



NYC Department of Parks & Recreation



Hudson River Park Trust



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Progress on the waterfront and waterways. From left: the new Freshkills Park on Staten Island; Hudson River Park, Manhattan; Jamaica Bay.

## CHAPTER 2

# Achievements on the New York City Waterfront

The first comprehensive waterfront plan, released in 1992, proposed ways to reclaim the shoreline for public access and productive uses. The plan identified four functional categories for waterfront activity: the Natural Waterfront, the Public Waterfront, the Working Waterfront, and the Redeveloping Waterfront. And it organized the waterfront into 22 specific stretches, or “reaches,” and made recommendations for each one. The plan proposed many exciting projects that have come to fruition in the 18 years since the report was published, recommended regulatory changes that have since been implemented, and provided a foundation for waterfront planning and policies.

The 1992 plan laid the groundwork for the revision of the City’s Waterfront Revitalization Program (WRP), adopted by the state in 2002.

The WRP is the City’s formal statement of policies for balancing economic development, natural resources protection, and public access on the shoreline. When a proposed project in the coastal zone requires a local, state, or federal discretionary action, a determination of the project’s consistency with the policies and intent of the WRP must be made before the project can move forward.

In addition to the revisions to the WRP, much has been accomplished in all four of the functional categories identified in the 1992 plan, and achievements in these categories are detailed below. The New York Department of State has awarded more than \$55 million to the City to support the implementation of many of the initiatives of the 1992 *Comprehensive Waterfront Plan*.

Progress has also been made in the conditions of the waterways themselves. As a result, the Department of City Planning has added a fifth functional category, one devoted to the Blue Network. The assessment of the current state of the waterfront and waterways therefore includes advances on five fronts citywide. In addition, communities across New York City have drawn up plans and made concrete improvements to their local stretches of waterfront, and these accomplishments are also touched on here.

## THE NATURAL WATERFRONT

New York has made great strides in protecting, restoring, and enhancing natural resources on the waterfront. Major citywide strategies to improve water quality and promote ecological health have ushered in a new era of environmentally conscious planning, policy, and action.

### Water Quality

New York's waterways are the cleanest they've been in a century (see Figures 1 and 2, page 10). This is primarily due to the City's investment of billions of dollars in water infrastructure, wastewater treatment facilities, and the restoration of natural systems. Since 2002, the Bloomberg Administration has made a larger commitment to maintaining and improving the City's water system than any administration in New York's history. Approximately \$6 billion has been allocated for upgrading the City's 14 wastewater treatment plants (WWTPs), and more than \$1 billion has been invested in reducing combined sewer overflows (CSOs), the mix of excess storm water and untreated sewage that flows into the waterways as a result of heavy rains or snow. CSO investments are projected to reduce CSO discharges by 8.5 billion gallons per year relative to the mid 1990s. Such expenditures are designed to reduce pathogens and protect human health.

Other investments are intended to support fish and wildlife. Excess nutrients from treated wastewater can lead to algal blooms and low oxygen levels that are limiting to animal species. To meet this new challenge, the City has committed \$195 million to upgrade nitrogen-control measures at several WWTPs.

Such traditional "grey infrastructure" solutions have been successful at achieving water quality goals, but the cost of these investments has been significantly increasing and the marginal contribution to the attainment of water quality objectives has been diminishing. To make additional improvements in water quality, the City has adopted a more holistic, sustainable approach. While it continues to make cost-effective improvements in grey infrastructure, the City is creating a network of small-scale "green infrastructure" installations and environmental restoration projects.

The City's green infrastructure efforts build on a rich history of natural solutions to improve



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Richmond Creek Pocket Wetland, part of the Staten Island Bluebelt.

water quality. One stellar example of these natural solutions is the Staten Island Bluebelt, a groundbreaking program that provides ecologically sound and cost-effective stormwater management for nearly one-third of Staten Island's land area by preserving streams, ponds, and other wetland areas. Since the inception of the Bluebelt program in the late 1980s, the City has purchased 325 acres of wetland property. Other natural solutions are being implemented to enhance water quality in Jamaica Bay. The City has reclaimed more than 440 acres of environmentally sensitive land adjoining the Bay since 2002, and has piloted restoration projects that include planting eel grass and reintroducing oyster and mussel beds.

### Ecological Restoration and Preservation

The 1992 *Comprehensive Waterfront Plan* designated three Special Natural Waterfront Areas (SNWAs): Northwestern Staten Island, Jamaica Bay, and the East River-Long Island Sound area. These SNWAs were selected for their large concentration of natural resources, including wetlands and other habitat areas, which are mostly contiguous and buffered from adjacent uses. Through the Waterfront Revitalization Program, the City prioritizes public and private actions in SNWAs that advance the protection

and restoration of ecological systems.

