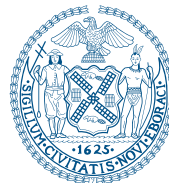




SUSTAINABLE STORMWATER MANAGEMENT PLAN

PROGRESS REPORT
OCTOBER 2010

A GREENER, GREATER NEW YORK



The City of New York
Mayor Michael R. Bloomberg

The Sustainable Stormwater Management Plan Progress Report
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Introduction

In December 2008, the City of New York released a Sustainable Stormwater Management Plan as part of PlaNYC, the City's comprehensive long-term plan to create a greener, greater New York. PlaNYC contains ten goals and over 100 initiatives that seek to enhance the quality of life, protect the environment and public health, invest in the city's infrastructure, and create additional economic opportunities all while accommodating one million more New Yorkers. The plan's water quality goal is to improve public access to our tributaries from 48 percent today to 90 percent by 2030.

The Sustainable Stormwater Management Plan put the City of New York on the path to an extensive implementation of green infrastructure to capture stormwater. This strategy, which was expanded upon by the recently released NYC Green Infrastructure Plan, will lead to lower volumes of combined sewer overflows (CSOs) and other untreated discharges. These reductions will provide benefits that include the improved ecological well-being of waterbodies, enhanced water quality, increased opportunities for recreational uses, and improved public health.

The Sustainable Stormwater Management Plan builds on nearly 40 years of progress towards improving the ecological health of New York Harbor. Since 2002, over \$7 billion has been dedicated to water quality improvements in New York City. These investments have resulted in reductions of pollution, bacteria, and water-borne litter and debris due to enhanced sewage handling and treatment. The City has improved the capture rate of CSOs from approximately 30 percent in the 1980s and 67 percent in 1994 to over 72 percent today. Progress is even greater when the decrease in CSO potency is taken into account. As a result, New York Harbor is cleaner than it has been in over 100 years.

Water quality in New York Harbor has improved to the point where significant portions of the city's surrounding waters are available for recreation. Over 130 out of the 156 square miles on the New York side of the Harbor are available for boating. This is in addition to the 14 miles of swimmable waters adjacent to public beaches in the Bronx, Brooklyn, Queens, and Staten Island.

Moving Forward

Although the city has realized significant water quality improvements, difficulties still remain. CSOs from cities

surrounding New York Harbor are the largest sources of pathogens on an annual basis. Within New York City, CSOs are one of the major reasons that some of our tributaries do not meet standards for recreational use. In New York City, approximately 422 sewer regulators can discharge CSOs during wet weather directly into the receiving waters of the New York Harbor. These discharges result in localized water quality problems such as periodically high levels of coliform bacteria, nuisance levels of floatables, depressed dissolved oxygen, sediment mounds, and unpleasant odors.

To address these challenges the City is investing in both grey and green infrastructure. Grey infrastructure is known as an "end-of-pipe" solution composed of water treatment and storage capacity. Green infrastructure comprises a series of source controls in order to capture runoff closer to where it falls, allowing water to evaporate or permeate into the earth rather than overburdening the sewer system. The Sustainable Stormwater Management Plan identified opportunities to use vegetation and permeable surfaces to keep water out of the City's sewer system and established collaborative relationships between City agencies to facilitate the planning, design, and installation of green infrastructure. The plan concluded that controlling stormwater through source controls offers significant cost savings versus building certain future grey infrastructure. The use of green infrastructure to capture stormwater results in positive externalities that include improving air quality, providing cooling, reducing vulnerability to climate change impacts, creating open space, and increasing property values.

Building on this work, the NYC Department of Environmental Protection recently released the NYC Green Infrastructure Plan. The new plan will supplement the existing approach for sewer overflow control. Traditional investments like holding tanks, new interceptors, and in-line storage will be complemented with a mix of green infrastructure and cost-effective grey infrastructure. This hybrid strategy will reduce sewer overflows into waterways by 40 percent by 2030. The NYC Green Infrastructure Plan will lead to the investment of \$2.9 billion in cost-effective grey infrastructure and \$2.4 billion in green infrastructure. This investment will lead to the capture of the first inch of rainfall on 10 percent of impervious surfaces in combined sewer areas. This reduction in water entering the system will reduce the City's long-term sewer management costs by \$2.4 billion over 20 years, helping to hold down future water bills.

Key Progress

The Sustainable Stormwater Management Plan provides a detailed framework and implementation plan to meet the twin objectives of better water quality in New York Harbor and a livable and sustainable New York City. The Plan consists of ten initiatives that are designed to achieve three strategies: implement the most cost-effective and feasible stormwater source controls, resolve the feasibility of promising stormwater technologies, and explore funding options for source controls.

The City has taken several important steps to implement the Sustainable Stormwater Management Plan. The City has increased the amount of permeable surfaces by installing Greenstreets. It has expanded the Bluebelt system and continues to implement the MillionTreesNYC initiative. On the logistical side, the City has created pilot projects to better understand the installation costs, maintenance requirements, and overall performance of promising technologies. Alongside these projects is an effort to study the feasibility of implementing source controls on a grand scale.

