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Planet-Friendly Paving Lets Water Seep Through

By Jeanne Huber
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Paved sidewalks and driveways keep shoes clean and cars out of the mud. But environmentally speaking, too much paving is a disaster, blanketing the ground and preventing rainwater from soaking in. Runoff, especially after strong storms, erodes soil and carries oily residue into streams and eventually into sensitive estuaries such as the [Chesapeake Bay](#).

Pervious paving, though, is friendlier. Attractive enough for casual patios and walkways and sturdy enough for driveways, it is designed to let rainwater drain through, usually into a deep layer of gravel where it can slowly percolate into the soil.

"The paving keeps the storm water from acting like a fire hose on stream banks," says Ann English, a landscape architect at the Low Impact Development Center. The nonprofit organization in [Beltsville](#) helped pioneer the use of natural systems, rather than culverts, to manage storm water. "Permeable paving cuts down on erosion," English says. "It lets the water get cleaned as it moves through soil layers. And it recharges the groundwater."

The environmental benefits are so profound that [Montgomery County](#) has started offering rebates of up to \$1,200 to homeowners who rip out standard paving and switch to one of the four kinds of pervious paving: a special kind of concrete, porous asphalt, permeable concrete pavers and grid systems filled with sod or gravel.

Homeowners also can be reimbursed for other projects that reduce runoff, including planting trees, installing rain barrels, converting lawns to more spongelike planting beds, and retooling driveways by such methods as digging up a center strip and installing water-absorbing landscaping there.

Most pervious paving looks like conventional materials but has more texture. Pervious concrete, for example, looks a bit like rice cakes rather than sliced bread. Made of portland cement and gravel of uniform size, the surface has spaces between the gravel that water flows through, into a deep gravel layer underneath. Porous asphalt, made of the standard tarlike binder plus gravel, works similarly.

Permeable concrete pavers resemble standard pavers, but wider joints or gaps between them let water through while still being smooth enough for wheelchairs and high heels. Grid systems resemble lawn or ordinary gravel, except that you can drive on them without killing the grass or packing down the gravel.

Pervious concrete mix arrives in the same trucks as standard cement but requires special installation and equipment. The mix is so stiff that it needs to be smoothed with a roller; it can't be leveled with a screed board, as most cement is. Most asphalt companies can install porous asphalt, because it is spread and rolled in the same way as the standard kind. Pervious



Gaps in permeable concrete pavers draw rainwater into the ground, minimizing runoff. (By Bruce K. Ferguson)

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pavers are sold by the same companies that sell other types of pavers, and the equipment and installation are similar. Grid systems can be installed by handy homeowners, especially in small areas.

Of the options, permeable pavers create the classiest look for residential driveways and patios. But they also cost the most -- perhaps \$12 to \$15 per square foot installed, vs. \$4 to \$8 for pervious concrete, \$5 to \$6.50 for plastic grid systems and \$4.60 for porous asphalt. The pavers, concrete and asphalt can cost 10 to 20 percent more than standard paving, in part because of the site preparation and drainage layer installed underneath.

In this country, pervious concrete first showed up in [Florida](#) in the 1970s, and porous asphalt was invented about the same time. A porous asphalt parking lot installed in 1977 at Walden Woods in [Massachusetts](#) is still performing well. Concrete paver designs that allow water to penetrate were first used in [Germany](#) in the 1980s and in the United States in 1992.

Interest in pervious paving is growing as more communities adopt green building programs and tighten rules about dealing with storm water. In new developments, builders often discover that pervious paving saves money overall because it reduces the need for other storm-water systems and allows them to put buildings or other features on more of the land.

When a parking lot doubles as its own water-storage area, for example, a developer may not need to set aside part of the property for a pond that holds storm water, says Rick Brush, manager of Montgomery County's water resources permitting and plan review program. For more information about the county's Rainscapes Rewards initiative, visit the Web site at <http://www.montgomerycountymd.gov/rainscapes>.

Denise Zeck, president of the Glen Echo Heights Citizens' Association, says many residents of her 480-home neighborhood embrace the program as a way to deal with runoff, which she says has increased dramatically as more trees have been cut to make way for seemingly ever-larger houses.

The success of pervious paving depends on the right setting and installation. In general: The soil needs to drain reasonably well. The site cannot slope more than about 10 percent (or water draining through is likely to blast out from below). And the homeowner needs to be willing to sweep, blow or vacuum off leaves as needed, since a buildup of debris can clog the surface. Pervious paving should start at least 10 feet from the house so the water doesn't seep into a basement or crawl space.

The pavers are most popular in residential settings because finished projects wind up looking as though they're made of traditional bricks, cobblestones or pavers. Pervious concrete is also popular, and grid systems are good for overflow parking areas, utility easements and other places where vehicles travel infrequently.

It's easy to spot the success stories: When it rains, they're puddle-free.

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