The Department of Parks & Recreation and the Department of Environmental Protection have spearheaded ecological restoration in wetlands, in upland areas, and on the smaller islands of New York. City agencies—in cooperation with federal, state, and local non-governmental partners—have engaged in a range of projects to restore and create habitats over the last two decades. Between 1993 and 2010, the City completed or planned for restoration projects on 69 acres of salt marsh and 18 acres of freshwater marsh. For example, since 1998 Alley Pond Park and Alley Creek in Northwest Queens have been the focus of extensive salt marsh restoration, including CSO abatement, covering approximately 13 acres. In Orchard Beach in the Bronx, more than six acres have been restored through the installation of clean fill and planting of native salt-marsh vegetation. In Brooklyn, salt marsh restoration has taken place along the southern coast, including at Four Sparrow Marsh and on Jamaica Bay. In the Bronx, the Bronx River has been a focus of efforts, with salt-marsh restoration in Concrete Plant Park, forest and upland restoration, exotic invasive species removal, and the installation of in-stream habitat structures including a pilot oyster reef. In Manhattan, the City worked with Randall's Island Sports Foundation to re-



Figure 1: Harborwide Water-Quality Improvements from 1985 to 2009: Summer average for dissolved oxygen in bottom waters, showing increasing oxygen levels.

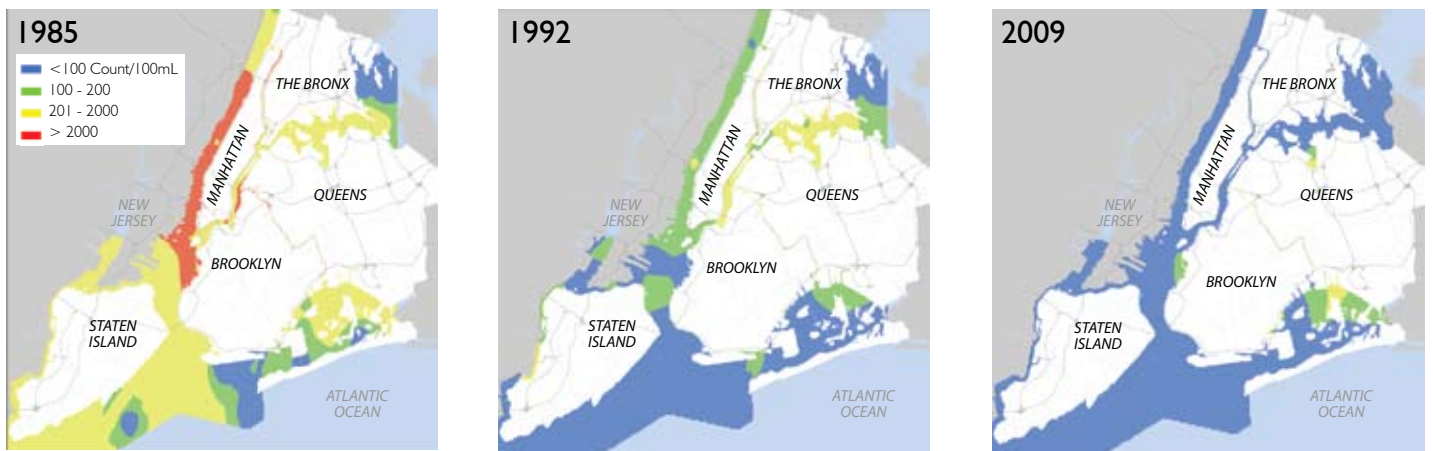


Figure 2: Harborwide Water-Quality Improvements from 1985 to 2009: Summer geometric mean for fecal coliform in surface waters, showing declining bacteria levels.

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store salt marshes and freshwater wetlands on Randall's Island and Ward's Island.

Jamaica Bay has been an active site for both pilot and large-scale salt marsh restoration. The primary technique for wetland restoration employed by the U.S. Army Corps of Engineers here is the "dredge and spray" method, where dredged sediment is layered onto fragmenting marsh, raising the elevation of the land and creating a viable substrate so smooth cord grass can be planted. The New York City Department of Parks & Recreation restored several acres of salt marsh south of the village of Broad Channel in the 1990s. In 2003 the U.S. National Park Service did an experimental restoration of two acres of salt marsh at Big Egg Marsh. Starting in 2006 a partnership of city, state, and federal agencies and the Port Authority of New York & New Jersey started a much more ambitious program, restoring about 32 acres of salt marsh at Elders Point East in that year, and another 28 acres of salt marsh at Elders Point

West in 2010.

In addition to engaging in restoration, the City is preserving land in its natural state. Forever Wild Nature Preserves and Natural Areas are City parklands that are protected from development due to their precious habitat value. Since the program's inception in 2001, DPR has designated 51 Forever Wild Preserves and 26 Natural Areas—many of them on or near the waterfront—including virtually all recorded nesting sites for Harbor Herons in the New York City area.

### Estuary Planning

New York City is not an isolated conglomeration of land and water. It is an integral part of the Hudson-Raritan Estuary. In 1988 the Estuary was recognized by Congress as an estuary of national importance and thus became part of the National Estuary Program. This designation also marked the inception of the Harbor Estuary Program (HEP), comprised of stakeholders

from federal, state, and city governments and non-governmental organizations devoted to improving the environmental quality of the Estuary.

