



Portland State
Digital City Testbed Center

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PSU graduate takes canopy research to new heights on DCTC's "Smart Trees" project

Portland State University alumna Hannah Prather will soon scale trees 200 feet above Portland city streets to install sensors that monitor everything from temperature to humidity as part of Digital City Testbed Center's Smart Trees project.

Prather, who earned her PhD in biology, is no novice when it comes to these heights. She started climbing 10 years ago as an undergraduate student, then as a certified arborist and PSU researcher, and most recently as a postdoctoral researcher at Reed College where she mentors the next generation of climbers.

"I love the height," she said. "I also really love what this research drives us to do, gain a new and intimate perspective of urban tree tops."

This summer, she will help gather data on temperature, weather, humidity, and other conditions from the trunk to the canopy to better understand what trees experience in the urban environment. She joins her former PhD research advisor, Biology professor Todd Rosenstiel, on the project.



The data that Prather collects will help open a window into the future for non-urban settings under climate change because urban conditions are already hotter and drier.

“In some ways urban trees are already living in the future with greater levels of ozone, more drought, more heat waves and drier conditions,” Rosenstiel said, who helps lead the effort at Portland State University.

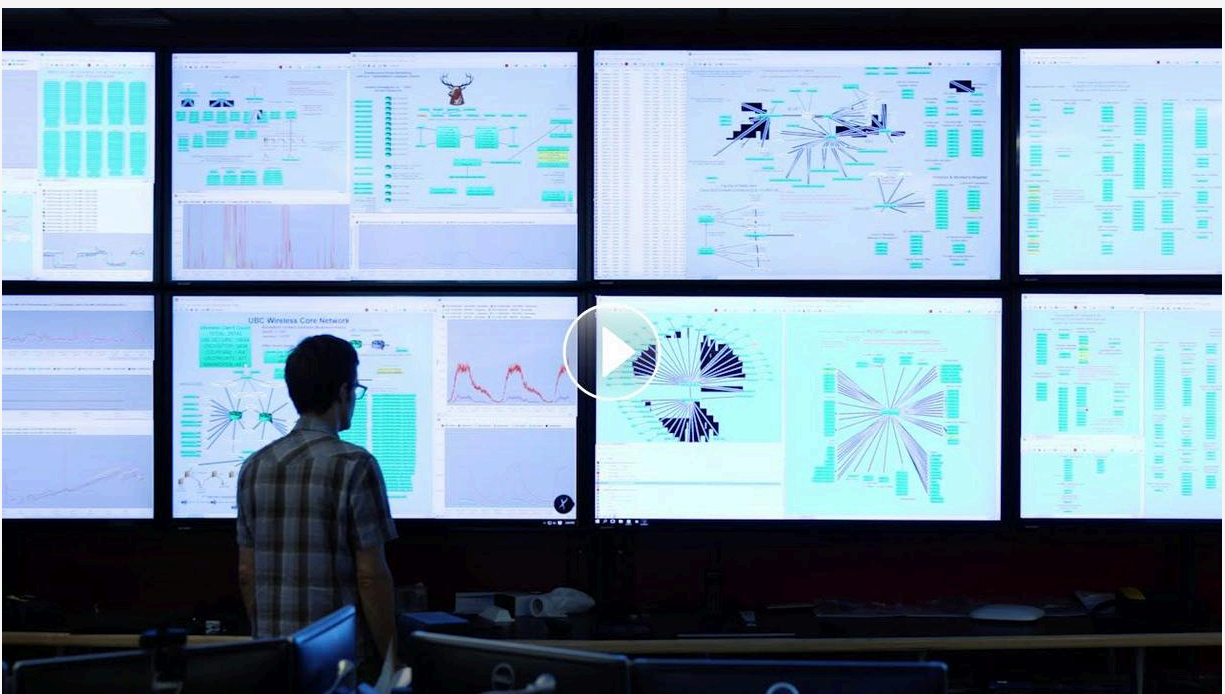
Researchers will get the chance to understand how urban temperatures impact tree canopies and how trees respond. One species, western red cedar, is at a tipping point. The project gives researchers the opportunity to detect decline, the source of decline and possible ways to intervene on the loss of this important species, Rosenstiel said.

Data exists for urban heat and air quality at the street level, but this project will take that research 200 feet up to see what trees experience. The ultimate goal is to track tree health and preserve it in order to maintain all the benefits urban trees offer ranging from natural air conditioning to better air quality.

“I feel so excited about working at Portland State University again,” Prather said about the project.

“The close knit environment of PSU led me to many experiences in graduate school I couldn't have even imagined without the encouragement of my advisors. My PhD took me from the tops of tree canopies in the Northwest all the way to the polar landscape of Antarctica,” she said.

