Sustainable Infrastructure Installation: Beekman Early Success Project

A Summary of the Grant Application to the State's Clean Ohio Revitalization Fund (CORF)

July 13, 2011

Goals

This project meets the desired criteria and outcomes of the Sustainable Infrastructure Category: Green Infrastructure Project of the Clean Ohio Revitalization Fund (CORF) Sustainable Reinvestment Pilot Track. It is a wet weather management project with the primary goal of reducing local combined sewer overflows. The project intends to improve aesthetic, environmental quality and public health conditions for residents of and visitors to the South Fairmount community and the greater Lick Run watershed.

Background

Every year, about 14.1 billion gallons of raw sewage- mixed with stormwater- overflows from sewers in the Cincinnati metropolitan area into local streams and rivers and backs up into basements. A major cause of this issue is the city's combined sewer system, which conveys sewage and stormwater in the same pipe. This design dates back to the 19th century, and since then the simultaneous outgrowth of the local built environment and human population have increased the volumes of both sewage and stormwater entering the sewer system for treatment. The inability of many older pipe systems to hold these increasing volumes, especially during wet weather events, leads to sewer overflows as often as 105 times a year in some neighborhoods. The scale of this problem places the Cincinnati region as one of the top 5 locations in the county for urban combined sewer overflows (CSOs). The Metropolitan Sewer District of Greater Cincinnati (MSD) has been mandated by the U.S. EPA, Ohio EPA, and the Ohio River Valley Sanitation Commission (ORSANCO) to capture, treat, or remove at least 85 percent of the 14.1 billion gallons of annual CSOs. MSD's proposed solution is Project Groundwork, a multi-year, multi-billion dollar program to rebuild and improve the sewer system through a variety of source control (removing stormwater), product control (enhancing treatment capacity), and conveyance and storage upgrades in neighborhoods throughout the city.

Of the over 14 billion gallons that overflow annually, the Lick Run Watershed on Cincinnati's west side accounts for 1.7 billion gallons (Figure 1). As the largest single-watershed contributor to CSOs in Hamilton County, Lick Run is the focus of a major phase in MSD's strategic integration plan to meet their mandated overflow reductions. The community of South Fairmount is located at the easternmost edge of the watershed, where the watershed feeds into the Mill Creek and ultimately flows out to the Ohio River. Like many of the nation's urban neighborhoods, the South Fairmount community was developed on top of historic, natural and hydrologic features, including Lick Run and a number of stream tributaries. Currently, a number of previous natural streams have been replaced with man-made underground sewer lines, including a 19.5-foot-diameter pipe that runs under the South Fairmount neighborhood business district. Less than 25 percent of the flow through this pipe is sewage, meaning that the majority of the flow is stormwater and flow that used to be in natural streams.

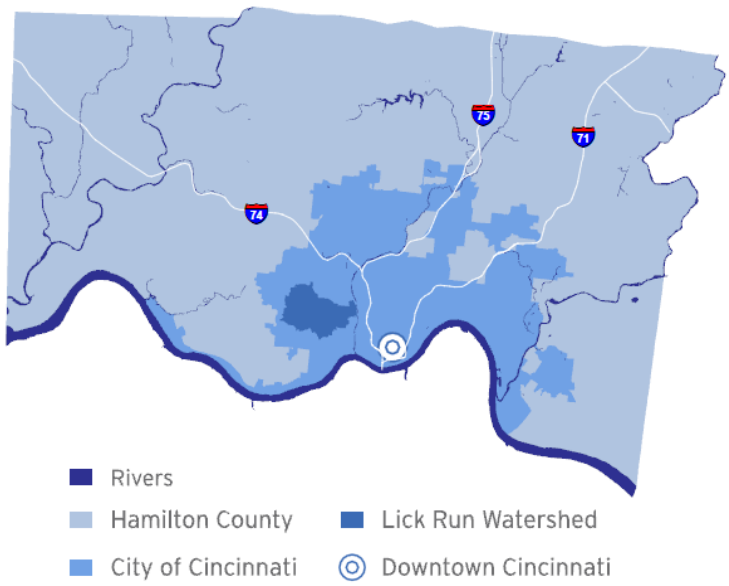

Figure 1: Regional Context of Lick Run
Source: Human Nature, Inc.