Since the release of the Sustainable Stormwater Management Plan in December 2008, the City has taken the following key actions to increase the use of green infrastructure to manage stormwater:

- Released the NYC Green Infrastructure Plan, an ambitious strategy to better manage stormwater from 10% of impervious surfaces by 2030. This investment in a mix of green infrastructure, cost-effective grey infrastructure, system-wide optimization, and conservation will reduce CSOs by more than 12 billion gallons per year
- Launched over 30 demonstration projects to test the performance and costs of green infrastructure over time in order to determine how to best encourage widespread adoption
- Created proposed performance standard for new development and expansions of existing development to require a stricter stormwater runoff release rate into the sewer system
- Planted over 379,000 trees, including 63,600 street trees under MillionTreesNYC
- Secured \$2 million in Federal stimulus funding through the American Recovery and Reinvestment Act (ARRA) to install at least 26 Greenstreets that are specially designed to capture stormwater. A total of 146 new Greenstreets have been built since the 2008 fall planting season
- Adopted the Green Roof Tax Abatement, providing New Yorkers with the opportunity to receive tax incentives for installing eligible green roofs
- Expanded the Bluebelt system on Staten Island by acquiring over 65 acres since 2007
- Released the Street Design Manual and the Sustainable Urban Site Design Manual to provide guidance for how to design right of way infrastructure and facilities more effectively
- Began replacement of notification signs adjacent to all 422 CSO outfalls and created an online water body advisory page that allows the public to see where CSOs are likely - based on recent rainfall activity
- Completed a water rate study in December 2009 that evaluated expenditures, revenue sources, and alternative water, wastewater, and stormwater rate structures
- Approved a sewer charge for stormwater at parking lots which have not previously paid any sewer charges in order to assess these properties for the runoff generated by their impervious surface area
- Undertook a \$15 million planning study to support the monitoring of pilot projects and the modeling of CSO reductions through green infrastructure investments
- Initiated the creation of guidelines for the design and construction of approvable stormwater management systems to assist in the development of several different onsite stormwater controls for new development and expansions of existing development
- Completed impervious surface mapping using detailed satellite infrared imaging for the entire city

NYC Green Infrastructure Plan

The Sustainable Stormwater Management Plan called for additional planning and analysis to resolve the feasibility of promising source control strategies. This effort has culminated in the creation of the NYC Green Infrastructure Plan, which calls for the widespread adoption of green infrastructure to improve water quality. The City is prepared to spend \$1.5 billion over 20 years and \$187 million in capital and additional operating funds over the next four years towards the implementation of the NYC Green Infrastructure Plan. This will ensure that the City will immediately obtain the benefits of green infrastructure that will continue to accrue over time. The City will also leverage additional resources that can be freed up by deferring the design and construction of inefficient grey infrastructure investments.

These commitments depend upon regulatory approval by the New York State Department of Environmental Conservation (DEC) and the City receiving credit from regulators to count their investments in the NYC Green Infrastructure Plan as meeting current and future regulatory commitments. The City currently operates under a CSO Consent Order with DEC that includes specific plans for 13 individual combined sewer drainage areas throughout the city. Upon its release, the NYC Green Infrastructure Plan was submitted to DEC in order to request approval for green infrastructure investments as part of the City's CSO reduction strategy.

Once approved, the NYC Green Infrastructure Plan will invest a total of \$5.3 billion in a mix of green infrastructure, cost-effective grey infrastructure, system-wide optimization, and conservation. This multi-pronged strategy will result in a net reduction in combined sewer overflows of roughly 12 billion gallons per year, or 2 billion gallons more than under the present Consent Order. In addition to City commitments, over the next 20 years, approximately \$900 million in infrastructure will be funded by private investment through new regulations and standards that will require onsite stormwater detention and infiltration to be incorporated into design new development and expansions of existing development.

The NYC Green Infrastructure Plan presents an alternative approach to improving water quality that integrates green infrastructure such as swales and green roofs in order to optimize the existing system. A second aspect of the plan is to build targeted, smaller-scale grey or traditional infrastructure. This is a multi-pronged, modular, and adaptive approach to a complicated problem that will provide widespread and immediate benefits at a lower cost. The green infrastructure component of this strategy builds upon and reinforces the strong public and government support that will be needed to make additional water quality investments.

The NYC Green Infrastructure Plan builds on the Sustainable Stormwater Management Plan and proposes to continue coordination among City agencies to build green infrastructure projects. This effort will be led by the Mayor's Office and DEP, and will include collaboration with many City agencies. Such agencies include: the Department of Transportation (DOT), the Department of Parks and Recreation (DPR), the Department of Design and Construction (DDC), the Department of City Planning (DCP), the Department of Education (DOE), the Department of Sanitation (DSNY), the Department of Citywide Administrative Services (DCAS), the Department of Housing and Preservation and Development (HPD), the New York City Economic Development Corporation (EDC), and the New York City Housing Authority (NYCHA).

Progress Towards Goal

The Sustainable Stormwater Management Plan established a goal that within two years the City would enact policies to create a network of source controls to detain or capture over one billion additional gallons of stormwater annually when fully implemented. This goal was intended to be met by the implementation of a new stormwater performance standard for new development. While the performance standard has not yet been implemented, the City has drafted the proposed rule change and began outreach to key stakeholders in the real estate and engineering industries.

The City has analyzed the impacts of setting a stricter standard for onsite stormwater detention and infiltration. The performance standard would encourage use of several types of stormwater management technologies to provide developers, engineers, and architects with flexible and cost-effective alternatives. Proposed stricter release rates could be met by installing rooftop or subsurface systems. Detention systems would continue to be a key strategy for on-site stormwater management due to New York City's spatial and subsurface conditions and the continuing need to ensure the protection of the sewer system. However, design guidelines would be provided to the development community to encourage open-bottom detention systems that would allow for infiltration where feasible. Approvable systems would include blue roofs, green roofs, detention tanks, gravel beds, storm chambers, and perforated pipes. DEP and DOB are currently developing design guidelines and criteria for each of the approvable systems to assist the development community in selecting the appropriate system for achieving the new performance standard.

