To: Ali Abdelfattah

From: William Dyess

Date: June 10, 2021

Re: Technical Summary for PurpleAir Particulate Matter Sensor

PurpleAir Particulate Matter Sensors

One of the most popular sensors on the market is the PurpleAir sensor which measures particulate matter. The PurpleAir sensors use a new generation of laser particle counters to provide real-time measurement of PM1.0, PM2.5 and PM10. PurpleAir sensors are easy to install and only require a power outlet and Wi-Fi. They use Wi-Fi to report in real time to the PurpleAir map.

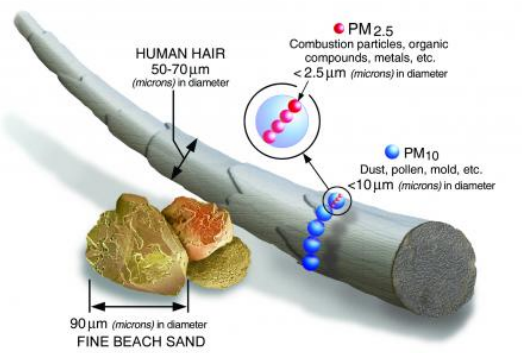
There are many PurpleAir sensors installed in the Central Texas Region. The data is displayed using the Air Quality Index (AQi). View the current map of PurpleAir Particulate Matter sensor data in the region.

What is PM, and how does it get into the air?

PM stands for particulate matter (also called particle pollution): the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope.

Particle pollution includes:

- **PM_{10}** : inhalable particles, with diameters that are generally 10 micrometers and smaller; and
- **$PM_{2.5}$** : fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.
    - How small is 2.5 micrometers? Think about a single hair from your head. The average human hair is about 70 micrometers in diameter – making it 30 times larger than the largest fine particle.

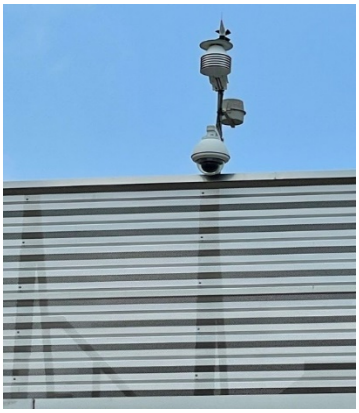


Sources of PM

These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks or fires. Most particles form in the atmosphere as a result of complex reactions of chemicals such as sulfur dioxide and nitrogen oxides, which are pollutants emitted from power plants, industries, and automobiles.

Where to install the sensor.

The sensor should be mounted in an open area without trees directly around. With the idea of wanting to mount the sensor close to the downtown area, several areas were considered. The Library met all criteria that would be needed. The sensor can be mounted on the pole with the weather data collection equipment. Pictures below are of the location (back of Library). Facilities Maintenance is on board with helping install. Once installed very minimal maintenance will be needed.



Coordination with Environmental Agencies

As a general member of the Clean Air Coalition (CAC), Pflugerville supports the regional effort toward improvement of air quality in the Austin-Round Rock Metropolitan Statistical Area. The air sensor will help to support one of the CAC's purposes of "Establish and monitor a regional effort toward improvement of air quality". Having the ability for the coalition to monitor the quality of air helps to guide clean-air plans in order to achieve and maintain compliance with federal standards.

Benefits to City and Residents

The ability to get a more localized measurement for air quality. Allowing residents to become more aware of their surroundings. This data can also be used on the city's social media promoting air awareness education.