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City Announces Major Expansion of Nationally Recognized Green Infrastructure Program to Further Improve the Health of Local Waterways

Data Collected from Pilot Program Demonstrates that Green Infrastructure Installations Performed Even Better Than Anticipated

Construction Underway to Build Approximately 2,000 Specially Designed Curbside Gardens in Brooklyn, the Bronx and Queens that will Beautify Neighborhoods, Help Clean the Air and Improve the Health of the Bronx River, Flushing Bay, Gowanus Canal, Jamaica Bay and Newtown Creek

Photos of Curbside Gardens Can be Viewed on DEP's Flickr Page

Department of Environmental Protection (DEP) Commissioner Emily Lloyd today joined partner agencies, elected officials, environmental advocates and community groups to announce a major expansion of New York City's nationally recognized Green Infrastructure Program. Over the coming months the City will accelerate the ongoing construction to build approximately 2,000 specially designed curbside gardens in Brooklyn, the Bronx and Queens. When construction is completed, the 2,000 curbside gardens, also called bioswales, will have the capacity to collect and absorb more than 4 million gallons of stormwater when it rains. It is estimated that the bioswales will capture more than 200 million

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gallons of stormwater each year, thereby improving the health of the Bronx River, Flushing Bay, Gowanus Canal, Jamaica Bay and Newtown Creek. There are currently 255 bioswales in the ground and there are plans to add thousands more over the next several years. To view a video of a bioswale collecting stormwater go here.

By softening the impervious urban landscape and naturally absorbing rainwater that would otherwise drain into the combined sewer system, the multi-agency effort will help to reduce combined sewer overflows into local waterways. Analysis shows that this adaptive approach to improving the health of our waterways, in addition to the ancillary sustainability benefits, can be achieved at a lower cost than a traditional strategy that does not include green infrastructure. In addition, some of these neighborhoods currently have less than average street tree counts and higher than average rates of asthma among young people. The increased tree canopy and vegetation created through the addition of the bioswales will help to improve air quality, provide shade during hot summer months, and beautify the neighborhoods.

The approximately 2,000 bioswales will be built in the following neighborhoods:

- In the Bronx: Soundview, Clason Point, and Castle Hill
- In Brooklyn: Bedford-Stuyvesant, Brownsville, Bushwick, Canarsie, Carroll Gardens, Cobble Hill, Crown Heights, Cypress Hills, East New York, Ocean Hill, Park Slope and Prospect Heights
- In Queens: Corona, Elmhurst, Forest Hills, Glendale, Kew Gardens, Jackson Heights, Maspeth, Middle Village, Rego Park and Ridgewood

“In order to improve the health of local waterways we need to better manage the precipitation that falls on city streets, roof tops, parking lots and sidewalks,” said **DEP Commissioner Emily Lloyd**. “Investing in green infrastructure is a cost-effective way to manage stormwater that also delivers multiple benefits to local communities including a greener landscape, cleaner air, and increased shade and cooler temperatures during the summer.”

“NYC Parks is pleased to partner with the NYC Department of Environmental Protection on the Green Infrastructure Program, building cost-effective stormwater capture techniques to help improve our water quality,” said **NYC Parks Commissioner Mitchell J. Silver, FAICP**. “This major expansion of adding new bioswales in our communities will reduce combined sewer overflows into local waterways while greening and beautifying our neighborhoods.”

“The Green Infrastructure Program will increase our City’s resiliency to future storm events, make our waterways healthier and cleaner, and beautify neighborhoods across New York City,” said **New York City Economic Development Corporation President Kyle Kimball**. “Neighborhoods in Brooklyn, the Bronx and Queens will reap the benefits of these critical green infrastructure investments, making the City a more livable place for all New Yorkers.”

“Bioswales provide much-needed greenery for our urban neighborhoods and capture stormwater to reduce overflows into our City’s rivers. Starting this year, DDC will be installing more than 500 bioswales to support Mayor de Blasio’s efforts to make our infrastructure more environmentally sustainable and resilient after rainstorms, with even more in the design phase. I thank the Mayor and our partners at DEP for making this forward-looking investment in the health of our neighborhoods and waterways,” said **DDC Commissioner Dr. Feniosky Peña-Mora**.

“From Canarsie to Carroll Gardens and from Bushwick to Brownsville, Brooklyn neighborhoods are getting ‘greener’ through the expansion of the Green Infrastructure Program,” said **Brooklyn Borough President Eric Adams**. “Bioswales are more than just a community beautification tool; they significantly improve our stormwater management while cleaning our environment. Some of our most important and at-risk waterways, including the Gowanus Canal,

Jamaica Bay and Newtown Creek, will benefit from this effort, which is helping us become a more sustainable and resilient borough."

