PlaNYC

UPDATE APRIL 2011

A GREENER, GREATER NEW YORK

The City of New York
Mayor Michael R. Bloomberg

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PlaNYC

A GREENER, GREATER NEW YORK

Introduction

Credit: NASA/GSFC/METI/ERSDAC/JAROS, and U.S./Japan ASTER Science Team

Four years ago we asked what we want our city to look and feel like in 2030.

A growing population, aging infrastructure, a changing climate, and an evolving economy posed challenges to our city's success and quality of life. But we recognized that we will determine our own future by how we respond to and shape these changes with our own actions.

We created PlaNYC as a bold agenda to meet these challenges and build a greener, greater New York.

This effort has yielded tremendous results. In just four years we've added more than 200 acres of parkland while improving our existing parks. We've created or preserved more than 64,000 units of affordable housing. We've provided New Yorkers with more transportation choices. We've enacted ambitious laws to make existing buildings more energy-efficient. And our greenhouse gas emissions have fallen 13% below 2005 levels.

Now we must do more.

Today, we put forward an updated plan that builds upon the progress and lessons of the past four years.

PlaNYC complements other City efforts, such as those we are making on crime, poverty, education, public health, or social services.

The Plan focuses on the physical city, and the functionality of its infrastructure in our everyday lives: housing that is too often too expensive, neighborhoods that need more playgrounds, aged water and power systems overdue for upgrade, congested streets and crowded subways. If these challenges remain unaddressed, we will undermine our economy and our quality of life.

Our city's history teaches us that investing in our future is not a luxury, but an imperative. In the 19th century, innovative and ambitious investments in infrastructure like the Croton water system and the Brooklyn Bridge, plus an unprecedented influx of new people, firmly established New York as the nation's leading city. In ensuing decades, the city's dynamism and ability to reinvent itself, exemplified by new investments in subways, skyscrapers, sanitation, and sewers all propelled New York's status as a global leader in infrastructure and innovation.

That's the story of our city, century after century. Times change, but New York City often leads the change. The key to New York's success has always been our leaders' foresight and courage to boldly meet challenges and capitalize on opportunities.

Those are our aims with PlaNYC.


FEDERATED CRANE

New construction in
Long Island City, Queens

Our Challenges and Opportunities

For New York to thrive, we must accommodate a growing population, invest in and maintain our infrastructure, enhance our economic competitiveness, and improve the quality of our air and water, while reducing our contributions to climate change and preparing for its effects.

Growth

New York City's population is still growing. By 2030 we project that our population will increase to more than 9 million, some newcomers and some who are already here, along with their children and grandchildren.

This growth, if properly planned for, offers tremendous opportunities. New people bring new ideas and innovation to our economy. Growth can enrich our communities and add to the energy and diversity of our city. But unplanned growth—development in places that don't make sense and that out-strips the capacity of public infrastructure—can burden our city and harm everyone's quality of life.

As we plan for a growing population, we must think not just of our quantitative goals but also of our qualitative desires. While we build more capacity in statistical terms like housing units and subway mileage, we must simultaneously realize our task is to preserve and maintain neighborhoods that people want to live in, or where they can start new businesses. As New York City gets bigger, it's up to us to make sure it gets better as well.

Infrastructure

Serving our people, attracting and supporting innovation and entrepreneurs, and preparing our city for the effects of climate change requires a visionary approach to the design, financing, and maintenance of our shared physical space and infrastructure.

From the subways we ride on, to the pipes that deliver our drinking water, to the power lines that bring electricity into our homes and offices, we rely on an inherited array of invaluable infrastructure to meet our basic needs. The New Yorkers who built these systems looked beyond the short-term and planned for a city that could outlast its challenges and continue to prosper beyond their own lifetimes. We must have equal foresight.

Today, in some respects, we are living on the limits of our inheritance. With ridership at its highest levels in half a century, our subways are increasingly jammed. Our bridges, some over 100 years old, are in need of repair, or even replacement. Our water system, continuously operating since it was first turned on, is leaking and in need of maintenance. Our energy grid, built with the technology and demand assumptions of an earlier era, strains to meet modern needs.

For much of the second half of the 20th century, New York did not take care of what it had inherited. The city was widely believed to be in decline and the City failed to adequately invest in new infrastructure or maintain the existing assets we depend upon. We have learned that prophecies of decline can be self-fulfilling and so, despite the recession, we have chosen to renew our investment in our civic assets in order to increase opportunities and build a greater city now and for the future.

New Yorkers deserve to be able to turn the tap and have pure water come out, and flip a switch and be confident the lights will come on. They deserve to ride a frequent, reliable subway, the ability to stroll to a nearby park, or safely walk their children to school without the hazards of traffic. They deserve to live in the greener, greater New York that is the goal of PlaNYC.

The new Willis Avenue Bridge being transported up the East River

Credit: AP Worldwide Photos/Seth Wenig

Credit: NYC Economic Development Corporation

A Global Economy

New York has always been a place of promise and possibility, a place where people go in search of a better life. The millions who come to our city arrive with the capacity for hope and hard work.

And, as a result of their efforts, New York City has become an epicenter of global commerce, attracting the best talent from around the world.

New York can still attract talent and the prosperity that comes with it. But today's mobility of people and capital has created a fierce competition among cities. We're competing for the best ideas and the most capable and highly-trained workforce. To thrive economically, we must create a setting where talented entrepreneurs—and the businesses they grow—want to be.

One of the fundamental prerequisites for creating that business climate is functional, cost-effective infrastructure: a transportation system that gets goods to and from market and commuters to and from work efficiently, and energy systems that businesses and households can rely on.

Another of the fundamentals is quality of life, no longer a vague nicety but a tangible feature that business leaders consider when deciding where to locate or expand: where do talented workers want to live, in an age when they can choose to live anywhere? They don't consider great parks or clean air to be a frill.

The economic implications of sustainability become even more important in periods of dynamic change. As technology changes, energy prices fluctuate, and climate conditions change, economic opportunity will come first to those cities that are leading the way to the adoption and commercialization of new services and infrastructure suitable for new conditions. PlaNYC's emphasis on innovation and the application of new techniques to difficult problems will help keep the city's residents and businesses in the role of global economic leaders.

Waterfront parks
ringing Lower Manhattan

Climate Change

Our climate is changing. Temperatures are increasing, glaciers are receding, oceans are rising, and storms are intensifying. We must acknowledge the risks posed by climate change and accept our responsibility to address them. This includes our own readiness, guided by science.

Climate change poses acute risks to our city. By 2030, average temperatures could rise by as many as three degrees Fahrenheit in New York City. Hotter temperatures will increase public health risks, particularly for vulnerable populations such as the elderly, and place further strains on our infrastructure. Our city is more affected by rising temperatures than the rest of the region because urban infrastructure absorbs and retains heat. This phenomenon, known as the "urban heat island effect," can cause temperatures in New York City to be seven degrees Fahrenheit warmer than the surrounding suburbs.

As a city with 520 miles of coastline, we are also at risk of increased flooding as sea levels rise and storms become more intense. Our sea levels have already risen a foot in the last 100 years and are projected to rise by up to 10 inches more in the next two decades. Some of our homes, businesses, and infrastructure like streets and power plants will be further exposed to hazards.

The challenge of climate change for New York City is two-fold; we must reduce our contribution to global warming and we must prepare for its inevitable effects. We are taking steps to address both needs.

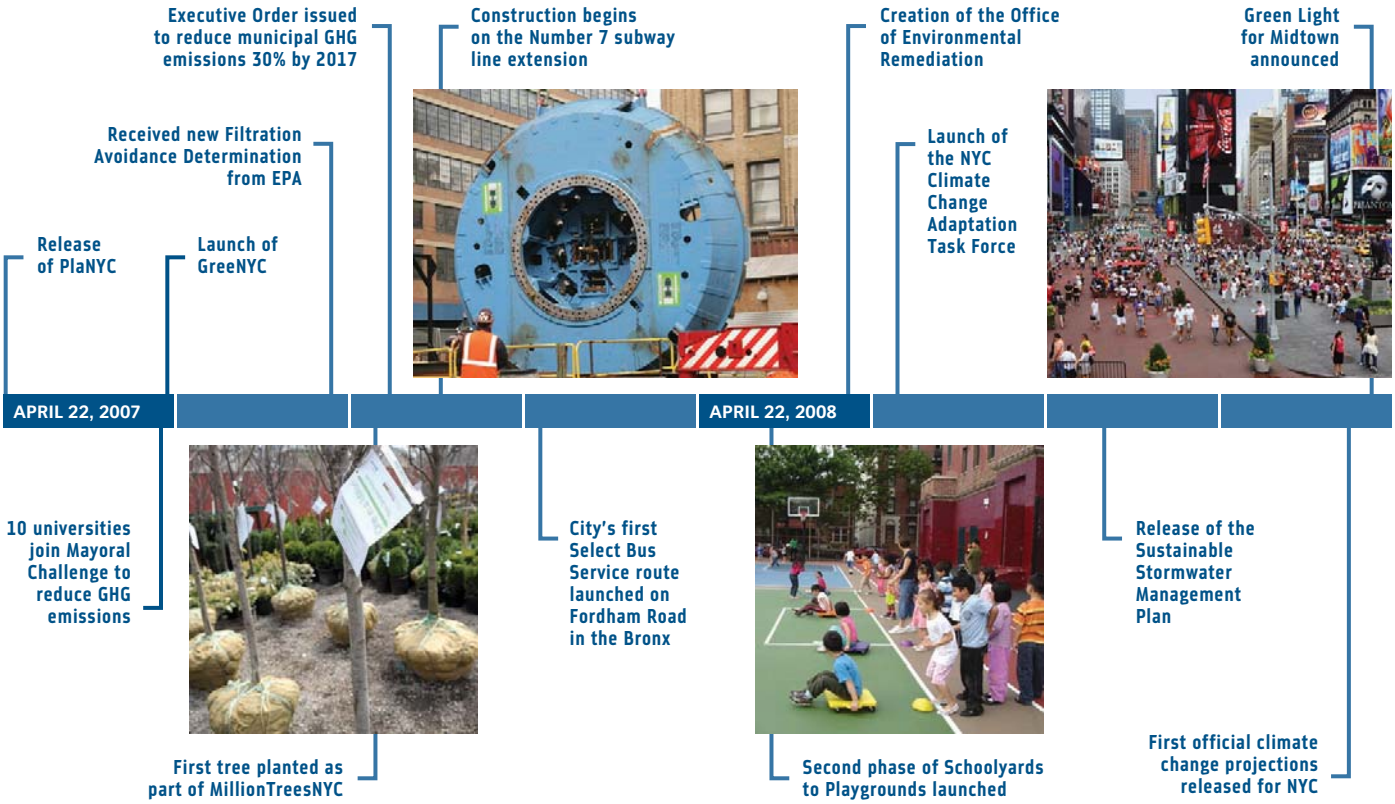
New York City already has one of the lowest per capita greenhouse gas (GHG) emissions levels among major global cities, one-third the U.S. average, due to our density and reliance on mass transit. In 2007 we set a goal to reduce our GHG emissions by more than 30% by 2030 compared to 2005 levels. A series of actions have yielded significant progress toward this goal. We also launched a comprehensive effort to understand our climate risks and take concrete actions to reduce the vulnerabilities we identify.

But we must do more if we hope to slow the rate of climate change and protect our city from the changes already occurring.

No city can solve this challenge alone. Nor can any of us afford to wait. New York has always pioneered the development of answers to pressing problems. It is incumbent on us to do so again, rising to the definitive challenge of the 21st century.

Highway flooding from intense precipitation

Credit: NYC Office of Emergency Management

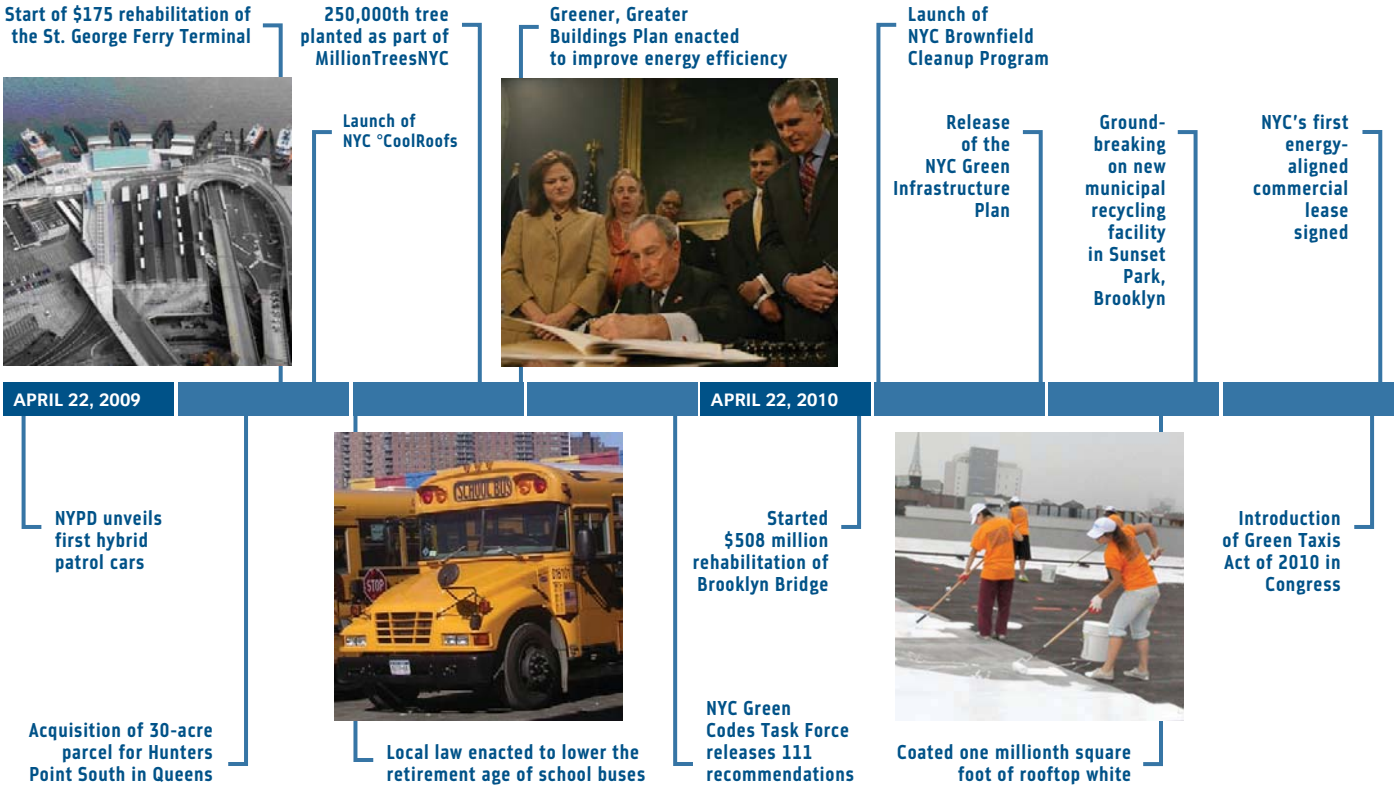


Our Progress

Released in 2007, PlaNYC was an unprecedented effort to prepare for one million more residents, strengthen our economy, combat climate change, and enhance the quality of life for all New Yorkers. The Plan brought together over 25 City agencies to work toward the vision of a greener, greater New York. While our long-term goals will not be met for many years, we are on schedule toward most of them and launched 97% of the 127 initiatives in the 2007 Plan, as documented in annual progress reports.

We've made smart and innovative investments in our infrastructure, which will help us accommodate future growth and better meet the needs of present-day New Yorkers. In just four years, we've created or preserved over 64,000 units of housing. We've completed over 20 transit-oriented rezoninings so that more than 87% of new development is transit-accessible. We've embarked on a new era of parks construction, bringing over 250,000 more New Yorkers within a 10-minute walk of a park. We've launched the city's first bus rapid transit system and committed $1.5 billion for green infrastructure to clean our waterways. We've planted nearly half a million trees. We're making unprecedented investments in our drinking water supply network.

Over 30% of the yellow taxi fleet is now "green," reducing emissions from some of our heaviest-used vehicles. We've enacted regulations to phase out dirty heating fuels, which are responsible for more pollution than all of the cars and trucks on our streets. We've streamlined the process to remediate brownfields, reducing the average time it takes to begin a cleanup of our city's most polluted plots. We've created public plazas for pedestrians, including one in Times Square, the "crossroads of the world," that are attracting tourists and New Yorkers alike. Pedestrian fatalities are down. We've completed over 100 energy efficiency retrofits



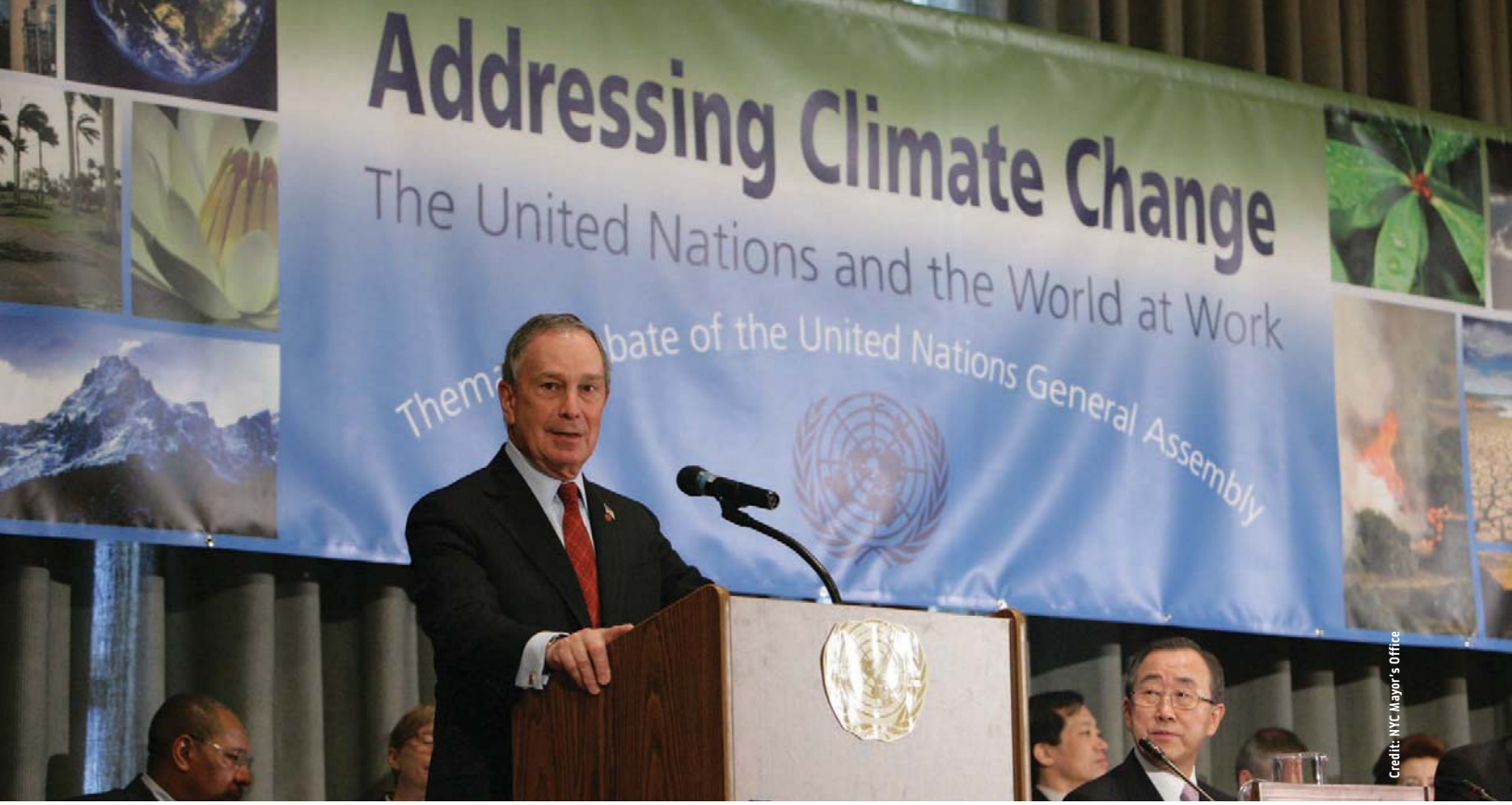
on City-owned buildings as part of our commitment to reduce City government greenhouse gas emissions 30% by 2017. Working with the City Council, we've enacted landmark green building legislation that will have the equivalent impact of making a city the size of Oakland, CA carbon neutral. And we've launched one of the most comprehensive efforts of any city in the world to increase our resilience to climate change.

These actions are having a direct positive impact on the lives of New Yorkers, as well as reducing our greenhouse gas emissions.

At the same time, we have encountered obstacles to achieving some of our goals. Our efforts to maintain, improve, and expand the transit network have been stymied by the lack of a stable, sufficient, and rational funding source. Congestion continues to clog our streets, costing us all money measured in time, wasted fuel, and dirtier air. The global recession has forced us to reduce our capital budget; and as a result we have delayed some PlaNYC projects. Several initiatives have also been slowed by a lack of state or federal permission, action, or funding. But we remain resolved toward our long-term goals.

While we have made great progress, much work remains.

When PlaNYC was first launched we recognized that we didn't have all the solutions to the challenges we faced. We also knew that the city would face additional challenges in the years ahead. That's why we're updating PlaNYC now, four years after its initial launch. This update is a reaffirmation, not a redirection, that includes modifications and additions that do not significantly alter our overall trajectory.



Our Way Forward

We have been explicit and accountable in stating goals and measuring progress toward them. But truly achieving our goals will require the active engagement and involvement of all New Yorkers, not just City government. Thousands of community-based organizations and individuals are already working to enhance the sustainability of our neighborhoods: the Bronx River Alliance is helping clean up the Bronx River; the Staten Island Greenbelt Conservancy encourages children to engage with nature; and the Brooklyn Waterfront Greenway organization promotes the ability to walk or bike along the harbor.

Neighbors are also coming together to create plans to make their own blocks or neighborhoods more environmentally sustainable, like the Sustainable Flatbush effort in Brooklyn to promote energy efficiency and recycling, or the Lower East Side Ecology Center in Manhattan, which organizes community composting and education. These examples are illustrative of hundreds of other groups with diverse interests and different geographic roots, sharing one thing in common: they care enough to work to create the greener, greater neighborhoods that will compose a greener, greater New York.

We will encourage and support these efforts while inspiring more New Yorkers to join with us.

In the meantime, while we're doing our part in Red Hook and Hamilton Heights, the eyes of Rotterdam and Hong Kong are on us. In November 2010 Mayor Bloomberg was selected as Chair of the C40 Cities Climate Leadership Group, a network of 40 of the largest cities in the world whose leaders are dedicated to reducing greenhouse gas emissions. C40 cities, including 18 smaller, affiliate cities, account for approximately 21% of the global Gross Domestic Product. Nearly one out of every 12 people on Earth lives in or near their city limits. Those cities' selection of our Mayor as the leader of C40 is a recognition of the pace that New York City is now setting. It also represents an opportunity to learn from these sister cities. Ideas about bus service improvements from Curitiba might be put to use in Canarsie, and parks reforestation techniques from Melbourne might be transplanted to Middle Village.

Global challenges and neighborhood challenges truly are linked. We all have a role to play and a responsibility to act. The City of New York takes its responsibility seriously. Just as generations before us rose to the challenges they faced and bequeathed this great city to us, so shall we to the next generation. Striding toward the future, we will create a greener, greater New York.

Our goals for achieving a greener, greater New York

Housing and Neighborhoods

Create homes for almost a million more New Yorkers while making housing and neighborhoods more affordable and sustainable

Parks and Public Space

Ensure all New Yorkers live within a 10-minute walk of a park

Brownfields

Clean up all contaminated land in New York City

Waterways

Improve the quality of our waterways to increase opportunities for recreation and restore coastal ecosystems

Water Supply

Ensure the high quality and reliability of our water supply system

Transportation

Expand sustainable transportation choices and ensure the reliability and high quality of our transportation network

Energy

Reduce energy consumption and make our energy systems cleaner and more reliable

Air Quality

Achieve the cleanest air quality of any big U.S. city

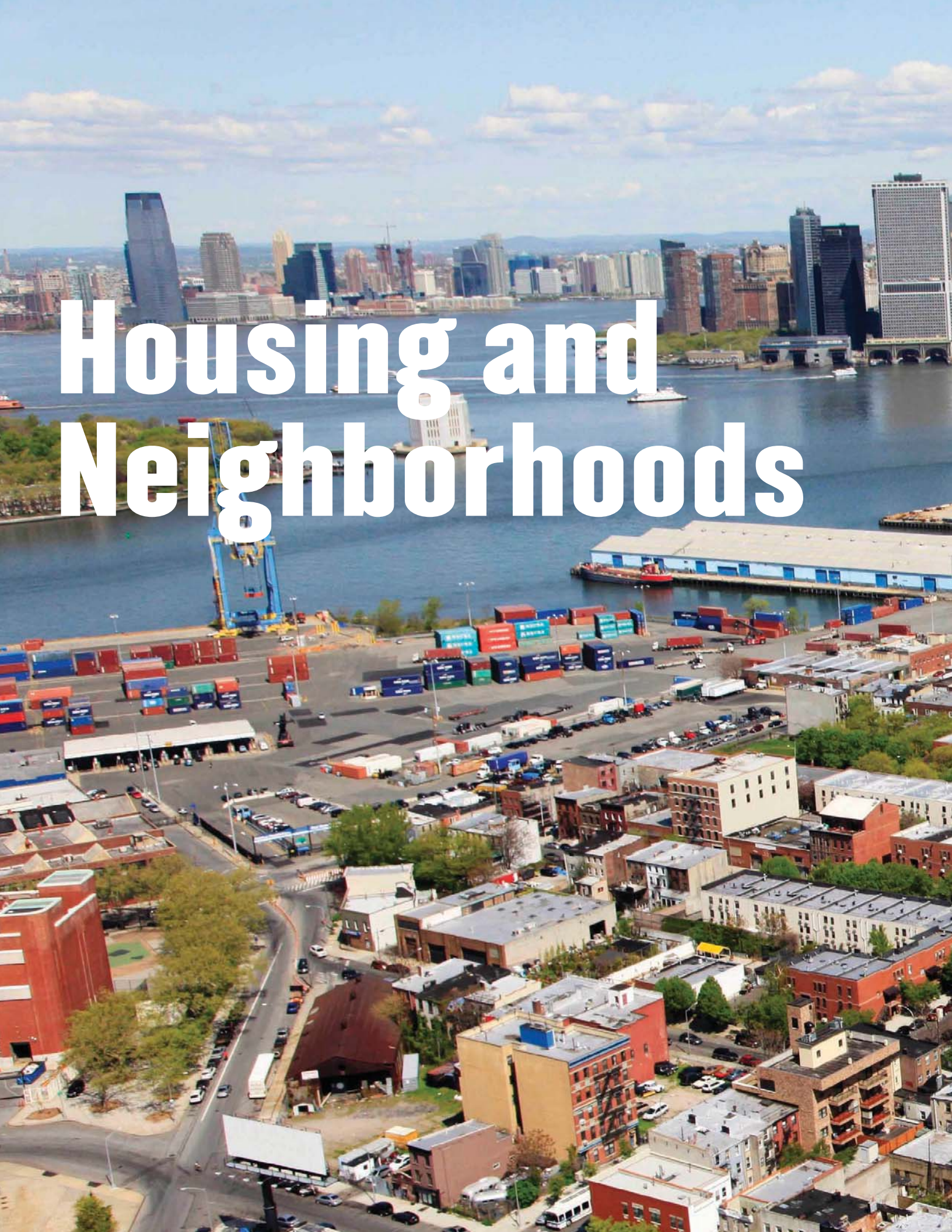
Solid Waste

Divert 75% of our solid waste from landfills

Climate Change

Reduce greenhouse gas emissions by more than 30%

Increase the resilience of our communities, natural systems, and infrastructure to climate risks



Housing and Neighborhoods

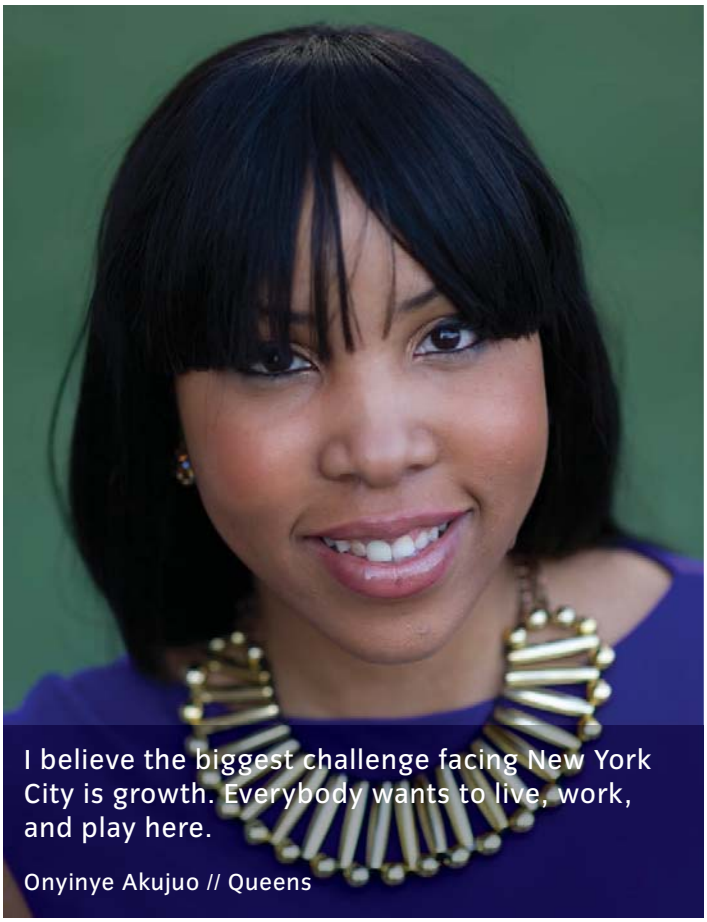
Credit: AP Wirephoto/Photos/Mark Lennihan

Together we can

Create capacity for new housing

Finance and facilitate new housing

Encourage sustainable neighborhoods



I believe the biggest challenge facing New York City is growth. Everybody wants to live, work, and play here.

Onyinye Akujuo // Queens

This is a city of neighborhoods where dynamism, diversity, and enterprise come together. You have people from 192 countries that make New York City their home. These neighborhoods become this beautiful mosaic of the world.

Rahul Sur // Manhattan

Just realizing that a small group of people could band together to make their own change in their own environment and their own neighborhood. That's the gateway for me to explore the power of community organizing as it relates to the environment in the city.

Nathan Storey // Brooklyn

I think that low-cost housing for families earning $40,000 or less is the number one thing many neighborhoods in the city need. People come to [Queens Community House] on a regular basis and say, 'My rent is too high. I can't afford it anymore. I need a cheaper apartment. Where do I go?'

Anna Dioguardi // Queens

Housing and Neighborhoods

Create homes for almost a million more New Yorkers while making housing and neighborhoods more affordable and sustainable

By 2030, New York City will be home to over nine million people—nearly one million more people than lived here in 2005.

As we prepare for the challenges and opportunities that will come with population growth, we must set our goals beyond just increasing the number of housing units—which will continue to be a major focus for the City. We must also create and maintain sustainable, affordable neighborhoods. We recognize that strong neighborhoods are among our greatest assets. Each neighborhood has its own distinctive character, history, and culture; maintaining this diversity plays a vital role in the continuing health of the city.

To accommodate a growing economy and population within our fixed boundaries, we face challenging decisions about how to invigorate neighborhoods, and provide opportunities for a range of housing, in ways compatible with the existing surroundings. Increased population density can generate tangible benefits for neighborhoods, but can also provoke valid concerns about potential impacts of new development.

For most of the 20th century, housing growth followed the expansion of the subway system. Mass transit allowed residents to disperse to lower-cost land on the edges, while giving them easy access to the jobs concentrated at the center.

In the latter half of the century, though, this pattern became even more dispersed. The percentage of New Yorkers living within a half-mile of transit decreased, as many of our neighborhoods with the best subway access either lost population or experienced only modest growth. Development accelerated in parts of the city that depend more heavily on cars.

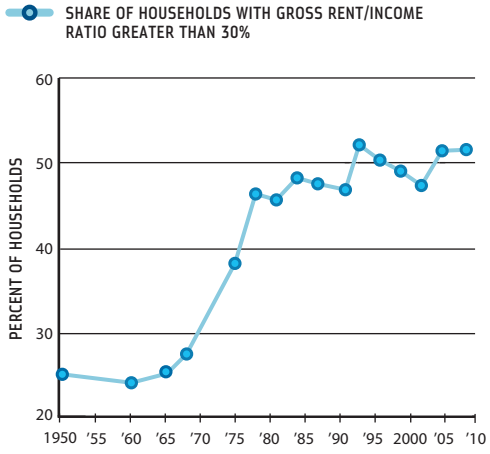
Although this expansion helped create a diversity of neighborhoods and lifestyle choices, continued growth in car-dependent areas poses significant challenges. Encouraging growth in more transit-oriented neighborhoods helps stem congestion on our roads, protect our air quality, and lower our global warming emissions.

The primary tool we have to accomplish this shift is zoning, a type of regulation that governs the use, bulk, and density of development in the city. By increasing allowable densities at appropriate locations in areas of the city near transit, and decreasing them in more auto-dependent areas, we can direct growth to more transit-oriented parts of the city.

Providing housing opportunities near transit is fundamental to building greener, greater neighborhoods—and, therefore, a greener, greater New York. Mixed-use communities with a variety of employment opportunities and local retail and services, including access to healthy food within walking distance of residences, are increasingly desirable. We must use resources like energy, water, and construction materials more efficiently as well as ensure that residents have access to clean air and ample public spaces like parks and plazas. And we must encourage mixed-income communities that provide a variety of housing choices available to households at a range of incomes.

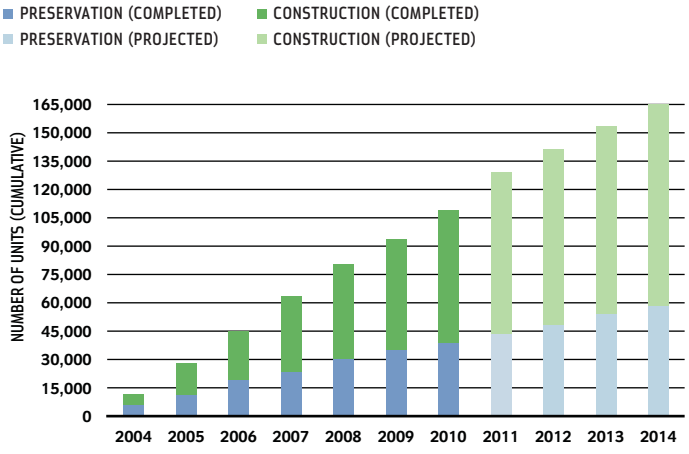
The need to create and preserve affordable housing continues to be a priority across the city. Increasing the affordability of housing for New Yorkers is directly connected to increasing the supply of housing. When supply cannot keep up with the demands of a growing population, housing becomes less affordable as residents bid higher to live in existing units. As sites available for new development become scarcer, the land price component of housing costs rises, which further increases the cost of new housing. To ease this scarcity premium, we can continue to increase the zoned capacity in areas where additional development can be supported, and shift capacity from inappropriate to appropriate locations.

Rent-Burdened Households In New York City



Source: U.S. Census Bureau Housing and Vacancy Surveys

Units of Affordable Housing Created or Preserved under the New Housing Marketplace Plan



Source: NYC Dept. of Housing Preservation and Development

Making housing more accessible and affordable to New Yorkers requires more than increasing the overall housing supply. New market-rate housing generally serves higher income levels. While new inventory generally relieves pressures on costs in the long run, housing currently is too expensive for many New Yorkers. Over half of households spend more than 30% of their gross incomes on housing costs, and only 64% of apartments are affordable to a median income New Yorker. We must employ targeted programs geared toward creating new affordable housing units and preserving existing ones, in addition to increasing housing supply. Without action from the City, there will continue to be fewer options for many New Yorkers.

Since 2007, we have made significant progress in overcoming these diverse challenges. As part of a program of 109 comprehensive neighborhood rezonings dating back to 2002, we have created new housing opportunities in areas better served by transit, while limiting growth in auto-dependent areas and preventing development that would undermine the livability of neighborhoods. Already, these rezonings have helped to shift our growth toward transit-supported options. While roughly 70% of the city's population lives within a half-mile of transit, over 87% of new housing starts since 2007 have been within a half-mile of transit.

Furthermore, we have implemented targeted affordability programs aimed at low- and middle-income New Yorkers through Mayor Bloomberg's New Housing Marketplace Plan, launched in 2003. In 2010, the plan was updated to address the challenges and opportunities of the current housing market. We will strengthen neighborhoods by preserving the investments we have made in the past, expand the supply of affordable housing, and stabilize families. Although a decline in the real estate market has shifted our focus more toward preservation, we have remained committed to creating housing as well.

Despite the current downturn in the housing market, the City has continued to make substantial investments in affordable housing. Since 2004, we have created or preserved 110,000 units of affordable housing. We remain committed not only to creating and preserving a total of 165,000 units of affordable housing by 2014, but also to making the housing built or rehabilitated by the City more energy efficient and, therefore, more affordable.

Despite these achievements and commitments, we have more to do. In planning for the city's growth, we must recognize that we will only create a greener, greater New York if we are a city of greener, greater communities. We must also recognize that we can't meet this goal on our own. A majority of the new units will be built by private developers. And we must empower communities to develop and implement neighborhood-specific solutions to the challenges they face. By providing local partners with technical, financial, and regulatory assistance, we can foster greener, greater communities. In doing so, we will create a healthier, more equitable city, block by block, neighborhood by neighborhood.

Our plan for housing and neighborhoods:

Create capacity for new housing

1 Continue transit-oriented rezonings
2 Explore additional areas for new development
3 Enable new and expanded housing models to serve evolving population needs

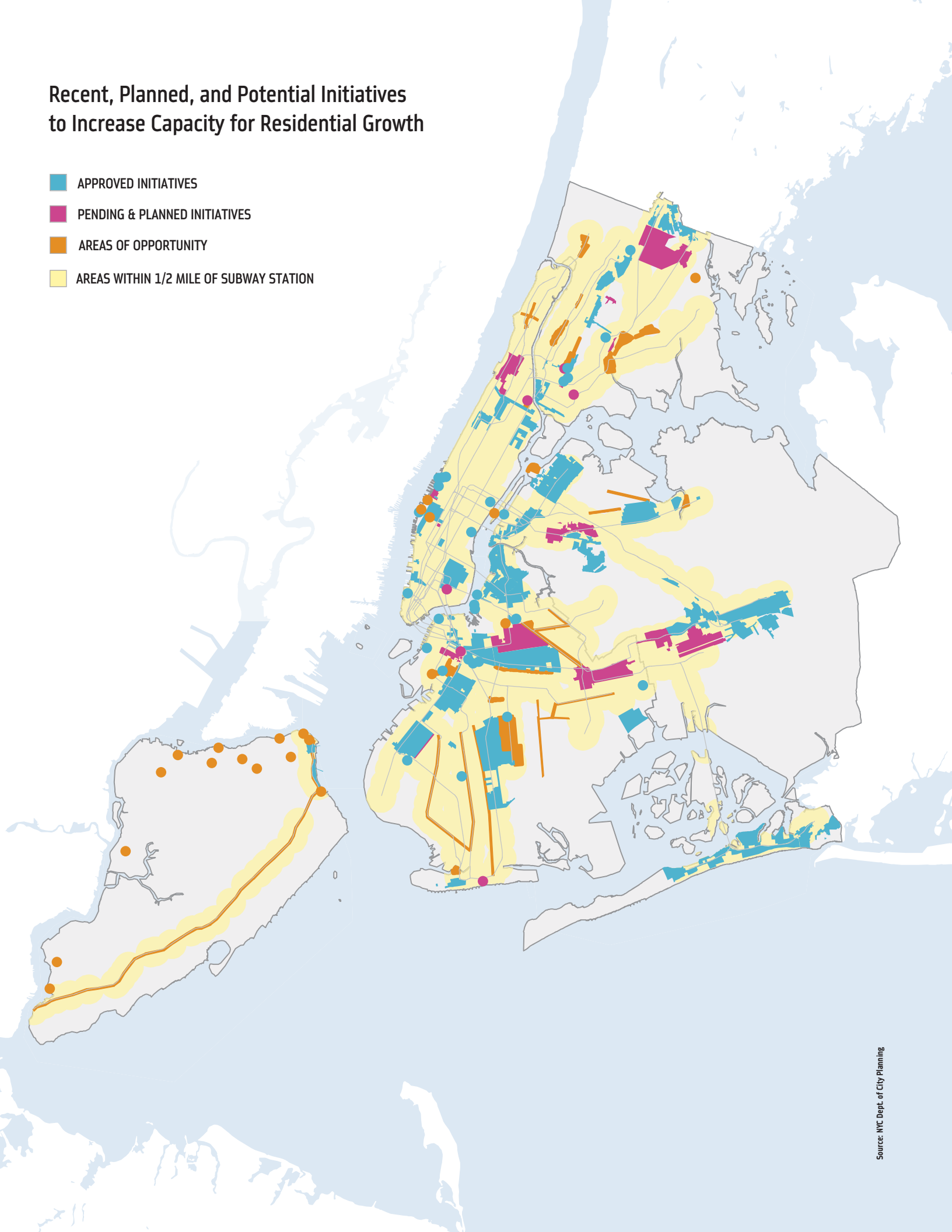
Finance and facilitate new housing

4 Develop new neighborhoods on underutilized sites
5 Create new units in existing neighborhoods
6 Develop new housing units on existing City properties

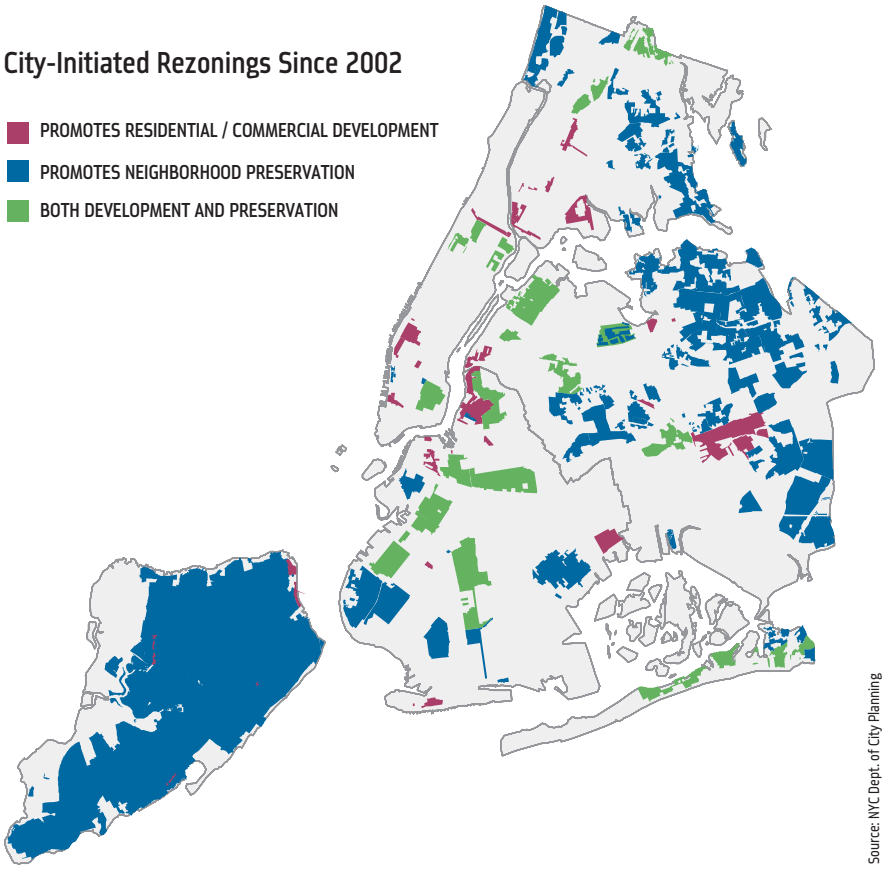
Encourage sustainable neighborhoods

7 Foster the creation of Greener, Greater Communities
8 Increase the sustainability of City-financed and public housing
9 Promote walkable destinations for retail and other services
10 Preserve and upgrade existing affordable housing
11 Proactively protect the quality of neighborhoods and housing

Recent, Planned, and Potential Initiatives to Increase Capacity for Residential Growth



Source: NYC Dept. of City Planning



Our Plan

We will continue to create new housing to meet the needs of our growing population. To increase potential supply, we must work with communities to study where new development is most appropriate. We must act on those studies, rezone, and facilitate new housing creation. And we must explore other mechanisms for enabling existing properties to be used more efficiently.

But we will do more than expand potential supply; we will continue to finance and facilitate the creation of new housing. We will enable the creation of housing on a wide range of scales, from creating entirely new neighborhoods such as Hunter's Point South in Queens to financing new housing units in neighborhoods where we have already made large investments, such as Melrose in the Bronx.

We will also ensure that our housing and neighborhoods become more sustainable. Sustainability means more energy-efficient buildings, walkability, the availability of transportation choices, employment opportunities, and access to retail, including healthy food.

City government can't make New York sustainable on its own. We need everyone to build a greener, greater New York—which is by definition made up of greener, greater neighborhoods. We will engage with and support local sustainability efforts and projects to nurture those neighborhoods.

Create capacity for new housing

To accommodate our growing population and improve the affordability of housing for New Yorkers of all incomes, we will propose regulatory changes and other actions to enable the creation of new housing units. We will study areas of the city that could potentially be redeveloped, and continue to invest in infrastructure to support new development. We will also explore opportunities to update regulatory standards to reflect 21st century uses and needs.

INITIATIVE 1
Continue transit-oriented rezonings

Rezoning has been a powerful tool for the City both to promote the creation of additional housing and to steer those new units toward transit oriented neighborhoods. Rezonings, such as the 2009 rezoning of the Lower Concourse in the Bronx, have helped prepare the city for long-term growth in the places where it makes sense, while addressing our communities' needs today.

By encouraging denser development in neighborhoods well-served by transit while limiting growth in auto-dependent areas, we can steer new development to areas where residential growth is sustainable. Even in areas close to transit that may be able to accommodate more growth than current zoning allows,

CASE STUDY
Lower Concourse Rezoning

For much of the 19th and early 20th centuries, the South Bronx waterfront along the Harlem River hummed with industrial activity. The area's good rail and canal connections attracted garment and piano factories, stone masonries, iron works, and coal and lumber yards.

But this activity faded as heavy industry left New York City and the Bronx experienced a general decline, including devastating population losses in the South Bronx. By 2002, despite access to multiple subway lines and highways, many buildings in the Lower Concourse area stood vacant, and outdated zoning limited redevelopment options. Aside from public facilities such as Lincoln Hospital and Hostos Community College, investment on and near the Harlem River was limited to self-storage, gas stations, and parking.

Four subway and ten bus lines pass through the Lower Concourse, making it a neighborhood rich in public transportation and able to sustain significant growth. In 2009, the City rezoned a 30-block area from the Harlem River to Morris Avenue south of 149th Street to stimulate private investment, start the next phase of this neighborhood's development, and help repopulate the South Bronx. New mixed-use zoning districts will help facilitate the development of more than 3,000 units of housing in renovated lofts and new apartment buildings while retaining light industrial businesses. The rezoning was the first in the Bronx to use the Inclusionary Housing Program to encourage the creation and preservation of permanently affordable housing, and it will leverage investment in housing and retail to create a public esplanade along the Harlem River.

To promote a complete, healthy neighborhood, the City eased restrictions on supermarkets and mapped a 2.2 acre public park along the Harlem River. With the rezoning in place, the Lower Concourse is poised to become a walkable, mixed-use neighborhood with a revitalized waterfront.

neighborhood rezonings must be done carefully and with community involvement and consideration of local infrastructure and services. By increasing density along key corridors, while putting in place appropriate limits on the height and bulk of buildings, we can reinforce the current character of neighborhoods, while increasing capacity and promoting a diversity of housing types.

We will continue to propose and implement transit-oriented rezonings throughout the city. Anticipated areas include corridors in Sunnyside/Woodside, Queens; Bedford-Stuyvesant North, Brooklyn; West Harlem and West Clinton, Manhattan; and East Fordham Road, the Bronx.

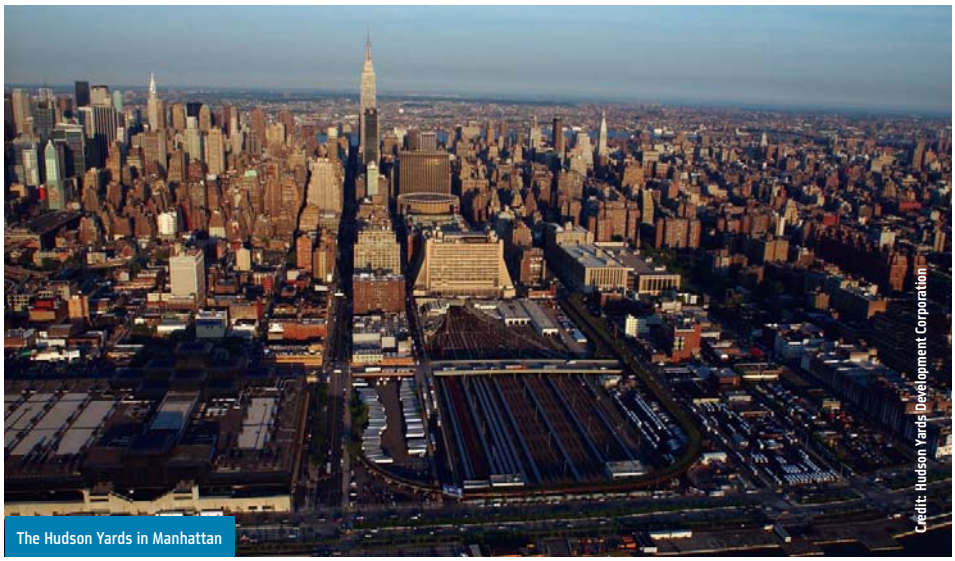
Through the Inclusionary Housing Program, we will continue to encourage the creation and preservation of affordable housing in conjunction with new development. The Inclusionary Housing Program permits an increase in the floor area of residential developments in exchange for the provision of low-income housing. Since 2005, the program has yielded more than 1,900 units of permanently affordable housing.

The City can't take on the enormous task of readying New York for growth on its own. Privately initiated rezoning actions can contribute to our objectives for transit-oriented growth. Where appropriate, we will work with developers proposing to make new development accessible, well-connected to transit, and responsive to communities.

INITIATIVE 2
Explore additional areas for new development

We are investigating areas throughout the city that could potentially accommodate new growth, and one day could be rezoned or redeveloped to create housing.

Over the next few years, we will advance studies that identify potential opportunities for development across the city, including in Staten Island's North Shore, where we are working with the community and studying transportation and other supporting improvements. In cooperation with the MTA, we will study the areas around Metro North stations in the Bronx to identify opportunities for both new development and transportation access improvements. We will also work with the MTA to study additional properties they own or lease that could be used to create housing or other enhancements for surrounding communities.



The Hudson Yards in Manhattan

We will evaluate potential scenarios for the improvement of the Sheridan Corridor and Hunts Point area in the Bronx, as part of a study of possible changes to the highway network described in the Transportation chapter of our Plan. The outcome of this study will be based on a vision for the overall land use needs in the corridor.

We will also work with the New York City Housing Authority (NYCHA), their tenants and surrounding communities, to determine if there are additional opportunities for development on the grounds of NYCHA properties.

We will continue to implement the Hudson Yards Plan, including taking ownership of the last portion of the High Line in Manhattan and completing the 7 train line, to continue to catalyze development in this district. These steps will help transform Hudson Yards in Manhattan into a vibrant extension of the Midtown business district with 24 million square feet of commercial use, over 13,000 units of housing, as well as substantial public open space and cultural uses.

We will also act to realize the potential of underutilized Seward Park sites on the Lower East Side of Manhattan. The Seward Park Extension Urban Renewal Area was created in 1965, for commercial and housing development. Portions of the plan were implemented over the years, but five sites remain undeveloped. We are consulting with the community to create a plan for a vibrant mixed-use development suitable for the area.

Finally, opportunities exist to consolidate the approximately 42,000 acres of land and 285 million square feet of built space that the City owns. Many of these sites are devoted to the storage or repair of the City's 26,000 vehicles. Using new technologies, we could transform conventional fleet storage lots into automated vertically stacked facilities, thereby reducing the municipal footprint and creating opportunities for appropriate development.

The City also has many facilities where it stores and archives data. By centralizing data centers, using archiving and filing management systems, and exploring the use of re-locatable storage facilities, we can free up space for new housing and other types of development. We will continue to use these and other methods to reduce City government leased or owned space by 1.2 million square feet.

INITIATIVE 3
Enable new and expanded housing models to serve evolving population needs

Between now and 2030, the demographics of our city will change. The median age is expected to rise, leading to more elderly and single, and fewer family, households. However, this portion of the population is not necessarily well-served by the present day housing stock and current codes and development practices may not adequately allow for the development of new housing geared toward these smaller households. We can better serve individuals seeking smaller housing alternatives through better use of our existing stock and by building more efficient new housing models.

The City will explore regulatory changes affecting existing housing stock that would enable the addition of a legal apartment to one- and two-family homes, where appropriate. These units could add housing options suited to elderly or single residents and smaller households in neighborhoods where diverse and smaller housing types are otherwise hard to find. The City will carefully weigh options that would make such units possible, taking into account a range of factors, including transportation access and neighborhood character.

CASE STUDY

Hunter's Point South

Along a barren strip of the Queens waterfront overlooking midtown Manhattan, the City is building the largest affordable housing development in New York City since the early 1970s. This new neighborhood, Hunter's Point South, will include approximately 5,000 new units of housing and is anticipated to catalyze more than $2 billion in private investment and create more than 4,600 jobs.

Once completed, residents living in Hunter's Point South will be able to enjoy neighborhood stores, restaurants, an 11-acre landscaped waterfront park, and their children will be able to attend a newly-built local school. With affordable housing for middle-income New Yorkers and good access to public transportation, Hunter's Point South is a model of a new neighborhood that will help the city grow more sustainably.

By 2013, the first phase of Hunter's Point South will have transformed more than 800,000 square feet of vacant waterfront land into an active neighborhood with vibrant retail corridors.

The neighborhood will feature wide sidewalks and buildings that access the street with multiple entries to shops and apartments. Hunter's Point South will also be served by the East River Ferry pilot program set to launch this spring, giving residents even more choices for ways to move around the city.

An architectural rendering of Hunter's Point South

Finding an affordable place to raise a family is a challenge for many middle-income New Yorkers. At least 75% of the apartments in the first phase of Hunter's Point South will be permanently targeted to low-, moderate-, and middle-income residents, with household incomes ranging from $32,000 to $130,000 per year for a family of four. Building Hunter's Point South is key to achieving the affordable housing targets set in Mayor Bloomberg's New Housing Marketplace Plan.

As a new waterfront neighborhood, Hunter's Point South will help expand access to the shoreline, promote economic development, and enhance the public experience of the waterways.

We will also explore the development of new housing models to better serve the needs of segments of our growing population. In areas that could accommodate higher density, we could consider rethinking traditional unit design and pursue the development of new non-conventional housing alternatives. The City will carefully weigh options that could make smaller housing models possible, taking into account housing quality and safety, as well as the appropriateness of such arrangements with respect to surrounding land uses.

Finance and facilitate new housing

Simply creating the potential for the private sector to increase the supply of housing in the city is not enough. Without action from the City, many New Yorkers will continue to have fewer affordable housing options.

The City must proactively finance and facilitate the creation of new units, particularly affordable units, to ensure that we can meet our housing needs. That is why we are creating entirely new neighborhoods, such as Hunter's Point South and Willets Point in Queens. We are also leveraging existing programs to finance and create new affordable housing developments throughout the city.

