THE NATION'S HEALTH PODCAST TRANSCRIPT: SPECIAL SERIES ON EXTREME HEAT

The Heat Rx, Episode 1: Smart surfaces for public health

May 2025

McGILL: Welcome to The Nation's Health Podcast. I'm your guest host, Natalie McGill.

You may have heard singer Alicia Keys sing about New York City being the concrete jungle where dreams are made of. But it's the concrete infrastructure in major cities like NYC that create climate nightmares called urban heat islands — the result of surfaces like concrete sidewalks, dark roofs and asphalt roads that track the kind of heat that takes a toll on physical, mental and economic health.

But smart surfaces, like reflective pavements, solar panels or even trees, can go a long way in cooling cities down. In this first of a three-part series on extreme heat, we talk to experts about urban heat islands and how communities use smart surfaces to create healthier places to live.

We begin with Shweta Arya, a senior project manager for smart surfaces at the Center for Climate, Health and Equity at APHA, which is a founding member of the Smart Surfaces Coalition. Arya talked with The Nation's Health Podcast about how the coalition carries out its mission of helping cities adopt smart surface technology.

ARYA: So smart surfaces are transformative infrastructure technologies. They're highly reflective, highly permeable, and they're designed to make cities cooler, healthier and more livable. And as a founding member of the Smart Surfaces Coalition, APHA plays a key role in this work, and is currently partnering on a multiyear grant to support 10 cities through the Smart Cities for Smart Surfaces Project.

What are the human health and economic challenges you've seen in urban heat islands that make them ideal candidates for smart surfaces?

ARYA: So urban heat islands trap heat, and they intensify the effects of extreme heat, which is the leading cause of weather-related deaths in the U.S. This really poses a serious public

health risk, including heat strokes, respiratory issues and even death, especially among the low-income and vulnerable populations.

Economically, the impacts are just as severe. We are seeing skyrocketing energy bills, lost worker productivity and increased strain on health care systems. These burdens fall hardest on communities that are already under-resourced. So smart surfaces offer a cost-effective, scalable solution helping cities cool down, reduce health risks and save money in the long run.

So there are regular shingle roofs, and then in the world of smart surfaces, there are cool roofs or green roofs. Exactly how do these and other smart surfaces battle extreme heat?

ARYA: Cool roofs are made up of reflective materials. They reflect back 80-85% of the sunlight, unlike traditional dark roofs that absorb most of the heat. This can make the roof surfaces over 50 degrees cooler on a hot day. So that helps lower indoor temperatures, reduce air conditioning use and protect people from heat-related illnesses.

Actually, cool roofs are the lowest-hanging fruit when it comes to smart surfaces. Thanks to the price parity with traditional dark roofing material, cities now can adopt them widely without major cost barrier.

Green roofs, on the other hand...they are kind of like living, breathing roofs layered with soil and vegetation. They naturally cool buildings, absorb stormwater, filter air pollutants and even improve local air quality.

The importance of community involvement for the growth of smart surfaces isn't lost on climate scientist Vivek Shandas, who talked with us about how his research gets citizens involved in monitoring hot spots and connects city leaders all over the country to compare notes on smart surfaces that work best for them.

SHANDAS: My name is Vivek Shandas, I am a professor of geography at Portland State University and the founder and advisor of CAPA Strategies, a climate consulting firm.

Vivek, thank you so much for joining us today.

SHANDAS: Thanks for having me.

So what is an urban heat island, and in what ways does it negatively affect human health?

SHANDAS: So an urban heat island is an area where we're defining the city as being much hotter than its surrounding area.

We know that heat kills more people than any other natural hazard annually, and that's because the majority of people now live in cities. And because cities are hotter, they tend to have that kind of amplifying effect that really affects human health.

You founded the Sustaining Urban Places Research Lab at Portland State University, which focuses on projects where climate science and environmental justice intersect. What urban heat issues are unique to Portland, and how did the lab tailor solutions to meet residents' needs?

SHANDAS: In large part, what we wanted to do through the university was to establish what we call a living laboratory model. And that was to be able to really understand technology, community policy and do this in a very interdisciplinary and integrated way where we can study something that we know really well — our own backyard, our own city, our own place.

And so we were able to engage dozens of graduate students, community members to go out and deploy a series of different sensors over a decade, and we were able to essentially refine and kind of improve the quality of the sensing that was happening...understand some of the challenges of sending community scientists out, to go out and collect data and the quality of data. And kind of getting going through quite an elaborate process to kind of tie together this community, these community science efforts very locally.

Once we dialed those in and figured out where the data were compromised or where the community understanding might be missing. We were able to go in and refine several of our techniques for engagement, as well as sensing — environmental sensing, and put together kind of this model that we think could be deployed anywhere.

