

The Benefits of Green Stormwater Infrastructure

Green stormwater infrastructure (GSI) is an approach to water management that **protects, restores, or mimics the natural water cycle** through the use of plants and soils or engineered solutions that recreate natural processes. GSI practices are often more effective and less expensive than traditional stormwater controls and can enhance the effectiveness of traditional infrastructure by diverting stormwater from overburdened pipes and reducing sewer overflows. GSI provides multiple environmental and economic benefits to communities, from groundwater recharge and flood management to cleaner air and beautification. GSI also has the added benefit of improving quality of life—revitalizing communities, supporting a long-term viable workforce and improving public health and safety.

Mercedes Benz Stadium (Atlanta, Georgia)

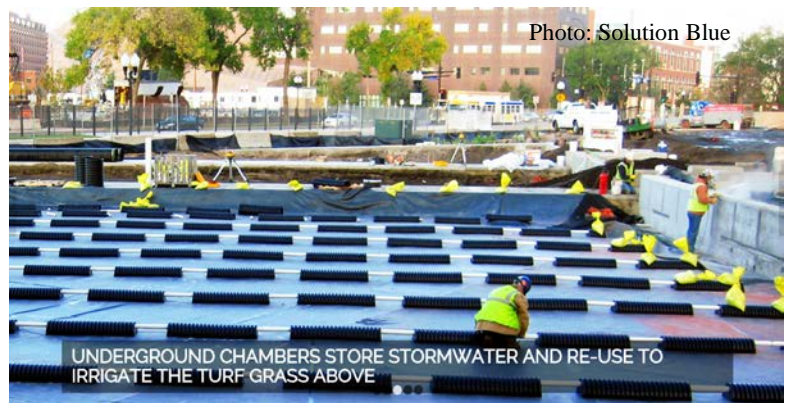


The new stadium for the Atlanta Falcons has several stormwater features to manage water quality and quantity. The stadium is designed to surpass the City's requirement to capture 1.0" of rainfall onsite; opting instead to capture 1.2" (~750,000 gallons) using the GSI practices of bioretention and rainwater cisterns. Grey infrastructure, in the form of a vault, was also installed to detain the 100-yr storm event onsite (1.2 million gallons). The project is targeting LEED Certification. The rainwater captured in the cistern will be reused to offset potable water demand for irrigation and cooling towers.

TCF Bank Stadium (Minneapolis, Minnesota)

The innovative stormwater drainage system uses a combination of green and grey infrastructure as part of a comprehensive stormwater management plan for the surrounding 75 acres where stormwater behaves as if would have before people settled the area. The proprietary system reduces water use for landscape irrigation by 50 percent by pulling stored water into the root zone by capillary action.

The system is designed for aesthetic appeal, and can support the weight of media trucks and emergency vehicles. Other elements of the stormwater runoff system include bioswales, native and adaptive vegetation, bioretention basins, and a wet detention pond. The need for stormwater management was balanced alongside other community needs such as student parking, maintaining traffic flow. The result was a 0.50-acre green space with 120,000-gallon storage capacity, which accommodates a 3.75-acre watershed and efficiently manages the 5-year rainfall event (3.5" in 24 hours). The stadium became the first ever LEED® certified collegiate football stadium in the U.S.



Cheney Stadium (Tacoma, Washington)

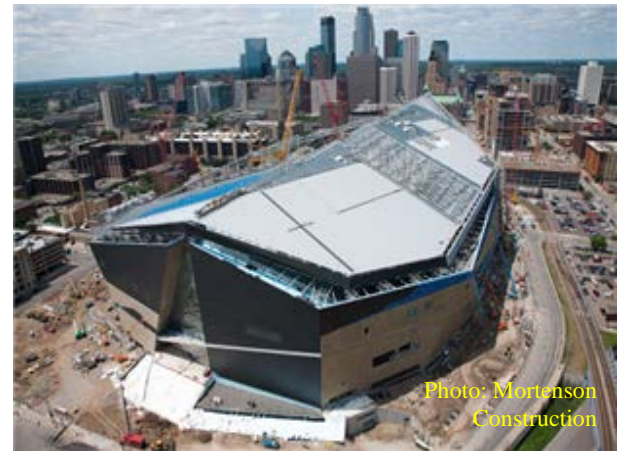


The City of Tacoma received a 2014 Municipal Excellence Award for the Cheney Stadium Sustainable Stormwater Project. The project includes six acres of permeable pavement, three rain gardens, sustainable landscaping, new pedestrian walkways and seven acres of new tree canopy over two off-seasons using green stormwater infrastructure to reduce runoff and improve access. The site serves as a model for commercial development demonstrating the effectiveness of GSI elements. The project was estimated to reduce the stormwater leaving the site by 66%, but the site far exceeded the modeling predictions in the first two years. This project cost \$3.1 million, whereas traditional grey infrastructure

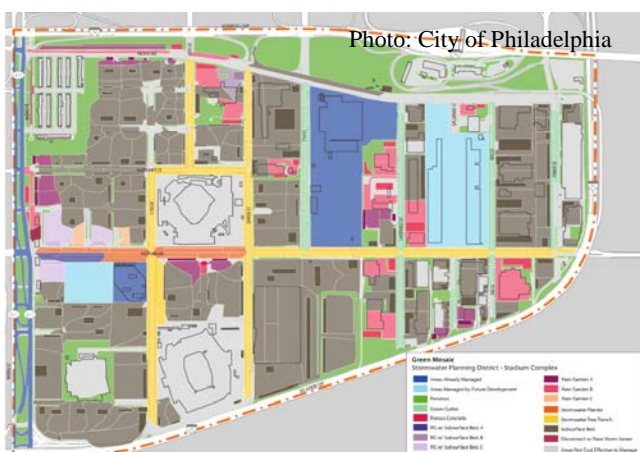
would have cost nearly double to achieve the same benefits.

US Bank Stadium (Minneapolis, Minnesota)

U.S. Bank Stadium features an innovative fixed-roof that helps with energy efficiency and stormwater management. Since the stadium is downtown, there is limited footprint for a stormwater system. Engineers chose to store the stormwater in a 1.35 million gallon underground retention system that provides the required storage in a limited and constrained footprint. The system not only stores the water, it releases it slowly over time into the surrounding soil via the perforations in the pipe. This reduces the amount of runoff leaving the site, recharges the ground water supply, and eliminates the need to pipe the water into the city's sewer system.



Stadium District Redevelopment (Philadelphia, Pennsylvania)



As part of a 25-year commitment to manage one-third of the impervious cover across the city with green stormwater infrastructure, Philadelphia has envisioned a “green mosaic” for the stadium district just south of downtown. This area is 77% impervious and the parking areas associated with the stadiums are drastically underutilized. The most recent concept plan has 131% (1.3”) of the minimum requirement being managed with green stormwater infrastructure across 313 acres of public and private land. This project would include green gutters, rain gardens, stormwater planters, stormwater tree trenches, subsurface beds, porous concrete, and storm sewer disconnection, at a cost of \$81 million.

This vision has involved dozens of stakeholders and includes three alternative strategies: sewer separation, separation with pre-treatment, and a hybrid approach. Philadelphia Water will choose the final plan based on cost-effectiveness, visibility, and alignment with partner interests.

For more information: www.americanrivers.org/greeninfrastructure