 µg/m^3. Although, the former EPA Administrator chose not to propose a more stringent NAAQS. The decision by the former Administrator not to propose a more stringent PM NAAQS, despite staff recommendations, could support a reconsideration of the decision for the new administration. Since the Austin area's annual $PM_{2.5}$ design value is 9.6 µg/m^3, a more stringent NAAQS in the range proposed by EPA staff would potentially put the Austin area at a much higher risk of a nonattainment designation for the PM NAAQS than for the O_3 NAAQS.

5.2 RIDER 7 GRANT PROGRAM

The "Rider 7 Grant Program" refers to Rider 7 to the TCEQ's budget, which directs the agency to award $4.5 million in grants for local/regional air quality planning in "near-nonattainment areas" for O_3-related

[42] https://www.govinfo.gov/content/pkg/FR-2020-12-18/pdf/2020-27125.pdf

[43] https://www.govinfo.gov/content/pkg/FR-2020-12-31/pdf/2020-28871.pdf

[44] https://www.whitehouse.gov/briefing-room/statements-releases/2021/01/20/fact-sheet-list-of-agency-actions-for-review/

[45] https://www.epa.gov/newsreleases/epa-reexamine-health-standards-harmful-soot-previous-administration-left-unchanged

monitoring and emissions inventory research. For the 2020-2021 biennium, CAPCOG received $281,250 in grant funding for the Austin area. However, due to a change in the Rider for the 2022-2023 biennium, CAPCOG expects funding will increase to approximately $750,000 - $1,550,000. Existing funding corresponded closely to the cost of operating CAPCOG's eight O_3 monitoring stations, so CAPCOG will need to consider what kind of monitoring and emissions inventory projects to pursue over the next two years to use this funding.

5.3 Texas Emission Reduction Plan

As mentioned in Section 3.1.2, the Legislature passed landmark TERP legislation in 2019 (HB 3745) in that is intended address the continued growth of the TERP account due to under-appropriation of funds for grants ($155 million for 2020-2021) relative to the revenues collected (over $550 million for the 2020-2021 biennium), which has resulted in a fund balance approaching $2 billion that has accumulated since 2001. The legislation extended all TERP revenue provisions until all areas of the state are designated "attainment" for all O_3 NAAQS. This would coincide with when the authorization for awarding grants would end, would establish a new "TERP Fund" that would receive all TERP revenue collected after August 31, 2021, and enable TCEQ to award funds out of the fund without needing to go through the appropriations process. This change is expected to dramatically increase the amount of funding available for the TERP program starting in FY 2022.

5.4 TxVEMP

In 2021, TCEQ continued the Refuse Vehicle grants and Freight & Port Drayage Vehicle grants. As of June 5, 2021, the Refuse Vehicle grants program had awarded $1,225,993.00 of the $3,895,870.70 requested out of the $4,074,400.50 available for the Austin area.[46] As of June 5, 2021, the Freight & Port Drayage Vehicle grants program had awarded $304,146.00 of the $1,563,306.00 requested out of the $3,259,521.00 available for the Austin area.[47] On September 10, 2020, TCEQ announced the opening of the Level 2 Charging Equipment for Light-Duty Zero Emission Vehicles grants. This grant continued into 2021, and it is still open as of June 9, 2021. As of June 5, 2021, $1,795,000.00 had been requested from the MSA for the Level 2 Charging Equipment for Light-Duty Zero Emission Vehicles grants.[48]

5.5 Transition of Commute Solutions Program to CAMPO

In February 2020, CAPCOG and CAMPO entered into an agreement to transfer the Commute Solutions program to CAMPO. This followed the CAMPO board's decision to award approximately $500,000 in Surface Transportation Block Grant funding to CAMPO for a regional TDM program from 2020-2022, and to provide funding to CAPCOG to continue managing the Commute Solutions website and

[46] https://www.tceq.texas.gov/assets/public/implementation/air/terp/VW/refuse-status-6-5-21.pdf

[47] https://www.tceq.texas.gov/assets/public/implementation/air/terp/VW/freight-status-6-5-21.pdf

[48] https://www.tceq.texas.gov/assets/public/implementation/air/terp/VW/level2-status-6-5-21.pdf and https://www.tceq.texas.gov/assets/public/implementation/air/terp/VW/levl2-apps-by-county-6-5-21.pdf

myCommuteSolutions.com platform until the transition takes place. CAPCOG is currently working with CAMPO to transition the program by August 1, 2021.

5.6 Air Quality Study Related to Transportation and COVID-19

CAPCOG and City of Austin staff are working on conducting a study evaluating the air quality impacts of changes in transportation behavior connected to the COVID-19 pandemic in 2020. The study has three tasks:

1. Extended Analysis of On-Road Activity and Air Pollution Data Potentially Affected by COVIID-19 Behavior Change
2. Estimate the Impact of Increased Telecommuting Related to COVID-19 on On-Road Emissions
3. Model the Ambient Air Quality Impact of Reductions in On-Road Emissions Related to COVID-19

The study will be finalized at the end of August 2021.

6 CONCLUSION

Ozone levels in the Austin metro area were better in 2020 than in 2019. Also, particulate matter levels were lower in 2020 than in 2019. Since the region's primary O_3 monitor was offline for the majority of the year, the region's O_3 levels appear better than they probably were for 2020. The region's emission reductions continued to be implemented. While emissions from regional power plants on average were similar from May 1, 2020 – September 30, 2020, to 2019, they were substantially higher on the top 4 days that affected the region's design value calculation. With Austin Energy continuing to plan to shut down the Decker Creek Power Plant's two boiler units from late 2020 to late 2021, emissions from power plants should be lower in 2021 and 2022.

Moving forward, a number of steps taken at the state and regional level in 2020 and 2021 will help control air pollution levels within the region over the next few years.

- The CAC implemented measures committed to in the 2019-2023 Austin-Round Rock-Georgetown MSA Regional Air Quality Plan;
- The CAC joined EPA's PM Advance Program to incorporate PM emissions and education into the Regional Air Quality Plan; and
- TCEQ awarded more than $15 million in TERP grants and TxVEMP grants to the Austin area in 2019 and 2020, which will reduce over 700 tons of NO_X emissions over the next 4-7 years.

7 APPENDIX

CAC members reported on their implementation of Tier 1 and 2 emissions reduction measures in 2020. Organization-specific measures and information that were implemented is provided in this Appendix as an Excel workbook. To view the Excel workbook, click on the paperclip icon below.