



Implementing GI Infrastructure Into Stormwater Management

By Lori Kieffer Yeich, Recreation and Conservation Manager
PA Department of Conservation and Natural Resources

Throughout my career at the PA Department of Conservation and Natural Resources (DCNR), I've worked with communities on publicly accessible amenities such as parks, trails, and open spaces. In recent years, I have witnessed municipalities grappling with aging infrastructure, a limited tax base, and blight, along with how to meet and pay for new state and federal regulations on stormwater management.

In the November *Borough News*, part one of this article outlined the challenges boroughs face with meeting federal mandates meant to improve waterways, and how multifunctional green infrastructure (GI) enables them to address these requirements and revitalize their communities

This month's article explores how communities can leverage funding from various agencies to holistically and sustainably revitalize their communities and clean up waterways. It also highlights projects in Carlisle, Etna, and Wrightsville boroughs and how they are revitalizing their communities through strategic investments in streets, parks, and brownfield areas that incorporate GI elements.



Current view of the former Carlisle Tire and Wheel Plant, which will become Carlisle's Fairground Avenue Stormwater Park. Photo courtesy of DCNR.

Carlisle Borough, Cumberland County

Between 2008 and 2010, Carlisle Borough, Cumberland County, lost three major industries, which provided nearly 4,000 good-paying jobs. Once closed, these businesses left 63 acres of vacant and polluted brownfields.

Determined to look at this loss as an opportunity, the borough hosted a week-long workshop that resulted in the Carlisle Urban Redevelopment Plan (CURP) that linked land use, public space, stormwater management, transportation, and economic development into a new, modern neighborhood. CURP included a \$125 million mixed-use public-private investment and \$49 million in tax increment financing over 20 years.

An important element of the plan was the Carlisle Connectivity Urban Stormwater Park. The borough envisioned the need for stormwater management, not as a detriment but as an opportunity to create a wonderful amenity for its residents.

The signature "anchor" park is planned in a four-block area where the existing neighborhood and the redevelopment site meet. The project includes an entry plaza with a water feature, seating, landscape plantings, vertical stormwater silos, trees, and interpretative signage.

The design integrates environmental engineering controls and meets the PA Department of Environmental Protection (DEP) Act 2, the U.S. Environmental Protection Agency (EPA) municipal separate storm sewer system (MS4) requirements, and Chesapeake total maximum daily load (TMDL) regulation requirements for pre-treatment and detention.

The project will result in the removal of 5,190 square feet of impervious surface, and annual reductions of 4 pounds of phosphorus, 62 pounds of nitrogen, and 8,080 pounds of sediment.

The borough received a \$599,453 grant from the National Fish and Wildlife Foundation (NFWF) and matching funds of \$600,000, EPA; \$30,000, Chesapeake Bay Foundation; and \$15,000, National Endowment for the Arts.

The borough also applied to DCNR for \$300,000 for “anchor” park amenities that included the water feature/splash pad, plaza, seating, entry walls, landscaping, shade/canopy trees, and interpretative signage. As of the deadline for *Borough News*, this grant award request was still pending. In addition, Carlisle plans to use tax increment financing (TIF) to support the construction of portions of the park. All phases of the project will cost about \$6 million.

Borough Manager Matt Candland said through extensive public participation, storm water management was identified as a priority.

“Given the existing contamination, we had to devise approaches that were not only consistent with best practices but also minimized infiltration to prevent further contamination,” Candland said. “It is our hope that the plan we have created, and the partnerships we have developed, will result in a win-win.”

Etna Borough, Allegheny County

In another corner of the state, my counterparts work similarly with boroughs. In 2004 as the result of Hurricane Ivan, 25 percent of Etna Borough, Allegheny



The Butler Street project is part of the nearly \$1 million spent on Etna's Smart Growth. Photo courtesy of Buchart Horn Inc.

County, was underwater including its municipal complex. To mitigate future flooding and tackle stormwater challenges, the borough of 505 people is using a pro-active and non-traditional approach.

Through a multi-municipal planning effort – North Hills Council of Governments – in partnership with non-profit and governmental agencies, such as 3 Rivers Wet Weather – who provided funding, Allegheny County, and Pennsylvania Environmental Council, Etna developed and adopted a Green Master Plan that incorporated best management practices (BMPs) into streetscape, park, and trail development projects.

Twenty-five high impact sites were identified to divert 16.1 million gallons of stormwater including a high-tech infiltration bed and porous-pavement parking lots.

At the same time, the borough developed an ordinance to encourage and incentivize residents to address stormwater by supporting the installation of small-scale wetlands and the use of rain barrels and gardens. These BMPs give residents a small credit on their bimonthly sewer environmental surcharge fee.

As these projects were consistent with the DEP-approved Pine Creek Watershed Implementation Plan, Etna applied for and received \$44,500 from Growing Greener and approximately \$920,000 from the EPA for streetscape improvements.

By improving the aesthetics and function of Etna's commercial district with a green streetscape, the community followed the Smart Growth principles that encourages development that serves the economy,

continues on page 50...

community, public health, and the environment.

Another project from the Green Master Plan was the rehabilitation of a public parking lot off of the business district. In conjunction with funding from 3 Rivers Wet Weather through the R.K. Mellon Foundation in cooperation with the Pennsylvania Environmental Council, the parking lot was rebuilt and included the installation of a high-rate infiltration bed. These projects remove an estimated one million gallons of stormwater from the combined sewer system.

One of the boldest recommendations was preserving and protecting a 50-foot buffer around Pine Creek, which was the location of the majority of the undeveloped land in the borough of just 0.8 square miles. Based on data from their Green Master Plan, Etna Borough officials decided preserving this land was more valuable than developing more impervious surfaces.

