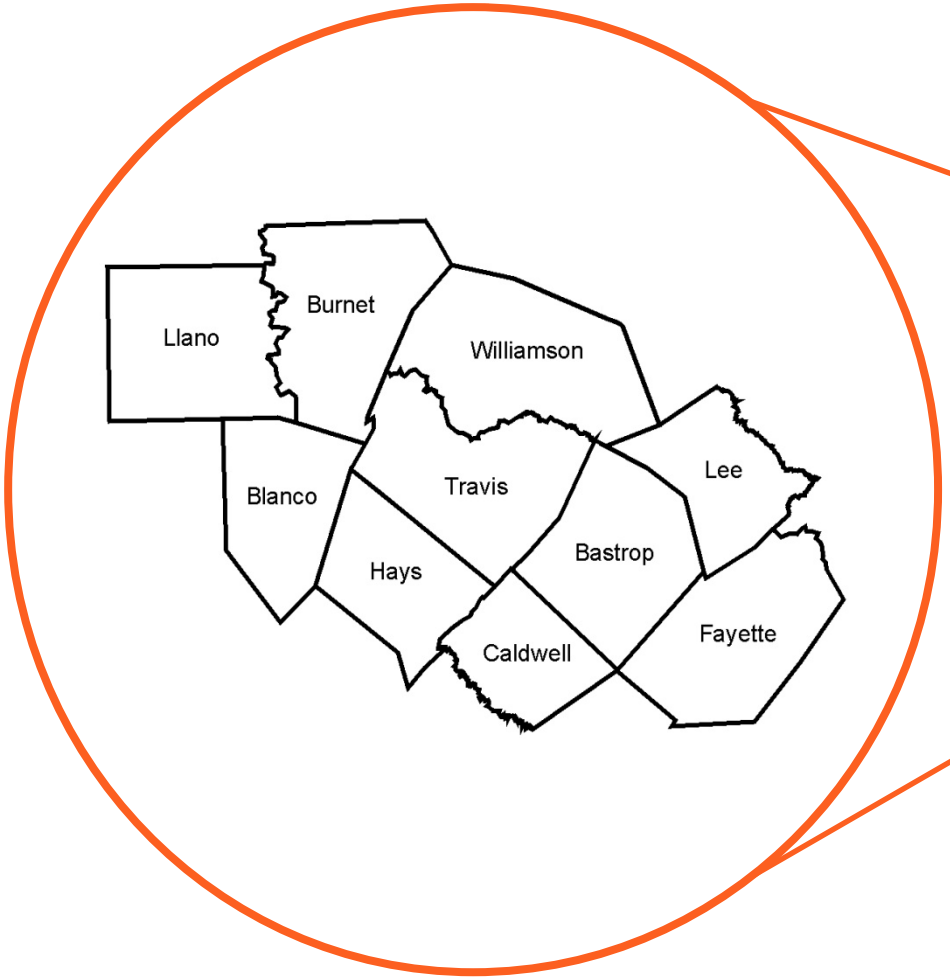
PARTICULATE MATTER AND EMISSION REDUCTIONS

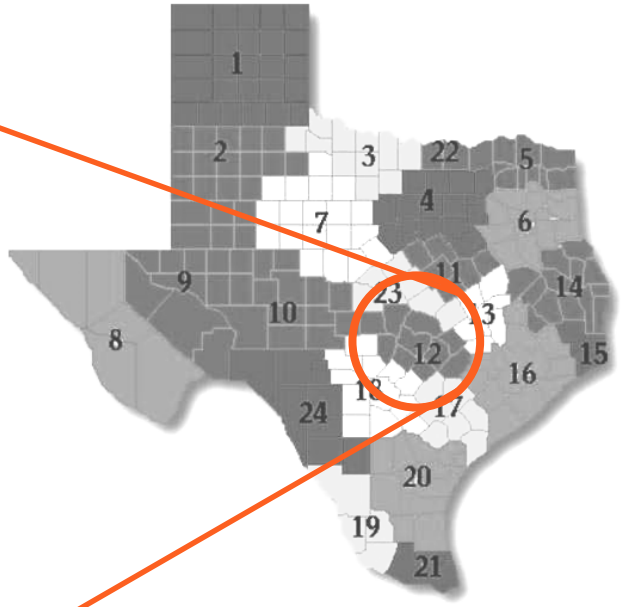
City of Austin
Joint Sustainability Committee
April 28, 2021

CAPCOG – Regional Planning Commission in Statute; more often called a COG.

