

2011–2012 Projects related to Green Harbor/Aquatecture in the NYC Comprehensive Waterfront Plan & Waterfront Action Agenda

Goal 4:

Improve water quality through measures that benefit natural habitats, support public recreation, and enhance waterfront and upland communities.

Part of an effort to build new cost-effective grey infrastructure and optimize existing systems to meet goals for water quality throughout the city:

2011

- **Paerdegat Basin, Brooklyn and Alley Creek, Queens:** Complete new CSO storage facilities.

2012

- **Gowanus, Brooklyn:** Participate in ongoing reviews of remedial investigation results and feasibility study for EPA's cleanup of Gowanus Canal.
- Launch comprehensive program to build on improvements to existing wastewater systems, including surveying and improving 136 miles of inceptor sewers; inspecting and repairing tide gates; and developing programs to prevent grease from obstructing sewers.

Part of an effort to maximize the use of green infrastructure and other source controls to capture rainfall on impervious surfaces, helping reduce combined sewer overflows and other discharges:

2011

- Green infrastructure pilot projects
- **Bronx, Brooklyn, and Queens:** Monitor effectiveness of constructed "blue roof" pilot projects to minimize runoff impacts.
- **Brooklyn and Queens:** Complete construction and install permeable pavement pilot projects at municipal parking lots.
- **Queens:** Monitor stormwater capture tree pits and street design pilot projects.
- **Queens:** Transform the North and South Conduit Avenues median into a natural water filter and bio-retention area.
- **Queens:** Transform the North and South Conduit Avenues median into a natural water filter and bio-retention area.
- Capture the first inch of rainfall on 10 percent of impervious areas in combined sewer watersheds over 20 years by implementing green infrastructure in capital projects.

Part of an effort to restore natural systems to improve ecological productivity, reduce pollution, and provide habitat, recreation, and climate-adaptation services:

2011

- **Mid-Island Bluebelt, Staten Island:** Negotiate acquisition of 123 acres at New Creek, South Beach, and Oakwood Beach.

Part of an effort to improve monitoring and public awareness of water quality:

2011

- Install new CSO outfall signs, enhance CSO website notification, and increase water quality sampling sites.
- Develop comprehensive water use, navigation, and access policy.

Goal 5:

Restore degraded natural waterfront areas, and protect wetlands and shorefront habitats.

Part of an effort to acquire and augment protection of wetland and other shoreline habitat:

2012

- Consider revising the Waterfront Revitalization Program to designate additional sites of ecological importance, such as the Upper Bronx River, Arverne, Plumb Beach, southern portion of the Arthur Kill shoreline, portions of the Raritan Bay shoreline, Staten Island Greenbelt, and Staten Island South Shore Bluebelts.
- Develop a citywide strategy for protection and restoration of wetlands and coastal ecosystems.
- Complete transfer of at least 5 additional City-owned wetland properties to DPR.

Part of an effort to increase scientific understanding, public awareness, and stewardship of the natural waterfront:

2012

- Identify opportunities to increase public awareness and stewardship of specific waterfront reaches, modeling successful public/private partnerships and working with the Partnerships for Parks Catalyst Program to link new conservation, protection or enhancement efforts with existing organizations and programs.

Part of an effort to promote ecological restoration that enhances the robustness and resilience of local and regional ecosystems:

2011

- **Fresh Creek, Brooklyn:** Pilot study of ribbed mussel beds, evaluating filtration of nutrients and pollutants.

- **Breezy Point, Queens:** Study the feasibility of planting 3,000 eelgrass plants. If planting is successful, begin larger-scale project.
- 2012**
- **Pugsley Creek Park, the Bronx:** Complete restoration of tidal wetlands, including excavation work, sand placement, and planting salt marsh grasses.
 - **Paerdegat Basin, Brooklyn:** Create Ecology Park by restoring 12 acres of tidal wetland and 26 acres of adjacent upland habitat.
 - **Plumb Beach, Brooklyn:** Complete a study to address long-term impacts of shoreline erosion and potentially execute a project partnership agreement with the U.S. Army Corps of Engineers, National Park Service, and New York State Department of Environmental Conservation.

