


SHOWCASE

6

Intercept, Detain and Release

Custer Avenue CSO Relief

GRESHAM, SMITH AND PARTNERS



Intercept, Detain *and* Release

CUSTER AVENUE CSO RELIEF



CLIENT
City of Atlanta

LOCATION
Atlanta, Georgia

MARKET
Water Resources

SERVICES
Construction Engineering and Inspection
Green Infrastructure
Hydrology and Hydraulics
Site Design
Wet Weather

TEAM
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Combined sewer systems are designed to collect rainwater runoff and sewage in the same pipe and transport it to a treatment plant, where it's treated and then discharged to a water body. During especially heavy rainfalls, the volume of stormwater can overwhelm a city's sewer system, causing it to overflow. Residents of Peoplestown, a low-lying Atlanta neighborhood, were especially vulnerable to this type of combined sewer overflow event (CSO). When back-to-back rainstorms caused significant flooding to residents' homes in the area, Atlanta Mayor Kasim Reed vowed to implement short- and long-term solutions.

As a first step towards solving the problem, the City of Atlanta Department of Watershed Management reached out to GS&P via an emergency task order issued by the Mayor. As part of the BGR joint venture with Black & Veatch Corporation and Rohadfox Construction, the GS&P team quickly began working on a phased plan that would alleviate flooding in the Lloyd and Connally sewersheds.

"When GS&P—along with our partner firms—first began exploring ways to tackle this issue, we started out by assembling three teams to cover the two side-by-side drainage basins," says John Barlow, GS&P senior vice president of water resources. "The City had given us a list of areas where we could start implementing solutions, and our teams evaluated

the topography and potential runoff in those locations. We then made our recommendations to the City."

"We came up with an implementation plan that categorized different design concepts into short-term, medium-term and long-term approaches to solve the flooding problem," adds Mark Hellerstedt, GS&P senior water resources engineer. "Since we were under an emergency task order, we began focusing on the short-term solutions immediately."

Phase one of the project (known as the Southeast Atlanta Green Infrastructure Initiative) focused on the Peoplestown, Summerhill and Mechanicsville communities. Locations were identified throughout the two basins where stormwater best management practices (BMPs) could be installed to intercept, detain and slowly release stormwater into the collection system. These BMPs included bioretention ponds, rain gardens and detention ponds, which were developed on abandoned streets, City-owned park property and parking spaces in the city's right-of-way. Sustainable features implemented in the short-term initiative were designed to have an immediate impact on stormwater detention, preventing it from reaching the problem areas.


"The Custer Avenue CSO basin is located in and around an area where

Collectively, all six projects provide almost 300,000 gallons of stormwater retention.

the peak flows started to develop in the upstream reaches and eventually infiltrated the piping systems,” explains Chris Haney, GS&P senior vice president of water resources. “At that juncture, it reached a hydraulic pitch point, and under extremely high-flow conditions the area ended up with severe flooding issues.

“The purpose of the first phase of this project was to reduce flooding by implementing green infrastructure. This meant applying sustainable solutions—such as bioswales and stormwater retention ponds—that would allow the stormwater to seep naturally into the ground and mitigate flooding. This was opposed to using other methods, such as a hard-pipe drainage system where stormwater goes through a parking lot’s curb and gutter system and then goes downstream where it can potentially overload the system. And that’s what happened in Peoplestown. By putting in these smaller green infrastructure systems, the impact of peak flow infiltrating the downstream system is significantly reduced.”

As part of the short-term initiative, six projects were executed to help reduce flooding throughout southeast Atlanta. These included: the conversion of City-owned parking spaces and sidewalks into rain gardens; the expansion of an existing detention basin to help divert stormwater runoff from parking lots and surrounding streets at Rosa Burney Park; and the conversion of an abandoned roadway into a bioretention pond. Collectively, all six projects provide almost 300,000 gallons of stormwater retention.



Designers and engineers worked together quickly and efficiently to come up with solutions that would ultimately bring relief to residents who lived in the affected areas.”