- Emergency Communications 9-1-1
- Area Agency on Aging/Aging & Disability Resource Center
- Homeland Security Planning & Training
- Regional Law Enforcement Academy
- Air Quality Planning
- Solid Waste Planning
- Economic Development Analysis & Technical Assistance
- Transportation Planning

Ten – county service area; State of Texas planning region 12





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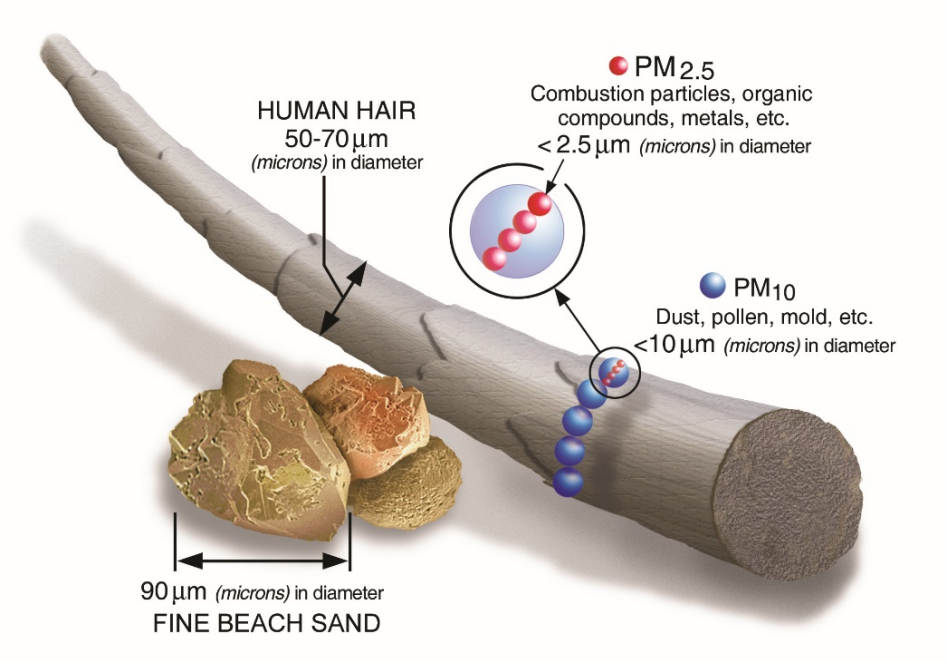
What is particulate matter?

- PM stands for particulate matter (also called particle pollution): the term for a mixture of solid particles and liquid droplets found in the air.
- PM includes:
  - PM_{10}/"Coarse PM": inhalable particles, with diameters that are generally 10 micrometers and smaller
  - **$PM_{2.5}$/"Fine PM": fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller**



Source: EPA, https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#PM

$PM_{2.5}$ Pollution

- $PM_{2.5}$ is both a primary pollutant (i.e., directly emitted from different sources) and a secondary pollutant (i.e., formed in the atmosphere through chemical reactions and processes from other direct emissions).
- Sources of $PM_{2.5}$ include:
  - Crustal $PM_{2.5}$ – particles from dust/soil
  - Elemental carbon (EC) $PM_{2.5}$ – particles that contain the elemental form of carbon (i.e., graphite)
  - Organic carbon (OC) $PM_{2.5}$ – particles that contain organic molecules (hydrocarbons)
  - Sulfate $PM_{2.5}$ – particles that contain SO_4 molecules
  - Nitrate $PM_{2.5}$ – particles that contain NO_3 molecules
  - Ammonium $PM_{2.5}$ – particles that contain NH_4 molecules
- The type of $PM_{2.5}$ that appears to be contributing the most to the highest levels of annual $PM_{2.5}$ concentrations within the region is <u>organic carbon $PM_{2.5}$</u>
  - **Reducing organic carbon $PM_{2.5}$ emissions would be the most important step that the region can take towards reducing the highest annual $PM_{2.5}$ concentrations, which are located in the urban core.**