Prather will continue her work through the summer and then return to Reed College with a National Science Foundation Postdoctoral Fellowship in Biology.



PSU might soon pilot the use of Wi-Fi to reduce COVID-19 risks in re-opened campus buildings

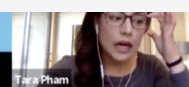
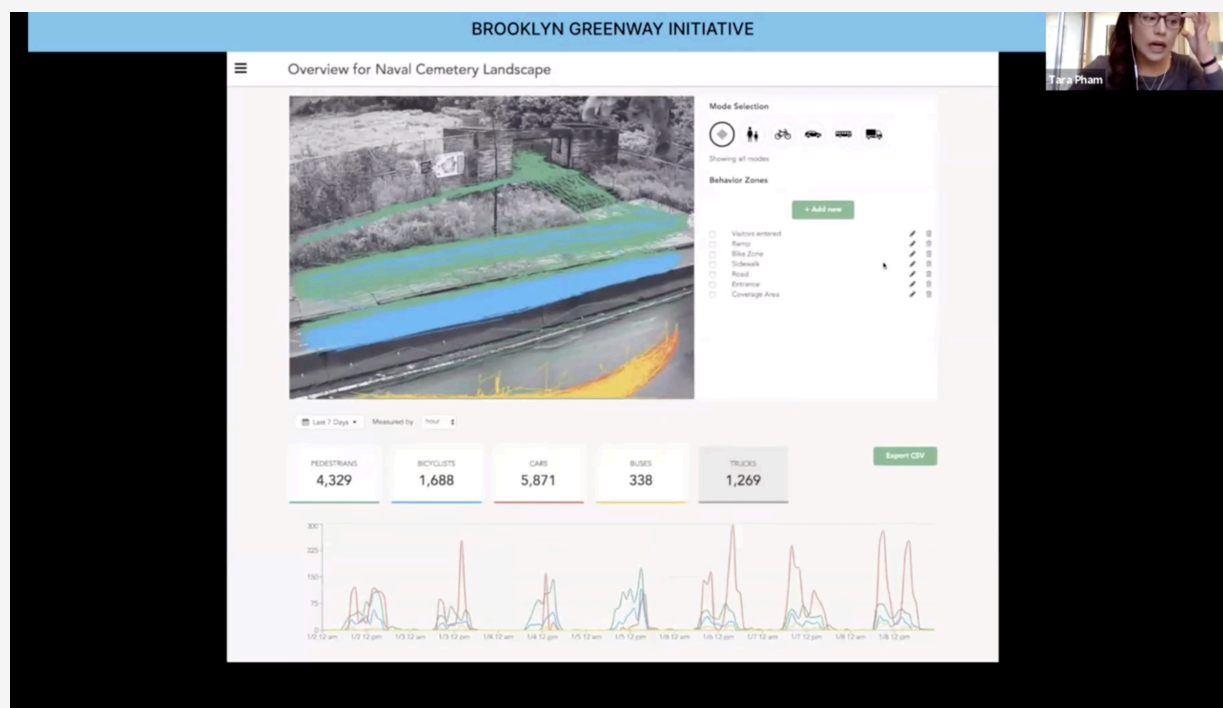
Financially-strapped universities across the country are developing reopening plans that minimize the chances of students and staff contracting COVID-19. One of the proposed steps is to greatly increase airflow, the rate of fresh air coming in and stale air going out, in all campus buildings to dilute and disperse coronavirus. However, this can significantly increase both costs and carbon emissions.

Digital City Testbed Center is working with Sensible Building Science (SBS) and Cisco Systems on a proposal to use Portland State University's wireless routers to track building occupancy as a way to target increased uptake of fresh air and venting to areas with the most people. The approach builds on the experience of the University of British Columbia (UBC), one of DCTC's sister testbeds.

SBS relies on information from Cisco Wi-Fi routers, which routinely measure how many devices are looking for them. Once calibrated, these data sets can be used to map occupancy throughout buildings in near real-time. SBS then automatically adjusts the settings of lighting, heating, and cooling systems to the number of people in a given location. UBC has reduced energy consumption 5% to 20% per building.

This technique can similarly adjust the intake of fresh air and venting to more precisely dilute and disperse indoor possible contaminants in areas where the most people are.

DCTC has asked Cisco to contribute the considerable cost needed to upgrade the university's current routers in order to launch the program. The center is also pursuing other funding opportunities.



Advisory board discusses projects and opportunities

The Digital City Testbed Center convened its Advisory Board in a virtual meeting May 20. Board members discussed everything from the latest [DCTC projects](#) to the impact of COVID-19.

