Madison preparing for big leap in air quality monitoring

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FULL TEXT

May 16 - With some of the state's highest concentrations of air particulate matter pollution in recent years, Madison is moving to use a big federal grant to install a citywide network of air quality sensors to provide real-time information at the neighborhood level and address health disparities.

The City Council on Tuesday will consider amending the capital budget to accept the $430,000 grant from the U.S. Environmental Protection Agency and execute an agreement with the EPA authorizing non-competitive contracts with a leadership team to implement the project.

Currently, the city has two regulatory-grade air quality sensors, but the initiative will install a network of 68 sensors focusing on particulate matter across the city, which will deliver far better information on when and where that type of pollution happens.

"This would make Madison the most monitored community in Wisconsin with regard to particulate matter," said Tim Bertram, a professor of chemistry at UW-Madison and a member of the project's leadership team.

The project is important because particulate matter air pollution, especially fine particles, poses serious risks to respiratory and cardiovascular health, the city's project plan says.

Solid particles and liquid droplets suspended in the air are known as particulate matter and include everything from dust and pollen to fine particles that result from smoke or from tailpipe and smokestack pollutants. The fine particles (known as PM2.5), can penetrate deep into the lungs and even the bloodstream, causing breathing problems, heart attacks and even premature death in people with heart or lung disease.

The project's leadership team, which includes the city, the Foundation for Black Women's Wellness, the Latino Health Council, the Hmong Institute, Public Health Madison and Dane County and UW-Madison will engage the community through multiple venues to raise awareness about the connections between air quality and health, especially regarding people of color.

Using data from the sensor network, the city will show the distribution of particle matter pollution across the city, identify neighborhoods experiencing the highest levels of pollution, and work with the community to determine next steps for improving air quality and protecting the health of residents.

The funds will be used to install the network of air quality sensors on city-owned light and traffic signal poles throughout the city and support community engagement to provide greater awareness, education and action to address disparities. The Foundation for Black Women's Wellness, Latino Health Council, and Hmong Institute will each receive $50,000 and UW-Madison will get $37,019.

"Clean air is fundamental to the health and well-being of everyone in our community," said Jessica Price, the city's sustainability and resilience manager. "But exposure and vulnerability to air pollution are experienced more acutely by people with low to moderate income, (Black, Indigenous and people of color) communities, people with disabilities, children and the elderly."

The city plans to start installing the sensors next summer.

Serious risks

In Madison, there are two regulatory-grade air quality sensors - Madison University Avenue established in 1992 and Madison East established in 1999 - that are run by the state Department of Natural Resources.

While Dane County is in compliance with federal air quality standards, the sensors in Madison have detected some of the state's highest concentrations of particulate matter in recent years.

From 2018 through 2020, the University Avenue station recorded the second-highest annual PM2.5 and the highest 24-hour PM2.5 of all sensors in the state DNR's ambient air monitoring network. The Madison East station recorded the fifth-highest annual PM2.5 and the third-highest 24-hour PM2.5 in the state.

Research by UW professor and project partner Tracey Holloway has found that vehicles are the leading contributor to high particle matter pollution in Madison, followed by sources such as buildings and power plants, Price said.

Over the past few years, the community also has seen an increase in the number of air pollution events that are related to the long-range transport of smoke from wildfires in the western U.S. and Canada, Bertram said.

While the current sensors give a broad understanding of air pollution in the region, they aren't able to identify differences across Madison's neighborhoods.

Exposure and vulnerability to air pollution are experienced more acutely by low- to moderate-income residents, BIPOC communities, people with disabilities, children and the elderly. In Wisconsin, BIPOC and low-income communities are disproportionately burdened by respiratory and cardiovascular illnesses.

Getting real-time, ground-level information from the new sensor network, combined with satellite data, will enable an understanding of locations, magnitudes and potential sources of particulate matter, and inform short- and long-term solutions to improve air quality and protect community health.

Bertram, with input from the leadership team, will design the spatial arrangement of the air quality sensor network to provide the best data on ground-level particulate matter. Community members will be invited on-site for the installation of three to five of the sensors.

The project's community partners will provide community-based expertise for the project's development and help disseminate the findings, Price said.

"The project partners will work together to raise awareness about the connections between air quality and health, spread the word about this new source of air quality information, and provide resources so folks can reduce their own and their family's exposure to particulate matter pollution," she said.

The leadership team will plan a host of community engagement activities and the city will create a web page for the project where the public can get information about project aims, progress and outputs. The city and partners also will host multiple opportunities to engage in the projec

DETAILS

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