Connecting the Secret Stream:

An Action Plan to Expand the Green Infrastructure Network in the Day Brook Watershed

March 2019

Prepared by the Pioneer Valley Planning Commission for the City of Holyoke with an Urban Small Rivers Grant from the U.S. Environmental Protection Agency

PIONEER VALLEY PLANNING COMMISSION

ENCHANTED CIRCLE
Arts Inspired Education

Acknowledgements

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This project has been funded largely by the United States Environmental Protection Agency under an Urban Waters Small Grant to the Pioneer Valley Planning Commission. The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency, nor does the EPA endorse trade names or recommend the use of commercial products that may be mentioned in this document.

Cover photo: Sullivan School students participate in the unveiling of the Day Brook Story Walk, which tells the story of the "Secret Stream" through their own drawings. Story Walk panels were created by Sullivan School 5th graders with Enchanted Circle Theater Teaching Artists.

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1. Project Summary

Because much of its journey through the City of Holyoke is unseen, Day Brook has become known as the "The Secret Stream" or "La Corriente Secreta." After its start at the base of the East Mountain Wildlife Management Area and its course through the Jarvis Avenue Neighborhood and down the eastern slopes of Community Field, Day Brook is piped underground through the Oakdale, Elmwood, Churchill, and South Holyoke neighborhoods. In this pipe, Day Brooks' waters join with sewage and stormwater flows—all of which are directed to the Holyoke Water Pollution Control Facility at Berkshire Street for treatment before spilling into the Connecticut River. During larger storms, the volume of flow can exceed the plant's capacity for treatment. As a result, some flow bypasses the plant, moving directly into the Connecticut River as untreated sewage.

This action plan and accompanying companion poster, entitled "Connecting the Secret Stream," arise from a partnership between Pioneer Valley Planning Commission, Enchanted Circle Theater, and the City of Holyoke funded by the U.S. Environmental Protection Agency's Urban Waters Small Grant. The overall Day Brook project has entailed engaging Holyoke's youth in increasing the visibility of the Secret Stream and developing a conceptual plan to extend the network of green infrastructure stormwater management practices in the watershed.

To keep momentum moving forward on decreasing the volume of storm flows into Day Brook and thereby reducing localized flooding and sewer overflows into the Connecticut River, this action plan has two overall recommendations:

1. Continue to engage neighborhood residents and property owners in the story of Day Brook, from art events to educational programs. Enabling people to understand the story of the "Secret Stream" promotes connection to the history of the place where they live. More importantly, it invites creative imagining of a different and more vibrant future.

Sullivan School students (6th to 8th grade) created a mural about Day Brook that now hangs on a building at Community Field.

2. Design and construct additional green infrastructure stormwater management facilities wherever possible in Day Brook's watershed. Such facilities have tremendous benefits, including improved water quality, reduced localized flooding, mitigation of summer heat, and more green and livable neighborhoods for Day Brook.

Stormwater at the Pulaski Park skate area flows into rain gardens where soils and plants soak up the water.

The two main chapters of this action plan—Recommended Actions for New Green Infrastructure Locations; Recommended Actions for Public Engagement—give shape to these two recommendations. There are also a host of important strategies identified in the Lessons Learned chapter.

Together, the poster and action plan comprise the final products of this project. It is planned that the poster will hang in public locations to provide a continued visual reminder of the opportunities to improve Day Brook's condition, while the Action Plan provides written guidance toward implementation.

What is Green Infrastructure?

Green infrastructure promotes capture and control of stormwater near to where it falls. This includes the use of natural or engineered systems—such as green roofs, rain gardens, tree plantings, or cisterns. Because these facilities typically use plants to enhance and/or mimic natural processes, they are called "green infrastructure." In these facilities, stormwater can be cleansed as it moves through soils and the roots of plants, returned through soils to groundwater (infiltration), returned to the air (evapotranspiration), and/or captured to irrigate plants or flush toilets (reuse).

Green infrastructure can range in approach, from tree plantings to rainfall capture and reuse with cisterns to a series of bioretention basins as shown in image below.

A rain garden/bioretention basin at the Massachusetts Green High-Performance Computing Center on Bigelow Street receives and soaks up storm flows from the parking lot. If used along roadways, these facilities can beautify neighborhoods and help to slow traffic.

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2. Day Brook Watershed and Major Issues

The headwaters of Day Brook are formed along the slopes of the East Mountain Wildlife Management Area just west of Jarvis Avenue. Waters then flow east under Jarvis Avenue and by the Jarvis Heights Housing Complex, behind the Sullivan School and down through Community Field. At Community Field, the Holyoke Parks Department has installed stormwater facilities to help reduce peak flows in Day Brook during storms. These facilities include planted basins throughout the parking lots of Community Field. As Day Brook courses down the slopes to the Oakdale neighborhood, it enters the pipes of the combined sewer system, mixing with rainfall flows (during storm events) and sewage from nearby homes and businesses.

From where it enters the pipe, Day Brook continues the remainder of its journey underground and unseen for 1.8 miles through five City neighborhoods to reach the Holyoke Wastewater Treatment Plant. Here waters are treated before discharge to the Connecticut River. Larger storm events, however, produce flows that exceed treatment capacity at the plant. As such, some of these contaminated flows bypass treatment, going directly into the Connecticut River as "combined sewer overflows" via what is known as Berkshire CSO#9.

The containment, channeling, and burying of free-flowing waters is a legacy of Holyoke's industrial history. During this time, rivers and streams were considered to be either useful for energy to power mills or a nuisance, taking up space that could be better purposed for roads and buildings. This legacy of having treated Day Brook as a nuisance has produced several significant issues for the City in the modern day:

- What is essentially a freshwater stream tumbling off the slopes of nearby hillsides, is routed through pipes to a wastewater plant for treatment. The long-term costs—in terms of wasted energy and financial burden—of treating all of Day Brook's flow over the past 12 years (since completion of the treatment plant in 2007) is unknown, but likely very high.

- With larger storms, additional rainfall causes the volume in the pipe carrying Day Brook and wastewater to exceed capacity in the pipe itself (evident in localized flooding), causing damage to private and public property.

- Overflows of raw sewage into the Connecticut River due to the magnitude of storm flows and capacity limits at the treatment plant result not only in significant impacts to the recreational and ecological values of the river, but also federal and state environmental enforcement actions.

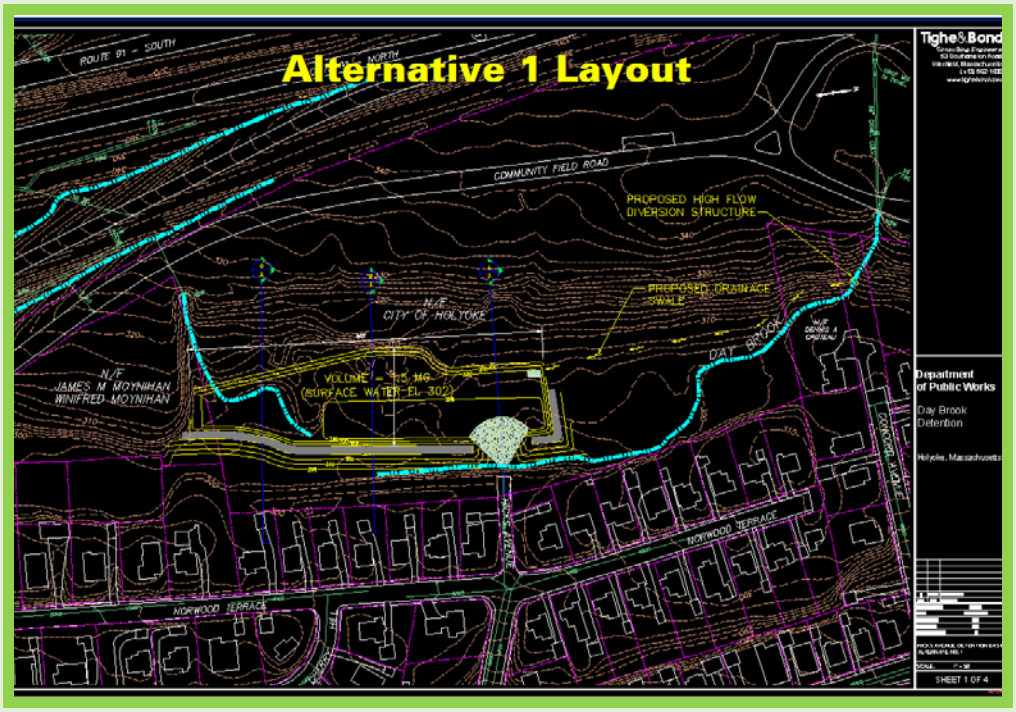
Day Brook's Journey through Holyoke

Storm flows from five Holyoke neighborhoods drain to either Day Brook itself in the upper watershed (shown in blue) or the combined sewer pipe containing Day Brook (shown in pink). Flows then pass through the City's Berkshire Street wastewater treatment plant and into the Connecticut River.

Past Efforts to Resolve Storm Flow Issues Associated with Day Brook

In the early 2000s, the City of Holyoke explored the possibility of a large fix to overcome combined sewer overflows associated with Day Brook's peak storm flows. At the time, the city's engineering consultant developed a conceptual plan to add a large detention basin (Alternative 1) or series of detention basins (Alternative 2) on city property above Hicks Avenue. The idea was that by detaining peak flows in this location, there would be fewer sewer overflows into the Connecticut River. Alternative 1 and Alternative 2 were compared against a third alternative that entailed building a large underground detention storage facility. Storage capacity under each alternative would be 1.5 million gallons.

Former City Public Works Director Bill Fuqua reports that the neighborhood was firmly opposed to the project concepts given a host of reasons, including: the need to cut forest; the location of basins up gradient and in close proximity to existing homes; and the potential for odors and presence of mosquitoes from standing water in the basins. After a public meeting, it became clear that overwhelming objections from the neighborhood would be insurmountable. The City, as a result, opted to pursue the less controversial end-of-pipe solution with construction of the Berkshire Street treatment facility.



Among two alternatives, this scheme involves one large earthen detention basin above Hicks Avenue.

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3. Overview of Project Activities

Activities for this project included engaging youth in learning about Day Brook and developing a conceptual green infrastructure plan to reduce urban storm flows and localized flooding. In many instances, the activities overlapped these two broad categories of work, each providing a synergy for the other. Following are the major activities:

- Engaged Holyoke Community College (HCC) geology students in learning about conducting soil percolation tests, using several publicly owned sites along the path of Day Brook. The aim was to determine whether these sites might be suitable for green infrastructure stormwater management installations. Students worked in the field with PVPC staff, Holyoke's Conservation Agent, and their HCC professor, using a soil perc test worksheet that PVPC developed in collaboration with the University of Connecticut's NEMO (Nonpoint Education for Municipal Officials) Program Director Mike Dietz. Students conducted soil perc tests at six sites across three locations (Sullivan School, Wyatt Harper Park, and Holyoke High School). While these tests provide a preliminary indication of whether sites are suitable, a much more thorough analysis is essential before actual design and construction of facilities.

Holyoke Community College students wait for a percolation test hole to drain at Sullivan Elementary School. The City provided water for test holes with tank shown in background.

- Engaged students in grades five through eight in learning about “The Secret Stream.” A collaboration between Enchanted Circle Theater and a Sullivan School art teacher, the activity integrated visual arts and environmental science into lessons in which students studied Day Brook’s journey from the slopes above the Sullivan School to the Connecticut River, and explored the impact that industrialization and urbanization, including stormwater, gray infrastructure (pipes), and combined sewage overflows, have had on Day Brook itself, the Connecticut River watershed, and the community at large. For their final project, the 8th grade students created a public art mural that is now a permanent installation at Holyoke's Community Field, and the 5th grade students created a mobile story walk that tells the story of Day Brook from pre-settlement and industrialization to the current day when green infrastructure can help to reduce combined sewer overflows. The mobile story walk has been presented in multiple locations throughout the City, including the Sullivan School, Community Field, City Hall, and the Public Library.