Finally, we are identifying existing government buildings and properties to adapt to housing. All together we will develop approximately 20,000 new affordable units by 2014 under the New Housing Marketplace Plan.

INITIATIVE 4

Develop new neighborhoods on underutilized sites

In a city as densely developed as New York, few large tracts of land present opportunities to build entire new residential neighborhoods. Where such opportunities exist, we will capitalize on them to create vibrant new neighborhoods with housing that meets the needs of households with a range of incomes.

We are investing more than $65 million in infrastructure—including roads, sewers and utilities—in Hunter's Point South to create an entirely new neighborhood on the Queens waterfront. Over the next three years, we will begin construction of 900 new housing units. When completed, this project will provide 5,000 new units of housing, 3,000 units of which will be permanently reserved for low-, moderate-, and middle-income families. It will provide more than 11 acres of landscaped waterfront parkland, retail spaces, and a new 1,100-seat public school.

On Willets Point in Queens, we are also preparing for the construction of an entirely new neighborhood. During much of the early 20th century, the approximately 60-acre peninsula on the Flushing River in Northern Queens known as Willets Point was used as an ash dump. While the surrounding areas have experienced remarkable transformation, including the development of Flushing Meadows-Corona Park in preparation for the 1939 World's Fair, Willets Point became further environmentally compromised.

Over the next four years, we will select a developer and begin infrastructure construction, environmental remediation, and development for Willets Point Phase I, a mixed-use development including 400 new housing units. When completed, the entire Willets Point development will include 5,500 units, 35% of which will be affordable. It will include 150,000 square feet of community space, a school, eight acres of open space, 1.7 million square feet of retail, a hotel, office space, and a convention center.

We will complete similar developments in Arverne, Queens, and Gateway in East New York, Brooklyn, together creating 2,600 new units.

INITIATIVE 5

Create new units in existing neighborhoods

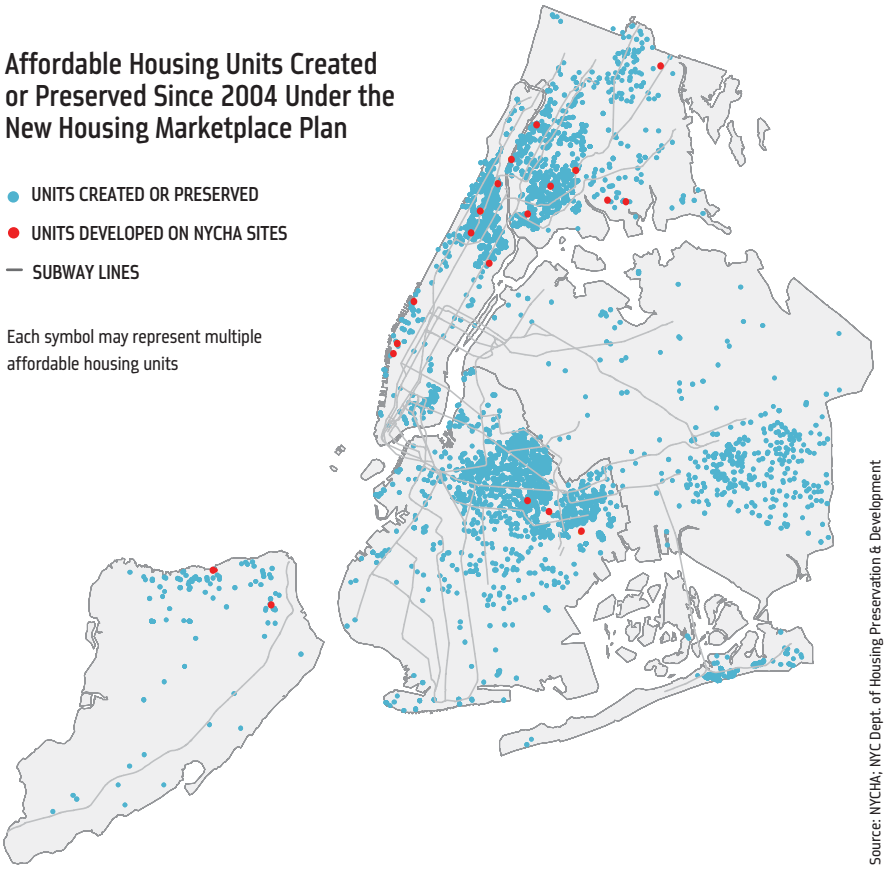
Vacant or under-used land in our existing neighborhoods also presents opportunities for new housing development. We will strategically target new construction funding in neighborhoods where it will have the most immediate impact, particularly in ones that are near to experiencing or experiencing the rewards of revitalization after many years of community and public investments.

In the Melrose Commons Urban Renewal Area in the South Bronx, we will transform the last three large City-owned parcels of vacant land by financing the development of more than 700 rental units for low- and moderate-income residents. These units will add to the more than 2,800 units of City-financed new construction already completed or under construction in the Melrose Commons area.

Opportunities exist to repurpose and redevelop lightly used portions of New York City Housing Authority (NYCHA) sites, including surface parking facilities, in ways that can reinforce their relationship to surrounding neighborhoods. When NYCHA began building tall towers surrounded by open space and parking lots beginning in the 1940s, the result often interrupted the continuity of neighborhoods and retail corridors, and too often left NYCHA developments as islands isolated from the broader community. In 2004, NYCHA and the City agreed to target some of the areas on these sites for new housing.

When developing sites, NYCHA has carefully selected areas in communities that can support additional development. It has consulted with the community and local elected officials to determine the ultimate shape of development. Through partnership with the City and the New York City Housing Development Corporation, nearly 2,400 units have been built or are being built on NYCHA land, including 168 units at the Elliot-Chelsea Housing in Manhattan and 748 units in University Avenue Consolidated Housing in the Bronx. Through this partnership, by the end of 2014, we will have completed or started construction for nearly 3,400 new affordable units located throughout the five boroughs.

We will also explore whether current parking minimums for affordable housing are appropriate. In more densely populated areas where car ownership rates are low, particularly among low-income individuals, we will determine whether parking minimums may be unnecessarily adding to the cost of affordable housing. By lowering construction costs, we will be able to stretch our dollars further, creating more units in the developments we finance.



INITIATIVE 6

Develop new housing units on existing City properties

The City and other public authorities own acres of land that are underutilized and could be used for housing. There are significant opportunities for housing to co-exist with current uses—from libraries to schools to parking lots. We will work to maximize these co-locations and opportunities to convert City-owned underutilized sites into affordable housing.

Across the city, there are also dozens of sites that are no longer appropriate or needed for their original use. These sites, ranging from warehouses, former schools, shuttered hospitals, or former police stations, can be reclaimed as affordable housing. We will capitalize on opportunities to preserve these buildings while meeting our housing needs. For example, 90 affordable units will be built as artists' housing, in P.S. 109, a former public school in East Harlem, Manhattan.

Encourage sustainable neighborhoods

In addition to facilitating more housing, we must make our communities more sustainable. Sustainability means encouraging growth in areas well served by transit. It means nurturing neighborhoods that provide housing choices and employment opportunities at multiple income levels. It means building housing that conserves energy and water, constructed of materials that do not harm residents' health. It also means cultivating neighborhoods that contain a vibrant mix of uses, including retail that offers healthy foods—a community asset missing from too many neighborhoods—and other services within walking distance of residences.

We will lead by example by promoting these elements through publicly sponsored development and regulatory tools. However, City government can provide only some of the tools to build communities. Greening our neighborhoods begins at the neighborhood or even block level, and relies on local knowledge, energy, and ingenuity to succeed.

We will support the work local neighborhood groups, community-based organizations, and individuals are already doing to make New York greener and greater. By providing technical, financial, and regulatory assistance, we can help these efforts grow, build a new model of collaborative action, and create greener, greater communities.

INITIATIVE 7

Foster the creation of Greener, Greater Communities

This Plan outlines numerous initiatives that the City will undertake to make New York a more sustainable city, while realizing the vision of a greener, greater New York will also require the efforts of community organizations and millions of individual New Yorkers.

Communities are already coming together to decide what they can do to make their neighborhoods more sustainable. The available opportunities and local priorities will be different in every neighborhood. The solutions that work in Bay Ridge, Brooklyn may be different than those that work in Bayside, Queens—and will often originate with the people who call those places home.

We will launch the Greener, Greater Communities approach to help community- and neighborhood-based organizations develop and implement local initiatives. This includes projects to manage stormwater, improve energy efficiency, establish community composting resources, create new public space, and enhance the stewardship of parks.

We will also help create greener, greater communities by integrating sustainability into neighborhood planning. We have begun and will complete a study in East New York, Brooklyn, where, working in close cooperation with the Community Board and other local stakeholders, including the Cypress Hills Local Development Corporation, we will generate recommendations for land use and zoning changes, and assess other opportunities for making the neighborhood greener. The collaboration will include identifying opportunities to improve walkability, bicycle access, streetscape, traffic safety, and connections among housing, retail, educational, and employment opportunities. The study will also identify opportunities to improve the energy efficiency and environmental performance of buildings and public spaces in the area, and promote stormwater management best practices and increases to tree canopy.

The study will also incorporate efforts to promote public health through improved access to fresh food by seeking to utilize the City's FRESH (Food Retail Expansion to Support Health) program and build on the efforts of local groups such as East New York Farms. By integrating these efforts and finding new opportunities for collaborative action in one neighborhood, the City and its citizens will set a new high standard for neighborhood sustainability planning.

INITIATIVE 8

Increase the sustainability of City-financed and public housing

Rising utility costs are increasing rents throughout the city. Between 2005 and 2008, citywide contract rents increased 1.6% in real dollars; median gross rents, which include utilities, increased by 4.2%.

To manage rising utility costs and reduce our greenhouse gas emissions, we must find ways to use less electricity, heating oil, and natural gas in all housing, including our publicly financed housing. A more energy-efficient housing stock will not only reduce stress on our infrastructure and lower our global warming emissions, but also contribute to the long-term financial viability of our affordable housing stock.

Building on previous work we have done in modifying our rehabilitation building specifications to include energy and sustainability requirements, we will require that all major City-financed substantial rehabilitations and new construction certify with Enterprise Green Communities (EGC). EGC is a set of guidelines specifically suited to greening affordable housing. By achieving Enterprise Green Communities certification, we will ensure that City-financed affordable housing will be built to minimize construction waste and maximize water conservation, energy efficiency, and the use of non-toxic building materials. We will certify approximately 40 affordable housing projects annually as Enterprise Green Communities and provide financing for more than 30,000 units with energy efficiency and sustainability requirements by 2014.

Making our homes sustainable extends beyond the materials and systems we use, to the actions of individual owners and tenants. To reach out to the individuals who run buildings, we will expand the NYC Green House program to educate small and medium-sized building owners on what they can do to increase energy efficiency, conserve water, use healthy materials, and educate their tenants. We will distribute educational toolkits that provide information on how private building owners can avoid high energy bills or costly rehabilitations that can drive up housing costs. We will also conduct six Green Owner's Nights a year. These events teach best practices on building management, and connect building owners to local experts on operation and maintenance practices.

Similarly, NYCHA is implementing its Green Agenda. This is a series of sustainability initiatives aimed at preserving public housing and

CASE STUDY

Greener, Greater Communities

All across the city, New Yorkers are helping make their neighborhoods greener and greater.

In Brooklyn, Sarita Daftary of East New York Farms is tending the largest community garden in the city. She and other local residents are capturing stormwater to transform what was once vacant space into a useful resource. In East Harlem in Manhattan and on Forrest Avenue in the Bronx, the Harvest Homes Farmer's Market has teamed up with Transportation Alternatives and the Strategic Alliance for Health to create two Play Streets, closed to traffic during certain times in the summer to give youth space to socialize. On Staten Island, the Joan and Alan Bernikow Jewish Community Center has teamed up with MillionTreesNYC to give away trees to local residents. In Queens, the Jackson Heights Beautification League recruited 400 people to community workshops that developed the Green Agenda for Jackson Heights.

Our Plan includes numerous City programs that New Yorkers can tap into. We will connect communities with a number of existing City, state, and federal programs in seven priority areas: energy efficiency, public space creation, tree stewardship, stormwater management, air quality improvement, and landfill diversion. We will also align our brownfield remediation efforts with local visions for employment growth and redevelopment.

In each of these areas we want to provide organizations with financial and technical support to help them achieve community impact.

To engage all New Yorkers, we will launch an online platform, "Change By Us," to empower New Yorkers to self-organize around issues that matter to them. This site will ask "How can we green our neighborhoods?" and connect New Yorkers to other residents, groups, and resources. Like GreeNYC, "Change By Us" will give citizens the information they need to take action in their own lives.

Greener, Greater Communities will connect New Yorkers to each other and to these programs, so that together we create a greener, greater New York, block by block, neighborhood by neighborhood.

CASE STUDY

Roofs

In a crowded city, rooftops represent our last big frontier. Constituting almost 20% of our total area, rooftop space equates to an entire extra borough. Currently this asset is not just underutilized; it contributes to our problems. Largely impervious, black tar worsens the urban heat island effect, smog, and problems with stormwater runoff.

But it could be different. Coating roofs white ("cool roofs") could help moderate our temperatures. Installing collars around drains ("blue roofs") could help retain stormwater and improve water quality. And extensive plantings ("green roofs") could do both. Additionally, rooftops could provide sites for clean energy installations like solar panels, gardens, urban farms, or recreational spaces.

To take advantage of these opportunities, we are working to ensure property owners can get the most out of their roofs. Proposed amendments to local codes will allow alternative energy equipment to be sited like other equipment and expand the areas allowed for solar panels, and new guidelines for building-mounted wind turbines will ensure safety. Our new codes will expand requirements for cool roofs, and possibly blue roofs, too, through the NYC Green Infrastructure Plan.

Roofs in Northern Manhattan

Credit: Nicholas Noyes

We are also helping New Yorkers install sustainable roofs. Through our tax incentives we are offsetting the costs of solar panels and green roofs, through our Solar Empowerment Zones we are encouraging the placement of solar panels in key neighborhoods, and through a CUNY partnership we will create a Solar Map showing the solar potential of every rooftop. And volunteers working with our NYC °CoolRoofs program have coated over a million square feet of roofs with cool coating.

We are just beginning to understand the potential of our rooftops. As every roof is different, finances, technical constraints, and desired uses will result in a unique mix of strategies for each building. But over time, a vibrant patchwork of beneficial uses should replace the current sea of tar.

improving quality of life while reducing environmental impact and operating costs. As part of its Green Agenda, NYCHA successfully piloted innovative lighting and heating upgrades at Castle Hill Houses in the Bronx, saving more than $660,000 in heating costs in 2009 and 2010.

Based on this success, NYCHA is pursuing a multi-phase Energy Performance Contracting program to scale up energy conservation and efficiency measures in other developments. NYCHA is also exploring innovative techniques such as Building Information Management Software and Green Physical Needs Assessments. These will allow NYCHA to more strategically assess the environmental and financial impact that green retrofit efforts will have on its building stock.

In 2009, NYCHA created 37 Resident Green Committees with more than 400 members. The members have embraced a responsible, low-carbon lifestyle by switching to CFLs, recycling, conserving water, and taking care of newly planted trees. NYCHA will continue to work with the current Resident Green Committees, while helping to create at least six new Committees.

Building on the success of pilot programs at the Bronx River Houses, NYCHA, in collaboration with the City, will explore scaling up stormwater retention best management practices at other sites. NYCHA will also expand upon its current work to better incorporate sustainability into its procurement practices.

INITIATIVE 9

Promote walkable destinations for retail and other services

By encouraging the location of residents, jobs, retail, and other services within a walkable distance from one another, we can encourage the use of sustainable modes of transportation and decrease greenhouse gas emissions.

In order to support a mix of uses in neighborhoods, we will promote neighborhood shopping districts as part of a broader Neighborhood Retail Strategy that seeks to maintain built environments to attract private investment, local residents, and visitors and support the needs of small businesses. The City will create a local retail zoning "toolkit" that will expand the use of zoning tools to address specific retail issues facing different types of commercial corridors throughout the city.

Stores selling fresh, healthy foods do not exist in some communities. More than three million New Yorkers currently live in dense neighborhoods with limited opportunities to purchase nutritious, affordable foods. In these areas, consumption of fruits and vegetables is low, and rates of diet-related diseases are high.

Opportunities exist to use existing food distribution infrastructure, like bodegas and food carts, and the City's regulatory powers to increase access to healthy foods. In partnership with the City Council, we are developing and implementing programs to provide low-cost temporary solutions, while encouraging the development of more permanent markets.

Through the Healthy Bodegas initiative, more than 1,000 bodegas have promoted the sale of fresh produce and low-fat dairy products, increasing sales of these products to local residents. The Green Carts program has issued almost 500 new permits to street vendors selling fresh fruit and vegetables in underserved neighborhoods, quickly and effectively expanding retail options. By augmenting the federal food stamp program (SNAP) with "Health Bucks," we are providing SNAP recipients with $2 in coupons for every $5 in SNAP spent at farmers markets. More than 110,000 Health Bucks were distributed in 2009, generating an additional $220,000 in sales of fresh, locally grown fruit and vegetables.

We will facilitate the creation of 300 more healthy food retail options in targeted underserved neighborhoods. To encourage the growth of new grocery stores and supermarkets, we launched the FRESH program, which provides zoning and financial incentives for full-service grocery stores that locate in certain neighborhoods considered underserved by food retailers. We will identify additional amendments to zoning, including an expansion of the FRESH program, to direct grocery stores to more communities with food access needs.

Shopping for produce at a Greenmarket

Credit: Samuel-Christophe Tedjasukmana appears courtesy GrowNYC

In partnership with the City Council, we are also creating food retail and production opportunities by maximizing the use of City-owned land. The City has helped establish both the Kitchen Incubator at La Marqueta in East Harlem, and the Entrepreneur's Space (E-Space) in Long Island City. These programs provide facilities, equipment, and other resources to entrepreneurs starting businesses in the ever-growing food manufacturing industry. The City currently serves 100 clients at E-Space. We will graduate 25 new businesses from that incubator and an additional 40 at La Marqueta, so that food entrepreneurs can bring healthy food and economic development to neighborhoods throughout the city.

INITIATIVE 10
Preserve and upgrade existing affordable housing

Preservation is a top priority in today's economic climate where buildings are more susceptible to accelerated financial and physical distress. We have spent over three decades investing in our existing affordable housing stock, building up an important long-term source of affordable housing for low- and moderate-income New Yorkers. However, many of the original affordability restrictions set by the state and federal governments to restrict rents on properties are now expiring, and owners are often inclined to convert their buildings to market-rate housing. The City is working with owners of buildings with affordable units to refinance and preserve their buildings in exchange for accepting or extending affordability restrictions. Some of these buildings also need repair to improve conditions for tenants. We will work to preserve these units using strategies specific to each development.

To protect Mitchell-Lama and similar types of housing, we will develop creative financing arrangements that combine property tax incentives, low-interest refinancing, rehabilitation loans, and other subsidies with long-term affordability commitments. To keep smaller buildings affordable and in good condition, we will implement the Small Owner Repair Program, which couples 10-year forgivable loans with upkeep and maintenance agreements to ensure the financial viability, physical upkeep, and continued affordability of participating buildings. Together these methods will allow us to preserve an additional 34,000 units through 2014.

It is also important to preserve the integrity of neighborhoods and their residents. While the single family foreclosure crisis has not necessarily affected New York City to the same degree as other areas, it has impacted specific neighborhoods such as Jamaica, Queens. To bolster these neighborhoods, we will provide an estimated 4,000 New Yorkers with mortgage and foreclosure prevention counseling, legal services, and education annually through the Center for NYC Neighborhoods.

Finally, NYCHA will invest more than $397 million at 189 developments to improve its building stock, which currently houses one-in-twelve New Yorkers. In addition, NYCHA will apply for a $300 million bond to address additional façade and roof renovations at more than 32 developments.

INITIATIVE 11
Proactively protect the quality of neighborhoods and housing

Preservation is not only critical for affordable housing, but to all housing across the city. To protect tenants, neighborhoods, and the quality of our housing citywide, we must identify distressed properties before they fall into a state of severe disrepair. Until recently, the City's systems and tools have been largely reactive and geared toward 311—our non-emergency source for information and services—and tenant or neighbor complaints.

We will work with community groups, the City Council and state agencies to consolidate data from multiple sources to identify distressed buildings that are declining and are at risk of becoming blighted. We will evaluate over 1,000 at-risk buildings over the next three years, assessing conditions, and performing roof-to-cellar inspections for those buildings that are clearly in distress. We will take action to improve the conditions of buildings, including more code enforcement, litigation, receivership, as well as ownership transfer, preservation loans, financial counseling, and referrals.

Conclusion

While our near-term housing priorities have shifted in response to the changing economic environment, our long-term planning continues to be driven by the need to house nearly a million more New Yorkers by 2030 and a desire to create greener, greater communities.

As the economy has changed, the tools we have used to create and preserve affordable housing have adapted. We can anticipate that the economy will change again, and we must continue to be prepared to respond with creativity and compassion as newer challenges emerge.

We must also maintain our focus on the long-term housing needs of the city. By continuing to expand the potential for housing supply, coordinate and finance the creation of new and affordable housing, and address the sustainability needs of our neighborhoods, we can realize our vision of New York as a city of opportunity for all.

Parks and Public Space

Credit: Iwan Baan

Together we can

Target high impact projects in neighborhoods underserved by parks

Create destination-level spaces for all types of recreation

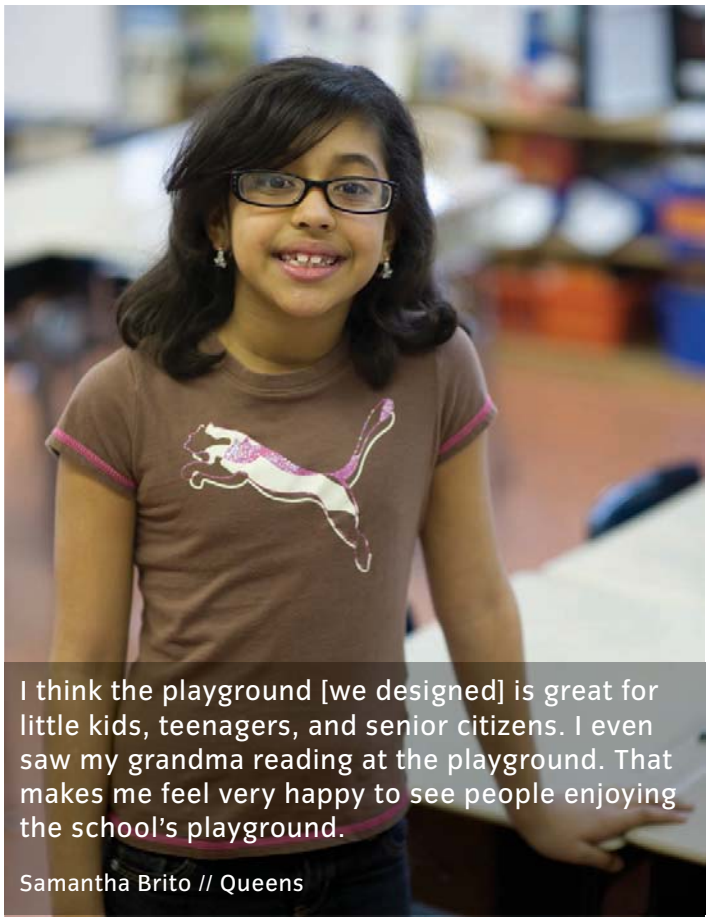
Re-imagine the public realm

Promote and protect nature

Ensure the long-term health of parks and public space

Parks range from the simplest form for kids to the most complex form like wetlands that have wildlife and rare species. You have constituencies that can enjoy all of these, and it's right here in our community.

Alex Zablocki // Staten Island

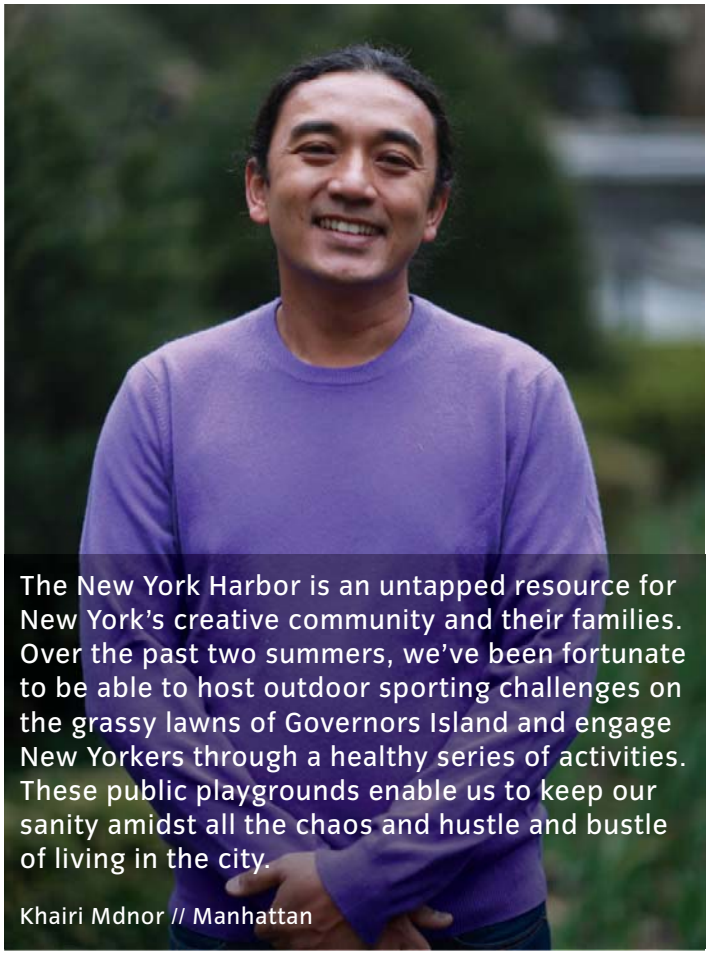


I think the playground [we designed] is great for little kids, teenagers, and senior citizens. I even saw my grandma reading at the playground. That makes me feel very happy to see people enjoying the school's playground.

Samantha Brito // Queens

I felt excited to help in the playground [design]. We are the ones who planned out the whole thing. People love this playground. I can tell by a lot of people coming to the playground.

Seana Edwin // Queens



The New York Harbor is an untapped resource for New York's creative community and their families. Over the past two summers, we've been fortunate to be able to host outdoor sporting challenges on the grassy lawns of Governors Island and engage New Yorkers through a healthy series of activities. These public playgrounds enable us to keep our sanity amidst all the chaos and hustle and bustle of living in the city.

Khairi Mdnor // Manhattan

Parks and Public Space

Ensure all New Yorkers live within a 10-minute walk of a park

For generations, parks have been among New York's most cherished forms of public infrastructure. From internationally-renowned flagship parks such as Central and Prospect Parks, to neighborhood playgrounds, to emerging recreational areas on our waterfront, parks provide vital public spaces for New Yorkers. All together, our city boasts more than 52,000 acres of City, state and federal parkland, representing 25% of the city's area.

Parks and public space play indispensable roles in our neighborhoods. They provide places to exercise. They are community forums for formal and informal interactions. They serve important ecological functions. They are also an important catalyst for economic development, raising property values and breathing life into neighborhoods.

Despite parks' importance, over two million New Yorkers still live more than a 10-minute walk from one. And the need for a variety of parks and public space will only become more acute as our population increases. As New Yorkers' recreation interests grow to include cricket pitches and kayak launches, we must also make sure our parks evolve.

To respond to this growing demand for more parks and public space, we have embarked on what has become New York's third great era of park building. The first era began in the second half of the 19th century, when Frederick Law Olmsted and his partner Calvert Vaux designed over 1,900 acres of city parkland including our most iconic open space, Central Park. The second great era began with the appointment of Robert Moses as City Parks Commissioner in 1934. Taking advantage of New Deal funding, he more than doubled park acreage in the city. But in the 1970s, our parks were poorly maintained. Dangerous and unkempt, they lay neglected. In 1981, Mayor Edward Koch started a turnaround with a capital plan to rebuild our system. In the last 10 years, we have accelerated our progress into the third great era of parks transformation, including the historic investment in parks and public spaces made in 2007, heralded by the launch of PlaNYC.

Because the supply of vacant land and capital budgets are both finite, creating new parks will require creative new strategies. We will continue to reuse unconventional sites such as Concrete Plant Park in the Bronx, where a former industrial concrete mixing plant has been transformed into a striking new waterfront park, or the High Line, which transformed an abandoned elevated freight rail line into one of Manhattan's star attractions.

We must also work to protect the great investment in parks and public spaces that we have made. The long-term health of our parks and public spaces requires continued maintenance, stewardship, and attention.

We have made substantial progress. Since 2007, we have improved access to parks and public space, ensuring more than a quarter million more New Yorkers live within a 10-minute walk of a park. This new wave of construction includes almost 180 Schoolyards to Playgrounds sites and nearly 260 Greenstreets. Construction has begun on four of eight new destination parks. We have planted over 430,000 new trees.

But simply having access to parks is not enough; the type and quality of parks and public space matter as well. To accommodate our diverse open space needs, we have begun to re-imagine what the public space outside of parks can be, as well as design sustainable, high-performance open spaces that have the potential to enhance ecosystems.

Our Plan

To meet the quality and access needs of all New Yorkers, we must continue to improve our existing parks, identify new opportunities to transform underutilized sites throughout the city, and enhance stewardship of our public space.

We will target high-impact projects in the neighborhoods with the greatest open space needs. These projects will include community gardens and urban agriculture opportunities, which enrich many of the city's neighborhoods least served by parks. We will continue to create and renovate parks such as Calvert Vaux Park in Brooklyn and Soundview Park in the Bronx that will attract people from all over the city.

We will reconceptualize and green our streets. And because vibrant open spaces both need and support biodiversity, we will increase the health and vitality of natural areas. Finally, we will ensure the long-term health of our open spaces and protect the great investments we have made through expanded stewardship and care.

Collectively, we estimate that by 2030 we will acquire or upgrade more than 4,700 acres of parkland and public space throughout the five boroughs. By 2030, every New Yorker will live within a 10-minute walk of a park.

Target high-impact projects in neighborhoods underserved by parks

In many of the neighborhoods most in need of parks and public space, there are schoolyards, lightly-trafficked streets, vacant lots, and athletic fields that have not realized their full potential. Through targeted investments that use existing land better, these spaces can become valuable community resources.

, high-value projects such as Schoolyards to Playgrounds have been vital in increasing access to usable parks and public spaces close to where people live. We must identify the next generation of these projects and where they should be located.

INITIATIVE 1

Create tools to identify parks and public space priority areas

Challenging economic times and the demands of an increasing population require that we make the most out of our funding for parks and public space projects. To do this, we need new tools for assessing new project proposals.

Escaping the heat at Sweetgum Playground in the Bronx

Credit: NYC Dept. of Parks and Recreation/Daniel Avila

We will create a scorecard that will use a weighted system across selected criteria, including demographic data, environmental factors, physical condition, community need and support, and conformity with the goals of programs like PlaNYC. It will take into account funding needs for ongoing maintenance and seek to increase partnerships with local community groups for stewardship. These criteria will help us gauge how well the investment will be maintained over the long term and strategically target our limited dollars where they get the highest return.

We will also use new methods for assessing New Yorkers' distance from parks, looking at the street network and actual access routes to a park instead of simply looking at distance as the crow flies.

Our plan for parks and public space:

Target high impact projects in neighborhoods underserved by parks

1 Create tools to identify parks and public space priority areas
2 Open underutilized spaces as playgrounds or part-time public spaces
3 Facilitate urban agriculture and community gardening
4 Continue to expand usable hours at existing sites

Create destination-level spaces for all types of recreation

5 Create and upgrade flagship parks
6 Convert former landfills into public space and parkland
7 Increase opportunities for water-based recreation

Re-imagine the public realm

8 Activate the streetscape
9 Improve collaboration between City, state, and federal partners
10 Create a network of green corridors

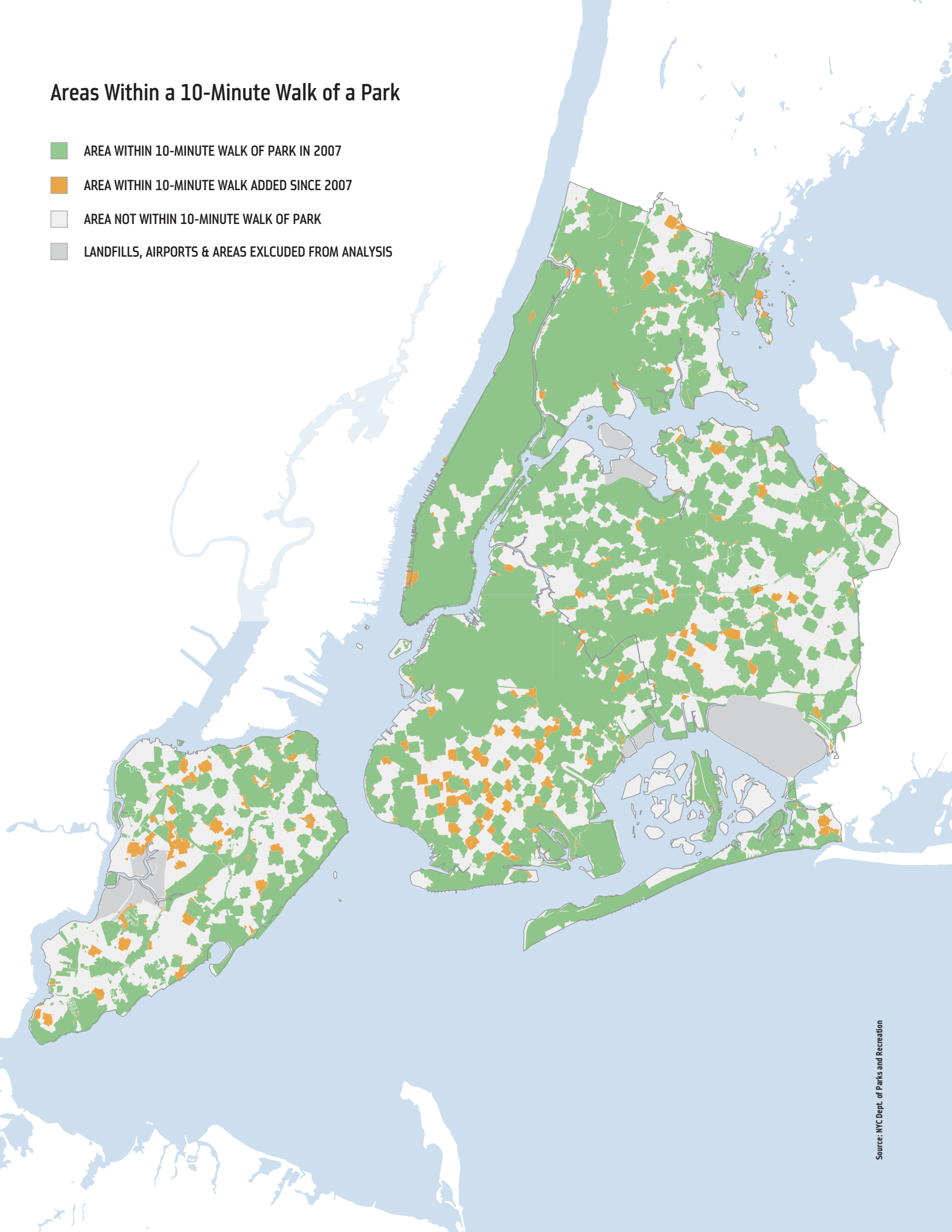
Promote and protect nature

11 Plant one million trees
12 Conserve natural areas
13 Support ecological connectivity

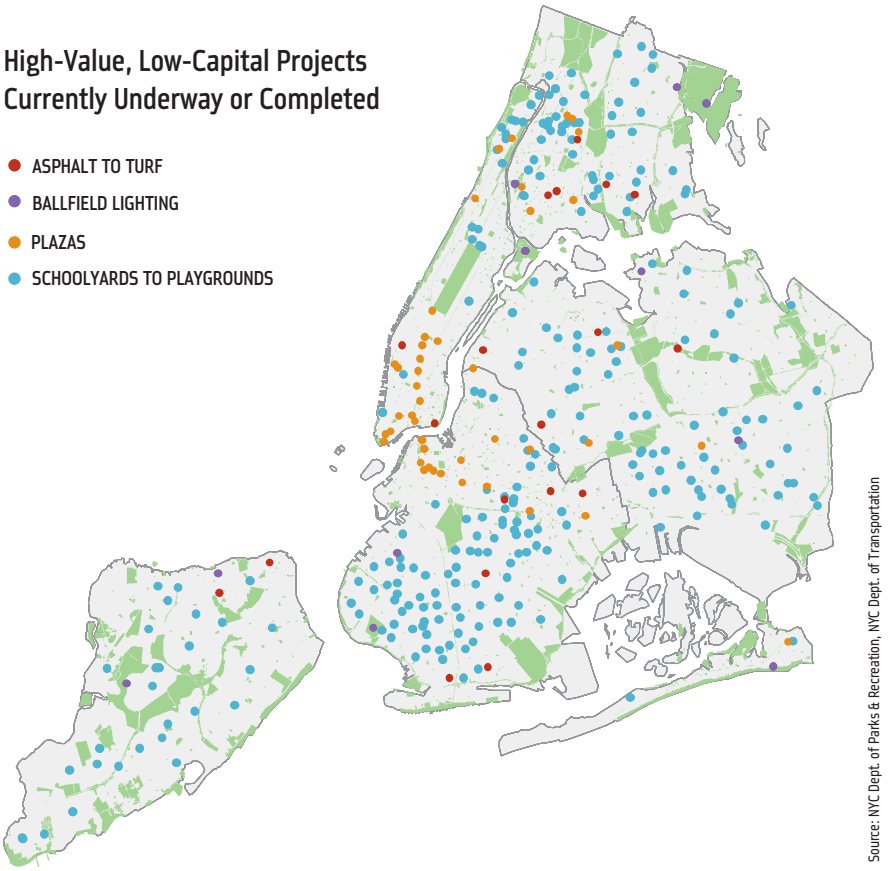
Ensure the long-term health of parks and public space

14 Support and encourage stewardship
15 Incorporate sustainability through the design and maintenance of all public space

Areas Within a 10-Minute Walk of a Park



Source: NYC Dept. of Parks and Recreation



INITIATIVE 2

Open underutilized spaces as playgrounds or part-time public spaces

In 2007, we identified 290 schoolyards in areas underserved by parks that could be better utilized. While neighborhoods lacked play space, schools with empty lots or playgrounds were closed throughout the summer, on weekends, and in the evenings.

We launched the Schoolyards to Playgrounds program to renovate these spaces and open them to the community when school is not in session. Sixty-nine of these sites needed no additional capital investment and were opened almost immediately. For the remaining sites, we partnered with the Trust for Public Land (TPL) and instituted a participatory design process, in which students and community members selected amenities they wanted in their new playgrounds. Since 2007, we have built and improved more than 100 sites, bringing the total to nearly 180 sites open so far—equaling over 130 acres—and putting us well on the way to completing over 230 sites by 2013.

We are also creating temporary play places for the times of the year when the need for play space is even more acute. For example, as part of the Summer Streets program, we transformed Park Avenue in Manhattan into something that lives up to its literal name: a lively place to play, walk, or bike for three Saturdays each summer. We will continue to do so each year.

We have also created programs that enable community groups to recommend, apply for, and manage part-time play spaces in our streets. Local organizations in all five boroughs have managed Weekend Walks, which close streets to vehicular traffic on summer weekends. The city hosted 17 of these in 2010 and will conduct them at 20 locations in 2011.

Through our Play Streets program we have permitted non-profits and schools to temporarily close off streets, giving children safe and supervised places to play and learn. In partnership with non-profit organizations, we will work to open 15 Play Streets each year where they are needed most. We will also provide 40 schools with access to a Play Street so children have places to play during recess.

INITIATIVE 3

Facilitate urban agriculture and community gardening

We are committed to promoting community gardens and other forms of urban agriculture. We recognize the important role they serve in building communities, supporting local cultural heritage, and bringing individuals together around the vital issue of access to healthy food.

More than 1,000 community gardens exist in the city. More than 600 are on sites maintained by the New York City Housing Authority (NYCHA), and nearly 500 are registered with the City's GreenThumb program. To support and enhance well-established gardens throughout the city, we will increase the number of registered GreenThumb volunteers by 25%.

Approximately 80% of the city's community gardens grow food. Most food-producing gardens are located in neighborhoods with limited open space and inadequate access to fresh produce and other healthy foods. To increase public access to fresh foods, including produce grown in community gardens, we will partner with the non-profit organization, Just Food, to establish five additional farmers' markets at community garden sites. We will also explore additional ways to support farmers markets.

We are also working in partnership with GrowNYC, a non-profit, private organization, to support gardens at our schools. Already 70 school gardens have registered with Grow to Learn NYC, the Citywide School Gardens Initiative, and are actively educating students about healthy food choices and environmental stewardship. Through 2013, we will retain 75% of registrants annually and register 25 new gardens with a goal of reaching 150 registered school gardens throughout the city. Furthermore, 50 school gardens participate in the Garden to School Café program that helps school cafeterias serve food grown in those gardens.

We are also exploring ways to increase the number of gardens and urban farms. We will take a full inventory of municipal land and identify properties that could be suitable for urban agriculture. We will also review existing regulations and laws to identify and remove unnecessary barriers to the creation of community gardens and urban farms. For example, only green roofs that use drought-resistant plants are currently eligible for the New York State green roof tax abatement. Broadening this legislation to include agricultural plants could encourage an increase in green roofs and urban food production.

NYCHA will also expand its urban agriculture program, creating at least one urban farm and 129 community gardens on its grounds.

INITIATIVE 4

Continue to expand usable hours at existing sites

Today the city does not have enough grass fields to accommodate the growing demand for soccer, field hockey, cricket, and rugby. Those that we do have are quickly worn by intensive use.

To meet demand, we will accelerate the conversion of 26 multi-purpose asphalt fields to synthetic turf. Since 2007, 12 fields have been completed and opened to the public. These turf fields require less maintenance and can remain open more days every year. They host a greater range of games, including contact sports, and can withstand frequent and intensive use.

To address possible health and safety issues with synthetic turf, we will consult with an advisory committee prior to using new turf technologies in parks. The committee was organized in response to local legislation in 2010.

We also have dozens of high-quality fields that are unusable after the sun sets. By placing additional lights around our athletic fields, we can allow two additional hours of use for each field during the summer and four additional hours during the spring and fall. We will install lighting at 19 fields within the next two years.

Create destination-level spaces for all types of recreation

In addition to targeted investments at the neighborhood level, we are also focused on enhancing access to larger, "destination-level" parkland.

Large regional parks are the most visible end of our continuum of public land. The larger parks provide a full range of experiences—recreational, cultural, and educational—for every resident in the city. Adding nearly one million more residents means that we need to update and create new destination parks that cater to diverse recreational needs.

Only a handful of spaces are big enough to create such destination-level parks in our developed city. Particular opportunities along our 520-mile waterfront can transform neighborhoods. We can turn previously inaccessible places into vibrant community areas that provide for recreation and encourage commerce and economic growth. Nearly half of our waterfront is part of our parks and public space network thanks to new public and private investments, as well as more effective waterfront zoning regulations. Recent improvements in waterfront access and quality have also increased opportunities for in-water recreation. Boating, fishing, and, in some areas, swimming can increasingly be part of the way New Yorkers enjoy our waterfront.

Cyclists relax at Brooklyn Bridge Park in Brooklyn

Credit: NYC Dept. of Parks & Recreation/Daniel Avila

INITIATIVE 5
Create and upgrade flagship parks

Recreational sites across the city have the potential to become destination-level parks. With additional investment, these parks could have the space and features to serve a large amount of people from around the city. For each of these sites we have or will engage in an extensive planning effort with the surrounding community.

In McCarren Park in Brooklyn, we are rebuilding McCarren Pool as both an outdoor Olympic-size pool and a year-round recreation center. We are constructing a 2,500-seat field house in Staten Island's Ocean Breeze Park, creating the city's third indoor track and field facility. Spanning the Harlem River, a rebuilt High Bridge will once again provide Bronx residents with access to the parks along the northern Manhattan greenbelt, including the Highbridge Pool and Recreation Center. Highland Park in Queens will be improved with the construction of new reservoir perimeter lighting, path restoration, and new entry points for wheelchair users. On Manhattan's High Line, we will open a new section of the former rail line to the public.

Since 2002, the City has also acquired more than 373 acres of waterfront land for parks. Under the direction of the recently released Comprehensive Waterfront Plan (CWP) we will continue to to help New Yorkers reconnect with a waterfront once underused and obstructed by infrastructure, regulations, fencing, and private uses.

On our waterfront, at Calvert Vaux Park in Brooklyn, we are constructing new fields and bicycle paths. Also in Brooklyn, we are constructing Brooklyn Bridge Park, the most significant major park to be built in that borough since Prospect Park was built 135 years ago. At Fort Washington Park in Manhattan, we are improving entrances and pathways. In Soundview Park in the Bronx, we are restoring 15 acres of natural areas, adding new seating and pathways, and upgrading sports facilities. At Hunter's Point in Queens, we are completing construction of a new 5-acre site featuring new courts, green stormwater infrastructure, and public ferry access. In Stapleton, Staten Island, we have begun construction of a 6-acre esplanade. We will also commit $260 million toward improving Governors Island, modernizing critical infrastructure, upgrading the Historic District landscape, planting thousands of trees, and transforming the desolate southern part of the island into the new Hammock Grove and Play Lawn. On Randall's Island, improved pathways and environmental restoration projects will complement recently-constructed tennis courts, new and lighted playing fields, and track and field facilities.

These destination-level parks will increase access to open space and the water, help meet our diverse recreational needs, and improve the quality of our outdoor experiences.

A kayaker launches his boat from a pier at the Downtown Boat Basin in Manhattan

INITIATIVE 6

Convert former landfills into public space and parkland

In the early 20th century, the huge dumping ground in Northern Queens was famously characterized as "a valley of ashes" in F. Scott Fitzgerald's *The Great Gatsby*. Since then, we have transformed this space into the 1,255 acre Flushing Meadows Corona Park, one of the most actively used spaces in our park system.

Today, some of the best opportunities to create parks exist in former landfills, huge swaths of open space undergoing transformative care and adaptive reuse. By decommissioning and remediating them to assure public health, we can eventually turn them into places for New Yorkers to relax and play.

Chief among these will be Freshkills Park in Staten Island. At 2,200 acres, it will be almost three times the size of Central Park. When fully developed, it will be the largest park developed in New York City in more than 100 years.

We will also remediate the Brookfield Avenue Landfill in Staten Island, Ferry Point in the Bronx, and Edgemere Landfill in Queens with impermeable landfill caps. This will transform these former landfills into several hundred acres of sprawling natural area. Our first challenge is to ensure contaminants are fully remediated, a necessary precaution which is painstaking and time-consuming. But over time, we will continue to invest in safely converting these landfill sites into parks.

INITIATIVE 7

Increase opportunities for water-based recreation

With its diverse water bodies, from winding rivers and creeks to expansive sandy beaches and narrow tidal straits, New York City offers a variety of possibilities for water-based recreation like kayaking and canoeing. Improvements in water quality and access to the waterfront have spurred participation in water-based recreation. One of the most successful catalysts for the recreational waterways is the New York City Water Trail, which we run in conjunction with the New York City Water Trail Association. Capitalizing on the surge in popularity of human-powered boating, this program established launch sites for kayaks, canoes, and rowboats and provides online maps for guidance on routes to take.

To meet increases in demand, we will need to add still more access points, docks, and onshore facilities to ensure that New Yorkers can both reach and use the water. In concert with the CWP, we will complete an expansion of the launch platform for small boats at Hunts Point-Riverside in the Bronx, build a multi-use "Eco Dock" in Bay Ridge, Brooklyn, and make improvements to the West Harlem Pier in Manhattanville and to the floating docks at the Dyckman Street Marina in Inwood, both in Manhattan.

The need for recreation must be balanced with the need for commercial uses of our water, as well as concerns for user safety and water quality. A multi-agency task force will assess opportunities for expanding the blue network for water-based recreation. These improvements will create better access to the water and balance the needs for recreation and commerce on our waterfront.

CASE STUDY

Fresh Kills

At 2,200 acres, Freshkills Park will be almost three times the size of Central Park and the largest park developed in New York City in over 100 years. Along with this massive scale comes massive opportunity.

At its peak, Fresh Kills was the world's biggest landfill, receiving as much as 29,000 tons of waste each day, making it an example of wastefulness, excess, and environmental neglect.

Its transformation into a productive and beautiful cultural destination will make the park a symbol of renewal and an expression of how we can restore balance to our landscape.

The park's plan, which will be built in phases over 30 years, matches this vision of restoration and renewal. Visitors to the park will be able to mountain bike, run on trails, kayak, and horseback ride—uncommon activities in an urban park. The park's design, ecological restoration, and cultural and educational programming will emphasize environmental sustainability and a renewed public concern for our human impact on the earth. The park will serve as a living laboratory, articulating a new relationship with the land as a source of recreation, habitat for native plant and seed nurseries, a source of renewable and alternative energy, and the site of botanical and ecological research.

The New York City Department of Parks & Recreation has begun implementing the master plan developed by the landscape architecture firm James Corner Field Operations. Initial development has focused on providing public access to the interior of the park and showcasing its unusual combination of natural and engineered beauty. The park's ecosystem has already begun to restore itself, as birds, wildlife, and native habitat thrive. Visitors can learn about this transformation through a public tour and education program.

Over 150 years ago, Central Park brought nature into the lives of New Yorkers; Freshkills Park will provide 21st century New Yorkers with a new park filled with exciting recreational activities that integrate nature into city living.

Destination Parks Upgrades and Improvements

Source: NYC Dept. of Parks and Recreation

Highbridge Park

Restore bridge and add new entry points for wheelchair users

Randall's Island

Complete Living Shoreline Recreation Area and improvements to pathways

Soundview Park

Construct three-mile bike loop, new playground, fields, and amphitheatre

The High Line

Open Section 2 (20th to 30th Streets) and pursue acquisition of land for Section 3

East River Park Esplanade

Complete construction of 8.5 acres of East River Esplanade Park South, featuring water uses, educational uses, and café

McCarren Park

Construct new swimming pool, shaded pavilions, and recreation center

Governors Island

Modernize infrastructure and transform South Battery into acres of lawn and shrubs

Brooklyn Bridge Park

Re-open Empire-Fulton Ferry Park; complete construction on piers 4 and 5 and on upland areas of Piers 3 and 5

Rockaway Beach

Construct performance venue and lawn area, new courts, football field, skate park, and climbing wall

Freshkills Park

Develop the first public access areas overlooking Main Creek

Ocean Breeze Park

Construct 2,500 seat, world-class indoor track and field house

Calvert Vaux Park

Renovate lighted soccer fields, improve pathways, and restore wetlands

CASE STUDY

Flatiron Plaza

Before 2008, the intersection surrounding the Flatiron Building was a maze of streets and cars crossing from six directions. With traffic turning from some of Manhattan's busiest streets and few places for pedestrians to stop, the intersection did not work well for cars or people.

Today, the intersection has been redesigned to improve traffic flow and create new spaces that have themselves become destinations. A triangular plaza brings 41,700 square feet of public space to the bustling streets of the Flatiron district. Pedestrians, people-watchers, residents, and workers from nearby office buildings can now enjoy spectacular views of one of New York City's most photographed buildings while eating their lunch in a plaza surrounded by planters and shaded by umbrellas.

The redesigned Flatiron Plaza

Credit: NYC Dept. of Transportation

The new public spaces and redesigned streets have enhanced pedestrian safety and traffic flow. The wide streets, once so difficult for people and cars to cross, have been narrowed by adding pedestrian islands. Bus routes through the intersection are simpler, reducing passenger travel time; and bike lanes on Broadway and 5th Avenue provide alternative ways to move around the city.

DOT worked with the Flatiron Business Improvement District to fill the plazas with plantings, tables, chairs, and umbrellas. The group maintains the plazas for the city through a public/private partnership agreement.

Throughout New York City, plazas like the one by the Flatiron Building are transforming our streets and creating spaces for recreation and relaxation in unlikely places. A survey conducted by the Flatiron Business Improvement District found that 84% of people surveyed enjoyed the new plazas. For a tired shopper, a harried office worker, or a person taking a stroll on a Saturday afternoon, the plazas offer a place of respite in a busy city.

Re-imagine the public realm

Providing access to parks is about more than simply having them near where people live. We will also re-imagine our streets, sidewalks, and other public spaces as places in their own right. By using greenways, plazas, street trees, and other measures we will bring a park experience to nearly every corner of the city. These features will provide shade and color, clean our air, and increase property values.

INITIATIVE 8

Activate the streetscape

Maintaining a strong quality of life is one of the keys to the city's vibrancy and competitiveness. Transforming our streets from utilitarian corridors for vehicles into great places for people improves the everyday experience of the millions who use them and has clear economic benefits. Attractive and walkable streets increase foot traffic and retail sales, improve safety, and encourage the use of sustainable modes of transportation.

We are moving on multiple fronts to make our streets more attractive places for a wide range of users. We are building plazas within public rights-of-way to create multi-use open spaces. These plazas are bringing residents together and extending outdoor opportunities beyond our parks and into our neighborhoods.

Through the NYC Plaza Program, not-for-profit organizations apply to create new or enhanced existing pedestrian plazas, focusing on neighborhoods that are least served by parks. We select the best sites and partner with organizations to redesign parts of streets into successful neighborhood plazas.

Fourteen different sites from Plaza de Las Americas in Washington Heights, Manhattan, to Marcy Plaza in Bedford Stuyvesant, Brooklyn are currently in some phase of planning, design, or construction. This is in addition to other public spaces that the City has developed at iconic crossroads like Times Square and Madison Square in Manhattan, Fordham/Kingsbridge Plaza in the Bronx, and Willoughby Plaza in Brooklyn.

All of these sites create or enhance public spaces and increase pedestrian safety. We will continue to develop these enhancements by completing construction on 13 plazas by 2013.

We are also opening up a new type of space—pop-up cafés—to provide outdoor public seating in the curb lane during warm months. We are working with community boards to permit the opening of at least four of these in the coming year, building on a successful pilot in 2010. We will also streamline rules to make it easier for private café owners to open up a sidewalk café.

We will also make it easier for New Yorkers to enjoy life on our sidewalks. Our sidewalks currently provide few spaces to stop. To remedy this, we will initiate our CityBench program and, in coordination with community stakeholders, install over 500 benches throughout the city in key locations where sidewalk space permits, such as bus stops that can't accommodate a shelter.

We will also build on the recently held international urbanSHED Design Competition that developed a standard alternative to current sidewalk sheds. Sidewalk sheds, protective scaffolding put up when façade work is being performed, keep New Yorkers safe, but also represent ugly and dark intrusions on our sidewalks. The city currently has 6,000 of these sheds, spanning nearly one million linear feet. The winning design, Urban Umbrella, will keep New Yorkers safe while also promoting attractive and walkable streets. We will work with City agencies, buildings owners, contractors, and professionals to adopt the new design.

We will also continue to activate our streetscape by allowing movable tables and chairs in arcades on Water Street in Lower Manhattan. Street furniture will help activate these privately-owned, publicly accessible areas that currently diminish vitality along this important pedestrian corridor.

INITIATIVE 9

Improve collaboration between City, state, and federal partners

Over 40% of our city's 52,000 acres of parks is not owned by the City, but by other entities, mostly the state and federal governments. Though many of these space are side by side, they often have different rules that prevent our parks and public spaces from operating as a continuous network.

We will strengthen our collaboration with state and federal agencies to improve connections between our city's public spaces. For example, state parks in New York City don't allow dogs or bicycles and typically have more limited hours. This disparity has led to numerous issues; in Brooklyn, a fence had to be built to separate East River State Park from the City's Bushwick Inlet Park because of the differing rules and hours. Plans for a greenway along the Bronx side of the Harlem River will need to stop short of Roberto Clemente State Park unless we can work with the State to change its rules prohibiting cycling.

