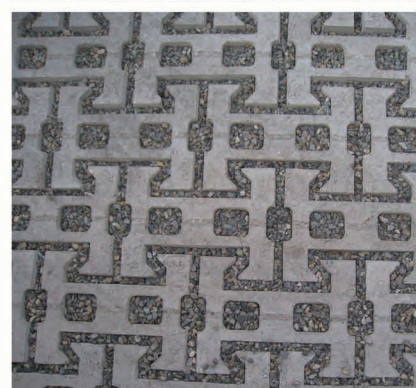




NYC GREEN INFRASTRUCTURE PLAN

A SUSTAINABLE STRATEGY FOR CLEAN WATERWAYS

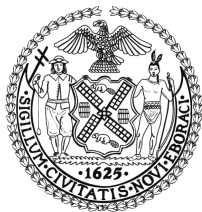
Michael R. Bloomberg, Mayor
Cas Holloway, Commissioner



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Green infrastructure photographs (clockwise, starting from the top-left): rain barrel, enhanced tree pit, Staten Island Bluebelt, porous concrete sidewalk, porous pavers, restored wetland, green roof, blue roof

Credit: Topmost cover photograph taken by Nancy Hey; all others taken by DEP employees.



THE CITY OF NEW YORK
OFFICE OF THE MAYOR
NEW YORK, NY 10007

Dear Friends:

Cleaning up New York City's rivers, creeks, and coastal waters has been a top priority for our Administration, and the pace of progress has increased dramatically over the past several years. Since 2002, the City has invested more than \$6 billion in water quality, and key indicators show that New York Harbor is the cleanest and healthiest it's been in more than a century. But to open as much of our waterfront as possible to recreation and development, we need a long-term plan to manage the stormwater that can overwhelm our combined sewer system when it rains, impairing water quality in the harbor and its tributaries.

To succeed, any plan must be effective and affordable, and the 8.4 million New Yorkers who will pay for it must see and feel its benefits. The NYC Green Infrastructure Plan will achieve that goal. Based on years of study and our experience with new technologies, we know that green infrastructure—advanced street-tree pits, porous pavements and streets, green and blue roofs, and many other stormwater controls—can improve water and air quality, help to cool the City, reduce energy bills and greenhouse gas emissions, increase property values, and beautify our communities. And we can achieve all of these benefits for billions of dollars less than the cost of the traditional tanks and tunnels that are useful only when it rains.

The NYC Green Infrastructure Plan continues the implementation of PlaNYC, not only by improving water quality, but by helping the City achieve cleaner air and greener streets, and we look forward to working with the New York State Department of Environmental Conservation and the U.S. Environmental Protection Agency to make our plan a reality. The unprecedented scale of this plan and our commitment to implement it will put the City at the forefront of stormwater management, and ensure our progress toward a greener, greater New York.

Sincerely,

A handwritten signature in black ink that reads "Michael R. Bloomberg".

Michael R. Bloomberg
Mayor

ACRONYMS

AMR	Automated Meter Reading
ARRA	American Recovery and Reinvestment Act
BID	Business Improvement District
BMP	Best Management Practice
CAC	Citizens Advisory Committee
CAPA	City Administrative Procedure Act
CSO	combined sewer overflow
DCP	New York City Department of City Planning
DEC	New York State Department of Environmental Conservation
DEP	New York City Department of Environmental Protection
DDC	New York City Department of Design & Construction
DOB	New York City Department of Buildings
DOE	New York City Department of Education
DOT	New York City Department of Transportation
DPR	New York City Department of Parks & Recreation
EPA	United States Environmental Protection Agency
FOG	fat, oil, and grease
HPD	New York City Department of Housing Preservation & Department
LTCP	Long Term Control Plan
MTA	New York City Metropolitan Transit Authority
NYCHA	New York City Housing Authority
OMB	New York City Office of Management and Budget
SCADA	Supervisor Control and Data Acquisition
RCNY	Rules of the City of New York
ROW	Right-of-Way
WWFP	Waterbody Watershed Facility Plan
WWTP	Wastewater Treatment Plant