Site History

The specific focus area of this grant proposal is an approximately 3-acre site on the east end of the neighborhood business district. Historic records indicate that portions of the site were once used as a fill site for the Lunkenheimer foundry. Nearby historic uses have also included gas stations and a laundromat. Based on Phase I and Phase II environmental site assessments, fill materials at the site are impacted with lead, arsenic and polynuclear aromatic hydrocarbon (PAH) compounds locally in excess of "applicable or relevant and appropriate requirements" (ARARs), based on soil direct contact risk-based standards for residential and construction worker exposure scenarios available through Ohio's Voluntary Action Program (VAP; Ohio Administrative Code [OAC] 3745-300-08).

Proposed Solution

While pipe expansions are a traditional option for reducing CSOs, MSD has been actively investigating the feasibility of sustainable or "green" infrastructure approaches to reducing overflows. MSD's plan for Lick Run is to use a combination of traditional and green techniques for sewer separation and source reductions. One possible solution being investigated for South Fairmount is to separate the stormwater and historical stream flow from the sewage and to divert the stream flow into an above-ground channel, creating a new public amenity that would greatly increase the amount of local green space, improve neighborhood aesthetics, and provide a catalyst for future investment in the area.

Regardless of when and if this large-scale project moves forward, the site described in this grant will provide independent utility as a stormwater demonstration feature. The major green infrastructure component of the design concept (Figure 2) is a bioretention/ filtration feature near the center of the site, at the location of a naturally pre-existing depression. Additional stormwater reductions will accompany the conversion of the existing land cover. This project will reduce impervious land cover on site from 66 percent down to only 15 percent. This, combined with the infiltration capacity of the bioretention basin, will reduce stormwater volumes generated on site by over 1 million gallons per year (a 52% reduction). Educational signage and a public art installation will be additional community benefits. A small parking lot will provide site access for service vehicles.

Figure 2: Green Infrastructure Design Concept
Source: Human Nature, Inc.

Benefits

The community-scale project is still in the design and neighborhood input phase, but the site discussed in this proposal has the potential create a number of short- and long-term community benefits that can be realized before the full plan is implemented. First, as a precursor to the ultimate source control solution, the site will be a tangible model that community members can view to appreciate the full potential of the final project. Additionally, the site's location at the far east end of the business district will make it an attractive gateway into the community for residents and visitors. Finally, the environmental remediation of a brownfield site into a green infrastructure installation will transform a public health risk into a public health asset. Specific project benefits are discussed below.

Economic

- Creates jobs and business revenues for local contractors and tradesmen working on sewer improvement projects
- Eliminates chronic sewer backups in homes and businesses, which can lead to an increase in property values
- Creates a public amenity which can catalyze additional reinvestment in the area

Community

- Improves neighborhood aesthetics through the conversion of industrial space to green space
- Creates more effective use of green space through development of green infrastructure
- Facilitates urban renewal and community revitalization

Environmental & Public Health

- Reduces CSOs into local rivers and streams
- Decreases human exposure to pathogens and pollutants
- Decreases impervious land cover on site from 66 percent to 15 percent

Sustainable Reinvestment

- Reduces CSOs by diverting stormwater flow to above-ground channel
- Increases natural, pervious land cover to enhance stormwater infiltration capacity
- Reuses existing light poles as public art installation
- Commits future construction on site to LEED guidelines

Funding Sources

Funding for green infrastructure investments in the Lick Run watershed has been set aside in MSD's 2012 Capital Improvement Plan (CIP). This includes funding for environmental assessments, engineering fees, and other match-eligible items. Other matching funds have been identified in already-expended Department of Transportation projects along the Western Hills Viaduct.

Implementation

All twelve parent parcels composing the site are currently owned by the City of Cincinnati, so no additional property acquisition is necessary. Existing users on the site have either purchased land nearby for relocation or are actively searching for a new site. The Cincinnati Department of Community Development has contributed guidance and Clean Ohio expertise throughout the grant preparation process, and continued collaboration with their office will ensure timely completion of proposed project activities.