UCLA Luskin Center for Innovation

Hot New Observations about Shade in the U.S.

RESEARCH BRIEF

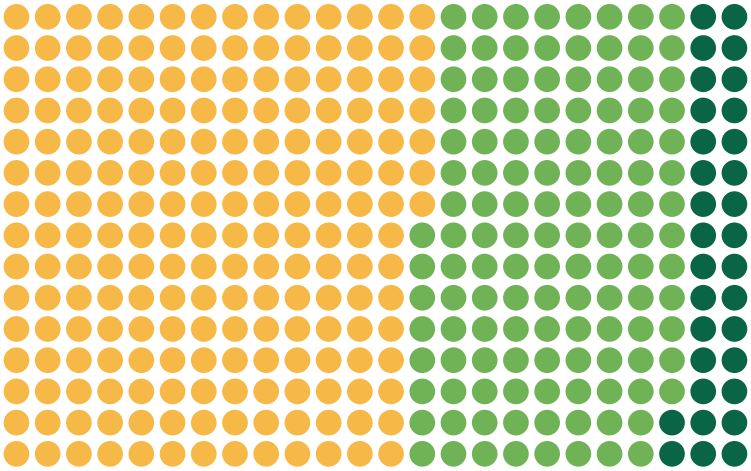
Shade is an essential heat-management solution for hot cities...

The cooling power of shade can make the difference between safe and unsafe for daily life outside. Shade maps can help cities plan to best protect their community. **Does your city have enough shade in the right places?**

The Tree Equity Score National Explorer makes it easy for 360 cities in the United States to see when and where shade is cast. Armed with this cutting edge data, the UCLA Luskin Center for Innovation experts made the following new observations about shade in the United States.

...but most cities do not have enough shade.

Out of **360 cities**... ● = 1 CITY



202 have 25% or less shade coverage at noon

126 have 25% to 50%

and 32 have 50% or more

Ninety-one percent of the U.S. cities in this tool have less than 50% shade at noon; and more than half have under 25% shade! That means that most places in U.S. cities leave people fully exposed to sunlight, with less usable space safe for everyday life when temperatures rise. How much shade is enough? While percent shade cover targets can be a useful place to start, shade needs and benefits are local and contextual. Cities should consider who uses space for what, how, and when. See examples of school routes in Austin, TX, bus stops in Detroit, MI, and parks in Phoenix, AZ.

Use the Tree Equity Score National Explorer to see which neighborhoods in your city have access to shade.

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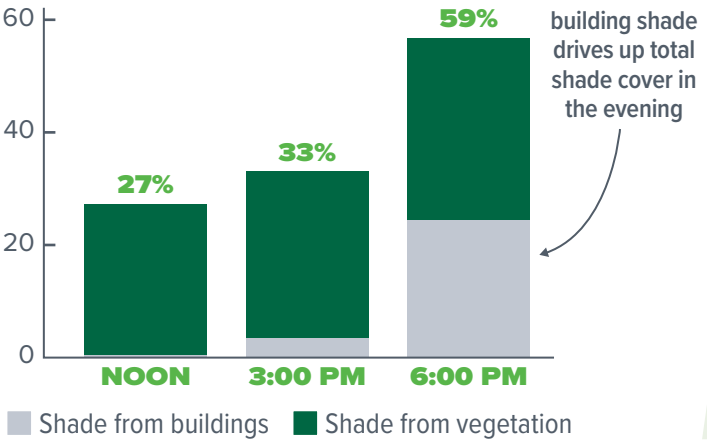
Trees provide 99% of shade when the sun is directly overhead — but as the day goes on, buildings contribute more shade.

Shade throughout the day for 360 U.S. cities



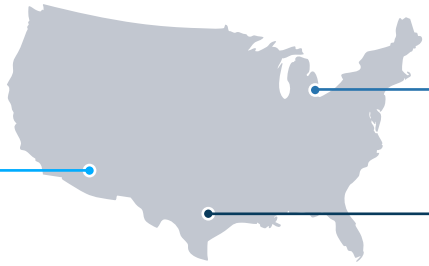
Most cities experience a large increase in shade from minimum cover at noon to maximum cover at 6pm. The shade cast throughout the day depends on each city's mix of trees and buildings.

Trees provide fairly consistent shade, so cities with high tree shade tend to have more consistent shade cover throughout the day. Meanwhile, shade from buildings changes significantly throughout the day. As a result, cities with high building shade often have a bigger gap in shade from midday to evening.

Many cities have large shade gaps between neighborhoods.

When some neighborhoods have lots of shade and others have little, it is an equity and access issue. Shadier cities might have "shade deserts," where less shade means less time in the day when it's safe to be outside. And even cities with little shade overall may have "shade oases," where more shade enables people to spend more time outdoors. These **shade gaps** (differences in shade coverage between the shadiest and least shady neighborhoods) can worsen other inequities, including environmental racism. Below, we illustrate shade gaps using our three case study cities.

Example shade gaps for three cities: 6:00 pm



74

DETROIT, MI
Shade gap: 74
Highest shade: 80% coverage
Lowest shade: 6% coverage

62

PHOENIX, AZ
Shade gap: 62
Highest shade: 65% coverage
Lowest shade: 3% coverage

80

AUSTIN, TX
Shade gap: 80
Highest shade: 92% coverage
Lowest shade: 12% coverage

What is your city's shade gap? Find out with the Tree Equity Score National Explorer.

The National Shade Map is available in Tree Equity Score through our partnership with American Forests.