"As New York City continues to contend with the challenges posed by climate change, innovation and sustainability become increasingly important," said **City Council Member Donovan Richards, Chair to the Committee on Environmental Protection**. "The initial success of DEP's green infrastructure program is a commendable step in a resilient and responsible direction. I look forward to seeing the expansion of integrated green and grey infrastructure to protect communities that are most susceptible and improving the quality of life for many New Yorkers."

"I am very glad that DEP will soon begin construction on curbside gardens in several areas across the City, including in the Gowanus watershed," said **City Council Member Brad Lander**. "This is a crucial step to address the problem of combined sewer overflows, which remain a very serious problem for the Canal. And this infrastructure is an example of the kind of creativity that will be required to help make the Gowanus neighborhood a model for sustainability in a low-lying, once-polluted industrial area, on a warming planet."

"I am excited that the green infrastructure program will be expanded to improve the health of waterways in New York City," said **City Council Member Stephen Levin**. "Waterways like the Gowanus Canal and Newtown Creek will benefit greatly from these improvements and I look forward to seeing them implemented. Thanks to Mayor de Blasio for expanding this important program."

"Today's announcement is great news for New York City's environment and for all New Yorkers," said **New York League of Conservation Voters President Marcia Bystryn**. "The expansion of the Green Infrastructure Program will help cleanup polluted rivers, creeks and bays in a cost-effective and proven way. In addition, this program will create new green spaces for community enjoyment, while also helping to make our neighborhoods more resilient to extreme weather and flooding. We applaud the Department of Environmental Protection and the de Blasio administration for this important environmental milestone."

"We are pleased see that New York City is scaling up its investments in green infrastructure, to create healthier communities and cleaner water," said **Larry Levine, Senior Attorney for the Natural Resources Defense Council**. "This is an important step towards meeting the City's larger commitments to reduce sewage overflows. We look forward to working with the City to develop a comprehensive approach to achieving fishable, swimmable water, with green approaches at the forefront."

"New York City's latest update on the success of its green infrastructure program is good news; stormwater capture and infiltration is clearly a key element of a sustainable approach to improving water quality, especially in a dense urban environment," said **Phillip Musegaas, Hudson River Program Director at Riverkeeper**. "By coupling Green Infrastructure with well-planned investments in wastewater treatment, the City will be able to realize real progress to reduce sewage pollution in a way that benefits all New Yorkers and the health of the Hudson River and New York Harbor."

"The Nature Conservancy applauds the City's commitment to expanding its bioswale program," said **Bill Ulfelder, executive director of The Nature Conservancy in New York**. "By continuing to promote the use of nature and green infrastructure across our neighborhoods to help absorb stormwater, manage flooding, and improve water quality, Mayor Bill de Blasio and Commissioner Emily Lloyd are leading the way in beautifying our communities and enhancing our environment."

"The addition of 2,000 bioswales in the Bronx, Brooklyn and Queens will help to reduce pollution in our local waterways and also improve air quality in neighborhoods that have an insufficient number of trees and high rates of asthma among young people," said **Eddie Bautista, Executive Director of the NYC Environmental Justice Alliance**. "The Green Infrastructure program is a

big win for all New Yorkers and I look forward to seeing even more bioswales in additional neighborhoods in the future."

"Over the past two years The Trust for Public Land has partnered with DEP, the Department of Education and private donors to design and construct six green infrastructure playgrounds capable of capturing 3 million gallons of storm water each year," said **Marc Matsil, NYS Director, The Trust for Public Land**. "These playgrounds also provide outdoor recreation opportunities to students in some of the most underserved neighborhoods in the city, many with high diabetes and obesity rates. Bravo Mayor de Blasio and Commissioner Lloyd."

"We are thrilled to hear that the City will be accelerating the implementation of its innovative green infrastructure plan," said **Executive Director of the Gowanus Canal Conservancy Andrea Parker**. "Creating absorptive gardens throughout our Watershed is a critical step towards curbing CSOs and achieving a cleaner Gowanus canal. We also look forward to partnering with DEP in developing our Bioswale Stewardship Certification program, which will train residents to care for this essential urban infrastructure. Together, we can make our city cleaner and greener."