EXECUTIVE SUMMARY

New York City's efforts to improve water quality are a critical part of PlaNYC, Mayor Bloomberg's blueprint for a greener, greater city. Already the Harbor is cleaner than it has been in over 100 years, and millions of people enjoy the City's waterfront and waterways every year, thanks in part to the New York City Department of Environmental Protection's (DEP's) investment of billions of dollars in sewer and wastewater treatment plant upgrades. But in those waterbodies that do not yet meet water quality standards for pathogens, the biggest remaining challenge is to further reduce combined sewer overflows (CSOs) that discharge a mixture of untreated sewage and stormwater runoff when it rains. Traditional approaches to reduce CSOs further would include the construction of additional, large infrastructure, but the remaining opportunities for such construction are very expensive, and do not provide the sustainability benefits that New Yorkers rightly expect from multi-billion dollar investments of public funds.

This Green Infrastructure Plan presents an alternative approach to improving water quality that integrates "green infrastructure," such as swales and green roofs, with investments to optimize the existing system and 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, 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 necessary to make additional water quality investments. A critical goal of the green infrastructure component is to manage runoff from 10% of the impervious surfaces in combined sewer watersheds through detention and infiltration source controls.

New York City's "Green Strategy" is nimble enough to incorporate new technologies and approaches as they emerge during the implementation of our plan. DEP will preserve its ability to pursue larger grey infrastructure if necessary and appropriate in the event that the Green Strategy cannot achieve water quality objectives in a particular drainage area. Promoting green infrastructure has been endorsed by the U.S. Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (DEC). Under Administrator Lisa Jackson, EPA has testified that green infrastructure is an "effective response to a variety of environmental challenges that is cost-effective, sustainable, and provides multiple desirable environmental outcomes." (Testimony before the U.S. House of Representatives, Committee on Transportation and Infrastructure, Subcommittee on Water Resources and Environment, March 19, 2009)

In fact, this approach is not so new — the City and its partners have a long track record of successfully meeting water quality standards with natural solutions that have substantial, quantifiable co-benefits. For example, in our Catskill and Delaware watersheds, the City, EPA, New York State, and community and environmental groups came together and agreed that preserving forested areas and natural buffers was a better way to keep our drinking water clean than relying upon end-of-the-pipe, energy-intensive filtration systems. Since the City first applied for a waiver from filtration requirements for the Catskill and Delaware system in 1991, DEP has committed more than \$1.5 billion and dedicated staff to sustain the pristine quality of source waters, and so far has eliminated the need for a filtration plant that would cost \$10 billion or more. These commitments are included in the Filtration Avoidance Determinations issued by EPA and

implemented by DEP and its watershed partners, including New York State, watershed towns, and civic organizations. Similarly, since the early 1990s DEP has relied upon wetlands and natural areas in our Bluebelt system in Staten Island to absorb stormwater runoff from streets, thereby eliminating the need for costly sewer systems.

In 2007, PlaNYC committed the City to build more Bluebelts and Greenstreets, to require green parking lots, to incentivize green roofs, and to form an Inter-agency Best Management Practices Task Force. The *Sustainable Stormwater Management Plan* issued by that Task Force in 2008 concluded that green infrastructure was feasible in many areas in the city and could be more cost-effective than certain large infrastructure projects such as CSO storage tunnels. This 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, including 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).

This Green Infrastructure Plan builds upon and extends the commitments made in PlaNYC and the *Sustainable Stormwater Management Plan*. This plan provides a detailed framework and implementation plan to meet the twin goals of better water quality in New York Harbor and a livable and sustainable New York City. The analysis in this Green Infrastructure Plan is based upon the predicted impacts of the strategy on CSO volumes in individual watersheds and upon the City's estimates of capital and operating costs. Further analysis, which is substantially under way, will refine the modeling and projections in this report by using more updated geospatial impervious data, incorporating detention technologies, and assessing the impact of CSO reductions on water quality. It will also present data about the operating costs, maintenance, and performance of the green infrastructure projects currently underway. This Green Infrastructure Plan forms a framework for CSO reduction strategies and investments over the next 20 years and will lead to both clean waterways and a greener, more sustainable city.