We will also collaborate closely with state and federal agencies through the New York City Urban Field Station (UFS). The UFS is a joint enterprise of the U.S. Department of Agriculture Forest Service's Northern Research Station and the Department of Parks & Recreation located at historic Ft. Totten in Queens. The UFS is modeled after the Forest Service's experimental forest research stations, this one with a unique focus on issues relevant to urban forestry. Going forward, we will foster partnerships that combine research and practice to improve the health, promote conservation, and strengthen stewardship of our parks and public space.

INITIATIVE 10

Create a network of green corridors

Streets and other dedicated paths perform multiple functions, including promoting recreation, capturing stormwater, and cleaning our air. We will seek opportunities to create a network of green corridors.

Greenways are multi-use pathways for non-motorized transportation along linear spaces such as rail and highway rights-of-way, river corridors, waterfront spaces, parklands and, where necessary, city streets.

In 1993, the City released *A Greenway Plan for New York City*, which identified the essential structure for the creation of a citywide system of greenways. Since then, we have been building out this network, and efforts are under way in each borough to further expand it.

For example, we are constructing the Brooklyn Waterfront Greenway which, when completed, will be a 14-mile-long bicycle and pedestrian path stretching along the Brooklyn waterfront from Greenpoint to the Shore Parkway. It is envisioned as a path for both commuters and recreational users that will knit neighborhoods together and enhance access to the waterfront. We will also complete improvements to the Bronx River Greenway and South Bronx Greenway, Queens East River Trail, Soundview Greenway, Staten Island South Shore Greenway, and Manhattan Waterfront Greenway.

In addition to promoting greenways, we seek to continue to transform our streets. Over the past few years, we have made significant strides in improving the design and functionality of our right-of-ways. We no longer treat streets solely as vehicular conduits, but also as vital public spaces, promoters of mobility by a variety of modes, and as ecological assets.

We must do more to make our streets live up to their full potential. Every street is different, so the effort must begin by understanding which functions—whether it be automobile movement or stormwater capture—different streets should incorporate and prioritize.

By using green infrastructure funding and coordinating street improvements being done throughout the city, we can design a template for what the complete streets of the future will look like.

To illustrate this, we will release an updated version of the Street Design Manual, a comprehensive resource for promoting higher-quality street designs and more efficient project implementation. The updated version will include a landscape chapter on the use and maintenance of green infrastructure, street trees, and other plantings to help guide the transformation of our streets. These elements are already being employed in capital projects throughout the city, and include block plantings of street trees and the construction and planting of Greenstreets on reconfigured roadbed.

CASE STUDY

Meeting the Needs of a Dynamic Urban Forest

When most Americans think of the U.S. Forest Service (USFS), they might think of Smokey the Bear or the secluded mountains of Montana. Now they should also think of Queens.

Urban forestry is a complex and rapidly-evolving science. To be on the leading edge, in September 2010 the City and the U.S. Forest Service jointly opened the New York City Urban Field Station (UFS) at Ft. Totten in Queens. The UFS is modeled after the Forest Service's century-old experimental forest research stations across the nation, but this one has a unique attribute: it's within the limits of the biggest city in the U.S. and focuses on the specific conditions inherent to trees in urban areas.

UFS scientists conduct long-term research, sharing knowledge to support PlaNYC initiatives like MillionTreesNYC, parks improvements, and urban ecosystem management.

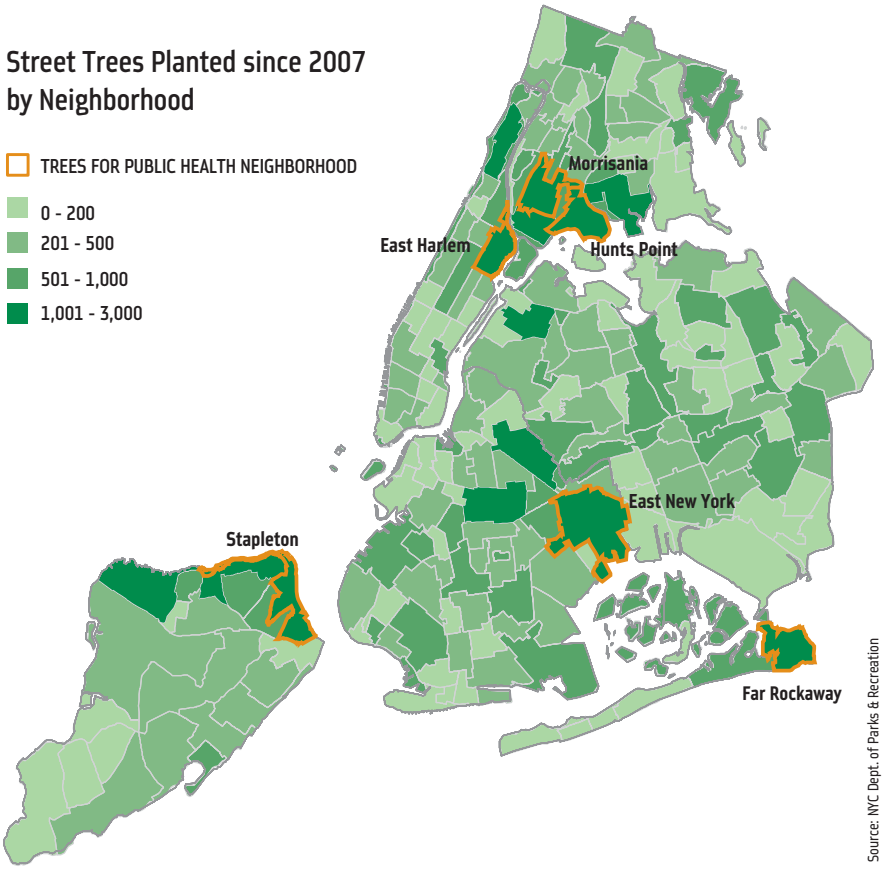
For example, they study bioindicators, organisms that provide clues to ecosystem health. Their research on salamanders is helping managers gauge forest health in Van Cortlandt Park and Inwood Hill Park, because salamanders' health is an indicator of forest health.

Researchers are also examining how urban restoration affects ecosystem structure and human health, and they are quantifying the benefits trees create for air quality and neighborhood cooling. To aid this analysis, researchers will use a new land cover map that will measure New York City's tree canopy using LiDAR (Light Detection And Ranging) technology. This information may influence how the City uses street trees to maximize the benefits they provide.

This research partnership between the City of New York and the U.S. Forest Service is producing useful information to keep New York City trees, parks, and natural areas healthy.

Promote and protect nature

New York City's ecological systems are unique, as the city sits on the border between southern climes in the Mid-Atlantic and northern climes in New England. This geographical and climatological overlap allows for a special mix of species and habitats. The health of these systems is critical to supporting the natural functions and systems that give New York clean air, clean water, and rich, abundant nature.



INITIATIVE 11
Plant one million trees

We are becoming more and more aware of the multiple benefits of urban trees. Today, a growing body of knowledge identifies trees as assets to a city's economic and environmental health. City trees cool summer air temperatures, filter air pollution, conserve energy by providing shade, and reduce stormwater runoff. In fact, New York City's trees are considered so valuable that it is illegal to damage, destroy, perform unauthorized tree work, or otherwise harm a street or park tree.

In 2007, in collaboration with the New York Restoration Project, we started MillionTreesNYC, an ambitious campaign to plant one million trees throughout the city. We targeted more than 60,000 of these plantings in six "Trees for Public Health" neighborhoods with particularly low street tree stocking levels and high asthma hospitalization rates for children aged 0-4.

We have already planted over 430,000 trees. By the end of 2013, we will have planted another quarter-million, bringing the number to nearly 650,000.

We will research ways to ensure the long-term health of our newly expanded urban forest by identifying built environment factors that affect the mortality rates of young planted street trees, and pilot new planting techniques that optimize street tree growing conditions. By continuing to track and monitor trees that were a part of the Young Street Tree Mortality Study we will be able to better understand the long-term viability of these trees. We are monitoring tree survival in our MillionTreesNYC reforestation sites and implementing experimental research plots to help us assess forest restoration strategies. We are also conducting additional research on the long-term outcomes of forest restoration projects implemented two decades ago.

INITIATIVE 12
Conserve natural areas

Our city is home to 11,000 acres of natural areas, from the Ramble in Manhattan to Alley Pond Park Preserve in Queens.

Fifty-one preserves have been specifically designated as Forever Wild sites. Each site represents the gold standard of natural habitat in the city, and in some cases features species of plants and animals that are endemic to that site. These sites include more than 8,700 acres of towering forests, vibrant wetlands, and expansive meadows. They are home to thousands of species, including flying squirrels, Great Horned Owls, and rare plants. They are critical natural elements in the city's infrastructure and give New Yorkers and visitors the chance to walk in the woods, paddle on a stream, or observe thousands of species of wildlife in their natural states.

To conserve these areas, we will explore the creation of a natural area conservancy. It will promote an integrated approach to the restoration, conservation, and ongoing management of our wild ecosystems.

INITIATIVE 13
Support ecological connectivity

We will also seek to promote ecological connectivity—closely linked green spaces that increase opportunities for people, flora, and wildlife to transition more easily between fragmented natural spaces.

In 2007, the City committed to expanding Greenstreets, a program that has successfully transformed hundreds of acres of unused road space into vibrant green assets. We have already planted nearly 260 Greenstreets. We will build 80 additional sites each year. Greenstreets capture stormwater and improve water quality, while also serving as important ecological respites within the urban landscape.

We are also seeking to expand the role of green roofs in our city. Green roofs have the potential to create ecological links between fragmented ecosystems and habitats. They can reduce the urban heat island effect and energy costs for buildings and help retain stormwater. We will conduct a study to determine best practices for promoting biodiversity in green roof design and construction.

We will also restore landscapes on the Belt Parkway in Brooklyn to promote ecological connectivity and ecosystem restoration.

Finally, we will study other ways that building sites can support the city's ecology. Building sites represent nearly half the land area in the city and have a great potential to mitigate the urban heat island effect, increase biodiversity, retain stormwater, and perform other critical ecological functions. We will address this issue comprehensively, for the first time, by developing a framework to address landscape issues on buildings sites in City codes. We will lead by example by building on the City's Urban Site Design Manual. We will create a set of standards and a design handbook for sustainable site design and construction practices for all municipal construction projects.

Ensure the long-term health of parks and public space

The greatest period of park building since the 1930s is appropriate at a time when parks are being called on to provide numerous ecological, economic, and social functions and serve more people. The demands on our parks system will only become greater given the challenges of an increasing population coupled with global climate change. Maintenance considerations must be incorporated into the planning and design process. Stewardship–engaging citizens and community groups in the upkeep of their parks–must be fostered by involving the public early in the park development process.

INITIATIVE 14

Support and encourage stewardship

The long-term health of our parks and public space is dependent on our collective effort to care for it. The City will continue to build on its long history of working with non-profit, volunteer organizations, and "friends of" parks groups to maintain these essential elements of our city.

Through the Catalyst for Neighborhood Parks program, we combine City-funded capital improvements with the City Parks Foundation's privately-funded arts, sports, and education programs. The Catalyst Program connects ideas, people, and networks to help care for targeted parks and provides stewardship training with the goal of increasing attendance at park events and programs. The current round of catalyst parks is focused on sustaining stewardship at Soundview Park in the Bronx, East River Park in Manhattan, and Calvert Vaux and Kaiser Parks in Brooklyn. The program will train 20 groups on park maintenance and stewardship and increase attendance at park events to more than 15,000 a year.

We will also build off of a successful series of Park Network Meetings, which bring together relevant community groups and advocates to support local parks. The first meetings were instituted in Manhattan and we will now expand this pilot to four parks in each borough.

Our focus on ongoing maintenance and care necessarily extends to our tree canopy, where we have added over 430,000 new trees in the last four years alone. To increase tree stewardship, we created the MillionTreesNYC Stewardship Corps. The Stewardship Corps will continue to recruit community-based organizations and individuals and offer them stewardship and community organizing training, including free tree care workshops and tool kits.

Our relationship with TPL, which helped build and design many of our Schoolyards to Playgrounds sites, is serving those sites as well. Over the next three years, TPL will host seven stewardship workshops to teach communities how to care for their playgrounds. TPL will disburse nearly 100 grants to promote onsite stewardship on new playgrounds, and deliver plantings to approximately 60 schools twice each year.

Through our partnership with the U.S. Forest Service, we will contribute to the New York City Stewardship Mapping and Assessment Project, an online database of environmental stewardship groups. This citywide database will support community-based efforts to maintain our public spaces and help connect those groups to each other and to City agencies.

Every plaza project also has a community partner involved in the maintenance and programming of the space. And Weekend Walks are initiated by community groups. These programs are rooted in a value system that partners with neighborhoods in the programming and care for the public realm.

INITIATIVE 15

Incorporate sustainability through the design and maintenance of all public space

In addition to engaging the broader community in stewardship, we will increasingly view design and construction through the lens of ongoing maintenance by continually updating our internal practices. We are developing training and education programs for our staff, tying together sustainability-related practices and setting targets for improvements. Because 14% of city land is City parkland, even small changes in the sustainability of operations will have a huge impact.

We will base many of our internal practices on the High Performance Landscape Guidelines, a joint effort between the City and the Design Trust for Public Space. This manual is the first of its kind in the nation. It recognizes that parks must function as climate-resilient landscapes that enable recreation, detain stormwater, and function as ecological corridors. We will instill these principles into our design, construction, and operations practices for years to come.

To implement these new guidelines, we will develop a digital library tracking system to catalog sustainable aspects of capital projects. We will also develop a design checklist for designers to set a baseline for performance and create achievable goals.

We will also ensure compatibility between the City's Parks Inspection Program's ratings and the functions of capital projects to ensure our standards measure the right outcomes. For example, what might be viewed as a poorly draining area by the current rating system may actually be a well-functioning rain garden. In addition, ecological restorations and native plantings may require different types of maintenance, such as meadows being mown annually rather than complying with the more frequent standards applicable to turf.

Conclusion

Through these initiatives, we will continue to advance toward our goal of ensuring all New Yorkers live within a 10-minute walk of park. However, the challenge of connecting New Yorkers goes beyond access alone. We must also ensure the quality of our parks and public space by providing for evolving recreational needs, along the continuum of park types from the newly-planted street tree on the corner, to the dazzling urban square, forested hillside, or quiet wetland.

We will re-imagine the public realm by envisioning public space beyond park walls, extending down parkways and greenstreets, and creating public plazas in our communities. We will link City, state, and federal parks into a cohesive network of open space that can be used more seamlessly by all people.

Finally, we will partner with New Yorkers to maintain our open space. By implementing new sustainable design guidelines, promoting biodiversity, and engaging communities and volunteers to care for the health of our urban ecosystems, we can ensure that our parks and public space can survive for future generations.

Brownfields

Credit: NYC Office of Environmental Remediation

Together we can

Develop programs to accelerate brownfield cleanup and redevelopment

Strengthen incentives for brownfield cleanup and redevelopment

Deepen our commitment to communities for community brownfield planning, education, and service

Expand the use of green remediation

My firm is transforming a vacant brownfield into a large development. The Brownfield Cleanup Program has helped us facilitate cleanup planning. The incentives, like liability protection and City certification of the property are important. I think these programs will make a big difference throughout the city.

Sin Senh // Queens

Brownfields hold an important opportunity to facilitate the "Green Economy" by simultaneously addressing social, environmental, and economic factors. This triple bottom line advances economic development and community goals. To bring a range of local constituents to the table within our Brownfield Opportunity Area, we hold public meetings and engage other local organizations in area-wide and site-specific planning initiatives.

Shira Gidding // Bronx

Brownfield cleanup helps residents become stakeholders in what's developed in their backyards. Many wonderful ideas come from our planning work—for small business development, job creation, and affordable housing. Brownfields were a significant challenge in creating the affordable senior housing we're opening this fall in Harlem.

Lucille McEwen // Manhattan

Looking for more opportunities, I took advantage of free training offered through a local training provider and got certifications in working with hazardous materials, asbestos and lead abatement, and air sampling. By December 2010, I got work as a temporary employee—when I reached my yearly review I was made permanent.

Ronell Marshall // Brooklyn

Brownfields

Clean up all contaminated land in New York City

New York City's need for space is growing. Of course, our supply of land remains fixed, so we must use our available space more effectively.

Brownfields—vacant or underutilized land often thought to be unusable due to environmental contamination—represent one of our greatest opportunities to secure new land for development. Brownfield cleanup and development will improve our economy and our environment, especially in poor and disadvantaged communities that suffer the greatest burden of brownfield sites.

The biggest obstacles to brownfield cleanup and redevelopment are the uncertainty of cleanup obligations, fear of pollution liability, and lack of financing. Property owners, developers, and community organizations that are in a position to redevelop brownfields are also encumbered by the often lengthy and uncertain cleanup process. These risks usually lead developers to pass over brownfield properties and choose clean properties, perpetuating a cycle of disinvestment, abandonment, and neglect.

New York City can break this cycle. We can provide communities, land owners, and developers with education, regulatory support, technical assistance, and financial incentives. Together, we can unlock the potential of vacant and contaminated properties, improve environmental quality, and provide land for new housing, commercial spaces, and parks.

Brownfield cleanup and redevelopment can help us revitalize neighborhoods and prevent exposure to contaminants. It can also create new jobs and stimulate our economy. Our efforts since 2007 have been successful and we are now cleaning up and redeveloping brownfields throughout the city.

In 2008, we created the City's new brownfields office, the Office of Environmental Remediation (OER). OER designed and operates a comprehensive series of brownfield programs. The New York City Brownfield Cleanup Program (NYC BCP)—the nation's first municipally-run cleanup program—addresses some of the greatest challenges in brownfield redevelopment. It reduces the uncertainty of investigation and cleanup requirements, streamlines the regulatory process, and provides liability protection from environmental enforcement under City and state laws. The New York City Brownfield Incentive Grant (BIG) Program funds investigation and cleanup to make brownfields more competitive with clean properties for new development.

In just the first few months of operation, NYC BIG grants have demonstrated a high return on cleanup investment to the City. The BIG Program has paid out or earmarked $800,000 to support cleanup on 16 brownfield tax lots. This investment is projected to leverage nearly $165 million in new development and 500 permanent new jobs in the city.

Brownfields are often concentrated in low-income neighborhoods, and there are few mechanisms available to ensure that development plans are coordinated with the community's vision for reuse of brownfield properties. To address these needs, we have assembled a landmark set of tools for community brownfield planning and participation, education, and networking. We also provide City grants to facilitate community brownfield redevelopment planning. The City founded the NYC Brownfield Partnership, an association of more than 50 community-based organizations (CBOs) and environmental businesses dedicated to providing grassroots community services and brownfield cleanup support. Finally, we have also extensively supported the New York State Department of State's (DOS) Brownfield Opportunity Area (BOA) Program, which provides grants to CBOs doing planning in areas burdened by clusters of brownfields.

In 2007, our set of tools to facilitate brownfield redevelopment planning was limited. Since then, we have established the Searchable Property Environmental Electronic Database (SPEED).

Environmental professionals conducting a brownfield investigation on a Brooklyn property

SPEED is an online real estate search engine that contains environmental data on sites throughout the city and historic land use information on more than 3,150 vacant properties. SPEED has received over 500,000 visitors in its first five months of operation. As we continue to develop tools like SPEED, our ability to support brownfield planning will dramatically improve.

We will also expand green remediation efforts to advance PlaNYC goals. We will develop performance metrics to evaluate green remedial efforts and seek new ways to provide incentives for activities that increase the sustainability of cleanups in our city.

Our Plan

Since 2007, we have learned a great deal more about New York City brownfields, and we have begun to operate new programs to achieve our goal of cleaning up all of the city's contaminated land. We will expand this new brownfield infrastructure in several ways to make previously undesirable sites more competitive for new development.

We will leverage the City's regulatory and technical oversight, including the high-quality cleanups we render, to lower the risk to lending institutions and encourage more investment in brownfield properties. We will also establish preferred environmental insurance policies to improve coverage and lower costs for brownfield developers.

In partnership with the state and federal governments, we will work to improve liability protections for sites cleaned up through the City's Brownfield Cleanup Program. This will make brownfields more competitive with uncontaminated properties.

We will make existing incentive programs stronger and expand the suite of brownfield incentives that we provide. We will make it easier to use incentives offered by the state and federal governments for brownfields. We will work with the environmental industry to help small businesses and small- and mid-size developers find qualified experts to clean up properties by creating a *pro bono* environmental expert referral program to encourage new projects.

To expand our commitment to grassroots, community-led brownfield planning, we will create 25 new NYC Community Brownfield Planning Districts and facilitate linkage of these local brownfield planning efforts into larger networks. Collectively, we will use intergovernmental collaborations, public-private partnerships, and the track record of cooperation we have established with community organizations to achieve the next generation of advances. Ultimately, we will make New York City's brownfields competitive for redevelopment and revitalization.

Develop programs to accelerate brownfield cleanup and redevelopment

With limited resources, we must find creative new approaches to make brownfield properties more competitive for reuse. We will accomplish this by collaborating with all stakeholders, including the financial and real estate sectors, the environmental industry, state and federal governments, and citizens and community groups throughout New York City. Together, we will ensure that the cleanup and revitalization of brownfield properties is a driving force in the city's economic recovery.

Our plan for brownfields:

Develop programs to accelerate brownfield cleanup and redevelopment

1. Increase participation in the NYC Brownfield Cleanup Program by partnering with lenders and insurers
2. Increase the capacity of small businesses and small- and mid-size developers to conduct brownfield cleanup and redevelopment
3. Enable the identification, cleanup, and redevelopment of brownfields
4. Build upon existing state and federal collaborations to improve the City's brownfield programs

Strengthen incentives for brownfield cleanup and redevelopment

5. Study the economic value of brownfield redevelopment in New York City
6. Leverage the NYC Brownfield Cleanup Program to establish funding and other incentives for cleanup and redevelopment

Deepen our commitment to communities for community brownfield planning, education, and service

7. Support community-led planning efforts
8. Support local and area-wide community brownfield planning efforts
9. Increase the transparency and accessibility of brownfield cleanup plans

Expand the use of green remediation

10. Promote green remediation in the NYC Brownfield Cleanup Program
11. Promote green space on remediated brownfield properties

First Brownfield Cleanup Program Projects and Brownfield Opportunity Areas

Source: NYC Office of Environmental Remediation

INITIATIVE 1

Increase participation in the NYC Brownfield Cleanup Program by partnering with lenders and insurers

The NYC BCP oversees environmental cleanups on lightly and moderately contaminated properties. It uses a streamlined and predictable process and provides liability protection to land owners and developers who enroll their properties. To ensure the highest-quality cleanups, we adopted New York State's cleanup standards and oversee all projects with a team of City scientists and engineers. We will establish new ways to leverage the value of the high-quality cleanups we render in order to minimize the risk and uncertainty normally associated with brownfield redevelopment. This will encourage more transactions between landowners and developers, and more lending and financial investment in brownfield properties.

We will establish programs to encourage lending institutions to expand financing to parties seeking to redevelop contaminated land and assist community banks and other lenders that do not have in-house staff to evaluate environmental risk. We will enable these institutions to rely on the NYC BCP to lower their risk when financing mortgages or other property loans, such as those for small business expansion.

Environmental risk is substantially lower for cleanups under the NYC BCP, compared to developer-directed cleanups. We will work with insurance companies to deliver preferred environmental insurance policies that offer better coverage and lower premiums for sites enrolled in the NYC BCP. To support this effort and encourage land transactions on brownfields, the BIG Program will allow grants to be used for pollution legal liability insurance to protect developers and their financial institutions.

INITIATIVE 2

Increase the capacity of small businesses and small- and mid-size developers to conduct brownfield cleanup and redevelopment

Many small- and mid-sized developers, as well as non-profit community developers, lack the expertise needed to remediate brownfields. To address this issue, we will collaborate with the NYC Brownfield Partnership to establish a *pro bono* environmental expert referral program. This program will provide inexperienced developers with advice on managing properties that require investigation and cleanup. It will enable businesses and CBOs to access free consultations provided by environmental industry professionals.

INITIATIVE 3

Enable the identification, cleanup, and redevelopment of brownfields

We will establish flexible provisions within the NYC BCP that recognize that the timeline for brownfield cleanup and redevelopment can vary greatly from project to project. For example, to improve prospects for the sale of a property, owners can utilize the NYC BCP to clean up the property prior to putting it on the market for sale.

There are instances in which a property owner cannot afford to conduct a cleanup and potential buyers are discouraged by environmental issues that complicate redevelopment. To address this obstacle, we will allow a landowner to investigate a property, develop an approved cleanup plan, and then defer performance of the cleanup until after a purchaser has been identified. Establishment of this standstill provision in the NYC BCP, where the property is safe and no government environmental authority is violated, can enable properties to be marketed more effectively for sale and can provide comfort to potential purchasers and lenders regarding the environmental risks and costs associated with a project. Ultimately, we can achieve a cleanup sooner than would have occurred without such a program.

We will continue to assist developers in finding brownfields for new development through improvements to SPEED, our online real estate search engine. SPEED features government environmental database information, historical maps from the 19th and 20th centuries, and aerial photographs of the entire city. It provides the land use history of more than 3,150 vacant commercial and industrial properties throughout the city. SPEED also promotes transit-oriented development by allowing users to superimpose mass transit data layers over property searches. We will continue to consult with community leaders and development professionals to identify new information that can be added to SPEED to improve this resource.

We will make our brownfield programs more effective for community-guided development. We will seek development-oriented community partners in neighborhoods with brownfield properties. We will assist them in working with City agencies and provide advice on how to use City cleanup and grant programs. Partnerships with CBOs and community development financial institutions will help achieve local visions for brownfield revitalization.

CASE STUDY

First NYC BCP Projects

Several years ago, a developer identified a vacant lot that they believed had great potential to bring value and services to the newly rezoned Grand Concourse in the South Bronx, near Yankee Stadium. A former industrial center, the brownfield property was ideally located near a hub for transit lines and major highways. It was identified by Brownfield Opportunity Area (BOA) community planners as a strategic property for redevelopment—an anchor site capable of spurring further economic activity.

The developer planned to remediate the site and build a new hotel expected to generate 60 permanent jobs. However, a portion of the property was rejected for enrollment in the New York State Brownfield Cleanup Program in July 2009, and the developer was unable to acquire needed liability protection.

In March 2011, the property developer enrolled in the newly launched New York City Brownfield Cleanup Program (NYC BCP) as a means to get necessary liability protection. The cleanup proposed by the development team is expected to achieve a Track 1 cleanup, the highest standard available under the NYC BCP, allowing the site to be reused without restrictions. The City will also certify the property as a New York City Green Property, a tangible symbol of the City's confidence that the cleanup is protective of human health and the environment.

To help finance the cleanup the project has also been awarded $60,000 by the New York City Brownfield Incentive Grant (BIG) Program. Because the project will achieve a Track 1 cleanup and has received strong support from BOA community planners, it also qualifies for a $75,000 bonus cleanup grant. Finally, by enrolling in the NYC BCP, the project qualifies for a low-interest cleanup loan from the Bronx Overall Economic Development Corporation, providing additional funding for remediation.

Other projects enrolled in the NYC BCP include new affordable and market-rate housing, office and retail development, and a church. These projects are expected to bring 500 permanent new jobs to the city. The NYC BCP is unlocking land plagued for years by vacancy or underutilization. In addition to creating new jobs and serving the needs of the people who will live and work on these properties, these new projects will drive growth in surrounding neighborhoods and sustainable development throughout the city.

CASE STUDY

Community Outreach and Training Program

New York City is home to many people who are chronically unemployed, young adults at risk, on public assistance, or among the working poor. Meanwhile, our environmental industry has great potential to provide career opportunities for these New Yorkers. However, working in the brownfield sector requires specific skills, training, and certifications including 40-hour Hazardous Waste Operator, electrical/carpentry/plumbing, and lead and asbestos abatement certifications.

Two things are needed to match the needs of interested workers and employers who are hiring —job preparedness training and opportunities for employment. STRIVE, a non-profit organization located in East Harlem, is making a big difference in this area with its Green Jobs training program.

STRIVE prepares its trainees for work in a variety of emerging green technology fields. After three weeks of basic job readiness training to prepare its clients for entering the workforce, participants can get specialized training in areas with demonstrated demand among local employers.

But training alone does not guarantee a job. Once trained, participants need help connecting with employers. To expand placement possibilities, the City established the BrownfieldWORKS! wage subsidy program. By reimbursing up to six months of a worker's wages, BrownfieldWORKS! encourages employers to provide job opportunities to graduates of environmental training programs. STRIVE worked with fellow members of the NYC Brownfield Partnership and OER to help graduates obtain job training placements with the NYC Brownfield Partnership's environmental businesses. In 2010, 26 training program graduates found placements through BrownfieldWORKS!, and fifteen of them were hired permanently.

As our new brownfield programs make remediation easier and encourage more cleanups, there will be more opportunities for job growth in this field. Job creation, especially for our city's most vulnerable, is important to New Yorkers. By harnessing the potential of the environmental industry and partnering with organizations like STRIVE, we can increase opportunities for job growth and economic development.

The start of remediation at a brownfield site in Flushing, Queens

The steps in a brownfield cleanup program can be complex, especially for those unfamiliar with the process. To simplify this process and increase program predictability and speed, we will establish the Environmental Project Information Center (EPIC). This online tool for program participants will automate and streamline navigation of our programs by providing online applications, communication portals, step-by-step guidance for City brownfield programs, real-time project tracking, and access to project archives. This e-government initiative will accelerate cleanups and lower transaction costs for parties enrolled in the NYC BCP. In addition, EPIC will enable completely paperless program management.

We will partner with the U.S. Environmental Protection Agency (EPA) to improve the field technology available in the investigation and cleanup of brownfield properties. We participated in a pilot demonstration of alternative approaches to investigation, called Triad, at two New York City brownfield sites and with the EPA, published a joint report in 2010 on the Triad approach. We will continue to collaborate to customize Triad tools for the investigation of contamination common to city properties and train environmental professionals in the use of these methods.

Recognizing that many of the city's waterfronts were filled in and used for industrial purposes, we will work with BOA grant recipients and local communities in Significant Maritime Industrial Areas to examine existing conditions and strategies for remediation, reuse, and redevelopment. We will encourage cleanup and redevelopment of waterfront sites by proposing amendments to the Zoning Resolution that would allow greater flexibility for non-residential uses and floor area to achieve certain goals, such as brownfield cleanup, adaptive reuse of outmoded buildings, expansion of maritime uses, and provision of in-water infrastructure.

INITIATIVE 4

Build upon existing state and federal collaborations to improve the City's brownfield programs

Continued collaboration with state and federal governments will further improve incentives for cleaning up and redeveloping brownfields, making them more competitive with uncontaminated land. At the state level, we will advocate for a full liability release for parties who remediate sites under the NYC BCP.

We will work to reach an agreement with the EPA that provides federal liability protection for parties who remediate sites under the NYC BCP.

Finally, to accelerate cleanup at sites where past legal actions by the state government have left an environmental lien that discourages new development and cleanup, we will pursue a program for environmental lien forgiveness. We will work with government partners to establish a pilot program that waives part or all of an environmental lien on a property where the developer agrees to clean up the property in the NYC BCP and redevelop the property within a defined schedule.

Strengthen incentives for brownfield cleanup and redevelopment

Both financial and non-financial incentives can be powerful tools to promote brownfield investigation, cleanup, and redevelopment. The NYC BIG Program and the NYC Green Property Certification Program, a LEED-like certification for remediated land, have demonstrated just that. We will work with the state and federal governments to develop new brownfield financial incentives and establish other innovative programs that provide value to developers.

Deepen our commitment to communities for community brownfield planning, education, and service

Our efforts can succeed only with the active participation and support of community partners. Through PlaNYC, we established several programs to join with communities in brownfield planning and development. We will build upon these programs and deepen our commitment to authentic community engagement and the highest level of community protection during and after cleanup.

INITIATIVE 5

Study the economic value of brownfield redevelopment in New York City

Although brownfield cleanup is widely acknowledged to be essential to economic development in the city, few studies have been conducted to quantify the financial return of cleanup and redevelopment. We want to ensure that our existing incentives are designed properly and that new incentives encourage activity that is beneficial to the city.

To better understand the financial return of City cleanup investment, we will collect relevant data on these projects. We will develop an economic model that quantifies the monetary value of brownfield redevelopment. We will also evaluate economic indicators such as job creation and new revenue generation from income and sales taxes.

INITIATIVE 6

Leverage the NYC BCP to establish funding and other incentives for cleanup and redevelopment

Cleanups conducted under the NYC BCP and the redevelopment that follows revitalize neighborhoods. These projects achieve a broad range of goals. They create jobs. They build affordable housing and green buildings. They can also integrate green stormwater infrastructure, use renewable energy, and contribute to transit-oriented development.

Many financial incentive programs currently exist to promote these broader goals. As we clean up brownfields and make them available for redevelopment, there is potential to combine the City's brownfield incentives with other incentives.

For example, the City collaborated with the Bronx Overall Economic Development Corporation (BOEDC) to establish a low-interest loan program that funds Bronx brownfield cleanups in the NYC BCP with the broader goal of creating new jobs and revitalizing neighborhoods. The NYC BIG Program offers cleanup grants for the same projects. Through this partnership, we maximize financial incentives available to these projects and ensure that BOEDC's investment will result in high-quality cleanups, while the redevelopment provides new jobs in the community.

Numerous financial incentives are available for brownfield redevelopment projects in the city, but these sources can be difficult for landowners and developers to find. We will establish an informal financial counseling program to help parties seeking assistance. We will also build a web-based financial assistance search tool to make funding easier and more convenient to find.

INITIATIVE 7

Support community-led planning efforts

To promote community-initiated brownfield planning, we will establish the NYC Community Brownfield Planning District (CBPD) Program and designate 25 CBPDs. Putting contaminated land back into productive use has enormous benefits to communities such as protecting public health and the environment, creating jobs, spurring economic activity, and realizing community visions for better neighborhoods.

The CBPD Program, linked closely with the BOA Program, will designate geographic areas in communities that have clusters of brownfield properties and active CBOs interested in addressing them. The CBPD Program will incorporate the 17 current New York City BOA study areas.

Through CBPDs, the City will support development of a community vision for brownfield redevelopment linked to community revitalization. We will help realize that vision by providing focused City assistance and services for brownfields. We will also provide stronger incentives-such as higher grant award limits and special bonus grants for land owners and developers that clean up and redevelop brownfields consistent with community brownfield plans. We will pilot the coordination of these efforts in East New York, where the City is leading an integrated land use and sustainability planning study. We will also provide CBPDs with support from a variety of City programs and resources that promote community sustainability.

Finally, we will work to expand the State BOA Program in New York City. We will identify 8-12 potential BOA projects in the city and work closely with community stakeholders to support new BOA applications for these areas.

CASE STUDY

New York City Brownfield Partnership

For small businesses, small- and mid-size developers, and community developers in New York City, brownfield cleanup and redevelopment can be a difficult undertaking. Landowners and developers usually learn about potential contamination when trying to finance their projects and can quickly become entangled in environmental due diligence investigations and soil sampling obligations with no obvious place to turn for advice.

New York City's environmental consulting industry has many businesses that perform environmental studies and implement cleanups on contaminated properties. Together, these firms represent an enormous resource to New Yorkers, not just for the environmental protection they provide but for community service they can deliver. However, until recently there was no mechanism for these firms to work together to establish meaningful programs and provide vital services for residents of our city.

To take advantage of this untapped opportunity, in 2008 we worked with environmental businesses, developers, and community-based organizations to establish the New York City Brownfield Partnership, an association dedicated to community service in the environmental industry. The association is now a fully functioning, non-profit organization with an elected board of directors and 50 member organizations.

The NYC Brownfield Partnership offers a series of valuable programs including a pro bono community counseling program, to help residents interpret cleanup plans, and a scholarship and internship program to help cultivate future environmental leaders. The NYC Brownfield Partnership also provides experts for City-run brownfield education workshops and informs potential employers about BrownfieldWORKS!, the City's program that provides subsidized job training and employment opportunities in the environmental industry to New Yorkers facing employment challenges.

The resources mobilized by the NYC Brownfield Partnership are a great example of creative collaboration that provides valuable community services to New Yorkers, while making it easier to find quality environmental services and clean up brownfields.

An architectural rendering of a brownfield redeveloped with housing and retail in Williamsburg, Brooklyn

INITIATIVE 8

Support local and area-wide community brownfield planning efforts

To ensure that CBOs leading BOA planning projects can undertake complex brownfield planning efforts, we will establish programs to help them collaborate with City agencies. We will publish a report to identify best management practices for such planners. To support the implementation of their plans, we will provide technical assistance grants for consulting services associated with brownfield cleanup and redevelopment projects.

We will work closely with the NYC Brownfield Partnership to expand educational programs and provide more convenient ways to access brownfield redevelopment information. To distribute training materials and planning tools as widely as possible, we will work with the State DOS to develop an online community brownfield planning portal. This online tool will provide BOA grantees with specialized access to environmental and planning information and allow for direct communication with the City.

To support the goals of community-based brownfield planners, we will encourage establishment of larger geographic networks of proximate BOAs with common priorities and challenges. To start, we will support a pilot program established by State DOS for area-wide community brownfield planning and cross-government collaboration in Brooklyn and Queens that links multiple BOAs, anchored by the Sunset Park BOA and the Newtown Creek BOA.

INITIATIVE 9

Increase the transparency and accessibility of brownfield cleanup plans

New Yorkers should be informed of the scope of cleanup work performed in their neighborhoods. They should know that all work is done in a way that protects community members. They also have the right to contribute to the development of cleanup plans by expressing their concerns before any work is performed. Under the NYC BCP, we will establish advanced safeguards for community protection in our cleanup plans and encourage community engagement.

Under NYC BCP regulations, all cleanup plans are subject to a public comment period. To increase accessibility of NYC BCP cleanup plans and other project documents, we will establish an online document repository for the public. The repository will also be accessible on the websites of local library branches throughout the city.

Work plans for brownfield cleanups are usually highly technical documents that can be difficult to understand. While cleanup programs typically offer documents for public comment, meaningful public review can be an unrealistic expectation because most community members do not have the technical training to fully understand document contents. We will eliminate this frustrating barrier by more clearly communicating brownfield project information to residents. We will also work with the NYC Brownfield Partnership to establish a *pro bono* community counseling program, through which community members can receive feedback about a cleanup plan from independent third-party experts.

We will provide a Community Protection Statement (CPS) with each NYC BCP cleanup plan. The CPS will summarize activities that assure community protection in clear, plain language. The CPS will also provide residents with contact

Nearly completed construction on a former brownfield in the Morrisania neighborhood in the Bronx

Credit: NYC Office of Environmental Remediation

information for key project personnel so they can obtain more information or register project-related complaints.

To provide training for the general public and students on environmental investigation and cleanup practices, we will produce a permanent online library of brownfield educational videos. These will include short documentaries that highlight Big Apple Brownfield Award-winning projects that demonstrate the best examples of brownfield transformation in the city.

We will continue to bring brownfield-related jobs to New York City through the promotion of the NYC BrownfieldWORKS! Program. Under this program, we will work with community-based job-training organizations, and the NYC Brownfield Partnership to utilize this job training and salary subsidy program. This will provide opportunities in the environmental industry for graduates of community-based environmental workforce training programs.

Expand the use of green remediation

Brownfield remediation and redevelopment in New York City is inherently sustainable. It reuses underutilized land resources, protects the environment and public health, and lowers carbon emissions by encouraging more efficient land usage. By incorporating green cleanup methods into brownfield redevelopment, we can increase the overall environmental benefit of our efforts.

INITIATIVE 10
Promote green remediation in the NYC Brownfield Cleanup Program

To promote green remediation practices, we will request that each cleanup plan under the NYC BCP include a Sustainability Statement. The Sustainability Statement will provide an opportunity to document green remedial measures that are incorporated into the cleanup process. It is also a tool to build awareness about green remediation practices that add to the sustainability of brownfield cleanups, encourage innovation in this emerging field, and provide a means to quantify green remediation activities. The Sustainability Statement will not mandate specific green remediation approaches, but will encourage their use on all projects.

We will establish grants to fund green remediation audits for cleanups planned under the NYC BCP. Green remediation grants will enable an independent expert to review cleanup plans and recommend additional actions that will make the cleanup and redevelopment more sustainable. Such reviews will accelerate the adoption of green remediation practices. We will also continue to familiarize the local brownfield industry with state-of-the-art practices in this emerging field.

We will establish a collaborative pilot program to integrate our brownfield programs with the City's sustainability goals and activities. We will promote the reuse of local, clean, recycled concrete aggregate as backfill at appropriate cleanups. This will eliminate the use of non-renewable resources that are routinely trucked long distances. We will explore the use of trees to implement *in situ* phytoremediation (an on-site, plant-based technology) for end-of-cleanup destruction of low-level pollutants in soil and groundwater. This will also advance the goals of MillionTreesNYC.

We will encourage stormwater retention practices on remedial sites. We will encourage green infrastructure implementation as part of redevelopment at appropriate brownfield sites. Finally, we will work to promote renewable energy projects on city brownfield sites.

These multidisciplinary sustainability efforts will improve our environment and conserve City resources. They will also help achieve the broader goals of PlaNYC and a greater level of sustainability on brownfield properties across the city.

INITIATIVE 11
Promote green space on remediated brownfield properties

In addition to "brick and mortar" development, brownfields present important opportunities to create valuable public green spaces. Our New York City Pocket Parks Program will convert small brownfields to community parkland. We will collaborate with community brownfield planning organizations, State DOS, and non-profit parks development organizations to identify prospective sites in neighborhoods that are underserved by open space. We will begin with a pilot program to create three pocket parks. Candidate sites will undergo environmental investigation and cleanup by leveraging BIG Program funding and other government grants.

We will design protective measures such as liners for state-of-the-art community gardens on remediated brownfield properties. We will work with GreenThumb and the New York Restoration Project to pilot a community garden on a remediated brownfield site.

Conclusion

To achieve sustainable land use and meet our city's infrastructure, housing, commercial, and energy needs, we must effectively identify, clean up, and reuse the thousands of brownfield properties in New York City.

Through the goals established in this plan, we will ensure that this work protects public health and the environment, and gives our residents a voice in this process. By forming partnerships across the private and government sectors, we will increase the overall success of our work. By taking this comprehensive and progressive approach, together, we can clean up all contaminated land in New York City.

Waterways

Credit: NYC Dept. of Parks and Recreation

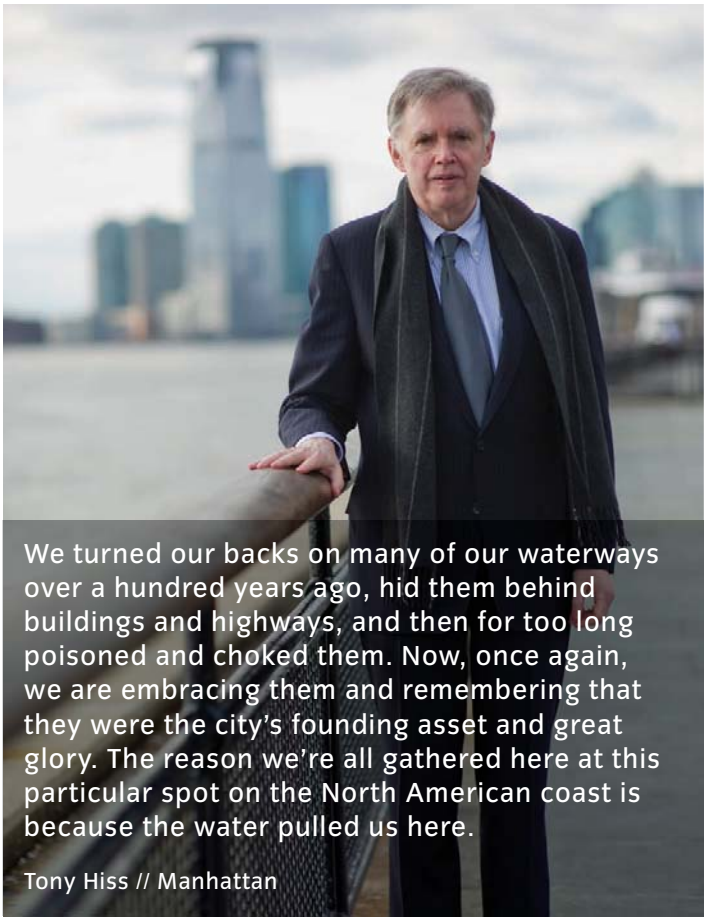
Together we can

Continue implementing grey infrastructure upgrades

Use green infrastructure to manage stormwater

Remove industrial pollution from waterways

Protect and restore wetlands, aquatic systems, and ecological habitat

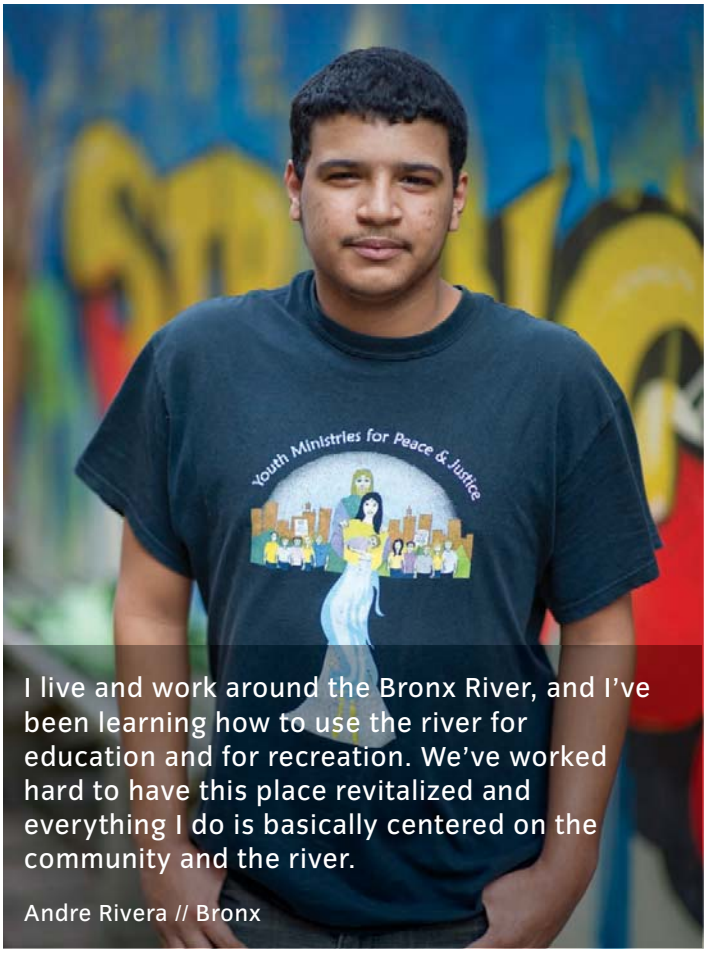


We turned our backs on many of our waterways over a hundred years ago, hid them behind buildings and highways, and then for too long poisoned and choked them. Now, once again, we are embracing them and remembering that they were the city's founding asset and great glory. The reason we're all gathered here at this particular spot on the North American coast is because the water pulled us here.

Tony Hiss // Manhattan

Few people realize that the Atlantic delivers impressive swells to New York City during hurricane season, a time when some gorgeous surfing can be observed on the gritty shores of Far Rock. As a mother of two, what draws me into the sea is not the thrill but the joy and serenity I feel catching waves under the rising sun before most people in the city have even risen from bed.

Jungwon Kim // Brooklyn



I live and work around the Bronx River, and I've been learning how to use the river for education and for recreation. We've worked hard to have this place revitalized and everything I do is basically centered on the community and the river.

Andre Rivera // Bronx

Not only does capturing stormwater prevent our harbors from becoming polluted, but it becomes a precious resource for greening the spaces where we live. I painted a mural in Cypress Hills, where captured stormwater sustains community gardens. These gardens provide better air for our children to breathe and healthy, local food for our communities to eat.

Katie Yamasaki // Brooklyn

Waterways

Improve the quality of our waterways to increase opportunities for recreation and restore coastal ecosystems

Water surrounds New York City, and the story of our harbor in many ways reflects the history of our city. The Hudson, East, Harlem, and Bronx Rivers, Jamaica Bay, and the Upper and Lower New York Bays have physically defined the city and supported trade, industry, diverse ecological communities, and recreation. Our waterways, as much as any other element of the city, distinguish our people and neighborhoods.

When Henry Hudson arrived over 400 years ago in what is now New York City, he encountered a land filled with forests, wetlands, and an abundance of nature. During storms, this undeveloped land naturally filtered rainwater into pristine waterways teeming with aquatic life.

New York City's transformation into a global center of industry and commerce dramatically and irrevocably altered this natural environment. People drained coastal marshes, ponds, and streams to make room for development. After a series of cholera outbreaks in the 1840s, city leaders invested in sewers to remove sanitary sewage and discharge it directly into waterways. Their vision proved to be a wise expenditure, and by the late 1860s, the threat of cholera from wastewater in the streets subsided. Nonetheless, the quality of our waterways became progressively worse. Eventually, wastewater treatment plants were built near bathing beaches, but construction didn't keep up with need in every waterway.

Industrialization also degraded our waterways. Wetlands were filled, and many waterways were deepened and their edges hardened with bulkheads and piers to support navigation and manufacturing. Oil refineries, factories, and shipyards clustered along our tributaries, and their waste products were often dumped into the water. While manufacturing declined after World War II, the health of the waterfront continued to suffer. For decades, stretches of waterfront sat largely abandoned while historic pollution seeped deeper into the soils and surrounding waters.

A lot has changed since then. Throughout the 20th century, the City built 14 plants that today are capable of treating 100% of the 1.1 billion gallons of sanitary waste that New Yorkers generate every day in dry weather. The City's efforts were helped by landmark federal legislation that included the 1972 Clean Water Act, which for the first time established pollution discharge standards and made grants available to meet them. The City's efforts have continued even after federal grants ended in the 1990s. We have invested more than $6 billion in harbor water quality improvements since 2002 alone.

In 2011, we are poised to certify system-wide attainment of Clean Water Act secondary wastewater treatment standards for the first time ever. And water quality in New York Harbor is cleaner now than at any time in the last century. Over 130 square miles, or 95%, of New York Harbor is available for boating. New Yorkers also have access to swimmable waters adjacent to the city's 14 miles of public beaches in the Bronx, Brooklyn, Queens, and Staten Island. More than 116 square miles, or 75%, of the New York side of the harbor meets pathogen standards for swimming.

Despite these major improvements, we continue to face four primary challenges to the quality of our waterways. First, while our wastewater treatment plants can handle all of the volume the city generates on a dry day, the treated water released from our plants still contains comparatively high levels of nutrients, such as nitrogen. These don't pose a public health risk, but they can impair water quality by depleting the dissolved oxygen that fish and other aquatic life need to survive.

Second, the majority of our sewer system accepts both sanitary and stormwater flows. There are design limits on the amount of stormwater flows the plants can handle without threatening the effectiveness of the wastewater treatment process. To protect treatment

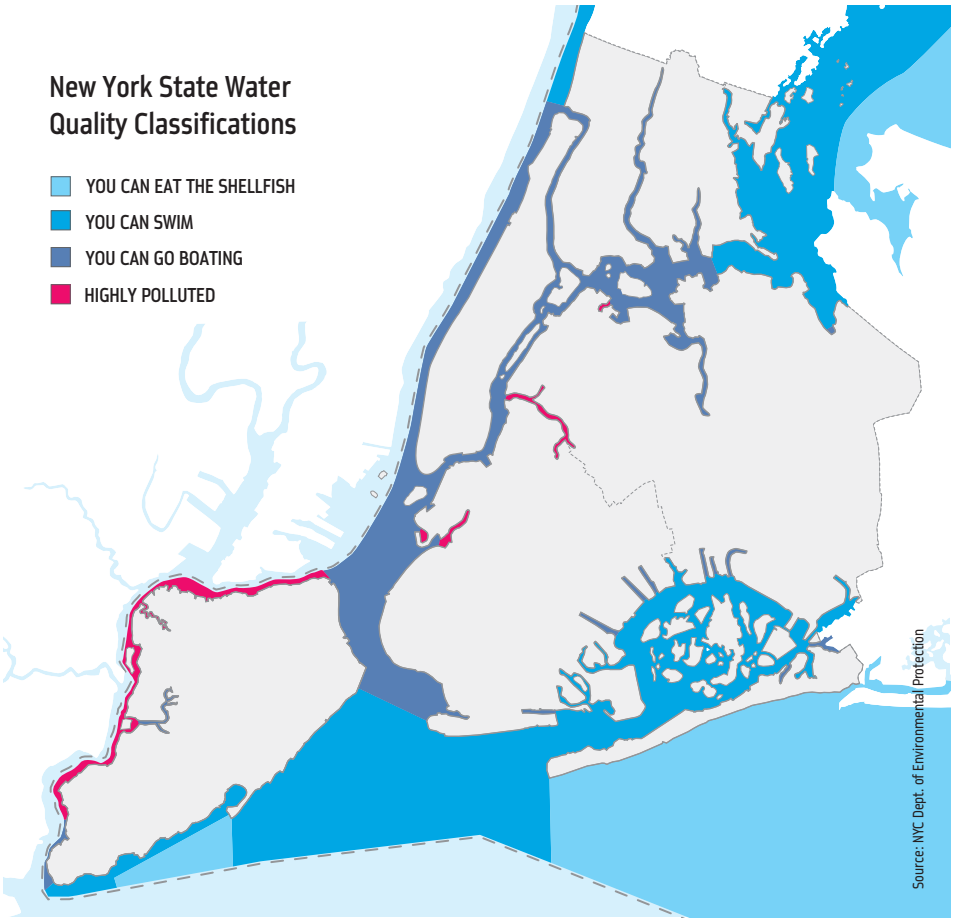
plants, the system has safety valves, known as combined sewer outfalls. Similarly, combined sewer outfalls are necessary in some locations because of limited capacity in the sewer system itself. These discharge excess sanitary and stormwater flow—otherwise known as Combined Sewer Overflows (CSOs)—into the city's surrounding waterways during heavy rains.

While CSOs are the largest source of pollution entering our waterways, the number and potency of these events has dropped dramatically over the last 30 years, limiting water quality impairments to our smaller tributaries. Since 1980, we have increased our rate of CSO capture from 30% to over 72%. The portion composed of sewage has continued to decrease from 30% by volume in the 1980s to 12% in 2010. However, we still discharge an estimated 30 billion gallons of CSOs each year.

Third, some of our waterways are severely impaired by contaminated sediments that leach pollutants deposited decades ago. These legacy contaminants continue to degrade coastal ecosystems that never fully recovered from the levels of pollution and development that occurred during the 19th and 20th centuries.

Fourth, we also face challenges to our remaining natural areas within our waterways. The construction of bulkheads and hardened shorelines and the dredging of channels have significantly altered tidal wetlands, aquatic habitats, and hydrology. For the Hudson-Raritan Estuary as a whole, including New York City, only 14 square miles of coastal wetlands remain from an estimated 100 square miles when Henry Hudson arrived 400 years ago. We must protect remaining wetlands and restore them where they can make the greatest long-term contribution to water quality and the ecosystems necessary for the harbor to thrive.

As a harbor city, the waterways that surround and adjoin the five boroughs are among our greatest assets. Improving the quality of our waterways will enhance the quality of life for New Yorkers. Cleaner waterways will provide additional recreational opportunities and support the public access provided by our waterfront parks. Removing pollution from contaminated waterways will benefit local ecosystems and provide economic opportunities for surrounding neighborhoods. A healthy harbor will provide benefits not just for the people enjoying nature, but also for the other species that call this region home.



Our plan for waterways:

Continue implementing grey infrastructure upgrades

1 Upgrade wastewater treatment plants to achieve secondary treatment standards
2 Upgrade treatment plants to reduce nitrogen discharges
3 Complete cost-effective grey infrastructure projects to reduce CSOs and improve water quality
4 Expand the sewer network
5 Optimize the existing sewer system

Use green infrastructure to manage stormwater

6 Expand the Bluebelt program
7 Build public green infrastructure projects
8 Engage and enlist communities in sustainable stormwater management
9 Modify codes to increase the capture of stormwater
10 Provide incentives for green infrastructure

Remove industrial pollution from waterways

11 Actively participate in waterway clean-up efforts

Protect and restore wetlands, aquatic systems, and ecological habitat

12 Enhance wetlands protection
13 Restore and create wetlands
14 Improve wetlands mitigation
15 Improve habitat for aquatic species

Our Plan

We are one of the world's great waterfront cities—a series of islands and archipelagos, with 520 miles of waterfront. But we have yet to fully realize the promise of our waterways as a source of recreation and inspiration. To fulfill this potential, we must improve the cleanliness of the water itself.