As part of the HEP partnership, the U.S. Army Corps of Engineers and the Port Authority of New York & New Jersey issued a draft of the *Hudson-Raritan Estuary Comprehensive Restoration Plan (CRP)* in 2010. The plan identified critical habitat types and described the sources and extent of contamination by dredged materials, pathogens, excess nutrients, waterborne litter, and stormwater runoff. It also recognized the importance of public outreach and access to natural areas in the Estuary. The CRP is a master plan for ecosystem restoration in the Estuary and is intended for use by all stakeholders.



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Brooklyn Bridge Park is born. Above left: Before construction, the site was an underutilized pier. Right: The new park opened in 2010, with Manhattan views.

## THE PUBLIC WATERFRONT

Since the 1992 *Comprehensive Waterfront Plan*, public access to the shoreline has increased and publicly accessible areas have become much more diverse. There now are approximately 220 linear miles of shorefront parks or publicly accessible waterfront areas—that’s nearly half of the entire shoreline. New greenways, parks, and shorefront walkways have made New York City’s waterfront more active and inviting than ever.

### Greenways

Over the last 18 years, there has been substantial progress towards creating a network of waterfront greenways—multi-use paths along the shore for recreation and non-motorized transport. This progress is the result of ambitious plans as well as investments by New York City’s Department of Parks & Recreation and Department of Transportation. In 1993 City Planning released *A Greenway Plan for New York City* establishing a framework for building a 350-mile greenway system throughout the city. Subsequent plans for individual areas and boroughs followed, such as the 1999 *Bronx River Action Plan*, the 2004 *Manhattan Waterfront Greenway Master Plan*, and the 2005 *Brooklyn Waterfront Greenway Plan*.

Today the greenway network has become much more robust, with many sections of it along the waterfront. For example, the Manhattan Waterfront Greenway now circumnavigates almost the entire island of Manhattan. And

the Brooklyn Waterfront Greenway is rapidly expanding. These greenways provide access to the waterfront, connect waterfront parks, and are enormously popular both for recreation and transportation.

### Waterfront Parkland

New waterfront parks are part of the dramatic transformation of New York City’s shoreline. They are also part of a park renaissance fostered by *PlaNYC*, Mayor Bloomberg’s long-term sustainability plan, which established a goal of having all residents live within 10 minutes of a park by 2030. Waterfront parks vary in size and use, from small street-end parks to large recreational areas, from natural areas such as wetlands and marshes to public beaches. Since 1992, approximately 1,250 acres of waterfront land have been acquired by the City as parkland (see Figure 3).

In the Bronx, the City has acquired nearly 190 acres of parkland on the waterfront since 1992—land that has fostered the creation of new neighborhood parks (like Barretto Point Park) and helped preserve large natural areas (North Brother Island and South Brother Island).

In Brooklyn, more than 320 acres of waterfront parkland have been acquired. Some of this acreage has gone towards the 9.5-acre Brooklyn Bridge Park, part of which opened in 2010, and 169-acre Paerdegat Basin Park.

In Manhattan, nearly 90 acres of new waterfront parkland have been created since 1992, including Riverside Park South, Harlem River Park, and wetlands at Sherman Creek. Hudson River

Park Trust, a city-state initiative begun in the late 1990s, continues to advance the completion of Hudson River Park. Today, this glorious 550-acre riverside park and estuarine sanctuary on the west side of Manhattan—the largest park constructed in the borough since Central Park was created—offers active waterfront recreation, public piers, a waterfront esplanade, and a limited number of commercial uses.

In Queens, 205 acres of new parkland have been created on the waterfront since 1992, including the 46-acre Powells Cove Park as well as numerous sites around Jamaica Bay that are part of the Buffer the Bay program, a joint effort by the Trust for Public Land and the New York City Audubon Society to protect the Bay’s marshland.

On Staten Island, the City has acquired 445 acres of new waterfront parkland, including additions to Conference House Park and Great Kills Park. In 2001, the closing of the Fresh Kills Landfill on the Arthur Kill waterfront enabled planning to begin for the transformation of the landfill into a new public park, construction of

Borough	Acres
The Bronx	187.5
Brooklyn	322.6
Manhattan	88.4
Queens	205.2
Staten Island	445.8
Total Acreage	1,249.5

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Figure 3: Acres of New Parkland Acquired Since 1992 by the NYC Department of Parks & Recreation

which began in 2007. Freshkills Park is one of the most ambitious public works projects in the world—when fully developed it will be 2,200 acres, nearly three times the size of Central Park. It combines state-of-the-art ecological restoration with extraordinary settings for recreation, public art, sports, and programs.