The importance of the choice we face as a city and the urgent need for collaborative partnerships with our state and federal regulators cannot be overemphasized. The City is facing tremendous economic challenges and tightly constrained resources while the cost of grey investments such as 50-million gallon underground storage tanks is significantly increasing and the marginal contribution of such investments to the achievement of overall water quality objectives is diminishing. At the same time, PlaNYC and the many studies that guided it made clear that New Yorkers need and want sustainability benefits such as more open space, improved air quality, more shade, and increased property values. In this new reality, the City must strive to get the most water quality and sustainability benefits out of every dollar it invests.

The Green Infrastructure Plan

The Green Infrastructure Plan will achieve better water quality and sustainability benefits than the all-Grey Strategy that is mandated or is currently under consideration by:

- Reducing CSO volume by an additional 3.8 billion gallons per year (bgy), or approximately 2 bgy more than the all-Grey Strategy;
- Capturing rainfall from 10% of impervious surfaces in CSO areas through green infrastructure and other source controls; and
- Providing substantial, quantifiable sustainability benefits – cooling the city, reducing energy use, increasing property values, and cleaning the air – that the current all Grey Strategy does not provide.

Ultimately the success of this program will be measured by water quality objectives, not by CSO reductions alone.

The Green Infrastructure Plan has five key components:

1. Build cost-effective grey infrastructure

DEP has already built or is planning to build over \$2.9 billion in targeted grey infrastructure to reduce CSO volumes (the Cost-Effective Grey Infrastructure Investments). These projects were set out in Waterbody Watershed Facility Plans (Facility Plans) submitted to the New York State Department of Environmental Conservation (DEC) pursuant to a consent order.¹ For the most part, these projects are the most cost-effective among a number of alternatives considered. The cost-effective projects will reduce CSOs by approximately 8.3 bgy compared to the projected baseline for the year 2045 that was used in the 2007 Facility Plans. The grey investments planned or underway reduce CSOs at a cost of \$0.36 per gallon. These investments are five times more cost-effective than certain other alternatives that DEP seeks to avoid or defer.² The Cost-Effective Grey Infrastructure Investments are presented in greater detail in the chapter on *The Green Infrastructure Plan*, especially Tables 6 and 8.

2. Optimize the existing wastewater system

DEP will optimize the existing wastewater system through both targeted and system-wide capacity enhancements to ensure that it can store as much combined flow as is possible. DEP has already started a comprehensive assessment of the existing system and its hydraulic capacity to assess further cost-effective improvements. In the meantime, we are already improving existing programs by inspecting tide gates, surveying and rehabilitating interceptor sewers, preventing obstructions and cleaning lateral collection sewers, and identifying inflow and infiltration. These initiatives include the purchase of two new Vactor trucks and a commitment to rehabilitate 136 miles of interceptor sewers within two years. By these additional measures, DEP can reduce CSOs by approximately 586 million gallons per year (mgy), and will achieve greater re-

¹ Under a 2005 Administrative Consent Order, DEC file no. CO2-20000107-8, as modified by a 2008 Order on Consent, DEC file no. CO2-2007-0101-1 (the CSO Order or the Consent Order).

² These are the CSO detention tunnels in the Newtown Creek and Flushing Bay drainage areas, the CSO detention tanks in the Hutchinson River and Westchester Creek drainage areas, and the wet weather expansions at the 26th Ward and Jamaica WWTPs (Potential Tanks, Tunnels, and Expansions).

ductions from the additional system improvements that will occur as additional areas are surveyed. The Green Infrastructure Plan is DEP's first attempt to integrate those particular elements into a comprehensive CSO reduction program.

A critical element of wet weather overflows is the base flow of sanitary waste from household and other uses, which can take up sewer system storage and wastewater treatment plant (WWTP) capacity that could otherwise be used to convey and treat stormwater. Lower sanitary flows maximize plant capacity during wet weather. Sanitary flows vary with the overall consumption of water, which has constantly and significantly declined in recent years and will continue to decline. DEP estimates that continued declines will reduce CSO volumes by approximately 1.7 bgy, or 8% of overall city CSOs, by 2030. This is nearly equivalent to the CSO reductions estimated for large grey infrastructure investments that are currently contemplated under the CSO Order or in future Long Term Control Plans (LTCPs).