That is why we will upgrade our wastewater treatment plants. We will increase their capacity and improve the quality of the water they discharge. We will ensure that all 14 of the City's wastewater treatment plants will meet monthly secondary treatment standards for the first time since the standards were established in 1972. We will also cut nitrogen discharges into Jamaica Bay, the East River, and Long Island Sound by 50% by 2020 in order to minimize negative effects on aquatic ecosystems.

We will make cost-effective "grey infrastructure" investments such as upgrading and constructing new detention facilities and pumping stations. These traditional strategies will reduce the impact of CSOs around some of our more polluted waterways, but they alone will not sufficiently raise the quality of our waterways to desired levels. We will address the root cause of CSOs by making a transformative investment in green infrastructure that captures or detains stormwater before it can enter and overwhelm the sewer system.

In 2010, we launched the NYC Green Infrastructure Plan. It will supplement traditional approaches with a $1.5 billion, 20-year effort to improve water quality by making the city greener and more permeable. This investment, combined with targeted cost-effective grey infrastructure, will reduce CSOs by 40%. It will save ratepayers more than $2 billion if the plan is implemented rather than an all-grey approach. Green infrastructure will not only improve the quality of our waterways. It will also clean the air, lower energy demand, reduce carbon emissions, increase species habitat and property values, and reduce the city's vulnerability to the impacts of climate change.

We must also address contaminants that have lingered for decades. By working with our federal and state partners, we will ensure that our most contaminated tributaries are cleaned up. Similar partnerships will help us support ecosystem protection and restoration efforts.

Through the initiatives outlined below, we will improve the quality of our waterways and create a healthier habitat for fish and wildlife. Our efforts will help to ensure that we can more fully enjoy the waters that surround us.


Newtown Creek Wastewater Treatment Plant

Credit: NYC Dept. of Environmental Protection

Continue implementing grey infrastructure upgrades

The NYC Green Infrastructure Plan includes a hybrid of green and grey approaches, and we will continue to implement those grey infrastructure upgrades that are underway and are cost-effective. We will complete the expansion and modernization of the Newtown Creek Wastewater Treatment Plant and upgrade other plants to decrease nitrogen discharges into sensitive natural areas. We will construct cost-effective holding facilities for CSOs and upgrade other grey infrastructure to improve water quality in our tributaries. We will also maintain and upgrade our sewer system to support existing communities, accommodate new growth, and reduce pollution. We have embarked on a massive investment program to enhance the quality of our waters and assure the health of our residents.

INITIATIVE 1

Upgrade wastewater treatment plants to achieve secondary treatment standards

Treating more than a billion gallons of wastewater a day is an enormous undertaking. Our massive wastewater treatment plants—which New York City pioneered in the early 20th century—are equipped to handle twice the volume of flow that would occur on a normal day of dry weather.

For the last 40 years, the City has increased its wastewater treatment capacity and enhanced the level of pathogens that are removed through the treatment process. The substantial improvement in the quality of effluent, or the water that leaves these plants, is one of the main reasons that the water within the harbor is cleaner than at any other point over the past 100 years.

To further improve water quality, we are in the midst of a $5 billion upgrade to the Newtown Creek Wastewater Treatment Plant. This massive upgrade will increase treatment capacity from 620 million gallons per day (mgd) to 700 mgd for a plant that serves approximately one million residents within a 15,000 acre drainage area. In 2011, we will certify that the Newtown Creek Wastewater Treatment Plant—the largest of our plants—meets the effluent discharge requirements of the Clean Water Act. Once the certification process is complete, it will be the first time that all 14 of the City's wastewater treatment plants meet secondary treatment standards since they were established in 1972.

INITIATIVE 2

Upgrade treatment plants to reduce nitrogen discharges

Although not harmful to humans, high levels of nitrogen can impair coastal ecosystems. Nitrogen can cause algae blooms that rapidly deprive the water of oxygen under certain environmental conditions, typically in late summer.

We will complete $770 million worth of upgrades at the Bowery Bay, Tallman Island, and Wards Island wastewater treatment plants to reduce nitrogen discharges into the East River by more than 50%. We will also reduce the nitrogen discharged into Jamaica Bay by nearly 50% over the next 10 years. In February 2010, we reached an agreement with the New York State Department of Environmental Conservation (State DEC), the Natural Resources Defense Council, and other environmental groups under which we will dedicate $100 million to install new nitrogen control technologies at certain wastewater treatment plants in Jamaica Bay and another $15 million for marshland restoration projects. These investments, made in concert with $95 million the City has already committed for

Paerdegat Basin CSO Facility

nitrogen control upgrades in Jamaica Bay, will significantly improve the health of one of New York City's most valuable ecological areas.

INITIATIVE 3
Complete cost-effective grey infrastructure projects to reduce CSOs and improve water quality

Over the next 20 years, we will invest $2.9 billion to construct cost-effective grey infrastructure projects that reduce the amount of untreated water discharged into our waterways. We will implement two categories of grey investments—infrastructure that reduces the volume of CSOs and other projects that improve the water quality in waterways impacted by CSOs.

In some areas where it is cost-effective, we will reduce CSO volumes by building large detention facilities that capture and hold CSOs and pump back wastewater to a treatment plant when storms pass. We recently completed a rehabilitation of the 20-million gallon CSO detention facility at Spring Creek and a new 43-million gallon facility at Flushing Bay. In 2011, we will complete a 50-million gallon facility at Paerdegat Basin that will capture 1.7 billion gallons of CSOs per year. This will enable Paerdegat Basin to achieve a greater than 90% attainment of existing dissolved oxygen standards and 100% attainment of existing pathogen standards.

Also in 2011, we will complete a 5-million gallon CSO facility at Alley Creek in Queens. We will increase the capacity of the Avenue V Pumping Station in Brooklyn from 20 mgd to 30 mgd. This will help reduce CSOs and increase oxygen levels in Coney Island Creek. We will increase the capacity of the existing Gowanus Canal Pumping Station from 20 mgd to 30 mgd. Together, these grey infrastructure projects will reduce CSOs by more than 8.2 billion gallons a year.

We will implement other CSO-related grey infrastructure projects to improve water quality. We will invest $50 million to reactivate the Gowanus Canal Flushing Tunnel. The tunnel was opened nearly 100 years ago, but has not operated at its full capacity since it fell into disrepair in the 1960s. It brings oxygen-rich water from the Buttermilk Channel, which is fed by the East River, into the canal to improve overall water quality and mitigate the effects of CSOs. The existing single pump will be replaced with three pumps, increasing the daily flow of water into the canal by 40%. We will also complete an in-water aeration system in Newtown Creek and a destratification facility at Shellbank Creek.

INITIATIVE 4
Expand the sewer network

To support current residents and future growth, we will prioritize the extension of sanitary and storm sewers to neighborhoods throughout the five boroughs that need additional capacity.

On the Rockaway Peninsula, we have spent almost $55 million to construct separate storm sewers since 2002. This investment has improved water quality and reduced flooding and sewer backups. We will target Southeast Queens for separate sewer projects to increase capacity and reduce street flooding. We will also finish key projects on the South Shore and Mid-Island of Staten Island, in Hunts Point in the Bronx, and in the Springfield Gardens, Maspeth-Middle Village, and Hunters Point neighborhoods in Queens.

We will also invest in High Level Storm Sewers (HLSS) to keep water out of our combined sewer system. HLSS partially separate the flow in combined sewer areas by capturing 50% of rainfall and diverting it into our waterways through permitted outlets. We will build HLSS in the Throgs Neck area of the Bronx, the Gowanus neighborhood of Brooklyn, and in the Laurelton neighborhood of Queens.

CASE STUDY
Nitrogen

The quality of some of our waterways can be affected by nitrogen that enters our waterways through discharges from wastewater treatment plants and other sources such as stormwater runoff. Although it poses no threat to human health, high levels of nitrogen can deplete dissolved oxygen in the water, inhibiting fish habitation. Other chemicals such as de-icing fluids can have the same effect.

This effect is a problem in those waterways where tidal or other natural flushing actions have been compromised; nitrogen has been identified as one contributor to the recurring water quality problems in Jamaica Bay, the East River, and Long Island Sound. As part of our efforts to improve water quality, we have committed to reduce nitrogen discharges into Jamaica Bay and the East River by 50%.

Traditional nitrogen removal processes require large, capital upgrades that are energy intensive and have high operating costs. But there are new technologies available that can cost-effectively remove nitrogen by supplementing existing infrastructure. We will introduce two of these technologies, SHARON and ARP, to begin removing nitrogen from wastewater treatment plant discharges.

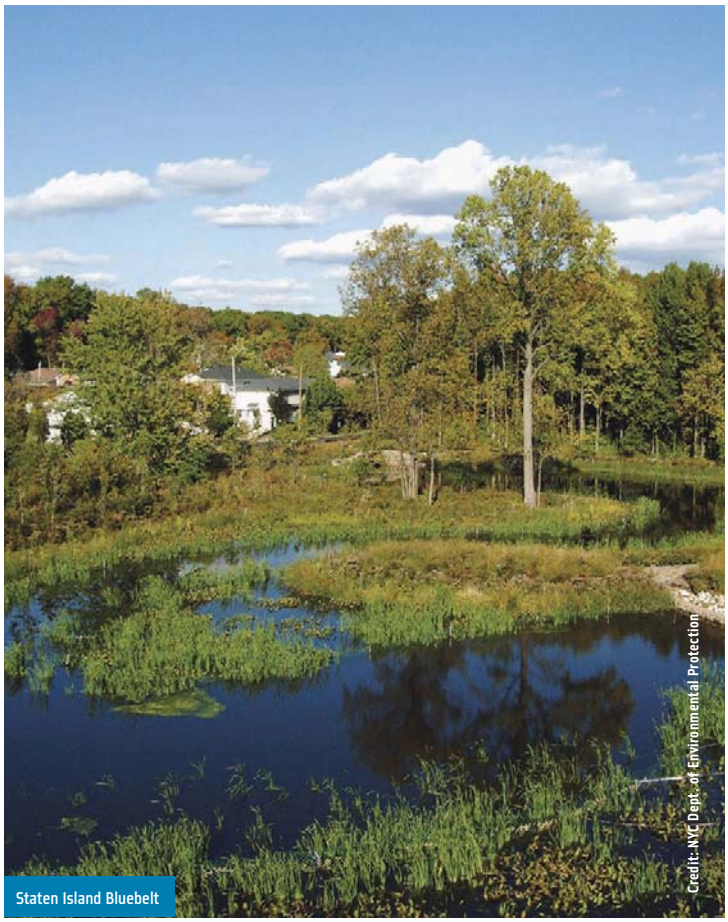
The SHARON, or Single Reactor System for High Ammonia Removal Over Nitrate, process uses heat to raise bacterial activity to a level where nitrogen-rich wastewater can be treated more efficiently in a single reactor. Within the reactor, ammonia oxidizing microorganisms transform nitrogen by-products into a gas, which is then trapped and removed from the facility. We have been operating one of the two vessels for about a year at the Wards Island Wastewater Treatment Plant. Once SHARON is fully operational it is expected to reduce the nitrogen discharge load by 10,000 pounds per day.

We will install the Ammonia Removal Process (ARP) at the 26th Ward Wastewater Treatment Plant in Jamaica Bay. ARP combines flash vacuum distillation with ion exchange to remove an estimated 90% of nitrogen from filtrate streams. When the installation is completed by 2014, the ARP technology should reduce the plant's nitrogen load by an additional 3,000 pounds per day.

SHARON and ARP are good examples of how new technologies are making it possible to remove nitrogen using less energy and fewer chemicals. These technologies will lessen the tradeoff that has existed between improving the quality of our waterways and reducing greenhouse gas emissions.

City workers cleaning sewers

Credit: NYC Dept. of Environmental Protection



Staten Island Bluebelt

Credit: NYC Dept. of Environmental Protection

INITIATIVE 5

Optimize the existing sewer system

Building new sewers that separate stormwater from wastewater is an effective, but expensive solution to CSOs. The most cost-effective way to reduce CSOs is to optimize the existing sewer network. In the large areas of the city where the combined sewer system is well-established, we will optimize the sewer system by repairing catch basins, fixing tide gates, and cleaning interceptor sewers.

Catch basins help control flooding from heavy rains. When built with special hoods, they prevent street debris from reaching our sewers. Our 144,000 catch basins are an important part of the sewer system that prevents blockages and keeps trash off our beaches. We have established a system to prioritize repairs by risk and set targets for catch basin repair time. More than 2,350 catch basins are in need of repair. By 2014, we will inspect all catch basins and seek to substantially eliminate the repair backlog.

The tide gates that cover CSO discharge points are also in need of repair. Damaged tide gates allow wastewater to leak out and corrosive salt water to leak in. To combat this problem, we will continue to implement a tide gate rehabilitation survey that inspects 25 tide gates per month. We will make repairs as needed in order to ensure maximum CSO storage and treatment plant productivity.

Built-up sediment and debris within portions of our sewer system are of similar concern. 138 miles of large intercepting sewers connect the system to the wastewater treatment plants. For our system to operate at full capacity, these interceptor sewers must be clear of any blockages or potentially damaging debris. In spring 2010, we launched an effort to clean the entire interceptor sewer network within two years, beginning with the neighborhoods with the most severe flooding issues. We are also using sonar and video surveys to catalogue the extent and location of sediment and impacted areas. We will establish a permanent program to maintain the maximum capacity of this vital infrastructure once the initial cleaning and rehabilitation is complete.

Use green infrastructure to manage stormwater

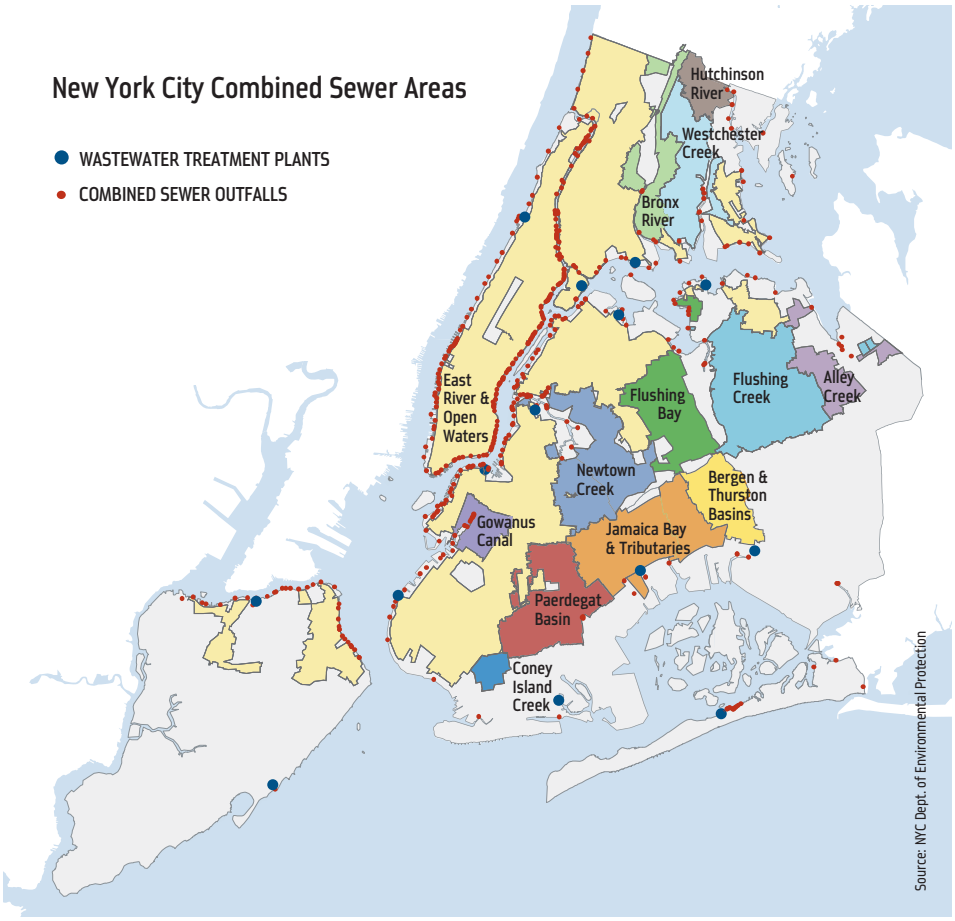
Trying to reduce CSOs entirely with traditional grey infrastructure would be very expensive. Nor would it maximize the water quality gains we can make with public funding. Therefore, we will shift some of our investment dollars to a more sustainable approach that not only improves the quality of our waterways, but also provides multiple additional benefits.

Green infrastructure improves the quality of waterways by using vegetation and other features on buildings, roads, and parks to absorb and retain stormwater. By considering all surfaces of our environment as opportunities to enhance drainage, we can reduce the amount of stormwater runoff that reaches our sewers immediately after a rainfall. Our use of green infrastructure to manage stormwater is part of a comprehensive approach to a complicated problem. The benefits will be immediate and come at a lower cost.

INITIATIVE 6

Expand the Bluebelt program

Using green infrastructure to manage stormwater is not a new concept for New York City. In fact, since the early 1990s we have relied upon wetlands and natural areas in our Bluebelt system in Staten Island to absorb stormwater runoff, thereby eliminating the need for costly storm sewer systems. Using natural systems in place of traditional sewers has saved taxpayers $80 million in infrastructure costs, raised property values, and restored damaged habitats. The Bluebelt system is a successful model of a cost-effective sustainable stormwater management strategy that provides multiple benefits in addition to improving water quality.



The Bluebelt system is composed of streams, ponds, and wetland areas that treat and detain stormwater prior to its release into the harbor. It provides effective stormwater management for more than 14,000 acres of Staten Island, or about one-third of its total land area. In effect, we have reshaped the natural environment to filter drainage from buildings, lots, and streets, instead of constructing sewers through which this runoff would be sent to surrounding waterways.

This same strategy can be applied in other lower-density areas with key natural features. In Staten Island, we will expand the Mid-Island Bluebelt to Oakwood Beach, New Creek, and South Beach. We will also expand the use of this approach in parts of Queens and other boroughs where it is cost-effective and there is sufficient space.

INITIATIVE 7
Build public green infrastructure projects

New York City experiences a tremendous volume of runoff from rooftops, streets, and other impervious surfaces every time it rains. To address the root cause of runoff—impermeable surfaces—we must design, build, and maintain stormwater source controls, or small installations that control stormwater where it meets impervious surfaces. By implementing a distributed system of source controls throughout our built environment, we will capture rainwater before it enters our over-burdened sewer system.

In 2008, the City undertook a comprehensive study of the costs and benefits of adopting citywide source control scenarios in the streets, sidewalks, private and public buildings, and parks. The result was a Sustainable Stormwater Management Plan that was the first in the country to analyze the location and feasibility of source controls in a dense, ultra-urban environment on a citywide basis. The plan included a rigorous analysis of capital and maintenance costs and potential benefits of widespread source controls. It concluded that many would be just as effective as traditional CSO controls, for a fraction of the cost.

One major initiative of the Sustainable Stormwater Management Plan was to implement 30 pilot projects that would test promising source control technologies in New York City. There are several demonstration projects underway. Swales and stormwater-capturing tree pits allow water to pool in underground holding areas until it can dissipate. Blue roofs slow roof water from draining too quickly and overwhelming storm sewers. Permeable pavement allows water to seep through and be absorbed into the ground rather than becoming runoff. By 2013, we will complete these pilot projects by collecting monitoring data and publishing the findings.

Building on the Sustainable Stormwater Management Plan, we released the NYC Green Infrastructure Plan in 2010. The plan provides an implementation strategy for launching a source control program. We committed $187 million in fiscal years 2012 through 2015 to immediately begin implementing the plan. At the same time, we are seeking approval from the State DEC and the United States Environmental Protection Agency (EPA) to modify existing regulatory agreements necessary to fully implement the plan. We are working with the State DEC to integrate green infrastructure into the current CSO program and in the Long-Term Control Plans that will be completed for 13 waterbodies by 2017. Each Long-Term Control Plan will undertake a detailed examination of the level of green infrastructure investment necessary to meet water quality standards.

To implement sustainable stormwater source controls across the city, we will work through an interagency Green Infrastructure Task Force. We will exploit opportunities provided by planned public infrastructure projects. We will develop approved specifications for source controls in commonly-used applications. We will streamline design and permitting processes for the incorporation of source controls in public projects.

We are prepared to spend $1.5 billion on green infrastructure over the next 20 years. This investment, combined with cost-effective grey infrastructure investments, will reduce CSOs by 40%. Through these investments, we will capture the first inch of rainfall on 10% of impervious surfaces within combined sewer areas. The budget includes funding for maintenance and operations to ensure that green infrastructure continuously performs as designed. Implementing the NYC Green Infrastructure Plan, rather than an all-grey approach, will save New Yorkers more than $2 billion.

INITIATIVE 8
Engage and enlist communities in sustainable stormwater management

Incorporating green infrastructure within neighborhoods is best accomplished by working with the people who live there. Because of differences in soils, slopes, and adjacent land uses, solutions in the Canarsie neighborhood of Brooklyn may be different from solutions in the West Village of Manhattan. This creates both the need and the opportunity for innovation. Local communities can also provide essential stewardship support for green infrastructure installations.

CASE STUDY

Enhanced Tree Pits

Since 2008, we have launched over 30 green infrastructure pilots ranging from bioswales along roadways to green roofs on public buildings. These projects provide specific data on costs, maintenance needs, and the effectiveness of various forms of green infrastructure. This information will help implement green infrastructure citywide.

Some types of green infrastructure, such as enhanced tree pits, take familiar elements of our urban environment and redesign them so that they are able to capture stormwater. Traditionally, street trees were planted in heavy soils within confined pits that restricted root growth and provided limited soil moisture and oxygen levels. This leads to stunted growth, damaged sidewalks, and does little to capture stormwater runoff. Using enhanced tree pits will not only improve stormwater management but also improve the health and growth of our street trees.

Enhanced tree pits use inlets to capture stormwater runoff from the sidewalk and funnel it into the soil where it can be absorbed by tree roots and infiltrate. The enhanced tree pits are bigger at 100 square feet compared to 25 square feet for a traditional pit. Two curb cuts allow stormwater to enter the pit from the street and allow overflow to travel back to the street for conveyance to storm sewer catch basins. These pits also include native plants, subsurface storage, and specially-engineered soil to filter pollutants and absorb greater quantities of stormwater runoff.

Enhanced tree pit in the East New York neighborhood of Brooklyn

Credit: NYC Dept. of Environmental Protection

By using enhanced pits, our street trees will grow larger, absorb more stormwater, sequester more carbon, and provide more environmental co-benefits. Healthier trees provide a larger cooling effect, additional habitat, and higher property values. So far, we have installed five enhanced tree pits that will be closely monitored to measure the storage of stormwater and to form the basis of our planning efforts. Already, these pilots have been copied in standard designs for bioswales and enhanced tree pits that can be used in most Department of Transportation and Department of Design and Construction road reconstruction projects.

One way of encouraging innovation is by providing grants to local groups to develop and implement green infrastructure projects that are right for their neighborhoods. In 2009, we awarded $2.6 million to five projects through the Flushing and Gowanus Green Infrastructure Grant Initiative. This program targets projects in the Flushing Bay or Gowanus Canal CSO drainage areas to fund construction of a green roof, vegetated swales, bioretention basins, and treatment wetlands. In early 2011, we launched a new $3 million Green Infrastructure Grant Program to fund efforts by private property owners, businesses, and not-for-profit organizations to install stormwater source controls within combined sewer drainage areas. We expect to expand the Green Infrastructure Grant Program in coming years.

Grant programs are just one of the ways we will partner with local stakeholders to shift to more sustainable stormwater management. We have formed the Green Infrastructure Citizens Group, which is open to the public and headed by the Green Infrastructure Steering Committee, made up of civic organizations, environmental groups, developers, engineers, and design professionals. They will meet regularly to ensure that their input factors into future planning and implementation efforts. In partnership with the State DEC, we will seek public input into future regulatory decisions through meetings of these groups and through waterbody-specific advisory groups leading up to the creation of Long-Term Control Plans. Community engagement will ensure that our investments provide the greatest benefits to both local communities and the city as a whole.

INITIATIVE 9

Modify codes to increase the capture of stormwater

Modifying design codes is another effective way to incorporate sustainable source controls and other forms of stormwater management within our built environment.

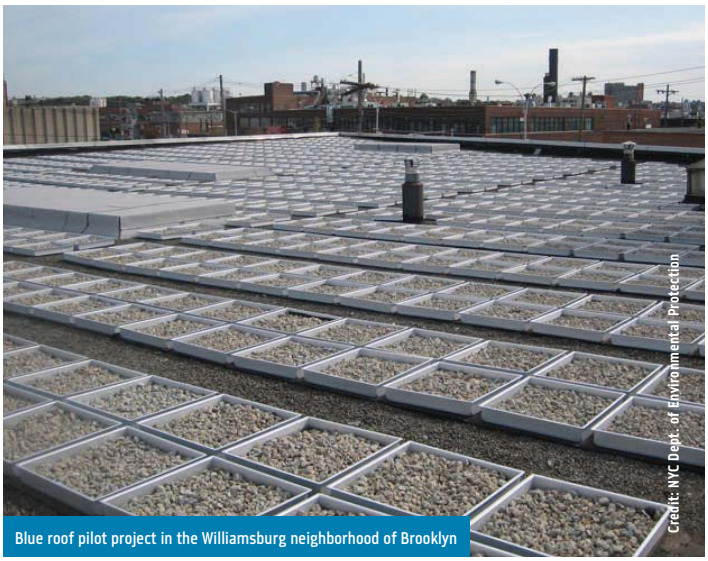
Since the 2007 release of PlaNYC, we have made several key changes. Through zoning amendments initiated by the Department of City Planning, new commercial parking lots are now required to include perimeter and interior green infrastructure. Buildings in lower density districts are no longer allowed to pave over their entire front yards. New developments citywide must plant street trees and, in lower density areas, provide sidewalk planting strips.

These measures will allow less stormwater to enter the sewers. They will increase or protect the amount of permeable surfaces that absorb rainfall and help reduce CSO events and local flooding by slowing the rate of runoff. We will build upon these measures by improving stormwater management practices on private sites in several key ways.

To ensure that private investment in source controls keeps pace with public investments, we will tighten existing requirements for stormwater management on all new development and redevelopment. By further limiting the rate at which stormwater can be released from sites, developers and owners will invest in green infrastructure and other source controls. Based on development trends, we estimate that an additional $900 million of green infrastructure will be built over the next 20 years.

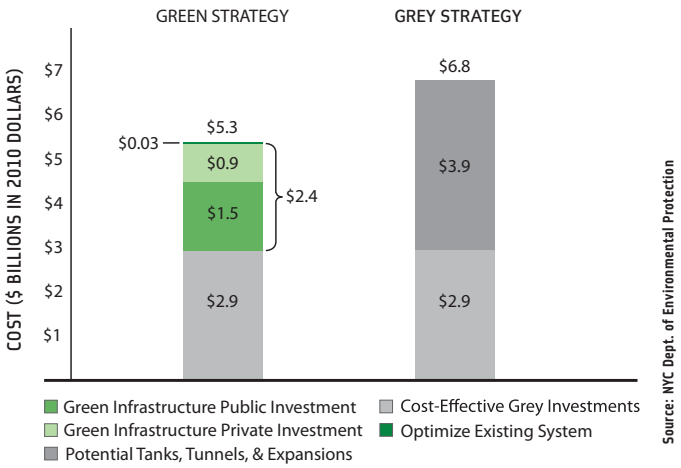
We will strengthen requirements for capturing stormwater from construction sites. Under federal and state regulations, construction sites over one acre must reduce the amount of stormwater runoff they generate. These rules have little effect in New York City where most construction sites are well below one acre. To close the gap, we will propose local legislation mandating that smaller construction sites follow additional requirements to reduce stormwater runoff. Better stormwater management at construction sites will reduce the amount of dirt and debris that washes into the sewers.

We will evaluate opportunities to detain stormwater on rooftops. Blue roofs are one of the source controls with the greatest potential to increase stormwater capture rates at low cost. Blue roofs, or rooftop detention systems, are a detention technique whereby a flow restriction



Blue roof pilot project in the Williamsburg neighborhood of Brooklyn

Citywide Costs of CSO Control Scenarios
2011 – 2031



device around drains holds back water while the storm surge passes, and then slowly releases the water out to the sewers. We have successfully built blue roofs on new schools throughout the city, but we have not yet proved that blue roofs could be cost-effectively installed on existing buildings. We are currently piloting blue roof systems on existing buildings. We will study the results to determine whether we will adjust codes to require blue roofs on existing buildings in the future.

We will address the inconsistent rules and regulations that are an impediment to incorporating sustainable source controls within sidewalks. Well-designed sidewalks can reduce stormwater runoff, increase the longevity of trees, and reduce the urban heat island effect. We will develop and implement a single, consistent sidewalk standard that includes permeable strips, water storage capacity, and increased planting and recycled materials within all new sidewalk construction. This will not only provide new opportunities for the implementation of stormwater source controls, but also create a healthier tree canopy.

We will examine ways to reduce stormwater runoff from unenclosed industrial uses. Although current regulations require source controls for certain types of new construction, there are fewer controls for undeveloped sites on which many of these uses operate. Runoff and emissions from open uses can produce a poor environment for other businesses, discouraging investment in industrial areas, as well as pollute waterways and adversely affect air quality and the quality of life in adjacent residential areas. To address these issues, we will explore zoning requirements and land use controls for certain, potentially polluting unenclosed commercial and manufacturing uses to improve upon existing controls for noise, odor, dust, and stormwater discharge.

INITIATIVE 10

Provide incentives for green infrastructure

Much of the existing impervious urban landscape will not be redeveloped and is not controlled by the City. Many private property owners lack either the incentive or the means to install sustainable source controls on their own. By realigning incentives, we will enable residents, businesses, and property owners to partner with us in our effort to reduce CSOs and clean up our waterways—efforts that benefit all New Yorkers.

New York City's water and sewer use charges are currently based on the volume of potable water consumed, not the property's discharge of stormwater. The result is little correlation between the stormwater generated by a property and the stormwater fees that the owner pays.

We will evaluate the opportunities for a separate stormwater rate and credit system that charges landowners for their runoff and provides incentives for them to reduce impervious surfaces. As an initial step, we are piloting a separate stormwater charge for parking lots that is aligned with the burdens that those lots put on the system which then has to be paid for by everyone else. The pilot stormwater charge applies to approximately 300 lots that currently have no water service and therefore don't pay towards the City's costs to collect and treat the stormwater they generate. These stand-alone parking lots are charged $0.05 per square foot of property area, a figure derived from the City's stormwater-related capital and expense budget items.

We will use the results of this pilot to determine whether and to what extent a stormwater charge could be applied more broadly throughout the city. We will also evaluate the feasibility of creating a crediting program that would give property owners an incentive to install approved green infrastructure technologies in exchange for reduced stormwater fees.

We will continue encouraging the private sector to incorporate green infrastructure into their property through our Green Roof Tax Abatement. This program, which was passed by the New York State Legislature in 2008 and implemented by the City in 2009, provides an abatement from City property taxes of $4.50 per square foot of legally-installed green roof, up to $100,000. Property owners qualify with the installation of a green roof on at least 50% of a roof and preparation of a maintenance plan to ensure the viability of the vegetation and expected stormwater benefits. The program is currently scheduled to run until 2013. We will evaluate the program's efficacy to determine whether to extend or modify it.

Remove industrial pollution from waterways

The presence of industrial pollution has been a long-standing issue for New York's shoreline. Lingering contaminants have proven to be a lasting legacy of our working waterfront. During the first half of the 20th century, oil, coal tar, ink, and other pollutants were routinely dumped into waterways, and some discharges such as PCBs continued much later. The passage of the Clean Water Act mostly put an end to this blatant environmental degradation—but the effects of these pollutants are still felt to this day.

The Gowanus Canal

Credit: NYC Dept. of City Planning

Wetlands restoration at Alley Pond Park in Queens

Credit: NYC Dept. of Environmental Protection

INITIATIVE 11

Actively participate in waterway clean-up efforts

Some of New York City's waterways contain contaminated sediments caused by past industrial use. The Gowanus Canal and Newtown Creek were both designated as Superfund sites in 2010 by the EPA. We will work with the EPA and the State DEC to assist in the investigation of the contamination and the study of potentially feasible remedies.

Even before the Superfund listings, we had begun substantial projects to improve the water quality of the Gowanus Canal and Newtown Creek. At the Gowanus Canal, we will address stagnant water, CSOs, and odor by upgrading the Gowanus Flushing Tunnel, expanding the capacity of the canal's pumping station, and building a new interceptor sewer. At Newtown Creek, we are installing equipment to increase oxygen levels in the water.

In addition to the ongoing work at the Superfund sites, we will investigate CSO-related and other sediments that lie at the bottom of the Paerdegat Basin, Flushing Bay, Flushing Creek, Bergen Basin, Thurston Basin, Hendrix Creek, and Fresh Creek. Dredging these tributaries will remove CSO sediments that cause odors at low tide.

Protect and restore wetlands, aquatic systems, and ecological habitat

Wetlands are a biologically-rich intersection of land and water. They act as natural filtration systems by slowing and retaining stormwater runoff and trapping pollutants that would otherwise contaminate downstream waterways. Wetlands also provide an undeveloped edge to the urban coastline that can reduce storm surge and mitigate the impacts of erosion. Their highly-productive ecosystems form the base for estuarine and aquatic food webs. This biological productivity makes them ideal foraging and breeding sites for shorebirds, fish, and invertebrates.

Despite the significant loss of historical wetlands and streams, New York is still home to many critical natural areas. Large swaths of wetlands in Staten Island, along Long Island Sound, and Jamaica Bay are some of the most valuable natural habitat in the country. Jamaica Bay is an important resting place for endangered migratory birds and is home to more than 325 different avian species.

Vital wetland habitats are not the only natural systems within the harbor in need of restoration and habitat creation. Eelgrass, oysters, and ribbed mussels were all once widespread throughout the harbor. The loss of these species means the loss of some of nature's finest filtration systems. We must improve degraded areas and create new habitat by managing ecological functions. We can't merely protect existing natural resources—we must actively restore them.

INITIATIVE 12

Enhance wetlands protection

In many ways, the health of our harbor mirrors that of our wetlands. Wetlands are no longer being drained and filled like they were only a few decades ago. However, wetlands still face a variety of threats ranging from legacy pollution to climate change.

In 2005, we formed the Wetlands Transfer Task Force to assess available City-owned properties that contain wetlands. The group was tasked with addressing the future of City-owned wetlands, as well as broader questions regarding wetland management and policy. In its 2007 report, the task force recommended 82 parcels for transfer to the Department of Parks and Recreation (DPR) and 111 additional parcels for further review. We have completed a comprehensive review of these 193 parcels to determine existing conditions, including field inspections of all parcels.

We have already transferred 9 parcels to DPR. While some of the remaining parcels are acceptable for transfer now, the majority are degraded, with unresolved dumping and encroachment issues evident. Some parcels have other potentially significant environmental problems. We will finalize the transfer of those wetlands properties that don't suffer from environmental degradation. We will also identify resources that will allow for the incorporation of additional parcels into the City's park system.

New York City's wetlands face challenges far more serious than how the City manages its own wetlands. In January 2009, we released a report that assessed the vulnerabilities of existing wetlands and identified additional policies to protect and manage them. *New York City Wetlands: Regulatory Gaps and Other Threats* found gaps in federal and state regulations—particularly for small freshwater wetlands less than 12.4 acres, unmapped wetlands, and adjacent upland buffer areas.

The report identified the need for more accurate mapping as an important step in improving protection of vulnerable wetlands. State regulation requires wetlands to be mapped in order to enjoy protection by New York State. However, wetlands naturally expand, contract, and migrate, which makes current and accurate mapping essential to ensure their protection. State DEC tidal wetlands regulatory maps are based on aerial photography from 1974, and freshwater wetland maps have not been updated since 1995. New maps of wetland areas would identify those areas falling through the gaps of regulatory protection. We will work with state and federal partners to update wetlands maps.


Credit: U.S. Army Corps of Engineers

Elders Point before restoration


Credit: U.S. Army Corps of Engineers

Elders Point after restoration

We will expand protection through the New York City Waterfront Revitalization Program (WRP). This program establishes policies for the review of all discretionary actions by City, state, or federal government entities within the city's coastal zone and takes into consideration protection of natural waterfront areas. As we update the WRP in the coming year, we will consider designating 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.

More than regulatory enforcement is needed to protect tidal salt marshes, New York City's most abundant and visible type of wetland. Salt marshes are in decline around the city due to inundation from sea level rise and a variety of complex interactions in the urban ecosystem. We will collaborate with state, federal, and university researchers to evaluate both the vulnerability of salt marshes and strategies to provide protection.

We will develop a comprehensive strategy that addresses wetlands management and protection. In 2009, the City Council passed Local Law 31 requiring the Mayor's Office to create a wetlands strategy by March 1, 2012. Through this process, we will evaluate appropriate legal requirements, incentives, management, funding, and enforcement mechanisms to protect, restore, and expand wetlands, associated buffer areas, and the streams corridors that connect them.

INITIATIVE 13
Restore and create wetlands

Protecting existing wetlands is not enough to reduce the threats to our natural systems. We must restore degraded wetlands and create new habitats to replace losses that have occurred.

We have undertaken wetlands restoration projects in connection with the construction of recent CSO detention facilities. At Alley Pond Park in Queens, we recently completed 16 acres of restoration to revive the local ecosystem and improve water quality. We will create 38 acres of new and restored habitat along Paerdegat Basin near Jamaica Bay.

We have also partnered with state and federal agencies to share resources and expertise and achieve the greatest benefit for wetlands within the region. This collaboration has led to the development of the Comprehensive Restoration Plan (CRP), a joint project of the U.S. Army Corps of Engineers (Army Corps), the EPA's New York-New Jersey Harbor Estuary Program (HEP), and the Port Authority of New York and New Jersey (Port Authority).

CASE STUDY
Jamaica Bay Restoration

Kayaking through the brackish waters and marsh grasses of Jamaica Bay, it is easy to forget you are less than 10 miles from the bustling streets and tall towers of lower Manhattan. The buildings, traffic, and people disappear in this 26-square-mile natural sanctuary that is home to over 325 bird and 91 fish species. But this diverse and ecologically-rich habitat is threatened by rising sea levels, pollution, non-native species, and sediment deprivation. Most of all, it suffers from historic dredging and filling. A century ago, there were over 16,000 acres of salt marsh lands around the bay. Today there are just 800 acres, plus pockets of deep water borrow pits and navigational channels.

We have made major commitments to enhance water quality by improving stormwater runoff, reducing CSOs, and cutting nitrogen discharges into the bay in half. Although better water quality in the bay is essential, the City and multiple state and federal agencies are actively restoring marsh islands to enhance and protect fish and wildlife. We have partnered with the Army Corps of Engineers, the National Park Service, State DEC, and the Port Authority to restore the Elders Point marsh island complex, which was among the most eroded in the bay.

Long ago, the Elders Point marshland was a contiguous 132-acre island teeming with birds, fish, and other aquatic life. But years of erosion and sediment loss cleaved the land into separate islands connected by tidal mudflats. Reconstruction of Elders Point East was completed in 2006 and Elders Point West was completed in 2010. The restoration and establishment of the appropriate tidal elevations to support *Spartina alterniflora* (Smooth Cordgrass) growth used approximately 500,000 cubic yards of clean sand dredged from the bottom of New York Harbor. This material was dredged to deepen the shipping channels to accommodate larger vessels. Native plants grown from seed collected from within Jamaica Bay have been used to restore over 80 acres of habitat.

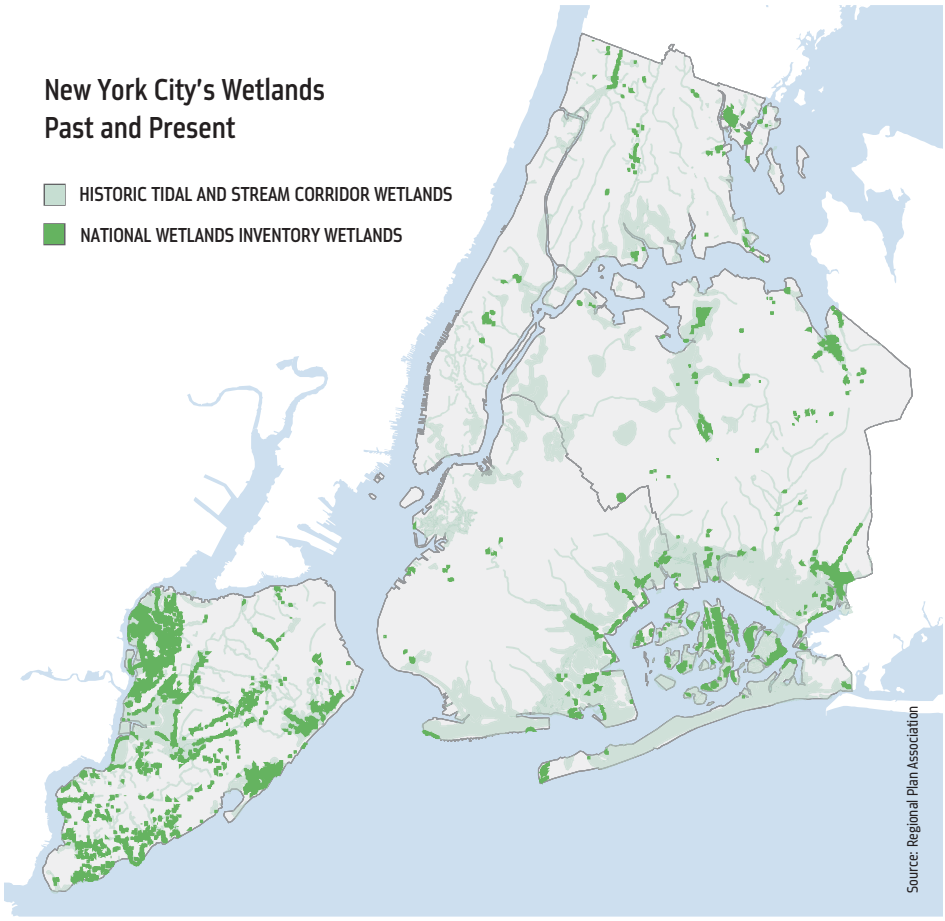
Restoring the Elders Point marsh would not be possible without the partnership of City, state, and federal agencies. This partnership brings together critical resources, leveraging limited funding and scientific knowledge to produce sustainable and cost-effective restorations. These efforts that will help to promote an ecologically vibrant Jamaica Bay that can be enjoyed by future generations.

Credit: NYC Dept. of Parks and Recreation

Salt marsh in Udalls Cove Park Preserve in Queens

Credit: NYC Dept. of City Planning

Wetlands in Staten Island



The CRP is a master plan and strategy that establishes broad goals for restoring wetlands and other ecosystems in the Hudson-Raritan Estuary. We will work with our partners to implement specific ambitious, yet achievable ecosystem restoration targets in the harbor.

Our work with state and federal partners has resulted in the completion of over 165 acres of restored or enhanced wetlands since 2002. In Jamaica Bay, we worked with the Army Corps, State DEC, the Port Authority, and the National Park Service to restore more than 80 acres at Elders Point in 2009. We also restored 22 acres at Gerritsen Creek.

In the next three years, we will work with state and federal partners to invest over $54 million at 17 sites to restore and enhance over 58 acres of wetlands and adjacent habitat. We will complete wetlands restoration projects in the Bronx at Pugsley Creek Park, Soundview Park, and along the Bronx River. We will also restore wetlands along Randall's Island, at Calvert Vaux Park in Brooklyn, at Meadow Lake in Queens, and at Freshkills Park in Staten Island. We have also committed $15 million for additional wetlands restoration in Jamaica Bay, and we will seek to leverage this funding by collaborating with our federal and state partners.

We have worked with state and federal partners to invest over $74 million to restore over 175 acres of wetlands since 2002, but that amount falls far short of what is need to restore all degraded wetlands in the harbor. There is no stable funding source for wetlands restoration and management, and most restoration projects have been conducted using relatively small funding sources. Compared to other areas across the country of similar ecological importance—such as the Chesapeake Bay and the Great Lakes—Jamaica Bay receives far fewer federal dollars. We will advocate for our fair share of federal funding for wetlands and ecosystem restoration.

INITIATIVE 14
Improve wetlands mitigation

Large-scale wetlands destruction no longer happens regularly. However, on occasion, wetlands must be filled for essential infrastructure or economic development projects. All proposed projects in designated wetland areas are subject to regulatory oversight that requires applicants to avoid, minimize, and, if necessary, mitigate any damage.

Mitigation is the practice of restoring, enhancing, or protecting wetland functions to offset their loss elsewhere as a result of construction projects. The current mitigation system in New York State requires restoration at the site of the disturbance or at a nearby location. This system often is not practical in New York City due to a lack of available space for on-site mitigation. It is also inefficient as the existing system often encourages restoration projects that are small, expensive, and of lesser habitat value. These significant flaws mean that we are not getting the greatest benefit from the money being spent.

Federal regulators acknowledge these failings and encourage the use of alternative mitigation mechanisms. One alternative is in-lieu fee mitigation, which allows wetlands loss to be mitigated by paying a fee to a fund that then aggregates payments to larger restoration projects. Another option, mitigation banking, uses a similar approach by encouraging large-scale wetland restoration projects to generate "credits" that can be transferred to compensate for wetlands loss within a predetermined area.

Both mechanisms provide numerous benefits over the current system by consolidating funding into larger projects that produce economies and ecologies of scale. By consolidating restoration projects and permitting approvals, these alternative mitigation strategies can save taxpayers and regulators time and money. We will work with the State to develop wetland mitigation alternatives that will make the regulatory process more efficient and increase wetland restoration and creation opportunities.

CASE STUDY

New York Harbor School

New York Harbor is a source of inspiration. Nowhere is this better illustrated than at the Urban Assembly New York Harbor School. Established in 2003, Harbor School was born with the belief that the harbor could provide a previously untapped potential for excellence in secondary, maritime public education.

The creation of Harbor School is part of our ambitious efforts to reform public education and replace under-performing schools. Harbor School welcomed students from an existing high school in the Bushwick neighborhood of Brooklyn. Within four years, graduation rates at Harbor School were more than triple the rate of the school that it replaced. And college retention rates are far higher than other high schools with similar demographics.

Harbor School's approach is to engage students, most of whom live below poverty and are considered at-risk, by using the waterways that surround the city as their classroom. Harbor School provides a rigorous, college-preparatory education built upon the city's maritime environment.

In 2010, Harbor School became Governors Island's first permanent tenant since the Coast Guard abandoned the island in 1995. This location is not just symbolic. It also provides unique opportunities to provide hands-on education. Harbor School has embraced oyster restoration as a vehicle to teach marine science. In 2010, students raised 300,000 oysters from larvae as part of their aquaculture class. The juvenile oysters were placed on the Oyster Restoration and Research Project's reefs by Harbor School student scuba divers.

In 2011, Harbor School will expand into their new Marine Science and Technology (MAST) Center, a 9,000 square foot, two-story structure located alongside the water and partially constructed over the harbor. The facility will be critical for marine science education as it will house aquaculture facilities to raise native New York species.

By providing a maritime-based education for young adults, we are not just preparing students for college and teaching valuable skills. We are also investing in the long-term health of the harbor.

Harbor School students working on oyster restoration project

INITIATIVE 15

Improve habitat for aquatic species

New York Harbor used to be filled with oysters, eelgrass, and mussels. To recoup lost water quality benefits and increase the biological diversity and resilience of the region, we have launched pilot programs to test the feasibility of reintroducing these three species into the harbor. The pilots will establish the potential water quality benefits of reintroduction, test whether reproduction of these species is naturally-occurring, and help determinewhether current restoration methods successfully restore or replace damaged or lost habitat.

Oyster reefs were once abundant in New York Harbor, but overfishing, disease, and pollution all but eliminated these once-dominant features by the early 20th century. We are working to address whether sustainable oyster populations can be reintroduced in our waterways through the Oyster Restoration and Research Project (ORRP). This partnership, led by the Hudson River Foundation, New York/New Jersey Baykeeper, the Urban Assembly New York Harbor School, the Army Corps, the HEP, and the Port Authority, has constructed six small reefs throughout the harbor in 2010.

Initial results indicate that the oyster spat, or larvae, that were placed on the pilot reefs have survived and grown. But questions still remain about whether the oysters will reproduce and thrive as a self-sustaining species. We will work with the ORPP partners to better understand suitable environmental characteristics, appropriate locations, necessary water quality conditions, costs, and benefits. We will expand the size of our pilot project and undertake additional restoration efforts. We will also work with our ORRP partners to develop a strategy to evaluate the scientific findings and expand restoration efforts should the pilots prove successful.

We will also pilot the reintroduction of eelgrass. This species has the potential to serve as an important source of habitat and shelter for fish and shellfish. Much like trees do on land, eelgrass stabilizes sediments, reduces erosion, and naturally removes nitrogen from the water. We have sown 3,500 plantings since 2009 as a part of our effort to improve the ecology of Jamaica Bay. We will sow an additional 2,000 plantings in April 2011.

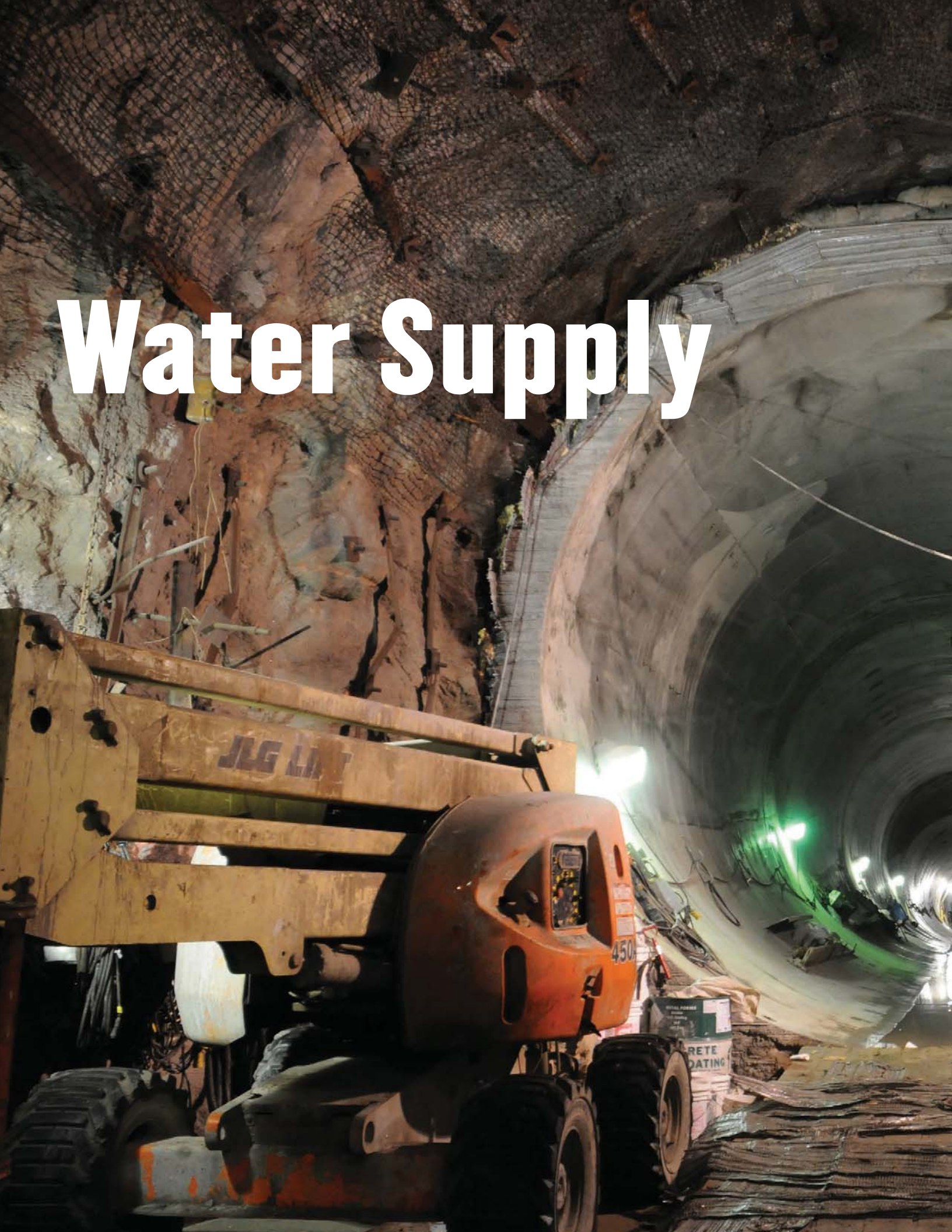
The final pilot project will evaluate the ability of ribbed mussels to filter nutrients and other pollutants from the water. The filtering capacity of mussels is well known, but it is unclear if that capacity could be tapped and applied in the harbor. In 2011, we will construct several artificial structures in Jamaica Bay to evaluate ribbed mussel growth and measure the effectiveness of these species in removing nutrients and particulate organic matter from the water.

Conclusion

Improving the quality of New York City's waterways is a long-term commitment that requires consensus about priorities and goals.

We must remove historical pollution that has had a prolonged and damaging effect on our waterways. We must also address the present-day pollution that comes from CSOs and continue finding ways to restore natural systems. As these investments can be costly, we need to focus on those problems that can affect public health or prevent New Yorkers from accessing their waterfront today.

These improvements will allow millions of New Yorkers to access areas that have been off limits to recreational use for decades. They will also revitalize our city's aquatic ecosystems. Our commitment to improving our waterways is a critical element of our environmental stewardship for the next generation, which needs and deserves a clean and healthy harbor ecosystem.