The City is prepared to expand its outreach efforts to environmental groups and impacted stakeholders. Outreach began in fall 2010 and will continue until the initiation of the City Administrative Procedure Act (CAPA) promulgation process in winter 2010/2011. Upon adoption, the performance standard would be incorporated into the Rules of the City of New York (RCNY).

The creation of a stormwater performance standard is one component of the NYC Green Infrastructure Plan's commitment to implement green infrastructure over twenty years. The City is committed to spend \$1.5 billion and will leverage \$900 million of private funding from new development. The City projects that these investments will result in an annual reduction of CSOs by over 1.5 billion gallons. This decrease in CSOs is in addition to the reduction of over 8.2 billion gallons of CSOs due to cost-effective grey infrastructure, over 1.7 billion gallons of CSOs due to reduced flow through water conservation, and over 500 million gallons of CSOs for the optimization of the existing system. In total, the NYC Green Infrastructure Plan provides a framework for reducing CSOs by more than 12 billion gallons per year over 20 years. This new plan supersedes the initial goals of the Sustainable Stormwater Management Plan.

Next Steps

While great progress towards using green infrastructure to sustainably manage stormwater has been made, much work still remains. The first step will be engaging with DEC in order to receive approval for the implementation of the NYC Green Infrastructure Plan. In addition, the City will seek and consider feedback on the proposed stormwater performance standard from the environmental, business, and real estate communities.

To help implement the NYC Green Infrastructure Plan, the City will create an interagency Green Infrastructure Task Force which will incorporate stormwater controls into planned roadway reconstructions and other public infrastructure projects. The Green Infrastructure Task Force will be led by the Mayor's Office and DEP and will be composed of City agencies with experience in planning, designing, and building sustainable stormwater management techniques. The Task Force will develop approved specifications for green infrastructure to streamline the design and permitting processes. The Task Force will also be charged with proposing an annual spending plan for DEP's consideration and would prioritize the selection, development, and implementation of green infrastructure plans for specific watersheds. These plans will provide a strategic road map for achieving widespread green infrastructure penetration in high priority areas based on the modeled benefits and costs of the NYC Green Infrastructure Plan.

The City will incorporate the initiatives of the Sustainable Stormwater Management Plan and the NYC Green Infrastructure Plan into the update of PlaNYC, which will be released on April 22, 2011. Over the next six months, the Mayor's Office of Long Term Planning and Sustainability (OLTSPS) will engage with the general public, City agencies, and stakeholders to collect feedback and seek new ideas about how to improve water quality and create a greener, greater New York.

Progress on Milestones

INITIATIVE	MILESTONES FOR COMPLETION BY OCTOBER 1, 2010	PROGRESS	STATUS
IMPLEMENT THE MOST COST-EFFECTIVE AND FEASIBLE CONTROLS			
1 Capture the benefits of ongoing PlaNYC initiatives			
Street trees	Plant a total of 55,262 street trees	Under MillionTreesNYC, over 379,000 trees have been planted, including 63,600 street trees.	Achieved
Greenstreets	Install 200 new Greenstreets from the beginning of the fall planting season of 2008 until the end of the fall planting season of 2010	At present, the City is preparing 31 Greenstreet locations for fall 2010 installation, which will bring the total number of Greenstreets since the start of fall 2008 to 177. Due to budget cuts, fewer Greenstreets were installed than originally anticipated in PlaNYC. However, a larger proportion of the Greenstreets are designed to capture stormwater.	Not Achieved
Green roof tax abatement	Adopt regulations, release application, and apply abatements as necessary	Governor Paterson signed NYC's Green Roof Tax Abatement legislation into law in August 2008. The Green Roof Tax Abatement rules and application were released in March 2009, and the City continues to offer tax abatements for eligible green roofs.	Achieved
NYC Plaza Program	Select and design first round of plaza projects and process applications for the second round of plazas	For the first round of the NYC Plaza Program, DOT selected nine proposals from not-for-profit organizations in Manhattan, Brooklyn, and the Bronx. Design for the first round plazas began in 2009 with construction slated for 2011. In the second round of the program, DOT selected one site each in Brooklyn, the Bronx, and Queens. Many of the permanent plazas have been designed to include landscaped areas that will capture stormwater.	Achieved
Bluebelts	Baisley Park Pond project slated for construction pending funding	Design is underway for Bluebelts in Springfield Gardens and Baisley Pond in Queens.	Achieved
Asphalt to Turf	Complete construction for all ballfields	The City completed designs for 26 fields. Ten fields have been completed and opened to the public; 5 fields are under construction; and an additional 5 fields are expected to start construction by the end of 2010. Construction has been phased because of the City's April 2009 capital budget cut.	Not Achieved
Schoolyards to Playgrounds	Begin construction for 35 sites and complete community outreach and planning for remaining 129 sites	The City has opened 130 schoolyards as playgrounds to date, completing the PlaNYC commitment to open all Category 1 sites. In partnership with the Trust for Public Land, the City completed renovations on 84 additional schoolyard sites that are now open to the public after school and on the weekends, with an additional 15 playgrounds to complete construction by the end of 2010. The City has completed the design and community outreach phase for all 187 schoolyard sites requiring capital improvements.	Achieved
Wetlands	Complete wetlands mapping	The City released <i>New York City Wetlands: Regulatory Gaps and Other Threats</i> in January 2009 to recommend policy options for wetland protection. One of the primary findings of this report was that up-to-date mapping was needed before determining the most appropriate wetlands protection strategies. The City received a grant from the New York State Department of State to obtain satellite images for wetland mapping. The preliminary survey of likely wetland areas based on satellite imagery and aerial photography was completed in September 2010.	Achieved
2 Continue implementation of ongoing source control efforts			
Waterfront Zoning Public Access Standards	Approve new zoning standards	On April 22, 2009, the City Council adopted the Waterfront Text Amendment. The amendment will ensure the development of inviting and high quality publicly accessible spaces on waterfront properties. The changes generally apply to new residential and commercial developments in medium and high density zoning districts, and to commercial and community facility developments in lower density residential and manufacturing districts along the waterfront. Among other changes, the amendment improves green space and potentially increases permeability into new waterfront development.	Achieved
Water Conservation Program	Launch program pending funding	As of September 2010, the City has installed over 477,000 Automated Meter Reading (AMR) units, putting the City ahead of schedule to connect all of its 834,000 customers by January 2012. AMR and awareness campaigns are expected to result in continued reductions per capita, offsetting expected population growth. Should consumption increase in the future, DEP is prepared to consider additional conservation programs.	Achieved
3 Establish new design guidelines for public projects			
Street Design Manual	Release manual	Released in May of 2009, the Street Design Manual provides policies and design guidelines to City agencies, design professionals, private developers, and community groups for the improvement of streets and sidewalks throughout the five boroughs.	Achieved

