

# From road coatings to a sweating manikin, these ASU research projects are helping Arizonans keep their cool

By Penny Walker, ASU News

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The heat isn't going away. And neither are sprawling desert cities like the metro Phoenix area.

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## About this story

There's a reason research matters. It creates technologies, medicines and other solutions to the biggest challenges we face. It touches your life in numerous ways every day, from the roads you drive on to the phone in your pocket.

The ASU research in this article was possible only because of the longstanding agreement between the U.S. government and America's research universities. That compact

With new summer records being set nearly every year — 2024 was the [warmest year on record](#) for Phoenix — it has become increasingly urgent for cities to find ways to keep summers livable for millions of residents.

There is no silver bullet; it will take a variety of approaches to keep people healthy and safe, from new technology to new policy.

Here are some of the tangible ways that Arizona State University researchers are helping to create more livable tomorrows.

## Pavement innovation cools neighborhoods

If you've ever owned a black vehicle, you know it gets hotter than a white or silver vehicle when parked in the sun. The same is true for the pavement we drive on. Lighter, more reflective surfaces will stay cooler than darker ones.

But could that difference be enough to make an entire neighborhood cooler and more comfortable? A project with the city of Phoenix that [applied a reflective gray treatment](#) to 36 miles of neighborhood roads and a parking lot says yes.

The [results are in](#):

- Cool pavement effectively reduces summer surface temperatures, up to 12 degrees Fahrenheit.
- Cool pavement may reduce long-term road maintenance needs and costs, saving communities money.
- Cool pavement impacts on air temperature appear, thus far, to be small but beneficial.

(Video: <https://vimeo.com/611056148>)

[Read more on ASU News.](#)

## New law protects mobile-home dwellers

Mobile homes account for 5% of the housing in Maricopa County — and up to 40% of indoor heat deaths each year.

provides that universities would not only undertake the research but would also build the necessary infrastructure in exchange for grants from the government.

That agreement and all the economic and societal benefits that come from such research have recently been put at risk.

Learn about more solutions to come out of ASU research at [news.asu.edu/research-matters](https://news.asu.edu/research-matters).

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There's a host of factors, but researchers found a deeper problem. Many residents — who may own the home but lease the land, often from the park owners — said their landlords prevented them from installing heat-mitigation systems, such as window air conditioners or shade sails.

ASU researchers worked with an organization that shaped the language that became Arizona House Bill 2146, guaranteeing mobile-home owners' right to install cooling measures. It passed unanimously, and Gov. Katie Hobbs signed it into law last April.

[Read more on ASU News.](#)

## **Manikin sweats to keep us cooler**

Outside in 115 degrees, an elderly man with diabetes will experience heat stress differently from an active woman in her mid-30s, and differently from a child in elementary school.

ANDI, the world's first indoor-outdoor breathing, sweating and walking thermal manikin, is helping ASU researchers measure the effects of extreme heat on different humans so they can design solutions. ANDI can be set to mimic specific characteristics of a variety of people and can be put in extreme weather situations that could be unsafe for humans.

Researchers are using the data to design interventions, such as cooling clothes or exoskeletons for backpacks that are designed for cooling support.

[Read the ASU News story.](#)

## **Roof coating may lower house temperature**

Imagine a coating applied to roofing materials that keeps your home cooler — and saves you on energy bills.

That's the goal of EnKoat, an ASU spinout company whose coating is being tested on several ASU buildings in collaboration with the Salt River Project, a nonprofit that provides water and power to residents in central Arizona.

The two-year study is tracking the temperatures and energy costs. SRP will then be able to calculate energy efficiency improvement, especially at times with peak demand in the grid. It could potentially even lead to rebate solutions for SRP customers.

[Read the story on ASU News.](#)

## **More tree planting creates shadier communities**

Under the heat of the summer sun, shade is invaluable.

Extreme heat impacts everyone in Arizona, but it does not do so equally. A neighborhood with trees and robust access to shade can be as much as 10 degrees cooler during the day and much more at night. However, not all communities have the resources to support this solution.

A new three-year project at ASU — in partnership with community-based organizations, municipalities and industry partners — will work directly with Valley residents to create actionable neighborhood urban forestry plans while supporting economic growth.

[Read the story on ASU News.](#)

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## **Listen and learn**

Moderated by Ten Across founder Duke Reiter, ASU researchers Jennifer Vanos and Konrad Rykaczewski share insights on groundbreaking heat research underway at the Global Futures Laboratory and how tools like ANDI the thermal manikin are helping inform important solutions for people to persevere through extreme heat conditions.

Ten Across is an initiative that focuses on building resilience to pressing problems impacting America's communities along the 2,400-mile Interstate 10 highway, from Los Angeles to Jacksonville, Florida. It's a stretch of the country that contains the three most populous states, many of the largest and most rapidly growing metro areas, the energy capital of the world, many of the largest American international ports, extremes in weather and water-related challenges, and great demographic change.

[Listen to the episode of the Ten Across podcast.](#)

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*This story originally appeared on [ASU News](#).*

## **Main image**



ANDI, the world's first indoor-outdoor breathing, sweating and walking thermal manikin, sweats while out on campus in August. The manikin will help researchers better understand how different human bodies with different health situations are impacted by heat stress. Photo by Samantha Chow/ASU