Goal 7:

Improve governmental regulation, coordination, and oversight of the waterfront and waterways:

Part of an effort to improve predictability and efficiency of the permitting process for in-water construction:

- 2011**
- Establish an in-water permitting task force to focus on developing permitting guidance documents, written mitigation policies and standards, a one-stop shop for in-water permitting, and a training program for applicants.

With input from stakeholders, establish design guidelines for in-water infrastructure, such as piers, docks, and bulkheads:

- Establish a task force to develop design and construction guidelines for inwater structures that minimize negative environmental impacts, ensure structural resiliency, and accommodate vessel tie-up.
- 2012**
- Develop a wetlands mitigation bank and/ or in-lieu fee program to promote more effective mitigation projects.

Goal 8:

Identify and pursue strategies to increase the city's resilience to climate and sea level rise.

Part of an effort to conduct a citywide strategic planning process for climate resilience:

- 2011**
- Establish a strategic planning process for climate resilience by updating PlaNYC.
- 2012**
- Conduct a citywide strategic planning process for climate resilience. Study best practices for increasing climate resilience to flooding and storm surge.

Part of an effort to explore regulatory and policy changes to improve resilience of new and existing buildings to coastal flooding and storm surges:

- 2012**
- Conduct a citywide strategic planning process for climate resilience. Study best practices for increasing climate resilience to flooding and storm surge.
 - Study urban design implications of enhanced flood protection, and explore zoning and building code changes to promote freeboard.

Part of an effort to work with the Federal Emergency Management Agency (FEMA) and the insurance industry to encourage the consideration of more accurate data on current and future risks of flooding and storm surges:

- 2012**
- Partner with FEMA to update FEMA Flood Insurance Rate Maps to more accurately reflect current flood risks.

Part of an effort to assist with local resiliency planning:

- 2012**
- Support coastal communities' efforts to undertake local resilience planning, and improve the dissemination of publicly available data on the locations of hazardous material storage.

Improve Water Quality: Strategies and Projects

Improving water quality is an essential goal in and of itself that will further many of the other goals of *Vision 2020*. It will enhance the Blue Network by encouraging biodiversity and allowing natural areas to flourish. It will provide for water recreation. And the use of innovative stormwater strategies will help create greener, more livable neighborhoods as well as increase climate resilience.

To realize this goal, the City will pursue the following set of strategies over the next 10

years. While continuing to make improvements to grey infrastructure (such as wastewater treatment plants and sewer systems), the City will also invest in green infrastructure and other projects that utilize the ability of natural systems to absorb and filter water. Finally, the City will work to promote the safe enjoyment of New York's waterways through improved monitoring, notification systems, and education.

Vision 2020's 10-year strategies are complemented by the *New York City Waterfront Action*

Agenda, a set of projects chosen for their ability to catalyze investment in waterfront enhancement. The City commits to initiating these projects over the next three years and will be tracking progress on an ongoing basis. For each project, the lead agency and implementation year are noted.

Together, these strategies and projects lay out a comprehensive vision for the waterfront and waterways and a plan of action to achieve that vision.

1. Build new cost-effective grey infrastructure and optimize existing systems to meet goals for water quality throughout the city.

VISION 2020 STRATEGIES

- Reduce nitrogen discharges through improvements to wastewater treatment plants.
- Improve pathogen and dissolved oxygen levels by reducing combined sewer overflows and other discharges, and improving aeration and flushing of constrained waterbodies.
- Optimize the existing sewer systems through improvements to drainage, interceptors, and tide gates.