INITIATIVE	MILESTONES FOR COMPLETION BY OCTOBER 1, 2010	PROGRESS	STATUS
Park Design for the 21st Century Manual	Release guidelines	DPR is partnering with the Design Trust for Public Space to develop guidelines for sustainable park construction. Park Design for the 21st Century: High Performance Landscape Guidelines will serve as our guide for conceiving and building green spaces. The manual will offer instructions on assessing sites holistically, integrating green construction and maintenance into park design, and facilitating the interconnectivity of soil, water, and vegetation to increase the resilience, vigor, and maintainability of parks. DPR anticipates that the guidelines will be released in November 2010.	Not Achieved
Sustainable Sites Manual	Release manual	Released in July 2009, the Sustainable Urban Site Design Manual offers an introduction to more environmentally, economically, and socially responsible urban site design practices for New York City capital projects.	Achieved
Water Conservation Manual	Release manual	The DDC Water Conservation Manual will describe and evaluate best practices for potable water use reduction and a hierarchy for implementing the methods weighted on costs, code compliance, and environmental reward. DDC anticipates that the manual will be released by the end of 2010.	Not Achieved
4 Change sewer codes to adopt performance standards for new development			
Stormwater Performance Standard	Implement new code requirements	DEP has developed a proposed performance standard for new development and expansions of existing development that would require a stricter stormwater runoff release rate into the sewer system. Stakeholder outreach to obtain input on proposed rule language began in fall and the rulemaking process is expected to be initiated in winter 2010/11.	Not Achieved
5 Improve public notification of CSOs			
New notification signage	Install new signs	The installation of CSO notification signs began in August 2010. To date, DEP has installed approximately 200 signs. Installation of all signs is expected to be complete by December 2010.	Not Achieved
Online notification system	Create notification on DEP website and make alerts available through the City's notification system	Starting in 2009, the DEP website has featured a water body advisory page that allows the public to see where CSOs are likely based on recent rainfall activity. DOHMH also has a monitoring and advisory system to protect bathers from pathogen infection, and this system is integrated with the City's 311 system and an email notification system to provide information to the public	Achieved
RESOLVE THE FEASIBILITY OF PROMISING TECHNOLOGIES			
6 Complete ongoing demonstration projects			
Green Roof/Blue Roof Pilot Study	Install pilot and collect data	DEP is undertaking a blue and green roof comparison pilot study in the Jamaica Bay watershed to allow for a direct comparison of design, installation, performance, maintenance, and cost between these two stormwater management technologies. In partnership with DOE and SCA, DEP selected PS 118 Lorraine Hansberry School in Queens as the site for the rooftop pilot. In addition to the blue and green roof installations, a section of the roof will remain unmodified to serve as the control in the study. Construction was completed in August 2010. Monitoring equipment is currently being installed to commence a 3-year monitoring period.	Achieved
Blue Roofs on Existing Buildings Pilot Study	Install pilot and collect data	The purpose of this study is to develop and test different blue roof technologies to address existing roof conditions such as slope, size and number of drainage areas to each drain, and detain maximum stormwater volumes that would otherwise run off into the combined sewer system. Construction is scheduled to begin in October 2010. Monitoring will commence after construction completion and last for a duration of two years.	Not Achieved
Rain Barrel Give-Away Pilot Study	Implement pilot and collect data	The Rain Barrel Give-Away pilot program involved the distribution of approximately 1,000 rain barrels to homeowners in the Jamaica Bay watershed and other residential areas of Brooklyn, Queens, and the Bronx. Evaluation surveys were collected over a two-year period to evaluate homeowners' interest and ability to install, operate, and maintain rain barrels. Survey results were overwhelmingly positive.	Achieved
Parking Lot Pilot Study	Install pilot and collect data	This pilot project by DEP will install and monitor different stormwater controls and technologies on two DOT municipal parking lots. The treatment technologies include the use of vegetated swales with enhanced subsurface stormwater storage, soil infiltration, and various porous pavement materials at a park and ride facility in Far Rockaway, Queens and in Canarsie, Brooklyn. Design for the first facility is complete with construction scheduled for winter 2010. Design for the second facility is nearly complete with construction anticipated for spring 2011.	Not Achieved
NYCHA or HPD Pilot Study	Install pilot and collect data	DEP and NYCHA are designing and constructing five types of stormwater source controls, including a blue roof system, a porous pavement retrofit, a bioretention pilot, and two subsurface stormwater retrofits under parking lots. Each pilot at Bronx River Houses will be monitored for a two-year period after construction is completed. Design was completed in September 2010, with construction anticipated to start in October 2010.	Not Achieved
Porous Pavement Pilot Study	Install pilot and collect data	To investigate the benefits of permeable pavement source controls and potential maintenance issues, DEP has installed permeable pavement at their Paerdegat Basin CSO Detention Facility and English Kills Aeration Facility. DEP will monitor the sites over a two-year period to evaluate maintenance requirements.	Achieved

