



# Module 3, Investigation 2: Briefing 1

## What's hot at the mall?

### Background

This investigation examines how shopping malls change natural environments.

NASA scientists have been studying how hot it gets around shopping malls. Wherever malls are built trees and wildlife habitat are lost. Malls use a lot of land, stand out on the landscape, and are visible on aerial photos and satellite images.

Vegetation shades areas, preventing a build up of heat. Trees absorb and use the Sun's energy for photosynthesis. The loss of vegetation in built-up and paved areas causes the formation of hot spots. Heat builds up during the day because the Sun's energy is retained by buildings and pavement. This causes surface temperatures and the surrounding air temperature to rise. Much of this stored-up heat is released at night.

On a hot summer day we may feel a blast of heat when we walk from an air-conditioned mall across an asphalt parking lot to our car. The heat rises from the pavement to meet us and warms us all the way across the lot. While we shopped, our car absorbed the Sun's rays and heated up. During the summer, temperatures in parking lots are as high as 49°C (120°F). When you add up all the heat from parking lots, buildings, cars, and roads, and remove the trees that might soak up the heat and keep things cool, it is no wonder that temperatures rise in built-up areas.

### Objectives

In this investigation you will

- identify topics that NASA scientists study;
- explain why NASA scientists are interested in studying malls;
- correctly identify a mall on the Huntsville, Alabama, thermal image;
- distinguish between hot and cool areas on thermal images; and
- explain some of the environmental consequences of constructing a shopping mall.

### Procedures for the Investigation

You will consider environmental changes caused by shopping malls by examining thermal images gathered by NASA showing an area in Huntsville, Alabama. A thermal image shows differences in temperature on Earth's surface. You may be working alone or in groups to complete Logs distributed by your teacher.

### References

*Geography for Life: National Geography Standards 1994*

[http://science.msfc.nasa.gov/newhome/headlines/essd08may97\\_1.htm](http://science.msfc.nasa.gov/newhome/headlines/essd08may97_1.htm)

Background on Huntsville and features of the Madison Square Mall vicinity was provided by Blaine Adams, geography graduate student at Virginia Tech and native of Huntsville, Alabama