



# BEAT THE HEAT

HARRISONBURG, VIRGINIA

## Green Cities = Cool Cities



### Demographics

#### Top Five Racial and Ethnic Groups\*

66.6%	White (Non-Hispanic)
14.5%	White (Hispanic)
6.61%	Black (Non-Hispanic)
3.91%	Asian (Non-Hispanic)
3.0%	Two+ Races (Non-Hispanic)
\$43,893	Median Household Income

\*Source: 2018 Data USA, at: <https://datausa.io/profile/geo/harrisonburg-va>



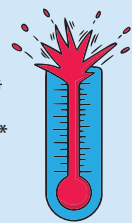
### Urban Forest

25.2%	Current tree canopy
41.0%	Potential tree canopy
15.8%	Potential canopy increase
32.5%	Impervious surfaces
1,389	Acres of Potential Planting Area (PPA)



### Urban Heat

87°F	Average surface temperature*
Projected future days above 100°F**	
2 days	Historically (1971 – 2000)
28 days	Mid-century (2036 – 2065)
57 days	Late century (2070 – 2099)



\*across study area on August 13, 2017  
\*\* Data source: Union of Concerned Scientists, Killer Heat in the United States, at: <https://www.ucsusa.org/resources/killer-heat-united-states-0>

### Overview

For most cities, there is no magic bullet solution to addressing urban heat, health and tree equity. Instead, a combination of strategies are required, the specifics of which depend on the built environment, past development patterns, codes and policies related to urban growth and the demographic distribution of residents. Harrisonburg, Virginia, is an excellent example of how no single strategy will solve all inequities. For example, the hottest areas in the city are in the neighborhoods surrounding the downtown core. However, there is little available planting space to easily add canopy (~2-3% increase) to this part of the city. In contrast, neighborhoods with the lowest median household incomes and predominantly comprised of student housing have significantly more potential for planting trees but already have overall cooler temperatures as a result of surrounding land uses. These areas have plenty of open space and adequate room for planting trees (~15-20% increase) making a more cost-effective solution. In addition, large parking lots in commercial districts lack trees and are big contributors to urban heat in nearby neighborhoods, but retrofitting existing parking lots remains expensive and challenging.

So how does a community start to address urban heat and in the most equitable way in complex landscape of various land uses and demographics? The answer in Harrisonburg involved developing an urban heat mitigation strategy tied to the city's urban forest management program; to its development and building codes; to its other ordinances; to climate actions; and to a city-wide tree sustainability plan.

By holistically examining urban heat impacts and engaging with the community, green infrastructure strategies can be developed to address different sources of heat and existing inequities. The U.S. Environmental Protection Agency

promotes 5 key heat-island cooling strategies. These are: 1) increasing tree and vegetation cover; 2) installing green roofs; 3) installing cool roofs; 4) using reflective or permeable pavements; and 5) using smart growth development practices (EPA 2021).

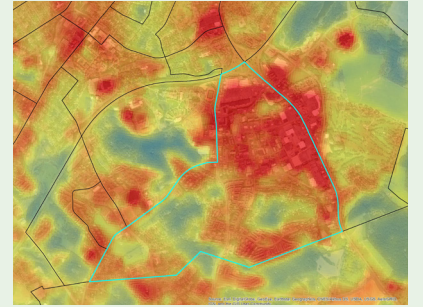
A multitude of approaches will be required. Co-strategies can have positive results; for example, reducing impervious surfaces leaves more space available for tree planting. Thus, Harrisonburg recently allowed the use of trees for credit, in order to meet the city's stormwater utility fee, which also resulted in reducing urban heat. Harrisonburg also recently re-upped its Tree City USA status and is working to amend its codes to make them even more tree friendly.

The work to reduce urban heat is not simple. However, starting this work now and integrating these strategies within your community's built environment will make all the difference as global temperatures continue to rise.

U.S. Environmental Protection Agency, Heat Island Cooling Strategies, Link: <https://www.epa.gov/heatislands/heat-island-cooling-strategies>, October 4, 2021.

### Step-Wise Strategy to Identify Communities and Mitigation Opportunities

1. Use maps to identify hot spot(s) in the city.



2. Identify vulnerable or underserved populations of interest.



3. Outreach and engage with the community.

4. Develop an urban heat mitigation tree planting plan.

### Green Infrastructure Co-Strategies Can Include:

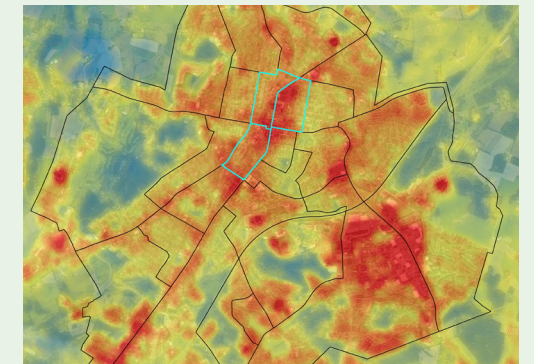


Identify policies and codes that promote impervious surfaces.

Strategically amend codes to support adding more pervious surfaces and trees.



Prioritize and strategically plant the hottest low canopied neighborhoods with trees.



Retrofit downtowns to include green infrastructure technologies such as underground support cells and bioswales that can accommodate shade trees.



The city currently requires preservation of mature trees on sites, but they also can collaborate with and incentivize developers to reduce impervious surfaces in the site design process.

