

Smart, Connected, Green Communities

As world leaders and activists prepare for the [Conference of Parties \(COP26\)](#) so they can talk about climate change, technology, and finance, it's time to start looking at how those topics are affecting people closer to home. According to the [Pittsburgh Tribune Review](#), Pittsburgh was in the top 10 worst areas in Pennsylvania for air pollution and unhealthy air days. The city's light pollution can make the area [unhealthy for plants, animals, and humans](#). However, Carnegie Mellon University and Metro21: Smart Cities Institute, in collaboration with its municipal and equity partners throughout the Southwestern Pennsylvania (SWPA) region, are working to alleviate the problems here at home.

CMU's Center for Atmospheric Particle Studies is working with the Breathe Project to [analyze how air pollution travels throughout the city](#). Mobile vehicles travel around Allegheny County and the surrounding area to analyze air quality in real time, and they are supplemented by volunteers from the community, who have air pollution monitoring technology at their homes and properties.

This project is done by [RAMPs](#), Real-time Affordable, Multi-Pollutant monitoring systems developed and deployed by [Professor Albert Presto](#) and his team. This smart technology is inexpensive, and it can measure air pollutants including carbon monoxide, ozone, and small particles. This technology specifically suits Pittsburgh's hilly terrain and industrial emissions.

By monitoring the area and using the RAMPs, the researchers involved with CMU and the Breathe Project can create a map of pollutants and show where the worst areas of pollution are located. This technology can help inform people on how to reduce their exposure to pollution, and potentially decrease or impact the sources of pollution. With time and more funding, perhaps these maps can be used to implement cleanup projects by mobilizing more community scientists informed by this information.

Besides monitoring physical pollutants, the City of Pittsburgh is also examining light pollution. In August, 2021, Mayor Bill Peduto announced a ["Dark Sky Lighting" ordinance](#) for city parks, streetlights, and city facilities. Part of this legislation is based on Metro21's own [artificial light survey of nighttime Pittsburgh](#), a collaboration with CMU, the City of Pittsburgh, and the Amateur Astronomers Association of Pittsburgh (AAAP). The survey investigated skyglow, which is artificial light that's directed up into the atmosphere. Based on the data, the project identified light polluters in the city, which can affect both local wildlife and people. However, this new legislation will alleviate the negative effects of light pollution, and it will increase energy efficiency in the city.

The City of Pittsburgh is also working with CMU's Center for Building Performance and Diagnostics (CBPD) to collect data on [energy, gas, and water usage](#). By collecting and analyzing data, the CBPD was able to offer targeted recommendations for various public buildings around the city, from firehouses to senior centers. For each building reviewed, they included specific strategies to reduce resource usage, reduce waste, and make the buildings more sustainable. The data collection was automated and frequently collected, so the City of Pittsburgh could acquire helpful data without the typical, tedious data collection process.

Besides helping with local issues, Metro21 is a part of the MetroLab Network, that is reaching beyond the city to assist with the [Climate Change Cup](#), which will be awarded at COP26. The Climate Change Cup is awarded to groups that create innovative, local solutions to the problems caused by climate change. Finalists have focused on either achieving net zero carbon dioxide emissions or helping communities adapt to the effects of climate change. Though groups are all over the US and the United Kingdom, some of these projects are still close to home, like restoring Pittsburgh's greenways to reduce landslides and transitioning the Appalachian region to sustainable energy sources.

COP26 is about finding smart, technological solutions to the problems of climate change, but these changes start right at home. Metro21 and CMU are trying to alleviate pollution and

climate change effects in the SWPA region with the help of technology, but organizations are not the only groups that can affect change. Local politicians, non-profits, and activist groups can advocate for more climate change legislation and more funding for technology that investigating and alleviate climate change's effects. If people can learn from COP26 and more local initiatives, perhaps the people of SWPA can further fight climate change here at home.