Water Supply

Credit: NYC Dept. of Environmental Protection

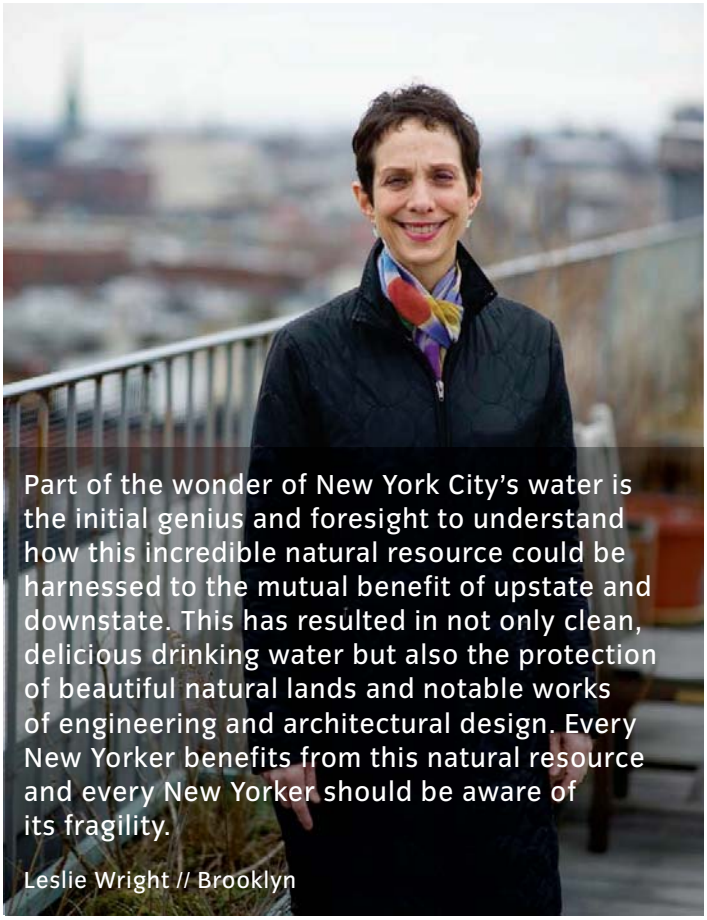
Together we can

Ensure the quality of our drinking water

Maintain and enhance the infrastructure that delivers water to New York City

Modernize in-city distribution

Improve the efficiency of the water supply system

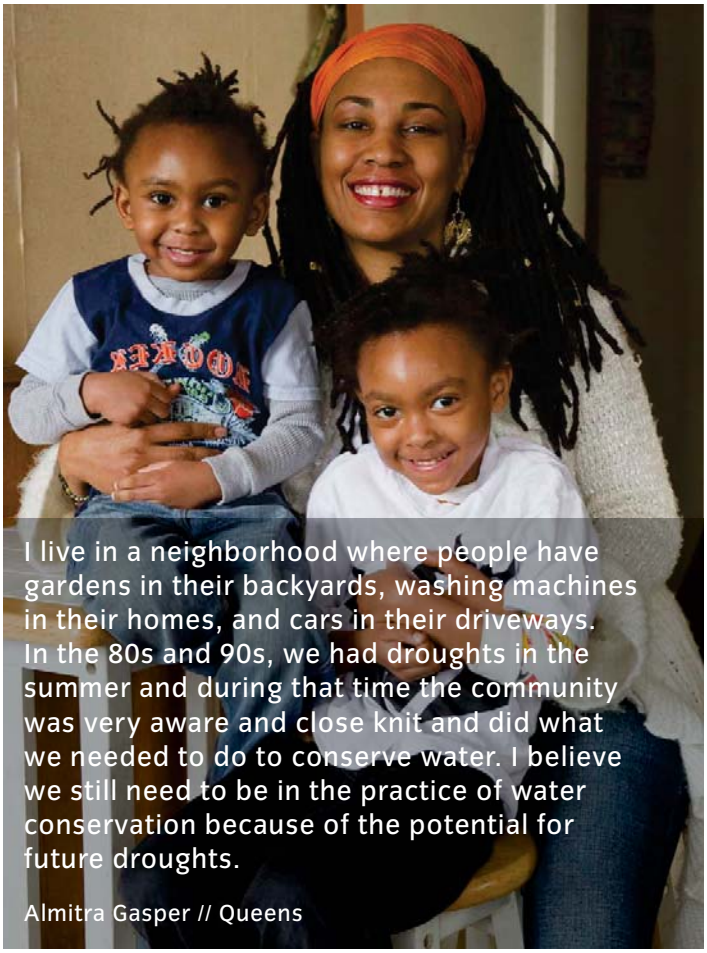


Part of the wonder of New York City's water is the initial genius and foresight to understand how this incredible natural resource could be harnessed to the mutual benefit of upstate and downstate. This has resulted in not only clean, delicious drinking water but also the protection of beautiful natural lands and notable works of engineering and architectural design. Every New Yorker benefits from this natural resource and every New Yorker should be aware of its fragility.

Leslie Wright // Brooklyn

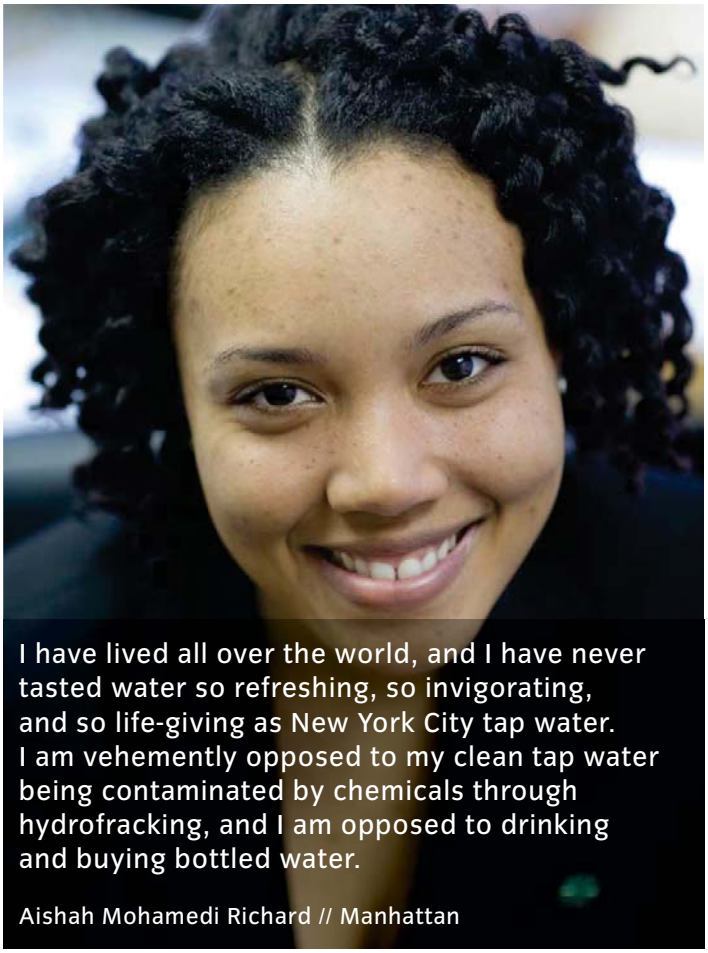
8.4 million people. We get up every morning and walk into our bathrooms and turn on the spigot, and we think nothing about it. We cannot take these things for granted. We have to make sure our infrastructure stays sound.

Robin Noble-Zolin // Manhattan



I live in a neighborhood where people have gardens in their backyards, washing machines in their homes, and cars in their driveways. In the 80s and 90s, we had droughts in the summer and during that time the community was very aware and close knit and did what we needed to do to conserve water. I believe we still need to be in the practice of water conservation because of the potential for future droughts.

Almitra Gasper // Queens



I have lived all over the world, and I have never tasted water so refreshing, so invigorating, and so life-giving as New York City tap water. I am vehemently opposed to my clean tap water being contaminated by chemicals through hydrofracking, and I am opposed to drinking and buying bottled water.

Aishah Mohamedi Richard // Manhattan

Water Supply

Ensure the high quality and reliability of our water supply system

Every day, more than one billion gallons of water travel hundreds of miles from upstate New York to the city. Our water supply system was developed through the foresight and vision of previous leaders who understood the importance of clean water to the long-term prosperity of the city. In 1837, the City began construction on the Croton Water Aqueduct System, the first to bring fresh water from outside the city limits. Over the next century, the City added two more upstate watersheds, the Catskill and the Delaware, and connected them to the five boroughs through an intricate network of aqueducts, tunnels, reservoirs, and water distribution lines. These watersheds cover 2,000 square miles and contain 19 reservoirs and three controlled lakes that have a storage capacity of 580 billion gallons. Today these invaluable assets serve more than nine million New Yorkers—more than eight million residents of the city and a million residents in Ulster, Orange, Putnam, and Westchester counties.

New York City's drinking water is among the best in the world, exceeding stringent federal and state water quality standards. Still, we must be vigilant to protect our source waters. The Catskill and Delaware watersheds are so pristine that water from them does not have to be filtered. To keep it that way, we must protect watershed lands from activities—like hydraulic fracturing for natural gas—that threaten water quality. Otherwise the City may be forced to build a filtration plant that could cost more than $10 billion to construct and $100 million per year to operate. This would not only mean spoiling one of New York State's greatest natural resources, but a water rate increase for New Yorkers of at least 30%.

The quality of our water supply is also threatened by climate change. Because the Catskill Mountains are steep and composed of comparatively soft clay soils, extreme storms cause turbidity (i.e., cloudiness) and other water quality problems that require active management to address. In recent years, these storms appear to be increasing in frequency—a pattern that may only get worse as our climate becomes more volatile. Our investment in cutting-edge management tools and the infrastructure necessary to supply drinking water to more than nine million New Yorkers must keep pace.

Our supply is abundant enough to meet our projected growth. In fact, water consumption in New York City in 2010 was near the lowest level in recent history, despite significant recent increases in our population. However, we must invest in the vast system that carries water to the city. The aqueducts that bring drinking water from the Catskill and Delaware watersheds to New York City have been in operation since they were activated in 1915 and 1944, respectively. The structural integrity of these conduits remains generally strong, but two stable, continuous leaks have developed in the Rondout-West Branch portion of the Delaware Aqueduct that collectively release between 15 and 35 million gallons of water a day. These leaks do not pose an imminent threat, but must be addressed to ensure the continuity of the city's supply over the long term.

Once our water reaches the city limits, three tunnels distribute it throughout the five boroughs. City Water Tunnel No. 1 was completed in 1917 and supplies most of Manhattan and Brooklyn. City Water Tunnel No. 2 went into service in 1936 and covers the rest of the city. Stage 1 of City Water Tunnel No. 3 was activated in 1998 and serves parts of the Bronx and Upper Manhattan. The Manhattan leg of Stage 2 is on schedule to be in service by the end of 2013. The Brooklyn/Queens leg of Stage 2 has been built, but it cannot be activated until two new shaft connections are made and Tunnel No. 3 is integrated into the water distribution network for Brooklyn and Queens. Completing City Water Tunnel No. 3 will provide critical redundancy and allow the City to shut down and repair City Water Tunnel No. 1 for the first time in its history.

The Ashokan Reservoir in the Catskill watershed

The Rondout Reservoir in the Delaware watershed

We will continue to work with upstate communities to vigilantly protect our water at its source. And we must complete projects planned for our water infrastructure to ensure a continuous supply of high-quality water.

Our Plan

A renewed era of capital investment is underway to ensure that the water supply system remains viable for generations to come. To protect drinking water quality and ensure reliable delivery, we will invest nearly $7 billion over the next 10 years.

Protecting our water supply at its source is our highest priority. We will thwart new threats to our watershed and continue to protect our supply from development that endangers water quality. At the same time, we will continue to support economic activity—like sustainable agriculture with partners including the Watershed Agricultural Council—that can be undertaken in a way that protects the city's watershed. We will continue our program to acquire watershed lands from willing sellers. We will also complete major projects to enhance drinking water quality, such as a filtration plant for the Croton system and an ultraviolet disinfection facility for the Catskill and Delaware systems.

We will establish a more reliable water supply by undertaking maintenance and repairs of key infrastructure that brings water to New York City. We will repair the leaking Delaware aqueduct and maintain the city's water supply capacity during the construction of the bypass tunnel. We will also make critical investments to shore up our ability to convey water from the Catskill and Delaware watersheds and deliver it to New Yorkers.

Within the city limits, we will continue to make historic levels of investment in our in-city distribution systems. We will complete City Water Tunnel No. 3 to create redundancy for our aging water tunnels. We will also build a back-up tunnel to Staten Island and enhance our water main infrastructure.

To support the entire water supply system and improve service for residents, we will improve the efficiency of our existing infrastructure. We will use new technology to increase transparency to customers and enhance our ability to detect leaks. We will also decrease stress on the system through continued water conservation efforts.

Investments in the city's water infrastructure not only ensure the reliable delivery of clean water but also create jobs and stimulate the economy. The City's three largest water network projects alone—the Croton Water Filtration Plant, the Catskill/Delaware Ultraviolet (UV) Disinfection Facility, and City Water Tunnel No. 3—have created approximately 6,100 construction and construction-related jobs.

The costs of these investments are high, but the cost of inaction would be greater.

Our plan for water supply:

Ensure the quality of our drinking water

1. Continue the Watershed Protection Program
2. Protect the water supply from hydrofracking for natural gas
3. Complete the Catskill/Delaware Ultraviolet (UV) Disinfection Facility
4. Complete the Croton Water Filtration Plant

Maintain and enhance the infrastructure that delivers water to New York City

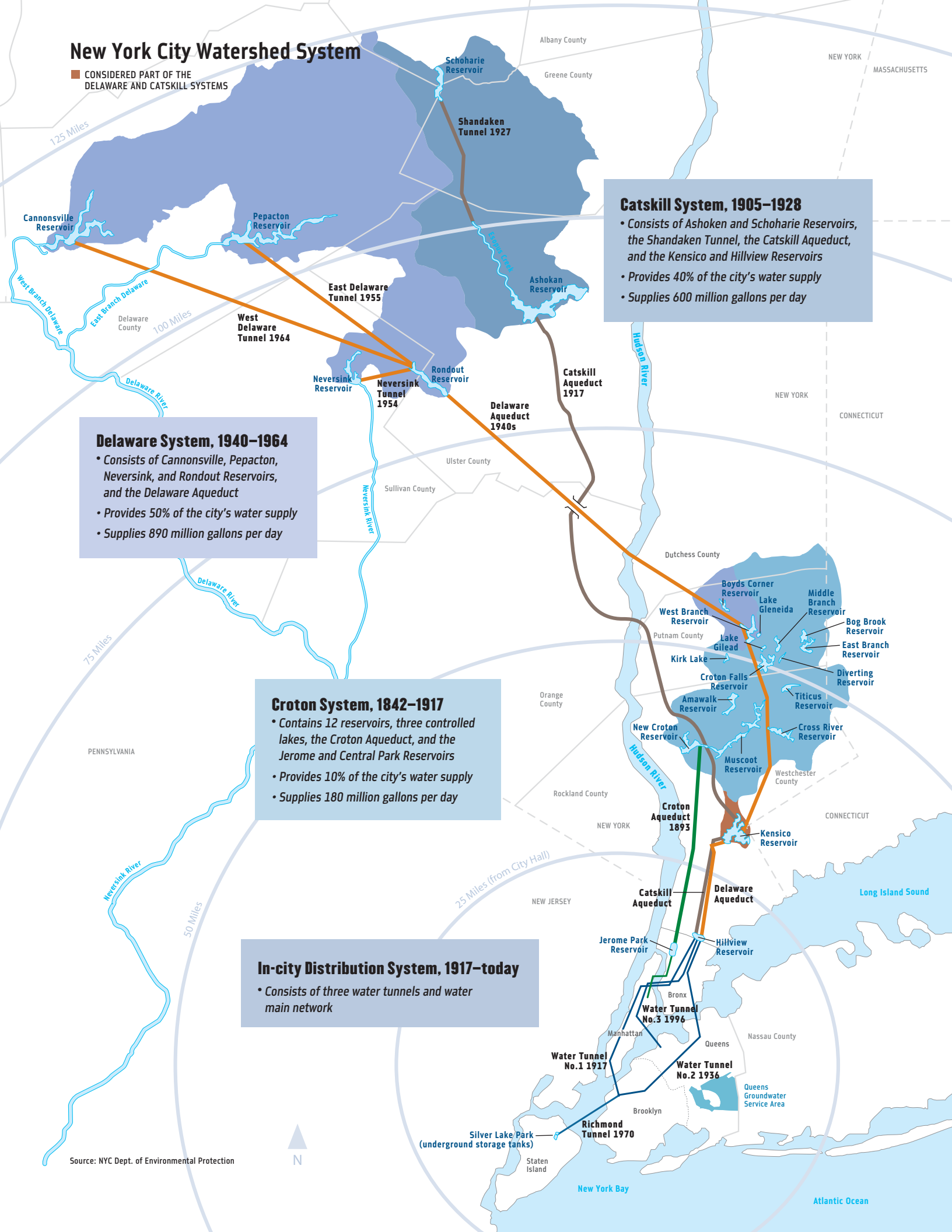
5. Repair the Delaware Aqueduct
6. Connect the Delaware and Catskill Aqueducts
7. Pressurize the Catskill Aqueduct
8. Maintain and upgrade dams

Modernize in-city distribution

9. Complete City Water Tunnel No. 3
10. Build a backup tunnel to Staten Island
11. Upgrade water main infrastructure

Improve the efficiency of the water supply system

12. Increase operational efficiency with new technology
13. Increase water conservation



Catskill System, 1905–1928

- *Consists of Ashoken and Schoharie Reservoirs, the Shandaken Tunnel, the Catskill Aqueduct, and the Kensico and Hillview Reservoirs*
- *Provides 40% of the city's water supply*
- *Supplies 600 million gallons per day*

Delaware System, 1940–1964

- *Consists of Cannonsville, Pepacton, Neversink, and Rondout Reservoirs, and the Delaware Aqueduct*
- *Provides 50% of the city's water supply*
- *Supplies 890 million gallons per day*

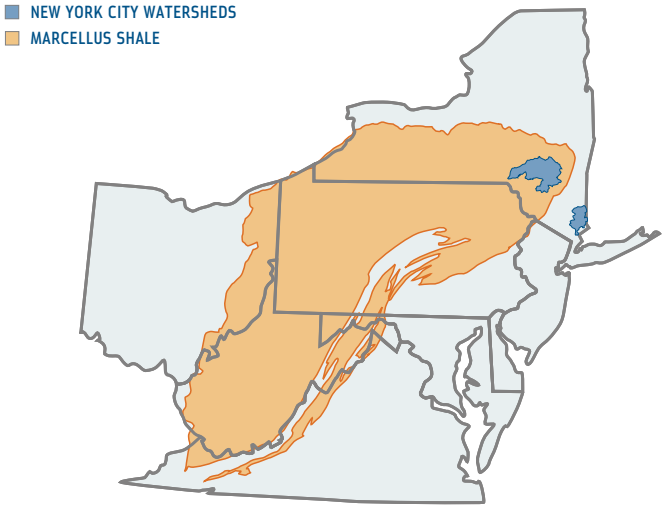
Croton System, 1842–1917

- *Contains 12 reservoirs, three controlled lakes, the Croton Aqueduct, and the Jerome and Central Park Reservoirs*
- *Provides 10% of the city's water supply*
- *Supplies 180 million gallons per day*

In-city Distribution System, 1917–today

- *Consists of three water tunnels and water main network*

New York City's Watersheds and the Marcellus Shale



Source: U.S. Energy Information Administration

A natural gas drilling site in Pennsylvania

Credit: NYC Dept. of Environmental Protection

Ensure the quality of our drinking water

The health, welfare, and economic well-being of all New Yorkers are linked to the quality of our drinking water. That is why we will continue to aggressively protect our watershed from development and hydrofracking, construct an ultraviolet disinfection facility for our upstate water supplies, and build a state-of-the-art filtration plant in the Bronx for the Croton system.

INITIATIVE 1

Continue the Watershed Protection Program

New York is one of only five major cities in the United States that doesn't filter the bulk of its surface water sources. Although the 1986 Safe Drinking Water Act mandated such facilities, New York City—along with Boston, Portland, San Francisco, and Seattle—received a special waiver, known as a Filtration Avoidance Determination (FAD). The FAD covers the Catskill and Delaware watersheds and ensures, for now, that the City of New York will not need to build a costly filtration plant for the 90% of its water that comes from these two sources. Since 1993, this waiver has been re-evaluated periodically, and the federal government issued New York City a new 10-year FAD for the city's water supply in July 2007.

To protect our customers and maintain our unfiltered water supply, we must continue to protect water quality. That is why we are implementing a $462 million Watershed Protection Program that targets the greatest potential threats and enlists the help of the surrounding towns, businesses, and organizations. The Watershed Protection Program is a unique strategy that combines protection, land acquisition, and environmentally-sustainable economic development to maintain the high quality of our water supply.

We will replace failing septic systems, preserve wetlands, and upgrade wastewater treatment facilities in towns near our reservoirs. We will work with private land owners to improve land management practices. By working with surrounding communities, we will continue to implement sustainable practices that bring economic development to the region and clean water to New York City.

We will continue to acquire watershed lands from willing sellers when possible. City ownership of land ensures that crucial natural areas remain undeveloped, while eliminating the threat from more damaging uses.

New York City protects more than 115,000 acres of watershed land through land ownership or conservation easement—including more than 78,000 acres acquired since 2002. To maintain this successful program and meet the requirements of our current FAD, we will contact the owners of at least 50,000 acres of land every year. To achieve our land acquisition goals, we secured re-authorization of our Land Acquisition Program from the New York State Department of Environmental Conservation (State DEC) in 2010. We will continue to strike a careful balance between protecting drinking water quality and facilitating sustainable local economic development.

The success of this program is possible thanks to strong partnerships with local stakeholders and communities throughout the watershed. Through our work with the Catskill Watershed Corporation, 203 watershed businesses have received $48 million in loans over the last 12 years to support tourism, hospitality, manufacturing, and other industries. We worked with local communities to rehabilitate more than 3,500 septic systems. We will continue to rehabilitate an estimated 300 residential septic systems per year and install new wastewater treatment systems in a number of communities. We will also continue our partnership with the Watershed Agricultural Council to promote sustainable farming techniques that limit the amount of fertilizer and other waste products that run into our reservoirs.

The Watershed Protection Program is costly, but compared to the costs of constructing and operating a filtration plant, as well as the environmental impacts of the additional energy and chemicals required by filtration, it is the most cost-effective choice for New York.

INITIATIVE 2

Protect the water supply from hydrofracking for natural gas

Lying beneath the Catskill and Delaware watersheds is a small portion of the Marcellus Shale rock formation. This is one of the largest potential sources of natural gas in the United States. Numerous land owners and natural gas companies are seeking permission from the State DEC to extract this gas through a process called hydraulic fracturing, or hydrofracking.

A scientific analysis commissioned by the City found that hydrofracking within the watershed requires a level of industrialization that would threaten drinking water quality for nine million New Yorkers. This study cited the potential introduction of thousands of tons of hazardous chemicals into the ground, damage to distribution tunnels, and clearing of thousands of acres of land if hydrofracking were to occur within our upstate watershed.

Based on current science and technology, we believe that hydrofracking can't safely be conducted in the city's watershed. The process would pose an unacceptable risk to 90% of the city's daily water supply, on which half of the State's residents and millions of workers and visitors rely. In light of the negative impacts it would have, drilling in the watershed can't be justified. We oppose natural gas drilling within the

watershed and will continue to work with the State DEC to secure the prohibition of hydrofracking within the city's watersheds.

INITIATIVE 3
Complete the Catskill/Delaware Ultraviolet (UV) Disinfection Facility

Although water from the Delaware and Catskill watersheds doesn't need to be filtered, it must be treated with chlorine to protect against bacteria, such as E. Coli, that could affect public health. Chlorine kills most pathogens and prevents the spread of waterborne diseases. However, it is not as effective against certain pathogens, such as Cryptosporidium, that can cause stomach illness, particularly for very young and elderly people. While there is no indication that these pathogens pose a public health risk in the city's water supply, federal rules require that public water systems treat their supplies with two forms of disinfection.

To satisfy that requirement, we will complete the world's largest ultraviolet disinfection facility in 2012. The $1.6 billion plant will use ultraviolet light to deactivate certain pathogens. The facility will have the capacity to treat more than two billion gallons of Catskill and Delaware water per day.

INITIATIVE 4
Complete the Croton Water Filtration Plant

The Croton system is the smallest and oldest of the city's watersheds. It is capable of supplying about 10% of the city's needs annually, and up to 30% in a drought, or if parts of the Catskill or Delaware supplies became inaccessible.

When the Croton system first came online in 1842, the surrounding area in Westchester County was predominantly rural. Since then, more than one million people have moved into the watershed, paving over fields, wetlands, and forests. Today the Croton watershed is highly developed. Although the water supply currently meets all health-based water quality standards, Croton water has seasonal variations in color, odor, and taste.

To meet the requirements of the Safe Drinking Water Act, the City was ordered to build a filtration plant for the Croton watershed. The Croton Water Fltration Plant—the city's first—is being constructed beneath the Mosholu Golf Course in Van Cortlandt Park in the Bronx. Hundreds of skilled workers are onsite every day to complete construction by 2013. Once complete, the plant will feature the city's largest green roof—in the form of a golf driving range—and will be able to provide up to 290 million gallons per day (mgd) of clean water from our oldest watershed. This $3 billion project includes more than $240 million for parks and other improvements for the surrounding community.

Rendering of the Croton Water Filtration Plant

Maintain and enhance the infrastructure that delivers water to New York City

Delivering water to New York City requires a vast network of infrastructure that was largely built before World War II. To ensure a reliable water supply, we will fix the Delaware Aqueduct leaks and upgrade key dams within our reservoirs. We will also connect the Delaware and Catskill Aqueducts and pressurize the Catskill Aqueduct to increase capacity and reduce the impacts of turbid water. These efforts will improve redundancy for our water supply system and ensure that we have the flexibility to reliably provide clean water to New Yorkers.

INITIATIVE 5
Repair the Delaware Aqueduct

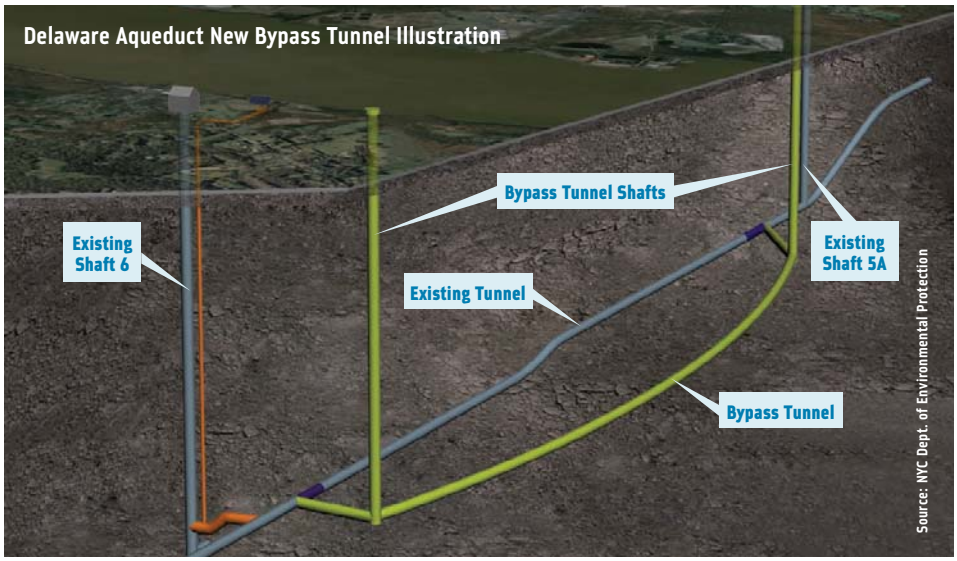
The 85-mile Delaware Aqueduct, completed in 1944, conveys approximately half of the city's drinking water—more than 500 mgd—from four upstate reservoirs. Since 1992, we have been monitoring stable, yet continuous leaks at two locations on the 45-mile section that carries water from the Rondout Reservoir to the West Branch Reservoir. After 10 years of study, we have identified the locations of the most significant leakage—near the towns of Wawarsing and Roseton-—where the aqueduct passes through limestone, a rock more susceptible to wear and tear than the sandstone, shale, gneiss, and granite that form the vast majority of the tunnel.

To re-establish the integrity of the tunnel, we will undertake a $2.1 billion project to build a bypass tunnel around the leak in Roseton, repair the leak in Wawarsing from inside the tunnel, secure alternative water sources, and implement conservation measures during the shutdown. The Delaware Aqueduct will be temporarily shut down for 6 to 15 months, during which time the city's water supply will have to be augmented to meet demand. Much of this increase will come from key infrastructure upgrades that will be complete by the time the Delaware Aqueduct needs to be shut off. In addition to the Croton Water Filtration Plant, which will provide up to 290 mgd of filtered water, upgrades at the Cross River and Croton Falls pumping stations, rehabilitation of the New Croton Aqueduct, and restoration work in the Catskill Aqueduct will increase the amount of water that can be piped down each day from the Croton and Catskill watersheds. We will upgrade the former Jamaica groundwater system in Queens to provide an additional 30 to 60 mgd during the temporary shutdown. We will also invest in conservation efforts to reduce overall demand.

Design for a bypass tunnel is already underway, and we expect to break ground before the end of 2013.

INITIATIVE 6
Connect the Delaware and Catskill Aqueducts

The Delaware and Catskill Aqueducts cross within yards of each other in Ulster County but do not connect. Due to steep slopes and fine soils left from glacial lakes, at times runoff from the Catskill watershed can cause the waters in Ashokan Reservoir to become turbid, or less clear, due to an increase in the amount of matter suspended in the water.



We will connect our two upstate watersheds to move cleaner water from the Delaware watershed into the Catskill Aqueduct. This will increase the system's conveyance capacity by 300 mgd from four key reservoirs and significantly increase our ability to deliver the highest quality water to nine million New Yorkers. The interconnection is in design, and construction is on schedule to begin in 2012.

INITIATIVE 7
Pressurize the Catskill Aqueduct

Once we begin operating the Catskill/Delaware Ultraviolet (UV) Disinfection Facility, the Catskill Aqueduct won't be able to sustain the water pressures needed to convey water between Kensico Reservoir and the new ultraviolet disinfection facility. The problem stems from a loss of 40 feet of gravitational pressure that was necessary for construction of the ultraviolet disinfection facility.

We will pressurize the Catskill Aqueduct to increase the volume of ultraviolet-treated water that can be delivered from the Catskill and Delaware watersheds. As climate change increases the intensity and frequency of rain events that can impair water quality, it is essential to maintain maximum flexibility in the choice of source waters that can be tapped to meet the city's drinking water needs.

INITIATIVE 8
Maintain and upgrade dams

The dams that impound our reservoirs are a critical part of New York City's water supply system. Throughout our three upstate watersheds, we own 29 dams that are considered "high hazard" based on the possibility of serious economic damage, environmental harm, and loss of human life if they were to fail. Since 1997, we have also purchased 76 small dams through the Land Acquisition Program. Many of these vital pieces of infrastructure, like the Gilboa Dam, were constructed almost a century ago and require repair and maintenance.

These massive pieces of infrastructure require particular attention due to the enormous potential consequences of neglect. While all of our dams meet existing dam safety standards, even partial failure could cause downstream communities to be flooded. That is why we continuously conduct maintenance and assessments. As part of this effort, we will continue to conduct engineering inspections, as well as weekly and monthly visual observations of our dam network.

The Gilboa Dam in particular will be a focus of our dam rehabilitation efforts. In 2005, it was determined that the Gilboa Dam didn't meet existing safety standards. Emergency work took place to anchor the dam until further improvements could be made. To upgrade the Gilboa Dam to meet new dam safety standards, a $300 million rehabilitation project is underway that is on schedule to be completed in 2016.

Modernize in-city distribution

Some of the oldest parts of our system are the tunnels, water mains, and pipes that carry water within the five boroughs. More than 1,000 miles of water pipes—out of 6,700—are already more than a century old.

We must develop ways to ensure reliable distribution of water across the city. We must complete City Water Tunnel No. 3 to make the system fully redundant and make it possible to take Tunnel No. 1 out of service. We must also improve reliability by constructing a backup tunnel to Staten Island and continue to aggressively upgrade and replace aging water mains.

CASE STUDY
Delaware Aqueduct Repair

The Delaware Aqueduct brings at least 500 million gallons of water to New York City every day. But deep below the ground in Orange and Ulster County, parts of the aqueduct are leaking. We must fix the Delaware Aqueduct leaks to achieve long-term reliability of our water supply and ensure future growth and prosperity.

Testing and monitoring the leaks provides critical information that is helping us design a cost-effective solution that will minimize any disruption to the city's water supply. Using dye, backflow, hydrostatic tests, and hourly flow monitors to get near real-time data, we know the volume of the leaks. The data clearly show that the rate of leakage has remained constant since we began monitoring the problem in 1992.

In 2003 and 2009, we launched an Autonomous Underwater Vehicle (AUV)—a cutting-edge, self-propelled submarine-shaped vehicle built in partnership with engineers at Woods Hole Oceanographic Institution in Massachusetts—to conduct a detailed survey of the entire length of tunnel that connects the Rondout and the West Branch reservoirs. The AUV took 360-degree photographs every eight feet, while also gathering sonar, velocity, and pressure data to assist in determining the location, size, and characteristics of the leaks.

To fix the leak, we will build a bypass tunnel around the most significant portion of the aqueduct that is leaking. We will also repair parts of the concrete liner in the existing tunnel. During the first phase of construction between 2013 and 2016, we will build new shafts to connect the aqueduct to the bypass tunnel.

The three-mile bypass tunnel will go around the leaking parts of the tunnel and be constructed between 2015 and 2019. Once the bypass tunnel is complete and ready for connection, the aqueduct will be shut down. While the aqueduct is shut off, workers will fix cracking in Wawarsing by injecting grouting from the inside of the tunnel near the affected areas.

But before the tunnel can be shut down and repaired, we must prepare the water supply system by completing several pieces of crucial infrastructure, such as the Croton Water Filtration and upgrades to the Jamaica groundwater system in Queens. These upgrades will help maintain the city's water supply capacity while the bypass tunnel is connected.

This multi-year effort will ensure that we can continue to deliver the highest quality water to nine million New Yorkers for generations to come.


Credit: NYC Dept. of Environmental Protection

Installation of shafts for City Water Tunnel No. 3


Credit: NYC Dept. of Environmental Protection

City workers repairing a water main

INITIATIVE 9

Complete City Water Tunnel No. 3

Construction on City Water Tunnel No. 3, the largest and most expensive capital project in the city's history, began in 1970. The 60-mile tunnel was designed in stages, beginning at the Hillview reservoir in Yonkers, traveling through the Bronx, moving south to the tip of Manhattan and then on to Brooklyn and Queens.

We are currently completing Stage 2 of this project, which consists of the Manhattan and Brooklyn/Queens legs. Work on the tunnel portion of the Brooklyn/Queens leg, which will deliver water to Staten Island, Brooklyn, and Queens, is substantially complete. The Manhattan leg will be completed by the end of 2013. We anticipate activating the Brooklyn/Queens leg by 2025. The completion of City Water Tunnel No. 3 will enable us to shut down City Water Tunnel No. 1 for inspection and potential repairs.

INITIATIVE 10

Build a backup tunnel to Staten Island

Staten Island is currently served by the five-mile-long Richmond Tunnel, which connects the borough to City Water Tunnel No. 2. Completed in 1972, the Richmond Tunnel tripled carrying capacity to Staten Island.

Currently, two pipelines embedded in New York Harbor provide redundancy for the Richmond Tunnel. However, the Port Authority of New York and New Jersey (Port Authority) is deepening the harbor channel for larger container ships to spur regional economic development. This requires the replacement of a significant part of Staten Island's supply.

In partnership with the Port Authority and the U.S. Army Corps of Engineers, we will construct a new 72-inch water tunnel that can deliver up to 150 mgd to Staten Island. Construction is scheduled to begin this year and will be complete by 2014.

INITIATIVE 11

Upgrade water main infrastructure

Once water leaves our in-city-tunnels, it travels through 6,700 miles of water mains to reach our homes. These aging pipes require continual maintenance and occasional upgrades. We will build out and replace critical water supply infrastructure to support the growth of the Coney Island community and make thousands of housing units and offices possible at Atlantic Yards. We will replace distribution mains in Jamaica Estates in Queens and Pelham Parkway in the Bronx. We will also complete the trunk main network in the Rockaways in Queens. Our commitment to upgrading and maintaining our system will save ratepayers money by preventing costly water main breaks and help support economic development in every borough.

Improve the efficiency of the water supply system

Optimizing the water system reduces stress on water infrastructure and supports all components of the supply and distribution network. By increasing the efficiency of our existing system, we will simultaneously reduce demand and increase supply, thus making the system more affordable and effective for residents.

By implementing new technology to track and monitor water usage, we will better manage the city's water system and use our resources more efficiently. Although our water supply is currently abundant, we will increase water conservation. This will reduce wear and tear on the system, use less energy and fewer chemicals for treatment, and provide additional flexibility during droughts and extreme weather events.

INITIATIVE 12

Increase operational efficiency with new technology

Historically, most water customers had their water consumption manually measured every three months. This meant that neither the City nor residents had the tools to accurately manage water use or detect leaks. To address this limitation, we will complete installation of new automatic meter reading (AMR) devices for all 835,000 water customers by 2012. We have already installed more than 650,000 AMR devices across the city, which puts us right on schedule.

The installation of an AMR system is a critical step to conserving water and saving money for New Yorkers. This technology provides real-time, web-based information about water consumption. It offers property owners the tools to reduce water use and find and repair leaks before they create unmanageable bills. The new wireless equipment will end the use of estimated water bills, giving homeowners and small businesses more accurate and timely records of usage.

Using new real-time consumption data available through AMR online, we launched a voluntary notification program in 2011 to alert property owners when their water consumption appears to deviate from normal usage. Spikes in water use can indicate a costly leak if not addressed quickly. We will also develop a smart phone application to allow customers to track their water use and respond to potential leaks and consumption spikes on the go.

Today, many of the largest water users are still billed an annual flat fee that often doesn't accurately reflect a property's actual water use. We

CASE STUDY

Water Consumption

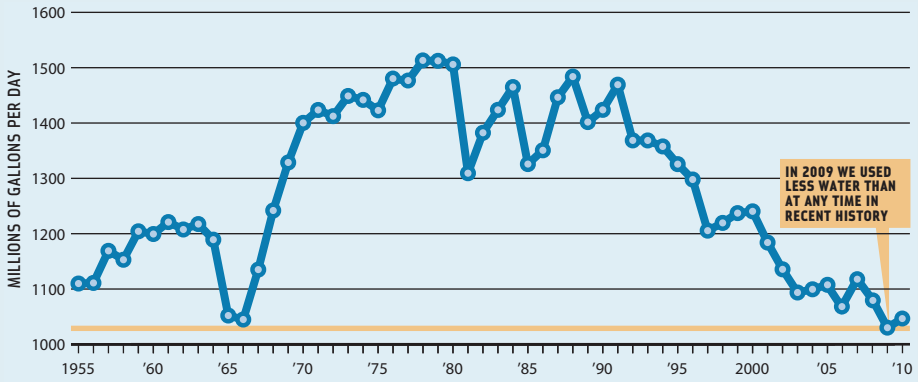
Population growth has increased demand for housing, energy, and transportation infrastructure across the city. Yet, New Yorkers use less water today than they did 50 years ago.

We have not always used our water supply so efficiently. Water consumption rates hovered around unsustainable levels as recently as two decades ago. High consumption rates overburdened the supply system and left the city's water levels precariously low during droughts. Instead of investing in large capital projects to increase supply, the City implemented several initiatives that helped bring consumption to near historic lows.

Beginning in 1985, the City began installing meters at properties to track water consumption. This allowed the City to charge residents and businesses based on how much water they consumed, instead of using an estimated rate. As people saw how much water they used—and how much they paid for it—consumption dropped by a total of 200 million gallons day (mgd).

In 1994, the City expanded its conservation efforts by launching the world's largest toilet replacement program. In order to speed the transition to new federally-mandated high-efficiency toilets, the City offered incentives for owners to make the switch.

New York City Average Daily Water Consumption
1955 – 2010



Source: NYC Dept. of Environmental Protection

Shower heads and faucets were exchanged for low-flow fixtures at the same time. The program replaced 1.3 million inefficient toilets between 1994 and 1997, reducing average consumption by 70 mgd and decreasing water usage by 37% in participating apartment buildings.

Advances in technology, stricter efficiency standards, and conservation incentives have reduced consumption levels by 200 mgd over the last two decades.

Although current levels of water consumption are near historic lows, it is important to maintain these gains to prepare for the Delaware Aqueduct repair or increased volatility that may occur due to climate change.

will replace the city's 30,000 largest meters over the next 10 years to increase the number of large customers on metered billing. This will help ensure that the cost of water and sewer services is fairly distributed.

Finally, we will develop next-generation forecasting technology to ensure the optimal use of the entire reservoir system for New Yorkers and other stakeholders. This new technology will enable us to more precisely anticipate storms, forecast the impact of weather events on water quantity and quality, and supply the highest quality water to the city. Our new system will also allow us to increase the volumes we can safely release to our regional partners without any additional risk to our supply of high-quality water.

INITIATIVE 13

Increase water conservation

The city's water usage has been declining despite population growth. We will implement several programs to continue this trend in the years ahead.

We will lead by example by increasing water conservation in City government buildings. Recent high-performance City buildings prove that meaningful results can be achieved with little or no cost increase and can reduce potable water consumption anywhere from 20 to 80%. In 2011, we will release a design manual for water conservation in buildings. We will also seek opportunities to use advanced strategies for water conservation in new and existing City-owned buildings

Because older toilets and fixtures use three to five times as much water as today's standard fixtures, we will replace old and inefficient toilets in City government buildings. We will also analyze the costs and benefits of the widespread replacement of inefficient toilets citywide as we develop a strategy to achieve an optimal level of water consumption for the city.

The absence of rules or recommendations on how to safely and efficiently use captured rain or water recycled from showers and sinks—also known as greywater—has inhibited its use in New York City. Due to the city's population density, careful planning and oversight must be considered in order to protect public health, prevent cross contamination, and to ensure the long-term sustainability of water re-use projects. The State DEC is charged under New York State law with developing statewide standards for re-use. They are expected to release a report to guide regulatory decisions in the near future. We will work within the State's comprehensive standards to encourage re-use, remove barriers in local building codes, conduct cost/benefit analysis, establish long-term compliance management and maintenance requirements, and, where appropriate, provide incentives.

Conclusion

New Yorkers sometimes take for granted that we can turn on a tap and instantly get pure water that has traveled more than 100 miles. We shouldn't take this for granted. This essential service is possible only because of extensive infrastructure, the product of the foresight, ingenuity, and financial investment of prior generations.

The initiatives described above are essential. But they are not inexpensive. Each will take a sustained commitment of public resources and communication so that New Yorkers are better aware of what it takes to supply a billion gallons or more of clean, great-tasting water every day. By making these critical investments, and making more efficient use of existing resources, we will ensure New Yorkers will enjoy a reliable water supply for generations to come.

Transportation

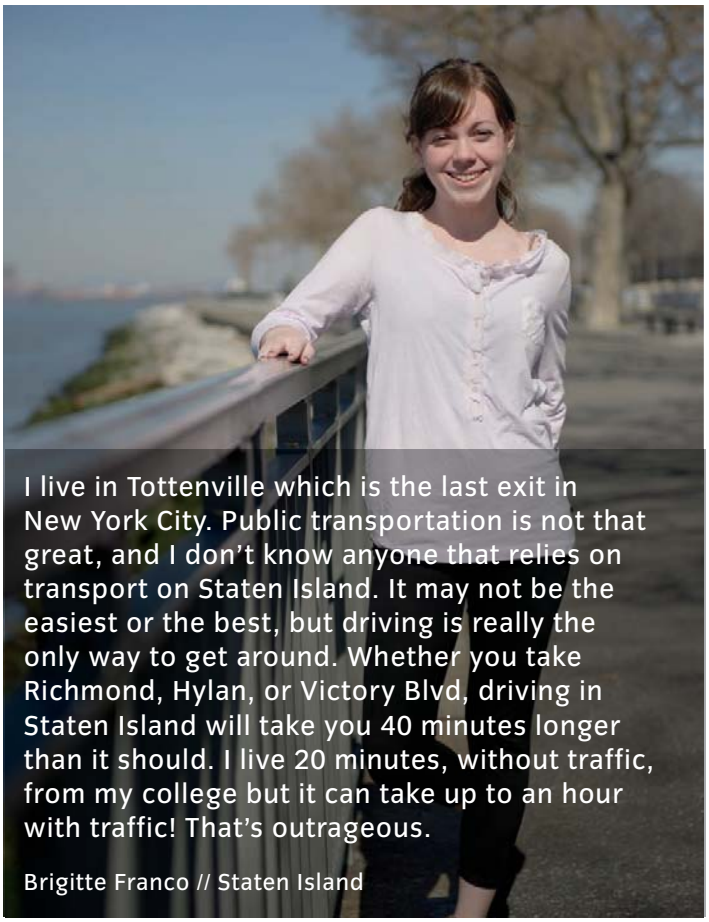
Credit: AP Worldwide Photos/Henny Ray Abrams

Together we can

Improve and expand sustainable transportation infrastructure and options

Reduce congestion on our roads, bridges, and at our airports

Maintain and improve the physical condition of our roads and transit system

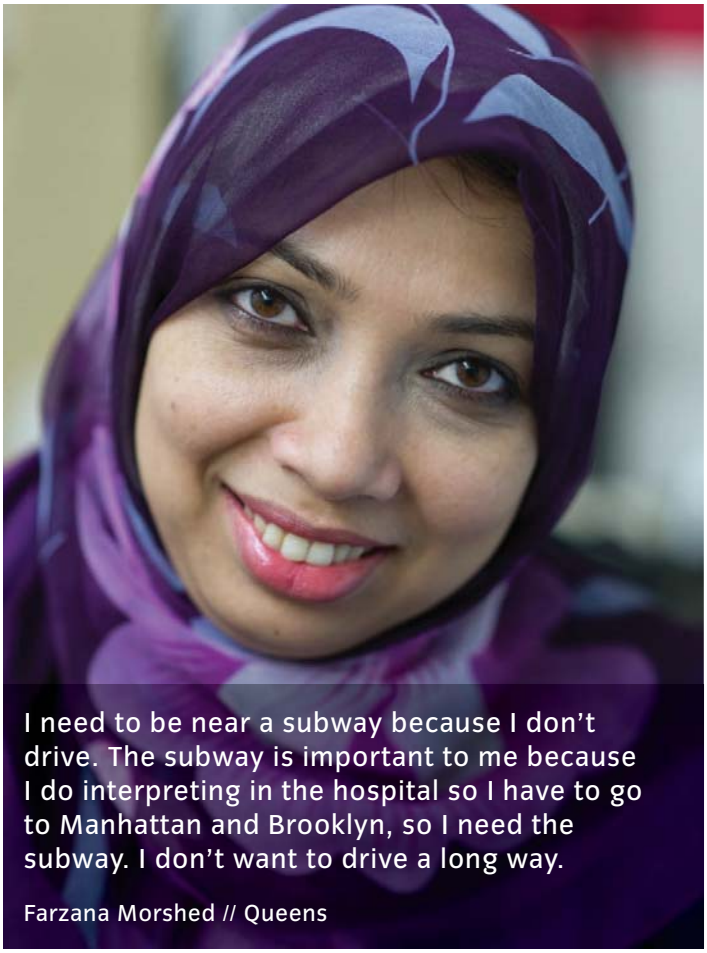


I live in Tottenville which is the last exit in New York City. Public transportation is not that great, and I don't know anyone that relies on transport on Staten Island. It may not be the easiest or the best, but driving is really the only way to get around. Whether you take Richmond, Hylan, or Victory Blvd, driving in Staten Island will take you 40 minutes longer than it should. I live 20 minutes, without traffic, from my college but it can take up to an hour with traffic! That's outrageous.

Brigitte Franco // Staten Island

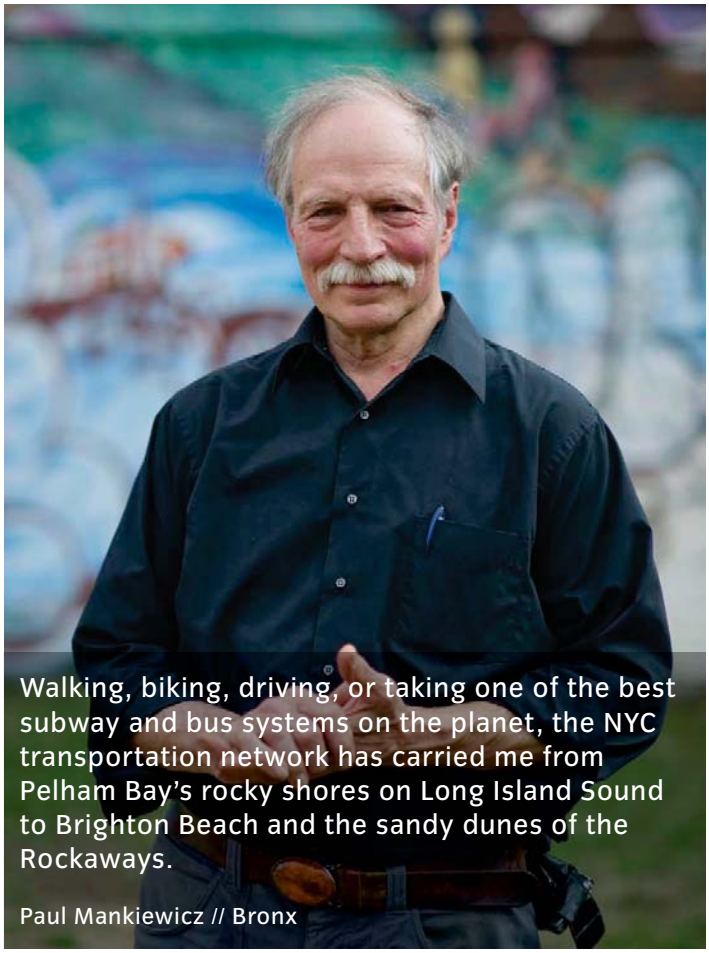
A ferry is really a cool part of an urban experience. It slows down life for a few minutes, and it's a cool way to see parts of the city that you might not otherwise see, and pass neighborhoods that you wouldn't otherwise know. It would be awesome if there were a great interconnected system that would let me take ferries around different parts of the city—it would give me even more reason not to have to drive my car.

Karen Levy // Brooklyn



I need to be near a subway because I don't drive. The subway is important to me because I do interpreting in the hospital so I have to go to Manhattan and Brooklyn, so I need the subway. I don't want to drive a long way.

Farzana Morshed // Queens



Walking, biking, driving, or taking one of the best subway and bus systems on the planet, the NYC transportation network has carried me from Pelham Bay's rocky shores on Long Island Sound to Brighton Beach and the sandy dunes of the Rockaways.

Paul Mankiewicz // Bronx

Transportation

Expand sustainable transportation choices and ensure the reliability and high quality of our transportation network

Transportation systems shape a city's growth and prosperity. New York City has benefited from billions of dollars of past investments in our bridges, tunnels, roads and subways. Those investments connected New York to the world and channeled development throughout the five boroughs. The shape and reach of our transportation system helped determine how and where we live and work today.

To support a vibrant economy now and for the future, we must demonstrate a similar commitment and maintain and expand our transportation assets. We must also actively manage our infrastructure to its highest return on investment. Our strategies must focus on our key transportation needs: handling increased demand from population and job growth; optimizing the speed, safety, reliability and comfort across modes; and managing the flow of goods into, out of, and around our city.

New York City's transportation network—our roads, bridges, tunnels, subways, commuter rails, buses, taxis, sidewalks, airports, train stations, and ferries—moves more people and goods than any other system in the country. The system performs remarkably well, considering the sheer number of people and tons of things being moved and the myriad of federal, regional, state, local, and private sector transportation agencies and entities involved. But in many ways, we still face significant challenges.

Many New Yorkers have long, unreliable, or crowded commutes. Our transit system faces large budget shortfalls. Our ability to add capacity is limited. The cost of distributing freight is high compared to other cities. And our passenger and freight gateways to the rest of the nation and world are not worthy of a global city.

Failing to address these issues imposes a cost on all New Yorkers. The Partnership for New York City estimates that traffic congestion, including reduced productivity, increased shipping times, and pollution-related health problems, costs the New York region more than $13 billion per year.

In addition to capacity constraints, our infrastructure is also aging. At a time when transportation investment by state and federal governments is declining, we must find ways to invest in maintenance to keep the network reliable. While we are working with state, federal, and regional agencies for a comprehensive solution, we will continue to take innovative incremental steps to improve the portions of the transportation network directly under the City's jurisdiction.

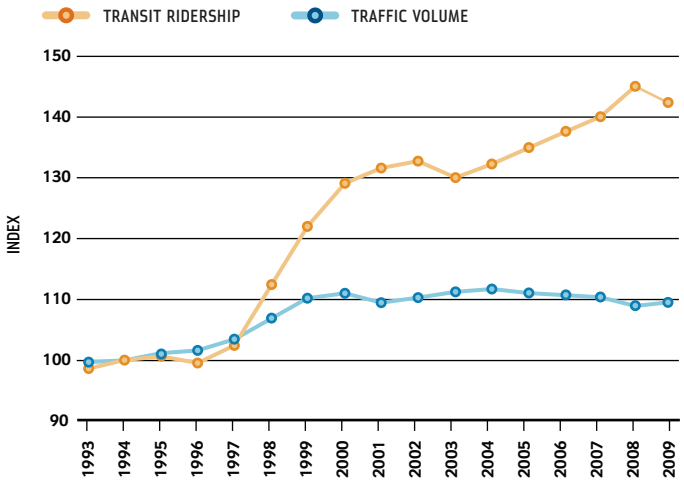
Even in the face of chronic budget shortfalls, we have shown we can find new ways to keep the network reliable and increase the performance of its assets.

Through innovative strategies we have strengthened and expanded transportation choices throughout the city. We partnered with the Metropolitan Transportation Authority (MTA) to launch the first bus rapid transit lines—Select Bus Service (SBS). The city's bike network has nearly doubled. We made it easier and safer to walk with the Safe Routes to Transit, Safe Routes to Schools, and Safe Streets for Seniors programs. Projects like Green Light for Midtown have simplified traffic patterns, improved pedestrian safety, and created new public plazas throughout the city.

To reduce congestion, we installed more than 4,500 Muni-Meters, increasing capacity for curbside parking. We launched Park Smart, a pilot program that promotes parking turnover in busy commercial areas. The City and the MTA also secured state approval to continue using red light cameras to enforce traffic laws and install cameras on buses to ticket drivers who block dedicated bus lanes.

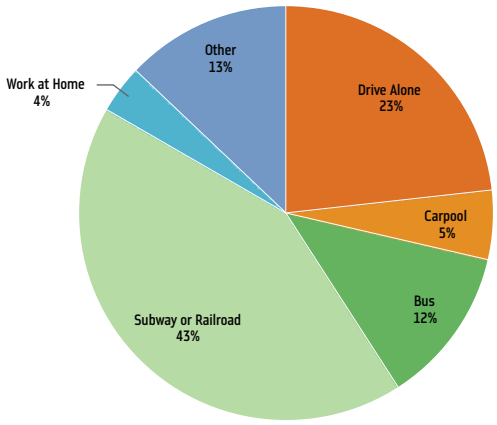
We used one-time federal stimulus funding strategically to begin 31 major repair projects on our transportation network, including upgrades to the St. George Ferry Terminal in Staten Island and rehabilitation of the Brooklyn Bridge.

New York City Traffic Volumes and Transit Ridership



Source: NYC Dept. of Transportation

How New Yorkers Get to Work



Source: American Community Survey 2007-2009

We have also experienced some setbacks. Four years ago, we proposed a plan to reduce traffic congestion and provide critical funding for transit to improve bus and subway service. Like the first gasoline tax proposal to pay for roads decades ago, the plan to charge drivers in the Manhattan Central Business District and devote the proceeds to improving transportation was controversial. The plan's merits were extensively debated, and the projected costs and benefits were broadly evaluated. It would have improved traffic conditions and transit service.

While a state commission modified the plan and reached a broad consensus in favor of it, the State Legislature chose not to vote on it. The Legislature did adopt a payroll mobility tax on employers in the region and a taxi surcharge, as well as other motor vehicle related fees. The state plan, which still required transit fare increases, left a large funding gap for system improvements, normal asset replacement, and expansion of transit. Due to the national recession, the payroll tax revenue fell short of forecast and resulted in shortfalls that the MTA filled through cost savings, including reductions in bus and subway service. In short, as a result of policy choices compounded by the effects of the national recession, transit service has been reduced, fares have increased, taxes have been levied on employers, and capital maintenance for the future of our transit system is in question.

This instability of financial support for New York City's transit system jeopardizes our economy and quality of life. We will continue to work with all of our partners at the regional, state, and federal levels to find ways to reduce congestion and finance our transit network. But we cannot afford to wait for others to act. We will take action in a variety of incremental ways to enhance our transportation network and mobility options for New Yorkers.

Our Plan

We will continue to expand transportation options for New Yorkers, and also invest hundreds of millions of dollars to maintain the assets they depend on. We will work with the MTA to improve the convenience and speed of our bus network. We will continue to support the megaprojects currently under construction to expand our subway system. To better meet the demand for taxis to underserved areas, we will expand "yellow-caliber" taxi service throughout the city.

To provide growing waterfront communities with transportation options, we will launch a trial ferry service along the East River. Building on the substantial investments we have made in our bike network, we will work to fill in gaps in our system and connect riders to other modes of transit by installing bike racks near subway stations. And we will continue to make improvements to enhance pedestrian safety.

To reduce congestion on our roads, bridges, and airports we will pilot technology and pricing-based mechanisms. We will modify our parking policies to reduce cruising and encourage greater vehicle turnover, using pricing to manage demand for scarce on-street metered parking.