- Held several events to celebrate student work on Day Brook, drawing a larger segment of the community into the fold in understanding the story of “La Corriente Secreta” and connecting to this unseen natural resource in their neighborhoods. The unveiling

At the Day Brook mural unveiling event at Community Field, students and families enjoy activities at several learning stations, including this one shown above that explores soil permeability.

of the mural at Community Field drew numerous families to a celebration that included a series of stations to "make your own rain gauge," explore soil permeability, and "make your own mini rain garden." The outdoor unveiling of the mobile story walk at the Sullivan School was recorded and televised. The Sullivan School event involved several classrooms participating in a stormwater scavenger hunt on school property, using a clue book prepared for the event, and then participated in a conversation about what stormwater structures they found, and what they noticed about the school property and stormwater flows.

- Conducted a series of meetings and events with residents and property owners to promote understanding about the need to reduce urban storm flows in the Day Brook watershed, to identify existing and potential green infrastructure locations and to obtain feedback on a draft conceptual green infrastructure plan for the Day Brook watershed. Events included a family engagement workshop at Beaudoin Village that promoted understanding about a new rain garden in the context of Day Brook, and an interactive Day Brook table at the most recent Celebrate Holyoke event. Meetings with property owners and other stakeholders included representatives of Holyoke Hospital, Holyoke Parks and Recreation Department, Holyoke Public Schools, Holyoke Public Library, and Holyoke Public Works. PVPC conferred with the facilities director of the Massachusetts Division of Conservation and Recreation through a series of e-mails and phone conversations about the state-owned Fitzgerald Rink site. PVPC also communicated with Berkshire Design Group about the planning and design work at the Peck Elementary School and with a representative of Russell Terrace Realty about the residential development at Russell Terrace.

- Developed a green infrastructure concept plan informed by municipal officials and the series of meetings and events indicated above. Development of this plan also included review of GIS information for the watershed and site walks through the watershed to more carefully review green infrastructure opportunities in neighborhoods, at schools, and on institutional lands. In its final form, the concept plan poster entitled, "Connecting the Secret Stream," shows the four existing locations with green infrastructure stormwater facilities and eight opportunities for additional green infrastructure facilities in the Day Brook watershed.

Celebrate Holyoke 2018 participants talk with PVPC staff Patty Gambarini and Corrin Meise-Munns about Day Brook (left to right).

4. Lessons Learned and Recommended Strategies Going Forward

Through the work of this project, there have been ten important lessons learned. These lessons are described below in conjunction with recommended strategies for moving forward.

Lesson: The Day Brook watershed is already home to several green infrastructure stormwater management facilities: two rain gardens/bioretention basins at Beaudoin Village, vegetated swales and retention basins at Community Field, and a bioretention basin at Holyoke Public Library. There are also many opportunities to deploy such green infrastructure facilities, including trees, throughout the watershed to reduce the volume and velocity of storm flows into Day Brook and the combined sewer system.

Recommended strategy going forward: Promote implementation of this action plan in terms of "extending the network of green infrastructure facilities" from existing locations to other parts of the Day Brook watershed. This approach will show that such practices are becoming the norm and lead to greater willingness by property owners to embrace green infrastructure stormwater management approaches. The implementation of new projects, such as the residences at Russell Terrace will only help in this regard.

Lesson: There is localized flooding in the Day Brook watershed, especially around Route 5 and Holyoke High School. This includes occasional back-ups of the combined system, most notably into the High School parking lot.

Recommended strategy going forward: Prioritize green infrastructure retrofits and tree planting in the areas up gradient of the High School and Route 5, especially the Sullivan School and Elmwood Neighborhood & Hillside Avenue, in order to reduce the risk of flooding.

Lesson: Holyoke has had a strong redevelopment requirement in its stormwater management ordinance since 2010. Unlike many surrounding communities, all redevelopment projects in Holyoke have had to reduce peak flow by 25%. This means that any site that is undergoing redevelopment must provide for greater control of stormwater flows. This regulatory requirement has produced projects—both public and private—throughout the City that serve as models for the region. Such projects include all the recent rehabilitation projects that have occurred in the City's Parks, including Community Field and Pulaski Park. This also includes the current People's Bank redevelopment project within the Day Brook watershed at the corner of Route 202 and Northampton Street (Route 5). This

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redevelopment project includes stormwater infiltrators below the parking area.

Recommended strategy going forward: Within the Day Brook watershed, consider offering credits to incentivize projects to go beyond current stormwater management standards. This might include an upgrade in zoning, expedited review and permitting, or a one-year property tax credit. (See pages 115-116 of the *Pioneer Valley Green Infrastructure Plan* for more details on these options.)

Lesson: It is not clear whether Route I-91 delivers storm flow to the Day Brook system.

Recommended strategy going forward: Work with MassDOT to determine whether the Route 1-91 storm drain system is tied to the Day Brook system. If yes, it would be of paramount importance to explore opportunities to reduce the volume of this flow. Note that though they are state numbered routes, Routes 5 and 202 are under the City's jurisdiction.

Lesson: While U.S. Department of Agriculture, Natural Resources Conservation Service, mapping for this project provides very little information about soils in the watershed, it is clear that soil conditions are greatly varied throughout the Day Brook watershed. For example, project team members learned that soils around the hospital tend to be sandy with high capacity for infiltration while just across the way, the area around the Peck School may have lower capacity for infiltration given the presence of shale/bedrock.

Recommended strategy going forward: Conduct site specific soils analysis before moving forward with any green infrastructure design. Where soils present problems for infiltration, consider other stormwater management practices such as cisterns for capture of roof runoff or extensive green roof systems with lightweight soils and smaller plants. Extensive green roof systems (versus intensive) are lighter weight and are better suited for potential retrofits on existing buildings. Roof runoff captured by cisterns can be used for irrigating landscapes or brought into a building for reuse in flushing toilets.

Lesson: Maintenance poses some of the greatest challenges with existing green infrastructure stormwater management facilities. There is no existing capacity within the City to maintain such facilities and officials report the planting plans for these facilities are too complicated, making it difficult to distinguish intended plantings from weeds. The bioretention facilities at Community Field, and the rain garden at the Public Library are prime examples of green infrastructure facilities with lapsed maintenance.

Recommended strategy going forward: The solution to this problem may be two-fold:
1. Future facilities should be designed for easier maintenance, including a simpler plant palette and the ability to be maintained with equipment commonly used within the City. For example, a street-side rain garden/bioretention facility should have an inlet that captures sediment that can easily be removed, perhaps a lipped shelf inlet that is sized to accommodate the width of a shovel or alternatively a catch basin inlet where sediment that settles can be removed by a vac truck.

2. Parks, Schools, and Public Works could coordinate to contract with a local firm expert in green infrastructure maintenance to take care of all such facilities City-wide. It will be important to have a maintenance plan for each such facility that provides instruction to the firm on design materials and frequency of maintenance. Newer facilities will require more care as plants get established, etc.

Lesson: Given that many residents of Holyoke are from Puerto Rico (a tropical climate), there is a very real understanding of mosquito-borne disease. When green infrastructure facilities are not maintained properly or if soils are compacted during construction, the resulting standing water creates great concern as was the case with the rain garden at Beaudoin Village.

Recommended strategy going forward: To build greater public support for green infrastructure projects, it is critical that they be properly constructed and well maintained to ensure facilities drain within 72 hours to avert mosquito production. If the City can adhere to this standard, it will be an important point to stress with residents to alleviate concerns.

Lesson: Engaging with youth is not only an effective way to share the story of Day Brook with school age children, but an effective way to reach parents and other family members. City Library Director Maria Pagan has said that parents of Holyoke youth are especially invested in a better life for their children. They show up at community events that feature the work of their sons and daughters, and they seek out enhanced enrichment experience for their children. The mural unveiling at Community Field and the mobile story walk showcased at major municipal institutions were critical in transmitting the story of Day Brook to a wider caring audience.

Recommended strategy going forward: Education and outreach efforts for Day Brook should continue to engage school age children in meaningful ways. For more information, please see Chapter 6, Recommended Actions for Public Engagement, toward the end of this plan.

Lesson: While outside the scope of this project, "daylighting" (uncovering) Day Brook may be an important consideration and exploration for the City over the longer term. Just as the industrial past put Day Brook underground with sewage flows, the future could restore Day Brook to follow a path on the surface that brings renewed life and beauty to the neighborhoods along its course. Reimagining such a future for Day Brook and nearby neighborhoods would require the acquisition of lands and significant investments.

Recommended strategy going forward: Look to the results of recent stream daylighting work on the Sawmill River (Yonkers, New York) and on Arcadia Creek (Kalamazoo, Michigan). Even works in progress, such as Tibbetts Brook in New York City[1], may provide good examples and inspiration for the City of Holyoke. For more information on daylighting, see: americanrivers.org/wp-content/uploads/2016/05/AmericanRivers_daylighting-streams-report.pdf

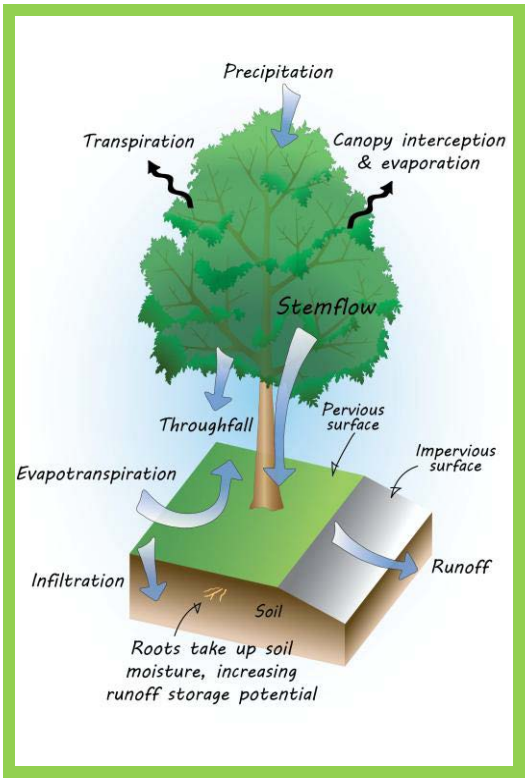
Photo source: Groundwork USA

In Yonkers, New York, the Sawmill River was buried in the early 1900s to make room for industrial and commercial activity. Today through various phases of work that began in 2012, the Sawmill River has been daylighted, radically altering the physical landscape and providing an invaluable public amenity in the city center.

[1] The daylighting of Tibbetts Brook is probably most relevant to Day Brook in that the project involves separating the freshwater flow of the brook from the City's antiquated sewer system to reduce combined sewer overflows. While the daylighting of Tibbetts Brook is very much in nascent stages, there could be some important early lessons from which to draw.

Lesson: The State of Massachusetts' Greening the Gateway Cities program provides free trees (ranging from 6 to 10-feet tall) to increase tree canopy in select urban residential areas. MassDCR foresters working for the program have planted some 1,600 trees in Holyoke over the past two years. The aim is to plant a total of 2,400 trees, which will increase tree canopy by an estimated 5 percent in the targeted area for Holyoke. The objective is to create shade that will keep urban areas cooler and provide some wind break from northeasterly storm systems during the winter months. While the focus of tree planting is on reducing heating and cooling energy use, trees also provide important stormwater management functions. A single mature tree has tremendous capacity to soak up rainfall. Within the Day Brook watershed, 19 trees have already been planted at the Holyoke High School, and 22 trees at the Peck Middle School.