Funding from DEP was used for stream bank restoration caused by Hurricane Ivan, while funding from DCNR helped to construct the Dougherty Nature Trail, which surrounds the ballfield.

“Etna’s newly-adopted Comprehensive Plan, Riverbend, places a strong emphasis on addressing stormwater within the community itself,” said Borough Manager Mary Ellen Ramage. “In order to be a sustainable,

healthy community, Etna needed to recognize this issue as a priority for the community.”

Etna has adopted a GI Master Plan Demonstration Project. Visit www.etnaborough.com to see the Stormwater Management pin its entirety.

Wrightsville Borough, York County

Through planning that prioritized recreation and GI improvements, Wrightsville Borough, York County, a borough of about 2,300, set into motion the rehabilitation of its Riverfront Park. The plan is to expand recreation amenities and access to the river, to create a welcoming entrance to the borough, and to mitigate stormwater run-off and address MS4 requirements.

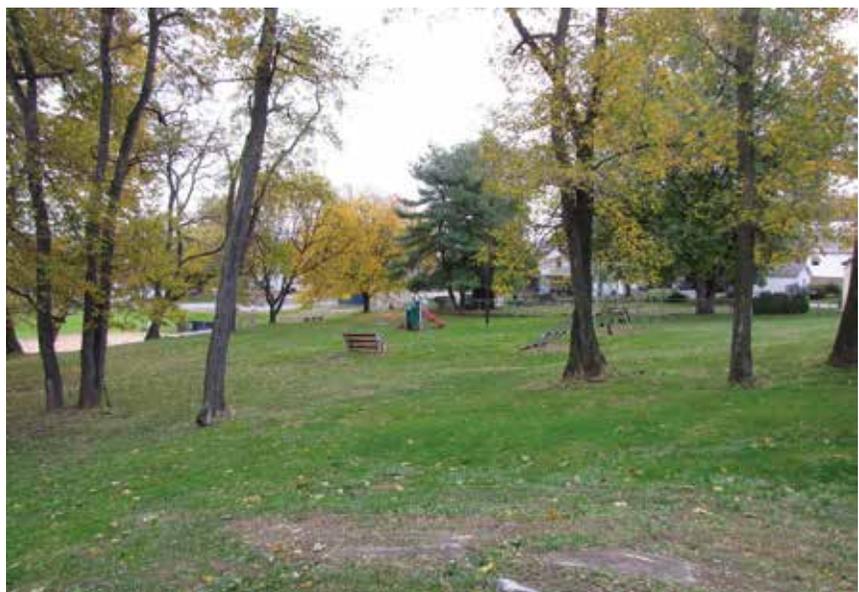
In 2011, Wrightsville received a Community Conservation Partnership Program (C2P2) grant from DCNR to complete

a public input-based Master Site Development Plan for its Riverfront Park, which runs along the Susquehanna River. In 2012, the borough received additional development funding from NFWF to enhance this master plan with GI elements.

The recreation improvements – upgraded playgrounds, walking paths, piers and docks to access the river, and an amphitheater – were enhanced by the GI improvements that included constructed wetlands, bio-retention areas, reforestation, and natural plantings.

Three of the borough’s primary stormwater outfalls discharge into the park site, so its bio-retention facilities could be used to meet the borough’s MS4 permit requirements.

GI elements were also incorporated in the rehabilitation of Front Street, located adjacent



Riverfront Park, Wrightsville Borough. Photo Courtesy of YSM Architects.

to the park and the main thoroughfare through the borough.

Additionally, in 2012, Wrightsville received funding from the York County Commissioners through the Act 13 grant program to hire a consulting firm to apply for, administer, and manage various grant programs.

This \$90,000, paid out over three years, has led to the borough securing over \$500,000 in additional grant funding for the nearly \$6 million dollar project. The various granting agencies include DCNR, NFWF, the Chesapeake Bay Trust, Exelon – via the York County Conservation District – and the York County Community Foundation.

Mayor Neil Habecker said the borough recognized staffing and funding challenges and was pleased that the borough could partner with a number of other agencies to make the project a reality.

“Small communities like ours realize that by planting a kernel of corn, we have been able to reap the investment multiple times,” Habecker said.

To learn more about managing stormwater with sustainable GI, visit dncr.state.pa.us/brc/grants/greening/greenresources/index.htm.

The following people contributed to the development of this article: Ben Craddock, PE, President, Lancaster Civil Engineering (Wrightsville Borough: Riverfront Park); Karla Farrell, PLA, AICP, LEED AP BD+C, Buchart Horn (Etna Borough); Jill Gaito, former DEP Secretary for Local Government Support & currently Principal of Gaito Associates LLC (Carlisle Borough: Stormwater Park); Sean Garrigan, Principal, Stromberg-Garrigan & Associates Inc. (Carlisle Borough); Kelly Gutshall, President, RSLA, LandStudies (Wrightsville Borough); Mary Ellen Ramage, Manager, Etna Borough; Ann Yost, RLA, YSLA, YSM Landscape Architects (Wrightsville Borough). 

DOES YOUR MUNICIPALITY have...



- Safe streets?
- Clean air? Water?
- Housing options?
- Healthy finances?
- Engaged residents?
- Green space?
- Transit options?
- A recent energy audit?

The Sustainable Pennsylvania Community Certification recognizes municipalities for these types of achievements and helps communities advance their sustainability goals.

Now featured as criteria in PA DCED's Single Application for municipal grants

To see where your community stands and to earn statewide recognition, **start the free online certification today!**

A program of



In partnership with



sustainablePAcommunitycertification.org

412.259.5331

717.236.9469

jprice@sustainablepittsburgh.org

sustainablepa@pamunicipalleague.org