ACTION AGENDA PROJECTS

- Continue major upgrades at wastewater treatment plants by investing \$1.6 billion (projects listed on facing page).
- Build cost-effective grey infrastructure to manage CSOs and improve waterfront areas (projects listed on facing page).
- Launch comprehensive program to build on improvements to existing wastewater systems, including surveying and improving 136 miles of inceptor sewers; inspecting and repairing tide gates; and developing programs to prevent grease from obstructing sewers. (DEP, 2012)

2. Maximize the use of green infrastructure and other source controls to capture rainfall on impervious surfaces, helping reduce combined sewer overflows and other discharges.

VISION 2020 STRATEGIES

- Commence implementation of the *NYC Green Infrastructure Plan*, which provides an alternative approach to improving water quality through stormwater-management technologies, such as roadside swales and enhanced street tree pits, subject to regulatory approval.
- Build green-infrastructure demonstration projects on a variety of land uses.
- Develop a Green Infrastructure Fund to supply capital and maintenance funds for the incorporation of green infrastructure in planned capital projects.
- Establish the Green Infrastructure Task Force, an interagency partnership to incorporate stormwater management into roadway, sidewalk, and other capital projects and to provide for the maintenance of green infrastructure.
- Develop approved specifications for green infrastructure in commonly used applications.
- Streamline design and permitting processes for the incorporation of green infrastructure in public projects.
- Engage in watershed-level planning to develop annual spending plans for green infrastructure.

ACTION AGENDA PROJECTS

- Complete construction of and monitor green-infrastructure pilot projects that promote more efficient rainwater capture (projects listed on facing page).
- Capture the first inch of rainfall on 10 percent of impervious areas in combined sewer watersheds over 20 years by implementing green infrastructure in capital projects. (DEP/SCA/DCAS/DDC/DOB/DOE/DOT/DPR/EDC/HPD/Law Department/NYCHA/Mayor's Office/OMB/SBS/TGI, 2011+)

3. Restore natural systems to improve ecological productivity, reduce pollution, and provide habitat, recreation, and climate-adaptation services.

VISION 2020 STRATEGIES

- Expand the Bluebelt in Staten Island, Queens, and the Bronx.
- Restore wetlands habitat in and around Jamaica Bay.
- Pilot additional ecological-restoration projects in Jamaica Bay.

ACTION AGENDA PROJECTS

- Mid-Island Bluebelt, Staten Island: Negotiate acquisition of 123 acres at New Creek, South Beach, and Oakwood Beach. (DEP, 2011)

4. Improve monitoring and public awareness of water quality.

VISION 2020 STRATEGIES

- Enhance water quality testing in Jamaica Bay, increasing the number of sampling sites, and monitoring combined sewer overflow (CSO) abatement measures in select tributaries.
- Refine DEP models to include new data on impervious cover and extending predictions to ambient water quality.
- Install signs on the water side and land side of all 422 CSO outfalls, using new signs that are clearer and easier to understand.
- Overhaul DEP's website notification system so that members of the public can check to see where CSOs are likely.

ACTION AGENDA PROJECTS

- Install new CSO outfall signs, enhance CSO website notification, and increase water quality sampling sites. (DEP, 2011)
- Develop comprehensive water use, navigation, and access policy. (Mayor's Office/ DEP/ DOHMH/ DPR/DCP/EDC, 2011)

Waterfront Action Agenda Projects to Improve Water Quality

Continue major upgrades at wastewater treatment plants by investing \$1.6 billion:

- Jamaica Bay, Brooklyn/Queens: Complete installation of nitrogen-control technologies at wastewater treatment plants, reducing nitrogen by 50% over next 10 years. (DEP, 2013)
- Newtown Creek, Brooklyn/Queens: Upgrade Newtown Creek Wastewater Treatment Plant to attain Clean Water Act Secondary Treatment Standards and expand wet weather capacity to 700 million gallons. (DEP, 2013)
- Tallman Island, Bowery Bay, Wards Island, and Hunts Point: Make improvements at wastewater treatment plants, reducing nitrogen discharge into the East River by approximately 40%. (DEP, 2013)

New cost-effective grey infrastructure to manage CSOs and improve waterfront areas:

- Paerdegat Basin, Brooklyn and Alley Creek, Queens: Complete new CSO storage facilities. (DEP, 2011)
- Willets Point, Queens: Break ground on sanitary sewers and outfall controls. (EDC, 2013)
- Coney Island, Brooklyn: Complete design and begin construction of first phase of separate sanitary and storm sewer upgrades. (DEP, 2013)
- Newtown Creek, Brooklyn/Queens: Design and construct aeration system in Lower English Kills to meet DEC water quality criteria. (DEP, 2013)
- Newtown Creek, Brooklyn/Queens: Design and begin construction of separate sanitary and storm sewers within a 60-acre section of the drainage area. (DEP, 2013)
- Gowanus Canal, Brooklyn and Avenue V/Coney Island Creek, Brooklyn: Complete pump station and force main. (DEP, 2013)
- Gowanus Canal, Brooklyn: Complete the upgrade and reactivation of the flushing tunnel from Buttermilk Channel. (DEP, 2013)
- Gowanus, Brooklyn: Design and begin construction of the first phase of high-level storm sewers within a 48-acre drainage area to reduce CSOs in Gowanus Canal as well as street flooding and sewer backups in adjacent neighborhoods. (DEP, 2013)
- Gowanus, Brooklyn: Participate in ongoing reviews of remedial investigation results and feasibility study for EPA's cleanup of Gowanus Canal. (DEP, 2012)

Green infrastructure pilot projects (DEP, 2011):

- Bronx, Brooklyn, and Queens: Monitor effectiveness of constructed "blue roof" pilot projects to minimize runoff impacts.
- Brooklyn and Queens: Complete construction and install permeable pavement pilot projects at municipal parking lots.
- Queens: Monitor stormwater capture tree pits and street design pilot projects.
- Queens: Transform the North and South Conduit Avenues median into a natural water filter and bio-retention area.

Restore the Natural Waterfront: Strategies and Projects

This plan envisions a waterfront in 2020 where wildlife flourishes and natural systems are healthy. Restoring the waterfront's ecological functions will not only advance biodiversity, it will also help clean waterbodies, make shorelines more resilient, and enhance the waterfront as a place for recreation and appreciation of nature.

To realize this goal, the City will pursue the following set of strategies over the next 10 years. To better protect natural areas, the City

will strengthen policies and improve coordination among government agencies at all levels. The City will continue to actively improve the region's ecology by restoring shorelines, wetlands, and coastal forests as well as creating habitat for key species. And it will pilot new restoration techniques and monitor results.

Vision 2020's 10-year strategies are complemented by the *New York City Waterfront Action Agenda*, a set of projects chosen for their ability

to catalyze investment in waterfront enhancement. The City commits to initiating these projects over the next three years and will be tracking progress on an ongoing basis. For each project, the lead agency and implementation year are noted.

Together, these strategies and projects lay out a comprehensive vision for the waterfront and waterways and a plan of action to achieve that vision.

I. Acquire and augment protection of wetland and other shoreline habitat.

VISION 2020 STRATEGIES

- Acquire privately owned wetlands and upland habitats where appropriate and where funding is available. Use plans such as the *NYS Open Space Conservation Plan* and the *Hudson-Raritan Estuary Comprehensive Restoration Plan* as the basis for site selection.
- Consider modification of the Waterfront Revitalization Program to include designation of additional sites of ecological importance. Evaluate areas identified by the New York City Audubon Society, New Yorkers for Parks, New York State Department of State, and the Harbor Estuary Program Habitat Workgroup.
- Pursue the recommendations of the Wetlands Transfer Task Force.
- Assess levels of degradation of currently mapped tidal wetlands and prioritize for protection and restoration by the New York City Department of Parks & Recreation (DPR), provided funding is available.