Health Effects of PM Pollution

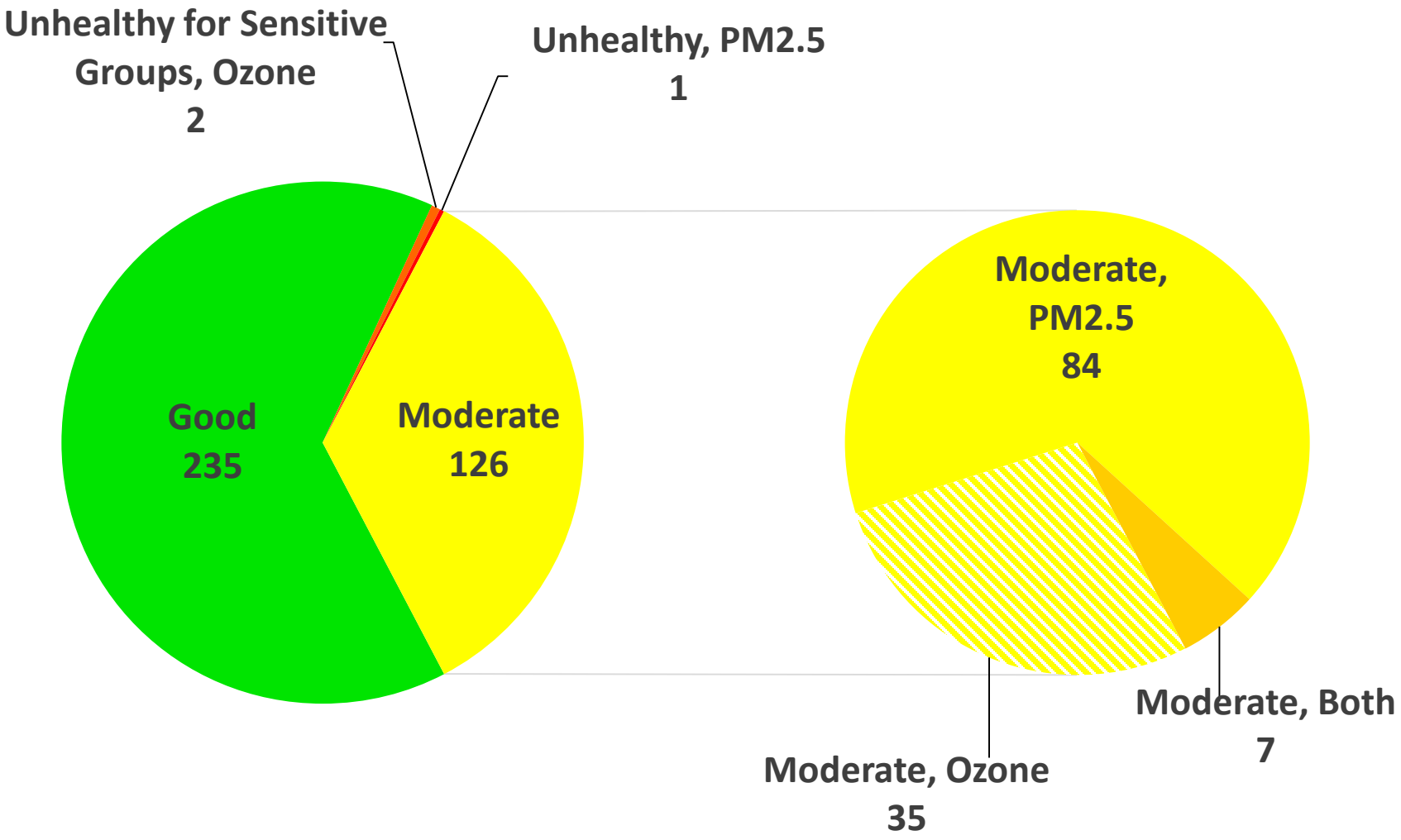
- $PM_{2.5}$ is small enough to penetrate and harm numerous body systems. EPA's review of PM health studies have indicated "causal" or "likely causal" relationships between short-term and/or long term exposure to $PM_{2.5}$ and the following health effects:
  - Premature death
  - Lung cancer
  - Cardiovascular effects
  - Nervous system effects
  - Respiratory effects
- EPA's review also indicated that there is no evidence of a threshold below which further reductions to $PM_{2.5}$ exposure would not continue to decrease risks.
  - **This means that there are public health benefits of reducing both long-term and short-term exposure to $PM_{2.5}$ even if an area is attaining the $PM_{2.5}$ NAAQS.**