INITIATIVE	MILESTONES FOR COMPLETION BY OCTOBER 1, 2010	PROGRESS	STATUS
Green Roofs on the Five Borough Buildings	Install pilot, collect data, and complete monitoring and reporting	DPR has constructed and monitored multiple green roof systems on their headquarters building of the Five Borough Technical Services Division on Randall's Island. Their strategy has been to build a variety of green roofs, featuring various growing mediums, plant types, planting depths, and installation designs, as a type of experimental station to determine the best practices in green roof technology. The green roof currently totals 26,000 square feet and is home to 21 uniquely-designed landscapes.	Achieved
Domestic Sewage Treatment Plant Pilot Study	Install pilot and collect data	This pilot will analyze the benefits and opportunities to the city's wastewater infrastructure of the decentralization of sanitary wastewater treatment. A unit will be installed at a DEP facility with conveyance of the treated effluent back into an existing sanitary sewer system, and the quality of the influent and effect will be monitored. Pilot site has not yet been selected.	Not Achieved
Flushing Bay and Gowanus BMP Grant Programs	Initiate contract	DEP awarded \$2.6 million in July 2010 to implement five innovative green infrastructure projects that manage and capture stormwater runoff. Grant recipients included the applications most likely to succeed and be replicated on a large scale. The awards went to Manhattan College for the installation of a modular green roof project on New York Hospital; Columbia University; a Greenstreets stormwater capture system in Rego Park; Regional Plan Association for Sponge Park™ bioretention basins under the Long Island Expressway near the Van Wyck Expressway; Gowanus Canal Conservancy for the 6th Street Green Corridor Project that will build seven curbside swales; and Unisphere, Inc. for wetlands and rain gardens to treat stormwater entering Meadow Lake. Each awardee will have one year to fully build the project and will then be required to monitor the project for three years after construction completion and track relevant data in order to evaluate its success. The contracts are currently in the process of being awarded and design will be initiated shortly.	Achieved
DEP Tree Pit Pilot Study	Install pilot and collect data	In spring and summer 2010, DEP constructed five 20' x 5' enhanced tree pits to capture, treat, and monitor stormwater runoff from public right of way. Runoff from the street is diverted by curb cuts and routed into innovative green infrastructure sites that have specially engineered soils and native plant species to absorb water and filter associated pollutants. The enhanced tree pits will also test different subsurface storage systems including stormwater chambers, 2" crushed stone and 3/8" recycled crushed glass. In the event of heavy rainfall, the tree pits also have curb-cut outlets to relieve additional flow volumes. DEP will monitor the sites over a three-year period to evaluate effectiveness over time.	Achieved
DPR Tree Pit Pilot Study	Install plantings in tree pits and collect and publish data	Approximately 50 experimental pits will be designed and constructed in the Bronx with either a storm chamber or a recycled glass drywell to store excess water. DPR anticipates construction to take place in fall 2010.	Not Achieved
Enhanced Greenstreets Pilot Project	Install pilot, collect data, and publish findings	DPR is working with the New York City Soil and Water Conservation District, Drexel University, and Atlas Scientific on this pilot. Drexel University designed a four-experiment methodology that will ultimately inform the development of standard protocols for monitoring Greenstreets. Grants from NYS DOS and NYS DEC supporting the study were executed in December 2009, allowing DPR to purchase the full equipment needed and allowing Drexel University to take on research assistants for field work in 2010.	Not Achieved
Bronx Block Saturation Pilot Study	Install pilot and collect data	DEP is studying the aggregate effects of vegetated source controls at 172nd Street in the Bronx. Through this pilot, two blocks will be saturated with vegetated source controls, including the expansion of existing tree pits. This pilot is currently going through design and contracting, with construction anticipated in 2011.	Not Achieved
Albert Road Area Reconstruction Pilot Project	Complete final design and begin construction	In its ongoing design for the Albert Road Area project in Queens, DDC is considering several source control opportunities. The design now calls for a cul-de-sac at the Albert Road and 149th Avenue intersection which will create possibilities for vegetated areas that stormwater could be directed to, and there is at least one other location along Hawtree Street near the Long Island Railroad where this same strategy might be implemented. There is also a possibility, depending on soil borings, of creating porous integral curbs and gutters. This project is in the design phase with the contract anticipated to go to bid by summer 2011.	Not Achieved
East Houston Street Reconstruction Pilot Project	Complete final design and begin construction	The reconstruction of East Houston Street focuses on the creation of two large pedestrian areas at East 1st and East 2nd Streets. The remaining blocks from the Bowery to the FDR will maximize street tree plantings and include elongated tree pits covered with permeable pavers. In addition, a strip of permeable pavers will be used to filter stormwater before it enters proposed biofiltration areas to be located at the intersections of Houston Street and Avenues A and D, where there is roadbed at present. The construction contract for this project has been awarded, and construction is anticipated to begin in fall 2010.	Not Achieved
Astor Place/Cooper Square Reconstruction Pilot Project	Complete final design and begin construction	The conceptual plan for Astor Place/Cooper Square calls for wider sidewalks and the expansion of Cooper Park in an effort to create additional green space. Where space and subsurface utilities permit, DDC intends to use pocket-sized infiltration swales constructed of native, salt-tolerant plants to capture and infiltrate stormwater from surrounding areas. This project is in the final design phase with construction anticipated to begin in summer 2011.	Not Achieved