Our plan for transportation:

Improve and expand sustainable transportation infrastructure and options

1 Improve and expand bus service throughout the city
2 Improve and expand subway and commuter rail
3 Expand for-hire vehicle service throughout our neighborhoods
4 Promote car-sharing
5 Expand and improve ferry service
6 Make bicycling safer and more convenient
7 Enhance pedestrian access and safety

Reduce congestion on our roads, bridges, and at our airports

8 Pilot technology and pricing-based mechanisms to reduce traffic congestion
9 Modify parking regulations to balance the needs of neighborhoods
10 Reduce truck congestion on city streets
11 Improve freight movement
12 Improve our gateways to the nation and the world

Maintain and improve the physical condition of our roads and transit system

13 Seek funding to maintain and improve our mass transit network
14 Maintain and improve our roads and bridges

CASE STUDY

SBS Riders

Two bus rapid transit routes—the Bx12 SBS along Fordham Road in the Bronx and the M15 SBS along First and Second Avenues in Manhattan—now move passengers quickly along what once were some of the slowest bus routes in the city.

SBS buses are faster than conventional local or limited bus lines because passengers pay their fare before boarding. The buses also have exclusive use of travel lanes to avoid traffic and smart traffic lights that stay green longer or turn green earlier when a bus approaches. When the bus arrives, passengers can get on using three different doors, decreasing the amount of time the bus spends at each stop.

For Jose R. Mejia, SBS has dramatically improved his trip across the Bronx. Each weekend, he travels by bus from Southern Boulevard to Sedgwick Avenue to visit his family. Before SBS, this would take close to an hour. Now using SBS, the trip to visit his family takes thirty to forty minutes.

According to Jose, "SBS is necessary because the city needs to move people more efficiently from place to place. Anything that facilities efficiency is necessary." And SBS is doing just that. By 2013, there will be Select Bus Service in all five boroughs.

Passengers boarding an SBS bus after paying their fares at vending machines

Manhattan resident A. Scott Falk frequently goes out of his way to take the SBS. "I live between Second and Third Avenues, so it used to make more sense for me to ride one of the multiple bus lines on Third if I wanted to go uptown. But having a better line on First Avenue made me switch to travel on First as much as possible."

With the next SBS routes rolling out on 34th Street in Manhattan, Hylan Boulevard in Staten Island, and Nostrand Avenue in Brooklyn, we will cut travel time and improve bus travel for more New Yorkers, making the bus a more desirable option.

We will work with the Port Authority of New York and New Jersey (Port Authority) and other partners to improve our freight network, including truck, rail, maritime, and aviation.

All of these efforts will be successful only if we are able to maintain and improve the physical condition of our roads and transit system. We will seek resources to improve our roadways and change our permitting process to better manage roadwork, which causes congestion. We will also continue to work with the MTA, the State, and neighboring jurisdictions to identify stable funding for transit operations, maintenance, and expansion in the metropolitan area.

Improve and expand sustainable transportation infrastructure and options

In general, one-third of all trips made in the city are by transit, one-third by foot, and one-third by car. But transit has an even bigger share of trips between home and work, and moreover, most of the growth in intra-city travel since the 1999 has been accommodated on transit—leading to subway ridership at its highest levels in 50 years. By providing New Yorkers with more choices for transportation—particularly those in neighborhoods with limited access to transit—we can improve mobility and quality of life.

INITIATIVE 1

Improve and expand bus service throughout the city

Buses carry 2.3 million riders each week day. In many neighborhoods, buses are the only transit options for residents, providing a critical link to jobs, shopping and recreation. Building on lessons from other cities, we have partnered with the MTA to use technology to make bus service more attractive and convenient for the customer.

In 2008, the MTA and the City launched the city's first SBS route, along Fordham Road in the Bronx. SBS routes use off-board fare collection, dedicated bus lanes, signal prioritization, and efficient spacing of bus stops to speed trips for riders. Travel time on the Fordham SBS line, the Bx12, improved by 20% over the service it replaced and total ridership increased by 10%. In 2010 the MTA installed additional SBS lines along First and Second Avenues in Manhattan. We will work with the MTA to expand SBS by adding routes on Nostrand Avenue in Brooklyn, 34th Street in Manhattan, and Hylan Boulevard in Staten Island, and we are studying improved bus access to LaGuardia Airport in Queens.

Regular buses can also use many of the features that we piloted on our SBS routes. For example, when bus lanes were installed on 34th Street in Manhattan, travel time on the M34 bus, which had been one of the slowest bus routes in the city, improved by 17% and ridership grew by 6%. Other features with applicability to non-SBS routes include Transit Signal Prioritization (TSP), which enables traffic lights to recognize approaching buses and either turn the light green or keep it green to allow buses to move more quickly. We will install TSP on 11 routes in all five boroughs. We will also make operational changes to improve bus priority on the Ed Koch Queensboro Bridge to make travel between the boroughs quicker and more efficient. Working with the MTA, we will implement SBS features on other lines to make our bus system quicker, easier, and more dependable for the customer.

Most New Yorkers today get their real-time bus information by peering anxiously down the street looking for the next bus. MTA Bus Time, the MTA's new real-time bus information system, will tell riders where their bus is by using a mobile web interface, a text-based cell phone service, or on-street LCD displays. MTA Bus Time is currently available on the B63 in Brooklyn and will be installed on all 31 bus routes in Staten Island.

Construction crews building the tunnels for the Second Avenue subway

INITIATIVE 2

Improve and expand subway and commuter rail

To meet our current and future needs, the MTA is undertaking three mega-projects that represent the largest expansion of the New York regional transportation network in more than seven decades.

Construction of the Number 7 Line extension to the Hudson Yards on the Far West Side of Manhattan is well underway and expected to be completed in 2013. The 7,000-foot, two-track extension will bring the Number 7 line from its current terminus at Times Square, along 41st Street to 11th Avenue and then south to 34th Street, linking Far West Midtown and Flushing. The City has funded this extension by issuing bonds against the expected appreciation in tax revenues resulting from the redevelopment of West Side property, which will be induced by the presence of the subway.

The MTA is constructing Phase 1 of the Second Avenue Subway. When Phase 1 is completed, the Q Line will run on the Second Avenue Line between 63rd Street and 96th Street. This new capacity will relieve the most crowded segment of the Lexington Avenue Line, which currently carries about 1.3 million riders a day (more than the Boston and Chicago subway systems combined). Phase 1 is expected to be completed in 2016 and is projected to carry 213,000 riders on opening day.

The East Side Access project will bring Long Island Rail Road (LIRR) service to Grand Central Terminal by 2016. This will increase the LIRR's capacity into Manhattan, reduce overcrowding on the LIRR between Jamaica and Penn Station, and provide Queens and Long Island residents with direct access to Manhattan's East Side. When complete, East Side Access will serve approximately 160,000 customers a day.

We are also exploring areas, such as the North Shore of Staten Island, where coordinated transportation improvements could dramatically improve the quality of life for current and future residents, business owners, and visitors to the working waterfront. The North Shore is one of the major maritime employment hubs in the region. We will complete an analysis of potential short-term improvements, focused on the area's major east-west connector streets and problematic intersections. In anticipation of findings from the MTA North Shore Right-of-Way Alternatives Analysis, we will also investigate minor relocations of the former rail right-of-way to support future transit use, to facilitate maritime business, and to improve waterfront access.

Despite significant population growth and economic expansion, no new rail tunnel has been built under the Hudson River in a century. Expanding trans-Hudson rail capacity is a critical regional economic development and sustainability priority. With Penn Station already at capacity and population projected to grow on both sides of the Hudson River, we are committed to working with our state and federal partners to identify cost-effective opportunities for additional capacity in the bi-state corridor that is so vital to both states and the nation.

INITIATIVE 3

Expand for-hire vehicle service throughout our neighborhoods

Taxis and car services are an important part of our public transportation system. They move over 1.2 million people every day—meaning New York taxis and for-hire car services carry more passengers than most public transit systems in the country other than the MTA, Los Angeles Metro, and Chicago Transit Authority. Taxis and car services are operated by private entrepreneurs and regulated by the City, which authorizes service providers and sets the rules under which they operate.

A 2007 survey of yellow taxi passengers revealed that 66% of riders believed that taxis helped them live without a car. Ninety-seven percent of non-car owning households in Northern Manhattan, Brooklyn, the Bronx, and Queens reported that they had used a car or taxi in the month prior to participating in a 2009 survey. Taxis and car services serve this important need.

But trying to find a taxi outside lower and central Manhattan is difficult unless you're at an airport. Ninety-four percent of all taxi trips originate in Manhattan, while 80% of city residents live in Brooklyn, Queens, the Bronx, and Staten Island. Demand for cab service in those boroughs and northern Manhattan is now met by dial-in, radio-dispatched car services rather than taxis.

Under the current City code, it is illegal for car services to pick up passengers who hail them on the street. As a result, New Yorkers who hail car services have to take their chances with a mix of unlicensed and licensed livery vehicles operating contrary to their licenses.

Hiring an unlicensed, unregulated car service is risky. Passengers who hail liveries cannot be certain that they are getting into a vehicle driven by a licensed operator with proper insurance. Fares are variable, and haggling is common. Although the City recently passed rules that have improved passengers' ability to distinguish a licensed livery vehicle from an unlicensed vehicle, passengers continue to unknowingly enter unlicensed vehicles.

We will expand "yellow-caliber" taxi service to neighborhoods beyond lower and central Manhattan by licensing additional vehicles which would provide street hail service in those areas which are currently underserved. By updating our regulations to more accurately serve the demand which exists today, we can provide New Yorkers with more options that enable them to more easily live without owning a car.

INITIATIVE 4

Promote car-sharing

Only 54% of New York City households own a car. Among car owners, many use their cars relatively infrequently yet want or need the flexibility of having access to a car for shopping, family visits, or recreation. Keeping a car in the city can be expensive, and finding a place to park can be difficult.

Giving people more alternatives to the fixed expense of car ownership makes economic and environmental sense. Car-sharing is an efficient and convenient option for people who use a car

Credit: AP Worldwide Photos/Adam Rountree

Ferries carrying passengers on the East River

infrequently and don't want to pay the insurance, maintenance, and parking costs that are the burden of ownership.

New York City is already the largest market for car-sharing in the country, accounting for about one-third of all car-share members. Given the number of occasional car users in the city, this market could grow significantly.

Zoning amendments initiated by the City in 2010 facilitated the expansion of car-sharing by enabling shared vehicles to be stationed in off-street parking lots and garages around the city. Another opportunity to encourage car-sharing is within the City's own fleet of 26,000 vehicles. During evenings and weekends, the periods of highest demand for car-sharing vehicles, many City vehicles sit dormant. Replacing these with car-sharing vehicles offers the potential for multiple benefits—producing fiscal savings for the City, freeing up valuable parking spaces, and making car-sharing more broadly available to the public.

In 2010, we launched a pilot program to replace 50 City-owned vehicles based in Lower Manhattan with ZipCars—vehicles owned by a private car-sharing company. We will assess more opportunities for car-sharing in the City's fleet.

INITIATIVE 5
Expand and improve ferry service

Ferries are a critical part of our transportation network, carrying over 90,000 people each day between Manhattan, Queens, Brooklyn, Staten Island, and New Jersey. The busiest route, the Staten Island Ferry, is the nation's largest passenger-only ferry operation.

We are now in the final stages of a comprehensive Staten Island Ferry Study, which includes a passenger demand forecast and preference survey, condition surveys of existing vessels, propulsion trade-off study, and new design concepts. The study will inform us as we secure funding for upgrades to an aging fleet of ferryboats as part of our citywide emphasis on maintaining all our transportation assets in a state of good repair.

To provide New Yorkers with more sustainable transit options and create vital links to waterfront communities underserved by existing transit, we will pilot ferry service along the East River, where there is potential for strong demand. The route will service Queens West, Greenpoint, North and South Williamsburg and Fulton Ferry in Brooklyn, and East 34th Street and Wall Street/Pier 11 in Manhattan. As part of the pilot, which will be run by a private operator, we will evaluate opportunities to integrate commuter and recreational service and intermodal connectivity to buses and bikes. We will also evaluate the long-term feasibility of ferry service along the East River and to other parts of the city.

INITIATIVE 6
Make bicycling safer and more convenient

For over a decade, we have been building a citywide network of greenways, on-street bicycle lanes, and signed bicycle routes. Since 2000, commuter cycling has more than tripled. These efforts are successful not only in attracting a rapidly-growing number of cyclists, but also in making streets safer for all users—drivers, pedestrians, transit riders, and cyclists alike. When protected bike lanes are installed, crash-related injuries for all road users have dropped by as much as 40% and in some cases the decrease has been even more significant. Continued expansion of the bike network, initiatives for bike parking, education, and implementation of a bike-sharing program will be needed to offer this alternative to more New Yorkers and achieve our goal of doubling bicycle commuting from 2007 levels by 2012 and tripling it by 2017.

Cities throughout the world—such as Paris, London, and Washington, DC—have created bike-sharing programs to provide convenient access to bikes and expand mobility options for residents and visitors. Through bike-sharing,

CASE STUDY

Bike-Sharing: Barclays Cycle Hire in London, England

London, like over 100 cities around the world, uses a bike-sharing program to provide more choices for short trips. In a bike share program, bikes can be picked up and dropped off at kiosks located throughout the city near street corners, parks, or train stations, businesses, shops or parks. Users pay a low annual or short-term access fee, and can then take unlimited 30-minute trips per day. After 30-minutes users are assessed a small fee. Bicycles are available 24 hours a day—especially useful when transit service is running on reduced or late-night schedules.

London's program, the Barclays Cycle Hire, makes 6,000 bicycles available at 400 locations. Bicycles are located every few blocks throughout Inner London and the program will expand eastward for a total of 8,000 bicycles in time for the 2012 London Olympic Games. The London program and cycle super-highway bike lane routes are sponsored by Barclays Bank for an estimated $40.4 million (£25 million) over the next five years.

Barclays Cycle Hire charges an access fee of $73 (£45) for an annual membership. Visitors or those interested in short-term memberships can choose the 24-hour option for $1.60 (£1.00) or the 7-day pass for $8.00 (£5.00). Since the program started in July 2010, 95% of trips have been less than 30 minutes—with bicyclists only paying the one-time access fee. Bike-sharing in London has been very successful—over 1.5 million trips were made on the bikes in the program's first three months of operation. Only 12 bicycles have been stolen.

Bikes ready for use at a bike-sharing kiosk in London

Bike-sharing makes it easy to get around and eliminates the need to find bike parking. Users can take a bike from one kiosk and drop it off at another. New York, like London, is a dense, multi-modal city, and New Yorkers and visitors alike would benefit from travelling across the city on two wheels. By 2012, New Yorkers will be able to get an annual membership to a bike-sharing program for less than the cost of a monthly MetroCard.

bicycles are made available to riders at kiosks for a small fee. When Paris installed its bike-sharing program, cycling quadrupled in one year. Bike-sharing will enable New Yorkers and visitors to check out bikes for short trips for a nominal cost, or for free if the trip is fewer than 30 minutes. We will partner with a third-party operator to establish a robust bike-sharing program in the city.

INITIATIVE 7

Enhance pedestrian access and safety

Most New Yorkers are pedestrians at some point in their day—whether walking to school, to the corner store, or to the subway. A safe and accessible pedestrian realm is a building block of a sustainable transportation system.

We have made significant strides to reduce traffic fatalities and improve pedestrian safety over the last four years. In fact, 2009 was the safest year on record for pedestrians in New York City, as traffic fatalities were down 35% from 2001. Despite this progress, pedestrians still accounted for over half of all traffic fatalities from 2005 to 2009.

To enhance pedestrian safety, we will install pedestrian countdown signals at 1,500 intersections across the city. These signals help pedestrians cross the street safely by counting down the number of seconds remaining before a flashing "Don't Walk" signal turns solid. To reduce conflict between vehicles accessing parking garages in areas with high pedestrian activity, we will adopt new guidelines for public garages that promote pedestrian safety.

In 2007, we targeted a series of sites across the city to alleviate sidewalk congestion and improve the pedestrian experience near subway stops and schools and at bus stops under elevated subway platforms. We will implement nine additional "Bus Stops Under the Els" projects to address the unique safety and visibility issues at these stops. We will also make walking to school safer for children by implementing 32 Safe Routes to Schools projects. The Safe Routes to Schools program enhances school safety patrols, reduces traffic speeds, and improves crosswalks and sidewalks.

Finally, we will complement these safety advances with improvements that make the city more accessible to walkers. Even the savviest New Yorkers can get disoriented, especially in unfamiliar neighborhoods. A recent study found 9% of New Yorkers (and 27% of visitors) had been lost in the week previous to taking the survey. We will partner with neighborhoods from across the city to design a standardized pedestrian wayfinding system for New York, making all of the city's neighborhoods accessible to natives and visitors alike.

Reduce congestion on our roads, bridges, and at our airports

Congestion costs our region more than $13 billion a year in lost economic output, and contributes to poor air quality. This price tag impacts every New Yorker in the form of our commuting time and delayed deliveries. Our regional airports, which are among the busiest airports in the U.S., are also among the most congested, increasing costs for businesses and consumers.

As our population continues to grow, we must take steps to manage demand and make our roads, bridges, and airports operate more efficiently. Managing demand can derive more efficient use from our limited transportation capacity. Tools like pricing and intelligent transportation systems technology enable us to better manage physically constrained assets by encouraging drivers to shift their trips away from the most congested travel times. Parking pricing is another opportunity to change driving patterns and optimize utilization of a finite physical space.

CASE STUDY

Roosevelt Island

In the middle of the East River between Manhattan and Queens, Roosevelt Island has long been a laboratory of transportation innovation. In 1969, the Master Plan for Roosevelt Island called for a car-free neighborhood. While the two-mile long island is no longer car-free, the legacy of innovation continues as the Roosevelt Island Operating Corporation (RIOC) actively promotes sustainable transportation practices.

One of the island's most iconic features is its aerial tramway that connects it to Manhattan. An estimated 2 million people ride the tram every year. Riders of the clean and efficient cable-propelled transit system enjoy spectacular panoramic views. Some of the best waterfront views can also be seen from the island's bike paths, and efforts to facilitate bike sharing are being planned.

In addition to maintaining the tramway, RIOC has successfully partnered with the New York State Energy and Research Development Authority (NYSERDA) and New York Power Authority (NYPA) to use hybrid-electric buses. They are building upon that program by installing electric vehicle charging stations and employing smart parking technologies. The public can now board a fleet of hybrid-electric buses that use ultra-low-sulfur fuel to get around the island. Using ultra-low-sulfur fuel reduces the emission of dangerous particulate matter by 90%, nitrogen oxide by 40%, and greenhouse gases by 30%.

To encourage use of electric vehicles, RIOC is installing charging stations at the centralized parking facility. This project is critical to building the infrastructure needed to support electric vehicles. Electric vehicles can reduce the levels of emissions associated with the use of conventional gasoline-fueled vehicles.

RIOC is also experimenting with smart parking technology to better manage the limited number of on-street parking spaces. Sensors embedded in the street will relay occupancy information to dynamic street signs or mobile applications. Drivers will be directed to available spaces instead of driving around looking for a parking space. By reducing the amount of time drivers spend looking for parking spaces, RIOC is creating streets with less congestion and improved air quality.

By implementing these ideas, Roosevelt Island is continuing its legacy as a site of transportation innovation.

Automobile congestion in Midtown, Manhattan

Credit: AP Worldwide Photos/Richard Drew

INITIATIVE 8

Pilot technology and pricing-based mechanisms to reduce traffic congestion

In our densely developed city, there are clear physical limitations to our ability to expand our road network. We must find ways to make more efficient, effective use of the infrastructure we have. Experiences from cities around the world suggest that pricing strategies are among the most cost-effective means of promoting mobility within a capacity-constrained system.

A major cause of traffic congestion on neighborhood retail streets is cars cruising for an on-street parking space—or double-parking when drivers can't find a space. To address this problem, we launched Park Smart, a parking program designed to encourage turnover of parking spaces by charging higher rates during the hours of peak demand. In three neighborhoods—Greenwich Village, the Upper East Side, and Park Slope—Park Smart encourages drivers to park for a shorter period of time, making parking spaces available to more drivers. We will expand this program to three new neighborhoods, and make it even more effective by combining it with innovative strategies to manage curbside loading in these areas, thus making the most efficient use of scarce curb space.

Over the last four years, the City has replaced over 11,500 single space parking meters with 2,986 multi-space Muni-Meters, providing debit and credit card payment options and creating more space on the sidewalks. We will install 4,500 additional Muni-Meters throughout the city to replace 51,800 older single-space meters, expanding these benefits to additional neighborhoods.

We will also continue to deploy innovative Intelligent Transportation Systems (ITS) technology to improve the safety and performance of our existing street network by improving signal timing, and reducing traffic congestion in key areas of the city. ITS uses real-time information about roadway conditions to help manage traffic signals and optimize performance.

INITIATIVE 9

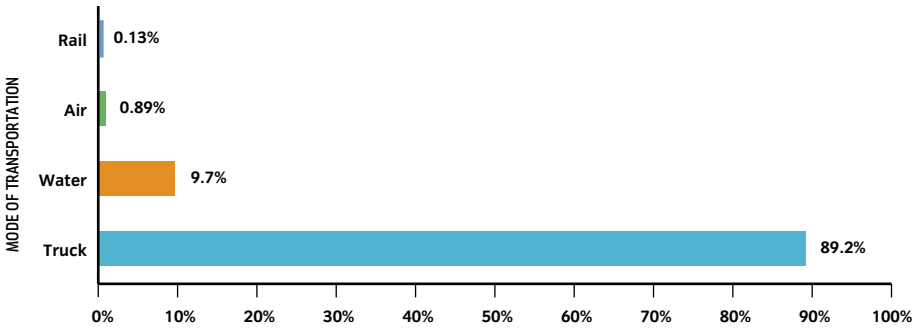
Modify parking regulations to balance the needs of neighborhoods

Zoning regulations dictate the amount of off-street parking spaces that must or can be built in new residential and commercial developments. Like other cities that came of age before the era of the automobile, many parts of New York City were built around subways and streetcars, not the automobile. In fact, parking spaces in residential buildings were prohibited until 1938 in New York City. Off-street parking requirements were not enacted until 1950; therefore, much of the housing stock was built without consideration for residential parking.

Setting parking requirements involves balancing the demand for parking with the effects of car ownership and use. While traditional zoning requirements are intended to ensure parking supply meets household demand for car ownership, requiring too much parking to be built in a dense city like New York can encourage driving, contribute to congestion, and unnecessarily raise the cost of new development. As density and transit availability varies across the city, the parking balance must be struck for each neighborhood; there is no one-size-fits-all rule.

In many neighborhoods in Manhattan, developments are not required to provide parking for residents, and most new surface parking lots are prohibited. Public parking garages in these areas are only allowed by special permit. In 1995, we expanded these parking regulations beyond these communities—known as the Manhattan Core—to include Long Island City.

Freight Modal Share In The New York City Region



Source: New York Metropolitan Transportation Council

We will complete a study of current parking trends in the Manhattan Core and explore modifications to parking regulations. We will also study areas outside the Manhattan Core to identify how we can revise parking regulations to better balance the needs of residents, businesses, workers, and visitors. When completed, these studies will guide future parking and curbside management policies for the City. As described in the Housing and Neighborhoods Chapter, we will also explore whether current parking minimums applicable to affordable housing are unnecessarily adding to the construction cost of some categories of housing, and explore amending those requirements as appropriate.

INITIATIVE 10
Reduce truck congestion on city streets

City residents and businesses depend on freight transportation for nearly everything we eat, wear, and use. More than 434 million tons of freight moved to and through New York City in 2004. Almost 90% of this was transported by truck. Traffic congestion and capacity constraints add delays and cost to truck-borne freight transportation in the city. This in turn adds to traffic congestions for all travelers. Effectively managing the flow of freight in New York will become an even greater challenge as the volume of freight in the city is projected to grow by 85% by 2030.

Freight deliveries to the Manhattan Central Business District (CBD) are essential to keeping businesses supplied, but during midday hours delivery trucks contribute to on-street congestion which in turn delays the deliveries. A recent City pilot found that when businesses in Midtown Manhattan voluntarily shifted their deliveries to off-peak hours (between 7pm and 6am), trucks experience less congestion and dramatically increase their productivity. We will seek to expand this program by working with business sectors and shippers interested in off-hour deliveries. We will also implement commercial paid parking at high-demand loading zones citywide to increase the turnover of curbside loading spots and to encourage businesses to make off-peak deliveries.

The New York Container Terminal (NYCT) at Howland Hook in Staten Island handles more than 10% of the three million containers that enter the Port of New York and New Jersey. Improving truck access to the terminal and reducing its impact on local streets is critical. Working with the Port Authority, we will reduce traffic bottlenecks at the intersection of Forest Avenue and the Staten Island Expressway, and create direct access between the NYCT and the Goethals Bridge.

INITIATIVE 11
Improve freight movement

The City has launched several initiatives to improve the flow of freight. Trucks bring us the things we want and need, and are essential to our prosperity and way of life, but they also bring noise and emissions. We must recognize the economic and logistical importance of freight delivery while also seeking methods to reduce its negative impacts. Solutions will include actions to reduce congestion on our roadways, shift more freight from trucks to rails and barges, and increase cargo-handling capacity on our waterfront.

The City plays an active role in other regional projects that impact freight in the City. For example, the Port Authority is currently leading its Comprehensive Long-Term Regional Goods Movement Plan, which will result in a 30-year action plan for improving freight movement in the New York/New Jersey metropolitan area. The City will continue to participate in this effort and take the appropriate actions that emerge within our jurisdiction.

A 2009 Port Authority study found that 25% of the trucks entering New York City via Port Authority crossings are carrying food, from multiple origins. Much of the food coming to the city passes through the Hunts Point Food Distribution Center (FDC) in the Bronx, the largest food distribution center in the U.S. The FDC contains more than 115 businesses that generate more than $3 billion in annual sales and support 10,000 jobs. We are currently reviewing the transportation needs of this area as part of a federal grant to study the Sheridan Expressway corridor. The study contains a range of alternatives, including the option of removing the highway and improving arterials. In evaluating all options, we will work to ensure that the FDC continues to play its vital role in the city's food distribution network.

Before we can increase the efficiency of our food-related freight movement, reduce its impacts on congestion, and improve residents' access to food, we need to better understand what New Yorkers eat, where it comes from, how it gets to the city, and where it ultimately gets delivered.

We will partner with the City Council, which is seeking to address many of these questions through the Speaker's FoodWorks program, to launch a food distribution study at the neighborhood level, as well as study improvements in how food flows into the city from elsewhere. We will also assess the barriers and potential municipal interventions to facilitate the expanded distribution and consumption of regional food products.

We will also work to shift inbound freight from trucks to rail and increase rail capacity into the city. The Hunts Point Terminal Produce Market, located at the FDC, presents an opportunity to expand the use of freight trains to supplement trucks for incoming shipments. The produce market handles 60% of the produce consumed in the city and 22% consumed in the region. Approximately 3,800 trucks travel to and from the market each day, with many additional trucks also serving other enterprises in the vicinity, an important employment cluster. As part of a potential redesign currently under negotiation, we will work to maximize inbound rail market share.

To enhance the prospects for more rail freight deliveries to other parts of the city, and to increase options for moving products out of the city, we need more rail transfer hubs. To address this challenge, we will solicit private interest in development of a rail-based use at the Arlington Rail Yard in Staten Island. We will also continue working with the Port Authority and its railroad, New York New Jersey Rail, to procure a third party to design, build, operate, and maintain marine-rail transfer hubs at the 51st Street and 65th Street rail yards in Brooklyn. Those yards

are adjacent to the docks for the railroad's rail-car-on-barge operation, the shortest-distance waterborne route for rail freight between Long Island, Brooklyn and Queens and gateways to the rest of the U.S. in New Jersey.

Freight access between Brooklyn and Queens and points west of the Hudson River is also extremely important to our economy. Yet many of the crossings are constrained, particularly for rail freight. The Port Authority is managing the Environmental Impact Statement for the Cross Harbor Freight Program, which will evaluate policy and infrastructure alternatives to enhance freight connections between New Jersey and various parts of the city, and includes consideration of a rail and/or truck tunnel under New York Harbor. The City will remain engaged in that effort.

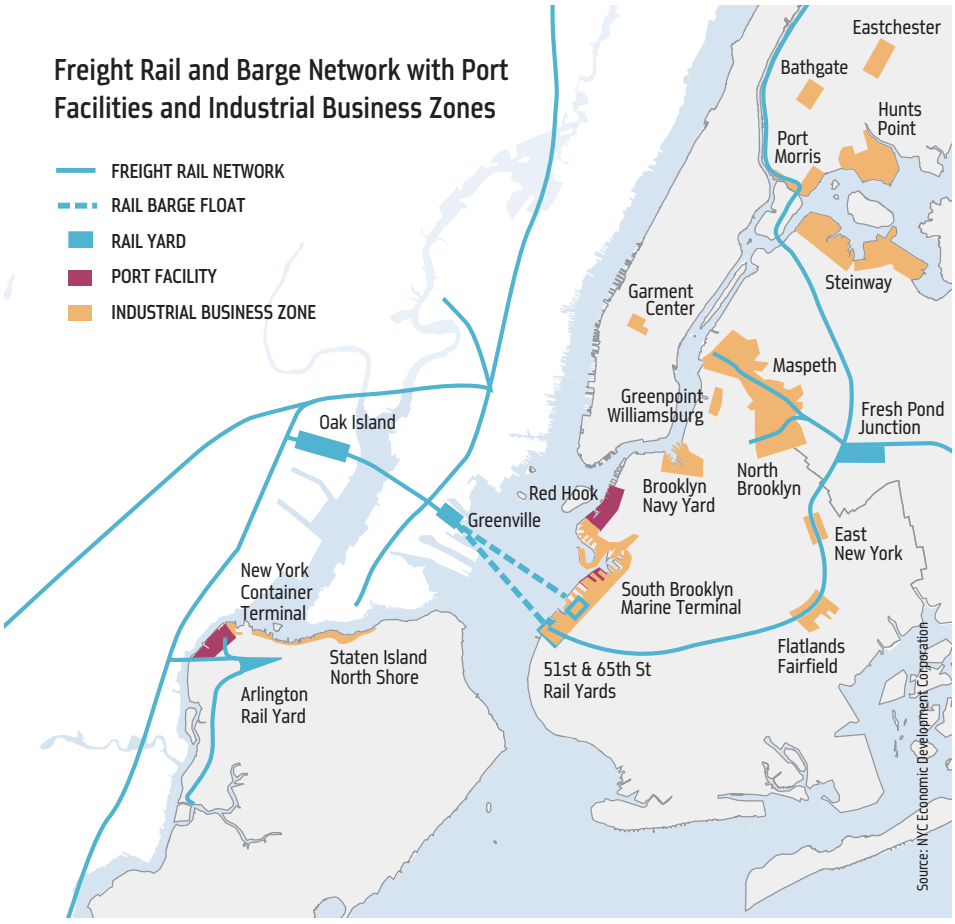
We will also increase rail and waterborne freight deliveries at the South Brooklyn Marine Terminal. The City will invest more than $90 million, to be matched by $60 million in private investment, to return the facility to a state of good repair. This will create 300 new jobs and allow ships and barges to deliver vehicles, construction materials, and unprocessed metal, glass and plastic to and from the facility. Because water transportation is six times more efficient than trucking in terms of tons per gallon of fuel burned, port deliveries will be more cost effective for shippers.

Since trucks are by far the dominant means of delivering goods to New York City, we also will work with the State and other regional agencies to improve operations and infrastructure of the arterial highways in the five boroughs and to manage on-street truck routes for improved safety and efficiency. We will continue efforts with partner agencies to coordinate truck permitting, enforcement, and routing initiatives in the metropolitan area.

INITIATIVE 12

Improve our gateways to the nation and the world

A dynamic city like New York depends increasingly on its connections to other places. Our future as a center of commerce and tourism as well as our own lifestyle depends on our ability to move people and goods to and from destinations across the nation and around the globe. While we have direct responsibility for many transportation assets within the city, we must also be vitally concerned about those transportation facilities and services owned by other government or private entities that connect us to the other places where we do business. We should not be satisfied until the day when someone stepping off an airplane or intercity train in New York City feels like he or she has arrived at an airport or train station suitable for a world-class city.



New York City sits nearly at the midpoint of the Northeast Corridor, the most promising potential high-speed passenger rail line in the U.S. This federal initiative involves states along the Atlantic seaboard as well as Amtrak. Additionally, New York State has undertaken strong commitments to improve the important Empire Corridor rail line linking New York City with important upstate cities like Syracuse and Buffalo. We will work with our federal and state delegations to maximize the planning and construction dollars that flow to our region in support of these important projects, and will continue to work directly with Amtrak and other state and federal entities to improve those long-distance passenger rail facilities within our city boundaries.

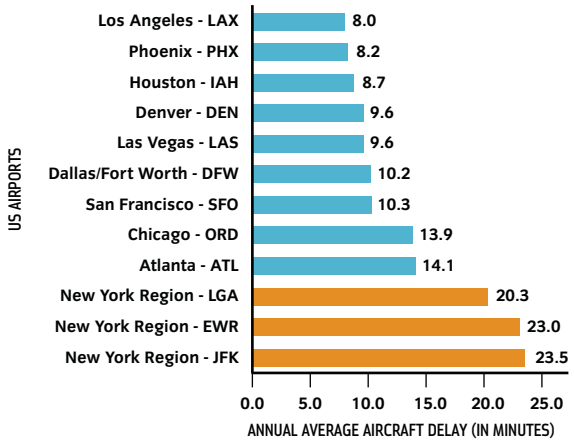
The three regional airports that serve the city—John F. Kennedy International Airport (JFK), LaGuardia Airport (LGA), and Newark Liberty International Airport (EWR)—are among the busiest and most congested airports in the nation. Together they handled 104 million passengers and 2.3 million tons of cargo in 2010, collectively leading the nation, but they rank near the bottom for on-time departures. Because New York area airports are major domestic hubs as well as international gateways, delays here have national implications because they ripple through the national system.

To reduce delays and expand capacity in the airspace system, the City will encourage the Federal Aviation Administration (FAA) and the airline industry to implement next-generation (NextGen) air traffic control technology in our region, upgrading from radar-based technology to a satellite-based system.

JFK also lacks available modern logistics facilities for freight businesses. While JFK handles 57% of the region's air cargo, growth of this critical industry faces challenges. In 2009, JFK's cargo volume dropped 21% from 2008 levels, compared to an average volume loss of 10% at the top 50 largest airports. This downward trend results in economic losses to the region, as major national distribution centers and airlines have moved operations to other areas where they face less congestion and lower costs.

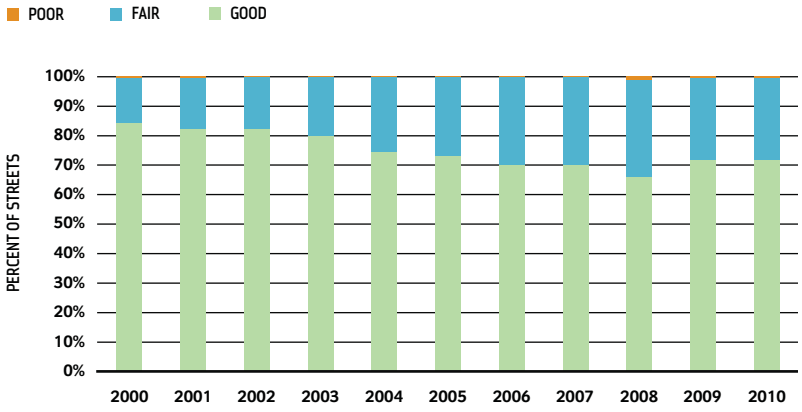
In partnership with the Port Authority, we will launch a comprehensive study of the JFK air cargo industry. The study will quantify cargo market conditions and trends, identify the specific costs and benefits of doing business at JFK, and identify opportunities for infrastructure, financing, and development programs that will benefit New York-based importers and exporters who depend on competitive access to global markets.

Passenger Flight Delays at the Busiest US Airports



Source: Regional Plan Association; Federal Aviation Administration

Streets Maintenance Ratings



Source: NYC Dept. of Transportation

Truck access to JFK's cargo-handling areas is essential to ensuring the airport's competitiveness. Several short-term solutions have been identified to ease congestion to and from JFK. These include marketing the Cross Island Parkway as an alternative to the Van Wyck Expressway for non-commercial vehicles, making improvements to the Van Wyck Expressway, allowing 53' trailer access to JFK, and providing a southern route to JFK for commercial vehicles. We will pursue these recommendations as we explore long-term solutions with the Port Authority and industry.

Maintain and improve the physical condition of our roads and transit system

We have come a long way toward improving the condition of our aging and fragile transportation network. But we have not yet achieved a full "state of good repair" on our roads, subways, and rail network, and the funding gap forecast for the future is more daunting. We must continue to vigilantly maintain our existing transportation network to ensure its reliability and quality.

INITIATIVE 13
Seek funding to maintain and improve our mass transit network

Even though passengers are paying more at the turnstiles, revenue generated from each swipe only takes the MTA so far. Fare box revenue accounted for 41% of the MTA's budget for 2011. The chronic financial instability of transit service in New York City is a significant vulnerability for a city that depends on reliable, robust transit service.

The MTA's subway, bus, and regional rail services provide 8.5 million rides per day in the city and the surrounding region, reducing traffic congestion and providing the foundation on which a New Yorker's low carbon footprint is based. Service reductions have direct impacts on New Yorkers today and jeopardize the maintenance and expansion needed for future generations. The MTA has sufficient funding to continue its capital program through 2011. We will continue to work with the MTA, the State, and the regional jurisdictions that rely on commuter rail to identify stable funding for transit operations, maintenance and expansion in the metropolitan area.

INITIATIVE 14
Maintain and improve our roads and bridges

Past experience has shown us the high cost of not maintaining our roadways and bridges. Nevertheless, the current economic downturn has forced significant reductions in the City's capital budget. We have been able to use $267.3 million in federal stimulus funding as a short stop-gap, but finding ongoing funding for transportation maintenance remains a challenge.

We are working aggressively to maintain reliable operations on our roads and bridges. Currently, 72% of our streets are in a "good" pavement condition or better. We have also continued our efforts to maintain the 787 bridges owned by the City, with all but four now rated in "very good," "good," or "fair" condition. Three of those four remaining bridges are either undergoing construction to repair deficiencies or scheduled for future repair.

One factor that leads to the deterioration of our streets is the frequency of street cuts to conduct sub-surface work. To improve efficiency, we will ask the State Legislature to allow joint bidding for street construction. Currently, utility companies must procure their construction work separately from public sector contracts to repair the streets. This divided process leads to long delays and multiple street cuts in the same streets, frequently causing traffic jams. Joint bidding will increase efficiencies, reduce the amount of time streets are under construction, and expedite their return to use.

Conclusion

Maintaining and improving a robust and reliable transportation system is essential to enhance our city's quality of life and provides a foundation for economic growth.

In a fiscally constrained time, we must continue to choose our investments and actively manage our infrastructure wisely, focusing on those expenditures and programs that bring more travel choices to more New Yorkers and maximize the use of our assets. We must build on the success of the past four years, during which we have undertaken innovative approaches to build and manage transit, pedestrian, and cycling capacity. We must also continue to explore creative tools like pricing, technology, and improved for-hire service to make the whole system function better. Finally, we must continue to look for ways to finance the upgrades and maintenance to keep our system in good physical condition.


SHREK THE MUSICAL
BROADWAY THEATRE
TNT
"THE CROWD GO WILD!"
JERSEY BOYS
BEST MUSICAL
2006 TONY AWARD WINNER
WINNER! BEST MUSICAL REVIVAL
2009 TONY AWARD
HAIR
Tonight belongs to…
PHANTOM
MAJESTIC THEATRE
So Much Happened Before Dorothy Dropped
WICKED
We're chang
MAYBELLINE
NEW YORK
TADS
GIFTS
sbarro
sbarro
sbarro
sbarro
Pizza
Pasta
ONE WAY

Energy

Credit: Matt H. Wade at Wikipedia // http://en.wikipedia.org/wiki/User:CupstateNYer

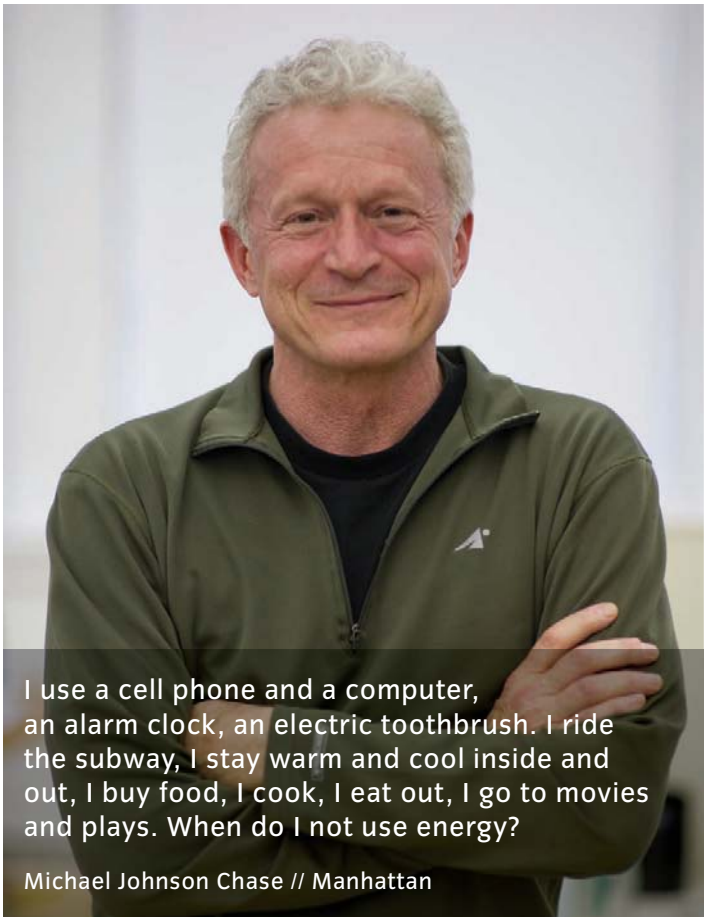
Together we can

Improve energy planning

Increase our energy efficiency

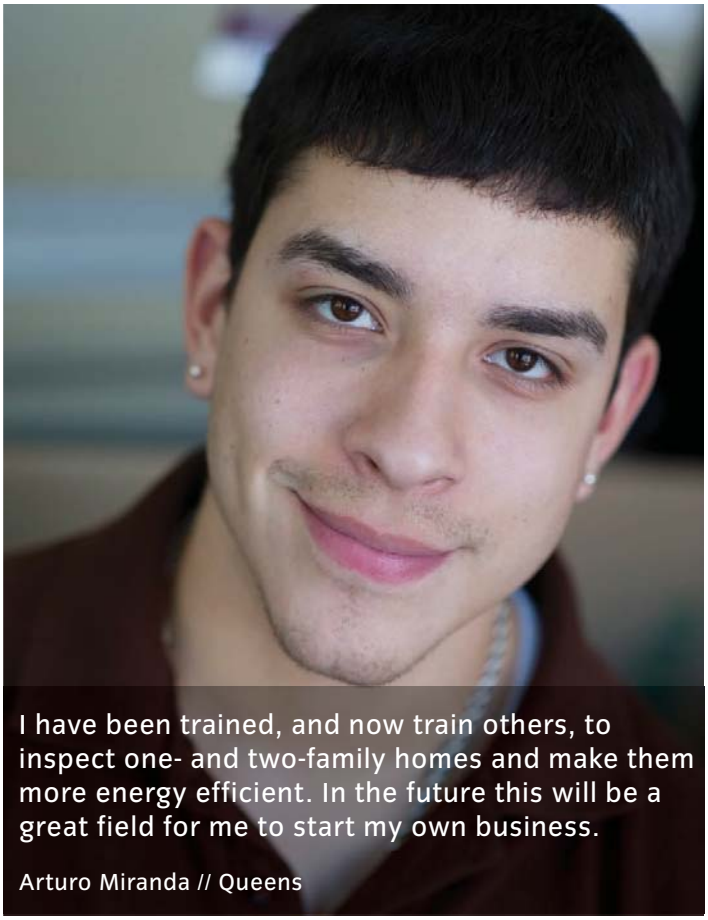
Provide cleaner, more reliable,
and affordable energy

Modernize our transmission
and distribution systems



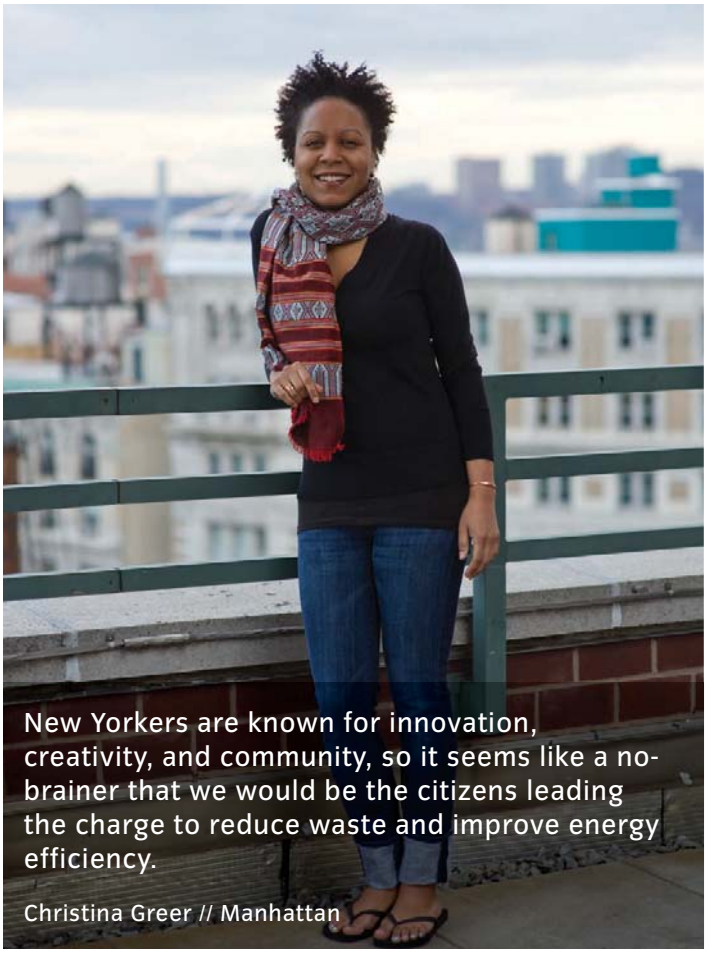
I use a cell phone and a computer, an alarm clock, an electric toothbrush. I ride the subway, I stay warm and cool inside and out, I buy food, I cook, I eat out, I go to movies and plays. When do I not use energy?

Michael Johnson Chase // Manhattan



I have been trained, and now train others, to inspect one- and two-family homes and make them more energy efficient. In the future this will be a great field for me to start my own business.

Arturo Miranda // Queens



New Yorkers are known for innovation, creativity, and community, so it seems like a no-brainer that we would be the citizens leading the charge to reduce waste and improve energy efficiency.

Christina Greer // Manhattan

Today's cogeneration technology has risen to a level of efficiency which now approaches 90%. Nearly all the fuel used in today's ultra-high efficiency cogen plants can be put to use producing electricity, high-temperature hot water, and chilled water for buildings.

John Bradley // Manhattan

Energy

Reduce energy consumption and make our energy systems cleaner and more reliable

From the birth of our gas distribution system in 1823, to Thomas Edison's creation of the first central power plant on Pearl Street in 1882, New York City has long been an innovator in urban energy systems. In turn, these systems have shaped our city. Electrically powered subways drove the city's expansion across the five boroughs, while elevators and district steam systems allowed the city to grow vertically into a breathtaking landscape of skyscrapers. Without energy, we would not have Broadway's bright lights, Astoria's movie studios, or Wall Street's trading floors. In short, these energy systems created a dense metropolis known for its high-energy lifestyle—"A City That Doesn't Sleep."

But compared to rest of the country, we are surprisingly low-energy when it comes to consumption. The average New Yorker is responsible for roughly one-third the greenhouse gas (GHG) emissions of the average American because our density makes for an extremely energy-efficient lifestyle. New Yorkers typically walk or take public transportation, rather than driving. And we inhabit smaller spaces, often in multi-family buildings with shared energy systems.

Yet, we can do better. Our once-innovative energy infrastructure needs to be modernized and our buildings are full of outdated equipment. Burning fossil fuels to create electricity, hot water, and heat contributes to air pollution and GHG emissions. As our summers get hotter and last longer, peak demand for electricity forces the activation of our dirtiest in-city power plants and causes stress to our electrical grid. Our energy is also expensive: New Yorkers pay among the highest retail energy prices in the nation, collectively spending more than $15 billion each year. We must reduce our energy consumption and clean our supply to ensure that we have reliable, affordable, and clean energy over the coming decades.

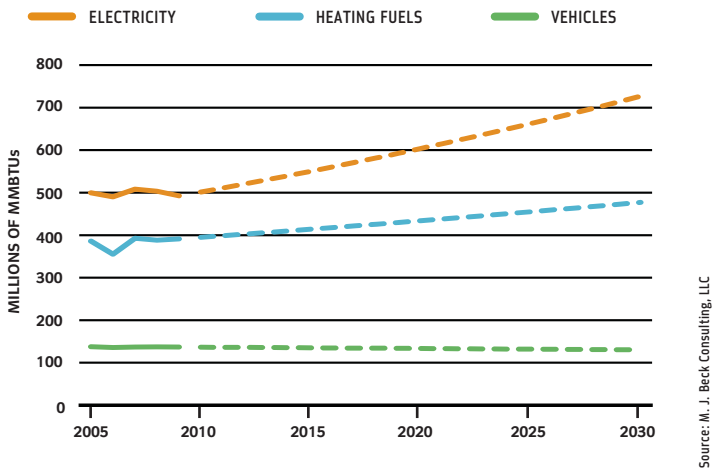
A central strategy for improving our energy system is to reduce energy consumption in existing buildings, which is the most cost-effective way to reduce GHG emissions. Energy use in buildings accounts for 75% of our GHG emissions, and up to 85% of the buildings that will exist in 2030 are already here today. Efficiency improvements will save money and energy, while also creating skilled, local jobs. But achieving this at the large scale will require transformational changes across the entire building industry.

We must also clean our supply of heating fuels and electricity. To create heat and hot water, roughly 10,000 of our largest buildings use residual oil, a viscous fuel that is nearly as dirty as coal. Eighty-six percent of soot pollution from buildings comes from the burning of residual oil—despite the fact that it is only used in 1% of our buildings. Eliminating the use of residual oil will require additional natural gas pipeline capacity to the city—which we have not received in over 40 years—as well as extensive upgrades to the local gas distribution system.

Our electrical supply, on the other hand, is already cleaner than the national average because we have access to low-carbon nuclear and hydroelectric power, as well as a portfolio of relatively clean natural gas-fired generation. Still we must go further. Older power plants can be retrofitted or "repowered" to achieve greater efficiencies. We can also encourage investments in efficient cogeneration, renewable power, and expanded transmission lines.

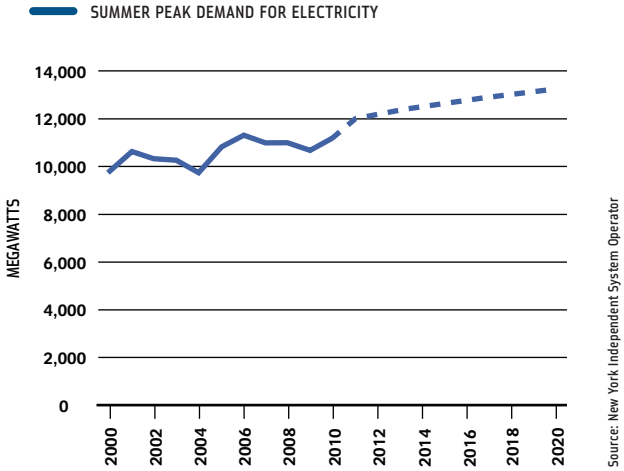
Attracting these investments has become increasingly challenging following the recession of 2008, which dampened growth in energy demand and prices. As our economy recovers, uncertainty about future consumption levels will affect the pace of private sector investments in modernizing our energy system. Further complicating matters is the potential closure of the Indian Point Energy Center, a nuclear power plant located in the Lower Hudson Valley

New York City Energy Consumption: Historic and Projected
Business as Usual Scenario



Source: M. J. Beck Consulting, LLC

Peak Demand for Electricity: Historic and Projected
Business as Usual Scenario



Source: New York Independent System Operator

that supplies up to 30% of our power virtually carbon-free. Removing this cornerstone of our electricity system could threaten reliability, increase prices, and jeopardize our GHG reduction efforts.

Since 2007, we have made significant progress to reduce energy demand. Working with the City Council, we passed the Greener, Greater Buildings Plan, the most far-reaching legislation in America impacting energy use in existing buildings. We also launched the Green Codes Task Force, which developed 111 specific proposals for sustainable improvements to our codes, many of which have already been enacted. We have also implemented an accelerated strategy to reduce GHG emissions from City government operations 30% by 2017, and nearly 30 major institutions have agreed to match us.

We have also made strides to improve the city's energy supply and distribution system. Con Edison, the regulated utility that serves most of the city, has made major upgrades to the electrical distribution grid to increase reliability. Two older power plants in the city have been repowered or replaced with more efficient technologies. Renewable energy investments have grown rapidly in response to new incentives, lower prices, and streamlined permitting. Together, these changes to our supply mix have made our electrical system more robust and reduced its GHG intensity by 26% since 2005.

This progress is encouraging, but we—the City, private and public utilities, state and federal regulators, financiers, and consumers—all need to do much more. Without continued energy efficiency improvements and investments in our supply and distribution infrastructure, we will not meet our energy, air quality, and GHG emission reduction goals.

Our Plan

We will build a greener, greater New York by reducing energy consumption and making our energy supply cleaner, more affordable, and more reliable.

We will pursue three general strategies to reduce energy consumption and improve efficiency: implementing and effectively enforcing the policies that we have already launched, broadening their reach to new sectors, and promoting the best new practices.