Source: EPA. Integrated Science Assessment for Particulate Matter. December 2019. EPA/600/R-19/188, http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=539935

Sensitive Groups to PM Pollution

- Groups that are most likely to be affected by $PM_{2.5}$ pollution exposure are:
  - People with heart or lung diseases
  - Children and teenagers
  - Older adults
- These groups are known as sensitive groups.
  - Comprise at least 40% of the population in the MSA
- Additionally, people of color and people with low incomes tend to have disproportionate exposure to high $PM_{2.5}$ levels.

Austin Area 2020 Air Quality Index (AQI) Days



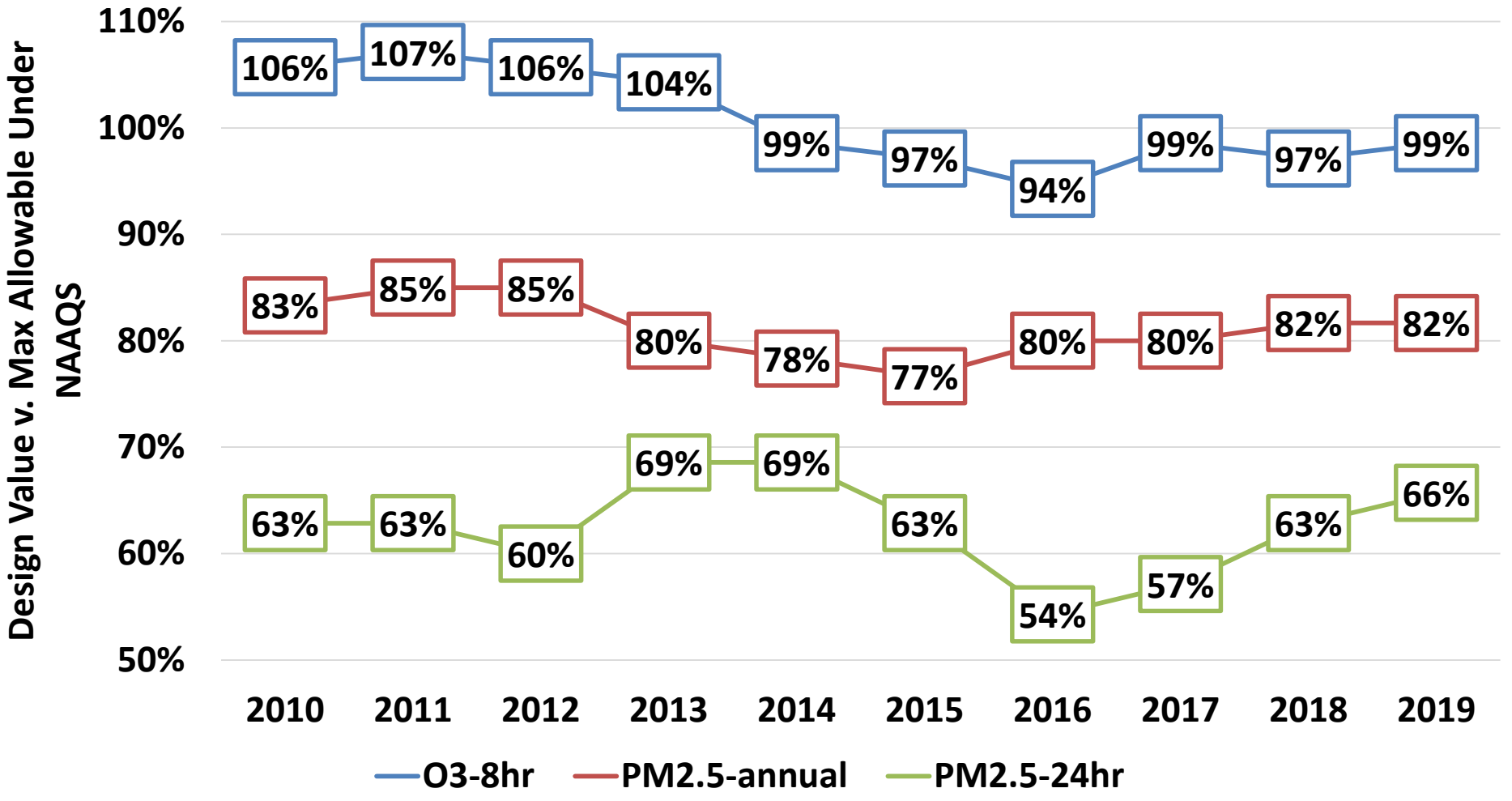
National Ambient Air Quality Standards (NAAQS)