Encouraging prudent water use also benefits DEP's water supply and wastewater treatment system by reducing wear on infrastructure, chemical costs, energy costs for pumping and treating flow, and greenhouse gas emissions. These are important considerations because in just a few years DEP's energy demand will be 30% greater than today as the ultraviolet disinfection plant for the Catskill and Delaware systems, and the Croton filtration plant come on line. DEP will undertake or continue conservation initiatives to ensure reduced flow in future years, including completing installation of the Automated Meter Reading (AMR) network and, if feasible, low flow fixture rebates and other initiatives.

3. Control runoff from 10% of impervious surfaces through green infrastructure

Green infrastructure is at the core of this plan. The City's goal is to capture the first inch of rainfall on 10% of the impervious areas in combined sewer watersheds through detention or infiltration techniques over 20 years. By preventing one inch of precipitation from becoming runoff that surges into the sewers over 10% of each combined sewer watershed's impervious area, DEP estimates that CSOs will be reduced by approximately 1.5 bgy. DEP proposes to meet this goal by achieving 1.5% impervious area capture by 2015, an additional 2.5% by 2020, an additional 3% by 2025, and the remaining 3% by 2030.

The strategies to achieve the 10% goal vary depending on the type of land use (see Table 1, following page). DEP's initial analysis shows that there are significant opportunities to incorporate green infrastructure in 52% of the land in CSO areas of the City, well more than needed to meet the 10% capture goal over 20 years. The remaining 48% of the City's land area consists of existing development, where stormwater retrofits may also be appropriate but are more difficult and expensive to build. For a highly urbanized city, the goal of 10% capture over 20 years is ambitious but achievable.

To reach this goal the City will create a Green Infrastructure Task Force to design and build stormwater controls into planned roadway reconstructions and other public infrastructure projects. The City is prepared to create a Green Infrastructure Fund and to immediately commit substantial capital and operating resources to this effort.

The Green Infrastructure Task Force will target investments on a watershed-by-watershed basis. Already, DEP has completed an unprecedented, detailed analysis of roadway projects and

Table 1: Green Infrastructure Opportunities, Strategies, and Technologies (citywide)

Land Use	% of Combined Sewer Watershed	Potential Strategies and Technologies
New development and redevelopment	5.0%	Stormwater performance standard for new and expanded development Rooftop detention; green roofs; subsurface detention and infiltration
Streets and sidewalks	26.6%	Integrate stormwater management into capital program in partnership with DOT, DDC, and DPR Enlist Business Improvement Districts and other community partners Create performance standard for sidewalk reconstruction Swales; street trees; Greenstreets; permeable pavement
Multi-family residential complexes	3.4%	Integrate stormwater management into capital program in partnership with NYCHA and HPD Rooftop detention; green roofs; subsurface detention and infiltration; rain barrels or cisterns; rain gardens; swales; street trees; Greenstreets; permeable pavement
Parking lots	0.5%	Sewer charge for stormwater DCP zoning amendments Continue demonstration projects in partnership with MTA and DOT Swales; permeable pavement; engineered wetlands
Parks	11.6%	Partner with DPR to integrate green infrastructure into capital program Continue demonstration projects in partnership with DPR Swales; permeable pavement; engineered wetlands
Schools	1.9%	Integrate stormwater management into capital program in partnership with DOE Rooftop detention; green roofs; subsurface detention and infiltration
Vacant lots	1.9%	Grant programs Potential sewer charge for stormwater Rain gardens; green gardens
Other public properties	1.1%	Integrate stormwater management into capital programs Rooftop detention; green roofs; subsurface detention and infiltration; rain barrels; permeable pavement
Other existing development	48.0%	Green roof tax credit Sewer charges for stormwater Continue demonstration projects and data collection Rooftop detention; green roofs; subsurface detention and infiltration; rain barrels or cisterns; rain gardens; swales; street trees; Greenstreets; permeable pavement

development trends to create a preliminary assessment of the specific opportunities, volume reductions, and costs for each of the 13 combined sewer watersheds that are the subject of the CSO Order. For example, in the Bronx River watershed, the goal of 10% capture over 20 years could be met through a combination of:

