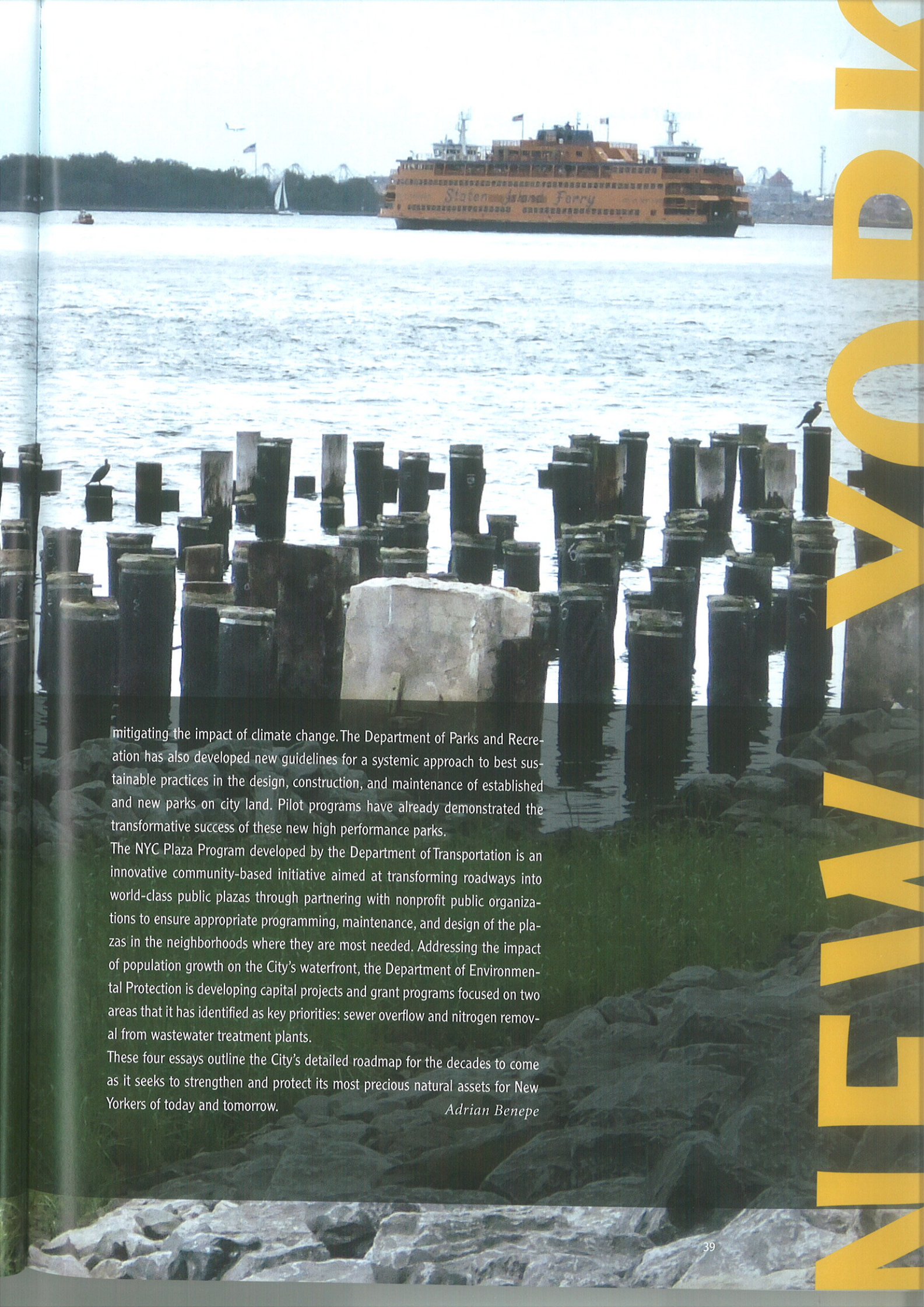


With a keen sense of urgency and opportunity, the City of New York has developed an ambitious strategic vision for the sustainable treatment of its open spaces and waterfront, 520 miles of shoreline accommodating a wide range of uses and supporting a rich diversity of wildlife and ecological systems in need of protection and reintegration into the fabric of the City and the lives of New Yorkers.