ACTION AGENDA PROJECTS

- Consider revising the Waterfront Revitalization Program to designate additional sites of ecological importance, such as the Upper Bronx River, Arverne, Plumb Beach, southern portion of the Arthur Kill shoreline, portions of the Raritan Bay shoreline, Staten Island Greenbelt, and Staten Island South Shore Bluebelts. (DCP, 2012)
- Develop a citywide strategy for protection and restoration of wetlands and coastal ecosystems. (Mayor's Office, 2012)
- Complete transfer of 70-acre Arlington Marsh property on Staten Island to DPR (DPR/SBS/EDC/DCAS, 2013)
- Complete transfer of at least 5 additional City-owned wetland properties to DPR. (DPR/DCAS, 2012)

2. Increase scientific understanding, public awareness, and stewardship of the natural waterfront.

VISION 2020 STRATEGIES

- Seek partnerships and funding to support scientific research assessing impacts of in-water construction and efficacy of restoration methods. Projects should be evaluated based on ecological services, biodiversity, and ecological productivity.
- Develop and test innovative designs and materials for in-water structures.
- Work with existing waterfront stakeholders to broaden the stewardship base and inform members of the public about what they can do to improve the health of the waterfront.
- Encourage locally based programs in partnership with community groups, schools, and other institutions that will play an important role in the maintenance and upkeep of the waterfront. Consider establishing an "adopt-a-waterfront" program similar to the adopt-a-highway programs.

ACTION AGENDA PROJECTS

- Seek to identify and secure funding for the Hudson-Raritan Estuary by coordinating with federal and state partners. (Mayor's Office, 2013).
- Identify opportunities to increase public awareness and stewardship of specific waterfront reaches, modeling successful public/private partnerships and working with the Partnerships for Parks Catalyst Program to link new conservation, protection or enhancement efforts with existing organizations and programs. (DPR 2012)

3. Promote ecological restoration that enhances the robustness and resilience of local and regional ecosystems.

VISION 2020 STRATEGIES

- Using the draft *Hudson-Raritan Estuary Comprehensive Restoration Plan (CRP)* as a framework, pursue restoration of a mosaic of habitats that provide renewed and increased benefits from the Estuary. Restoration projects should strive to incorporate multiple Target Ecosystem Characteristics from the *CRP* to achieve the greatest ecological benefit at a single location.
- Concentrate habitat creation and enhancement in protected ecological complexes such as Special Natural Waterfront Areas.
- Seek opportunities to restore and create wetlands.
 - Partner with the U.S. Army Corps of Engineers and other city, state, and federal agencies to prioritize wetlands restoration efforts identified in the *CRP*.
 - Focus ecological restoration projects in regionally significant ecosystem areas, such as Jamaica Bay.
 - Target City-owned wetlands for restoration.
 - Work with all appropriate federal, state, and city stakeholders to create new wetlands in areas where fragmentation has decimated historic habitat complexes.
- Seek opportunities to promote local shorebird population.
 - Continue to monitor and enhance habitat at known nesting sites.
 - Create and expand smaller islands with clean dredged material.
 - Coordinate wetland restoration and preservation in proximity to known nesting sites.
 - Promote local stewardship and appreciation for NYC waterbirds.
- Seek opportunities to create and restore coastal and maritime forests.
 - Engage in coastal and maritime forest creation and restoration in protected coastal areas.
 - Restore upland forests associated with coastal and maritime forests.
 - Collaborate with federal and state authorities to locate and coordinate restoration opportunities.
 - Update citywide soils maps to better inform coastal and maritime forest restoration.
- Seek opportunities to improve habitat for oysters, fish, and other aquatic species.
 - Engage in large-scale oyster reef pilot project and encourage local oysterculture and stewardship. Consider the use of alternatives such as blue mussels.
 - Engage in small-scale eelgrass pilot projects with different site conditions and installation techniques. Continue monitoring pilot eelgrass program in Jamaica Bay and consider expansion.
 - Install in-water habitat structures, such as reef balls and textured bulkheads, outside navigable channels.
 - Remove derelict vessels and degraded bulkheads where feasible.
 - Identify opportunities to install riparian vegetation demonstration gardens as buffers along waterfront parklands and greenways.
 - Cluster complementary habitat creation efforts such as pairing shorebird islands with wetlands.
- Seek opportunities to create and expand shorelines, shallows, and intertidal areas. Recognize the important physical, chemical, and biological services of nearshore habitats and sloping or stepped shorelines.
- Evaluate opportunities to improve tributary connections for aquatic species.
 - Further analyze freshwater streams in New York City to identify potential new connections, such as at the impoundments on the lower Bronx River where barriers could be removed or passage provided.
- Evaluate opportunities to improve water quality in enclosed and confined waters by re-contouring bathymetric depressions using dredged materials.
- Remediate contaminated sediments.
 - Adopt initiatives outlined in the *Regional Sediment Management Plan*.
 - Prioritize contamination hotspots in New York City for remediation.
 - Develop standards for beneficial reuse of clean dredged sediment.