- The Clean Air Act requires EPA to set national ambient air quality standards (NAAQS) for particulate matter and five other pollutants considered harmful to public health and the environment (the other pollutants are ozone, nitrogen oxides, carbon monoxide, sulfur dioxide and lead).
- The law also requires EPA to periodically review the standards to ensure that they provide adequate health and environmental protection, and to update those standards as necessary.
- When comparing a region's pollution levels to the NAAQS, the concentrations are referred to as "design values" and are usually based on 3 years' worth of data, (i.e., 2018-2020)
- EPA just completed its review of the PM and O_3 NAAQS in late 2020.

PM NAAQS

- 2020 $PM_{2.5}$ NAAQS review:
  - Kept short-term (24-hour) NAAQS of ≤ 35 µg/m^3
  - Kept long-term (annual) design value of ≤ 12.0 µg/m^3
  - **EPA staff recommended an annual NAAQS as low as 8 µg/m^3**
- Austin-Round Rock-Georgetown MSA:
  - 24-hour design value of 23 µg/m^3
  - **Annual design value of 9.8 µg/m^3**
  - Relative to the rest of the country:
    - Higher annual design value than 89% of all $PM_{2.5}$ monitoring stations
    - Higher 24-hour design value than 76% of all $PM_{2.5}$ monitoring stations
    - Compared to O_3 design value 75% higher than the rest of the country for O_3

Air Quality Trends – O_3 v. $PM_{2.5}$



Largest Sources of $PM_{2.5}$ Emissions

- The largest sources of $PM_{2.5}$ and organic carbon (OC) $PM_{2.5}$ within the Austin-Round Rock-Georgetown MSA from 2017 are listed below:

Source Category	Tons per year $PM_{2.5}$	% of Total $PM_{2.5}$ Emissions	Tons per year OC $PM_{2.5}$	% of Total OC $PM_{2.5}$ Emissions
Road Dust	2,325	22%	153	6%
Construction Dust	1,693	16%	78	3%
Open Burning	1,574	15%	611	26%
Prescribed Fires	861	8%	403	17%
Agricultural Dust	793	8%	24	1%
Commercial Cooking	417	4%	279	12%
Mining and Quarrying	326	3%	0	0%
Subtotal	**7,989**	**76%**	**1,548**	**65%**

Regional Air Quality Plan

- The 2019-2023 Austin-Round Rock-Georgetown Metropolitan Statistical Area (MSA) Regional Air Quality Plan is a voluntary plan to address regional air pollution issues for Bastrop, Caldwell, Hays, Travis, and Williamson Counties.
- The plan is designed to help the region:
  - Maintain and improve outdoor air quality within the MSA
  - Reduce the impact of emissions from within the region on air quality issues in nearby areas and elsewhere
  - Mitigate the health, environmental, economic, and social impacts of the remaining regional air pollution.
- Currently, the plan focuses on ozone pollution as the region has been close to violating the ozone NAAQS for years.
- After a review of PM from a public health perspective and a regulatory perspective, the Central Texas Clean Air Coalition (CAC) has decided to update the region's voluntary air quality plan to include additional measures targeted at reducing regional $PM_{2.5}$ air pollution and enhancing awareness of PM air pollution.