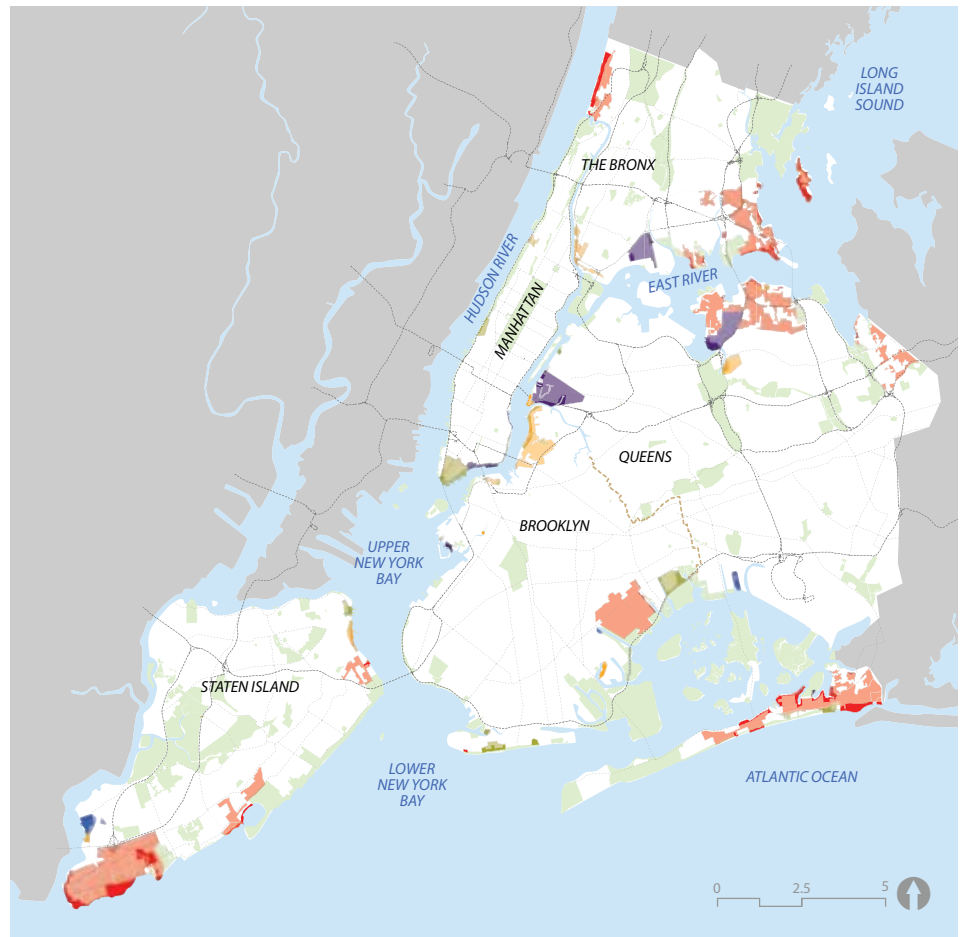
Many new regional parks envisioned in *PlaNYC* are on the waterfront. These include Calvert Vaux Park in Southern Brooklyn, Fort Washington Park in Manhattan, Far Rockaway Park in Queens, and Soundview Park in the Bronx. While none of these projects is completed, design or construction has begun on all of them.

### Public Access on Privately Owned Waterfront Sites

The 1992 plan not only called for more parks and other publicly owned open space on the waterfront, it also envisioned ways to increase public access on private lands undergoing redevelopment. Waterfront zoning was one such mechanism. Enacted in 1993 and modified in 2009, waterfront zoning requires that new residential and commercial developments on waterfront lots provide physical and visual access to the water. This policy has yielded impressive public benefits: Since 1992, public access has been provided on 12 privately owned sites throughout the city, with another six projects under construction, and 16 more approved or planned. When all these projects are completed, they will contribute approximately eight miles of publicly accessible waterfront including public walkways and visual corridors (open areas providing unobstructed views from upland streets to the water).






Waterfront Access Plans (WAPs), innovative zoning instruments created through waterfront zoning, have also been used to increase public access to the shore. These plans, which tailor bulk and public-access requirements to the specific conditions of a particular waterfront area, can be used to ensure the seamless continuity of shorefront public walkways developed over time by multiple property owners. The development of any parcel within a WAP area triggers requirements to build and maintain public access.

The Greenpoint-Williamsburg WAP is part of one of the most ambitious and transformative waterfront rezoning projects to date. It allowed for the coordinated, site-by-site devel-



**Figure 4: Shorefront Rezoning and Other Actions Since 1992**

Shorefront, defined as any area up to the first upland street, is shown on the map in darker colors. Portions of rezonings not within the first upland streets are represented with lighter colors. Subsequent actions that affected upland areas only are not reflected.

	Shorefront Rezoning or Action Type	Acreage
	Residential (higher density) to Residential (Lower Density/Contextual)	1,651
	Non-Residential to Residential/Mixed Use/Commercial	422
	Residential (Lower Density) to Residential (Higher Density) or Commercial (Higher Density) or Text Amendment to Facilitate Residential and/or Commercial	348
	Non-Residential to Commercial, Manufacturing, or Park	315
	Other	193
	<b>Total Acreage</b>	<b>2,929</b>

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opment of an interconnected public open-space network on a two-mile stretch of the Brooklyn waterfront. The WAP was also used to enlarge existing park spaces and require connections to the neighborhood at important locations. It took into account existing and proposed water-

front parks, such Grand Ferry Park and Transmitter Park, and included the mapping of new parkland at Bushwick Inlet.