ACTION AGENDA PROJECTS

- Pugsley Creek Park, the Bronx: Complete restoration of tidal wetlands, including excavation work, sand placement, and planting salt marsh grasses. (DPR, 2012)
- Soundview Park, the Bronx: Complete restoration of tidal wetlands, including excavation work, sand placement, and planting salt marsh grasses. (DPR, 2013)
- Paerdegat Basin, Brooklyn: Create Ecology Park by restoring 12 acres of tidal wetland and 26 acres of adjacent upland habitat. (DEP, 2012)
- Marine Park, Brooklyn: Restore White Island, including sand placement, shoreline stabilization, removing invasives, and planting of maritime grasses. (DPR, 2013)
- Jamaica Bay, Brooklyn: Implement marshland restoration projects. Sponsor U.S. Army Corps of Engineers' restoration project at Yellow Bar Hassock. (DEP, 2013)
- Fresh Creek, Brooklyn: Pilot study of ribbed mussel beds, evaluating filtration of nutrients and pollutants. (DEP, 2011)
- Breezy Point, Queens: Study the feasibility of planting 3,000 eelgrass plants. If planting is successful, begin larger-scale project. (DEP, 2011)
- Determine opportunities for large-scale oyster restoration efforts after evaluating the ecological and water quality effects of oyster planting pilot projects undertaken in partnership with the U.S. Army Corps of Engineers, New York/New Jersey Baykeeper, Hudson River Foundation, the New York/New Jersey Harbor Estuary Program, and the Urban Assembly New York Harbor School. (DEP, 2013)
- Plumb Beach, Brooklyn: Complete a study to address long-term impacts of shoreline erosion and potentially execute a project partnership agreement with the U.S. Army Corps of Engineers, National Park Service, and New York State Department of Environmental Conservation. (DPR, 2012)

Improve Government Oversight: Strategies and Projects

This plan envisions a waterfront in 2020 that is more productive, more active, and more accessible. But permitting difficulties, unclear oversight, and a lack of funding are all challenges to making progress on the waterfront.

To address these challenges, the City will pursue the following set of strategies over the next 10 years. The City will improve permitting predictability and efficiency by providing training and guidance to permit applicants, while

working with regulators to better synchronize permit decisions. The City will also improve maintenance and monitoring of City-owned infrastructure. And to address the need for funding for waterfront projects, the City will partner with stakeholders in the region to advocate for greater funding for the Harbor.

Vision 2020's 10-year strategies are complemented by the *New York City Waterfront Action Agenda*, a set of projects chosen for their ability

to catalyze investment in waterfront enhancement. The City commits to initiating these projects over the next three years and will be tracking progress on an ongoing basis. For each project, the lead agency and implementation year are noted.

Together, these strategies and projects lay out a comprehensive vision for the waterfront and waterways and a plan of action to achieve that vision.

I. Improve predictability and efficiency of the permitting process for in-water construction.

VISION 2020 STRATEGIES

- Establish a permitting liaison to assist applicants in filing applications.
- Create a coordinated process, or one-stop shop, for waterfront environmental permits.
- Support integration of coastal zone policies with Clean Water Act regulatory permit actions and clarify Waterfront Revitalization Program policies encouraging “water-enhanced” uses.
- Work with city and state agencies to expedite the review process and to give priority to bulkhead repair and replacement projects in Significant Maritime and Industrial Areas, while continuing to ensure that environmental concerns are addressed.
- Assist maritime businesses in navigating the environmental permitting process to reduce uncertainty.