INITIATIVE	MILESTONES FOR COMPLETION BY OCTOBER 1, 2010	PROGRESS	STATUS
Atlantic Avenue Reconstruction Pilot Project	No October 1, 2010 milestone set	The reconstruction of Atlantic Avenue includes the widening of Atlantic Avenue's raised median for a stretch of about one mile. The median will be planted with a variety of native trees in structural soil and spaced to maximize shading. With the use of structural soil, DDC hopes to produce larger, healthier trees. The crowning of the roadbed prohibits stormwater from being directed to the center median, but the center median's runoff will be directed towards the porous pavement surrounding the median's trees. Because the Long Island Railroad runs directly below Atlantic Avenue, DDC is limited in the amount of stormwater that can be infiltrated on-site. The second phase of this project will continue into Queens. This project is currently delayed due to budget constraints.	NA
Constructed Wetlands Pilot Study	Install pilot and collect data	DEP is working with the MTA to pilot a constructed wetland meadow at a bus depot facility parking lot in the Jamaica Bay watershed. The constructed wetland is expected to treat and absorb stormwater runoff from impervious surfaces within the parking lot. Monitoring will be performed over a three-year period to evaluate the effectiveness over time. Construction is anticipated to begin in October 2010.	Not Achieved
Belt Parkway Bridges Roadside Swale	Complete design and construction scheduled to begin	DEP and DOT, in consultation with DPR, have developed designs for stormwater source controls adjacent to the reconstruction of the Fresh Creek, Paerdegat, and Rockaway Bridges along the Belt Parkway. This project will be installed after the completion of bridge construction, which has been delayed due to budget cuts.	Not Achieved
Streetside Infiltration Swales Pilot Project	Install pilot and collect data	In spring and summer 2010, DEP constructed five 40' x 5' streetside infiltration swales to capture, treat and monitor stormwater runoff from public right of way. Infiltration and evapotranspiration are anticipated to serve as the primary stormwater treatment mechanisms. The pilot will be closely monitored for three years after installation and will define stormwater mass balance measurements by monitoring stormwater flow inputs and outputs from each system.	Achieved
Ballfields Source Controls Pilot Project	Install pilot and collect data	DEP and DPR will install stormwater source controls within Shoelace Park in the Bronx to help improve local water quality and promote beneficial infiltration practices that enhance existing natural areas. This project is in design and approval stages.	Not Achieved
Bronx River Pilot Project	Install plantings in 100 tree pits, collect data, and publish results	Under a NYSERDA grant, DPR is piloting green infrastructure stormwater technologies in the Morrisania section of the Bronx. These technologies include enhanced tree pits, connected tree pits, CU-Structural Soil™ pits, new lawn strip sites, and porous concrete. There will be up to 195 trees in CU-Structural Soil™ pits, with many trees in shared pits containing 2-4 trees. 71 trees are planted in stormwater capture tree pits which utilize a 1ft-thick "L-shaped" crushed bluestone wall both on the curb side and underneath the soil. Construction of this pilot was completed in spring 2010.	Achieved
7 Continue planning for the implementation of promising source control scenarios			
Sidewalk standards	Convene an interagency working group to examine technical and funding challenges	The Green Codes Task Force developed a standard sidewalk specification proposal for consideration by the City. The proposal would require a permeable strip along the outside edge of a sidewalk and require structural soil, and mandate more sustainable materials where appropriate. During this process, OLTPS convened multiple City agencies to discuss opportunities and challenges. The proposal is currently being considered by the Mayor's Office and the Speaker's Office.	Achieved
Road reconstructions	Convene an interagency working group to examine technical and funding challenges	The City agencies responsible for policies or projects in the city's right of way have met on a regular basis to discuss opportunities to incorporate sustainable stormwater management source controls into road design and reconstruction projects. Agencies have met as part of the Street Design Manual Task Force, a group that exists specifically to address street design issues. OLTPS has also convened agencies specifically to examine funding and maintenance challenges. With the release of the NYC Green Infrastructure Plan and the creation of the Green Infrastructure Task Force, City agencies will continue to meet to discuss how road reconstruction projects could be designed to incorporate source controls.	Achieved
Performance standard on existing buildings	Collect knowledge from building industry experts and manufacturers and continue researching solutions to technical and funding challenges.	As part of the Green Codes Task Force, OLTPS, DEP, and other City agencies engaged with outside experts to investigate the merits and technical challenges associated with requiring rooftop detention on existing buildings. The GCTF recommended that the City convene a study to closely examine a range of technical questions, and that proposal is currently under consideration by the Mayor's Office and the Speaker's Office. Multiple pilot projects are testing blue roof and green roof technologies on existing buildings and other stormwater source controls on lots with existing development. The results of these studies will be utilized by OLTPS, DEP, and the Green Infrastructure Task Force as they consider additional policies.	Achieved
Low- and medium-density residential	Collect knowledge from building industry experts and manufacturers and continue researching solutions to technical and funding challenges.	As part of the Green Codes Task Force, OLTPS, DEP, and other City agencies engaged with outside experts to investigate the merits and technical challenges associated with requiring rain barrels and cisterns on residential properties. The GCTF recommended that the City conduct a study to closely examine a range of technical questions, and that proposal is currently under consideration by the Mayor's Office and the Speaker's Office. Based on DEP's pilot and programs of environmental organizations such as GrowNYC and NYC Soil and Water Conservation District, rainwater harvesting provides irrigation, conservation, and other benefits for single- and two-family homeowners. In addition, DEP is planning to survey homeowners who participated in the rain barrel pilot program.	Achieved