## THE REDEVELOPING WATERFRONT

The 1992 *Comprehensive Waterfront Plan* held out a tantalizing vision of a shoreline revitalized with new commercial and residential development integrated with public access. The document built on the few successful examples of waterfront redevelopment that existed at the time—Battery Park City, Roosevelt Island, and Pier 17 at the South Street Seaport, for instance—and imagined a future in which such developments would be the rule, not the exception, along selected portions of the shoreline.

Eighteen years later, that vision of a waterfront redeveloped for productive purposes has to a great extent become a reality. Many of the redevelopment sites identified in the 1992 plan now boast a range of uses (see Appendix C, beginning on page 175, for an inventory of the sites proposed for redevelopment in the 1992 plan and their status today). New housing on waterfront property has helped the city accommodate the influx of nearly one million new residents. Since 1992, more than 20,000 new residential units have been built on waterfront blocks, with nearly 6,000 additional new units in the development pipeline. Large waterfront sites have proven receptive to other uses as well. They have enabled national retailers to open large-format stores here, providing New Yorkers with new options for shopping for a variety of goods.

### Rezoning

Rezoning selected areas of shorefront land has enabled redevelopment to take place on the waterfront (see Figure 4, page 12). Since 1992, there have been 70 rezonings and other actions that have affected approximately 3,000 acres of waterfront land. About half of the actions were to facilitate development, through rezoning from non-residential to mixed-use, or from lower to higher-density development. Twenty-five of these actions were contextual rezonings, replacing higher-density residential zoning with lower-density districts to ensure that new development is in keeping with the surroundings.

Brooklyn has had the most waterfront rezonings—19 of them—affecting 560 acres of waterfront. These include several contextual rezonings, such as in Canarsie, as well as rezonings that have increased land available for



Redevelopment under way on the Williamsburg waterfront.

### Greenpoint-Williamsburg Transformation

The *Greenpoint-Williamsburg Land Use and Waterfront Plan*, adopted in 2005, is an ambitious waterfront policy initiative that applies many of the principles of the 1992 *Comprehensive Waterfront Plan* and reflects the 197-a Plans drawn up by those two communities in 2002. The plan rezoned approximately two miles of Brooklyn waterfront for residential use, applying bulk regulations tailored to the special opportunities and constraints of these waterfront areas. The plan also includes provisions for a substantial amount of new public open space through zoning requirements for private developers, and through the creation of a new 27.8-acre public park at Bushwick Inlet and the creation and expansion of other smaller waterfront parks. Groundbreaking Inclusionary Housing regulations were also established that provide incentives for developers to provide new affordable housing.

To date, approximately 2,700 new housing units have been completed in the rezoned area, with approximately 2,900 more in development, including in the upland portions of the area. In accordance with the plan, these developments have already improved public access to the waterfront and provided opportunities for recreation along the water's edge. Two acres of public open space built by private developers are expected to be completed by 2011, and approximately five acres of public parkland are under construction within the rezoned area at Bushwick Inlet Park and Transmitter Park. Private developments include:

- **Northside Piers:** This mixed-use development in Williamsburg is planned to include approximately 900 apartments and 1.5 acres of waterfront public access, including a pier. The first phase of the development opened to residents in 2008. The first two sections of the public space are open.
- **The Edge:** Partially occupied with some portions still under construction, this mixed-use development in Williamsburg is planned to include approximately 1,200 apartments, among them nearly 350 affordable units. It will also provide almost two acres of public open space along the waterfront, including two piers. The first section of public space is expected to be opened in 2011.
- **184 Kent:** This conversion of Williamsburg's historic Austin, Nichols & Company warehouse to approximately 340 rental loft apartments is partially funded with historic preservation tax credits from New York State. The project includes a waterfront walkway connecting to open space north of the site.
- **155 West Street:** Construction of this 640-unit mixed-use development in Greenpoint is expected to begin in the near future. It will provide approximately half an acre of waterfront public access.

residential development. The largest of these rezonings was for Greenpoint-Williamsburg (see "Greenpoint-Williamsburg Transformation," page 13), affecting 127 shorefront acres; it has already stimulated the creation of more than 1,000 new housing units on the waterfront and more in adjacent upland areas.

Seventeen rezonings in Queens have affected 870 acres. Many actions have rezoned land from non-residential to residential, commercial, or mixed-use districts, such as in Long Island City, Hunters Point South, and Downtown Flushing. There have also been several large contextual rezonings in the Rockaways and in North Shore neighborhoods.

On Staten Island, there have been 15 actions affecting waterfront property since 1992. These include many contextual rezonings (such as in Tottenville, Rosebank, and Prince's Bay) and rezonings for higher-density residential development (Charleston and Stapleton).

Twelve rezonings and other related actions have been adopted for the Bronx waterfront, affecting 445 acres, including contextual rezonings (City Island and Throgs Neck) and actions to facilitate redevelopment (Port Morris, Bronx Terminal Market, and Lower Concourse).