ACTION AGENDA PROJECTS

- Establish an in-water permitting task force to focus on developing permitting guidance documents, written mitigation policies and standards, a one-stop shop for in-water permitting, and a training program for applicants. (EDC, 2011)
- Develop a wetlands mitigation bank and/or in-lieu fee program to promote more effective mitigation projects. (Mayor’s Office, 2012)

2. With input from stakeholders, establish design guidelines for in-water infrastructure, such as piers, docks, and bulkheads.

VISION 2020 STRATEGIES

- Establish design guidelines and location criteria for “soft” waterfront edges that create habitat for marine life, enhance ecological productivity, facilitate water access, manage stormwater, mitigate flooding, and control wakes.
- Develop new pier and bulkhead design guidelines that integrate ecosystem-enhancing features, such as oyster baskets.
- Design bulkheads and piers with accommodations for getting in and out of the water where appropriate.
- Create design guidelines for piers, docks, and bulkheads with hardware and structural standards that are functional for multiple types of vessels, including recreational boats and historic vessels. Guidelines should cover pier shape, strength, fendering, bollards, water depth, wake protection, railings and rail openings, floats, upland vehicle access, and water, electric, and sewer infrastructure needs. Incorporate the design standards into the Waterfront Revitalization Program and state coastal permitting, where appropriate.
- Support the creation of training, workshops, and courses on high-quality design of waterfront public space for designers, architects, landscape architects, engineers, and planners.

ACTION AGENDA PROJECTS

- Establish a task force to develop design and construction guidelines for in-water structures that minimize negative environmental impacts, ensure structural resiliency, and accommodate vessel tie-up. (EDC, 2011)

3. Ensure that the City adequately maintains City-owned waterfront infrastructure.

VISION 2020 STRATEGIES

- Create a detailed assessment of the condition of all City-owned in-water infrastructure, subject to funding availability.
- Expand on the model of WFMMS to improve the inspection and maintenance of City-owned in-water infrastructure, subject to funding availability.

4. Pursue regional coordination and partnerships on issues of regional significance.

VISION 2020 STRATEGIES

- Cooperate with regional stakeholders where opportunities exist to share information, pursue projects, or jointly seek federal funding for a range of purposes, including transportation, climate resilience, dredging, and ecological restoration.
 - Cooperate with regional partners to utilize the framework of the draft *Hudson-Raritan Estuary Comprehensive Restoration Plan* to guide restoration projects within the region.
 - Collaborate with partners in the NJ-NY-CT region to enhance the use of the waterways for freight movement, passenger transportation, and emergency evacuation.
 - Collaborate with relevant state and local governments and the Coast Guard on managing boat traffic and other means to improve the safety of water recreation and navigation.

ACTION AGENDA PROJECTS

- Seek to identify and secure funding for the Hudson-Raritan Estuary by coordinating with federal and state partners. (Mayor's Office, 2013)

Increase Climate Resilience: Strategies and Projects

Though the most severe effects of climate change are not expected to be felt by 2020, this plan considers steps to take within the next 10 years to prepare for rising sea levels and more intense storm activity associated with climate change.

Building on efforts already under way, the City will pursue the following set of strategies to develop a better understanding of future risks and identify means to reduce these risks. The City will work with communities, scientists, and policymakers to further research into physical

risk-reduction measures and evaluate the effectiveness of these measures to increase New York's resilience. In addition, the City will continue to examine regulations and programs currently in place to reduce flood damage—such as the building code, insurance, and emergency preparedness planning—and explore how to strengthen these tools to meet future climate risks. The City will also continue to engage communities in resilience planning, furthering local efforts by providing information and education.