"The Bronx River Alliance is pleased that NYC will be expanding implementation of green infrastructure throughout the city, including in the Bronx River watershed," said **Bronx River Alliance Executive Director Linda Cox**. "In addition to helping the City meet water quality standards for our local waterways, these features bring added benefits to our neighborhoods, such as better air quality, cooling and beautification."

"We are very excited to see this investment in green infrastructure within the Newtown Creek watershed," said **Newtown Creek Alliance Program Manager Willis Elkins**. "It will help mitigate Combined Sewer Overflow events that have a serious impact on water quality in the creek. We congratulate DEP and look forward to seeing more bioswales and other natural systems installed to capture rainwater before it enters the sewer system."

"As an organization which advocates for not just fishable and swimmable waterways but also livable communities, the S.W.I.M. Coalition overwhelmingly supports DEP's increased implementation of green infrastructure throughout the city," said **Coordinator of the S.W.I.M. Coalition Jaime Stein**. "More green spaces will not just lead to healthier waterways but the many co benefits of citywide greening can promote healthier communities through beautification, increased biodiversity, climate change adaptation and job creation."

"Green Infrastructure is an important and cost effective means of achieving our goals for cleaner and safer water," said **Robert Pirani, Director of the New York - New Jersey Harbor & Estuary Program at the Hudson River Foundation**. "This new commitment affirms New York City's leadership in using this innovative technology to both manage stormwater and green our neighborhoods."

"We are pleased that New York City is continuing to pursue green infrastructure projects to improve water quality and reduce impacts from combined sewer discharges," said **Debbie Mans, Executive Director & Baykeeper, NY/NJ Baykeeper**. "More importantly, green infrastructure is just one part of developing a comprehensive long-term approach to ensuring clean water for everyone."

"The 2000 new bioswales are a smart and important green infrastructure step towards capturing stormwater, diminishing CSO output and bringing us closer to compliance with the Clean Water Act - making our city of water more swimmable and fishable," said **Director of the Metropolitan Waterfront Alliance Roland Lewis**.

"We applaud DEP for initiating and greatly expanding the Green Infrastructure Program," said **Don Riepe, Director of the Northeast Chapter of the American Littoral Society**. "These plantings will not only help reduce stormwater problems but enhance neighborhood aesthetics as well."

"At the New York Harbor School, the Harbor is our classroom and our students are working every day to make it a cleaner and more bountiful platform for teaching and learning," said **Murray Fisher, President, New York Harbor Foundation, Co-Founder, New York Harbor School**. "The City's addition of 2,000 bioswales is an important step towards reducing pollution in the Harbor and increasing the number of days that we can work on, improve and learn from our local waterways."

Bioswales are built in city sidewalks and do not result in the loss of any parking spaces. They resemble standard street tree pits, except that they vary in size, have curb cuts that allow stormwater to enter and overflow, and have been designed in a way that will allow them to manage between 1,300 and 3,000 gallons each during a storm. DEP has worked with the Departments of Transportation, Parks and Recreation, and Design and Construction to develop standard designs, specifications and procedures for building green infrastructure in New York City. During construction, the bioswales are excavated to a depth of five feet and are then backfilled with layers of stone and engineered soil. These layers contain void spaces that store the stormwater and promote infiltration. The addition of hardy plants further encourages infiltration through root growth and increases the capacity of the bioswale through evapotranspiration. The bioswales are designed so that all the stormwater is absorbed in less than 48 hours. DEP provides funding to the Department of Parks and Recreation who assigns maintenance crews dedicated to the upkeep of the bioswales, including trash removal, pruning the trees and caring for the plants. Maintenance crews are active seven days a week and visit each bioswale approximately once a week. Additional crews will continue to be added as the program expands. DEP is funding the $46 million project and the contracts are being managed by DEP, the Economic Development Corporation, and the Departments of Design and Construction and Parks and Recreation. In addition to the bioswales, approximately 30 stormwater greenstreets will be built in underutilized roadway areas.

DEP primarily builds bioswales in neighborhoods that are serviced by combined sewers. Within these neighborhoods, locations for the bioswales are initially chosen by DEP engineers who, armed with maps of the local water and sewer systems, walk the streets and identify sidewalk locations that are upstream of a catch basin and have the room necessary to accommodate a bioswale. This initial group of potential locations is then reviewed by the Department of Transportation to ensure that they meet all necessary pedestrian and vehicle clearance requirements and the Department of Parks and Recreation who provides guidance on trees and planting plans. Soil samples will then be taken from the approved locations to ensure they can absorb the necessary amount of stormwater. The extensive survey and testing ensures that each site functions as designed. The locations that meet all these requirements will then be approved for construction.

