At least, it’s the question when it comes to the stormwater challenges that are currently faced as urban sprawl and impervious asphalt continue to proliferate exponentially above and beyond the capacities of our aging, undersized stormwater management systems. Unprecedented and unforeseen growth over the last few decades has overwhelmed entire stormwater systems, which are now in need of rehabilitation and expansion, making stormwater management one of the hot topics between municipalities, their commercial facilities, and residential communities.

Unfortunately, the Great Recession has left many municipalities struggling to cover the more pressing costs of our social service needs. Coupled with the financial crisis is the fact that Florida has almost daily occurrences...
of significant rain events, which can lead to flash floods in their own right. Also, there are the added problems brought on by tropical storms and hurricanes, which shows that stormwater management is indeed a problem across much of Florida.

Additionally, the Environmental Protection Agency (EPA) estimates that stormwater runoff can send as much as 90 percent of the pollutants (such as oil and other hydrocarbon liquids) found on the impervious surface of asphalt parking lots directly into a facility’s surface water system by the first 1½ inches of rainfall. The “Big Three” pollutants in urban runoff are sediment (dirt and debris), heavy metals (from the brake linings of cars), and hydrocarbons.

One source of hydrocarbons is the oil that drips onto pavements from vehicles, but the primary contributor is the petroleum-based binder in asphalt itself, which accounts for as much as 90–95 percent of the hydrocarbons in urban runoff according to some recent EPA studies. Stormwater drains don’t typically channel this polluted runoff to treatment facilities, but instead convey it directly into local water bodies. This can increase algae content, harm aquatic life, and require expensive treatments to make the water potable.

The primary reason for the ongoing problem with stormwater is the heavy use of traditional, impervious asphalt paving for our local roads and parking lots. This, coupled with our reliance on conventional underground stormwater drains and retention pond systems, has covered up nearly half of our urban and suburban permeable land mass. As more available land area in the state gets paved over, larger amounts of rainwater end up falling on impervious surfaces such as parking lots, driveways, sidewalks, streets, and roofs rather than soaking into the soil. Perhaps the biggest cost of all is the immeasurable damage that impervious surfaces such as asphalt do to our drinking water supply as rainfall is not allowed to return to our life-sustaining aquifers by soaking into natural landscape.

To address these serious pollution and sustainability concerns, the EPA along with many local municipalities and regional watershed authorities are tightening environmental regulations and requiring more stringent stormwater management practices. As you can see,
The Benefits of Pervious Concrete

- Reduces the amount of untreated runoff discharging into storm sewers.
- Directly recharges groundwater to maintain aquifer levels.
- Channels more water to tree roots and landscaping, so there is less need for irrigation.
- Mitigates pollutants that can contaminate watersheds and harm sensitive ecosystems.
- Eliminates hydrocarbon pollution from asphalt pavements and sealers.
- Absorbs water rather than allowing it to puddle, which reduces hydroplaning and tire spray for safer driving and better stopping on wet pavements.
- Absorbs less heat than asphalt due to its light color, which puts less heat stress on landscaping and lowers surrounding ambient temperatures.
- Eliminates the need for costly, low-value land use by reducing or removing the need for retention ponds.
- Lowers the first-cost and lifecycle costs of stormwater management by reducing the size or eliminating the need for traditional underground pipes and pond systems.
- Requires little to no maintenance other than an occasional vacuuming (every one to two years), or if left unattended for an extended period (five years or more), a light pressure washing followed by a vacuuming.

The failure of the stormwater runoff problem carries both a very high environmental and economic cost that few people truly understand.

After decades of shortsightedness, it is no wonder that pervious concrete is becoming one of the most viable solutions the market has to offer in combating the failings of traditional stormwater management practices. Instead of preventing infiltration of water into the soil, pervious concrete assists the process by capturing rainwater in a network of voids allowing it to percolate into the underlying soil making porous concrete instrumental in recharging groundwater, reducing stormwater runoff, and meeting U.S. Environmental Protection Agency stormwater regulations. In fact, the use of pervious concrete is an EPA Best Management Practice (BMPs), and is used by the EPA, as well as by other agencies and geotechnical engineers across the country, for the management of stormwater runoff on a regional and local basis.

While still called concrete, a pervious concrete mixture contains little or no sand, creating a substantial, interconnected void content that usually accounts for approximately 15–25 percent of the pavement’s total volume. This allows rainfall and stormwater to flow through the pervious concrete at rates of around 480 inches per hour (which is 5 gal/ft²/min), or higher depending on the depth of the underlying aggregate reservoir and the natural permeability of the underlying soil, which in Florida is usually...
fairly sandy allowing very favorable permeability.

Whereas the elimination of the sand allows very high rates of permeability, this also puts some limits on the applications for pervious concrete as long-term durability under extreme usage conditions are usually less than what you would expect from traditional concrete. Pervious concrete is perfectly acceptable for use in parking lots that service normal passenger cars, SUV’s, and light-duty trucks as well as driveways, sidewalks, swales, drainage structures, and other medium-to-light-duty applications.

Some heavy-duty traffic such as garbage trucks, school buses, moving vans, and other delivery vehicles is not a problem, but pervious concrete is not intended for applications where repeated, heavy loads are the majority of the traffic like you would find at distribution centers, loading docks, industrial parks, main arterial streets and heavy highways. In these applications, many designers

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are combining traditional concrete paving in the high-traffic areas with pervious concrete along the perimeters and in any light-duty locations providing the best of both worlds in one system.

Naturally, the question becomes “What’s the cost? If there isn’t money to repair the current system, there certainly isn’t money to replace asphalt pavements with pervious concrete.” But actually, there is. Asphalt is not considered a permanent pavement and usually wears out after eight to 12 years in high-traffic areas and 10 to 16 years in lower-traffic areas. When it is time for the asphalt to be replaced, replace it with pervious concrete. New construction should include pervious concrete from the outset, which is not just environmentally prudent but also economically viable as the cost of paving with pervious is almost always less than the cost of paving with asphalt whether it is a road or a parking lot.

Pervious concrete roadways and parking lots, along with their crushed rock base reservoir, double as your stormwater retention structures, reducing or even eliminating the need for traditional stormwater management systems, which require retention ponds, swales, pipes, sewer tie-ins, and sometimes pumping stations. This improvement in land use coupled with the elimination of costly underground water handling system components, and the fact that rising oil prices continue to drive asphalt prices higher every year, actually allows
pervious concrete to lower your overall costs on both a first-cost and life-cycle cost basis all while addressing a crucial environmental issue and supporting green, sustainable development and growth. What’s more, pervious paving usually lasts far longer than asphalt paving and requires much less maintenance as just a simple vacuuming every couple of years will keep the water flowing through the pavement at very acceptable rates for decades.

In municipalities that can’t depart from traditional thinking, the stormwater management problem and its cost will be pushed onto the developers, residents, and existing business owners as they will have to bear the financial burden of resolving this issue. Not only will they have to capture and retain their own water but also that of the streets adjacent to their businesses and communities. If that sounds difficult and expensive to you, you would be correct and it can create an economic disadvantage at a time when few can afford to be disadvantaged.

However, for those who are willing to embrace a new way of thinking and understand the value of a systems approach to solving problems, then environmental and economic benefits of pervious concrete will provide a solution whose benefits far outweigh the costs.