ULI Research Explores Impact of Rising Temperatures, Excessive Heat on Urban Development

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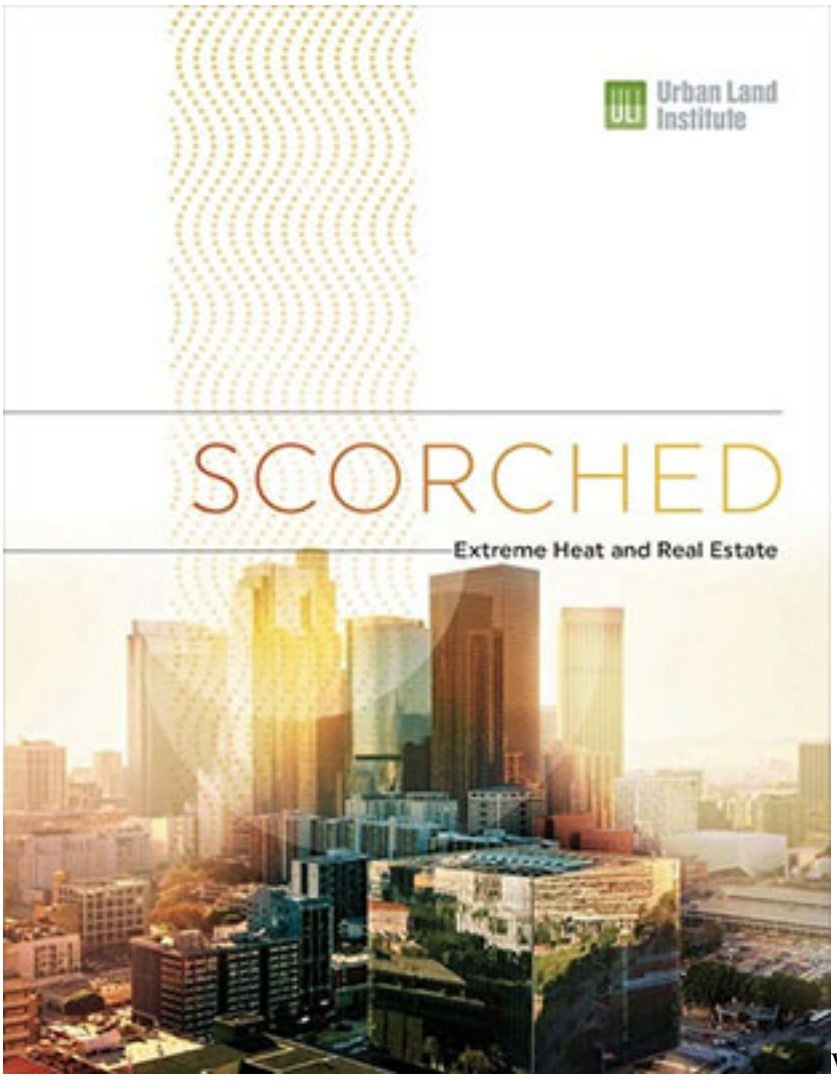

Worldwide, this past July was the hottest month on record, according to the European Union's Copernicus Climate Change Service. A new ULI report, *Scorched: Extreme Heat and Real Estate*, notes that such rising temperatures and excessive heat waves are already affecting urban development and reviews strategies that can help mitigate the effects on communities.

Scorched, published with support from the JPB Foundation, explores how extreme heat is emerging as a growing risk factor and planning consideration across the United States, and how the real estate industry is responding with design approaches, technologies, and new policies to mitigate the effects and help protect human health. The real estate sector can improve resilience to extreme heat through mitigation strategies that lower temperatures, as well as adaptation tactics to help people and businesses cope with extreme heat, the report says.

