

Urban heat islands



What is an urban heat island?

Urban heat islands are areas that get much hotter than surrounding areas, particularly during the summer. These areas have more roads, buildings, and other surfaces that absorb and radiate heat. They also have fewer trees and greenspace that help keep areas cooler.

The combination of these characteristics creates “islands” where the temperature measured can be significantly

higher than the temperatures of surrounding areas. The continued rise of temperatures due to climate change and continued growth of urban areas will likely make the urban heat island effect worse.

What causes urban heat islands?

Heat-storing materials

Dark surfaces absorb more energy from sunlight than lighter, more reflective surfaces. This absorbed energy is released over time as heat. Many materials that we use for roads and buildings absorb more heat than natural landscapes.

Lack of trees and other vegetation

Similar to how sweating helps cool our bodies, trees and other vegetation provide a cooling effect in our environment. Trees, vegetation, and soil absorb and release moisture. When that water evaporates, it pulls heat energy from the surroundings. This process cools the surrounding air.



Urban canyons and urban geometry

Tall buildings can create an urban canyon effect, blocking wind that would otherwise provide ventilation and cool the streets below as well as speed up evaporation. Tall buildings also can block heat energy from being released into the atmosphere, keeping it closer to where we can feel it.

Waste heat

Densely populated urban areas concentrate heat-emitting devices, like cars and air conditioners, over small areas. This heat adds up and contributes to higher air temperatures in cities.

Source: About Urban Heat Islands (heat.gov)

Why should we care?

Health

Extreme heat can contribute to breathing problems, heat cramps and heat stroke. It may also lead to illness or even death – especially in vulnerable populations such as the elderly.

Air quality

Heat islands raise energy demand to power air conditioning, which increases power plant emissions that contribute climate change. Higher temperatures also accelerate the chemical reaction that produces ground-level ozone, or smog.

Energy use

Heat islands are responsible for 5% to 10% of summertime electricity demand, leading to higher electricity bills and pressure on the electricity grid.

Equity

Urban heat is not distributed evenly across a city. Neighborhoods in the same city can differ in temperature by as much as 20°F due to the urban heat island effect. There is a strong correlation between hotter neighborhoods and historic discriminatory policies like redlining as well as current inequities.

Source: Keeping Your Cool: How Communities Can Reduce the Heat Island Effect (epa.gov)



Hennepin County's response

Addressing urban heat island dangers

- Continuously monitoring key temperature and humidity measures at the city level
- Working closely with the National Weather Service to provide forecasting, alerts and warnings
- Developing detailed urban heat island mapping to focus efforts in the most impacted areas
- Providing education for the public, especially those most susceptible or exposed to heat
- Creating more opportunities for the public to access air-conditioned spaces

Reducing urban heat island impacts

- Planting trees along streets to increase shade, especially in areas with lower tree canopy.
- Adding vegetation to urban spaces, including with green roofs and urban agriculture.
- Implementing cool surfaces on roofs and walls.
- Reducing paved area or using permeable or cool pavements.