- Three percent (3%) impervious area capture by street trees, swales, and sidewalks that are rebuilt or retrofitted with additional controls;
- Three percent (3%) impervious area capture by performance standards on new and expanded developments that would include bioinfiltration, blue and green roofs, subsurface detention/infiltration, or other source controls;
- Three percent (3%) impervious area capture by existing schools, residences, and other development; and
- One percent (1%) impervious area capture by additional planted areas in open spaces and waterfront areas.

To accelerate the implementation of green infrastructure, DEP is building more than 20 demonstration projects in collaboration with other city agencies and local authorities, including DPR, DOT, DOE, NYCHA, and MTA. These demonstration projects are testing techniques that are appropriate for a variety of land uses:

- Blue roofs and green roofs for rooftop stormwater detention and retention;
- Porous pavement for parking lots;
- Tree pits, streetside swales, and porous pavement for roadways;
- Greenstreets, medians, and curbside extensions for roads;
- Constructed wetlands and swales for parks;
- A variety of these techniques for high density multi-family housing; and
- Rain barrels for low density single family housing.

4. Institutionalize adaptive management, model impacts, measure CSOs, and monitor water quality

This Green Infrastructure Plan is an adaptive management strategy – an iterative, flexible decision-making process where incremental measures are continually evaluated and rejected or improved. This process produces better decisions about investments and overall resource allocation to achieve water quality objectives. Already, DEP has adjusted its approach to incorporate conservation strategies. An adaptive management approach is essential given the magnitude of investment required to manage stormwater and the wide range of uncertainties about future conditions, including climate, rainfall, population, water demand, land use, technology, and regulatory requirements. The effectiveness of adaptive management depends upon DEP's ability to measure performance. Accordingly, DEP will recalibrate its sewer system model using new and better impervious data and recently updated wastewater flow projections and will model the effects of a combination of detention and infiltration strategies on water quality. DEP will also assess the hydraulic capacities of the sewer system in key drainage areas.

DEP will monitor CSO events by three methods – water elevation monitoring at Tier 1, 2, and 3 CSO outfalls, flows measured at DEP wastewater treatment plants, and flows measured from CSO detention facilities – that will enable us to monitor up to 90% of CSO flow volume citywide. DEP is also seeking to develop the technology necessary to measure actual flows at CSO outfalls. Finally, DEP will gauge improvements in pathogen concentrations resulting from implementation of the Green Infrastructure Plan by building upon its network of 57 monitoring stations across the harbor increasing the number of sampling sites at the mouths of key tributaries.

5. Engage and enlist stakeholders

DEP will also take immediate steps to reduce exposure to potentially harmful waters by replacing the signs at all 422 CSO outfalls to reach non-English speakers, and by improving its website notifications about the risks in recreation after wet weather.

Partnerships with numerous community and civic groups and other stakeholders will be necessary to build and maintain green infrastructure. As part of the development of this plan, DEP

