



The Smart Surfaces Coalition is made up of more than 40 leading national and international organizations with a shared commitment to creating **cooler**, **healthier**, and **more resilient** cities by cost-effectively reducing the impacts of extreme urban heat and flooding.

What Are Smart Surfaces?

Infrastructure strategies that cost-effectively manage urban heat and stormwater while maximizing health, climate, and equity co-benefits

Cool Roofs



Green Roofs



Porous + Permeable Pavements



Solar Photovoltaics



Cool Pavements



Trees and Rain Gardens



Low- and Zero-Carbon Concrete



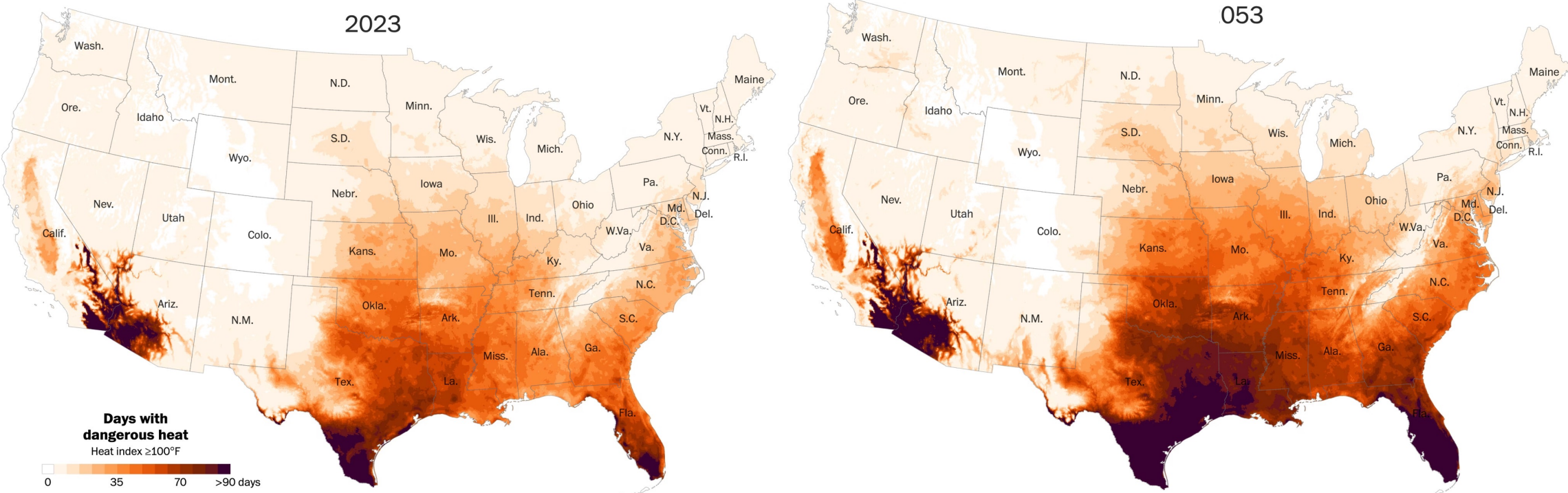
Combined Surfaces



Source: [Smart Surfaces Coalition & Carnegie Mellon University](#)

e.g., Green Roof + Solar PV

By mid-century, nearly two-thirds of Americans will experience perilous heat waves, with some regions in the South expected to endure **more than 70 consecutive days over 100 degrees.**¹



¹Washington Post, 2023

Source: [Washington Post](#)