Our plan for energy:

Improve energy planning

1 Increase planning and coordination to promote clean, reliable, and affordable energy

Increase our energy efficiency

2 Implement the Greener, Greater Buildings Plan
3 Improve our codes and regulations to increase the sustainability of our buildings
4 Improve compliance with the energy code and track green building improvments citywide
5 Improve energy efficiency in smaller buildings
6 Improve energy efficiency in historic buildings
7 Provide energy efficiency financing and information
8 Create a 21st century energy efficiency workforce
9 Make New York City a knowledge center for energy efficiency and emerging energy strategies
10 Provide energy efficiency leadership in City government buildings and operations
11 Expand the Mayor's Carbon Challenge to new sectors

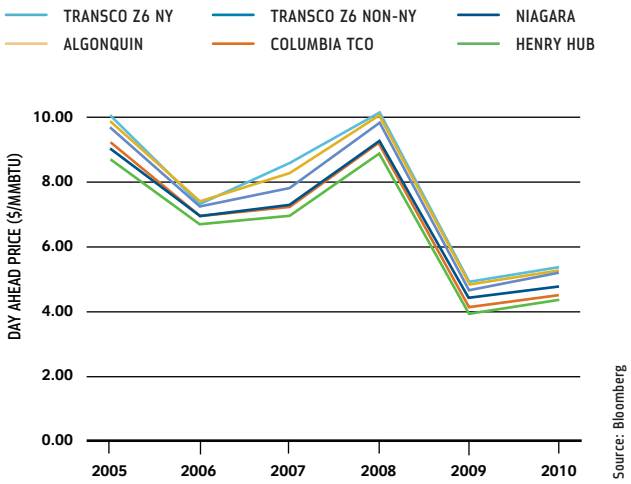
Provide cleaner, more reliable, and affordable energy

12 Support cost-effective repowering or replacement of our most inefficient and costly in-city power plants
13 Encourage the development of clean distributed generation
14 Foster the market for renewable energy in New York City

Modernize our transmission and distribution systems

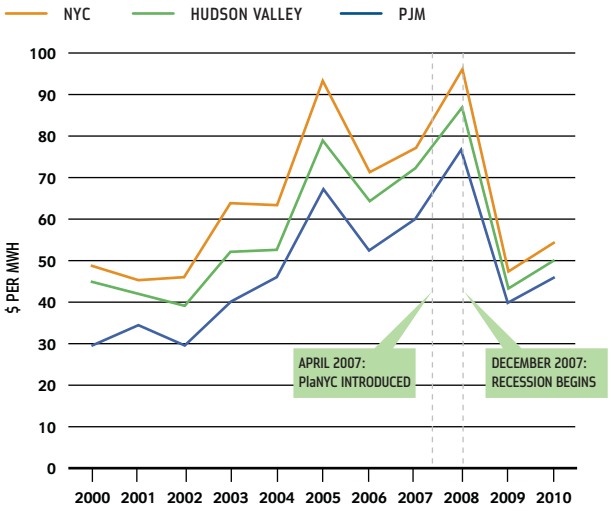
15 Increase natural gas transmission and distribution capacity to improve reliability and encourage conversion from highly polluting fuels
16 Ensure the reliability of New York City power delivery
17 Develop a smarter and cleaner electric utility grid for New York City

Annual Average Day-Ahead Natural Gas Prices
(Northeast Region and Henry Hub)



Source: Bloomberg

Average Annual Wholesale Electricity Price



Source: Ventyx Energy Velocity

To ensure the successful implementation of the Greener, Greater Buildings Plan and the Green Codes Task Force proposals, we will work to provide the building industry the resources it needs to comply. We will create an energy efficiency corporation to provide financing for energy upgrades in private buildings that will pay for themselves. We will remove barriers in our codes and regulations, and overcome split-incentives that are embedded in real estate leases. And we will collaborate with our partners to ensure that building owners and managers make informed decisions about their energy use and that we have a sufficiently skilled workforce.

We also need to expand our efforts beyond the largest buildings we initially targeted. We will work to increase the energy efficiency of our one million small and mid-sized buildings and in our historic building stock. And we will adopt the latest, more stringent national model codes for new construction and renovations.

Finally, we will continue to lead within our own building portfolio to accelerate GHG emission reductions and employ visionary technologies and design strategies. By partnering to create a world-class energy engineering program, a data clearinghouse on large building energy use, and venues to test cutting-edge practices, we will once again make New York City a knowledge center in urban energy innovation.

Changes to our energy supply portfolio can either advance or derail our efforts to reduce GHG emissions and improve air quality. For this reason, we will support the continued safe operation of Indian Point.

We will also encourage a more diversified portfolio of private sector-driven supply and transmission investments to ensure that future New Yorkers have access to clean, affordable, and reliable power. We want to attract the best ideas and world-class investments. We will offer support in the regulatory and permitting process for clean energy projects that will benefit New York City, including utility-scale renewable projects.

To foster the growth of smaller-scale clean energy technologies we will make targeted and cost-effective investments at City-owned facilities, and seek partnerships with the private sector to reduce direct costs to the city while capitalizing on best available practices. We will also work with utilities to encourage these types of investments across the city by streamlining permitting and interconnection processes.

Finally, we will accelerate the phase-out of highly polluting residual heating oil and mitigate future supply constraints by aiding in the development of appropriately sited natural gas transmission pipelines. To create economies of scale that will lower conversion costs, we will work with utilities and key stakeholders to cluster buildings in underserved neighborhoods where gas distribution upgrades can have the greatest air quality benefits.

Together, these strategies will enable us to invest wisely in our future. New Yorkers will save money. Our economy will grow. And we will make progress toward our clean air and GHG reduction goals.

Improve energy planning

We only have so much ability to influence our energy system. Unlike water and sewer infrastructure, the electric, gas, and steam systems in New York City are investor-owned and regulated by the state and federal governments, not the City. We can use building and energy codes to encourage efficiency and regulations to require cleaner fuels. But ultimately the decisions of millions of individual households and businesses will determine how energy is used. For this reason, it is essential to partner with utilities, regulators, state energy agencies, and other key stakeholders to align our goals, policies, and incentives.

INITIATIVE 1

Increase planning and coordination to promote clean, reliable, and affordable energy

No single entity oversees New York City's complex energy systems. Con Edison manages the entire electrical grid and steam system, National Grid and Con Edison share natural gas distribution, and dozens of companies provide fuel oil. The New York State Public Service Commission (PSC) regulates the electricity, natural gas, and steam distribution systems, while several state and federal regulators approve new energy infrastructure development. The New York State Energy Research and Development Authority (NYSERDA), Con Edison, and National Grid all manage programs to encourage energy efficiency and renewable energy. The City administers the energy code for buildings.

While the City is not in the energy business, we do have a compelling interest in ensuring that New Yorkers can access clean, reliable, and affordable energy today and in the future. To achieve these goals, we need to think holistically about the energy spectrum, from the largest power plants and transmission lines down to the heating systems in individual buildings. Clearly, this will require engagement, collaboration, and the sharing of information with the large number of public and private parties involved.

Energy supply projects take years to develop and decisions made by the energy industry stay with us for decades, impacting the cost of doing business in the city. To coordinate on strategic and regulatory issues, we established the New York City Energy Planning Board, consisting of the City, the State, and the utilities. In 2009, the Energy Planning Board presented for the first time a unified vision in its collective comments to the New York State Energy Plan and recently members helped shape the City's study on the potential impacts of an Indian Point retirement.

An energy retrofit will reduce the Empire State Building's energy consumption by 38%

Credit: Empire State Building is a registered trademark and used with permission

We have also created an Energy Policy Task Force to bring together a broader range of stakeholders to advise us on energy issues. We will rely on this group for guidance on topics such as the building out of the city's natural gas distribution system and public-private partnership models for financing clean distributed generation and renewable energy projects.

We will continue to work with the Planning Board and Task Force to encourage clean energy supply investments, effective incentive programs, shared data collection and management, and coordinated energy forecasting.

Increase our energy efficiency

In the past four years, New York City enacted the nation's most comprehensive set of policies to improve energy efficiency in buildings. We must successfully implement these policies, which include training tens of thousands of building managers, architects, and electricians. We will also combine federal funds with private dollars to provide building owners with access to capital for energy upgrades.

Energy efficiency practices must be expanded to address the one million smaller buildings not covered by the Greener, Greater Buildings Plan (GGBP). This expanded effort could include requirements for energy transparency measures for all buildings.

New York City must also continue to develop visionary building practices. We will work to streamline the approval of new technologies, and we will strive to make New York City a leader in the emerging discipline of energy efficiency.

INITIATIVE 2

Implement the Greener, Greater Buildings Plan

In December 2009, the City Council passed four laws, collectively known as the GGBP, that require energy efficiency upgrades and energy transparency in large existing buildings. Specifically, these laws call for annual benchmarking, energy audits, retro-commissioning, lighting upgrades, and sub-metering of commercial tenant space.

Three out of these four laws only impact the city's largest 16,000 properties, both public and private, that compose half the built area in the city. By 2030, these laws will reduce GHG emissions by at least 5% citywide, save New Yorkers more than $750 million per year, and create almost 18,000 construction-related jobs.

These laws will transform the building industry by making energy efficiency common practice. Transforming an industry involves developing new regulatory procedures—terms must be legally defined, procedures codified, and rules made comprehensive enough to cover a range of conditions. Working with the real estate industry, we will develop rules and guidelines to implement and fully enforce these new laws.

The Greener, Greater Buildings Plan requires the city's largest buildings to annually measure their energy use, called benchmarking, and for this information to be made public. We benchmarked 2,700 City government buildings and this data will be shared. To measure the effectiveness of the new benchmarking law and to understand energy use in buildings, we will analyze and report on benchmarking results for the first three years the law is in effect.

INITIATIVE 3

Improve our codes and regulations to increase the sustainability of our buildings

Buildings have a significant impact on New York City's environment. Energy use in our buildings is responsible for 75% of our carbon emissions, 94% of our electricity use, and 85% of our potable water consumption.

Green building and operating techniques can dramatically improve the performance of our buildings. We must ensure that the most cost-effective, sustainable, common-sense strategies become common practice by "greening" New York City's codes.

At the request of Mayor Bloomberg and Speaker Quinn, the Urban Green Council (UGC) assembled the New York City Green Codes Task Force, consisting of more than 200 experts in design and construction. The task force developed 111 proposals to green the City's codes. These proposals would modify City codes and regulations that impact buildings or impede green building practices.

Twenty-two Green Codes Task Force proposals have already been adopted through law, rule, or change to practice. We will complete the incorporation of the Green Codes Task Force proposals into our regulations. We will also refine a group of proposed changes to the Zoning Resolution to remove barriers to energy efficient building envelopes and the siting of clean energy on buildings. Going forward, it will be important to work with technical experts and industry and regulatory authorities to ensure that the new codes are cost-effective and achievable, while ambitious enough to bring the benefits of green building to all New Yorkers.

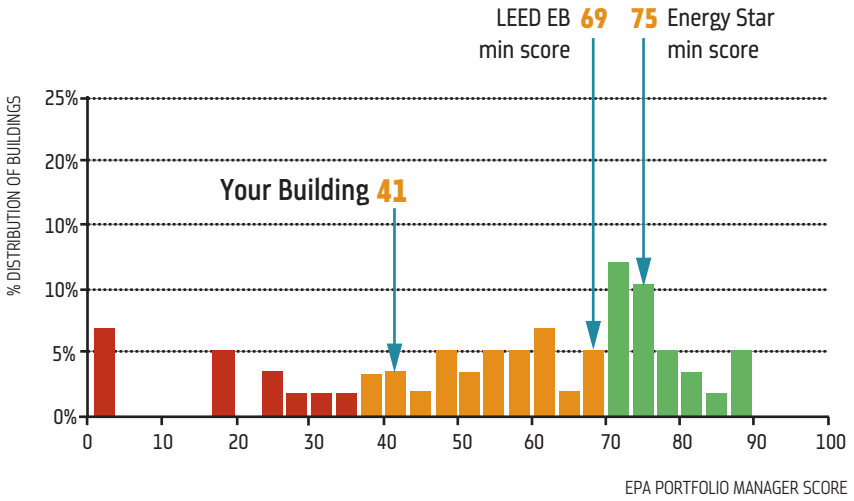
Concurrently, there have been national efforts to create comprehensive green codes that could apply across the country. These efforts culminated in the International Green Construction Code (IGCC) and ASHRAE 189.1. We will work with the International Code Council (ICC) and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) to bring New York City's codes and these model green codes into greater alignment.

Efficiency of new construction and renovations can also be improved by adopting the next iteration of the model energy codes, which are national standards. These codes are 30% more stringent than the 2010 City codes. We will amend the model energy codes to reflect the unique conditions of New York City and work with the City Council to adopt them.

We have also established several boards to approve new technologies and ambitious projects not addressed by current codes and regulations. This includes a Building Sustainability Board to develop building code and product standards for new technologies, an Innovation Review Board to bring together multiple agencies to review new codes or technologies, and the Interagency Green Team to address broader issues. We will continue to convene these entities to review and facilitate the use of new technologies.

41 Your Benchmarking Score:

Compared to the EPA Portfolio Manager Scores of other buildings in New York State



Source: New York State Energy Research and Development Authority

INITIATIVE 4

Improve compliance with the energy code and track green building improvements citywide

We have taken great strides to increase energy efficiency through our codes. Architects and engineers must now submit energy analyses and drawings to show how a design meets current energy code requirements, and we are requiring progress inspections during construction. We will aim to achieve 90% energy code compliance by 2017 through stringent enforcement and by providing energy code training for designers.

To track citywide impacts and provide better information to the public, we will develop a "Green Building Report Card" and an online tracking tool to show which buildings are making green improvements, such as installing a cool roof or converting boilers to cleaner fuels.

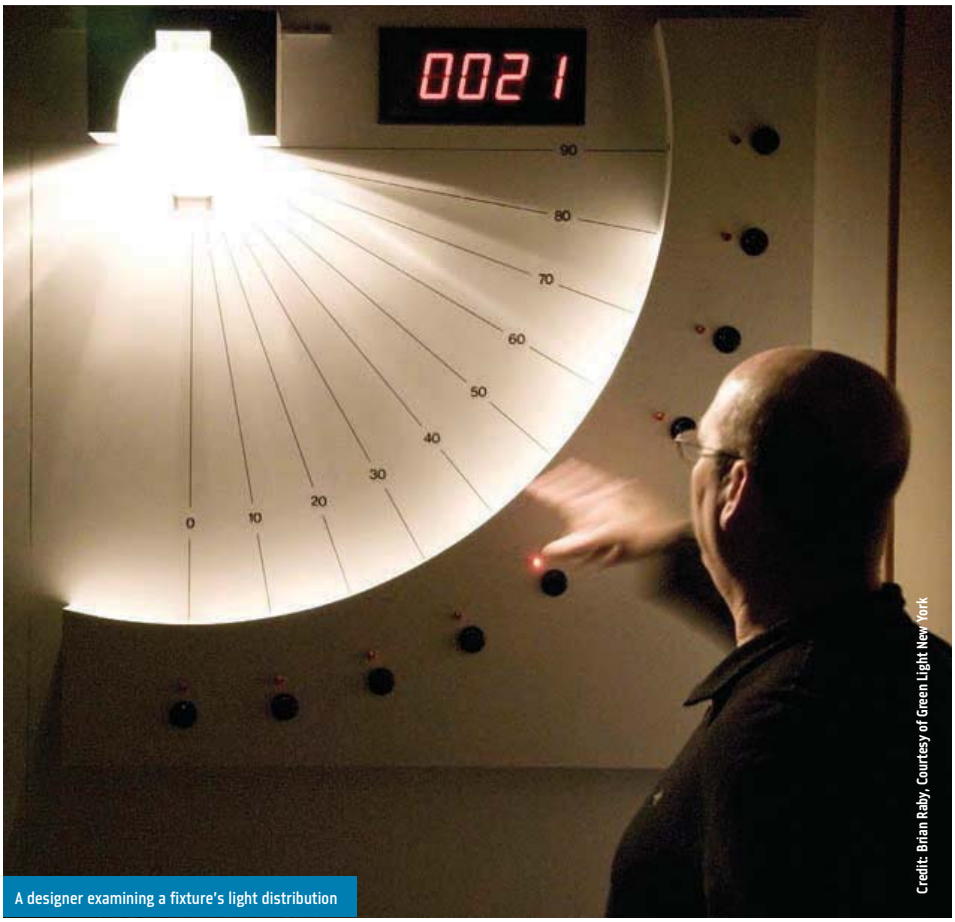
INITIATIVE 5

Improve energy efficiency in smaller buildings

The Greener, Greater Buildings Plan addressed energy efficiency in buildings over 50,000 square feet, which collectively constitute about half the floor area of the city. To meet our carbon reduction goal, we must also address the efficiency of the buildings that account for the other half of our inventory, which includes more than one million homes and small- to mid-sized buildings.

Several other cities and states have implemented policies to increase the energy efficiency of buildings by providing information to potential buyers at the time a building is sold. Austin, Texas requires energy audits for small residential properties; California requires benchmarking of all commercial properties; Montgomery County, Maryland mandates the disclosure of energy use and costs for residential properties. These requirements allow prospective building owners to learn about the energy efficiency of the property they are considering and have information about potential energy upgrades at the same time they are financing and planning other improvements. We will work with the City Council and other stakeholders to develop a strategy to increase the energy efficiency of smaller buildings.

To encourage energy efficiency in buildings at the time of change in ownership, we will launch a series of energy efficiency public education campaigns. These efforts will leverage the NYC Green House program and GreeNYC campaigns to educate New Yorkers about reducing energy consumption. We will also launch an energy efficiency competition between residential neighborhoods throughout the five boroughs.



Credit: Brian Raby, Courtesy of Green Light New York

A designer examining a fixture's light distribution

INITIATIVE 6

Improve energy efficiency in historic buildings

Architecturally and historically significant buildings are important for preserving New York City's identity. The style, design, and façades of our buildings merit protection—but their inefficient energy systems could sometimes benefit from modernization, without compromising external visual character.

The national model energy codes exempt national and state landmarks from complying with current standards. But the intention behind this exemption doesn't mean we should necessarily preserve inefficient lighting, leaky envelopes, and wasteful heating and cooling systems. In many cases, the integrity of historic buildings can be kept when hidden energy-using systems are modernized. We will work with the historic preservation societies to reconcile energy codes with preservation requirements. We will also partner to create a handbook of energy efficiency strategies for historic buildings, which will help design professionals retrofit such buildings more effectively.

INITIATIVE 7

Provide energy efficiency financing and information

To make energy efficiency upgrades, building owners need access to capital and information. Historically, banks have been reluctant to lend money for energy efficiency projects because the loans are relatively small and difficult to manage.

To overcome these obstacles, we will create a not-for-profit corporation, the New York City Energy Efficiency Corporation (NYCEEC), capitalized with federal stimulus funding and organized to partner with the commercial lending industry and philanthropic sources. NYCEEC will make energy efficiency financing less risky for lenders and more accessible to property owners.

New York State and the federal government have increased funding for energy efficiency programs roughly six-fold in recent years. However, the rules can be bewildering, and programs are run by different agencies and utilities. As a result, they often overlap or leave critical gaps for funding.

Through NYCEEC, we will create an information center to provide comprehensive, updated information on energy efficiency funding and tax incentives. We will also work with the State PSC, NYSERDA, and our utilities to ensure that state efficiency programs support our carbon

CASE STUDY

Green Light New York

"Bright Lights, Big City" couldn't be more appropriate. In New York City, 27% of our electricity is used to light buildings, accounting for 12% of our overall carbon emissions. Fortunately, efficiency gains from lighting can be made cost-effectively and quickly because of dramatic, ongoing advancements in lamp efficiency and in sensors and controls that turn lights off when they aren't needed. In response, the national model energy codes have doubled in stringency over the past 20 years. The Greener, Greater Buildings Plan will bring these improved standards to buildings throughout New York City.

Designing lighting that meets the stringent requirements of the new codes and still provides a workable, pleasant environment isn't easy. Lighting strategies must be seen to be understood and evaluated. A large number of professions are involved in lighting decisions, including architects, engineers, interior designers, lighting designers, building owners and managers, contractors, distributors, and electricians—over 50,000 people in New York City. According to a recent poll, few of these decision-makers are familiar with basic lighting concepts, the new codes, or new technologies.

To overcome these barriers and reap the efficiency benefits of the regulations, New York needs a lighting resource center—a physical space where exemplary lighting designs can be seen, classes taught, and lighting strategies mocked up and demonstrated. In California and Washington, such centers have effectively supported advanced energy codes for over 20 years. In partnership with the National Resources Defense Council, New York State authorities, and the professional associations, we have helped create a not-for-profit, Green Light New York, to be a resource center to support the New York lighting industry.

Green Light New York will demonstrate lighting solutions with a mock up space, exhibits, a day lighting lab, and interactive examples of best practices and solutions. It will also provide a venue for lectures, demonstrations, and classes in energy efficiency. By providing a physical center for this exchange of knowledge, Green Light New York can accelerate progress toward our energy and carbon goals.

CASE STUDY

Amalgamated Green

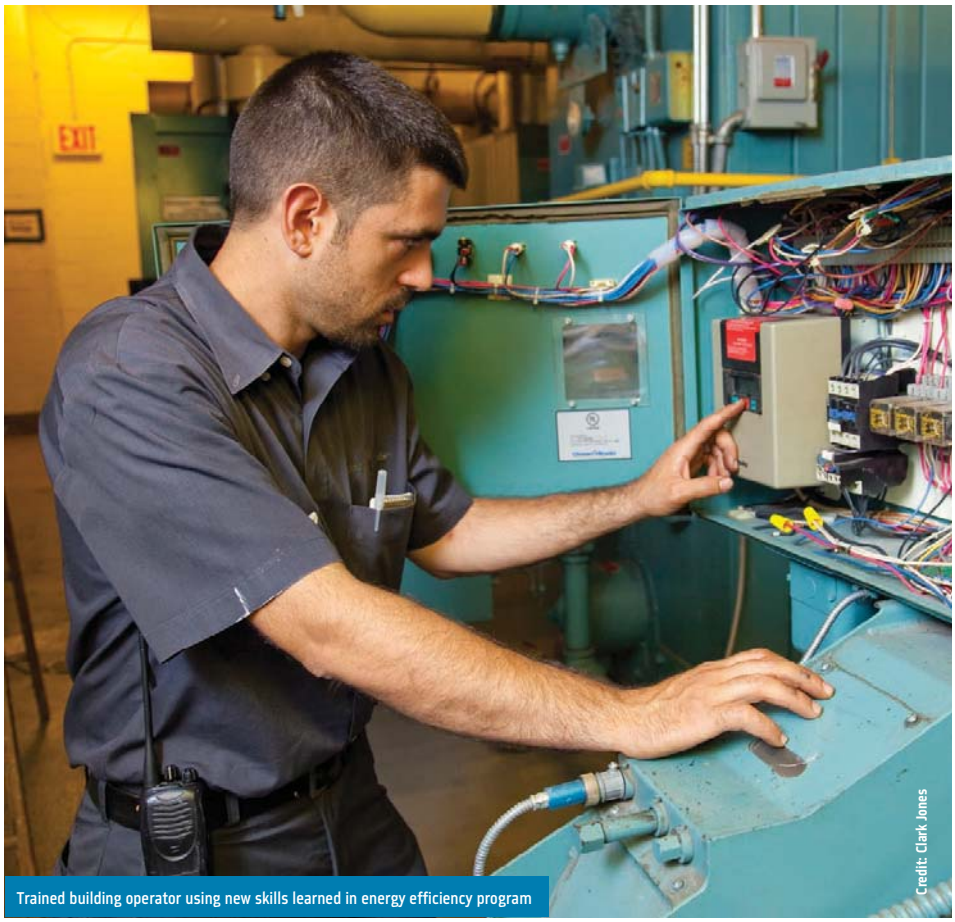
For the Greener, Greater Buildings Plan (GGBP) to transform the building industry and reduce energy use, the owners and managers of 16,000 properties and their workforce need training in the new specialties of energy efficiency.

City government can't assess these needs or deliver the trainings on its own, but we can convene the people with knowledge and resources. We helped create Amalgamated Green, a group of 30 stakeholders, including the unions, the Real Estate Board of New York (REBNY), City University of New York (CUNY), professional societies, and energy training providers to build these resources. For each GGBP law, the group analyzed training needs and how best to meet them. Through Amalgamated Green, resources have been created for outreach on the Greener, Greater Buildings Plan and for trainings in the NYC Energy Code and benchmarking.

For example, funded by Con Edison and NYSERDA and aided by a pro-bono market analysis by the firm of HR&A, Urban Green created a presentation about the GGBP and is managing volunteers who will deliver it to owners and managers. To educate the design community about the new energy code, NYSERDA has funded Urban Green to develop a class that will be delivered by American Institute of Architecture (AIA) chapters.

Benchmarking is another example. The largest buildings in New York are now being benchmarked thanks to the teamwork of organizations throughout the industry. Owners can now get aggregated building data from Con Edison and National Grid. The U.S. Environmental Protection Agency's online tool addresses multi-family buildings and tracks benchmarking data. NYSERDA funded the Association for Energy Affordability to hold benchmarking trainings twice a week, and CUNY students are managing a hot line to answer questions. Finally, Urban Green and the Related Companies have developed a step-by-step explanation of how to comply, and REBNY has hosted several comprehensive information sessions.

As we implement the Greener, Greater Buildings Plan and adopt the proposals of the Green Codes Task Force, we will continue harnessing the resources of our building industry through Amalgamated Green–now a proven resource.



Trained building operator using new skills learned in energy efficiency program

Credit: Clark Jones

reduction initiatives, become more transparent and accountable, and are fairly apportioned to New York City.

INITIATIVE 8

Create a 21st century energy efficiency workforce

Achieving large-scale energy efficiency requires transforming the knowledge, skills, and practices of the entire building industry. Architects and engineers must understand the energy code. Building managers and superintendants must learn to benchmark and operate their buildings more efficiently. Electricians must know how to correctly install advanced sensors and controls.

In 2010, we launched Amalgamated Green, a group including universities, unions, and professional associations focused on identifying and developing skills needed to achieve our goals. As the demand for workers with the skills to implement our sustainability policies evolves, we will work with this group to ensure we have a qualified workforce. Working with public and private partners, we will also help launch Green Light New York, an energy education center that will initially focus on lighting training for designers and other real estate professionals.

Because electricians will need to install advanced energy systems, we will incorporate the energy code into the licensing exam and continuing education curriculum for electricians.

A lack of national standards in energy efficiency professions is hampering progress. We are working with the U.S. Department of Energy and the National Renewable Energy Laboratory to help develop national certification standards. Once national standards are in place, we will adopt them.

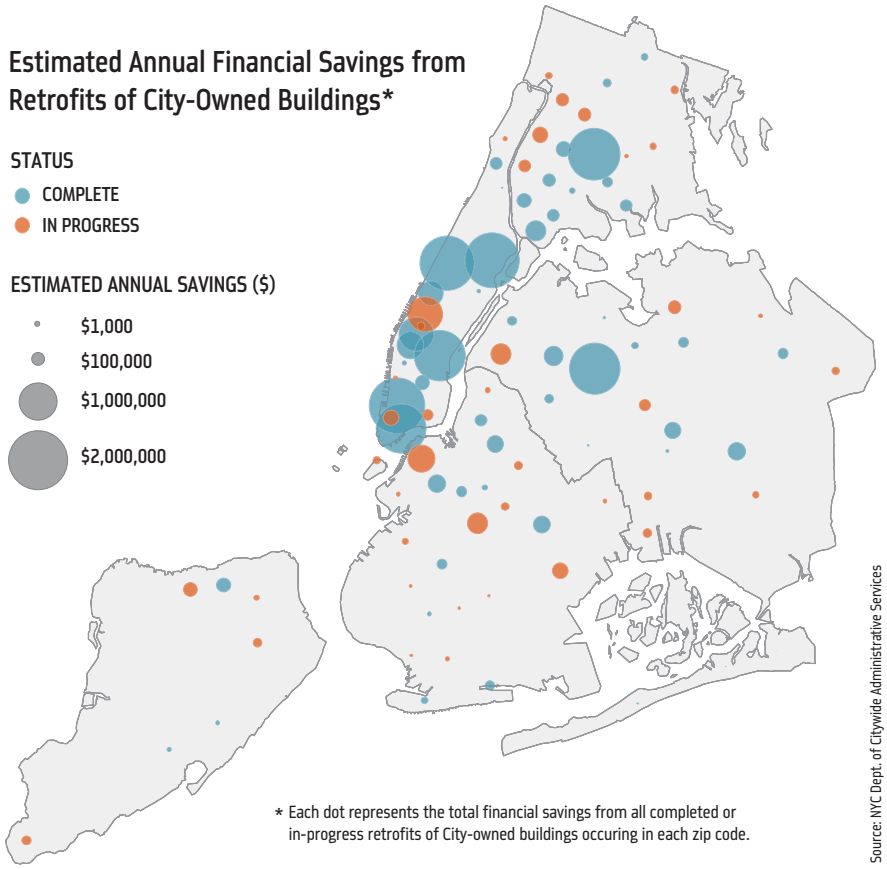
To encourage builders to upgrade their skills, we will develop and implement a sustainable contractors designation program for electricians, plumbers, and general contractors that demonstrate knowledge in green practices and technologies.

INITIATIVE 9

Make New York City a knowledge center for energy efficiency and emerging energy strategies

To make our city a national knowledge center for energy efficiency, we need an energy engineering program, a consolidated database of information on energy use in buildings, and broader exposure to new technologies.

While New York City has many skilled practitioners in energy efficiency, we don't have a major degree program in energy efficiency engineering. We will partner with a university to develop a program in energy efficiency engineering and building science. The program will train the next generation of building energy specialists and



host a research program to identify and address the most common and serious energy issues that affect our building stock.

Understanding how our building stock uses energy and the effectiveness of various efficiency strategies has been hindered by a lack of data. This is about to change. All of our energy efficiency efforts, including private sector benchmarking, audit reports, the upgrades to municipal buildings, energy projects funded by NYCEEC, and the Mayor's Carbon Challenge, will provide us with robust data. We will partner with one or more institutions to develop a standardized energy database and make this information available to the real estate, technical, financial, and business communities.

Finally, we need to encourage the best new practices in the private sector. New York City has long been a national leader in green design, from the first green skyscraper in Times Square, to the first green residential high-rise in Battery Park City. We need to quicken the cycles between the generation of new ideas and their incorporation into projects, and we need to broaden familiarity with new strategies in order to facilitate more widespread adoption. We will partner with our cultural institutions to create exhibits where the public and decision-makers alike can see and experience the best new strategies.

INITIATIVE 10

Provide energy efficiency leadership in City government buildings and operations

New York City will continue playing a leading role both in piloting innovative technologies and in implementing our aggressive plan to cut municipal GHG emissions by 30% below FY 2006 levels by 2017 (30x17). As a leader, we will develop industry capacity and promote best practices.

New York City government uses energy in diverse ways. This includes operating 14 wastewater treatment plants, a large vehicle fleet, thousands of streetlights, and 4,000 buildings. Our 30x17 program addresses all of these uses.

Since 2007, the equivalent of 10% of our energy budget has been allocated to energy efficiency investments. This commitment is being supplemented by $700 million received to fund energy efficiency work in schools. To further ramp up our efforts, we will pursue a variety of procurement mechanisms, including Energy Savings Performance Contracting.

As part our 30x17 program, the American Museum of Natural History underwent a comprehensive energy audit and received a series of energy efficiency upgrades. Lighting fixtures have been retrofitted throughout the museum and hundreds of occupancy sensors have been installed, along with other energy conservation measures. The museum is saving $356,400 from their annual utility bills, and reduced its annual GHG emissions by 1,431 metric tons.

Improving the operation and maintenance (O&M) of our buildings will reduce energy consumption. A pilot project in City buildings found that no-cost operational changes, such as turning off lights and setting thermostats correctly, reduced energy consumption by an average of 17%. By implementing our O&M plan, we can capture this low cost operational savings potential.

City agencies currently have little incentive to prioritize energy efficiency, because energy bills are paid centrally. We will create incentives to ensure that agencies prioritize conservation and proper energy system management practice.

We can also accrue savings by ensuring that interior renovations done to City facilities are more efficient. We will create standards and a handbook for green renovations of City facilities. Working with the City Council, we will also create a board to assess the merits of new technologies and pilot them in City buildings.

We will help the private sector address these opportunities for efficiency too. Under some leases, landlords are not motivated to make long-term capital improvements for energy efficiency because tenants pay the energy bills. To enable both parties to share in the benefits of energy efficiency, we have worked with the real estate industry to develop voluntary model lease language. We will incorporate this energy-aligned lease language in new City leases where the City is the tenant, and work with the private sector to make this standard practice in New York City.

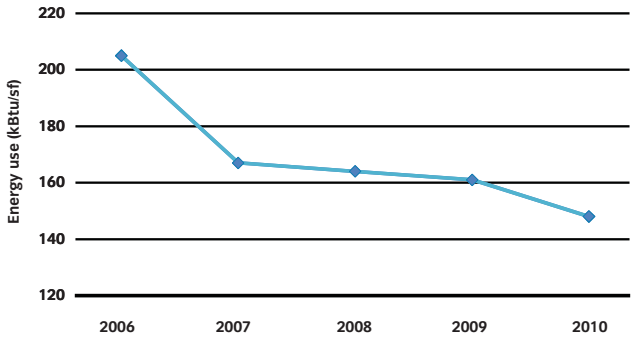
Today's industry leaders are going even further, creating new buildings that use little to no energy through techniques known as net-zero or Passive House. They are trying to dramatically cut energy consumption in existing buildings through "deep energy retrofits." By piloting at least one net-zero school, a Passive House building, and a deep energy retrofit project, we will continue to be at the forefront of building practice.

INITIATIVE 11

Expand the Mayor's Carbon Challenge to new sectors

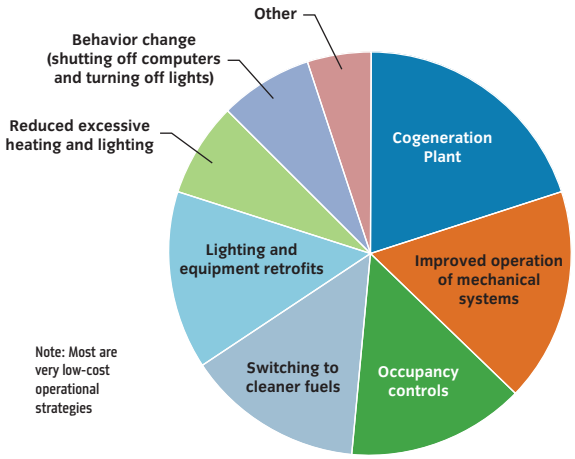
Institutions, such as hospitals and universities, are poised to reduce their energy consumption quickly. They have the long-term perspective of owning and operating their properties for many

New York University's Energy Reductions



Source: New York University

Key Components of NYU's Energy Reduction Strategy



Source: New York University

decades. In 2007, Mayor Bloomberg issued a challenge to the city's largest universities and hospitals to match the City's goal of reducing carbon emissions 30% in ten years.

Twenty-nine institutions have accepted the Mayor's Challenge. They have created GHG inventories and action plans for emissions reductions, and they meet regularly to share information. The institutions participating include many of the city's largest energy users and collectively account for more than 75 campuses and roughly 80 million square feet of real estate.

Only three-and-a-half years into the Challenge, many institutions are on track to achieve their 30% reduction well in advance of the ten-year timeline. Several universities and hospitals have already surpassed the goal and are eager to commit to a more ambitious target. We will continue to support the University and Hospital Challenges, and will develop "stretch goals" including setting a new carbon reduction goal for the next decade.

Building on our success with universities and hospitals, we will expand the Challenge program to at least two new sectors. Housing cooperatives and condominiums, large commercial tenants, hotels, religious institutions, and similar entities are good candidates. They compose a significant amount of real estate, and their ownership structures facilitate concerted management of energy efficiency.

The cooperative housing sector, for example, includes one in ten New York City housing units. It accounts for more than 350 million square feet of real estate, and is responsible for 1.7 million metric tons of GHG emissions per year. If 40% of the cooperatives in the city met the goals of a Mayoral challenge, by 2021 this could lead to an annual GHG emissions reduction of 206,000 metric tons. This is equivalent to making 35,000 New Yorkers carbon neutral.

Provide cleaner, more reliable, and affordable energy

We are working to make our energy supply portfolio cleaner, more reliable, and more affordable. New York City is fortunate to have an electricity supply that is already cleaner than the national average. Most in-city power plants are gas-fired and our imports are primarily carbon-free nuclear and hydropower. However, many of our in-city generation resources are old and inefficient, and congested transmission lines limit our ability to import larger amounts of clean electricity. And we have one of the highest wholesale electricity prices in the nation.

Complicating matters is the potential closure of the Indian Point Energy Center in the Lower Hudson Valley. Closing Indian Point without a viable and relatively clean replacement option would jeopardize reliability, significantly increase prices, worsen local air quality, and make it very challenging to achieve our goal of reducing GHG emissions 30% by 2030. For these reasons we will support the continued safe operation of Indian Point.

To ensure that future New Yorkers have access to clean, reliable, and affordable energy, we will also seek to diversify our supply portfolio and make existing generation in the city more efficient. This will require more robust electric and gas networks, better incentives for modernizing generation assets, targeted investments in cogeneration and renewable energy, and longer-term transformational options for harnessing cleaner resources outside the city. The development of two state-of-the-art gas-fired plants in the New York City area that will come online soon indicates that private developers can be attracted to build projects that improve air quality and increase system reliability. We will work with utilities, regulators, and the private sector to encourage more of these investments.

INITIATIVE 12

Support cost-effective repowering or replacement of our most inefficient and costly in-city power plants

Given the relative lack of available building sites in the city that are suitably zoned for power plant construction, one of the most promising means to increase energy production while improving affordability and environmental outcomes lies in repowering existing plants.

Repowering means replacing old generation units with new units that burn cleaner fuels, increase capacity and efficiency, and improve operational flexibility. Well-designed retrofits emit far fewer pollutants, use far less fuel, and can significantly reduce cooling water consumption. The result is cleaner air and water, as well as lower energy costs. Repowering is our first policy choice for cleaning our energy supply because it produces demonstrable benefits at current industrial sites.

Leaving older and dirtier power plants in place is simply too costly for New Yorkers' health and pocketbooks. Unfortunately, some energy market rules can deter potential developers from entering the market with new generation resources. For that reason, we support a wholesale energy market design that encourages sensible repowering and new generation projects. We will advocate that the New York Independent System Operator (NYISO) and the Federal Energy Regulatory Commission (FERC) adopt energy and capacity market rules designed to best serve the interests of ratepayers, while also recognizing the needs of energy infrastructure developers to obtain a fair return on their investments.

CASE STUDY

Public-Private Partnerships To Capture and Utilize Methane

Our 14 wastewater treatment plants utilize stomach-like "digester" units to remove solids from wastewater, while making methane gas as a by-product. Methane is a potent GHG when released to the atmosphere but, if captured, it is a relatively clean energy source known as natural gas. We currently capture and use about 30% of methane from treatment plants to meet on-site energy needs. However, we still emit large quantities, equivalent to over 250,000 tons of carbon dioxide annually. Public-private partnerships will allow us to put more of this gas into productive use at minimal direct cost to the City—thereby reducing our GHG emissions cost-effectively.

At the Newtown Creek Wastewater Treatment Plant we are partnering with National Grid to develop one of the nation's first "waste-gas-to-grid" projects. When completed in spring 2012, the project will inject purified digester gas into National Grid's distribution system, which serves Brooklyn, Queens, and Staten Island. The project will inject enough gas to heat 2,500 homes and will also reduce our GHG emissions, the same savings as removing 3,000 vehicles from the road.

Credit: NYC Dept. of Environmental Protection

The anerobic digesters of the Newtown Creek Wastewater Treatment Plant

National Grid is funding all capital costs in exchange for a guaranteed annual stream of gas. The delivery of any additional gas will generate revenue for the City. This innovative agreement will bring to market a cost-effective source of renewable gas and will serve as a replicable model for other urban sites.

We are also pursuing a partnership at the Wards Island Wastewater Treatment Plant that accomplishes multiple goals at once. Buildings on Wards Island are served by a 75-year old centralized heating system that must be replaced. We are exploring a private partnership to develop a cogeneration system at the Wards Island Wastewater Treatment Plant that would reduce direct costs to the City while providing necessary infrastructure and reducing emissions.

This system could use digester gas supplied by the treatment plant to produce district heat while also generating 10 to 30 MW of electricity.

INITIATIVE 13

Encourage the development of clean distributed generation

Clean distributed generation (clean DG) enables properties to create their own power with higher efficiencies and less environmental impact than central plants. For example, cogeneration systems can achieve high efficiencies by capturing the heat by-product of electricity production and reuse it for heating and cooling, thus reducing GHG emissions. Clean DG systems also help lower peak demand for electricity and improve the reliability of our electrical grid. We will seek to develop 800 megawatts (MW) of clean DG.

We have ample opportunities to develop clean DG at City-owned sites. We expect clean DG to contribute up to 10% of the GHG emissions reduction needed to achieve our 30x17 goal. We are currently developing cogeneration plants at Rikers Island and the new Police Academy in College Point, Queens, totaling over 15 MW in capacity. We are also examining cogeneration at the North River Wastewater Treatment Plant, at a complex of government buildings in Lower Manhattan, and at other sites, possibly in partnership with the private sector. We will also explore the feasibility of clean DG as part of the renovation of City Hall.

Many private building sites are also ideal for cogeneration, but private developers often face steep obstacles bringing projects to fruition. We will work with utilities and project developers to streamline permitting and interconnection processes. We will also encourage utilities to improve coordination of electric and gas distribution planning. This will help ensure that most residential clean DG sites have adequate gas supply and are able to provide demand reduction or emergency backup power benefits. Finally, we will continue to advocate for cost-effective ratepayer-funded incentives to catalyze clean DG development.

INITIATIVE 14

Foster the market for renewable energy in New York City

Nationwide, installed capacity of renewable energy has more than doubled in the past four years to over 53,000 MW. New York City's densely built environment makes it more difficult to develop large-scale renewable energy projects. However, the city does have some key opportunities to attract private investment and integrate renewable energy into our energy supply mix.

A recent GreeNYC study found that over 60% of New Yorkers would be willing to purchase renewable energy at a premium. We will explore possibilities for pooling consumer purchasing power to drive the development of local renewable energy resources. We will also promote consumer awareness about renewable energy options and work with energy service companies to account for the GHG reductions that result from consumer purchases.

Solar

Solar photovoltaic (PV) is ideal for an urban environment because it can be located near end-users, reducing the need for expensive transmission upgrades. Last year alone, New York City's installed solar capacity doubled from 3 MW to 6 MW. The City's solar property tax abatement and expanded "net metering" rules have significantly improved the economics for solar PV projects. Lower installation costs, improved technology, and streamlined permitting processes have also driven growth.

We expect to see even more growth over the next four years because of state and local incentive programs. The Public Service Commission (PSC) forecasts that a new five-year $125 million program for large-scale renewable energy projects in the New York City area will add more than 60 MWs of solar PV to Con Edison's service territory by 2015. We also expect continued growth in applications for the City's solar tax abatement, and we will evaluate the cost-effectiveness of this program in the coming years.

To support this growth, we will create an online solar map that will enable New Yorkers to determine the potential for generating solar power on their rooftops. We will also work with Con Edison, the National Renewable Energy Laboratory, and the private sector to create a performance monitoring system linked to over 100 solar PV installations across the city. This system

Clean Energy Projects at City-Owned Sites: Planned or Under Development

Source: NYC Dept. of Environmental Protection; NYC Dept. of Citywide Administrative Services

The Pennsauken, N.J. renewable energy park, built on a landfill

The Nysted Offshore Wind Farm in Denmark

will provide insight on how distributed solar resources interact with the electrical grid and can aid peak demand reduction.

Solar projects are currently subject to a complex permitting and interconnection process involving numerous entities. To streamline this process, we will work with Con Edison, NYSERDA, and other parties to explore the development of a centralized website for permit application and tracking. We are also modifying City codes and regulations to remove barriers to solar investments while maintaining necessary safety standards.

The City will also use its own assets to drive solar development. We currently have 15 photovoltaic and solar thermal projects in design. We are installing small-scale solar PV and solar thermal projects at City-owned sites and plan to release a Request for Proposals for third-party installation and ownership of 3 MW in 2011.

We will explore public-private partnerships to develop larger renewable energy projects, including utility-scale solar energy projects at capped municipal landfills. City landfills can accommodate more than 50 MW of solar power on only a small fraction of available land. These projects can be sensitively developed to complement habitat restoration efforts and longer-term plans for recreational use. Installing solar power at these sites could significantly improve local air quality by reducing generation at the city's dirtiest plants during periods of peak summer demand.

Wind

New York State is a leading location for wind energy in the Northeast, with nearly 1,300 MW installed. However, most wind projects were built far away from New York City, and we are unable to access these sources of carbon-free electricity. By using City assets and thinking creatively, we can create closer opportunities to build both small and large wind projects to serve New York City.

We are exploring the development of small wind projects at City-owned sites. These projects must be technically feasible, cost-effective, located near load centers, and compatible with local community needs. For example, the Oakwood Beach Wastewater Treatment Plant in Staten Island may provide an ideal location for a wind turbine, and we are studying the feasibility of developing a 1.5 MW project at the site. The Fresh Kills Landfill in Staten Island is also being studied by private developers for the feasibility of wind turbines.

Offshore wind projects present a potentially transformative opportunity to develop utility-scale renewable energy that will feed directly into the city. European countries have developed nearly 3,000 MW of offshore wind and the U.S. Department of Energy concluded that the mid-Atlantic area has vast potential. However, no offshore wind project has been successfully completed in the United States.

The City is an active party in an offshore wind development collaborative with Con Edison, the Long Island Power Authority (LIPA), and the New York Power Authority (NYPA). The collaborative seeks to develop several hundred megawatts of wind power more than ten miles off the coast of the Rockaways in Queens. Private developers are exploring additional areas for wind arrays and transmission interconnection options off the Atlantic coast. We will work with state and federal regulators to support cost-effective proposals for both public and private offshore wind projects that will benefit New York City.

Hydropower

The City's upstate watershed and downstate water distribution system provide opportunities to develop clean hydroelectric power.

We currently operate five hydroelectric power facilities at the City's upstate drinking water reservoirs. We have studied the economic and environmental feasibility of four additional generation facilities that could provide approximately 15 MW of power at those locations. We are working with energy developers and will develop generating capacity if sufficient commercial interest and public benefit is demonstrated, and if we can ensure that projects can be developed in an environmentally sensitive manner.

We will also investigate how to generate energy from the large volumes of water that flow through our water distribution and wastewater treatment systems. Additionally, we will evaluate the prospects for tapping into "geothermal" resources, such as sewer systems and groundwater, to serve heating and cooling loads at nearby buildings.

Biogas

Approximately 7% of the City government's GHG emissions come from methane that is vented and flared at wastewater treatment plants. If captured, this gas could be injected into the natural gas distribution system or productively reused as fuel for on-site power and heat generation for our buildings. We are pursuing innovative cogeneration and waste-gas-to-grid projects at the Newtown Creek and Wards Island Wastewater Treatment Plants. These projects can reduce GHG emissions with minimal direct cost to the City and will establish a financial model that can be replicated at other urban sites. By 2017, we will reuse 60% of the anaerobic digester gas produced in our wastewater system.

Modernize our transmission and distribution systems

New York City's energy infrastructure consists of a complex and interwoven network of power plants and electricity, steam, and gas transmission and distribution systems. Much of this infrastructure is in need of modernization to achieve our goals and to sustain New York City as a global financial and commercial hub. Investment by building owners and utilities in advanced

distribution and energy management systems improve demand reduction capabilities and the integration of distributed energy resources. The city's natural gas supply must be reinforced with new transmission capacity connecting to gas resources outside of the city, and distribution upgrades are needed within the city to keep up with growing demand. The city faces a number of reliability challenges and opportunities, including the possible closure of Indian Point and the development of new transmission lines that could one day deliver cleaner and less expensive electricity.

Con Edison workers installing local gas distribution upgrades

INITIATIVE 15

Increase natural gas transmission and distribution capacity to improve reliability and encourage conversion from highly polluting fuels

New York City has a critical need for additional natural gas capacity. Despite decades of population and economic growth, no new major direct transmission pipelines have reached the city in more than 40 years. Without additional capacity, utilities will be unable to respond to growing demand for new service as customers pursue clean DG and conversions from dirty heating oil. Supply constraints could also drive up electricity prices since 90% of our in-city power plants are gas-fired.

To ease supply constraints we will assist developers in obtaining permits and approvals for appropriately-sited natural gas transmission pipelines. The proposed Spectra Energy pipeline would provide natural gas supply to up to 2 million homes in New Jersey and the greater New York metropolitan region, as well as much needed supply to the Bronx, Manhattan, and portions of Queens. Similarly, the proposed Transco Williams pipeline would critically reinforce gas supplies in Brooklyn and Queens. We will work with pipeline developers, FERC, and community stakeholders to expedite the siting and development of both of these projects.

City regulations eliminating the use of highly polluting residual heating oil will increase demand for new gas service. With gas prices nearing historic lows and expected to remain below oil prices for some time, building owners have the unique opportunity to upgrade their heating systems while generating a return on their investment. In addition to significantly improving air quality, residual oil users can save over half a billion dollars annually by converting from dirty heating oil to natural gas.

We will work with Con Edison, National Grid, and key partners to accelerate upgrades to our natural gas distribution system in underserved areas where they can have the greatest air quality benefits. By identifying clusters of buildings that are ready to convert from oil to natural gas, we will help create economies of scale that will lower the costs of conversion for customers. We will collaborate in developing a multi-year infrastructure build-out plan and will advocate state regulators to allow utilities to aggressively implement it.

Increasing concerns about the environmental and health impacts of natural gas production cannot be ignored. We will work with state officials to protect New York City's watershed from natural gas exploration. As a responsible consumer of natural gas supplies, we will also forcefully advocate for improved regulations and safety standards nationwide.

INITIATIVE 16

Ensure the reliability of New York City power delivery

New Yorkers remember past disruptions to the electrical grid. Today the grid is more reliable thanks to expanded demand reduction efforts and Con Edison's improvements following the 2006 Queens outage. However, we still face significant reliability challenges. Principal among these is the potential closure of Indian Point, which could lead to major system disruptions in the absence of a viable replacement plan.

New York City's ability to import electricity is limited by under-sized and congested transmission lines, and opportunities to expand in-city generation are limited. Periods of peak summer demand put significant stress on utility infrastructure and cause the activation of the dirtiest in-city plants. As a result, each summer we must brace for the possibility of neighborhood-level outages and increased air pollution.

We will seek to diversify our energy portfolio by importing additional generation resources from outside the five boroughs. For example, we are pursuing more robust interconnection with neighboring power systems such as Pennsylvania-New Jersey-Maryland (PJM) to increase reliability and resource diversity. We will also continue to evaluate the costs and benefits of longer-term and more transformative transmission line proposals that would deliver additional sources of clean power to the city. One such proposal would connect deep offshore Atlantic wind directly with the city. Others would allow us to import Canadian hydropower or upstate wind resources.

Ensuring reliability goes beyond physical interconnections to electricity sources. For example, Con Edison relied on customers to reduce their demand by nearly 450 MW on the hottest days last summer to ensure reliability. Emergency load shedding programs have existed for decades, but they will take on a new importance as a model for market-based mechanisms to reduce energy consumption that will be made possible by a smarter, more responsive energy grid.

INITIATIVE 17

Develop a smarter and cleaner electric utility grid for New York City

When Thomas Edison opened the Pearl Street power station in Lower Manhattan in 1882, he laid the foundation for the modern electric grid—an innovation that changed the world but that has changed relatively little since that time.

Today the utility industry is making strides to develop a smarter, more responsive electric system. Enhancing two-way communications with energy users will help utilities to reduce peak demand while enabling consumers to earn money by saving energy. Advanced controls and diagnostics will facilitate the integration of clean

CASE STUDY

What Happens if Indian Point Closes?

New Yorkers receive up to 30% of their total electricity from Indian Point, a nuclear facility in the Lower Hudson Valley which emits virtually no greenhouse gases or air pollution. Indian Point's low operating costs help displace generation at more expensive and polluting power plants located inside the city and throughout the state. We also depend heavily on Indian Point for reliability, as congested transmission lines limit our ability to import power from more distant locations.

The City supports the continued safe operation of Indian Point. However, we know that Indian Point may not still be operating in 2030, the horizon for PlaNYC. The plant may be denied a New York State water quality permit that is required for federal relicensing in 2013.

Retiring Indian Point without replacing at least a portion of its capacity could lead to power system instability. Replacement costs would exceed $2 billion, New Yorkers would also pay at least $1.5 billion in higher energy costs over the next decade, and electricity consumers could see their bills increase by 15%. Local air pollution would increase and our efforts to reduce GHG emissions 30% by 2030 would be unachievable because we would most likely shift to electricity generated by more carbon-intensive sources. With these impacts in mind, we will work with Entergy (Indian Point's owner), Con Edison, and state and federal regulators to ensure that measures are taken to keep the plant safely online. At the same time, our objectives of reducing demand for energy and diversifying our sources of supply for energy are valid strategies regardless of Indian Point's expected lifespan.

The Indian Point Energy Center

Credit: Entergy

distributed energy resources, including a growing number of electric vehicles. Although these advances will take time to develop, they will transform the way we use energy.

The City will pilot strategies for a smarter grid by deploying an Energy Enterprise Metering System (EEMS) in thousands of its buildings. This innovative system will deliver real-time consumption information to building operators and will enable the City to increase its participation in peak load management from 17 MW up to 50 MW. We will also explore opportunities to leverage City assets such as its wireless communication infrastructure to assist utilities in conducting automated meter reading for power and gas customers.

We are also partnering with the private sector and academic institutions to implement a federally funded smart grid demonstration project at the Brooklyn Army Terminal. The project will tie together a building management system, a 500 kW solar PV array, and a battery system to store power generated on-site. Integrating these systems will demonstrate the viability of "virtual generation," in which buildings can profit from selling energy curtailment services on wholesale electricity markets.

Con Edison has received substantial federal funding to undertake smart grid demonstration and pilot projects. A demonstration project in Long Island City has tested the responsiveness of residential and business customers to price signals and other means of prompting demand reduction. We will continue to support Con Edison's efforts to capitalize on lessons learned and to scale up cost-effective technologies.

We will also work with regulators, utilities, building owners, and energy companies to encourage deeper participation by commercial and industrial consumers in market-based programs to reduce peak demand. In addition to enhancing reliability, these programs will improve air quality, lower electricity prices, and over the longer term mitigate the need for costly system upgrades.

Conclusion

We have set ambitious goals to reduce demand for energy, obtain a cleaner, more reliable, and affordable supply of energy, and reduce our city-wide carbon emissions by 30% by 2030. We have laid out comprehensive policies that put us on track to achieve those goals, but good policies alone will not ensure our success. Succeeding will require consistent commitment, strong partnerships, and proper alignment of actions that may be beyond our control.

Dramatically reducing energy consumption and carbon emissions in a city of more than 8 million people over 20 years is an unprecedented enterprise that will require persistence and vigilance. We must not only adopt the right policies, we must ensure that they are properly implemented, that their success is measured, and that the policies are amended as situations change and we learn more.

In addition, because our energy systems are owned and operated by a variety of corporate and public entities, and regulated by a variety of state and federal agencies, we will need to continue developing strong strategic relationships with property owners, consumers, regulators, financial institutions, funding authorities, and others, and work together to achieve our common goals.

Actions beyond our control, such as the closure of the Indian Point Energy Center, could make it difficult, if not impossible, to achieve our GHG reduction goals and to maintain reliability and affordability. Other actions, like a national carbon tax, could make it easier to reduce consumption and clean our supply. Clarity of purpose, constant measurement of our progress, and adaptability of our plan are essential to meet our goals in the face of such uncertainty.