Among the key observations in the report:

- More cities in the United States are or will be at risk of extreme heat because of climate change and increased urban development.
- Extreme heat is a pressing public health risk, particularly for low-income and elderly people. Cool design strategies, combined with public health and emergency responses, can help mitigate the risks of heat-related mortality.
- Without intervention, the current and potential future impacts of extremely high temperatures on real estate developments, infrastructure, and the economy could be substantial.
- Widespread adoption of mitigation strategies could help reduce the urban warming trends now occurring in cities, allowing them to contend with a more manageable 1- to 2-degree Fahrenheit increase, rather than the 5- to 10-degree increase currently projected for some cities due to the urban heat island effect. (The urban heat island effect is the difference in temperature between urban and rural areas.)

The report points to a broad range of options, many of which also add value as an amenity, including the use of light-colored surfaces and materials, increased shade provided by built and natural canopies, and the use of "heat-aware" building envelopes and heating, ventilation, and air conditioning (HVAC) choices that stabilize indoor temperatures even during power outages.

"Real estate developers, designers, and public policymakers are increasingly acknowledging the detrimental consequences of extreme heat and are seeking solutions to make buildings, neighborhoods, parks, and other outdoor spaces more adaptable to environmental conditions and comfortable for occupants," says W. Edward Walter, ULI global chief executive officer. "This presents an opportunity to reduce climate risk and create better communities in the process."

Scorched provides a snapshot of the issue with several statistics documenting the impact of extreme heat, as well as the significant potential of strategies to address it in the built environment:

- $1 billion—the amount that would be saved on electricity costs if all commercial buildings in the United States switched from dark to light roofs. (source: Global Cool Cities Alliance)
- 30 to 40 degrees Fahrenheit—the amount by which green roofs can be cooler than conventional rooftops. (U.S. Environmental Protection Agency)
- 6.2 years—the average payback period for installing a green roof on a commercial building. (General Services Administration)

- 35 degrees Fahrenheit—the maximum amount that trees reduce surface temperatures. Trees also reduce summer air temperatures by 2 to 9 degrees Fahrenheit. (*Scientific American*)
- 10 percent—the decrease in office worker productivity in thermally uncomfortable and poorly ventilated environments. (U.K. Green Building Council)

Investments in extreme heat mitigation technology and approaches can lead to a host of benefits, including an improved tenant experience, reduced operating costs, an improved likelihood of business continuity, enhanced branding, and additional foot traffic in pedestrian and retail environments, the report notes.

For example, being "heat-resilient" can potentially reduce the likelihood of construction delays caused by extreme heat; increase support from investors, public officials, and other stakeholders; and reduce stress on public infrastructure. In addition, heat-resilient projects can reinforce the developer's reputation for high-quality, green design, and they can become heavily patronized places of refuge during extreme-heat events, leading to enhanced asset value, higher rent premiums, and lower vacancy rates. Also, operating costs can decline as a result of less frequent replacement of heat-damaged materials, lower utility costs, and a higher chance of sustained operations during extreme heat events.

Scorched highlights several case studies of developments that have incorporated extreme heat mitigation strategies:

- Bagby Street, Houston—a commercial corridor redeveloped with ample shade trees and rain gardens to help with flood mitigation.
- Edison Eastlake, Phoenix—a mixed-income development under construction that is designed to maximize shade, ventilation, and energy efficiency.
- National Landing, the Crystal City area of Arlington County, Virginia—the neighborhood that will house Amazon's HQ2, which will test the effectiveness of a reflective pavement sealant, as well as feature additional shade trees, green space, and green roofs.
- Skysong, Scottsdale, Arizona—a mixed-use development designed with a heat-conscious building orientation, heat-efficient facade, natural and built shade, and energy-efficient lighting and HVAC.
- Sundance Square Plaza, Fort Worth, Texas—a two-acre (0.8 ha) parking lot transformed into a plaza featuring elaborate shade umbrellas, shade trees, large water structures, and reflective building materials.

"As extreme heat becomes increasingly prevalent because of the urban heat island effect and climate change, designing for heat and ensuring users' comfort is likely to become a mainstream concern," the report says. "This translates into different design and development decisions for buildings, which may need enhanced cooling capacity, and for public spaces and outdoor retail environments that are likely to be used differently in hot weather."

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ULI members can access copies of the full report and many more at knowledge.uli.org.
Registrants of the ULI Fall Meeting may wish to attend resilience related events listed here.