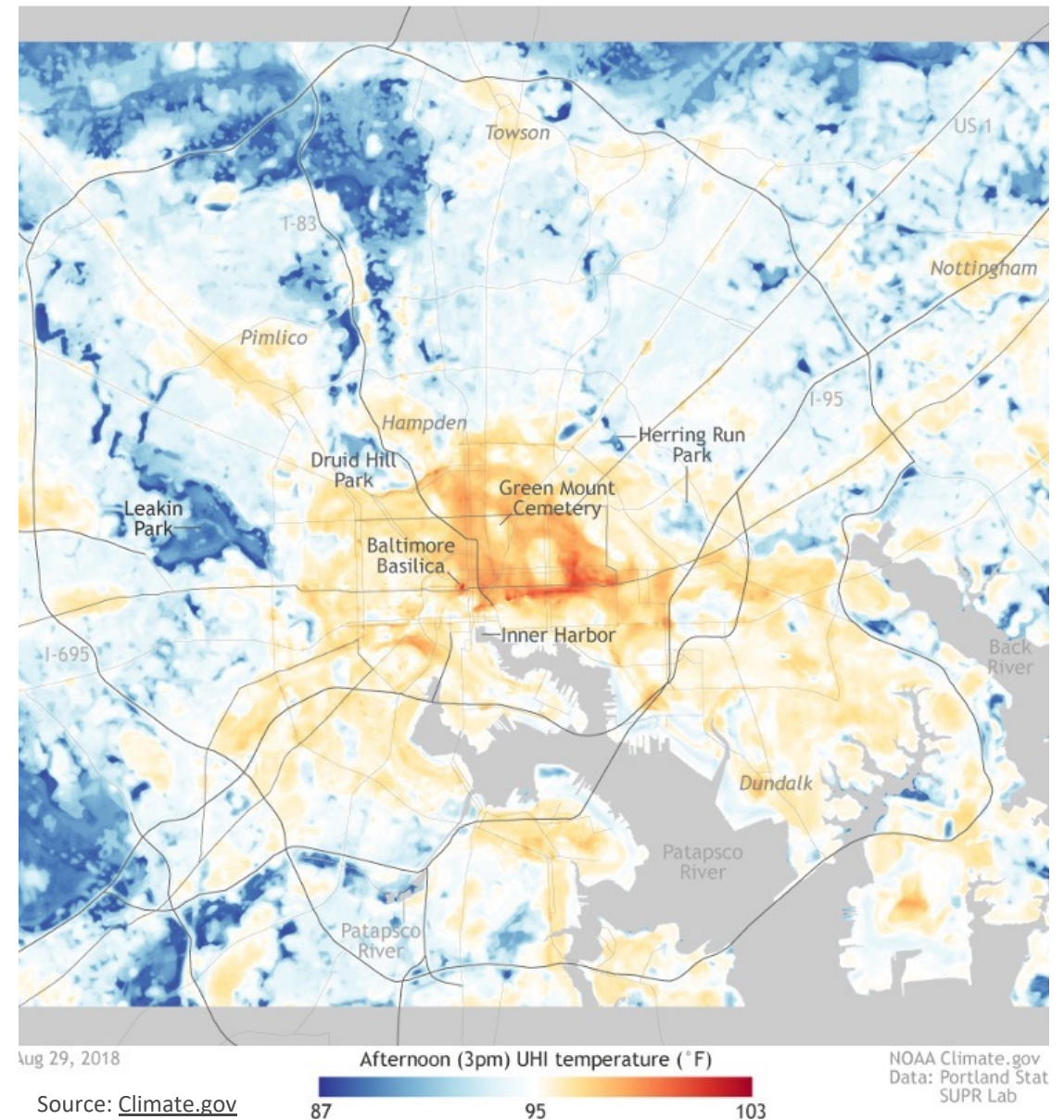
Urban Heat Islands

On average, urban heat islands are **5 to 7 degrees Fahrenheit warmer** during the day and can increase temperatures by as much as **22 degrees** at night.¹

Some neighborhoods in cities, often in low-income areas, can be as much as **15-20°F hotter**.