Recommended strategy going forward: Work with Greening the Gateways Cities program on additional tree planting within the Day Brook watershed in the next two years. Other properties eligible for tree planting within the Day Brook watershed, include Holyoke Medical Center, and the DCR Fitzgerald Ice Rink. In addition, the trees planted at the Peck Middle School should be safeguarded during reconstruction at that location. For more information, see: https://www.maurbancanopy.org/



Photos source: U.S. EPA, Region 1

Trees have tremendous capacity to soak up rainfall. Diagram at left shows the dynamics of how a tree manages rainfall and photo at right shows how tree can be integrated into a front yard area.

Existing Green Infrastructure Stormwater Facilities in the Day Brook Watershed

There are three properties within the Day Brook watershed that currently have green infrastructure stormwater management facilities. These include the following:

- Two rain gardens/bioretention basins at Beaudoin Village — A Holyoke Housing Authority property, Beaudoin Village consists of 217 federally assisted townhouse style units of family housing. Stormflow from a 27-stall parking lot is directed through curb openings to a stone pretreatment filter strip that removes sediments before it enters one of two rain gardens/bioretention basins. The basins are designed to receive and infiltrate rainfall into soil though larger storm events will send some flow to adjacent wetland areas.
- An extensive stormwater management system of bioretention basins and vegetated swales at Community Field — Managed and operated by the Holyoke Parks Department, Community Field is a large park tucked down along the eastern side of I-91. The park's stormwater management system was part of an extensive landscape renovation in 2011.
- A rain garden/bioretention basin at the Holyoke Public Library's Chestnut Street parking lot — The basin is designed to capture and infiltrate the initial surface runoff from a storm and overflow is directed to the combined sewer system. The stormwater facility was part of the 2013 renovation of the Holyoke Public Library.

A bioretention basin helps to slow the flow at Community Field.

5. Recommended Actions for New Green Infrastructure Locations

Following are eight locations that provide opportunity to extend the network of green infrastructure stormwater management facilities in the Day Brook watershed. Several locations were identified through the work of this project and two locations—Peck Middle School and Russell Terrace—entail site planning currently under way that seeks to integrate improved stormwater management. The proposed locations described here are organized from the upper to the lower part of the watershed. It should be noted that while all of these projects will help to reduce flows going into the pipe that conveys Day Brook and combined sewer, projects in the upper watershed have the additional benefit of helping to reduce localized flooding in the lower watershed. Potential project locations in the upper watershed of special interest include the Sullivan School and residential neighborhoods, particularly the Oakdale Neighborhood & Hillside Avenue.

A. Lt. Clayre Sullivan School

Overview: Located on Jarvis Avenue at the top of the Day Brook watershed, the Lt. Clayre Sullivan School (Sullivan School) is an elementary school in the Holyoke Public School system. The school property is approximately 16 acres in size, of which approximately 20 percent is impervious, including roadways, parking areas, and the school building itself. Runoff from all of these surfaces is piped east to an outfall located to the rear of the school property.

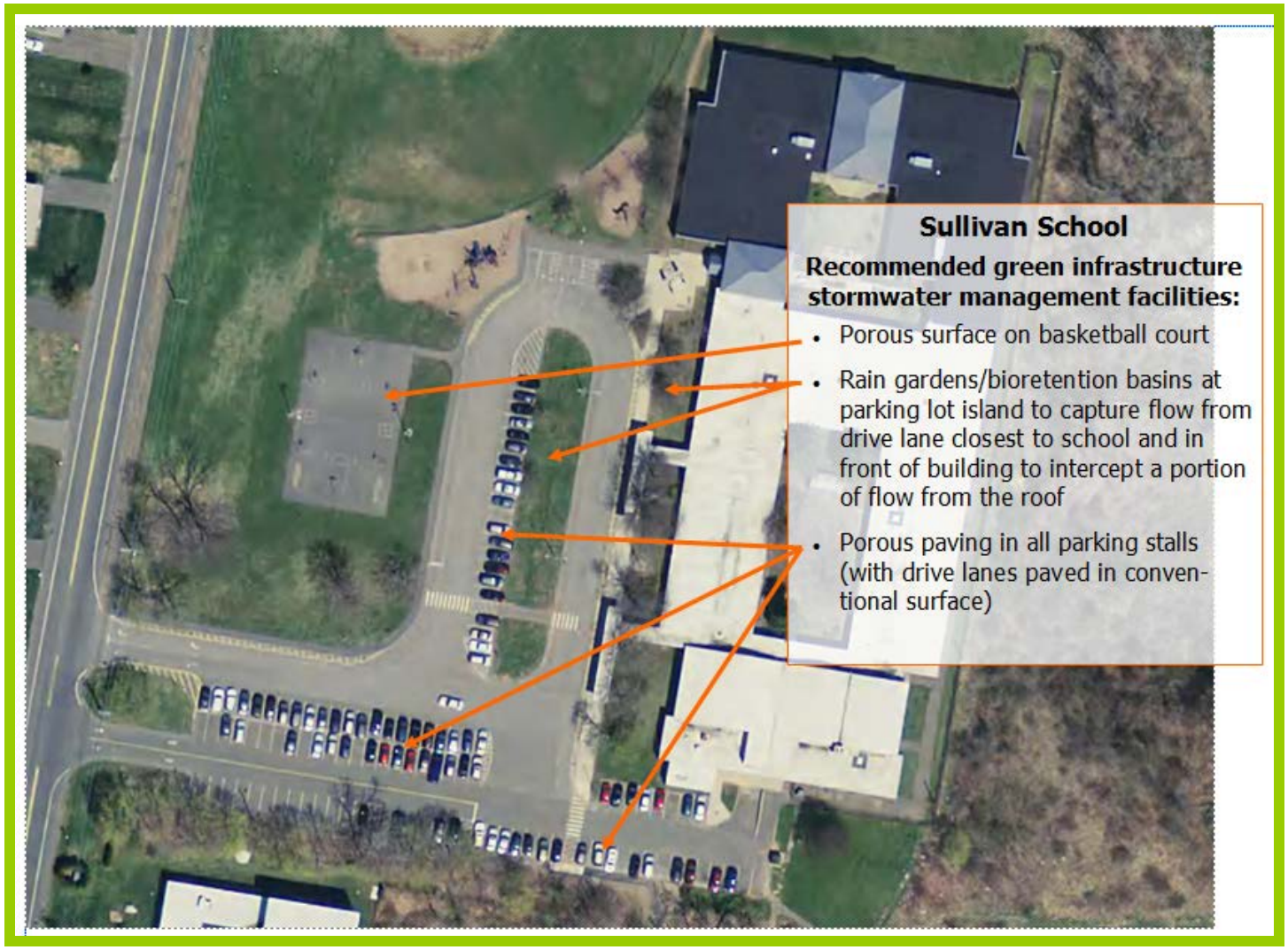
Potential partners: Locally, Holyoke Public Schools and the School Building Committee (SBC). The SBC is a local, mayor-appointed body with members representing school faculty and administration, the state receivership, and various City departments. At the state level, the Massachusetts School Building Authority (MSBA), a quasi-independent government authority, works with local communities to create affordable, sustainable, and energy efficient schools across Massachusetts.

Next steps:

Talk further with school officials to determine potential for accommodating stormwater retrofit projects at Sullivan School when there are currently no capital improvement projects on the horizon.

Evaluate the costs and benefits of installing green infrastructure—including construction costs, quantifying reduced stormwater flows and avoided costs of treating such volume at Wastewater Treatment Plant, and the value of improving the school environment.

Recommended green infrastructure facilities:



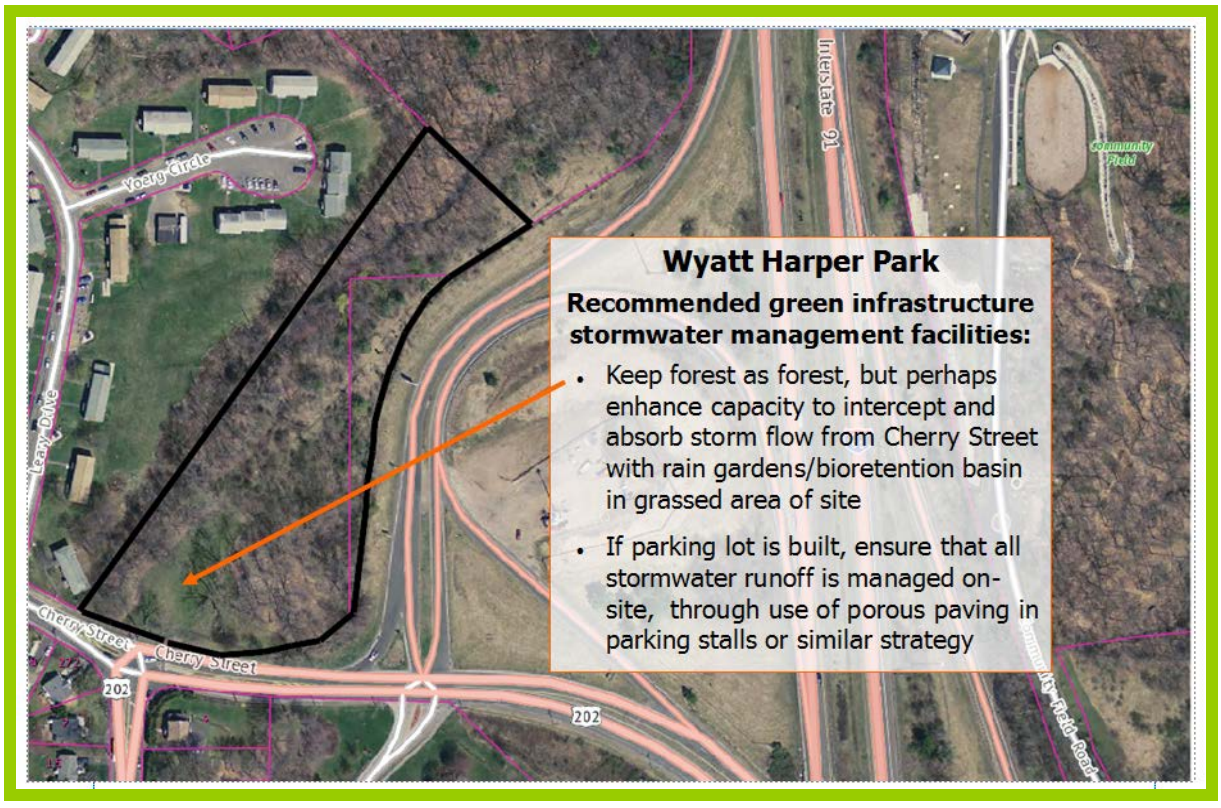
Base photo source: Google Earth

Stormwater runoff reductions could be achieved with installation of several green infrastructure facilities at the Sullivan School as indicated.

B. Wyatt Harper Park

Overview: Currently undeveloped, Wyatt Harper Park is owned and managed by the Holyoke Parks and Recreation Department. The 4.3-acre park is located on Cherry Street and is listed by Holyoke Parks for passive recreation only. It is bordered by I-91 to the east and Beaudoin Village to the west and has a small meadow area along Cherry Street/Route 202, but is otherwise forested. Holyoke Parks has reported it has no development plans for the site, but that there has been some discussion about creating parking to provide alternative access to Scott Tower on Anniversary Hill Park. The Tower can currently be accessed via Community Field. The park's adjacency to Beaudoin Village could provide some important opportunities to engage with residents in the future of this landscape.

Recommended green infrastructure facilities:



Base photo source: MassGIS Oliver

Currently undeveloped, Wyatt Harper Park could serve to reduce storm runoff impacts from Cherry Street/Route 202 with the installation of a rain garden/bioretention basin in the meadow area.

Potential partners: Parks Department, residents of Beaudoin Village and Nuestras Raices (which has worked with residents in planning and installation of successful on-site vegetable gardens), Conservation Department, Public Works, MassDOT (re: drainage from 202).