Projects included the use of technology to monitor the health of urban trees, improving accessibility for people with disabilities, and campus-based deployments of innovations from DCTC partners [Sensible Building Science](#), [Hello Lamppost](#), [Numina](#), and [Downtown AI](#).

Several board members discussed the role that technology can play in making indoor environments, such as offices and schools, safer to return to amid COVID-19.

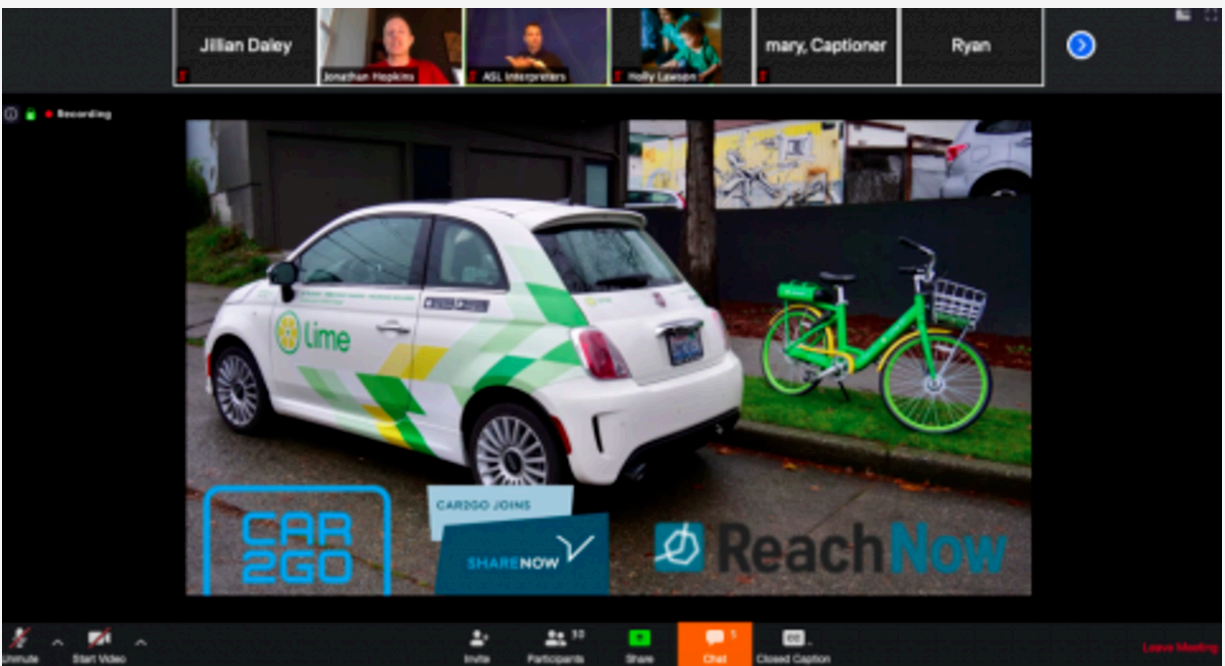
People are asking how to design buildings and retrofit existing buildings in light of COVID-19, said Kathy Berg, a partner at ZGF Architects who has designed many healthcare facilities. The answers need to be backed by research, she said. They're exploring touchless environments and antibacterial surfaces.

Heating and cooling systems, for example, were never designed to take into account the spread of germs, but that will change, said Sokwoo Rhee, associate director of Cyber-Physical Systems Innovation at the National Institute of Standards and Technology

One of the biggest needs is to make schools safe for kids to return so parents can reenter the workforce, said Antonie Jetter, Associate Professor of Engineering & Technology Management at Portland State University.

The issue is trust, said David DeVos, Global Sustainability Officer at PGIM Real Estate. How do we leverage technologies to build more trust to help get people back into buildings, he said.

The answers could be game changers in smart cities around the world.



The little conference that could: A summit on accessibility finds way forward despite pandemic

With less than a week to go before PSU's Mobility Matters conference March 18, organizers quickly transformed the face-to-face event into a virtual one. (The [conference is available online](#) through June 10 for those who missed it.)

A small team at PSU scrambled to rally the two dozen speakers from locations around the world, some of whom had never used video conferencing and some of whom were blind, low vision or deafblind. The PSU team helped train everyone on the technology that would later become part of daily life.

"It was the first major event affiliated with PSU (and likely one of the first in the country) to switch from in-person to online, which was not easy considering the need for interpreters for deaf, blind, and deaf-blind attendees and speakers," said Jonathan Fink, director of PSU's Digital City Testbed Center, one of the event's sponsors.

"The fact that it all worked without a hitch, despite only having four days to get set up, was truly remarkable," he said. [Read the full story.](#)

Mobility Matters available online

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