—Chris Haney

“The City gave us a budget of around \$2 million for phase one, and our joint venture team essentially worked day and night, at an almost frantic pace, to get these green infrastructure projects in the ground,” reflects Haney. “Designers and engineers worked together quickly and efficiently to come up with solutions that would ultimately bring relief to residents who lived in the affected areas.”

MID- AND LONG-TERM SOLUTIONS

During the mid-term phase of the project, the City provided the team with a map that identified city streets with slopes of 0-6 percent with deep sewers. These thoroughfares were the

optimum locations for the installation of permeable pavers, which would also mitigate flooding.

“The implementation of permeable paving involved removing the asphalt and sub-base on identified streets and replacing those materials with a series of sustainable interlocking pavers,” explains Haney. “When the water hits these pavers, instead of running into the gutter and entering the drainage system, the spacing between the different paver systems allows the flow to seep through the granular materials. Stormwater still ends up in the main drainage system, but at a much slower pace.”

Looking to the future, long-term measures aimed at reducing flooding in problematic areas include the installation of underground

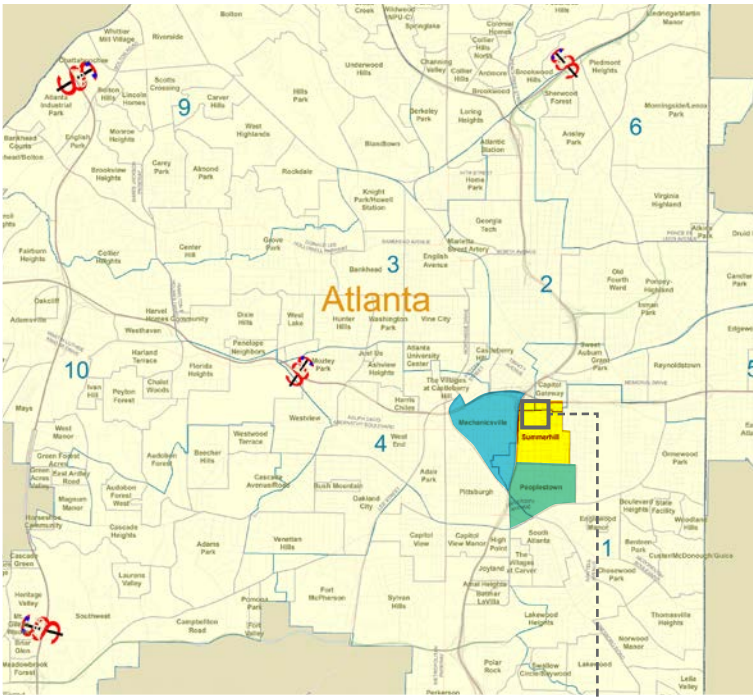




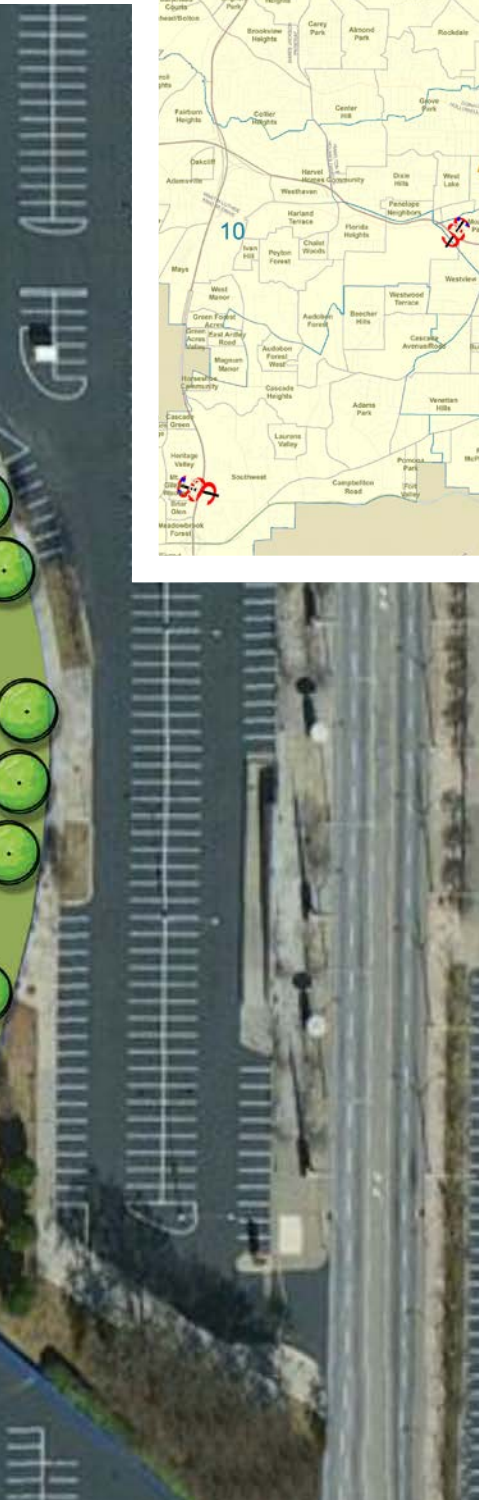
Short-term initiative projects included the conversion of an abandoned road into a bioretention pond (above), the conversion of parking and sidewalks into rain gardens (right) and the expansion of an existing detention basin.



Paying homage to the Atlanta Braves while providing stormwater retention and green infrastructure, the proposed Atlanta Fulton County Wet Pond at Turner Field will include jogging trails, walkways, recreation areas and an elevated amphitheatre for outdoor entertainment.



Turner Field



storage vaults for the combined sewer. Designed to manage excess stormwater runoff in developed areas, the implementation of these high-volume, subterranean storage vessels is another BMP that will help mitigate flooding while reducing erosion in rivers and streams.

Yet another innovative long-term design solution involves the former home of the Atlanta Braves.

“The site where the Atlanta-Fulton County Stadium once stood is now parking lot space for Turner Field,” explains Haney. “It’s of incredible historical significance because the Atlanta Braves played there for 30 years, and it’s the spot where Hank Aaron hit his 715th homerun.