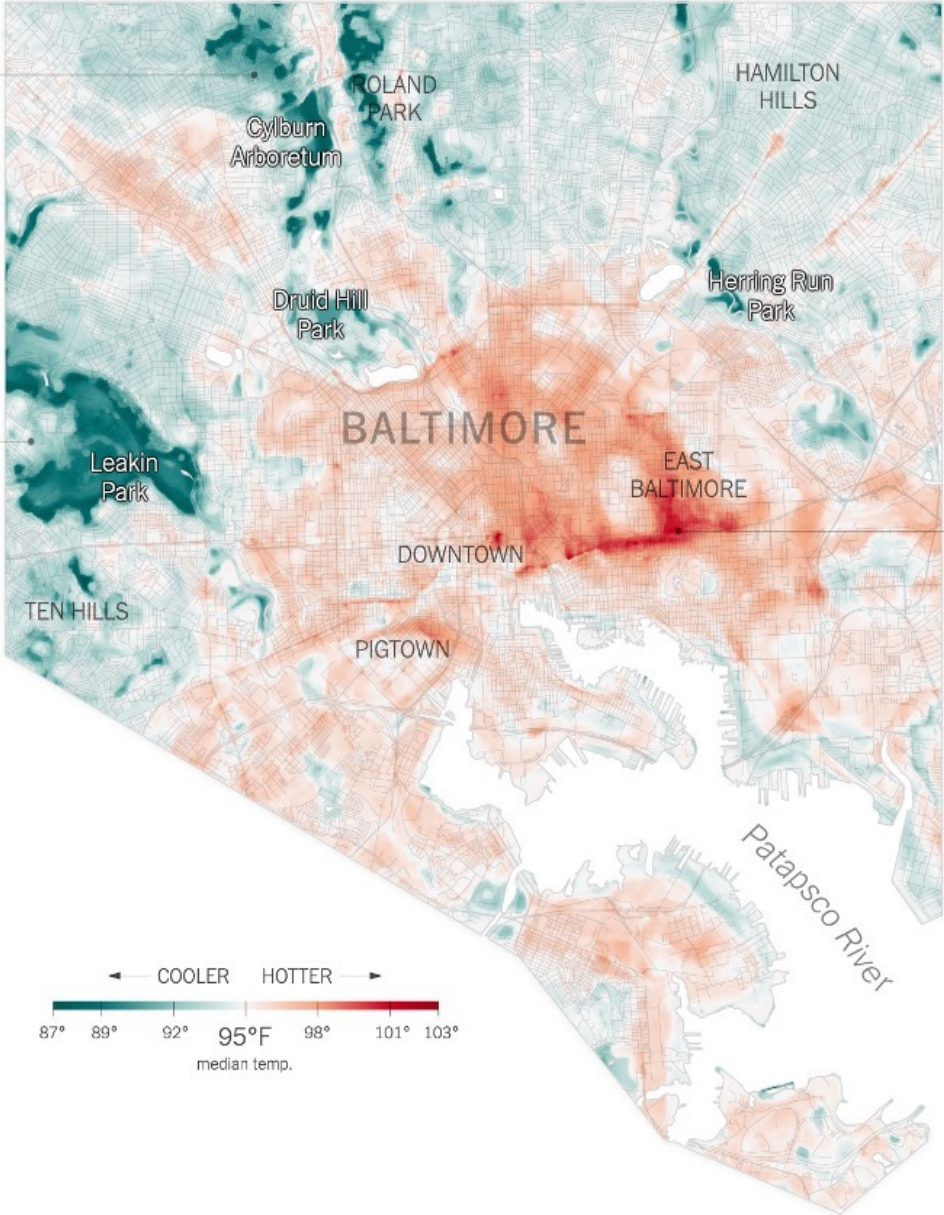
¹SSC, 2020 & American Forests, 2021

Heat Map of Baltimore, MD

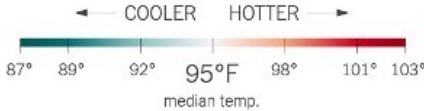


A Matter of Equity

Cooler: Neighborhoods next to parks and those with plenty of tree cover saw significantly cooler temperatures on a hot summer afternoon: **as low as 87°F.**



Hotter: On the same day, residential neighborhoods east of downtown saw hotspots reach **over 101°F.**