You're also the founder of CAPA Strategies, which provides expertise to cities to help them become more climate resilient. This includes a Heat Watch program, with a four-pronged approach to tackling extreme heat, one of which includes getting stakeholders involved. How do you engage the community as well as academic and government partners to help you gather data?

SHANDAS: A large part of approach that CAPA uses is to not go into any community we're not invited into. When CAPA is invited into a place, we are then working — usually with a local stakeholder, like a nonprofit organization, a university, a museum, some municipal agency — and we're able to then kind of walk them through the general overview of what is it that we do and then engage in a conversation of where are they in their heat planning journey.

Each community is unique in and of itself. So CAPA is a very, as you noted, tailored approach to this work. So by characterizing the kind of level of maturity and heat planning and then identifying the leverage points in a community where local stakeholders can get involved. We're then able to go out and tailor an approach.

Your approach also includes a peer learning network where cities share strategies they use to tackle urban heat. What effect do you hope this collaboration and info sharing will have in the long term on the work you and other climate scientists do to address extreme heat?

SHANDAS: Yeah, so big part of the approach to doing any kind of local natural hazard and climate environmental work is to ensure that we're learning from each other.

So there are some things that are very unique to a place...say, you know, Wichita, Kansas, or say Baltimore, Maryland, or Seattle, Washington. There's very unique things about the history, about the culture, about the policies, etc., that might be unique to that place.

There are some things that are more generalizable as well, and that's where the peer learning network can be enormously helpful. Somebody could say, “Hey, we tried planting trees in these particular locations, and we found that those trees didn't do well. And we attributed it to it being in a very concretized industrial area of a city and those trees really suffered.”

And so we can talk about the species of trees, we can talk about how much maintenance and watering and other things that those trees received, and really unpack why that happened as a peer learning network.

And then folks can try a different scenario in another location… say “Hey, we tried painting these roofs white over here, but we found that in this particular location that was only effective in the following circumstances.” And so there are these ways in which these peer learning networks and bringing together people around conversations can be really helpful.

Smart surfaces like tree cover have been a priority in New Orleans, which is the country's largest urban heat island.

CHALK: My name is Dr. Angela Chalk. I am the founder and executive director for Healthy Community Services, which is a non-profit organization located in the 7th Ward of New Orleans, Louisiana.

Dr. Chalk, thank you so much for joining us today. So what was your inspiration for starting Healthy Community Services?

CHALK: We needed to be in charge of our own destiny and our own futures. Because climate was changing...and whether you call it climate change or severe weather events, we knew that we were experiencing hotter days, more intense and more frequent events like hurricanes and more infrequent events such as repetitive flooding.

Healthy Community Services, when I set it up our founding board, we were determined to work at the intersection of climate health and public health because we knew that sea level rise was

occurring. We knew that heat was a detrimental factor, and we knew that repetitive flooding was going to occur because of all of the changes in our environment.

How have you seen extreme heat affect the health of your fellow 7th Ward residents — and then that you've had these interventions, how have you seen changes?

CHALK: The No. 1 thing that has come out of this is that folks understand severe weather events now and how to take precautions. Folks know that concrete pose heat. Folks know that trees provide shade that helps to cool down neighborhoods.

Have you seen residents of the 7th Ward become more engaged and in the know about green infrastructure and climate resiliency as a result of your work?

CHALK: Yes, residents are definitely engaged in what we do with climate resiliency, mitigation and adaptation matters.

Community engagement is leading the way on resiliency in Black communities — Black and brown communities. Indigenous people have always had a connection to the earth and knew that their power lies in knowing the value of the Earth. We have been an extractive community by just taking Mother Earth for granted. And industry has have even been even more extractive of our planet and the things that are most important...you know, water, air, land, flora and fauna, nutrition.

All of those things now we see are coming together again at the intersection of climate health and public health.

Dr. Chalk, thank you so much for taking the time to talk to us today.

So we know climate change has fueled a rise in once-in-1,000-year weather events and disasters. How can smart surfaces be used as a long term strategy to build a city's climate resilience?

ARYA: Extreme heat is one of the most urgent public health threat we face today, and it's hitting our cities hardest with over 80% of the U.S. population now living in urban areas. We need to design our cities for a hotter future and we can't rely only on air conditioning. We really need these passive cooling technologies like smart surfaces to reduce risk..and public...and build resilience.

In a nutshell, smart surfaces are a win for cities, a win for communities and even for the planet. They're not just a climate solution — they are a public health investment.

Thanks to each guest for their time and work. For more on smart surfaces, check out APHA.org/smart-surfaces.

Listen to this podcast episode at www.thenationshealth.org.