“The 65 acres of parking lots have a tremendous amount of stormwater runoff. So, our initiative is to preserve the historical value of the location, while replacing a portion of that area with an urban park and a

stormwater detention pond that will capture, detain and gradually release significant amounts of runoff.”

Paying homage to the Braves while providing stormwater retention and green infrastructure, the proposed Atlanta Fulton County Wet Pond will include jogging trails, walkways, recreation areas and an elevated amphitheatre for outdoor entertainment.

“Along with relieving flooding issues, the wet pond/urban park concept provides a green space where people can exercise, socialize and play,” says Barlow. “Currently, there’s no recreational space near the stadium because it’s all paved parking lots. People still tailgate in this area, but with this option, the general public would be encouraged to spend a lot more time there before the game.”

Starting with an emergency call to action, GS&P’s sustainable short-, medium- and long-term design solutions will not only take the pressure off overwhelmed municipal drainage systems, but will ultimately increase their capacity, bringing much needed flood relief to residents of southeast Atlanta communities.

“This phased initiative isn’t just about eliminating flooding issues,” says Barlow, “it’s also about enhancing the overall quality of life for these residents. The green infrastructure, sustainability and improved water quality generated by this project is going to have an incredibly positive socioeconomic impact on an area that is targeted for future development and growth.”

ABOUT US

Gresham, Smith and Partners provides design and consulting solutions for the built environment that contribute to the success of national and international clients. For more than 45 years, GS&P has focused on enhancing quality of life and sustainability within our communities. GS&P consists of industry-leading professionals practicing architecture and engineering design as well as scientists and highly specialized strategic and management consultants in Aviation, Corporate and Urban Design, Environmental Services, Federal, Healthcare, Industrial, Land Planning, Transportation and Water Resources. GS&P consistently ranks among the top architecture and engineering firms in the world.



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