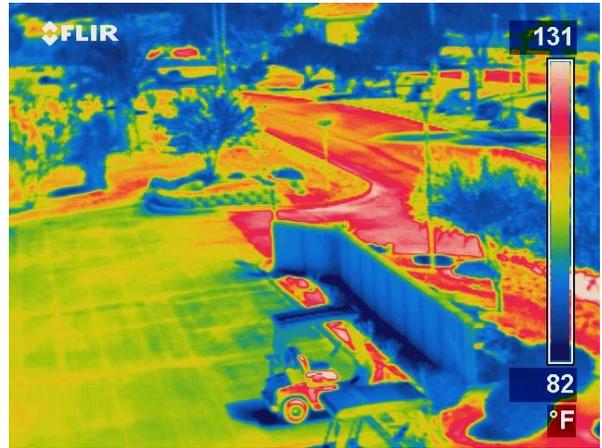
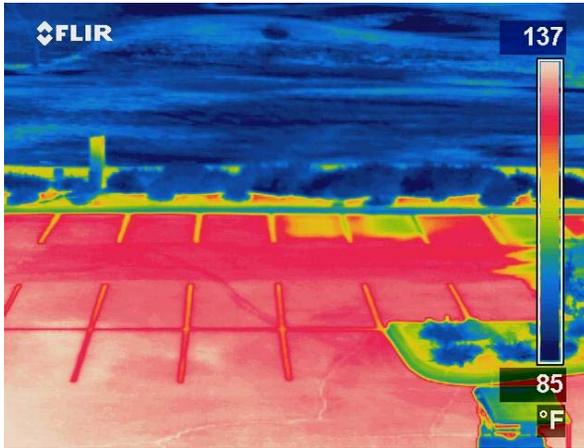


Hot Pavement

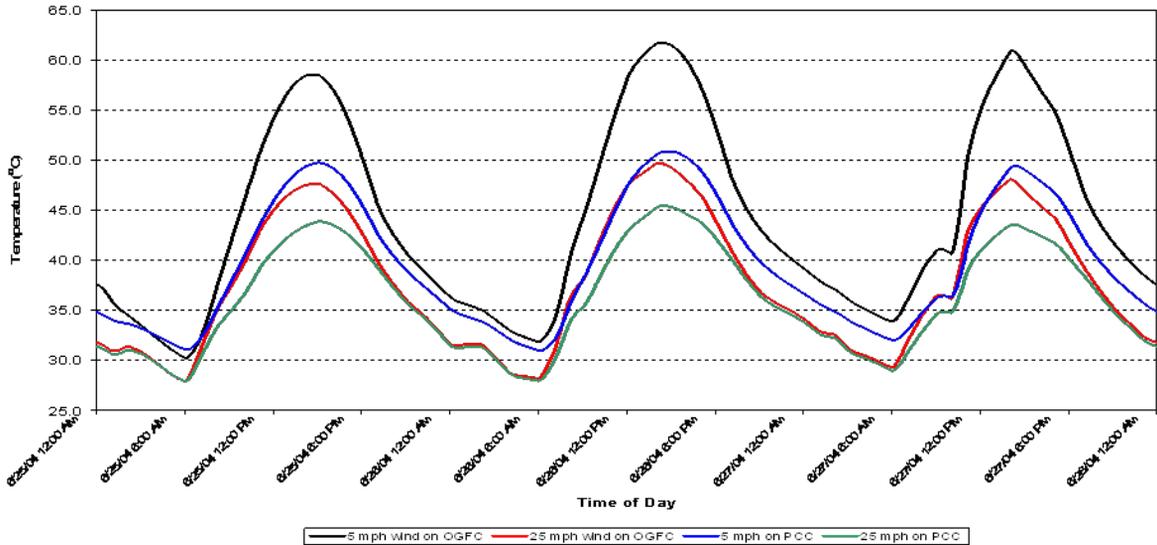


The Consequences of Dark Pavement Surfaces

An important but often overlooked consequence of overlaying a concrete surface is an increase in pavement surface temperature and the resulting effect on the surrounding facilities. As temperatures rise, cooling demands and electrical consumption increase. This is a direct consequence of the urban heat island effect. Prior to embarking on a long term strategy of overlaying concrete surfaces with darker-colored materials, agencies should consider the long term consequences and other concerns. The urban heat island effect is no exception...

Infrared Imagery Reveals the Solution

The image on the top right is an infrared photograph of an asphalt roadway leading into a concrete parking lot in Rio Verde, Arizona; the photo below it presents the same scene. Note the immediate transition from asphalt (red) to the UTW (yellow green) at the driveway. There was a 30-degree difference in temperatures between the asphalt and the concrete surfaces. The photo on the top left was taken of an asphalt parking lot adjacent to a golf course. Note the 85-90 degree temperature of the grass and the 135 degree temperature of the asphalt; the photo below it represents the same scene.

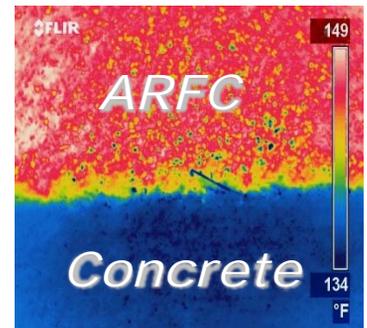
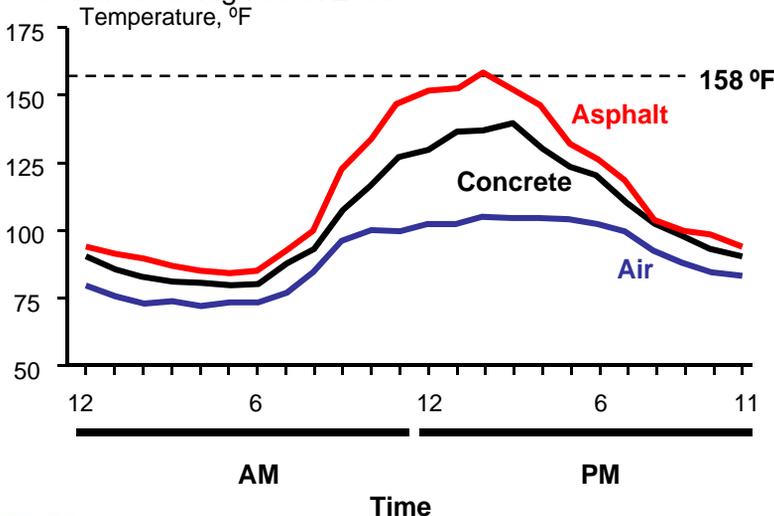


The figure above shows a model in development by Arizona State University to predict pavement surface temperature as a function of the time of day. The three surfaces included are dense graded asphalt (AC), asphalt rubber friction course (ARFC), and concrete (PCCP). These are simulations modeled after real data from the Arizona freeway system and show concrete is by far the coolest surface.

How Hot Can Pavements Get?

The graph below shows the daily temperature of a Phoenix street and the known burn temperature for human skin. A study, conducted for emergency medical personnel, found:

- ✓ Exposure of 1 second to pavement at 158 °F can burn human skin.
- ✓ At 158 °F you can cook an egg on pavement surface in five minutes.
- ✓ Dark-colored pavement temperatures in Phoenix have reached as high as 172 °F.



The photo above is an infrared image of an ARFC overlay next to a concrete pavement. The ARFC overlay (red area) is near 150 °F, while the concrete pavement is under 135 °F.