Over the last three years DEP has conducted extensive outreach on the program, including meeting with City Council Members, Community Boards, and neighborhood and environmental organizations to inform communities about the purpose of green infrastructure and the benefits it will bring to their neighborhoods as well as plans for future construction. During the design and site selection process, brochures with Frequently Asked Questions are distributed to the properties abutting the locations of future bioswales and, as construction commences, contact information for Community Construction Liaisons and DEP public affairs staff are made available.

In addition to building green infrastructure on streets and sidewalks, DEP is also partnering with the Department of Parks and Recreation, the Department of Education, the School Construction Authority, the New York City Housing Authority and the Trust for Public Land to identify and build green infrastructure, such as rain gardens and permeable pavements, on other City-owned property. DEP also administers a Grant Program for private property owners. During the first three years of the grant program DEP has committed over $11 million to

fund 29 different projects, which was matched by $5.6 million in private funds. In total, the grant projects completed thus far will prevent an estimated 13 million gallons of stormwater from entering the combined sewer system each year. For more information on the program or to apply for a grant visit the DEP website. Stormwater management regulations have also been put in place for new development and redevelopments. Over the next two decades, the City is planning for $1.5 billion in public funding, and another $900 million in funding connected to new development or redevelopment, for targeted green infrastructure installations, as well as approximately $2.9 billion in cost-effective traditional grey infrastructure upgrades, to significantly reduce sewer overflows and further improve the health of local waterways. For more information on the Green Infrastructure Program, view the 2013 Annual Report.

New York City, like other older urban communities, is largely serviced by a combined sewer system where stormwater that falls on roofs, streets, and sidewalks, and wastewater from homes and businesses are carried through a single sewer line to treatment plants. The city's 14 treatment plants can manage and treat to federal Clean Water Act standards all the wastewater created in New York City on a dry weather day, or about 1.3 billion gallons on average. On a rainy day they have the capacity to clean more than twice the dry weather flows. However, during intense precipitation events, the stormwater that falls on the city's impervious surfaces exceeds that capacity and overflows can be discharged into local waterways. If the overflows were not discharged, the City's treatment plants would be flooded and severely damaged and wastewater could backup into homes and businesses.

Over the last decade the City has invested more than $10 billion in upgrades to wastewater treatment plants and related efforts to reduce combined sewer overflows and testing confirms that the water in New York Harbor is cleaner today than it has been in more than a century. However, overflows remain the city's primary harbor water quality challenge. As traditional "grey" infrastructure upgrades became increasingly expensive, the NYC Green Infrastructure Plan was launched. An alternative approach to improving harbor water quality, it combines traditional infrastructure upgrades and the integration of green infrastructure to capture and retain stormwater runoff before it can ever enter the sewer system and contribute to overflows. The Plan has the ambitious goal of capturing the first inch of rain that falls on 10 percent of the city's impervious surfaces in combined sewer areas. New York City and New York State have entered into a Modified Consent Order which formalized the City's inclusion of green infrastructure as an important component of its plan to reduce combined sewer overflows into local waterways and improve the ecological health and cleanliness of New York City harbor water.

DEP manages New York City's water supply, providing more than one billion gallons of water each day to more than nine million residents, including eight million in New York City. The water is delivered from a watershed that extends more than 125 miles from the city, comprising 19 reservoirs and three controlled lakes. Approximately 7,000 miles of water mains, tunnels and aqueducts bring water to homes and businesses throughout the five boroughs, and 7,500 miles of sewer lines and 96 pump stations take wastewater to 14 in-city treatment plants. DEP has nearly 6,000 employees, including almost 1,000 in the upstate watershed. In addition, DEP has a robust capital program, with nearly $14 billion in investments planned over the next 10 years that will create up to 3,000 construction-related jobs per year. This capital program is responsible for critical projects like City Water Tunnel No. 3; the Staten Island Bluebelt program, an ecologically sound and cost-effective stormwater management system; the city's Watershed Protection Program, which protects sensitive lands upstate near the city's reservoirs in order to maintain their high water quality; and the installation of more than 820,000 Automated Meter Reading devices, which allow customers to track their daily water use, more easily manage their accounts, and be alerted to potential leaks on their properties. For more information, visit nyc.gov/dep, like us on Facebook at facebook.com/nycwater, or follow us on Twitter at twitter.com/nycwater.