Making a concerted effort to pursue the highest level of responsibility in sustainable design and practice, relevant city agencies have contributed to the waterfront plan, Vision 2020: New York City Comprehensive Waterfront Plan, which is itself part of PlaNYC, a goals-oriented plan for ensuring a sustainable future for the City over the next 25 years, launched in 2007 by Mayor Michael R. Bloomberg, to anticipate and enhance the City's response and resilience to climate change and the needs of a growing population. As part of Vision 2020, the New York City Department of Planning will focus, among other initiatives, on creating "soft edges" for the waterfront, green infrastructure, and new zoning guidelines for the waterfront and its structures. In addition, it will be addressing policies on restoring ecological systems and



mitigating the impact of climate change. The Department of Parks and Recreation has also developed new guidelines for a systemic approach to best sustainable practices in the design, construction, and maintenance of established and new parks on city land. Pilot programs have already demonstrated the transformative success of these new high performance parks.

The NYC Plaza Program developed by the Department of Transportation is an innovative community-based initiative aimed at transforming roadways into world-class public plazas through partnering with nonprofit public organizations to ensure appropriate programming, maintenance, and design of the plazas in the neighborhoods where they are most needed. Addressing the impact of population growth on the City's waterfront, the Department of Environmental Protection is developing capital projects and grant programs focused on two areas that it has identified as key priorities: sewer overflow and nitrogen removal from wastewater treatment plants.

These four essays outline the City's detailed roadmap for the decades to come as it seeks to strengthen and protect its most precious natural assets for New Yorkers of today and tomorrow.

Adrian Benepe

PLANNING ON THE WATERFRONT

Commissioner Amanda Burden leads the NYC Department of City Planning in the development of *Vision 2020*, which will strengthen New York's identity as a world-class harbor city for generations to come.

New York City is famous for its dazzling skyline, iconic bridges, glorious parks, and grand avenues. But this global city possesses two other extraordinary physical assets: its waterfront and waterways. New York City's waterfront is 520 miles, the longest and most diverse of any American city, which borders rivers, the Atlantic Ocean, inlets and bays, and encompasses active port areas, residential neighborhoods, wetlands, 14 miles of public beaches, and other natural areas and public open spaces. It is longer than the combined waterfronts of Chicago, Portland, San Francisco, and Seattle.

New York City's waterfront is also home to a maritime industry that supports 31,000 jobs and generates USD\$1.3 billion in tax revenue, as well as 220 miles of public open space for New Yorkers and visitors to enjoy. Boat launches, historic buildings dating back to the 1700s, housing, and natural habitats for hundreds of species of birds and fish are just a sampling of what New York's waterfront has to offer.

Since 2002, the Bloomberg Administration has transformed the City's waterfront. Under the leadership of Mayor Michael R. Bloomberg and City Council Speaker Christine Quinn, 373 acres of waterfront parks have been created, establishing neighborhood destinations such as West Harlem Piers Park in northern Manhattan

and Barretto Point Park and Mill Pond Park in the Bronx. The City has advanced other significant open space projects, including Brooklyn Bridge Park, Governors Island, Freshkills Park in Staten Island, and the Harlem River Park Greenway and East River Esplanade South, both in Manhattan. The NYC Department of City Planning has initiated rezonings in Greenpoint/Williamsburg in Brooklyn, Hunters Point South in Queens and the Lower Concourse in the Bronx that have provided for hundreds of units of new mixed-income housing on the water through the City's Inclusionary Housing Program. Throughout the City, waterfront communities are accommodating a growing urban population.

With these developments, the City has transformed vast stretches of long neglected waterfront land into active, vibrant, and economically productive locations. *Vision 2020: The New York City Comprehensive Waterfront Plan*, released in March 2011 by the Department of City Planning under the leadership of City Planning Commissioner Amanda Burden, builds on these accomplishments and establishes a sustainable blueprint for the City's waterfront and waterways and a framework for action for the next decade. The goal behind *Vision 2020* is to strengthen New York's identity



Kayaking and canoeing are favorite activities in the waterways of New York City, and participants are treated to unique landscapes, seemingly in opposition to the popular conception of the metropolis.



new waterfront areas like those near IKEA in Red Hook, Brooklyn establish new open space for recreation and raise awareness of the vibrant working waterfront of New York Harbor.

as a world-class harbor city and make its waterfront and waterways part of New Yorkers' everyday life.