Seven actions were in Manhattan, together affecting 265 acres. These actions encompass such projects as Riverside South and the Special Lower Manhattan District, which was enacted to permit limited residential development in an otherwise industrial and commercial area south of Canal Street.

## Brownfield Cleanup

Updating zoning hasn't been the only way the City has facilitated development on the waterfront. Much of the industrial land that has been made available for development through rezoning has impediments, such as residual contamination that is costly and time-consuming to remediate. The cleanup of such contamination is of course a goal in and of itself. Since 1992 the City has made impressive progress in the management and cleanup of brownfield properties, spurring private reinvestment.

With the introduction of *PlaNYC* in 2007, the City took unprecedented steps towards municipal brownfield cleanup. *PlaNYC* set forth 11 initiatives to address brownfield properties—all of which have been enacted. In 2008, the Mayor's Office of Environmental Remediation (OER) was established, and the office now manages



New York Container Terminal on Staten Island.

brownfield identification, research, and cleanup programs. On Earth Day of 2009 the City Council unanimously approved the New York City Brownfield and Community Revitalization Act, authorizing the establishment of OER as a permanent City office as well as the development of the New York City Brownfield Cleanup Program. Mayor Michael R. Bloomberg signed the Brownfield bill into law on May 11, 2009, and the New York City Brownfield Cleanup Program was officially launched in August of 2010—the first municipally run brownfield cleanup program in the nation.

In addition, the City has secured grants from the Brownfield Opportunity Areas (BOA) Program, a New York State program designed to help transform dormant and blighted land. In the latest round of BOA grants in October 2009, nearly \$3 million was awarded to projects in New York City.

## THE WORKING WATERFRONT

While the manufacturing and shipping that once dominated the city's waterfront has shrunk its footprint due to changes in the shipping industry and New York City's economic base, the working waterfront remains a vital part of the city's economy. It provides thousands of well-paying jobs and more than a billion dollars of tax revenue.

At the center of this industry is the Port of New York and New Jersey, the largest port on the East Coast and third largest in the country. The Port handles a large share of the country's international liquid cargo, containerized cargo, and vehicles. The Port sustains and depends upon a wide variety of water-dependent uses and maritime support services.

To remain competitive with other East Coast ports, the City, the states of New York and New Jersey, and the Port Authority of New York & New Jersey have invested in infrastructure to maintain and improve access to and from the Port. In addition, the City has promoted the growth of waterfront industries through policies and incentives.



Dredger on the Kill Van Kull.

## Significant Maritime and Industrial Areas

The 1992 *Comprehensive Waterfront Plan* established a framework for the retention of sufficient waterfront land to accommodate existing—and attract future—industrial, maritime, municipal, and other working-waterfront uses. Through the designation of six Significant Maritime and Industrial Areas (SMIAs), the plan aimed to protect and support working-waterfront uses in locations best suited to these uses. The six areas selected were: the Kill Van Kull area on Staten Island; Sunset Park, Red Hook, and Brooklyn Navy Yard in Brooklyn; Newtown Creek, spanning Brooklyn and Queens; and the South Bronx.

Since 1992, manufacturing zoning has remained in place in all six SMIA, and new investment in intermodal infrastructure has supported these areas for maritime and maritime-related uses. The city's SMIA remain concentrated areas of employment and are growing overall both in number of jobs and firms.

One of the biggest success stories on New York's working waterfront is the renovation and reactivation of Staten Island's New York Container Terminal in the Kill Van Kull SMIA. Closed

in 1986 and reopened 10 years later, the terminal now employs more than 500 people and unloads more than 400,000 containers a year.

The Sunset Park SMIA has had a number of meaningful Port-related improvements since 1992. These include major new leases with the Axis Group and SIMS Municipal Recycling at the South Brooklyn Marine Terminal (SBMT), which will return that facility to productive, job-intensive maritime-dependent use for the first time in nearly 25 years. These leases have led to more than \$100 million in improvements to bulkheads, piers, electric capacity, and rail infrastructure. Related to SBMT's return to productive use is the rebirth of major rail freight activity. In 2000, the NYC Economic Development Corporation reconstructed transfer bridges at the 65th Street Rail Yard, which will allow rail barges to float directly to the facility.

At the Brooklyn Navy Yard, the City invested approximately \$60 million in waterfront projects to retain approximately 200 maritime jobs while maintaining the integrity of 4.5 million square feet of upland industrial space. Since 2001 the City has invested more than \$250 million in basic infrastructure at the Brooklyn Navy Yard, leveraging more than \$400 million

in private investment and creating more than 2,200 new jobs.

## Industrial Policy

In 2005, the New York City Industrial Policy was formulated and resulted in the establishment of the Mayor's Office of Industrial and Manufacturing Businesses and in several new programs. Industrial Business Zones (IBZs) across the city were established where a range of business services and benefits are available for industrial and manufacturing firms. Many of the IBZs are on the waterfront: Eastchester, Zerega, Hunts Point, Port Morris, North Brooklyn, Greenpoint-Williamsburg, Brooklyn Navy Yard, Southwest Brooklyn, Steinway, Long Island City, Maspeth, and JFK. The City is currently working on studies of each IBZ to identify issues and opportunities to improve each industrial area.

