

Toxic Runoff: How Big-Box Stores Pollute Lakes and Streams



"From an environmental standpoint, parking lots rank among the most harmful land uses in any watershed," said Tom Schueler of the Center for Watershed Protection. During rain storms, parking lots deliver a hefty dose of toxic pollutants—including phosphorous, hydrocarbons, and heavy metals—into nearby water bodies.



While a 200,000-square-foot supercenter covers 4 acres and consumes another 12 for parking, the same amount of retail spread over two floors in a Main Street-style setting with shared parking takes up only 4 acres.

The passage of the Clean Water Act in 1973 helped restore the health of lakes and rivers by limiting industrial discharges. Today, however, many lakes and rivers are in decline once again. This time the culprit is polluted runoff from roads, parking lots, and other paved surfaces.

What Happens When It Rains

After a field or forest is paved, rainwater that would have soaked into the ground instead flows across the surface. It becomes warmer and collects pollutants leaked by vehicles or deposited from the atmosphere. These include phosphorus, nitrogen, hydrocarbons from motor oils and fuels, heavy metals, road salt, pesticides, and herbicides. This contaminated runoff then flows into a nearby lake or river, delivering pollutants and raising the water temperature.

In heavily paved areas, the ground no longer serves as a sponge—absorbing, filtering, and slowly releasing rainwater. As a result, nearby rivers run very high during storms, destroying stream-bank vegetation and spawning habitat, and low at other times, further stressing fish.

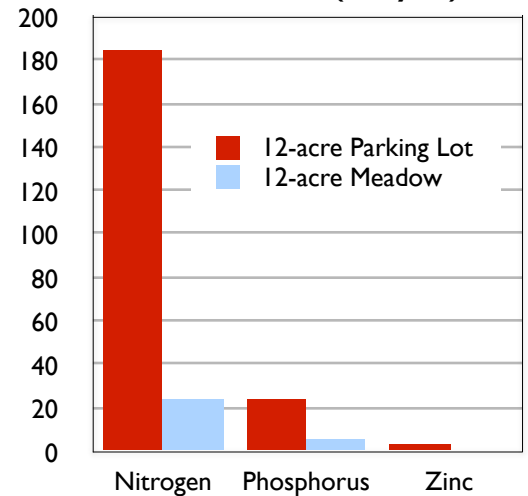
Big-Box Parking Lots

No other type of land use creates as much contaminated runoff as big-box retail. This is because of the vast amount of parking these stores require and the thousands of cars that enter their lots each day, coating the asphalt with pollutants. "Simply put, there is no other kind of surface in a watershed that produces more runoff and delivers it faster than a parking lot," explained Tom Schueler of the Center for Watershed Protection.

A 200,000-square-foot big-box store requires a parking lot of about 12 acres—much larger than would be needed for a similarly sized office, industrial, or residential development. This size parking lot generates 309,694 gallons of contaminated runoff during a one-inch storm. (Thomas Schueler, "The Importance of Imperviousness," *Watershed Protection Techniques*, 1994)

The explosive growth of big-box retailers in recent years has created vast new expanses of impervious surfaces. Since 1990, the amount of retail store space per capita in the U.S. has more than doubled. That translates into roughly 125,000 acres of rooftop and 375,000 acres of parking. (Stacy Mitchell, *Big-Box Swindle*, Beacon Press: 2006, p. 107, 119)

**Parking Lot vs. Meadow
Pollutant Load (lbs./year)**



(Source: Thomas Schueler, "The Importance of Imperviousness," *Watershed Protection Techniques*, 1994)

The Solution: Compact, Mixed Use Business Districts

In some cases, permits for big-box projects have been denied on the grounds that they would add additional pollution to a river already classified as impaired under the Clean Water Act. In Hermantown, MN, for example, plans to build a 203,000-square-foot Wal-Mart came to a halt when an environmental impact report by the Minnesota Pollution Control Agency concluded that the store would negatively impact the "impaired" waters of Miller Creek.

In addition to the federal standards, a few cities and states have adopted their own environmental impact criteria, allowing them to reject harmful projects or insist that developers reduce runoff by installing retention ponds and filtration systems. Depending on local conditions, however, these systems may only modestly diminish the volume and toxicity of runoff.

Long-term, the best solution is to revitalize existing downtown and neighborhood business districts and to adopt zoning rules that require new development to be similar in form. Compact commercial centers that have multi-story buildings and support a mix of uses take up far less land and create less pavement than big-box stores. While a 200,000-square-foot supercenter covers 4 acres and consumes another 12 for parking, the same amount of retail spread over two floors in a Main Street-style setting with shared parking takes up only 4 acres.

BIGBOXTOOLKIT

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