INITIATIVE	MILESTONES FOR COMPLETION BY OCTOBER 1, 2010	PROGRESS	STATUS
Green roofs on public projects	Convene an interagency working group to examine technical and funding challenges	City agencies have met on numerous occasions to discuss opportunities to increase the use of green roofs on public projects. As part of the effort to create a stormwater performance standard and the accompanying design and construction guidelines, the City has analyzed how green roofs could be utilized to fulfill the proposed requirements. Also, DPR's successful green roof pilot on the Five Boroughs facility has led to the expansion of green roofs on other DPR buildings. In spring 2010, 10 new green roofs were installed on recreation centers citywide, with at least one roof being installed in each Borough.	Achieved
Protocols for public projects	Work with agencies to consider protocols for incorporating source controls into projects	Multiple City agencies have considered new design standards to incorporate stormwater source controls, as evidenced by the recent release of the Street Design Manual, the Sustainable Urban Site Design Manual, and the forthcoming High Performance Landscape Guidelines. Also, the NYC Green Infrastructure Plan calls for a Green Infrastructure Task Force of City agencies to develop approved specifications for green infrastructure. This collaboration will build on recent efforts by City agencies to collaborate closely to develop standard specifications that were used to streamline the permitting process for sustainable stormwater management pilots.	Achieved
New demonstration projects	Develop proposals for new pilot projects and seek funding and partnerships	Instead of creating separate additional pilot projects, the City has incorporated these additional areas into the existing pilot projects that were already in development.	Not Achieved
Green Codes Task Force	Receive recommendations from the Urban Green Council and consider code proposals for adoption	On February 1, 2010 the NYC Green Codes Task Force released an analysis of building codes as well as other codes, such as zoning, health, consumer affairs, and environmental protection. Convened at the request of Mayor Bloomberg and Council Speaker Quinn in July 2008, the Task Force – led by Urban Green Council – was charged with recommending green changes to the laws and regulations affecting buildings in New York. The report contains 111 recommendations, including 7 for stormwater, 7 for water efficiency, and 5 for urban ecology. The Task Force report is now being reviewed by the Mayor's Office and Speaker's Office to determine a feasible and cost-effective strategy to move forward with proposed policy and legislative changes.	Achieved
8 Continue planning for the maintenance of source control			
Explore maintenance options	Convene an interagency working group to examine technical and funding challenges	OLTPS has convened City agencies on several occasions to examine the challenges of providing maintenance for source controls. Most of the pilot projects taking place are specifically examining the maintenance requirements and associated costs for various source control installations. As part of the NYC Green Infrastructure Plan, an interagency Green Infrastructure Task Force has also been created. In addition, as part of the City's Green Infrastructure Fund, resources will be allocated for maintenance in planned capital projects such as roadway reconstructions and vegetated source controls.	Achieved
EXPLORE OPTIONS FOR FUNDING SOURCE CONTROLS			
9 Broaden funding options for cost-effective source controls			
Broaden funding options	Support efforts to seek Federal stimulus for stormwater infrastructure projects	In September 2009, the City secured \$2 million in Federal stimulus funding through the American Recovery and Reinvestment Act (ARRA) to install at least 26 Greenstreets that are designed to capture stormwater. Collectively, they will add 58,000 square feet of planting area, with the ability to capture approximately eight million gallons of stormwater per year. The City also secured \$15 million in ARRA stimulus funding for the restoration of 38 acres of wetlands and natural grasslands in Paerdegat Basin.	Achieved
10 Complete water and wastewater rate study and reassess pricing for stormwater services			
Rate study	Complete study and reassess pricing structure for stormwater	The Water Board completed a water rate study in December 2009 that evaluated expenditures, revenue sources, and alternative water, wastewater, and stormwater rate structures. A primary goal of the study was to research possible structures that could be implemented in New York City to enhance revenue stability, equity for customers, and resource conservation. One strategy resulting from the study is a Sewer Charge for Stormwater for Parking Lots. The charge would apply to parking lots that have no water service and therefore do not pay for wastewater services, yet are generating demands on the wastewater system. Parking lots will be charged an annual wastewater charge for stormwater of \$0.05 per square foot of property area. A credit program will be in place when DEP implements this charge to incentivize approvable green infrastructure technologies. The charge will be implemented in January 2011.	Achieved
SUPPORT THE IMPLEMENTATION OF THE SUSTAINABLE STORMWATER MANAGEMENT PLAN			
Tracking and monitoring	Develop a system to track source controls	OLTPS has worked with multiple City agencies to track source controls installed in public projects, but no citywide tracking system has been established. DEP has committed \$15 million for a green infrastructure planning study, and part of this study will include a tracking system for source controls and the development of a citywide inventory and map. DEP will partner with community groups, environmental stewards, and academic institutions to compile data and develop a meaningful, user-friendly platform for viewing and adding source controls information to the database.	Not Achieved