The plan analyzes every inch of shoreline and presents recommendations for every stretch of waterfront as well as for citywide policies and initiatives. With unprecedented commitment, the City is shifting its focus from land to water – giving planning for the water more focused attention than ever before. The design of waterfront spaces and shorelines is a critical part of achieving the goals of *Vision 2020*, from fully integrating the City with its waterways, to advancing the ecological vitality of the waterfront, and making the City more climate resilient.

Design guidelines for waterfront public spaces.

As New York continues to expand its inventory of publicly accessible open space at the water's edge, it is critical to ensure the design quality of these spaces. Each portion of the waterfront demands design that reflects its own distinctive landscape and character, and all public spaces have to be inviting and accessible to the public. To accomplish this, City Planning has created new zoning and design guidelines for waterfront public spaces. The new zoning, which won an "Excellence on the Waterfront" award from the non-profit educational organization, The Waterfront Center, helps create vibrant and attractive spaces by allowing a greater diversity of experiences through design flexibility.

New York City's waterfront spaces should not be homogenous – they should be diverse, dynamic, populous, inviting, and fun. They should communicate both the City's values and its heritage. The waterfront near IKEA in Red Hook, Brooklyn features displays on the history of maritime industry, while overlooking an adjacent working barge-port – a reminder of the ongoing vitality of the working waterfront.

When designed well, parks and open spaces have the ability to transform whole neighborhoods. The new Lower Manhattan East River Esplanade South, designed by the award-winning team SHoP Architects, Ken Smith Landscape Architects, and HDR/Arup engineers, will enliven the dark spaces under the FDR drive, overcoming this physical barrier and reconnecting neighborhoods with the waterfront for the first time in over 50 years.

To draw people to the water, the waterfront zoning mandates that entrances to upland communities have comfortable seating and a balance of planting and paved areas. To ensure that the public space is well used, it must have a range of features, including a variety of plant species, seating in the sun and shade, tables, bike racks, and trash receptacles. Fences and other barriers are limited and as transparent as possible so that even when the space is closed, the waterfront is still visible.

Where appropriate, to help people get onto – and in some cases, into – the water, boat launches and “get-downs” along the water's edge are encouraged as are dock construction and tie-up space for recreational, educational, or commercial boats. The waterfront needs to be as environmentally sustainable as the rest of the City, if not more so. The guidelines suggest maximizing water-absorption for planted areas to minimize stormwater run-off, by using water- and salt-tolerant plantings in areas subject to flooding and salt spray, and by designing sites that anticipate the effects of sea level rise and storm surges.



Perspectives of the Lower Manhattan South by SHoP, Ken Smith Landscape Arup show a renewed life for the current under FDR Drive and along the East River to the water's edge is essential to this Manhattan with its true boundary – the



to *Vision 2020* is increased use of waterfront spaces as new access points to the water. Active recreation such as jogging as well as more contemplative activities are encouraged in these new spaces. At Barretto Park in the Bronx, an amphitheater-style seating arrangement is placed on a bank sloping down directly to the water.

Design guidelines for in-water structures.

Currently, there are no design guidelines for piers, docks, bulkheads and other in-water structures. By establishing guidelines, the City will be able to better facilitate the permitting process and encourage designs that achieve the goals of *Vision 2020*, such as providing access to the water for various types of vessels, improving water quality, creating habitat, and increasing climate resilience. A task force to develop these guidelines will be created this year.

Vision 2020 recommends these guidelines establish criteria for “soft” waterfront edges that create habitat for marine life, enhance ecological productivity, facilitate water access, manage stormwater, mitigate flooding, and control wakes. The plan also recommends developing new pier and bulkhead regulations that integrate ecosystem-enhancing features, such as oyster baskets. The guidelines should cover the shape and strength of piers, fendering, bollards, water depth, wake protection, railings and rail openings, floats, upland vehicle access, and infrastructure for water, electric, and sewer needs.

The guidelines should also include hardware and structural standards that are functional for multiple types of vessels, including recreational boats and historic vessels. For example, Pier 25 in Hudson River Park in Manhattan includes a town dock, infrastructure for historic vessels, provisions for utility connections for historic vessels and a dockmaster office.

