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EDITORIAL

The asphalt furnace

Our stand: We've paved our way into a black box, and it's time to lighten up

Ouch! If you've stepped barefoot onto asphalt and come close to getting a third-degree burn, you know that black pavement gets *really* hot in the sun.

Asphalt can be 40 to 60 degrees hotter than the air temperature.

Now think of all the pavement around the Valley. No wonder we're heating up.

Asphalt pavement is double trouble. Because of its color, it absorbs 95 percent of the sunlight that hits it. Because of its density, it stays warm for a long time after dark. That's why the Valley, especially heavily paved areas, takes so long to cool off at night and why summertime low temperatures just aren't so low anymore.

There are two approaches to reducing the furnace effect of pavement, and we should use both of them:

■ Pave with different and lighter-colored materials.

■ Lay down less pavement in the first place.

There are cooler choices than traditional asphalt paving, but they require a higher upfront cost.

Concrete reflects far more light: 25-30 percent, compared with 5 percent for fresh asphalt. The price runs 50 percent more than asphalt for the average street or parking lot, but concrete requires less maintenance.

While Valley cities opt for the cheaper initial cost of asphalt for most streets, other places calculate differently. Houston typically uses concrete, not for heat but for long-term economics: concrete lasts much longer than asphalt, particularly under the heavy pounding of buses and trucks.

Pavements can also be made cooler if they're pervious, allowing water to pass through. While the main goal of pervious pavement, used mostly in parking lots, is to improve drainage, it also stores less heat because it's less dense.

A few places in Phoenix are going even further, using stablized granite in small parking lots instead of regular paving.

Are there ways to make asphalt cooler? Yes, but they're not widely used.

Asphalt pavement is a mix of rocks held together by black asphalt. It lightens up a bit over time (good news on the heat side) as traffic scuffs off the top layer of asphalt and exposes the rock. By specifically using lighter-colored rocks for the mix, we could cool off the pavement a bit without a significant cost increase.

Asphalt pavement can also be sealed with a coating that's a lighter shade, such as gray or tan. While that's an extra cost, the seal will prolong the life of the asphalt.

Paradoxically, our latest freeway improvements are taking us backward in controlling heat. We're reducing noise by putting rubberized asphalt on concrete freeways, but we're making them a lot hotter.

Besides changing the pavement, we can try to reduce it.

Parking lots occupy about 10 percent of the land in cities. Yet they're rarely full, especially the shopping centers that plan parking areas based on the number of shoppers between Thanksgiving and Christmas.

Cities impose minimum parking requirements. Why not maximums?

Parking structures and underground parking are also ways to roll back the sea of asphalt. They're expensive, but higher land prices and customer comfort with shaded parking are making the economics more attractive. Cities should consider priming the pump with carefully crafted incentives.

Streets are another logical place to use less pavement.

Joe Johnston is trying to make his Agritopia development in Gilbert more pedestrian-friendly by shrinking the width of streets. But he's is also reducing heat buildup. Some of the streets are as narrow as 17 feet, with no parking on either side. Proposals for narrow streets often get shot down over fears that fire trucks won't be able to get in. Johnston used a street section in Portland, Ore., as a model and worked with the fire department to make sure there were no concerns about emergency access.

While it's in the name of nostalgia, Agritopia also has less pavement on driveways: they're "ribbon drives," two strips of concrete with grass or landscaping between them.

With less pavement and better pavement choices, we have a chance to turn back the clock on urban heat. Otherwise, crank up the AC because we're headed for nights when the temperature never goes below triple digits.

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The Arizona Republic

Asphalt soaks up heat and can be 40 to 60 degrees warmer than air temperatures.

SUNSTROKE

Our urban heat island, and how to escape it

Series at a glance

SEPT. 14: The Valley's urban area generates extra heat, putting a burden on our comfort, our wallets and our health. It's time to fight back.

SEPT. 15: Turn roofs into solutions, not problems.

SEPT. 17: Use the cooling power of trees.

TODAY: Make roads more reflective.

Go to www.azcentral.com/specials/editorial/ to read the entire series.

We turned up the heat, and we can turn it back down

The heat has lulled us to sleep, and we have to wake up.

We need to take strong steps to counteract the way buildings and pavement are making the Valley hotter, especially at night. There's a lot at stake, including our comfort, air quality, electric bills and economic appeal as a place to do business.

The major strategies to fight urban heat aren't mysterious: plant more trees, install light-colored roofs that reflect heat instead of absorb it, reduce the amount of pavement and use lighter-colored paving materials.

So why are we hesitating?

The devil is in the details, as the saying goes. Here are some ways to get at them:

■ Local governments must set an example. They should require "cool roofs," using highly reflective material, for their own building construction and repairs. Municipal parking lots should be models for the best ways to plant trees to shade the pavement.

■ When new developments are going through their approvals, the impact on urban heat should be just as standard a question as the effect on traffic.

■ The business community, especially developers and home builders, should put their skills and ingenuity into trying to reduce urban heat. They have an interest in the long-term economic implications — and can use their involvement as a marketing tool.

■ Arizona State University, which has been working on urban-sustainability projects, should connect its research to the local community. We need more scientific work, by ASU or other institutions, to answer the special questions of a desert city, such as the water trade-offs involved in planting trees.

■ We desperately need an easy-to-use Web site with the latest information about urban heat and practical details about ways to relieve it, both for professionals and the average person.

■ Average citizens must let elected officials know that urban heat is an important issue. We need more people like Paul Hollar. Six years ago, the Gilbert resident became alarmed at the way temperatures go up when fields turn into subdivisions. Armed with notebooks full of information, he spurred the town to address urban heat in its general plan and got a supermarket chain to install white roofs.

■ The Valley needs a strong tree program, with a solid volunteer base and emphasis on keeping trees alive, as well as planting them. It should offer in-depth information on such topics as the most effective placement and how to help trees thrive in parking lots. The Arizona Community Tree Council, sponsored by the State Land Department, has made a promising start by developing a matrix to identify the best street trees for various conditions.

Some people will argue that we shouldn't rush. They'll say researchers are still trying to understand the dynamics of urban temperatures, although scientists noticed the difference between rural and city temperatures more than a century ago.

We know that Valley nights are hotter.

We know some ways to make them cooler.

We know enough.

And we can't afford to wait.