INITIATIVE	MILESTONES FOR COMPLETION BY OCTOBER 1, 2010	PROGRESS	STATUS
Reporting	Launch and publish sustainability indicators	The 2010 PlaNYC Progress Report contains a series of new sustainability indicators, adding to those that were released in 2009 as part of the Citywide Performance Reporting (CPR) system. These indicators provide a new way to measure the City's overall progress toward achieving each of the ten goals laid out in PlaNYC, beyond the implementation of the 127 initiatives in the plan. The indicators are designed to help in assessing whether changes to the plan are needed and are part of the City's ongoing commitment to transparency and accountability.	Achieved
Public information tools	Determine and post appropriate web tools to support initiatives	The City has not developed a series of web tools to support the implementation of stormwater source controls. However, DEP recently revamped its website to include a comprehensive overview of the city's sewer system that explains how the system functions during wet weather and the issues surrounding stormwater and water quality. In the future DEP will provide multi-media information for a range of audiences to understand stormwater-related issues and the necessary steps to solve these issues.	Not Achieved
BMP Design Manual	Initiate contract	The contract was initiated and the development of this document is underway. The goal of the manual is to assist these groups in the design of several different onsite stormwater controls for new development and expansions of existing development. The design guidelines will support the promulgation of the new stormwater performance standard. The stormwater management systems detailed in the guidelines will be considered "approvable systems" by DEP and DOB if such systems are developed according to the siting, sizing, construction, and operation and maintenance guidance provided within the guidelines and submitted for DEP review as part of a developer's site connection application.	Achieved
BMP Modeling by Watershed	Initiate contract	DEP's \$15 million green infrastructure planning study has supported the modeling for the NYC Green Infrastructure Plan and future refinements to that modeling analysis. The results of the demonstration projects, tracking efforts, and modeling will be incorporated into watershed-specific Long-Term Control Plans (LTCPs) and the citywide LTCP. The modeling results underlying the NYC Green Infrastructure Plan are preliminary and reflect CSO reductions rather than ambient water quality improvements, which DEP expects to show, but has not yet quantified. By 2011, well in advance of the LTCPs, DEP will conduct additional modeling to understand the likely effects of the NYC Green Infrastructure Plan on ambient water quality.	Achieved
Impervious surfaces data mapping	Complete analysis	DEP completed impervious surface mapping using detailed impervious data for the entire City based on a satellite flyover in 2009 that took infrared images and captured the light spectrum emitted by vegetated and impervious areas. This mapping will be verified and complete by the end of 2010 and will be incorporated into the water quality modeling.	Not Achieved
Public education and training	Develop and distribute materials	A dedicated program for education and training materials for sustainable stormwater management has not been created.	Not Achieved
Green sector employment study	Release final report	EDC conducted a comprehensive study of green sector jobs to capture a global view and better understanding of the industry's current activity. This research provided valuable insight as the City developed the NYC Green Economy Plan. This plan, released in October 2009, details programs to support and attract green businesses and entrepreneurs and provide specialized job training for New Yorkers with the objective to create 13,000 green jobs over the next decade.	Achieved
Ambient water quality monitoring	No October 1, 2010 milestone set	DEP collects 20 water quality parameters from 57 stations across the Harbor, more parameters and locations than other municipalities in New York State. DEP conducts monthly testing at all 57 stations, with weekly testing during the summer season. DEP samples the waterways for dissolved oxygen to protect marine life and fecal coliform bacteria to protect human health. In addition to mandatory parameters, DEP measures 18 additional indicators in its testing regime, including water transparency, chlorophyll A (for algae blooms), temperature, and pH. DEP's water quality testing is supplemented with a shoreline water quality testing program conducted in partnership with the New York City Department of Health. These results are reported in DEP's <i>New York Harbor Water Quality Annual Reports</i> .	NA
Analysis on stormwater capture in separate sewer areas	Complete analysis	A full analysis of stormwater capture opportunities in separate sewer areas has not been completed. The City is exploring and implementing a number of measures in separate sewer areas. The new performance standard is one of example of a measure that will reduce discharges from separate sewer areas as well as from combined sewer areas.	Not Achieved
Local Law 5 updates	Complete update	This status update is submitted in accordance with the Local Law 5 of 2008 requirement for that OLTPS "shall submit a report to the mayor, the speaker of the council, and the public, which shall include, but not be limited to, the implementation status of the measures included in the plan... including a quantitative assessment, where susceptible to quantification, and a qualitative assessment of the progress made toward achieving each of the milestones identified in such plan and, where revised, an explanation for such revision." In addition to this status update, the City also released the NYC Green Infrastructure Plan on September 28, 2010.	Achieved

**Mayor's Office of Long-Term
Planning & Sustainability**
City Hall
New York, NY 10007
www.nyc.gov/PlaNYC2030