Ecological design. Much of the City’s natural waterfront consists of wetlands, the biologically rich area where water and land meet. Wetlands are foraging and breeding sites for shorebirds, fish, and invertebrates. They act as natural filtration systems, retaining stormwater runoff and trapping pollutants that would otherwise contaminate waterways. And they mitigate storm surges by absorbing the impact of waves. Other parts of the natural waterfront – beaches,

bluffs, and dunes – provide habitat for shorebirds and native plants and help protect buildings and infrastructure from wave action. Submerged lands in shallows and open water are also important foraging and breeding grounds for marine and avian species. All these landscapes are valuable assets, advancing biodiversity and performing services vital to New York City.

Vision 2020 describes several ways of promoting ecological systems on the waterfront and waterways, including environmentally proactive development. Innovative urban design and landscape practices have demonstrated that development does not have to be antithetical to environmental protection. In fact, practitioners, scientists, and policy makers have learned that with creative design and new technologies, development along the water's edge can benefit the natural environment. For example, Harlem River Park's innovative bulkhead design by Parks Department Landscape Architect Ricardo Hinkle with Marcha Johnson steps down to the water through a series of gabions planted with salt marsh grasses. The design creates a larger intertidal zone, an important breeding ground for marine life, such as fish and mussels, as well as reducing the impact of wakes. And at Brooklyn Bridge Park, naturalized "soft edges" attenuate waves, capture stormwater, and provide shallow water habitat.

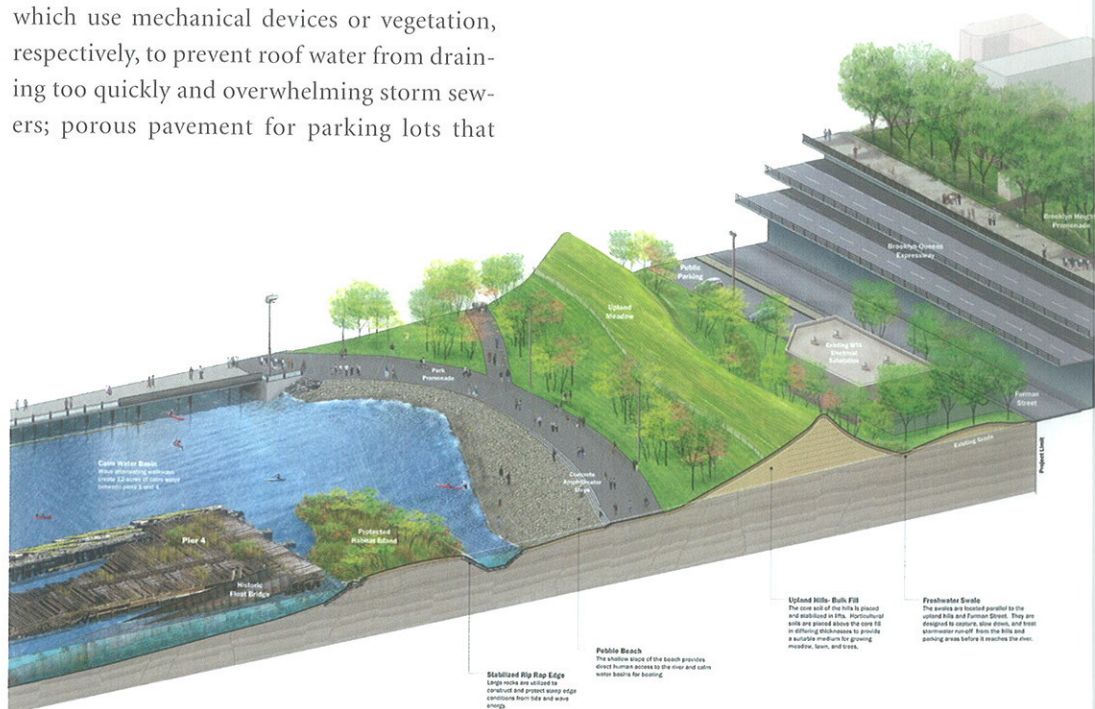
The City is also working to promote ecological systems through restoring the habitat of wetlands, shorelines, and shallows. Working with private groups and state and federal agencies, the City is engaged in many large-scale restoration projects and research to further understanding of how to best manage and improve natural resources. Over the next three years, the City will invest USD\$50 million in waterfront ecological restoration projects.