Vision 2020's 10-year strategies are comple-

mented by the *New York City Waterfront Action Agenda*, a set of projects chosen for their ability to catalyze investment in waterfront enhancement. The City commits to initiating these projects over the next three years and will be tracking progress on an ongoing basis. For each project, the lead agency and implementation year are noted.

Together, these strategies and projects lay out a comprehensive vision for the waterfront and waterways and a plan of action to achieve that vision.

1. Conduct a citywide strategic planning process for climate resilience.

VISION 2020 STRATEGIES

- This process would include outreach to a range of stakeholders; highlight efforts to assess the risks, costs, and potential solutions for building climate resilience; and outline an ongoing, dynamic, risk-based planning process that can take advantage of new information and projections as they become available.

ACTION AGENDA PROJECTS

- Establish a strategic planning process for climate resilience by updating *PlaNYC*. (Mayor's Office, 2011)

2. Develop a better understanding of the city's vulnerability to flooding and storm surge and examine a range of physical strategies to increase the city's resilience.

VISION 2020 STRATEGIES

- Identify resources to promote scientific research and micro- and macro-scale modeling of flood and storm surge risks and potential interventions to inform decisions about coastal management.
- Promote pilot projects to test potential strategies and evaluate their effectiveness in providing coastal protection as well as their beneficial and detrimental effects on aquatic life.
- Create an inventory of adaptation strategies with potential applicability for New York City and evaluate strategies based on a full range of costs and benefits. Options to be considered include the potential strategies identified in this plan as well as additional innovative strategies to be identified through engagement with practitioners.

ACTION AGENDA PROJECTS

- Study best practices for increasing climate resilience to flooding and storm surge. (DCP, 2012)

3. Explore regulatory and policy changes to improve resilience of new and existing buildings to coastal flooding and storm surges.

VISION 2020 STRATEGIES

- Consider changes to the Zoning Resolution to remove disincentives to enhanced flood protection of buildings through freeboard.
- Consider modifications to construction codes to require freeboard for a wider range of buildings.
- Incorporate consideration of projections for climate change and sea level rise into the design standards for infrastructure in waterfront areas.

ACTION AGENDA PROJECTS

- Study urban design implications of enhanced flood protection, and explore zoning and building code changes to promote freeboard. (DCP, 2012)

4. Work with the Federal Emergency Management Agency (FEMA) and the insurance industry to encourage the consideration of more accurate data on current and future risks of flooding and storm surges.

VISION 2020 STRATEGIES

- Explore measures to promote flood protection in areas that may become subject to flooding based on climate projections.

ACTION AGENDA PROJECTS

- Partner with FEMA to update FEMA Flood Insurance Rate Maps to more accurately reflect current flood risks. (Mayor's Office, 2012)

5. Assist with local resiliency planning.

VISION 2020 STRATEGIES

- Provide training to residents in emergency preparedness and response in order to further community engagement.
- Educate residents and businesses about property protection, infrastructure technology, and public/private partnerships.

ACTION AGENDA PROJECTS

- Support coastal communities' efforts to undertake local resilience planning, and improve the dissemination of publicly-available data on the locations of hazardous material storage. (Mayor's Office, 2012)

6. Integrate climate change projections into NYC's emergency planning and preparedness efforts.

VISION 2020 STRATEGIES

- Work with appropriate city, state, federal agencies and stakeholders to incorporate the potential effects of climate change into NYC's *Natural Hazard Mitigation Plan*.
- Analyze future flood and storm surge risks for NYC's *Coastal Storm Plan*.
- Assess how climate change and sea-level rise models may affect critical facilities.

ACTION AGENDA PROJECTS

- Revise NYC's *Natural Hazard Mitigation Plan* to reflect new information—for instance, updated Sea, Lake and Overland Surges from Hurricanes (SLOSH) data—as well as regulatory and policy changes. (OEM, 2013+)
- Revise NYC Coastal Storm Evacuation Zone maps based on updated SLOSH data to identify vulnerable populations. (OEM, 2013)