## Intermodal Connections

The Port Authority of New York & New Jersey has invested \$600 million in developing rail connections at major container terminals through the ExpressRail program launched in 2007. At Arlington Yards on Staten Island, the recently completed 39-acre on-dock rail facility has five working tracks and provides direct access from the container terminal to the inland freight network.

## Harbor Deepening Project

Trends in the shipping industry favor larger vessels with deeper drafts. With the expansion of the Panama Canal, expected to be completed in 2014, more of the latest-generation ships with 50-foot drafts are expected to reach the East Coast. Shipping channels within New York Harbor range in depth from 35 to 45 feet. The U.S. Army Corps of Engineers and the Port Authority began deepening the Harbor in the mid 1990s to meet industry demand. The Army Corps, along with cost-share sponsors such as the Port Authority and the states of New York and New Jersey, has several construction projects under way to deepen the federal shipping channels in the Harbor to 50 feet. This \$1.6 billion project—which will be completed in 2014—entails 15 construction contracts.

Work is under way in the Kill Van Kull Channel, starting at the Bayonne Bridge and working east, and in the Ambrose Channel. The Ambrose Channel project involves dredging sand from the western side of the waterway and will



provide a one-way 50-foot channel to the rest of the project area. The sand from this project is being used in a variety of beneficial ways including remediation of the Historic Area Remediation Site off the coast of New Jersey and the restoration of marsh islands in Jamaica Bay. The sand is also being used as capping material at Liberty State Park in New Jersey.

### Maritime Support Services

Oceangoing vessels rely on work boats based in New York Harbor to provide bunkering, feeder services, and repair. Most maritime support companies are located along the north shore of Staten Island and Brooklyn. As a result of the *Maritime Support Services Location Study*, conducted by the State University of New York Maritime College in conjunction with the NYC Economic Development Corporation and the Brooklyn Navy Yard Development Corporation and completed in 2007, the City now has a better understanding of this industry's economic impact and growth. The study found that the maritime support industry provides 11,870 direct and indirect jobs in New York City, of which 7,084 are waterborne positions. It also found that the tug fleet in New York City has increased 35 percent since 1991—tugs here now represent a quarter of the total East Coast fleet. The barge fleet here has increased more than 20 percent and is now one-third of the total East Coast fleet. Together tugs and barges keep more than 3.1 million trucks from New York City's roads each year.

### Cruise Industry

The cruise industry, another important part of the waterfront economy, has seen tremendous growth over the last two decades. The liners that come to New York Harbor support New York City's ever-increasing multi-billion-dollar tourism industry, which accounts for thousands of jobs. In 2005 Manhattan's Passenger Ship Terminal began a multi-year overhaul. In 2006, the Brooklyn Cruise Terminal opened in Red Hook.

## THE BLUE NETWORK

The impact of the 1992 *Comprehensive Waterfront Plan* went beyond the shoreline. The redevelopment of formerly inaccessible waterfront areas brought more people to the land's edge, which, in turn, fanned interest in the waterways themselves. At the same time, New York's waterbodies have remained valuable as marine highways for the transport of goods. While the ways in which the waterways are used has shifted over time, the Blue Network is still central to the life of the city.

### Water Recreation

Thanks to improvements in water quality and greater access to the shoreline, recreational use of the waterways has flourished in the past few decades. People can now enjoy boating, fishing, and, in some areas, swimming, throughout the city. Human-powered boating—such as kayaking, canoeing, and rowing—has exploded in popularity. The Metropolitan Waterfront Alliance estimates that 20 new paddling clubs have sprung up in the past decade alone.

The New York City Water Trail now offers 160 square miles of diverse waterways—rivers, bays, creeks, inlets, and ocean—that are accessible to the public for recreation. Intended for kayaks, canoes, and open-water rowing vessels, the trail connects green spaces along the shoreline, including Barretto Point Park, Brook-

lyn Bridge Park, Hudson River Park, Fort Totten Park, and Freshkills Park. Created in 2008 with 28 launch sites, the trail has grown to 40 locations on park and non-park land—and counting. The Department of Parks & Recreation website provides an interactive map showing launch sites and has information on safety regulations.

### Ferries and Water Taxis

As the population and number of jobs in New York City grow, demand for transportation increases. Ferries and water taxis have emerged as an attractive form of transportation, primarily for commuters to Manhattan but also for sightseers. New York City has the largest ferry system in the United States, with 20 routes, 70 vessels, and an annual ridership of 30 million.

The Staten Island Ferry, operated by the NYC Department of Transportation, is the largest provider. Offering free service from Lower Manhattan to St. George on Staten Island, the ferry carries an average of 60,000 riders a day—and annual ridership is growing, with a 10 percent increase in the last three years.

There are also many ferries and water taxis operated by private companies, and these, too, have been growing in popularity, from an average daily ridership of 16,000 in 1992 to 28,000 riders in 2009. Ferries and water taxis have also proven useful as transportation back-ups during emergencies, such as the evacuation of Lower Manhattan after the 9/11 terrorist attacks and the 2003 blackout.