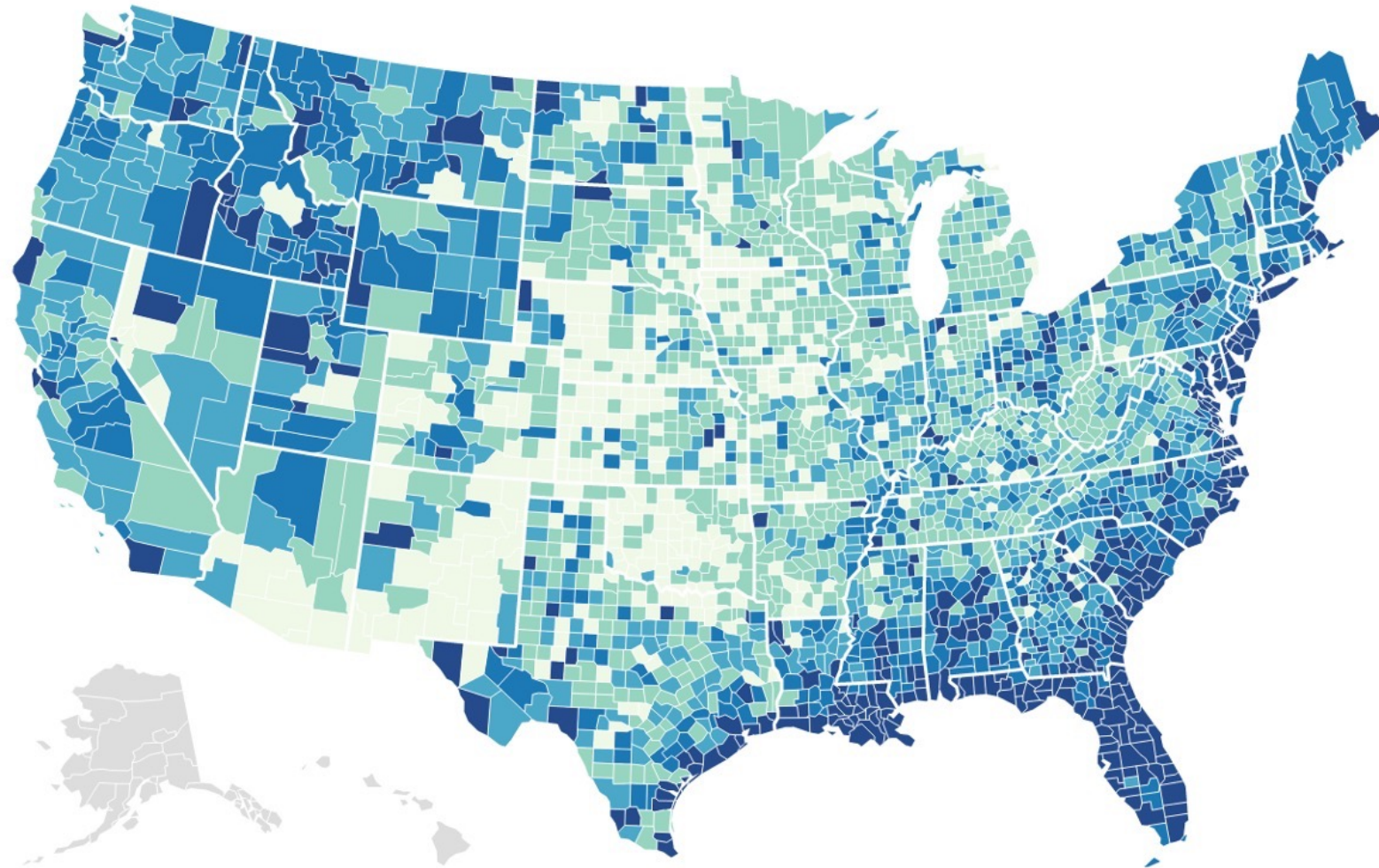
Source: [New York Times](#)

Smart Surfaces redress structural racial inequalities by cutting heat and air pollution and creating a healthier environment for everyone — regardless of ZIP code, income, race, or background.

Where flood risk is projected to rise fastest in the US

A new analysis projects changes in flood risk between 2020 and 2050 by zooming in on every neighborhood across the U.S.

Percentage rise, 2020-2050



Flood damage measured in 2020 U.S. dollars.

Map: The Conversation/CC-BY-ND • Source: Wing, et al. 2022 • Created with Datawrapper

Flooding by the Numbers¹

\$4.6B

Average cost per U.S. flood event (river basin or urban from excessive rainfall), 1980-2021.

25%

Share of critical infrastructure currently at risk of becoming inoperable due to flooding.

21.8M

Number of U.S. homes and businesses in harm's way today.

¹[NOAA](#) & [EDF](#)

City-wide Smart Surfaces can:

- Reduce peak summer temperatures by 5°F or more
- Provide \$10 in benefits and cost savings for every \$1 spent
- Cut energy bills by reducing summertime energy demands for indoor cooling
- Lower total city global warming impact 10-12%
- Deliver large reductions in flooding and resulting mold
- Improve public health and air quality
- Protect summer tourism and jobs

with the greatest
impact in lower income
communities and
communities of color

Smart Surfaces for Baltimore



Baltimore City Council introduces several bills that would accelerate Smart Surfaces implementation



SSC disproves cool roof criticism from industry groups representing dark surfaces



Baltimore City Council approved the city's [cool roof ordinance](#) on June 12, 2023, and it was signed by Mayor Brandon Scott on Sept. 18, 2023

Cities for Smart Surfaces

SSC is partnering with 10 cities across the US to facilitate the adoption of Smart Surfaces at the metropolitan level and working with communities in those regions to support community-led, local Smart Surface implementation projects.