Next steps: Examine potential to receive flows from Cherry Street/Route 202

C. Residential Neighborhoods

Overview: The Oakdale Neighborhood marks the beginning of the urban portion of the Holyoke Day Brook watershed. The neighborhood has residential avenues that are bounded by the sloping hillside of Community Field to the west, Northampton Street to the east, Cherry Street/Route 202 to the south, and Dwight Street to the north. Hillside Avenue runs north-south parallel to I-91 and Northampton Street. The Oakdale Neighborhood is an urban landscape with high density residential land use, large amounts of impervious surface, and small one-eighth to quarter-acre lots. Stormwater runoff begins to add substantial volume to Day Brook and the combined sewer system in this neighborhood.

While some homes in this area are set up to direct stormwater runoff from rooftops into front or backyard gardens, many appear to direct rooftop stormwater runoff onto driveways, where flows then move into the roadway and down street drains/catch basins that tie to the Day Brook pipe. Other homes appear to tie directly into the municipal sewer system via a pipe connection between downspouts and system pipes.

Creating a downspout re-direct campaign in the neighborhood that incentivizes homeowners to rehang gutters so that stormwater flows to lawns and gardens could result in important reductions of storm flow into the system. Redirecting flows away from driveways would also help to increase safety by reducing winter icing.

Rooftop flow from many neighborhood homes spill to driveways that then deliver flow to roadways and street drains/catch basins that tie to the Day Brook pipe.

Alternatively, residents might be encouraged to add porous paving to their driveways in order to reduce these flows. (See examples below.)

Source: Lake County, IL, Stormwater Management Commission

Introducing porous paving to a driveway can entail a variety of strategies. Image to the left shows a residential driveway where the homeowner installed brick to support tires and weight of vehicles, but left a center strip porous with soil and attractive groundcover. Image to the right, shows a driveway where homeowner used strips of porous pebble across the slope to receive rainfall that flows from the upper concrete segments of the driveway. In thinking about design, it is important to consider what implications a design will have on clearing of snow during winter months.

With the exception of the larger houses on Northampton Street, the majority of homes in this neighborhood appear to be single-family or converted two-families, each with a driveway. The presence of so many driveways indicates some opportunity to remove some on-street parking thereby narrowing roadway widths and using the space for green infrastructure stormwater management facilities. Even more space could be attained for green infrastructure with removal of sidewalk on one side of the street in locations where there are sidewalks on two sides of the street.

Many of the streets in this neighborhood are wide, with roughly 40 feet right-of-ways. Within the right of ways are located: two drive lanes (8 to 9-feet wide); unmarked parking lanes on each side (6 to 7-feet wide); and sidewalks on each side (5-feet-wide).

Hillside Avenue in particular has been used as a cut through by motorists to avoid the traffic on Route 202 and 5. This has resulted in excess traffic and speeds on what ought to be a quiet residential street. Public Works officials have indicated that they have been thinking about potential facilities to "calm traffic" and discourage use of Hillside Avenue as a cut through. There may be some important strategies, such as vegetated curb bumpouts that can be deployed to both "calm traffic" and also improve stormwater management.

Reimagined, the wide roadway right of ways in the Oakdale Neighborhood (in image above) could accommodate some important green infrastructure facilities that not only reduce flows into the pipe conveying Day Brook, but also greatly enhance the neighborhood with less paving and more vegetation (as shown in drawing at bottom from Maplewood, Minnesota's Living Streets Policy) .

Recommended green infrastructure facilities:

Residential Neighborhoods

Recommended green infrastructure stormwater management facilities:

- Vegetated curb bump outs along roadways that would also help to "calm" speeding traffic in the neighborhood

- Rain gardens/bioretention basins along street edge and "stepped" rain gardens or stormwater planters where slope is greater than 5%

Base photo source: Google Earth; Photos source: City of Portland, OR

Potential partners: City of Holyoke and Pioneer Valley Planning Commission

Next steps:

- Determine how neighborhoods figure into capital planning for road reconstruction
- Also examine timing of ongoing sidewalk work planned under the Complete Streets Program as upper and lower Oakdale Neighborhood are listed on the Complete Streets Funding Program Project Prioritization Plan
- Examine any plans that exist showing underground infrastructure and determine specifically how green infrastructure solutions might fit
- Evaluate values of installing green infrastructure--including quantifying reduced stormwater flows and avoided costs of treating such volume at Wastewater Treatment Plant, but also values of traffic calming, and compare with estimated construction costs

D. Holyoke Medical Center

Overview: Holyoke Medical Center has a highly impervious campus with numerous parking lots for patients, visitors, and employees of the various medical practices. The Center is composed of assorted buildings separated mostly by paved, and occasionally, landscaped areas. The roofs of these buildings and the parking lots all shed rainfall and snowmelt directly into the combined sewer that carries Day Brook.

Green infrastructure stormwater management facilities have important co-benefits, especially in a medical care setting. With more planted facilities across the campus, patients see more green and more nature. Research has indicated that patients with views of nature display less pain, shorter hospitalizations, less anxiety, and higher hospital and room satisfaction. (For a summary, see: https://depts.washington.edu/hhwb/Thm_Healing.html)

In a series of meetings with Corporate Director of Support Services John Thierrien, there were several important points of conversation:

- The hospital has been struggling with parking and its ability to adequately accommodate visitors and staff, and as such continue to buy up adjacent properties to expand capacity. Staff are currently working with an engineering consultant to help strategize potential solutions, including the possibility of a parking garage.
- A consultant is evaluating energy needs and systems and how the hospital might save on costs. Emerging ideas from this work are: install solar canopies over parts of the parking area and reuse condensation water in cooling towers.
- The hospital has experienced flooding in several locations, including at Portland and Winchester streets; A and B parking lots (in the area near the Wound Care Center), and the basement (though reportedly not for some time).
- It is recognized that there is a need to look at potential issue areas and come up with a better stormwater management plan overall for the campus.
- Green infrastructure stormwater management is of great interest.
- There is demand for expanding capacity to grow food on site, including portions of the roof, but further engineering analysis is required to understand weight bearing capacity of certain building roofs.

With all the mobilization toward problem solving on campus—parking, energy, flooding, and even on-site food production—there is tremendous opportunity to undertake projects that address several issues at once. For example, the move to a garage and consolidation of parking on a smaller overall footprint would make more land available for soaking up

rainfall, growing food, and planting of shade trees that could in turn help avert flooding in lower lying areas of the campus and reduce heating and cooling costs of adjacent buildings.

Potential partners: City of Holyoke, Executive Office of Energy and Environmental Affairs/Department of Conservation and Recreation Greening the Gateway City Program for tree planting, and Pioneer Valley Planning Commission.

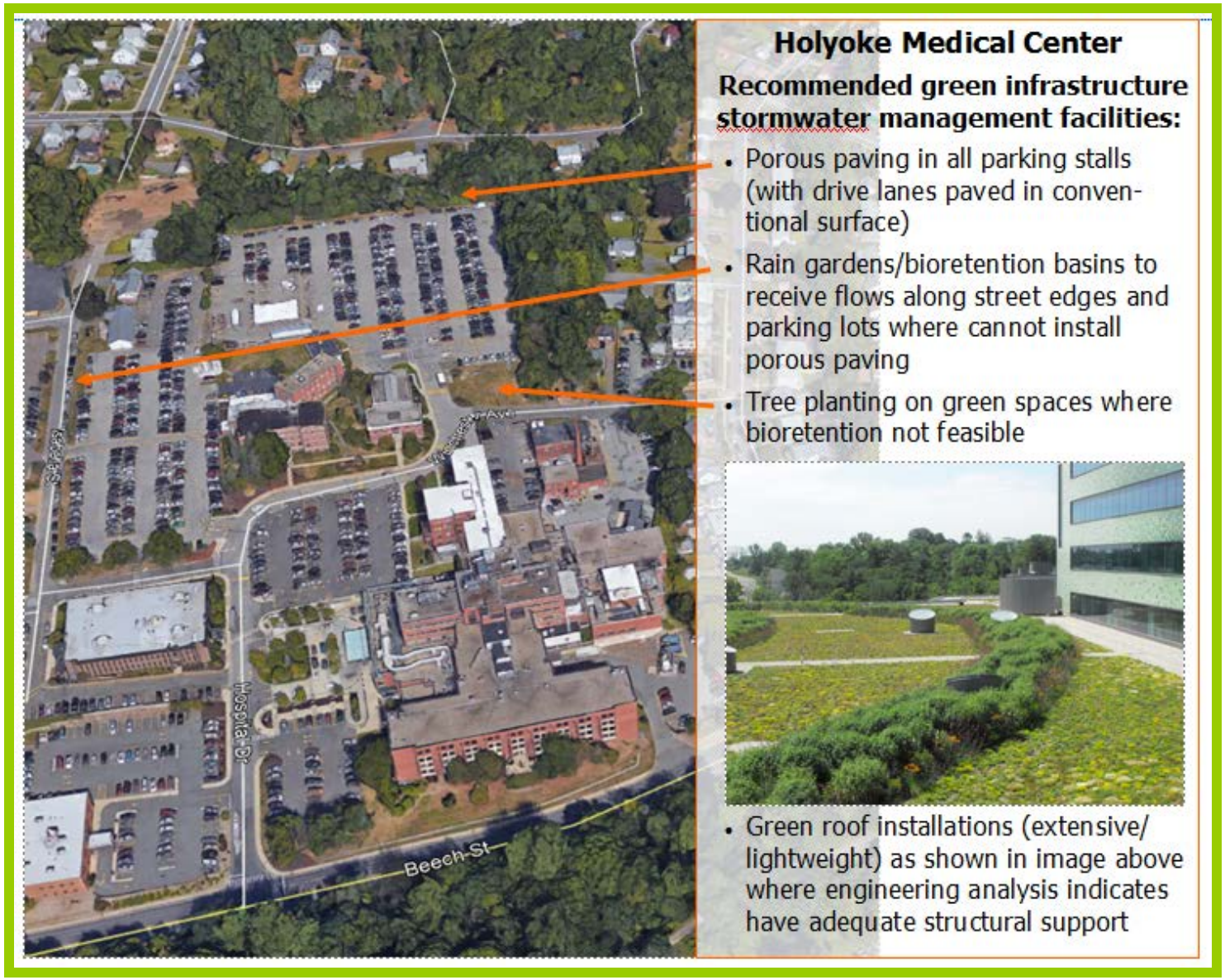
Next steps:

- Develop a campus master plan that integrates better stormwater management with energy and parking objectives (once they are known) and growing food. This might be accomplished through a private consultant or a studio project by one of the graduate landscape architecture programs in the area: University of Massachusetts or Conway School. PVPC could help facilitate and manage such a project for the Medical Center.
- Work with Greening the Gateway City staff at MassDCR to plant trees in a series of phases, including locations that will not be disturbed by currently emerging plans and locations that are destined for change and that can integrate trees into overall designs.
- Work with PVPC, the City and others to further identify funding sources and apply for grants that can help with engineering and design of projects that achieve improved stormwater management and reduced flows into the Day Brook pipe.

Source: minnehahacreek.org

A stream restoration and green infrastructure project at the Methodist Hospital in St. Louis Park, Minnesota, provided an initial step toward a long-term watershed-wide project that has been yielding great human and ecological benefits. The project transformed the hospital campus to reorient operations to the nearby stream and integrate more open space and green infrastructure stormwater management for the enjoyment and benefit of hospital staff, visitors, and patients.

Recommended green infrastructure facilities:



Base photo source: Google Earth; Green roof photo source: Mercy West Hospital, Cincinnati, OH

E. Peck Middle School

Overview: Holyoke Public Schools is working with the Massachusetts School Building Authority (MSBA) and the City of Holyoke to replace the current Peck Middle School. The School Building Committee (SBC) has contracted with Berkshire Design Group for the school redesign, and the firm has included a green infrastructure-based stormwater management program across the proposed new campus.