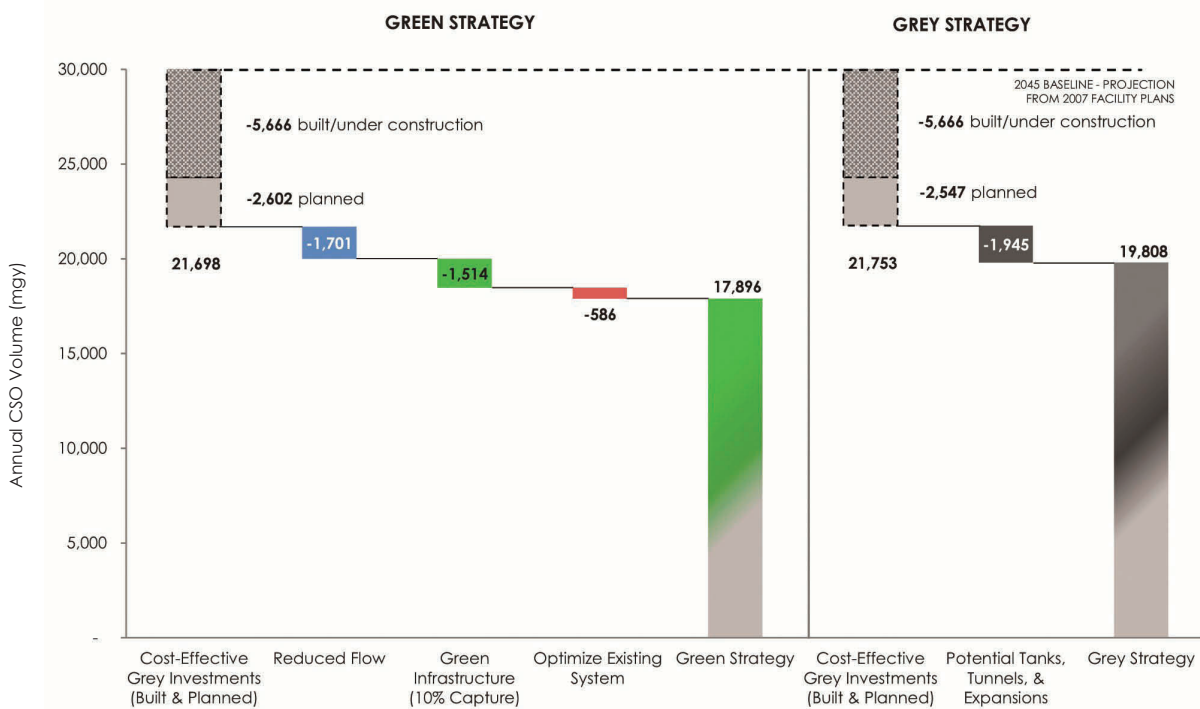
had several meetings with environmental groups, city agencies, and other potential partners, and held a general public meeting to explain its vision for the Green Infrastructure Plan. DEP will provide resources and technical support so that communities can propose, build, and maintain green infrastructure. This is particularly important in environmental justice communities that need the additional public health and other sustainability benefits of green infrastructure.

Cities around the world are developing innovative ways to meet the needs of growing populations. To incubate the practical application of advanced techniques and designs, DEP will sponsor an international forum about green infrastructure.

Overall Performance and Costs

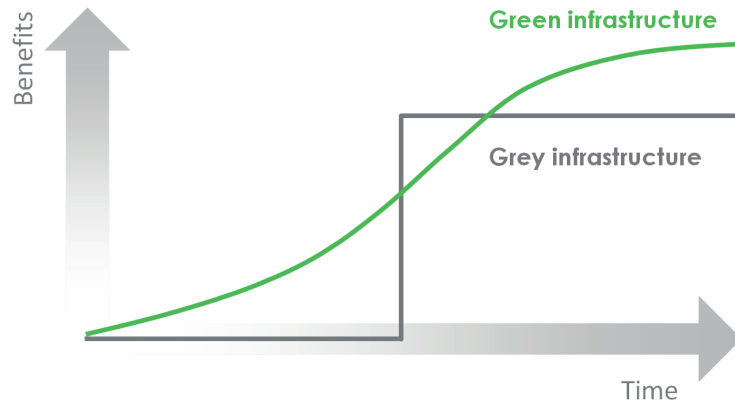
DEP modeling shows that the Green Strategy will reduce more CSO volumes at significantly less cost to New Yorkers than the all-Grey Strategy currently contemplated under the CSO Order and Facility Plans submitted to DEC. The Green Infrastructure Plan builds on DEP's Cost-Effective Grey Infrastructure with investments that will provide both water quality and other public sustainability benefits. Over 20 years, DEP projects that the Green Infrastructure Plan will reduce CSO volumes from approximately 30 billion gallons a year to approximately 17.9 bgy (Figure 1). This is nearly 2 billion gallons lower CSO volume per year than would be achieved by the Grey Strategy (Figure 1).