Funded and Engaged SSC Partners

Project Coordinator



Data Visualization and Cost-Benefit Analysis



City and Community Engagement



Federal Funding



Policy + Legal



Health Research and Communications



Smart Surfaces for San Francisco International Airport

SSC is working with SFO to develop:

- SFO-specific Cost-Benefit Analytic Tool
- Smart Surfaces adoption guidance to improve worker health, cut heat risks, reduce energy bills, and lower climate impact
- Full report with methodologies, key takeaways, and recommendations
- Proposed updates to SFO Sustainable Planning, Design, and Construction Standards

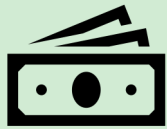


WORLD
RESOURCES
INSTITUTE



Altostratus^{Inc.}

SFO Project Impact



Economic

- Worker productivity
- More durable infrastructure
- Reduced electricity use



Social

- Worker and public safety
- Worker health



Environmental

- Reduced electricity use
- Negative radiative forcing
- Reduced stormwater runoff
- Reduced global warming impact

Smart Surfaces for Urban India

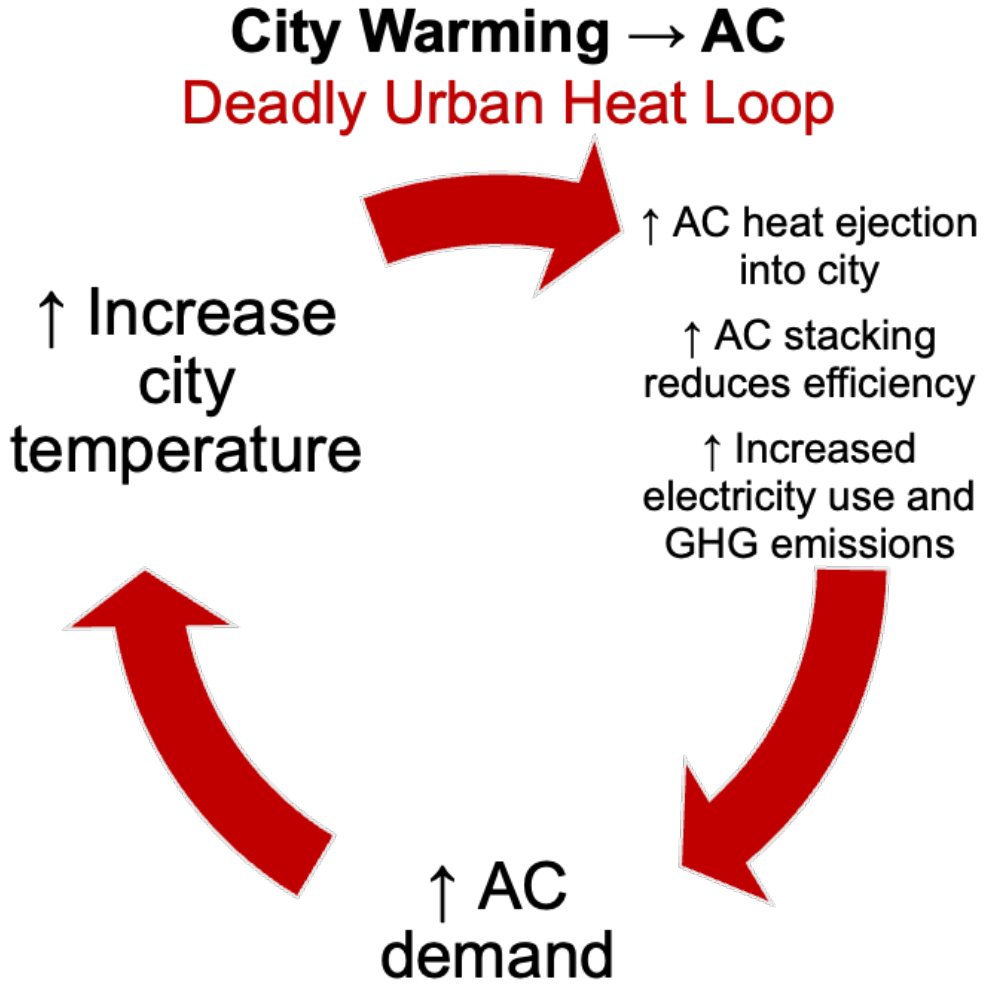
India could become one of the first inhabited places in the world to experience heat waves that cross the survivability limit for a healthy human resting in the shade. **This could occur as early as the next decade.**¹

To help Indian cities rapidly scale Smart Surfaces, SSC is working with the Energy and Resources Institute (TERI), the Green Rating for Integrated Habitat Assessment (GRIHA) Council, and the Public Health Foundation of India (PHFI) to develop the cost-benefit rationale for Smart Surfaces as the Indian urban design norm.

¹Woetzel et al., 2020



Avoiding the Urban Heat Death Feedback Loop



Source: Smart Surfaces Coalition

Before Smart Surfaces...



Source: Smart Surfaces Coalition

After Smart Surfaces...



Source: Smart Surfaces Coalition