Many of the green stormwater features in the Peck Middle School design include interactive elements intended to engage school children in play and learning. A stone runnel collects stormwater from a concrete play area and climbing mound, and then carries a small stream downgrade through an outdoor eating area before pooling in another play-space to the eastside of the schoolyard. The concrete play area is made of hexagonal pavers interwoven with mini rain gardens and molecule-shaped benches meant to integrate with the school's chemistry curriculum.

The design also relies on green infrastructure to treat runoff from vehicular lanes. There are two large rain gardens that are intended to treat runoff as it sheet flows from the drop-off area and all parking lots, and a grass swale to the east of the bus drive will filter sediments from that paved area.

With the Peck School design currently in a schematic stage, Berkshire Design Group and JWA, the project architect, do not have a definite budget estimate.

Potential partners: Berkshire Design Group is the project landscape architect, and Holyoke Public Schools is the property owner. The MSBA determines the decision-making structure and the phasing of project decisions, while the SBC manages local approvals and decisions.

Next steps: Proceeding from conceptual to detailed design for the project relies on a public vote to raise tax revenues beyond the levy limit of Proposition 2-1/2. An affirmative vote would enable the City to pay for debt (principal and interest) to be borrowed to replace the Peck School (as well as build a new middle school at Chestnut Street).

Recommended green infrastructure facilities:

Source: Berkshire Design Group

This conceptual design for the new Peck School features many green infrastructure stormwater systems integrated into the school's multi-purpose learning and play spaces. These include rain gardens, grass swales, and overall reduced impervious area.

F. Holyoke High School

Overview: Located to the east of Peck Middle School and north of the DCR Fitzgerald Ice Skating Rink, the Holyoke High School property sits above the pipe conveying Day Brook. The parking area is subject to stormwater flooding from surface runoff and, during extreme events, from manhole flooding due to the undersized capacity of the combined sewer that runs beneath the high school property. Student and faculty cars have been damaged due to flooding in the lowest parts of the parking area, which slopes down from the road toward the school.

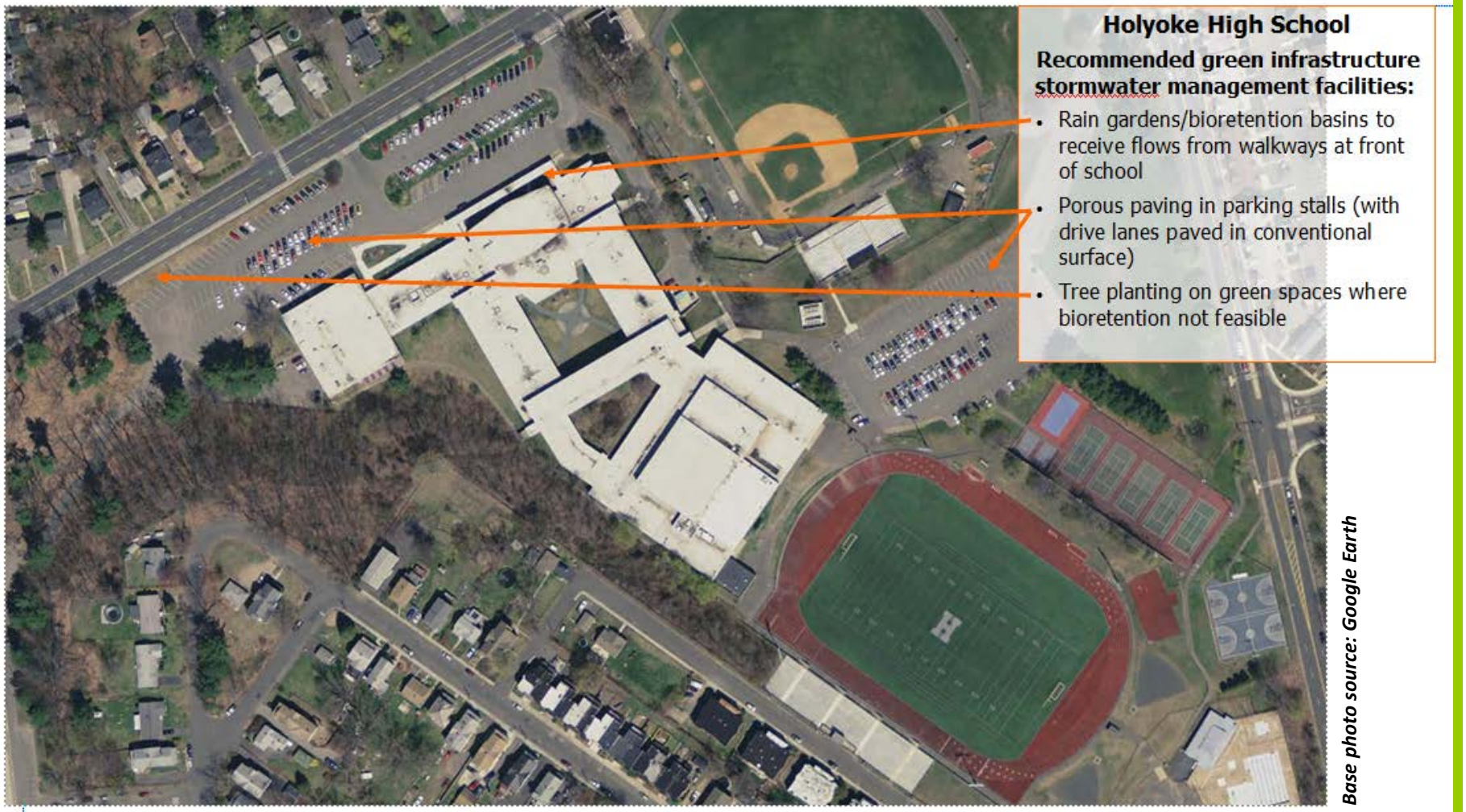
As there have been recent capital improvements to recreational and sport facilities at the high school, PVPC did not examine these locations for added stormwater improvements. Going forward, the greatest opportunity for improved stormwater management seems to be in the parking area and green space directly in front of the school.

Potential partners: Locally, the Holyoke Public Schools and School Building Committee. At the state level, the Massachusetts School Building Authority (MSBA).

Next steps:

- Talk further with school officials to determine potential for accommodating stormwater retrofit projects at the High School when there are currently no capital improvement projects on the horizon.
- Evaluate the costs and benefits of installing green infrastructure, including construction costs, quantifying reduced stormwater flows and avoided costs of treating such volume at the City's wastewater treatment plant, and the value of improving the school environment.

Recommended green infrastructure facilities:



G. Russell Terrace

Overview: Russell Terrace Realty LLC is developing a 10-unit market rate residential townhouse that includes a suite of green infrastructure stormwater management practices. Planned for Russell Terrace located just south of the Peck Middle School, the developer is seeking to improve stormwater management based on personal commitment and belief in good practice. Early in the project planning process, the developer also sought to introduce a gray water system that would capture and use roof flow to flush toilets, but given the scale of this development, the cost benefit analysis did not make it viable for the project.

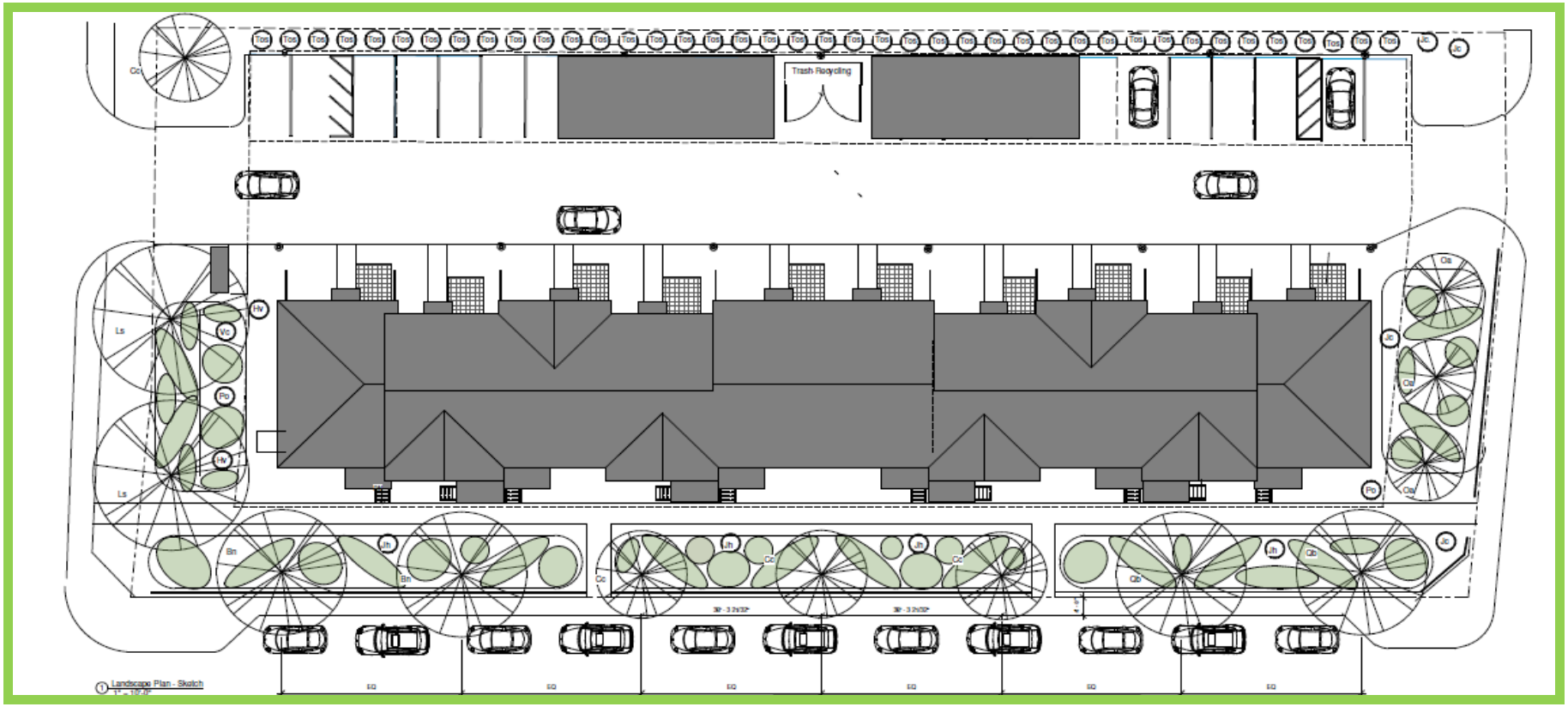
Representative Erica Gees indicated that the Russell Terrace property has great soils for infiltration of stormwater. The lot, site of a former school, has sat vacant since the 1980s. Previous proposals for this site have been opposed by neighbors. As such, developers for the current proposal worked with residents through a participatory planning process to design a building that fits with what they want to have in their midst in terms of use and aesthetics. The project is privately funded.

Proposed facilities:

- Five rain gardens, with three gardens on Russell Terrace, and one each on South Street and one on Carlton Street. These facilities will receive flow from part of the roof area and walkways.
- Infiltrators below ground in the parking area
- Porous paving of all patios
- At least two 2,000 to 3,000-gallon underground cisterns that will receive flows from rooftops and be used for irrigation

Potential partners: City nursery for trees, schools to engage students in design and planting of rain gardens.

Next steps: Developers plan to break ground summer of 2019 to construct all site infrastructure and buildings. For the fall of 2019, the plan is to engage school students in the final design and planting of five rain gardens planned for the site.



Source: Stiebel Properties

This schematic for Russell Terrace shows the 10 town-house development with the five rain gardens that are planned for the front of the site.