The Red Hook Boaters at Louis Valentino Jr. Pier Park, Brooklyn.

## Emergency Preparedness Efforts

New York's waterways are an important part of the City's strategy for responding to a catastrophic event. The *Area Evacuation Plan*, first completed in 2005, has a guide for conducting a large-scale evacuation using marine vessels. The guide, currently being revised to reflect recent developments on New York's waterfront, has the following objectives: to identify primary and alternative routes, develop strategies for emergency maritime service by coordinating the actions of more than 10 City agencies and private owners/operators, and identify a public messaging strategy. The plan relies on both public and private ferry operators and existing waterfront infrastructure to maximize trips away from affected areas.

As a coastal city exposed to the ocean, New York has always faced risks from severe storms and coastal flooding. The City has plans in place to address a variety of natural disasters that could affect waterfront areas. In 2009 the Office of Emergency Management (OEM) led the development of New York City's *Natural Hazard Mitigation Plan*, which assesses the city's vulnerabilities to coastal erosion, coastal storms, and flooding, and identifies mitigation opportunities. The plan—which represents a partnership among 39 city, state, and federal government authorities, and combines input from the private and public sectors—is the backbone of the City's mitigation program and is updated every five years. The plan provides a strategy to secure and apply federal mitigation funds in New York City.

In 2000, New York City released a *Coastal Storm Plan*—the first citywide plan for hurricane response. As a result of lessons learned from Hurricane Katrina, OEM made major revisions to the plan in 2006 and 2007, and continues to update it on a regular basis. Depending on the size of the storm, OEM estimates that 510,000 to 3 million New Yorkers might have to evacuate and 71,000 to 605,000 residents may need shelter. The *Coastal Storm Plan* would help New Yorkers evacuate the city's coastal hurricane flood zones, seek shelter if needed, and return to their daily lives as quickly as possible following a hurricane. The plan includes strategies for storm-tracking; disseminating information to the public; and evacuating, sheltering, and attending to people with special needs. It also addresses recovery and restoration after a hurricane.



Stuyvesant Cove in Manhattan, completed in 2002.

## Community-Initiated Waterfront Accomplishments

Across the city, communities have envisioned improvements for their sections of the waterfront—and they've made impressive concrete achievements. One of the formal ways to develop a community-based plan is set out in Section 197-a of the City Charter, which authorizes community boards and borough boards, along with the Mayor, the City Planning Commission, the Department of City Planning, and any Borough President, to sponsor plans for the development, growth, and improvement of the city, its boroughs and communities. Once approved by the Commission and adopted by the City Council, 197-a plans guide future actions of City agencies in the areas addressed in the plans. There are nine adopted 197-a plans that contain recommendations for waterfront areas, and many of the goals embodied in those plans have been realized, including the construction of a significant amount of publicly accessible waterfront space.

- Stuyvesant Cove, a 2.8-acre waterfront park, was constructed between East 15th and 25th streets on the East River, based on Manhattan Community Board 6's 197-a plan for Stuyvesant Cove, adopted in 1997. This richly landscaped park, which links sections of Manhattan's East River Esplanade, has plentiful seating, a bicycle path, and an environmental learning center.
- The Red Hook 197-a plan of Brooklyn's Community Board 6, adopted in 1996, set objectives for creating open space. Since then, three projects with publicly accessible spaces on the waterfront have been constructed: the Luis J. Valentino Jr. Park and two privately owned sites, Fairway and Columbia Street Esplanade.
- The 197-a plans of Greenpoint and Williamsburg in Brooklyn (both plans, by Brooklyn Community Board 1, adopted in 2002) called for continuous publicly accessible waterfront, and this goal was reflected in the 2005 rezoning of those communities. In keeping with the Williamsburg 197-a plan, Schaefer Landing, which includes a 0.86-acre public area on the waterfront, has been built; three other privately constructed spaces, covering the waterfront portions of The Edge, Northside Piers, and 184 Kent residential developments, are expected as these developments are completed. Together, these four spaces will add a half-mile of publicly accessible waterfront in the Williamsburg neighborhood.
- On the east side of Manhattan between 60th and 63rd streets, the new Andrew Haswell Green Park is being constructed on a former heliport site, following the recommendations in Manhattan Community Board 8's 197-a plan, adopted in 2006. The Economic Development Corporation and the Department of Parks & Recreation have been working in close consultation with Community Board 8 on this project.
- The two-acre West Harlem Piers Park, located on the Hudson River from 125th to 133rd streets, which opened in May 2009, was strongly supported in Manhattan Community Board 9's 2007 197-a plan.
- Site remediation is currently under way for the 45.8-acre Bush Terminal Piers Park, recommended in the Sunset Park 197-a plan by Brooklyn Community Board 7, adopted in 2009.
- The Manhattan Borough President's Office prepared a 197-a plan, adopted in 1997, which called for a network of continuous publicly accessible spaces on the Manhattan shoreline. A total of 44 linear miles now ring the borough of Manhattan.