EPA's Advance Program

- EPA's Advance Program promotes local actions in attainment areas to reduce ozone and/or $PM_{2.5}$ and provides EPA technical assistance to help attainment areas continue to maintain the NAAQS.
  - Since 2012, the CAC has participated in the Ozone Advance Program.
  - In August 2020, the CAC joined the PM Advance Program.
- Joining the PM Advance Program led to this update of the Regional Air Quality Plan to specifically address $PM_{2.5}$

ADVANCE

A U.S. Environmental Protection Agency Program

Emission Reduction Measures for PM

- The proposed emission reduction measures target the largest sources of $PM_{2.5}$ and seek to increase awareness about PM in the region.
- The emission reduction measures can be implemented in three main ways by a CAC member.
  1. Implement within own organization's operations
     - e.g., require that city/county construction projects implement PM emission reduction measures
  2. Encourage or require 3rd party organizations to implement
     - e.g., require or encourage that private construction projects within the city/county implement PM emission reduction measures
  3. Educate and encourage the public at large to implement
     - e.g., share outreach and education materials or best management practices about PM emission reduction measures from construction

Measure and Status (i.e., new or existing)	Implement within own organization's operations	Encourage or require 3rd party organizations to implement	Educate and encourage the public at large to implement
1: Reduce PM emissions from construction and demolition activities (new)	Yes No N/A	Yes No N/A	Yes No N/A
2: Reduce PM emissions from commercial cooking/charbroiling (new)	Yes No N/A	Yes No N/A	Yes No N/A
3: Reduce PM emissions from road dust (new)	Yes No N/A	Yes No N/A	Yes No N/A
4: Reduce PM emissions from mining and quarrying activities (new)	Yes No N/A	Yes No N/A	Yes No N/A
5: Reducing PM emissions from open burning (new)	Yes No N/A	Yes No N/A	Yes No N/A
6: Reduce PM emissions or impact of PM emissions from prescribed burning on high PM days (new)	Yes No N/A	Yes No N/A	Yes No N/A
7: Reduce emissions from mobile sources year-round (existing)	Yes No N/A	Yes No N/A	Yes No N/A
8: Reduce emissions from stationary combustion sources year-round (existing)	Yes No N/A	Yes No N/A	Yes No N/A
9: Installation additional $PM_{2.5}$ monitors/sensors within the region (new)	Yes No N/A	Yes No N/A	Yes No N/A
10: Promote awareness of health effects of PM air pollution (new)	Yes No N/A	Yes No N/A	Yes No N/A

Proposed Regional $PM_{2.5}$ Emission Reduction and Planning Measures

Next Steps

The next step is for CAC members to determine which $PM_{2.5}$ emission reduction measures will be committed to by your jurisdiction and approved by your governing board by May 31, 2021.

Date or Timeframe	Milestone
2/10/2021	CAC meeting; list of measures presented, public comment period opens
3/26/2021	End of public comment period
3/29/2021- 4/2/2021	CAPCOG will compile comments and disseminate to CAC and CACAC
4/29/2021	CACAC meeting; review progress
5/3/2021 – 5/7/2021	National Air Quality Awareness Week; Presentations to CAC Organizations
5/12/2021	CAC Meeting; review progress
5/31/2021	Target date for existing CAC members to update commitments
6/25/2021	Target date for commitments from new CAC members
7/22/2021	Target date for drafting plan & distribution to CACAC for review
7/29/2021	CACAC meeting to consider recommendation of plan update (tentative)
8/11/2021	CAC considers approval of update to plan
8/13/2021	CAPCOG submits plan to EPA as “Path Forward” for PM Advance Program

Thank You

Capital Area Council of Governments

www.capcog.org

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