H. Fitzpatrick Skating Rink

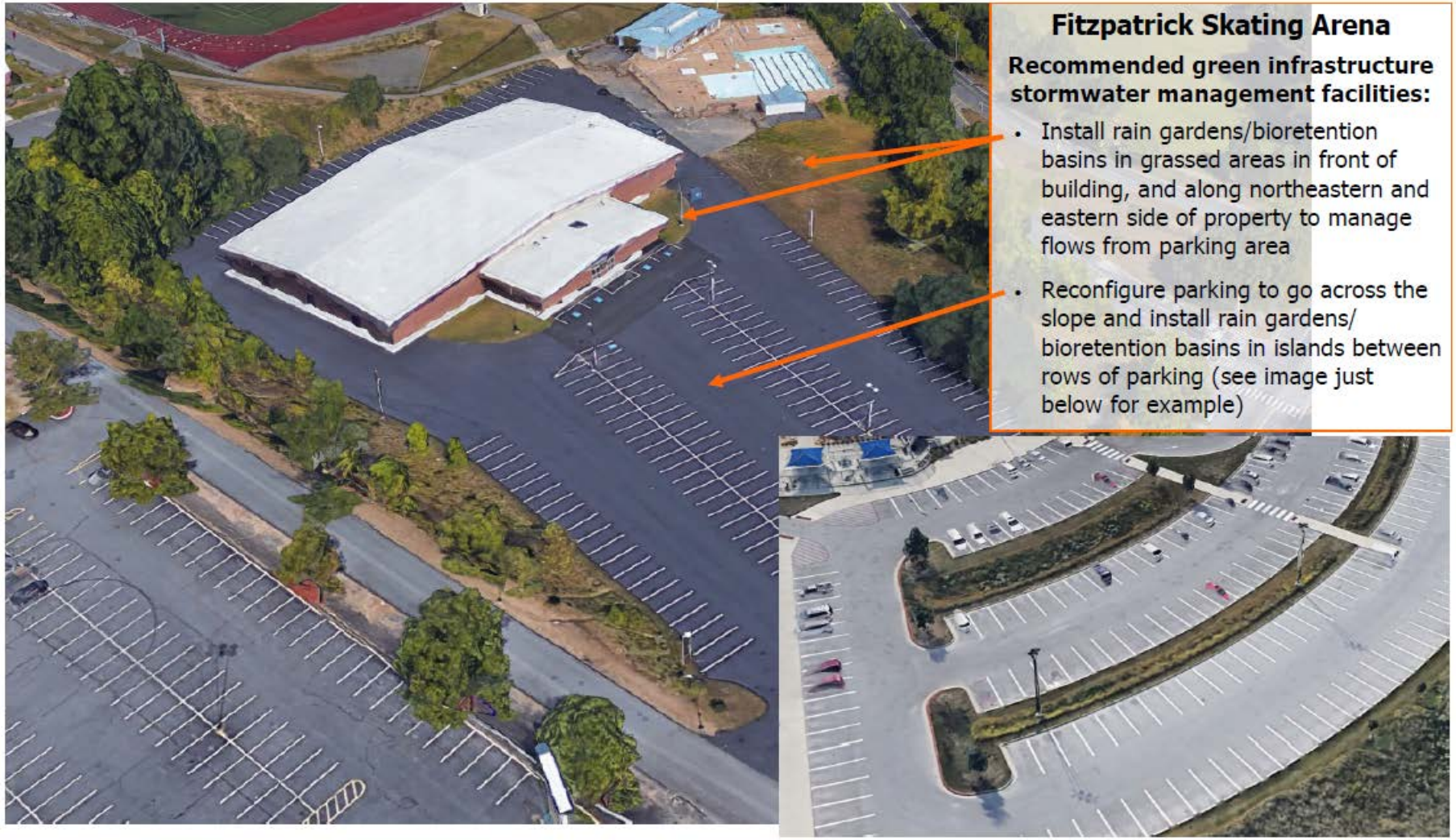
Overview: Owned by the Massachusetts Department of Conservation and Recreation (Mass DCR) and Operated by Facility Management Corporation, the Henry J. Fitzpatrick Skating Rink is located in the lower Day Brook watershed. The property is approximately 5.56 acres and nearly all impervious with rooftop and parking lot accounting for a very large part of the site. Slopes along the northwestern edge of the property are all steep and the asphalt of the parking lot has large cracks in many locations. While there are no plans to upgrade the rink, the City of Holyoke is renovating an adjacent public pool. The pool is accessed through the skating rink parking area. Installation of green infrastructure stormwater management facilities at the rink location would reduce flows into the Day Brook and combined sewer pipe, while also setting a new standard in this neighborhood where many commercial properties are nearly all covered in impervious surfaces.

Potential partners: City of Holyoke Public Works, MassDCR, Pioneer Valley Planning Commission

Next steps: Clarification of the terms of the management arrangement on this property—between MassDCR, the City of Holyoke and Facility Management Corporation--is essential before any work can progress. Once the arrangement is clear, a joint meeting of all parties to discuss the future of this site will be an important first step.

The skating rink is located at the top of the property with a large asphalt parking lot that slopes to the south and the entrance to the site. Reconfiguring parking stalls across the slope would lend itself to a layout for better green infrastructure facility design.

<u>Recommended green infrastructure facilities:</u>



Source of photos: Google Earth

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6. Recommended Actions for Public Engagement

Public engagement is perhaps the most important work to be done relative to Day Brook. Increased understanding among residents and decision makers about the implications and costs of running a freshwater stream through sewer pipes and the City's Wastewater Treatment Plant is essential to generating the political support for needed investments. Developing a long-term vision for Day Brook that engages, excites, and inspires must continue beyond this project. Following are a series of recommended actions under three categories: Making Green Infrastructure Stormwater Management More Visible; Making Day Brook Visible and Promoting Wider Community Connection to and Conversation about Day Brook.

Making Green Infrastructure Stormwater Management More Visible

- Develop and install interpretive signage for green infrastructure projects throughout Holyoke. Signage will promote understanding about how these systems function and what are the multiple benefits of such stormwater management. Signage will also help to make such stormwater approaches mainstream. Russell Terrace, a private development, and Library Director Maria Pagan have requested such signage specifically. Signage would also be useful at Holyoke Rows Boathouse, Community Field, and Beaudoin Village. Signs might be developed for a relatively low cost. PVPC has already designed a prototype that could be refined and signs could be produced potentially through Hampshire County Corrections. Going forward, signage could be an integral part of all new projects that are publically visible.

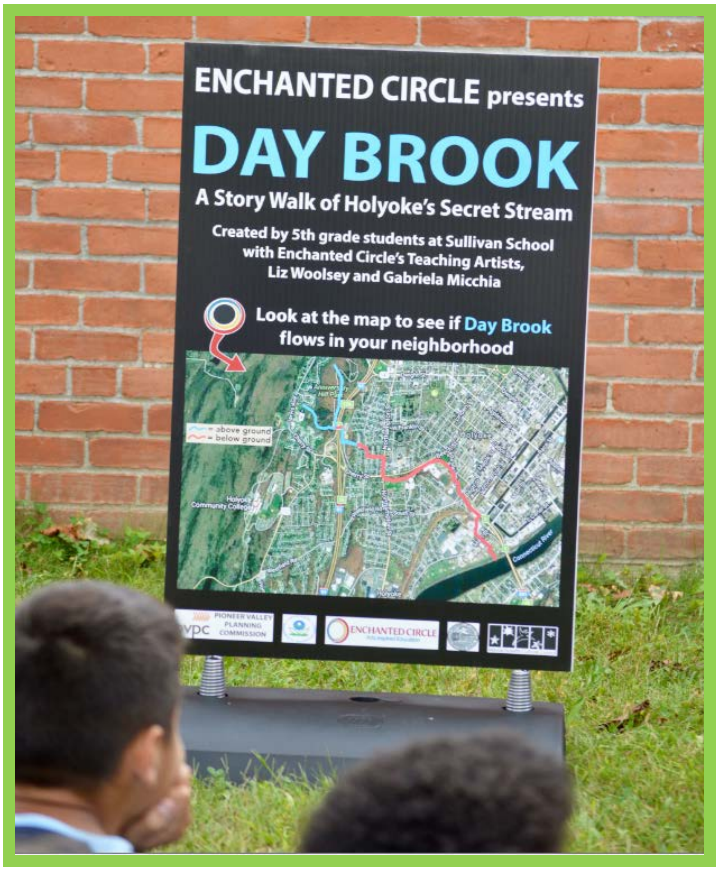
Interpretive signage need not be elaborate, but some explanation of how things function and why they are beneficial are important to building understanding. This sign describes how rainwater is captured from the roof for reuse inside the building.

- While elevating the visibility of green infrastructure, it is also important to keep such facilities maintained to ensure proper function and appealing aesthetic. Facilities that look bad and function poorly will only create barriers for the City in its ability to promote improved stormwater management. In Chapter 4 of this action plan, it is suggested that Parks, Schools, and Public Works coordinate to contract with a local firm that is expert in green infrastructure maintenance to take care of all such facilities City-wide. Another strategy may be to engage with the Western Massachusetts Master Gardeners program on an ongoing basis. People studying in the Master Gardeners program must provide 60 or more hours of volunteer service, including community service. There may also be an opportunity for Master Gardeners to pair with residents who are interested in caring for facilities located close to where they live.

Making Day Brook Visible

- PVPC will provide the City with the GIS layer it developed for Day Brook so that the layer shows on the City's property viewer, an important on-line resource used by both government employees and the public.

- Continue to deploy the mobile "story walk" to other locations in the Day Brook watershed, including Holyoke Hospital, the High School, Senior Center, and the newly renovated swimming pool during the spring and summer of 2019. Promote the "tour" through local media. The Children's Museum, though outside of the Day Brook watershed, could be another important location.



By reading the six panels of the mobile "story walk," viewers get a sense of Day Brook's story from the age of dinosaurs, through industrialization, to the present day. Shown is the first panel of the series.

- Promote the project poster and action plan in the coming year. Start by hanging framed Day Brook "Connecting the Secret Stream" poster in five prominent locations throughout the City, including possibly the Sullivan School, the High School, the Peck School, the Library, and City Hall. Also, make sure that both poster and report are available electronically through the City website and then promote availability through social media outlets.

- Host a "Secret Stream" table at the 2019 Celebrate Holyoke event to showcase the poster and share key elements from the action plan. Perhaps provide some fun related activities, including decorative henna tattoos of Day Brook's original pathway based on artist Bob Braine's work in Friesland, Germany, and New York City. See description in image below.

Estuary Tattoos

BY BOB BRAINE

Estuary Tattoos by artist Bob Braine coincides with the launch of SLO's "pop-up wetland". These body-painting events have been conceived in collaboration with ecologists and biologists, providing as a platform to explore the parallels between the human circulatory system with that of regional wetland ecology. In 2016, Braine carried out a similar series of events in Freisland, Germany translating the vast expanse of the Wadden estuary, which is only visible from the air, into vivid diagrams that evoked its hidden beauty, dynamic and nourishing circulation.
By making Bronx residents themselves into works of art, Braine will help them visualize and understand the estuary on a visceral level. The temporary 'tattoos' will be documented in still photographs and will be displayed at public outdoor sites near or around Van Cortlandt Park and/or the Lehman College Galleries.

Source: City as Living Lab

Temporary tattoo art could be a fun and effective way to promote understanding about healthy versus urbanized streams like Day Brook. Originally an idea that artist Bob Braine used in Germany, the latest application of this idea is related to building awareness about Tibbetts Brook and separating its flow from a combined sewer in New York City.

- Work with schools on storm drain art for Day Brook, perhaps selecting one design to be converted into a metal disk for installation at each drain within the watershed. After school program students might install disks on school property locations and other locations that do not involve busy streets. Alternatively, there could be a stencil that is developed that can then be spray painted near each drain.

There are a variety of products on the market to enable labeling of storm drains on a large scale throughout a watershed.

Sources: Monterey Sea (top); Garden State Highway Products, Inc.

