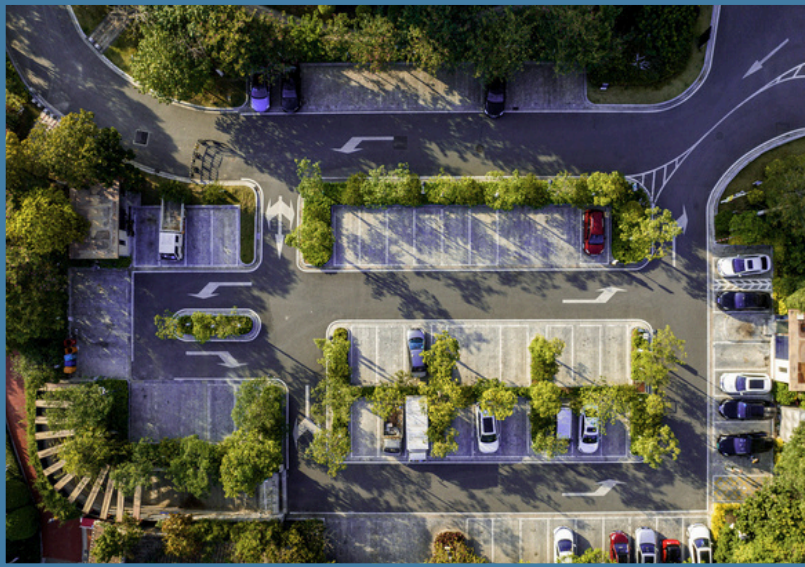


# Smart Surfaces and Public Health

## OVERVIEW



In 2026, APHA concluded the multi-year [Cities for Smart Surfaces Program](#) with the Smart Surfaces Coalition, an initiative that brought together six APHA Affiliates from across the country to advance climate resilience and public health in urban environments.

The Cities for Smart Surfaces Program demonstrates the critical role of public health leadership in advancing climate resilience. By integrating data, policy, community engagement and infrastructure solutions, APHA and its partners have created a scalable and replicable model for addressing extreme heat and health inequities across cities.

## WHAT ARE SMART SURFACES?

Smart Surfaces use reflective technology and natural cooling vegetation to help cities withstand the health effects of climate change.

### REFLECTIVE ROOFS AND PAVEMENTS



Cool roofs are light-colored and designed to reflect sunlight, reducing heat buildup.

Unlike traditional dark roofs that absorb and radiate heat, cool roofs help lower temperatures, improve comfort and reduce cooling costs and energy use.

### GREEN ROOFS



Green roofs absorb rainwater, reduce heat, improve air quality and provide habitat for plants and wildlife.

They help cool buildings and manage stormwater, and maintain longer effective lifespans than traditional roofs.

### POROUS AND PERMEABLE PAVEMENTS



Rainwater passes through these pavements to recharge groundwater, reduce stormwater runoff and flood risk, and cool surfaces.

### TREES



Trees provide shade, lower ambient temperatures, improve air quality, reduce runoff and flood risk, and support better health.

### SOLAR PANELS



Solar panels generate clean energy, reduce heat absorption and emissions and help lower urban heat.

### BIORETENTION



Bioretention areas include rain gardens and bioswales.

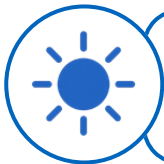
These areas absorb and filter rainwater, reduce flood risk, improve water quality and cool the environment while supporting native plants and wildlife.

# WHY DO WE NEED SMART SURFACES?

As climate change accelerates, cities are experiencing more extreme heat issues. The urban heat island effect is exacerbated by our built environment; Urban neighborhoods can be 15-20°F warmer than surrounding areas due to heat-absorbing surfaces like asphalt and dark roofs and lack of natural vegetation. Two-thirds of U.S. cities are made of these dark and impervious surfaces, contributing to urban heat while increasing air pollution, flooding and poorer health outcomes.

- Urban heat is a health equity issue, with low-income and climate vulnerable communities facing more heat issues than other neighborhoods.
- Climate change will exacerbate heat issues; for every .1°C of warming above present levels, about 140 million more people will be exposed to dangerous heat.
- Extreme heat events cause more deaths annually than hurricanes, floods and tornadoes combined.
- Heat-trapping surfaces increase ground-level ozone and fine particle pollution, which damage our lungs and are linked to health consequences.

# PUBLIC HEALTH BENEFITS OF SMART SURFACES



**Mitigating extreme heat.** As global temperatures rise, cities face more frequent and intense heat waves. Smart surfaces like reflective roofs and green spaces help cool urban areas, reducing the risk of heat-related illnesses.



**Preventing flooding.** Intense rainfall events lead to urban flooding. Smart surfaces like rain gardens and permeable pavements manage stormwater effectively, preventing floods and safeguarding communities.



**Reducing heat-related illnesses.** Extreme heat poses a significant health risk, especially for vulnerable populations. Smart surfaces mitigate heat island effects, making cities healthier and more livable.



**Improving air quality.** Trees, green roofs and reflective pavements improve air quality by absorbing pollutants and reducing emissions. Cleaner air translates to better respiratory health for residents.



**Boosting mental well-being.** Access to green spaces and aesthetically pleasing environments positively impacts mental health. Smart surfaces enhance urban aesthetics, promoting well-being.

Learn more at [APHA.org/Smart-Surfaces](https://www.apha.org/Smart-Surfaces)