For example, "oysterculture" has been gaining momentum in recent years as evidence suggests that oysters aid in filtering water and the

restoration of bottom-sea habitats. Many small-scale restoration projects have been undertaken in recent years, but further pilot studies are necessary to fully assess their impact on water quality. The City is going to 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.

Green infrastructure. While continuing to invest in traditional, or grey, infrastructure, the City is also implementing measures to maximize the use of green infrastructure to reduce stormwater runoff and improve water quality. Green infrastructure encompasses cost-effective measures that collect and treat stormwater using natural, passive systems. These measures include blue roofs and green roofs, which use mechanical devices or vegetation, respectively, to prevent roof water from draining too quickly and overwhelming storm sewers; porous pavement for parking lots that

A sectional rendering of Brooklyn Bridge Park by Michael Van Valkenburgh Associates shows the essential relationship between the neighboring expressway, occupiable surfaces and the East River. This sequence of spaces culminates in naturalized edges for ecological benefit.



allows water to seep through and be absorbed into the ground rather than running off into the sewer system; tree pits and street-side swales, or ditches, that allow water to pool in underground holding areas until it can dissipate in the ground or be absorbed by plants; wetlands and swales for parks; and rain barrels in some residential areas. Over the next three years, the City will be investing USD\$180 million in green infrastructure through pilot projects and incorporating these measures into capital projects. In addition to being more cost-effective, many of these green infrastructure strategies provide benefits that traditional grey infrastructure does not, such as cooling the city, reducing energy use, cleaning the air, and increasing property values.

Climate resilience. *Vision 2020* builds on the City's long-range sustainability plan, PlaNYC, to further the City's strategy on building climate resilience. As a coastal city, New York has always faced risks from flooding and storm surges. With climate change, these risks are expected to increase. New York is providing world leadership on facing this challenge. The City is working to reduce its contribution to climate change by reducing greenhouse-gas emissions by 30 percent by 2030. The City is also exploring its climate resilience, the adaptive strategies to increase the City's ability to withstand and recover from weather-related events.

Vision 2020 describes the implications of climate change on the City's waterfront, with its vast waterfront parkland, densely packed high-rises, and active industrial zones. There are nearly half a million people and almost 300,000 jobs in the City's flood zones. One option to build resilience is accommodation: a variety of actions can be employed to minimize damage from flooding and storm surges without completely shielding a facility or site. This involves requiring flood proofing for portions

of buildings located below projected flood elevation in flood-prone areas. In addition, this involves using design to configure streets and open spaces to accommodate controlled flooding, designing such areas with salt water-tolerant plant species and elevated structures that can survive temporary inundation.

Another option is developing protection strategies, including the deployment of structures that protect a building or the shoreline from erosion and block flooding, or reduce the force of storm surges. These strategies often are applied at the building or site scale, though they could also be used to protect an entire neighborhood or reach. Among the many protection strategies, the range of options include building retractable water-tight gates or barriers to shield a single structure and "soft edges," or naturalized, graduated edges, which can be created where possible to reduce the speed and force of tidal action and waves.

Increasing the City's climate resilience will be a long-term project involving many stakeholders over many years. However, there are steps that the City can take in the short-term to begin this process. To expand an understanding of how to make the City more resilient, the City will identify the range of potential measures to protect coastal areas from flooding and storm surges. This includes examining traditional methods of flood protection, such as dikes and levees, as well as innovative ideas, such as artificial barrier islands or reefs.

The City will also be exploring regulatory and policy changes to improve the resilience of new and existing buildings to coastal flooding and storm surges. This could potentially include changes to the Zoning Resolution, construction codes, insurance rates, and design standards for infrastructure in waterfront areas. The first step towards implementing these changes is to study all the applicable urban design implications, and act on them.

All of these design initiatives, along with the many other recommendations and goals of *Vision 2020*, will truly transform New York City's waterfront helping to ensure the health of the City's waterways, the strength of the port, the ecological vitality of natural habitat, the enjoyment of the shoreline, and the economic benefits of public and private investment.

New York City's waterfront and waterways are integral to its identity and its well being. The Bloomberg Administration understands that the waterfront is full of opportunities – it is the City's identity, its connective tissue – and *Vision 2020* will move this agenda forward for generations to come, reestablishing New York City's standing as a world-class harbor city.

The ease of exploration in New York's wild places allows ny to experience nature at a scale that can compare to of the bustling metropolis. *Vision 2020* will secure the of this experience into the future.