- Sponsor local juried arts contest, perhaps themed "Finding Day Brook," and celebrate at local event where artists present their concepts and a final concept is selected for implementation (funding would be awarded to the artist for execution of his/her artwork). PVPC conducted a successful project along these lines where artists responded to a call for concepts to develop "a visual metaphor for sustainability."

Promoting Wider Community Connection to and Conversation about Day Brook

- Engage decision makers going forward with some hard numbers about the costs of Day Brook. Begin by calculating Day Brook's annual flow to get at answering four questions: How much of what is treated at the Wastewater Plant can be attributed to Day Brook? What does it cost annually to run Day Brook through the Wastewater Treatment Plant? How much does Day Brook contribute to combined sewer overflows? What decrease in Day Brook's flow would be required to avoid combined sewer overflows?

- Hold a roundtable of municipal boards to relate the story of Day Brook and the importance of treating every project in the watershed as an opportunity to manage rainfall close to where it falls. Also, identify support or regulatory standards needed to ensure that projects maximize reductions of flow into the Day Brook pipe.

- Incentivize gutter redirects and rain garden/bioretention installations through mini grants programs for homeowners in targeted Day Brook neighborhoods, particularly Oakdale Neighborhood and Hillside Avenue. PVPC has worked with the City on such projects in the past with some success.

This slide from a PVPC presentation draws on a former project in Holyoke to highlight the ease and benefit of redirecting gutters away from driveways and toward gardens or planted stormwater facilities that soak up rainfall.

- Work with Holyoke Public Library to promote curiosity and engagement with information about Day Brook. Effective framing to pique interest could be along the lines of: "Do you know where your rainwater goes?" Ideas for how to tie Day Brook and improvement of the community to family desires in providing brighter futures for their children could be beneficial.

- Host local conversations about Day Brook that bring together the residents, businesses, and institutions within each of the watershed's neighborhoods. These might entail "living room" or "school room" meetings hosted by one or two people from a given neighborhood. A meeting kit could be assembled that includes materials and ideas for

hosting a successful conversation. City of PVPC staff could be invited to speak about Day Brook and hear thoughts and ideas for a given neighborhood.

- Elevate the habitat values of green infrastructure as it may draw in kids more effectively with conversation around where certain creatures live/visit. Perhaps include green infrastructure facilities as part of an urban "bioblitz" event to record insects, birds, and other creatures.

- While continuing to pursue green infrastructure stormwater management projects, also begin a conversation across City departments and community organizations about the potential to daylight Day Brook. What might this look like? Perhaps sponsor a group visit to the day-lighted Sawmill River in Yonkers, New York, and Tibbetts Brook in New York City (where day lighting plans are under way) to get some insights on what such an endeavor would entail. Studio projects with University of Massachusetts Landscape Architecture Department, Conway School program, or Harvard Graduate School of Design could help explore ideas and concepts. It may also be worth hiring a knowledgeable consultant on how the cost benefits of such a monumental project might pencil out. Remember that accounting for all benefits—including energy savings (from reduced urban heat island effect and avoided treatment of Day Brook flow at the Wastewater Treatment facility)—is critical. For inspiration, see: https://ny.curbed.com/2018/12/20/18150198/bronx-new-york-tibbetts-brook-daylighting-photo-essay

7. Funding Resources

By reducing urbanized stormwater flows into Day Brook, green infrastructure facilities provide an important strategy for the City in meeting obligations under federal wastewater and stormwater discharge permits. At the same time, these facilities can produce important co-benefits for surrounding neighborhoods.

These co-benefits include:

- safer streets with vegetated road-side stormwater facilities that are also designed to reduce vehicle speeds,
- reduced localized flooding as the soils, vegetation, and other elements of facilities operate to soak up rainfall close to where it falls,
- reduced urban heat during the summer months with less impervious cover and more shade given the trees and other vegetation that are so integral to green infrastructure facilities, and
- greater resilience to a changing climate where extremes in weather are occurring with more frequency, particularly warmer temperatures and larger storms.

Integrating the objectives of meeting federal permit obligations with objectives for safer, healthier, and more resilient neighborhoods can help generate a more powerful program of improvements within the Day Brook watershed. The program solves multiple problems and derives multiple benefits. Such a program also diversifies the field of potential funding sources that make sense for this work.

This chapter is just a beginning in identifying funding sources. It outlines some of the potential funding at the local and state level, as well as other sources, and is by no means meant to be comprehensive.

A. Local Sources

Community Development Block Grant Program

The City of Holyoke is an Entitlement Community under the Community Development Block Grant program and receives awards directly from the U.S. Department of Housing and Urban Development (HUD). Awards from HUD have remained relatively stable over the past 5 years and Holyoke's FY2018 award was approximately $1.2 million.

Under the Community Development Block Grant program, projects must meet one of the three national objectives: assist low- and moderate-income persons (service area = >51% LMI); prevent or eliminate slums and blight; or meet an urgent community need where no other funding is available.

In Holyoke, funding is distributed via a competitive multi-step process whereby interested agencies and others submit proposals to provide public services that benefit low- and moderate-income residents. Proposals must meet HUD regulatory eligibility criteria and be able to demonstrate performance objectives and outcomes. Proposals are reviewed and ranked by the Office of Community Development staff, the Citizens Advisory Council (CAC), the Mayor and the City Council. The Mayor makes all final award decisions and submits the allocation plan to HUD by May each year for activities beginning in July.

For more information, see: https://www.holyoke.org/departments/community-development/#extra4-tab

Contact: Alicia M. Zoeller, Administrator/Director, Holyoke Community Development
413-322-5610 | zoellera@holyoke.org

Community Foundation of Western Massachusetts

The Community Foundation of Western Massachusetts provides more than $8.1 million in funding through its competitive grant and scholarship programs and through donor advised and designated funds. Grants have an overall goal of making life better for all in the region. Grants include the following types of funding:

- Donor Advised, Designated and Special Purpose Fund, which provided more than $5.5 million dollars in 2018. These types of funds are provided directly to non-profits by the donor or through a designation to a specific agency.
- Competitive grant programs, which provided $1.8 million in 2018. Competitive grants target 501c3 organizations in the region and include grants that help to: build organizational capacity; support emerging ideas, projects and/or new organizations for solutions to challenging problems, and support time limited projects and programming that directly benefit residents of Hampden, Hampshire, and Franklin counties.

Upcoming or most recent application deadline: Various

For more information, see: http://communityfoundation.org/nonprofits/grants/

Contact: Look to specific grant program to determine contact

Community Preservation Act (CPA)

Signed into law in 2000, the Massachusetts Community Preservation Act (M.G.L., Chapter 44B), gives communities the ability to generate funding for specific projects based on a surcharge of up to 3% on local property taxes. Holyoke adopted the CPA in 2017, approving a surcharge of 1.5% on property tax bills. These funds, along with an annual disbursement from the state-wide Community Preservation Fund, are set aside in a local Community Preservation Fund. A nine-member committee receives applications and makes awards for funding annually. Eligible projects must entail any of the following:

- Acquisition, creation, and preservation of open space
- Acquisition, preservation, rehabilitation and restoration of historic resources
- Acquisition, creation, preservation, rehabilitation and restoration of land for recreational use
- Acquisition, creation preservation, and support of community housing
- Rehabilitation or restoration of such open space and community housing that is acquired or created with CPA funds

FY18 collections for CPA brought in $497,814, beyond the estimated budget of $450,000 and the state match for FY19 was $94,659.

Upcoming or most recent application deadline: Friday, November 30, 2018 by 12:30 p.m.

For more information, see: https://holyokecpac.org/

Contact: Amy Landau, CPA Administrator
(413) 561-1647 | landaua@holyoke.org

Holyoke Local Cultural Council

The Holyoke Local Cultural Council offers small grants ($500 to $750) to support projects that demonstrate a clear public benefit. Emphasis is placed on supporting local artists presenting work in Holyoke. Funding is made available to the widest range of community cultural needs possible.

As determined by the most recent community survey, the following are funding priorities:

- arts education in the schools
- public events like concerts or festivals
- support for community arts and cultural organizations
- field trips for students to museums or performances

- projects celebrating diversity

Funded projects must be completed in the calendar year (January - December) following the October application deadline.

Upcoming or most recent application deadline: October 15

For more information, see: https://www.holyoke.org/news/holyoke-cultural-council-grants-available/

Contact: Navae Fenwick Rodriguez at 413-320-2550, or
Jenna Weingarten at 617-780-9852.

Local Banks

Local banks typically offer small community grant programs. Like cultural council grants, these grants are relatively small amounts that can then be used to leverage larger grants.

B. State-wide Sources

Complete Streets

To boost local ability to provide context-sensitive, multimodal transportation options, MassDOT funds the Complete Streets Program. Consistent with this program and qualifying for funding, Holyoke adopted a municipal policy in 2016 and completed a prioritization plan in April 2018. Several of the projects in Holyoke's current prioritization plan are within the Day Brook watershed. It will be important to ensure that design of these projects gives consideration for green infrastructure stormwater management.

The program recognizes that some projects make sense to implement earlier than others such that a community is free to advance a lowest ranking project or three middle-ranked projects together. Communities participating in the program are also continually advised to cast a broad net and include projects that might be funded in the future with other funding sources, including Chapter 90, Safe Routes to School, Transportation Improvement Plan, Gateway Cities, etc.

Further, MassDOT is reviewing options for allowing communities to revisit their prioritization plans. This could be helpful for Holyoke in thinking about the possibility of additional complete streets projects in the Day Brook watershed that can help advance

integration of complete with green streets strategies to improve transportation options while also reducing the volume of flows into the Day Brook pipe.

For more information see: https://masscompletestreets.com/

Environmental Bond Bill

The bond bill, typically passed every five years by the Massachusetts legislature, provides funding authorization for environmental programs. Bond bills are usually passed in the same session they are filed so can be powerful vehicles for priority setting. The 2018 $2.4 billion environmental bond bill, for example, includes $501 million to respond to and prepare for extreme weather, sea level rise, inland flooding and other climate impacts.

PVPC and cities and towns in the region have had a variety of successes in advocating for local projects within the bond bill. In 2014, PVPC and the Connecticut River Clean Up Committee got a $10 million-line item included for combined sewer abatement and separation projects that helped to fund projects over several years. As $7 million of this amount from 2014 was not used, it was carried over into the 2018 bond bill. Securing a line item in the bond bill is an involved process and requires good communication with the local legislative delegation and a point person within the delegation that is committed to serving as champion to ensure that the line item holds fast throughout all the negotiations.

PVPC is in the process of reviewing the 2018 Bond Bill, identifying lessons learned and strategies for the next Environmental Bond Bill.

Massachusetts Environmental Trust

The Massachusetts Environmental Trust annually provides grants to innovative and well-designed projects that support the advancement of marine animal conservation efforts and restoration and enhancement of aquatic ecosystems within Massachusetts. Funding is available to certified § (501(c) (3) nonprofit organizations, and Massachusetts municipalities, including fiscal partnerships with §501(c) (3) organizations. In the latest grant round MET indicated there would be up to $400,000 available and that funding amounts generally range from $10,000 to $50,000.

Under the aquatic ecosystem restoration and enhancement side of their program, MET seeks project applications that will restore and improve aquatic ecosystems that benefit estuarine and river habitat and species coupled with enhancement of recreational fishing areas; and increased understanding of the aquatic environment and the effects of human

activities upon them. Some preference will be given to cold-water species and rivers of concern in the central and western regions of the state and underserved areas of the commonwealth.

Examples of the kinds of eligible project concepts:

- Addressing factors affecting areas that support nurseries, feeding, migration and spawning for at-risk fish;
- Advancement of the revival of urban rivers and rural rivers that go through mill towns;
- Collection, removal, and recycling of harmful marine and aquatic debris
- Construction of signage for public paths bordering a waterbody;
- River and estuary continuity and restoration efforts to restore natural biodiversity and habitat;
- Documentation and dissemination of results of monitoring and modifying marine, estuarine, and freshwater systems.