Figure 1: Predicted CSO Volume*



* Notes for Figure 1: (1) Volume is calculated over a 20-year implementation timeline, based on a 2045 CSO volume projection as a starting point. (2) While DEP is pursuing many efforts to optimize the existing system today, its additional efforts concerning interceptor rehabilitation, tide gate rehabilitation, and reduced flows are all included as part of the Green Strategy and not the Grey Strategy. That is because those elements were not considered or credited as part of the Facility Plans that are currently before DEC. (3) The Cost-Effective Grey Investments under the Grey Strategy do not include certain interceptor and bending weir projects for the 26th Ward wastewater treatment plant since they would not be necessary if the 26th Ward wastewater treatment plant wet weather expansion has to be built. The interceptor and bending weir projects are included in the Green Strategy that would defer expansion. This accounts for the projected 55 million gallon per year difference in planned Cost-Effective Grey Infrastructure Investments between the two scenarios.

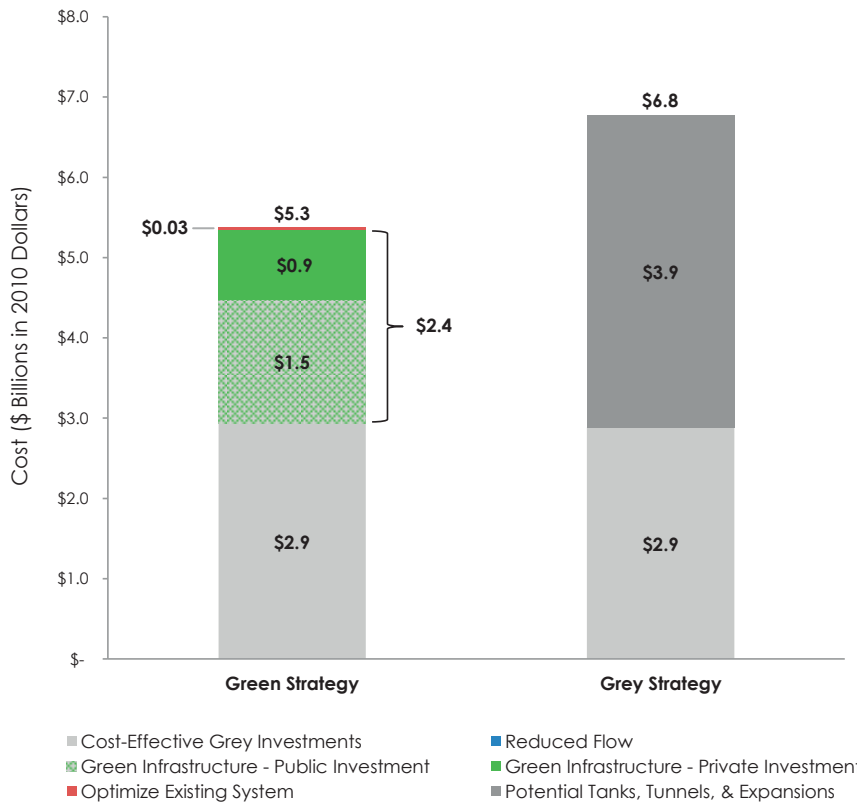
Figure 2: Phasing of Green Infrastructure and Grey Infrastructure Benefits



The significant sustainability benefits of the Green Strategy – which are not available through the Grey Strategy – would begin to accrue immediately and build over time, in contrast to tanks, tunnels, and expansions, which provide only water quality benefits at the end of a decades-long design and construction period (Figure 2).

The green infrastructure component – capturing 10% of the impervious area of combined sewer watersheds – would cost approximately \$1.5 billion in public funds compared to \$3.9 billion in public funds for additional grey investments (Figure 3). The overall cost of the Green

Figure 3: Citywide Costs of CSO Control Scenarios (after 20 years)



Infrastructure Plan would be approximately \$5.3 billion, \$1.5 billion less than the \$6.8 billion required for the Grey Strategy (Figure 3).³

The greater overall efficiency of the Green Strategy is critical for continued ratepayer and citizen support for additional water quality measures in light of competing social needs.

