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## Philadelphia's Cutting-edge Green Infrastructure Plan

05/10/2010 by [asladirt](#)



More than a hundred years ago, Philadelphia set the standard for water and sanitation, creating one of the world's first modern water management systems. To this day, tourists are still coming to view the more than 3,000 miles of underground water works. Now, [Philadelphia Water Department's Office of Watersheds](#) may be leading the next generation of innovation in water infrastructure with its plans to roll-out an ambitious \$1.6 billion green infrastructure plan, which would use rain gardens, green roofs, pervious pavements, and trees to recycle and reuse rainwater. According to one study, "one inch of rain water hitting one acre of asphalt means 27,000 gallons of water" is going into the sewer. For a city like Philadelphia, that means billions of gallons are flooding its now aged water management system.

The green infrastructure proposal would turn 1/3 of the city's impervious asphalt surface, or 4,000 acres, into absorptive green spaces. The goal is to move from grey to green infrastructure. Grey infrastructure includes "man-made single purpose systems." Green infrastructure is defined as "man-made structures that mimic natural systems." As an

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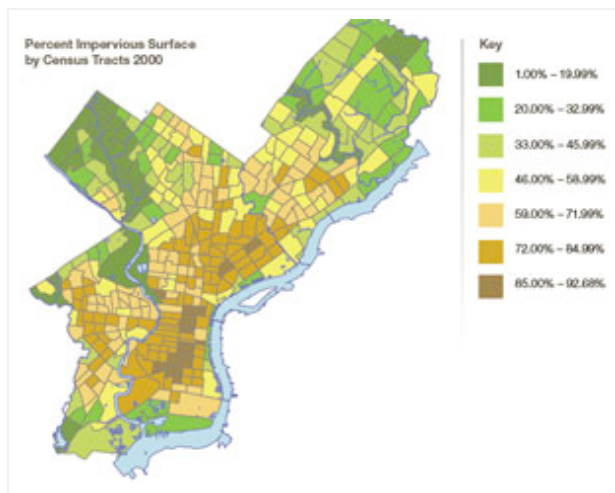
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example, networks of man-made wetlands, restored flood plains, or infiltration basins would all qualify as green infrastructure. The benefits of such systems include: evaporation, transpiration, enhanced water quality, reduced erosion / sedimentation, and restoration. Some grey / green infrastructure feature integrated systems that create hybrid detention ponds or holding tanks, which are designed to slow water's release into stormwater management systems.

Christine Knapp, [PennFuture](#), said a green infrastructure plan is desperately needed to deal with Philly's combined sewer system. (A combined sewer system doesn't have separate infrastructure for stormwater and sewage). Because the city's system is combined, when there's heavy rain, more than 1/4 of homes and 1/3 of businesses experience sewage back-up and overflow. "That has a real economic impact on property and is a major health issue." She added that the highest concentrations of impervious areas are also located in the poorest parts of town:



Options for fixing the overflow issue include: (1) separating the stormwater and sewage system, a solution "requiring billions," which isn't practical, (2) building more sewage holding tanks, which would be spread throughout the city, creating lots of NIMBY issues, or (3) green infrastructure, in which water would be captured on site. Interestingly, while the green infrastructure idea is the most innovative, it's also the most cost-efficient. "The green infrastructure proposal is really a response to the city's financial constraints," Knapp said.

The Philadelphia city government already seems to be moving in the direction of green infrastructure. City rules declare that all new buildings must capture the first inch of water on site. The idea, Knapp says, is to "use stormwater to feed grass and trees instead of letting it rush into the sewer." Recent additions to those rules ensure stormwater fees are now calculated based on size of impervious surfaces instead of the amount of water used (which has no relation to stormwater run-off). "For a big warehouse downtown with lots of parking spaces, they could be looking at half a million in stormwater fees per year," said Kate Houstoun, Director of Green Initiatives, [Sustainable Business Network of Greater Philadelphia](#). The rules incentivize green roofs and yanking out parking lots in favor of man-made landscapes.

The new comprehensive green infrastructure proposal, which has yet to achieve EPA or Philadelphia city council approvals, would call for \$1.6 billion in investment in these natural systems over a 20 year period. EPA approval would also give access to revolving green infrastructure funds. City council approval is needed for stormwater management rate changes on private property. The \$1.6 billion, which would be collected through fees, private and public investment, would help "streets, schools, and all open spaces" be more pervious, added Knapp. (One study cited said regular park lawn is 80 percent as

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impervious as asphalt. "So, not all green spaces are actually pervious.") In making their case, the city is calling for a triple-bottom line approach, aiming for: more green spaces, improved public health, and more green jobs.

The plan would also link up well with the recently launched [Green Works Philadelphia plan](#), which calls for 300,000 new city trees by 2015.

Learn more in the Sustainable Business Network of Greater Philadelphia's report: [Grey to Green: Jumpstarting Private Investment in Green Stormwater Infrastructure](#).

*This is part three in a three-part series on the "Good Jobs, Green Jobs" conference recently held in Washington, D.C. Read part one, [Moving Towards a Green Economy](#), and part two, [Rebuilding Communities through Brownfield Rehabilitation](#).*

*Image credit: (1) [Grey to Green: Jumpstarting Private Investment in Green Stormwater Infrastructure](#), (2) [TreeVitalize / Grey to Green: Jumpstarting Private Investment in Green Stormwater Infrastructure](#).*

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**Yvonne Chang**

on 05/13/2010 at 5:53 pm | [Reply](#)

Is the Green Infrastructure a new system or adaptive reuse of the 100-year old underground water works? What are the current conditions of the historic infrastructure?



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