Upcoming or most recent application deadline: December 14, 2018

For more information see: https://www.mass.gov/orgs/massachusetts-environmental-trust

Contact: Kim Tilas
100 Cambridge Street, Suite 900
Boston, MA 02114
(617) 626-1037 | Kim.Tilas@mass.gov

Massachusetts School Building Authority Green Schools Program

The Massachusetts School Building Authority (MSBA) has instituted a Green Schools Program that promotes reduced energy and water consumption on all projects that they fund. All projects must register for the most recent version of the U.S. Green Building Council's LEED for Schools criteria or the Northeast Collaborative for High Performance Schools criteria and exceed Massachusetts energy base code by 10 percent. The MSBA may award a school district up to an additional 2 percent of a project's eligible costs if the project meets these criteria.

Upcoming or most recent application deadline: Statement of Interest period opened in January and for core program due in early April

For more information see: http://www.massschoolbuildings.org/programs/green_schools

and http://www.massschoolbuildings.org/sites/default/files/edit-contentfiles/Building_With_Us/SOIs/2019/2019%20SOI%20-%20Core%20Program%20Process%20-%20FINAL.pdf

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MassDEP Section 604b and Section 319 Grant Programs

Part of EPA's funding to states under the Clean Water Act, the Section 604b and Section 319 grants, administered by MassDEP, are not good sources of funding for green infrastructure work in the Day Brook watershed. The January 2019 consent decree between the United States of America and Commonwealth of Massachusetts versus the City of Holyoke appears to present a barrier for EPA monies to fund Day Brook projects. This became apparent through a conversation with the Clean Water Act - Section 319 funding grants manager at MassDEP, who conferred with EPA on a potential 319 grant submission to advance green infrastructure work at two possible sites (not owned by the City): the Fitzpatrick Rink and Holyoke Medical Center. After conferring with EPA, MassDEP's grants administrator indicated that nothing in the Day Brook watershed would be eligible for 319 grants funding as any work would be seen as part of compliance on the Consent Order.

MassWorks Infrastructure Grant Program

The MassWorks Infrastructure Program is administered by the Executive Office of Housing and Economic Development, in cooperation with the Department of Transportation, the Executive Office of Energy and Environmental Affairs, and the Executive Office for Administration & Finance. Grants provide funding to public infrastructure projects that support growth opportunities contributing to the long-term strength and sustainability of the Commonwealth.

Projects support: economic development and housing opportunities in Gateway Cities; existing centers of development such as city and town center revitalization projects; commercial development; residential development and the construction of multi-family and single-family lots, and transportation improvements to improve roadway safety in small communities (at least 10% of funding must be awarded to these projects, per statute).

There is no set minimum or maximum amount that can be requested for a MassWorks grant and no match is required though projects with other funding sources are more competitive. Funding is largely for construction and no more than 10% of the total grant requested can be used for pre-construction activities, such as surveying, permitting, and design/ engineering. Award recommendations are based on internal review by MassWorks staff and outside reviewer comments provided by MassDOT, the Executive Office of Energy and

Environmental Affairs, the Executive Office of Administration and Finance, the Regional Planning Agencies, and the Smart Growth Alliance.

Holyoke received a $4 million award in 2015 and a $1.365 million award in 2017, both for the redevelopment and renovation of the 167-unit federally assisted housing at Lyman Terrace.

Upcoming or most recent application deadline: August 10, 2018

For more information see: https://www.mass.gov/service-details/massworks-infrastructure-grants

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Municipal Vulnerability Preparedness Action Grants

Action Grants administered by the Executive Office of Energy and Environmental Affairs (EEA) through the Municipal Vulnerability Preparedness (MVP) Grant Program provide direct funding (up to $2 million) and support to designated "MVP Communities" to advance prioritized climate change adaptation actions and implementation strategies identified through community-wide vulnerability assessments. Grants are available for a range of climate change adaptation strategies to reduce risk from and build resilience to climate change impacts, including temperature changes, extreme weather, sea level rise, coastal and inland flooding, changes in precipitation, and other impacts.

Proposals may include a range of climate change adaptation actions including, but not limited to, advanced vulnerability assessments, education and outreach, including to Environmental Justice communities, changes to local policies, plans or management strategies, redesigns and retrofits, energy resilience, nature-based solutions designed to increase resiliency within the community, ecological restoration and habitat management, safe toxics use, and land conservation to achieve resiliency objectives. Projects should be proactive, and applicants should clearly demonstrate how the projects have been redesigned, re-evaluated, or reconsidered to better respond to changing climate conditions and to incorporate new climate change data.

Upcoming or most recent application deadline: April 19; another round is planned for July 2019

For more information see: https://www.mass.gov/service-details/mvp-action-grant-eligibility-criteria

Contact:
Mia Mansfield, Director of Climate Adaptation and Resilience
Executive Office of Energy and Environmental Affairs

100 Cambridge Street, Suite 900, Boston, MA 02114
617-626-1162 | mia.mansfield@mass.gov

Urban and Community Forestry Challenge Grant

Provides 50-50 matching grants to build local capacity for urban and community forestry at the local and regional level. Projects serving environmental justice neighborhoods are 75-25 grant match. Urban and Community Forestry grant funds are provided by the USDA Forest Service and administered by DCR with guidance from the Massachusetts Tree Wardens' and Foresters' Association. Funding is intended to produce sustained improvements in local capacity in six key areas:

- Develop, strengthen, or sustain citizen groups or nonprofit organizations that advocate and/or act to promote excellent urban and community forestry management.
- Establish or expand existing community efforts to address household energy insecurity with local forests by recycling decommissioned trees into firewood and distributing this resource to residents in need of heating assistance forests provide additional public benefit beyond their growing life.
- Develop, approve, and implement new ordinances, zoning regulations, or written policies that will result in improved tree and forest management and the preservation of tree canopy on a community scale.
- Produce sustained improvements in professional staffing in a municipality's urban and community forestry program
- Develop and implement systematic urban forestry management through: inventories of public trees on streets, parks, schools, and other public areas; resource assessments that may include a traditional tree inventory, canopy analysis using satellite or aerial photography, an i-Tree Eco analysis, a GIS analysis, or a survey of available planting sites in a community; management plans or master plans that guide the strategic management of urban forest resources at the community level; new communities achieving the Tree City USA designation, a Growth Award, or in achievement of a Tree Campus USA award for colleges and universities
- Complete strategic community tree plantings and "Heritage" tree care projects through strategic tree plantings or professional arborist care of "Heritage" trees (those larger trees over 32" in diameter that have a *documented* cultural and/or historical significance).

DCR may also consider some well-conceived and executed projects that result in sustained improvements to urban and community forestry management in other areas. For example, DCR has funded community-wide urban forestry education programs, partnerships and multi-community approaches for improved tree maintenance, projects that substantively involve under-represented groups in urban forestry, or projects that result in greater local funding for urban forestry.

Upcoming or most recent application deadline:

For more information see: https://www.mass.gov/guides/urban-and-community-forestry-challenge-grants

Contacts: Julie Coop, Urban and Community Forester, DCR Office of Urban and Community Forestry | 617-626-1468 | julie.coop@mass.gov

Mollie Freilicher, Community Action Forester | 413-577-2966 | mollie.freilicher@mass.gov

State Funding for Land Acquisition

Should the City of Holyoke seek to acquire lands within the Day Brook Watershed, there are several state programs that provide funding for such efforts.

Massachusetts Land and Water Conservation Fund - The Federal Land & Water Conservation Fund is administered by the Massachusetts Executive Office of Energy and Environmental Affairs on behalf of the National Park Service (NPS), an agency of the Department of the Interior. The LWCF program provides grants to states and local governments for the acquisition and development of public outdoor recreation areas and facilities. LWCF grants reimburse a community up to 50% of the total project cost, up to a grant maximum of $1 million. Eligible projects include acquisition of parkland, development of a new park, renovation of an existing park, development of trails in an existing conservation or recreation area, or the acquisition of conservation land.

LAND - Local Acquisitions for Natural Diversity - Provides grants to cities and towns to acquire land for conservation and passive recreation purposes. The grants reimburse cities and towns—at a rate that ranges from 52-70%—for the acquisition of land in fee or for a conservation restriction. Grants can support the purchase of forests, fields, wetlands, wildlife habitat, unique natural, cultural, or historic resources, and some farmland. The general public must have reasonable access to the land.

PARC - Parkland Acquisitions and Renovations for Communities (PARC) - Provides grants to municipalities for the acquisition of recreation land, development of new parks, or the renovation of existing parks. The grant reimburses cities and towns—at a rate that ranges from 52-70% —to acquire parkland, develop new parks, or renovate existing outdoor public recreation facilities (formerly the Urban Self-Help Program).

Both the LAND and PARC grant programs also support Governor Baker's Executive Order 569, which calls for state government to adapt to climate change and build a more resilient Commonwealth, by including resiliency criteria in its scoring and incorporating priority projects from EEA's Municipal Vulnerability Preparedness program. The maximum reimbursement available for each grant under the LAND and PARC program is $400,000.

For more information, see: www.mass.gov/eea/dcs-grants

The contact for all three grant programs listed above is: Melissa Cryan | (617) 626-1171 | melissa.cryan@mass.gov

C. Other Sources

Great Urban Parks Campaign

The National Recreation and Park Association launched the Great Urban Parks Campaign in 2015 with the primary purpose of improving environmental and social outcomes in underserved communities through promoting and advancing green stormwater infrastructure projects within parks. Projects must occur at a "publicly-owned site(s) in an underserved community." To date there have been two rounds of grants: in 2016 and in 2018, with deadlines typically in August. In the last round, there were 10 awards made between $150,000 and $300,000. No match is required, but it is expected that a grant will supplement secured or anticipated necessary funding to complete a proposed project. Grant administrator Jennifer Cox says that though they do not have an anticipated timeframe for another round of grants at this time, they are continually fundraising to support such a grant program. To stay abreast of grant opportunities, she recommends signing up for their newsletter at: https://www.nrpa.org/our-work/Three-Pillars/conservation/

Also see: https://www.nrpa.org/our-work/partnerships/initiatives/water-conservation/great-urban-parks-campaign-pilot-projects/

Long Island Sound Futures Fund

Administered by the National Fish and Wildlife Foundation in collaboration with U.S. EPA, Long Island Sound Study, and U.S. Fish and Wildlife Services, Long Island Sound Futures Fund monies may not be not be used to support ongoing efforts to comply with legal requirements, including permit conditions, mitigation and settlement agreements. However, grant funds may be used to support projects that enhance or improve upon existing baseline compliance efforts.

Grants can be sought for: planning and design ($20,000 to $100,000) and implementation ($20,000 to $250,000). These can be divided into a first submission one year for planning and design and a second submission in a next year for implementation.

All projects must demonstrate a quantifiable and measurable impact on improving Long Island Sound. Within the 4 categories of funding within this grant program, only one is open to Massachusetts: Nitrogen removal projects. As such, projects *must demonstrate a specific nitrogen reduction outcome.*

Relevant program priorities to Day Brook include the following (assuming there is the ability to demonstrate a specific nitrogen reduction outcome):

Clean Waters and Healthy Watersheds – improve water quality by delivering projects that reduce nutrient loading, combined sewer overflows, stormwater runoff, and nonpoint source loading into Long Island Sound.

Educating for Sustainable and Resilient Communities – increase the knowledge and engagement of the public in the protection and restoration of Long Island Sound.

Involve the public in ecological restoration.

All public engagement and education projects must provide hands-on conservation experiences, direct engagement or activities for target audiences.

Upcoming or most recent application deadline: Monday, May 20, 2019

For more information see: https://www.nfwf.org/lisff/Pages/lisff-2019-rfp.aspx

Contacts:
Jessica Lillquist – Coordinator, Long Island Sound
National Fish and Wildlife Foundation
Jessica.Lillquist@nfwf.org | 202-857-0166