Green infrastructure will allow DEP to leverage opportunities to build cost-effective stormwater controls in new development at an incremental cost. DEP predicts that about 40% of green infrastructure investments over the next 20 years would be made in connection with new development if there were a rule to limit the release rate of runoff. That standard will provide for the capture of approximately two inches of precipitation. New development performance standards will provide a base level of green infrastructure across the city, in both combined sewer and non-combined sewer watersheds.

Green infrastructure costs vary widely across watersheds, but in general are approximately \$1 to \$2 per gallon of CSO avoided. The average cost is less than Potential Tanks, Tunnels, and Expansions. DEP will invest in those areas where green infrastructure is the most cost-effective and will ensure that private sector green infrastructure investments throughout the city are reasonable.

Green infrastructure, moreover, would be spread throughout the city and would provide many additional sustainability benefits. After a 20-year period, DEP estimates that New Yorkers would receive between \$139 million and \$418 million in additional benefits through reduced energy bills, increased property values, and improved health. A citywide policy to support green infrastructure would also help to address future regulatory requirements to manage stormwater in the separately sewered areas.

None of these benefits accrue through an all-Grey Strategy. Tanks, tunnels, and expansions are single-function items and lay dormant unless there is a storm of sufficient size. These large investments have long lead times for design and construction and are subject to intervening risks from changes in climate, labor, and economic conditions as well as regulatory requirements. Tanks, tunnels, and expansions also contain a significant amount of embedded energy – i.e., the greenhouse gas emissions and materials in their construction – involve significant amounts of construction-related air and other emissions, will require energy for pumping when in use, and are labor-intensive. For example, it costs approximately \$3.1 million every year to operate the newly-built Flushing Creek CSO detention facility.

Given these factors, the Green Infrastructure Plan presents more balanced benefits and fewer risks to the City. By pursuing a basket of different pollution control strategies with smaller footprints that can be adjusted, supplanted, and changed over the 20-year investment timeline of the plan, the City will gain knowledge through experience, improve effectiveness, and reduce costs.

³ A CSO detention tunnel for the Newtown Creek drainage area, for example, is estimated to cost \$1.3 billion. (See Tables 7 and 9, in *The Green Infrastructure Plan* section.)

Next steps

To implement this Green Infrastructure Plan, the City is prepared to spend up to \$1.5 billion over 20 years, including approximately \$187 million in capital funds over the next four years, to build green infrastructure. These commitments depend upon acceptance by DEC and EPA of the Green Infrastructure Plan as an alternative to the current all-Grey Strategy that costs billions more, reduces less CSO volume, and foregoes sustainability co-benefits. Additional grey infrastructure should be pursued only if more effective and beneficial green infrastructure investments fail. The City seeks to immediately engage with DEC to incorporate the Green Infrastructure Plan into the existing CSO Order and the 14 separate LTCPs required by 2017. DEP will also work with the EPA, community leaders, environmental groups, and other stakeholders to seek consensus on the scope and duration of our green infrastructure commitments.

Over the next year, the City will take a number of concrete steps to begin early implementation of the Green Infrastructure Plan. These actions include:

1. Preparing a Green Infrastructure Fund;
2. Creating an inter-agency partnership – the Green Infrastructure Task Force – to incorporate stormwater management into roadway, sidewalk, and other capital projects and to provide for the maintenance of green infrastructure;
3. Building green infrastructure demonstration projects on a variety of land uses;
4. Partnering with community groups to develop programs for the construction and maintenance of green infrastructure;
5. Launching a comprehensive program to increase optimization of the existing system, including drainage plans, hydraulic studies, the survey and rehabilitation of 136 miles of interceptor sewers in two years, the inspection and repair of tide gates, and programs to prevent grease from obstructing the sewers;
6. Developing a stormwater management standard for new construction and redevelopment that expands existing development;
7. Piloting sewer charges for stormwater for stand-alone parking lots;
8. Refining DEP models by including new impervious cover data and extending predictions to ambient water quality;
9. Identifying other funding for additional elements of the Green Infrastructure Plan; and
10. Replacing all CSO outfall signs to reduce potential exposure.

