

# Helping cities cool down

April 26 2016, by Laura Diamond

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Brian Stone, an associate professor in the School of City and Regional Planning in the College of Architecture and director of Georgia Tech's Urban Climate Lab. Stone studies the urban heat island effect, which turns cities into cauldrons because of the combined impact of climate change and rising temperatures driven by a predominance of concrete and a shortage of vegetation.

Louisville could significantly reduce the number of people who die

annually from heat-related deaths, under a series of recommendations that could also help other cities around the world respond to the growing hazards of extreme heat.

The plan released Monday calls for leaders to strategically plant additional trees and vegetation, cut energy consumption by cars and buildings, decrease impervious surface areas such as parking lots, and increase the reflectivity of roads and rooftops.

These recommendations are part of a new study that is the first in the nation to measure the benefits of heat management strategies for reducing urban temperatures and reducing the numbers of individuals dying from heat-related causes each year.

The strategies were developed by a research team led by Brian Stone, director of Georgia Tech's Urban Climate Lab and a professor in the School of City and Regional Planning in the College of Architecture.

If implemented, Louisville would be the first city worldwide to develop an urban heat-adaptation plan, Stone said. The city could then show how changes to a city's physical surface can alter the impact of the [urban heat island](#) effect, which turns cities into cauldrons because of the combined impact of climate change and rising temperatures driven by a predominance of concrete and a shortage of vegetation.

"Cities need to think about aggressive action if they want to measurably slow the rate at which they're warming," Stone said. "Louisville and this study can point the way for other cities to follow."

Heat is the deadliest natural disaster facing the United States – killing more people than hurricanes, tornadoes and earthquakes combined. About 650 people die every year because of exposure to excessive heat, according to the U.S. Centers for Disease Control and Prevention. That

number doesn't include deaths from cardiovascular disease and other illnesses exacerbated by the heat.

The bulk of heat-related deaths occur in cities, which are warming up about twice as fast as the rest of the planet. Urban surface area in the United States is expected to expand by one-third by 2050 as communities replace lush tree canopies with large swaths of paved surfaces. Asphalt, concrete and tall buildings absorb heat during the day and keep it trapped at night, which causes temperatures in cities to be warmer than neighboring, less developed areas.

A previous report by Stone found Louisville is warming at a rate faster than any other city in the country. For example, summer temperatures in the city core can be up to 20 degrees higher than surrounding areas. In response, Louisville commissioned Stone in 2014 to study the city and its heat island.

For this latest study, Stone measured existing tree cover in Louisville, found hot spots and identified the neighborhoods with the residents most vulnerable to heat hazards. The plan includes tree planting targets and cool roofing and paving goals for different neighborhoods. In all, an additional 450,000 trees are recommended.

Adopting these strategies and similar steps would reduce Louisville's annual [heat](#) mortality by more than 20 percent, Stone said.

City officials will review the report and seek public comment before deciding how to address the findings and recommendations.

Provided by Georgia Institute of Technology

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