Air Quality

Credit: NYC Economic Development Corporation

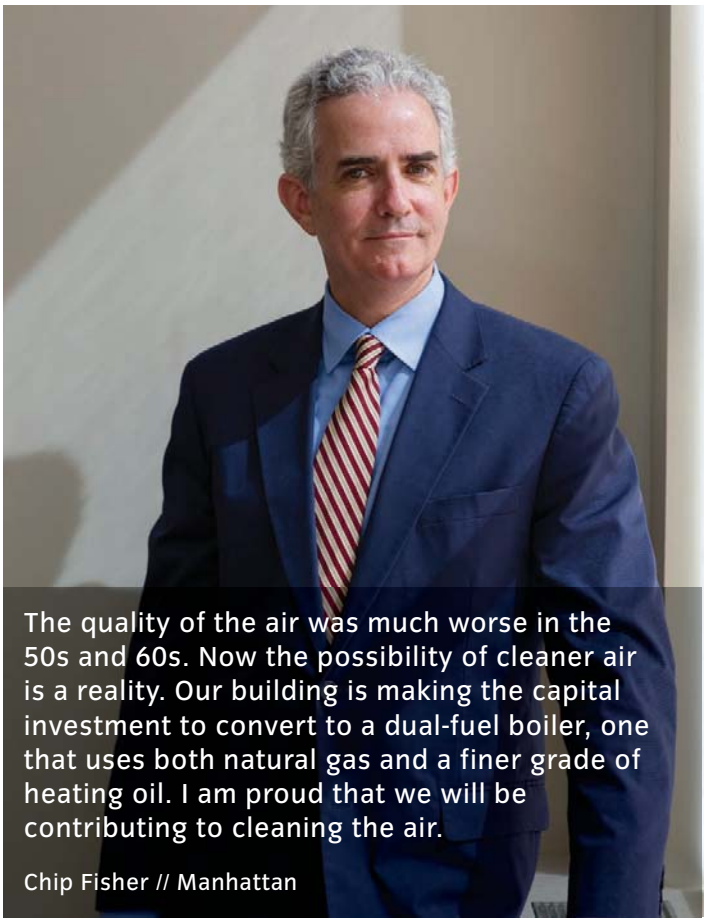
Together we can

Understand the scope of the challenge

Reduce transportation emissions

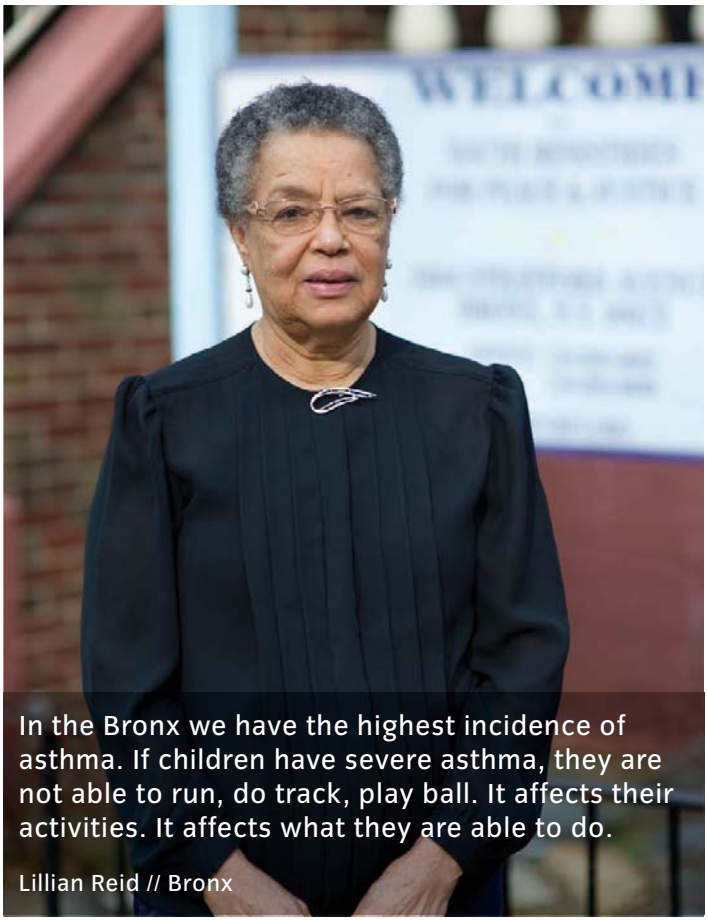
Reduce emissions from buildings

Update codes and standards



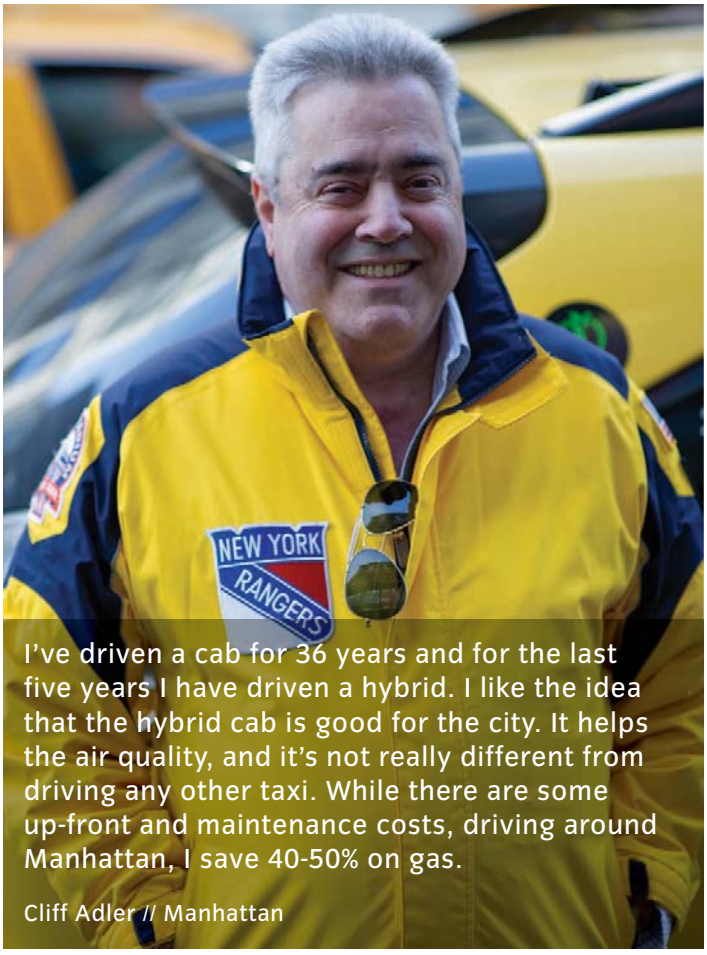
The quality of the air was much worse in the 50s and 60s. Now the possibility of cleaner air is a reality. Our building is making the capital investment to convert to a dual-fuel boiler, one that uses both natural gas and a finer grade of heating oil. I am proud that we will be contributing to cleaning the air.

Chip Fisher // Manhattan



In the Bronx we have the highest incidence of asthma. If children have severe asthma, they are not able to run, do track, play ball. It affects their activities. It affects what they are able to do.

Lillian Reid // Bronx



I've driven a cab for 36 years and for the last five years I have driven a hybrid. I like the idea that the hybrid cab is good for the city. It helps the air quality, and it's not really different from driving any other taxi. While there are some up-front and maintenance costs, driving around Manhattan, I save 40-50% on gas.

Cliff Adler // Manhattan

New York is growing in population, so we need to do things to keep our air clean and healthy and safe for all of us to breathe. And we need to do it now, not later. If we don't, especially in a large city like ours, it's going to cost us in the long run.

Mustaqeem Abdul-Azeem // Brooklyn

Air Quality

Achieve the cleanest air quality of any big U.S. city

Over the past two decades, as federal, state, and local regulations have strengthened air quality standards, New York City's air quality has dramatically improved. We have undertaken numerous actions to reduce emissions from local sources of pollution. Despite these efforts, our air quality still fails to meet federal standards for ozone and fine particle matter (PM 2.5). Many of our communities experience pollution levels significantly higher than the citywide average. Many of these same neighborhoods have high rates of asthma and other health conditions exacerbated by air pollution. In addition, future regulations from the U.S. Environmental Protection Agency (EPA) are likely to result in the city being in non-attainment for nitrogen dioxide (NO_2) and sulfur dioxide (SO_2) standards.

PM 2.5 is a by-product of burning fuel in trucks and buses, factories, power plants, and boilers. Each year, PM 2.5 pollution in New York City causes more than 3,000 deaths, 2,000 hospital admissions for lung and heart conditions, and approximately 6,000 emergency department visits for asthma in children and adults.

We have chosen PM 2.5 as our standard because of its significant health impacts—and because we lag behind other big cities in the levels in our air quality. To meet our goal of achieving the cleanest air quality of any big city in the U.S., we estimate that we need to reduce average PM 2.5 concentrations by 22% below 2005 levels. The City's Department of Health and Mental Hygiene (DOHMH) projects that if we meet this goal, we could prevent more than 750 premature deaths and almost 2,000 hospital admissions and emergency room visits.

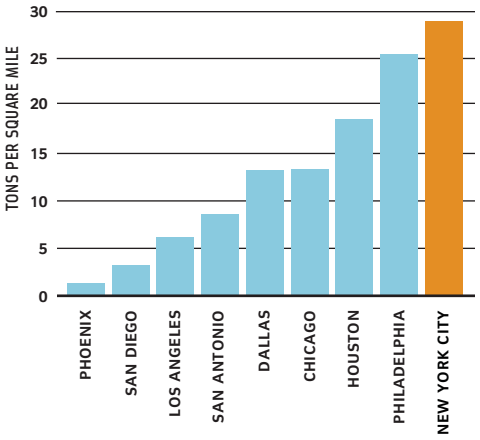
Other primary pollutants such as SO_2, NO_2, and volatile organic compounds (VOCs) also have impacts on our health, as does ozone, which is formed through chemical reactions of primary pollutants. Further reducing those emissions will be essential to meeting our goal of achieving the cleanest air quality of any big city in the U.S. These reductions are also critical to protect the health of New Yorkers. Air pollution is one of the most significant environmental threats we face, contributing to approximately 6% of annual deaths in New York City each year.

Over half of our PM 2.5 originates outside the city. Some pollution drifts in from neighboring jurisdictions, including from traffic, industry, and power plants. Other sources are more distant, such as mid-western power plants and factories. Depending on the time of year, up to 70% of particulate matter measured in the city comes from somewhere else. Because of these inter-state impacts, we will continue to ask our Congressional delegation to keep federal laws strong.

But a significant portion of our pollution comes from local sources. New studies undertaken by the City put real numbers to what we have long known—neighborhoods in close proximity to heavily-trafficked roadways or buildings burning Numbers 4 and 6 heating oil have annual average PM 2.5 levels that are 30% higher than areas with less traffic or fewer buildings burning those dirty fuels.

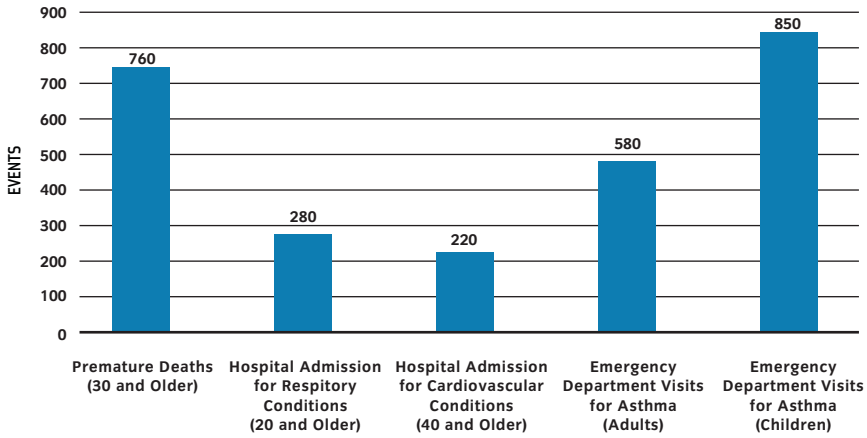
This information—the most comprehensive effort of its kind undertaken by a major city—is allowing us to strategically identify neighborhoods with the worst air quality as well as local sources to reduce emissions citywide. We successfully sought a state law that reduced the sulfur content in Number 2 heating oil by 99%. We enacted a local law that requires the use of 2% biodiesel in heating oil and created the new low sulfur Number 4 oil classification. We are investing hundreds of millions of dollars to convert school boilers that burn Numbers 4 and 6 oil in schools to cleaner fuels. We have already completed boiler conversions at 13 schools—and will phase out Number 6 heating oil at more than 200 school buildings by 2015. We worked with the City Council to lower the retirement age for school buses and require the installation of indoor air filters for bus cabins. We launched

PM 2.5 per Square Mile in U.S. Cities With Over 1 Million Residents



Source: U.S. Environmental Protection Agency; NYC Dept. of Health and Mental Hygiene

Number of Events Avoided Annually if PlaNYC Air Quality Goal Met



Source: NYC Dept. of Health and Mental Hygiene

the most comprehensive ground-level air quality monitoring program undertaken by a city. And, focusing on many of our neighborhoods with the highest asthma rates and fewest trees, we planted more than 430,000 trees, which help remove pollutants from our air.

Yet more remains to be done to achieve the cleanest air quality of any big city in the U.S. We must continue to reduce our biggest known polluting sources—motor vehicle exhaust, building heating oil, and aging power plants with outdated technology. We will continue to partner with other levels of government, private businesses, and building owners to increase the use of alternative fuels. These actions will improve our air quality, enhance public health, and in many cases, save New Yorkers money.

Our Plan

Our air quality has improved in recent years. Our three-year average of PM 2.5 concentrations has decreased since 2007. Similarly, PM 2.5 concentrations have continued a gradual decline on a national and regional level. But New York City still fails to meet all of the federal air quality standards and many of our neighborhoods have significantly higher concentrations of PM 2.5 than the citywide average.

As other cities also take steps to improve air quality, our efforts will have to be even more dramatic to keep pace. That means we must continually reevaluate our goal and benchmark it against other cities.

We will aggressively reduce emissions from cars, trucks, and buses by promoting fuel efficiency, cleaner fuels, and cleaner or upgraded engines. We will seek federal legislation to explicitly allow state and local governments to provide incentives for fuel-efficient vehicles. We will use federal funding to continue converting diesel vehicles to cleaner fuel sources. We will apply similar strategies to other vehicles, including ferries and planes. By partnering with the Port Authority of New York and New Jersey (Port Authority), we can achieve substantial reductions across all transportation sectors.

The electricity and heating fuels used to power and heat our buildings account for a quarter of local PM 2.5 emissions. We will enact regulations to reduce pollution caused by the dirtiest heating oils used in buildings, and reduce the indoor air quality risks posed by building materials.

We will also reap the benefits of our Parks and Public Space plan, which is planting more than one million trees throughout the city and creating pedestrian zones separated from the worst traffic. Our Transportation plan will better manage traffic congestion and improve the flow of freight, which affects our air quality. As part of our Solid Waste plan we will continue to shift the export of our waste from long-haul trucks to railcars and barges. And our Energy plan is replacing old, outdated power plants with modern, more efficient models and transitioning our energy supply to cleaner fuels.

These strategies will accelerate air quality improvements so that one day, every New Yorker will breathe the cleanest air of any big city in America.

Our plan for air quality:

Understand the scope of the challenge

1 Monitor and model neighborhood-level air quality

Reduce transportation emissions

2 Reduce, replace, retrofit, and refuel vehicles
3 Facilitate the adoption of electric vehicles
4 Reduce emissions from taxis, black cars, and for-hire vehicles
5 Reduce illegal idling
6 Retrofit ferries and promote the use of cleaner fuels
7 Work with the Port Authority to implement the Clean Air Strategy for the Port of New York and New Jersey

Reduce emissions from buildings

8 Promote the use of cleaner-burning heating fuels

Update codes and standards

9 Update our codes and regulations to improve indoor air quality
10 Update our air quality code

CASE STUDY

New York City Community Air Survey

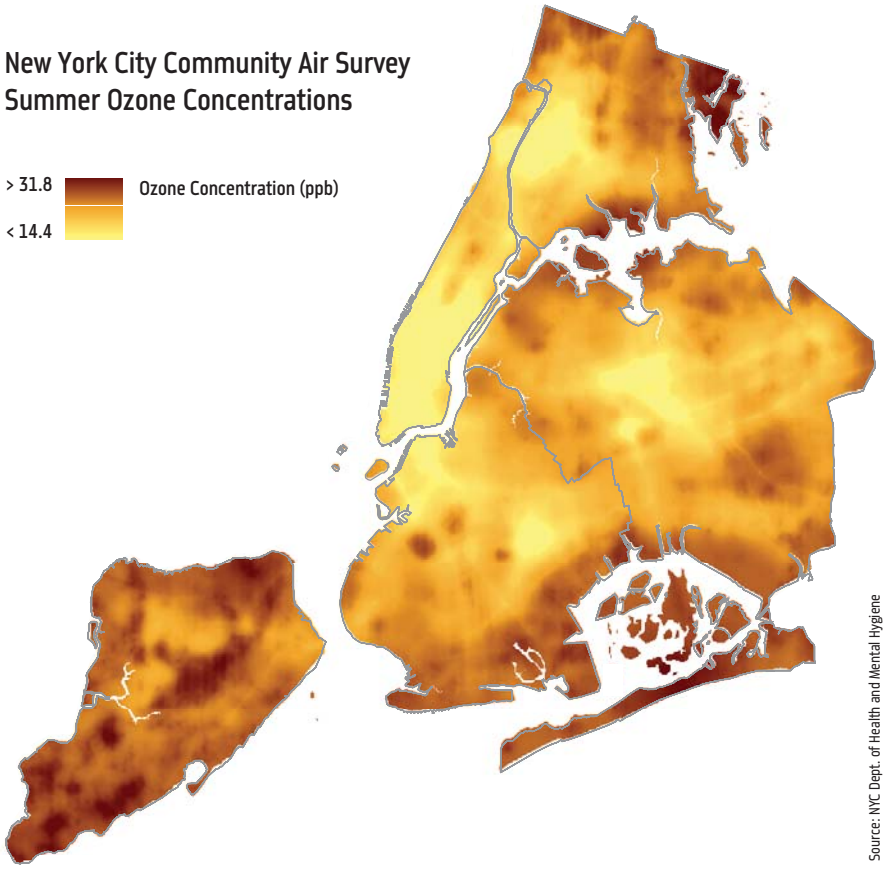
New York is a city of neighborhoods, each with its own unique history, character, and physical environment. These distinctive features extend to local air quality. Until 2008, relatively little was known about how air quality varied between neighborhoods in New York, what contributed to poor air quality, or how to best target policies to reduce local emissions.

As part of PlaNYC, the New York City Department of Health and Mental Hygiene, in partnership with Queens College of the City University of New York, launched the New York City Community Air Survey (NYCCAS) in 2008. NYCCAS is the first-ever comprehensive survey of street-level air quality in New York City. The program is designed to understand how average air pollution levels vary from place to place within the city.

The survey collects one air sample every two weeks, in each season, from more than 100 locations throughout the five boroughs. NYCCAS air samples are collected at street level, where people walk along sidewalks, and where traffic-related pollution is usually higher. Monitoring locations are in areas with high or low traffic and building densities, various mixes of commercial, residential and industrial properties, and in areas with dense or sparse tree cover. These locations reflect the variety of urban environments found in New York City.

NYCCAS monitors air samples for fine particles (PM 2.5), elemental carbon (EC), other elements in particles, nitrogen oxides (NO_x), sulfur dioxide (SO_2) in the winter months, and ozone (O_3) in the summer. The sampling results from each location are analyzed for statistical correlation with dozens of land-use factors such as the density of boilers and truck traffic. The results are then projected to other locations to create air-quality maps for the entire city.

By showing where air-quality levels are better or worse and identifying the most important local sources of harmful air pollutants, particularly diesel fuel and heating oil, NYCCAS can help focus our efforts on actions that can reduce air pollution and improve our health.



Understand the scope of the challenge

Launched in 2008, the New York City Community Air Survey (NYCCAS) is one of the largest studies of urban air quality to date. The survey measures street-level concentrations of pollutants year-round at more than 100 locations throughout the city. NYCCAS then uses these pollution measurements—and the distribution of known pollution sources such as traffic and oil-burning boilers—to estimate concentrations of air pollutants throughout the city.

The first NYCCAS report on winter air quality documented large geographic differences in the concentration of PM 2.5, NO_2, and elemental carbon. It demonstrated for the first time that many neighborhoods of all income levels in the city suffer from high levels of street-level pollution. Furthermore, it identified the main drivers of street-level air pollution in the winter to be high traffic volume and the use of residual fuel in buildings. This information is already informing strategies to reduce emissions and neighborhood variability in air quality.

NYCCAS has produced several more reports. A winter supplement reported on the wide disparities in nickel concentrations in air associated with the use of residual fuel boilers. The summer air quality report demonstrated that ozone, a secondary pollutant caused by the reaction of primary pollutants with sunlight, is greatest outside Manhattan, especially in southeastern Queens and southern Staten Island.

INITIATIVE 1

Monitor and model neighborhood-level air quality

Through NYCCAS, we have a better understanding of the drivers of local PM 2.5 emissions in the city and the impact these sources have on neighborhood variability. This has allowed us to effectively target our policy efforts at the sources most responsible for our local PM 2.5 emissions and in those communities that are most impacted.

Based on what we have learned from the first year of monitoring, we have identified 100 sites that represent a range of local emissions with significant impacts on neighborhood air quality. This smaller network will allow continued monitoring at lower cost, using the same pollutants to evaluate changes as local emission reduction initiatives are implemented. We will maintain a street-level air monitoring network to track neighborhood air quality differences over time.

Using the existing NYCCAS infrastructure, we will expand the methods and pollutants measured to look more closely at specific types of emission sources and exposure settings. We will

A NYPD hybrid patrol car in Willets Point, Queens

enhance monitoring and modeling to examine pedestrian exposures in different traffic configurations and at different times of day, emissions from the commercial cooking sector, and exposures to additional toxic air pollutants.

Reduce transportation emissions

In 2005, motor vehicles traveled 18.6 billion miles throughout the five boroughs. Each year, these trips generate about 11% of our local PM 2.5 emissions. They also generate 28% of nitric oxide (NO_x) and 17% of VOC emissions, both of which contribute to ambient PM 2.5 levels.

Areas in the city with the greatest traffic density have much higher levels of PM 2.5, NO_x, and NO_2 than areas with lower traffic density. But ozone is different. Ozone results from chemical reactions among other pollutants, NO_x and VOCs, in the presence of sunlight. As a result, high ozone levels often occur in locations downwind from emission sources including locations such as the Rockaways in Queens and in southern Staten Island. Therefore, our efforts to reduce emissions from transportation have a benefit for all neighborhoods, not just those along congested roadways.

INITIATIVE 2
Reduce, replace, retrofit, and refuel vehicles

The City owns and operates a fleet of more than 26,000 vehicles and motorized equipment. Through several strategies—increasing use of public transit, reducing the number of City vehicles used for commuting, and pursuing car-sharing opportunities—we will reduce our fleet by 5%. This reduction of light-, medium-, and heavy-duty vehicles will reduce fuel use by City vehicles and associated PM 2.5 and greenhouse gas emissions.

We are taking aggressive steps to make our fleet, which is already the largest clean-fuel municipal fleet in the country, even more efficient. More than 6,000 City-owned vehicles, or 25% of our total fleet, are already hybrid or other alternative-fuel vehicles, including garbage trucks, police cars, and heavy loaders.

To continue this transformation, we will implement the Clean Fleet Transition plan, a vehicle-by-vehicle plan to convert the City's fleet to cleaner vehicles, including hybrid and electric vehicles. We are among the first government fleets to receive Chevrolet Volts off the initial production line. To prepare for the expansion of our plug-in fleet, we will install more than 60 electric vehicle charging units at City-owned facilities and garages. We will also pilot other new technologies.

In addition to changing the make-up of our vehicle stock, we are piloting new, low-emission fuels. The Department of Parks and Recreation uses a 20% biodiesel blend (B20) in all of its diesel vehicles and equipment and is now piloting B50 blends. Other agencies, including the departments of Sanitation, Transportation, and Environmental Protection, use B5 in their diesel fleets, and will switch to B20 during the summer. All of these agencies' fueling stations dispense at least B5 fuel. To reduce emissions, we will expand the use of biodiesel in the City's fleet.

In addition to the City's efforts to improve the environmental performance of its own fleet, we aim to reduce emissions from private fleets. Private delivery fleets log thousands of miles a year on New York roadways. Since 2000, we have worked with the New York State Energy Research Development Authority (NYSERDA) to manage a federal Congestion Mitigation and Air Quality (CMAQ) funded initiative that helps private sector companies and non-profit entities retrofit their vehicles or switch to alternative fuels. Program participants can convert to either clean natural gas (CNG) or hybrid vehicles, or retrofit their diesel vehicles. To date, the City has spent roughly $15 million to retrofit, replace, or repower approximately 280 trucks, eliminating 63 tons of PM 2.5. We will complete upgrades of 400 vehicles through existing CMAQ and other funding sources.

We are currently working with private school bus companies to retrofit all full-size school buses to reduce emissions. Using CMAQ and Federal Transit Administration funding, we will install Diesel Particulate Filters (DPFs), which reduce particulate matter emissions by at least 85%, on 685 buses.

INITIATIVE 3
Facilitate the adoption of electric vehicles

We can reduce emissions in the city not only by reducing vehicle miles traveled, but also by making vehicles more efficient.

In recent years, automotive manufacturers have made great strides in producing vehicles that use less energy, emit fewer emissions, and burn little or even no gasoline. Among the most promising of these technologies are those that rely on electricity—either to enhance the distance a vehicle travels before consuming gasoline, or to produce an entirely electric operation relying on battery storage technology. For New Yorkers who will continue to rely on automobiles for their mobility needs, electric vehicles

CASE STUDY

Northeast Regional Electric Vehicle Partnership

For years, people have dreamed about quiet, exhaust-free cars. That dream is now becoming a reality with electric vehicles. But making electric vehicles work for every day driving requires planning and collaboration among cities, utility companies, and the private sector. In November 2010, Philadelphia, Boston, and New York City kicked off this collaboration by launching the Northeast Regional Electric Vehicle Partnership (NREVP) to help all three cities serve early electric vehicle adopters now and build for the future.

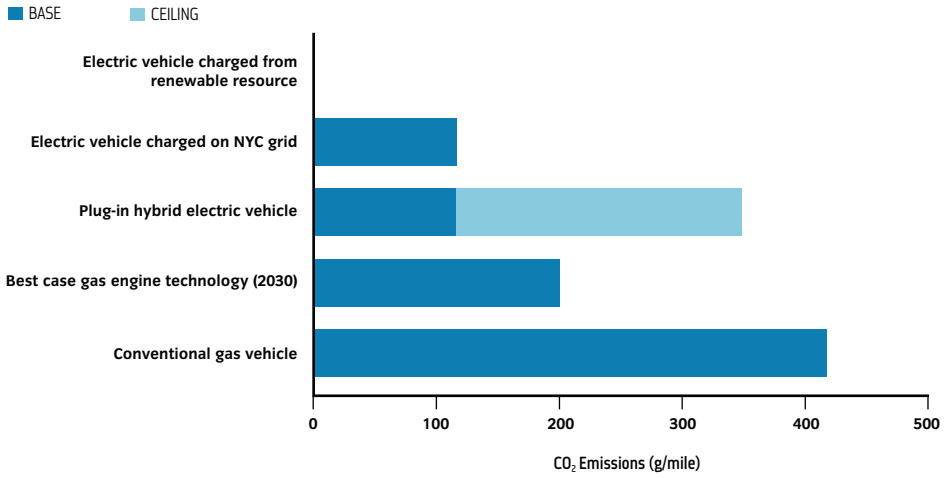
Electric vehicles benefit all city residents. Their owners will never have to fill up at a gas station or go in for an oil change. The cost of driving will become more stable since electricity prices are less volatile than those of gasoline. Non-owners will enjoy a city with quiet vehicles that don't contribute to local smog and create fewer greenhouse gases. Yet without the appropriate codes and regulations, the right cost of electricity, and a network of chargers, electric vehicles won't succeed.

That is why this tri-city partnership is vital. The partnership's initial goals include getting information to consumers and facilitating construction of an electric vehicle infrastructure. The partnership's websites will contain information consumers can't find in any one other place, such as: how each city is using electric vehicles, car availability, and local charging costs. We are sharing knowledge, exchanging information on curbside charging, the cost of prime and off-peak electricity, and on how to design building codes to accommodate electric vehicles.

Finally, we are educating our building owners. By installing chargers, offices and commercial parking facilities will supply key electric vehicle infrastructure. Through our close work with them, we are enabling the private sector to build a widespread charging network.

Boston, Philadelphia, and New York form the spine of one of the most important and densest transportation regions in the country. Together we play an important role in ensuring that electric vehicles are nationally successful. Yet, electric vehicles require us to reinvent our rules and infrastructure. In cities as old as ours, this is an even greater challenge. Pooling our resources helps us tackle these challenges and realize the dream of clean, quiet cars.

Emissions: Gas-powered Auto versus EV



Source: IEA; IAEA; AG Energiebilanzen; U.S. Dept. of Energy; McKinsey; Oak Ridge National Laboratory

offer an improvement over gasoline vehicles in reducing both urban pollution and greenhouse gas emissions.

The environmental benefits of electric vehicles over purely gasoline-powered vehicles depend on a number of factors. The extent of the benefits is determined largely by the generation source of the electricity used to charge the electric vehicle's battery. The mix of generation sources that provide power to the New York City electric grid are favorable to electric vehicles, as approximately 40% of the electricity consumed in New York City is generated by low carbon energy sources such as nuclear and hydroelectric power. In New York, an electric vehicle produces almost 75% fewer greenhouse gas emissions than an average sedan.

Research demonstrates that the potential demand for electric vehicles outstrips likely supply in New York City. By 2015, up to 16% of all new vehicles purchased by New Yorkers could be electric vehicles if these vehicles are made available. This would mean that electric vehicles could amount to 2.5% of the city's total vehicle population by 2015, or about 50,000 vehicles in total. However, converting this demand into actual deployment requires the concerted effort of various stakeholders.

To encourage the purchase of electric vehicles and eliminate impediments to their adoption, we are collaborating with Boston and Philadelphia as part of the Northeast Regional Electric Vehicle Partnership (NREVP). One of the first key barriers that this partnership has identified is the difficulty of the installation process for EV charging equipment.

New York City already has some of the most straightforward installation regulations in the country. If a home has sufficient electric wiring, an electrician can install a charger without getting pre-approval from the city. However, installation is not always easy. Old homes may need additional electrical wiring from the street, which can add significant costs and delays. We will work with Con Edison and auto manufacturers to streamline the installation process for home chargers to ensure that it is as quick and affordable as possible. We will also identify and adopt best practices from the partner cities in the NREVP.

Many New Yorkers do not park at home. Instead, they rely on commercial parking garages and on-street parking. Using federal stimulus funding, more than 200 EV chargers are being installed throughout the metropolitan area, including in commercial parking lots. To ensure that we have a sufficient EV infrastructure, we will work with parking garage owners, co-op boards, consumers, and Con Edison to ensure that each group understands the technical and consumer needs associated with EV chargers, as well as the rules and regulations governing their installation and operation.

Despite substantial and increasing media coverage of EVs, few New Yorkers are aware of their specific benefits and limitations, let alone differences between the various models. Prevalent myths about EVs—that they accelerate poorly, or merely shift pollution from the tailpipe to the power plant—discourage potential owners. As an impartial party, the City can serve a useful role in providing facts about EVs.

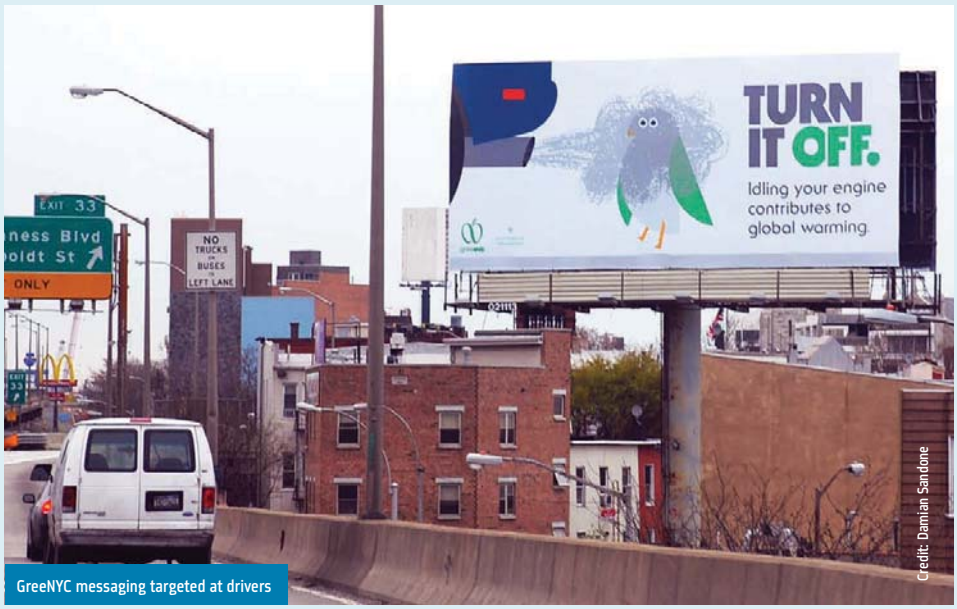
A survey conducted by the City found that providing basic information dramatically increases interest in EVs. In fact, 21% of consumers were more likely to adopt an EV after being educated about the potential benefits. To foster greater adoption and use of EVs, we will work with private and non-profit parties to launch an information campaign to inform New Yorkers about their benefits and use. And while we are building our EV infrastructure, we will also promote the use of hybrid vehicles which have significant air quality benefits.

CASE STUDY

"Turn it Off" Campaign

In response to the serious environmental, health, and financial consequences of idling vehicles in New York City, GreeNYC, our public education program, partnered with the Environmental Defense Fund, EcoDriving, and the New York City Department of Transportation to inform New Yorkers about the negative impacts of idling. The campaign, titled "Turn it Off," sought to educate New Yorkers about idling, reduce their idling tendencies (thereby decreasing their PM 2.5, ozone, and CO_2 emissions) and, ultimately, to change their attitudes towards adopting environmentally-friendly behaviors.

GreeNYC targeted both local drivers and commuters from the Tri-State region by strategically placing public service announcements where and when they would reach the greatest number of drivers while on the road. The announcements consisted of messages explaining the legal, health, financial, and environmental consequences of vehicle idling and engaged drivers by prompting them to call 311 (the City's phone number for non-emergency services) to report instances of idling.



GreeNYC messaging targeted at drivers

Credit: Damian Sandone

As a result of the campaign, GreeNYC increased issue awareness by generating over 194.6 million media impressions among New Yorkers. This resulted in a 111% increase in the number of 311 calls related to idling during the peak of the campaign—despite the fact that the total number of 311 calls for all issues actually declined during this period. The dramatic increase in 311 calls speaks to the success of the campaign in increasing public awareness of this issue.

INITIATIVE 4

Reduce emissions from taxis, black cars, and for-hire vehicles

In New York City, there are currently more than 13,000 yellow taxis, 10,000 black cars, and 25,000 for-hire vehicles. The average yellow taxi travels more than 80,000 miles annually. The entire for-hire fleet is so fuel-inefficient that taxis account for 4% of all ground transportation CO_2 emissions and 1% of all city CO_2 emissions. Making our taxis more fuel-efficient is critical to meeting our air quality and carbon reduction goals. That is why in 2007 the City attempted to mandate that all new taxis would have to achieve more than 25 miles per gallon beginning in the fall of 2008, and 30 miles per gallon in the fall of 2009.

In 2009, a federal court invalidated the City's attempts to set fuel economy standards and offer financial incentives to increase the use of hybrid taxis, on a finding that those rules were preempted by federal law. And in March of 2011, the Supreme Court refused to hear the City's appeal.

Despite this setback, over 30% of the city's 13,237 yellow cabs are hybrid or clean diesel vehicles, giving New York City the largest fleet of clean vehicle taxis in the country. These vehicles have proven themselves able to provide reliable service with dramatically lower emissions and fuel costs.

Empowering state and local governments to incentivize fuel-efficient vehicles is an important tool. We can reduce local emissions, reduce fuel costs for drivers, support the development of alternative fuels and new automotive technology, and reduce spending on foreign oil. We will work with Congress to pass legislation to explicitly allow state and local governments to incentivize fuel-efficient vehicles.

Electric vehicles are also a promising technology that may help to reduce emissions in our taxi and for-hire vehicle fleets. We will launch an electric vehicle taxi pilot to test this technology and its applicability for taxi use.

INITIATIVE 5

Reduce illegal idling

Idling releases pollutants into the air, increases engine operating costs for fleets, and shortens engine life. The best anti-idling strategies include a mixture of incentives for retrofits, laws and enforcement of those laws, and education. Converting diesel vehicles to cleaner fuels will play a significant role in reducing emissions from truck idling. But there is even more we can do locally.

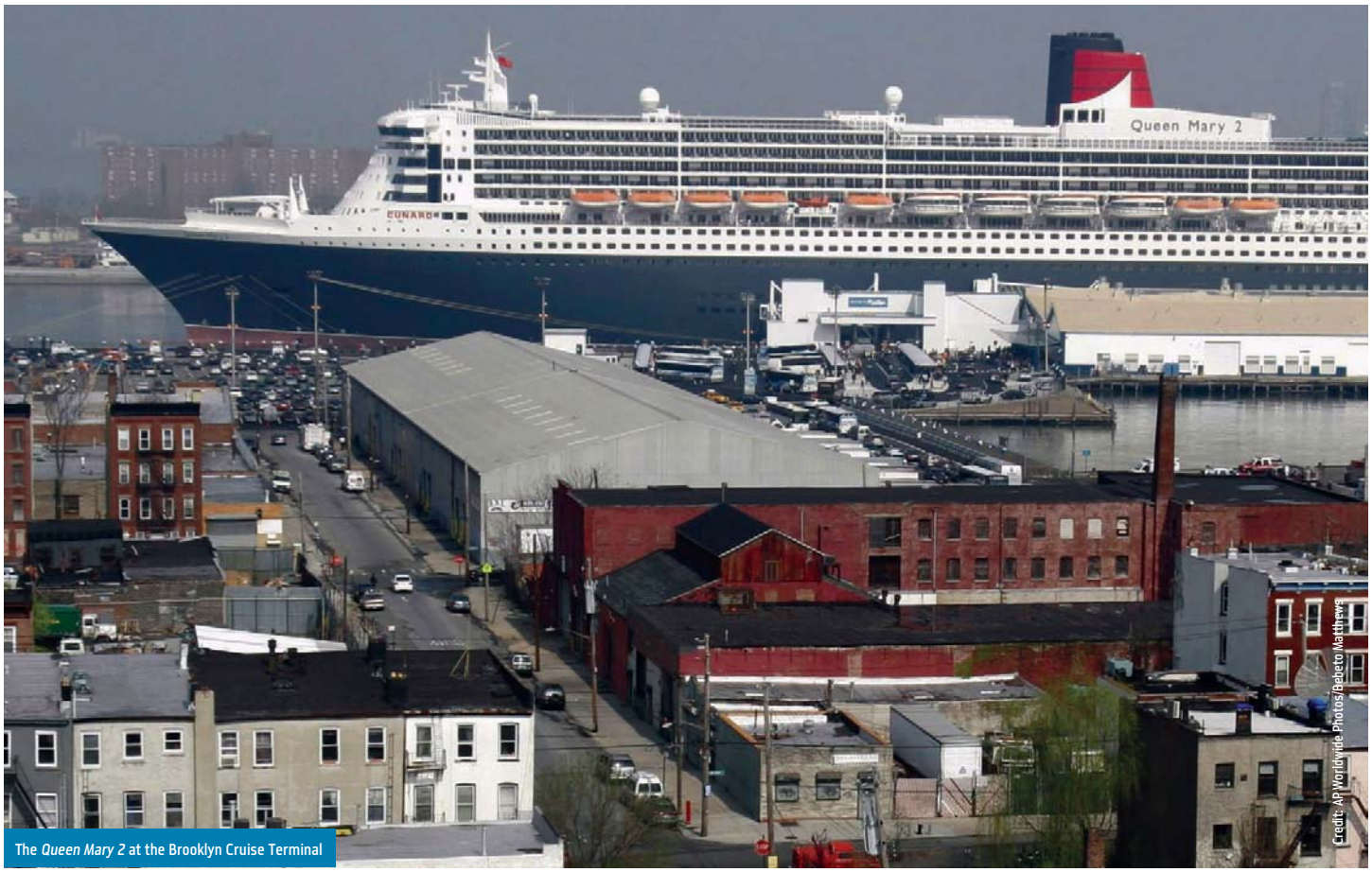
The amount of time a vehicle can idle is limited by law. New York City has a three-minute idling limit that targets all vehicles, including trucks and buses. New York State established an anti-idling law in 1990 that set a five-minute idling limit for heavy-duty diesel vehicles, excluding marine vehicles. Enforcement of these laws is an effective way to reduce emissions.

In 2009, we enacted rules that enable 2,300 Traffic Enforcement Agents to issue tickets for idling violations, greatly expanding our ability to enforce anti-idling laws. GreeNYC, our public outreach program, launched an anti-idling campaign to inform New Yorkers about the economic and public health costs associated with idling. This three-month campaign resulted in a 111% increase in 311 calls reporting illegal idling compared to the same period the previous year. We will continue to improve compliance of existing anti-idling laws through targeted enforcement and education.

INITIATIVE 6

Retrofit ferries and promote the use of cleaner fuels

Through upgrades and engine retrofits, the Staten Island Ferry fleet has become less polluting. The City fuels the ferries with ultra-low sulfur diesel (ULSD), which contains no more than 15 parts per million of sulfur, as a means of further reducing emissions from this sector. The switch to ULSD has produced immediate air quality



The *Queen Mary 2* at the Brooklyn Cruise Terminal

Credit: AP Worldwide Photos/Rebeto Matthews

benefits with no operational problems, well in advance of the EPA's 2012 deadline for the use of ULSD by ferries and similar vessels. We will also complete engine upgrades on four ferries.

We will also work with private ferry operators to reduce emissions from their fleets. Utilizing CMAQ and Federal Transit Administration (FTA) funding, we will retrofit 20 private ferry boats with Diesel Oxidation Catalysts (DOCs), which reduce particulate matter emissions, and repower nine additional vessels to improve fuel efficiency.

We will also work to clean up the fuel used by maritime vessels. New York State currently exempts bunker fuel, which is essentially Number 6 oil used for maritime purposes, from the Petroleum Business Tax. This creates an economic disincentive for the purchase of cleaner, more efficient fuels. Bunker fuel has a high sulfur content (27,000 parts per million) and is the heaviest and most polluting type of fuel used by ships. Other jurisdictions, including the State of California, have removed tax exemptions for bunker oil to incentivize the use of other fuels. We will work with the State to repeal the exemption on the Petroleum Business Tax for bunker fuels.

INITIATIVE 7

Work with the Port Authority to implement the Clean Air Strategy for the Port of New York and New Jersey

Trucks serving the Port of New York and New Jersey make up less than 4% of all trucks and less than 1% of all vehicles on the regional roadways. However, for the neighborhoods immediately adjacent to port facilities, truck emissions have a significant impact on local air quality and public health.

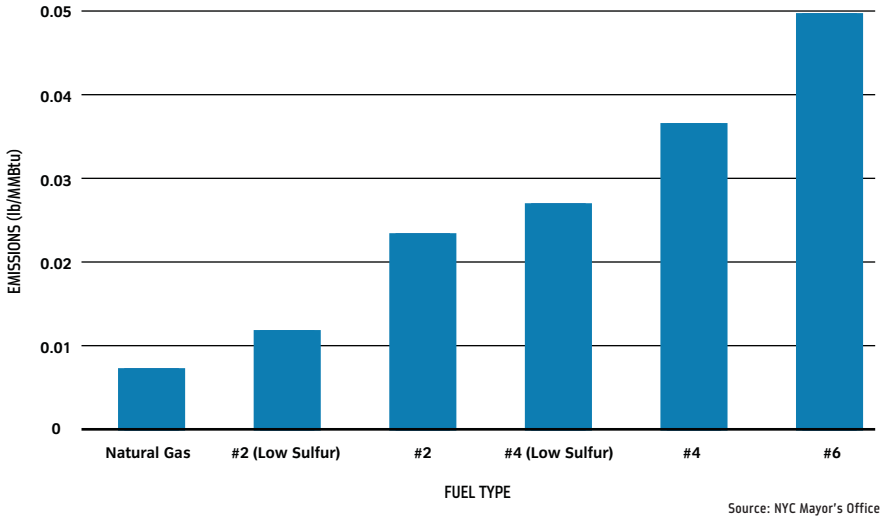
The City has a limited ability to directly regulate maritime and port activities. Our goal is to work with our partners in government and other stakeholders to reduce emissions from the ships, trains, and trucks that use our ports. Due to the complex regulatory structure governing our ports, much of this effort can be accomplished only in collaboration with the Port Authority and federal agencies.

The Port Authority, in partnership with the City, the EPA, the States of New York and New Jersey, and the maritime and trucking industries, participated in an unprecedented effort to produce an actionable and transparent strategy for reducing maritime emissions. In October 2009, the Port Authority released its Clean Air Strategy, demonstrating that emission reductions are feasible and measurable. As part of this effort, critical federal, state, and local partners agreed to take a number of actions to reduce harmful diesel pollution from the Port of New York and New Jersey.

The strategy adopts voluntary measures of the parties to reduce greenhouse gas emissions from port activities by 5% per year, and criteria pollutants such as particulate matter by 3% per year. As a 10-year strategy, this equates to a 30% decrease in criteria pollutants and a 50% decrease in greenhouse gas emissions from baseline 2006 levels despite any port growth over the next ten years. We will continue to work with the Port Authority and other partners to implement the actions outlined in the strategy and reduce emissions from all port sources.

As part of the strategy, we are partnering with the Port Authority, EPA, New York Power Authority, and Carnival Cruise Lines to develop the first operational "cold ironing", or shore power-capable cruise terminal, on the East Coast at the Brooklyn Cruise Terminal (BCT) in Red Hook, Brooklyn. Cruise ships dock at the BCT approximately 45 times a year. The ships stop for between 10 to 11 hours to load and unload passengers and supplies. During this time, they use their auxiliary engines, which burn high sulfur diesel fuel, to power their onboard systems. This practice emits as much pollution as 41,000 heavy-duty diesel trucks per ship each time they dock.

PM 2.5 Emissions From Heating Fuels



Source: NYC Mayor's Office

Cold ironing would allow cruise ships calling at the BCT to connect to the city's electric grid and shut down their engines while docked. If ships use shore power instead of high sulfur diesel fuel, the surrounding community in Brooklyn will benefit from substantial reductions in local air pollution. We will work with the Port Authority to install and operate shore-power capability at the BCT, which will result in annual reductions of 6.5 tons of PM 2.5 and 89.3 tons of NO_x. We will also look for opportunities at other facilities to connect ships to the city's grid.

Reduce emissions from buildings

Emissions from buildings are a significant source of local air pollution in New York City. We consume 1 billion gallons of heating oil annually, more than any other city in the U.S. Burning heating fuels accounts for nearly 14% of fine particulate matter pollutants emitted in New York City. More pollution comes from this source than from vehicles or power plants. The particulate matter created by heating oil contains heavy metals and other pollutants that damage our lungs and hearts, contribute to asthma, and significantly decrease life expectancy.

INITIATIVE 8
Promote the use of cleaner-burning heating fuels

Approximately 10,000 buildings in New York City burn Numbers 4 and 6 heating oil, which are the dirtiest heating oil types available and have significantly higher levels of sulfur, nickel, and other pollutants compared to other available heating fuels. These buildings, which represent only 1% of the total buildings in the city, are responsible for more PM 2.5 emissions than all cars and trucks in the city combined.

Working with our partners in the City Council and the environmental and business communities, we enacted a local law in 2010 that lowers the sulfur limits in Number 4 oil to 1,500 parts per million (ppm) starting in 2012. We recently published rules that, when fully enacted, will require that all boilers in New York City burn low sulfur Number 2 oil or natural gas. Low sulfur Number 2 oil—a new class of fuel created by state law—contains only 15 ppm of sulfur, compared to 3,000 ppm in current Numbers 4 and 6 heating oil.

Upon full implementation, these regulations will reduce the amount of fine particles emitted from heating buildings by at least 63%. They could lower the overall concentration of fine particles in the city's air from all sources by 5%. We estimate that these air quality improvements could prevent approximately 200 deaths, 100 hospitalizations, and 300 emergency room visits for illnesses caused by air pollution each year. The regulations will also reduce carbon dioxide by approximately one million metric tons.

By changing the type of fuel a building uses, owners also save money on maintenance and operating costs. The proposed heating oil regulations would phase out Numbers 4 and 6 heating oil by 2030. We can accelerate air quality benefits if buildings voluntarily phase out these fuels prior to the regulatory deadlines.

Property owners can begin to reduce pollution immediately. We can educate building owners and residents about the risks associated with heavy oils, as well as the financial benefits of switching to cleaner fuels. We can work with local utilities and clusters of buildings to achieve economies of scale to expand natural gas infrastructure. We will work with the Environmental Defense Fund, building owners and associations, local utilities, and NYCService to launch a program to encourage and support the early phase out of Numbers 4 and 6 heating oils. This program will provide benefits similar to those gained by cleaning our energy supply, which has a tremendous impact on local PM 2.5 emissions.

Currently, 415 City schools—roughly one-third of all schools—burn Numbers 4 or 6 heating oil, including 232 schools that burn Number 6. Many of these are in neighborhoods where the asthma rates are more than three times higher than the national average. By 2015, the City will phase out Number 6 heating oil at more than 200 of these schools. Schools located in neighborhoods with the highest pediatric asthma hospitalization rates—generally rates greater than seven per 1,000—will be prioritized to achieve the maximum local benefits. These neighborhoods are concentrated in the Bronx, Harlem, Central Brooklyn, and along Jamaica Bay in Queens.

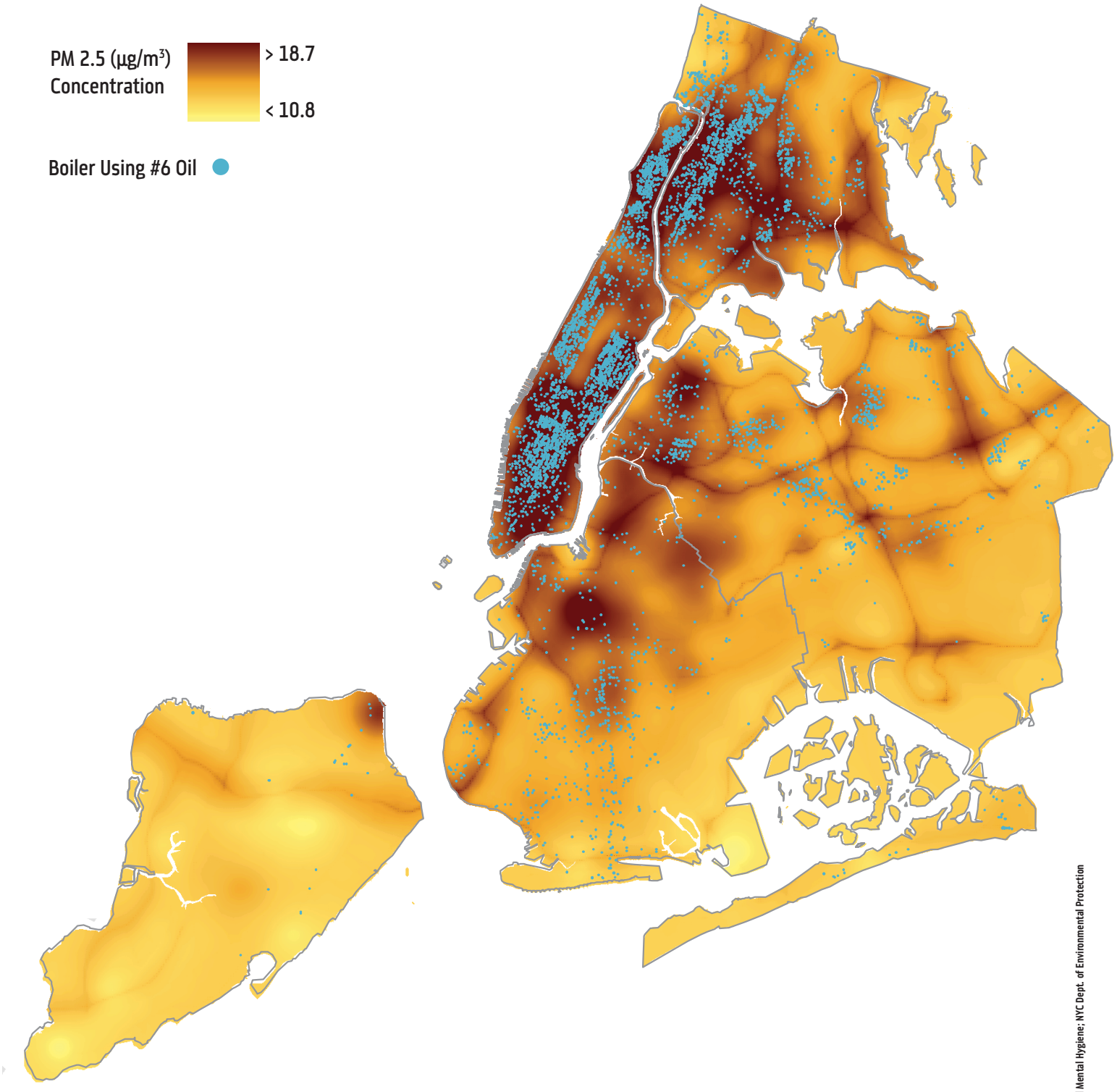
We have already replaced boilers at 13 facilities. This will lead to a 50% reduction in CO_2 and a 44% reduction in soot emissions at these locations, as well as reduced fuel and maintenance costs. We will release Requests for Proposals (RFPs) to enter into energy performance contracts for our schools. While Numbers 4 and 6 boilers are not the sole focus of this effort, successful bidders will conduct comprehensive energy audits of school buildings and make specific recommendations on how to improve each building's overall energy efficiency, which could include the replacement of outdated fuel oil boilers. We will continue to replace school boilers that burn Numbers 4 or 6 heating oil and will complete conversions at 15 additional facilities by 2013.

Update codes and standards

In addition to state and federal standards, New York City's air quality is regulated by the New York City Air Pollution Control Code (Air Code). The Air Code has not been thoroughly updated since 1975. It needs to be revised to take into account new scientific findings and changes in technology.

The quality of the air we breathe inside is as important as that which we breathe outside. On average, Americans spend about 90% or more of their time indoors. While detailed information on indoor air quality and its impacts on human health are limited, the EPA found that indoor levels of pollutants can be two to five times higher, and occasionally more than 100 times higher, than outdoor levels. This can be exacerbated in places like New York City, where indoor pollution sources from businesses can impact residential and commercial tenants sharing multi-use buildings.

New York City Community Air Survey
Winter Fine Particulate Matter Concentration
with Boilers Using #6 Heating Oil



Source: NYC Dept. of Health and Mental Hygiene; NYC Dept. of Environmental Protection

Pollution emitted from the burning of Numbers 4 and 6 heating oil

Credit: Environmental Defense Fund/Isabelle Silverman

INITIATIVE 9

Update our codes and regulations to improve indoor air quality

Many materials used in buildings, such as carpets, paint, and glue, emit VOCs long after they are installed or dry. VOCs are common chemical contaminants that can easily evaporate into the air. Their presence can be noticed as an odor, such as paint and "new car" smell.

Many VOCs are known or suspected carcinogens. They can cause other short- and long-term health problems. However, studies are still pending to determine the exact health impacts and exposure levels that could trigger symptoms.

A number of jurisdictions, including California and Illinois, have adopted standards for carpet manufacturing. These standards, most notably those created by the Carpet and Rug Institute (CRI), include testing for VOCs. They prohibit the use of materials that do not comply with these standards. In New York City, we enacted laws creating an environmentally preferable purchasing program, which requires the City to purchase only carpet and carpet adhesives that meet the CRI standards. This requirement does not apply to private buildings.

While New York State currently limits the amount of VOCs that can be emitted from paint and adhesives, several state and local governing bodies, including the Battery Park City Authority, have set more stringent limits for their purchases. As research and industry standards on these and other building materials evolve, we will propose regulations to reduce exposure to toxins released by building materials, including paints, glues, and carpets.

INITIATIVE 10

Update our air quality code

The goal of the New York City Air Pollution Control Code (Air Code), which gives the City authority to set and enforce emissions and fuel standards, is to preserve, protect, and improve the air resources of the city.

Unfortunately, the Air Code has not undergone a comprehensive overhaul and revision since 1975. Instead, it has been revised in a sporadic and piecemeal manner. This incomplete revision has made the Air Code inflexible to new types of fuels and technologies and difficult to comply with. We will update the Air Code to streamline compliance processes and encourage innovative ways to reduce local sources of pollution while maintaining rigorous standards to protect public health.

Conclusion

Despite decades of progress, air pollution in New York City remains a significant concern. Current levels of PM 2.5 are estimated to contribute to over 3,000 premature deaths and over 8,000 hospital admissions and emergency room visits annually in New York City. We are working to achieve the best air quality in any large American city. We have made great strides in measuring air quality, in legislating emissions reductions from school buses and from heating oil, and in reducing pollution from ferries, private trucks, and construction vehicles.

The air pollutants with the greatest public health impact in New York City result mainly from fuel combustion emissions of on-road and-off road vehicles, heating oil, other building sources, and electric power generators. By focusing our efforts on these areas, we can reduce citywide air pollution levels and also reduce variability across our neighborhoods.

Enlisting the help, funding, and expertise of private and public partners will help us reduce emissions from key sources.

Solid Waste

Credit: NYC Dept. of Sanitation/Michael Anton

Together we can

Reduce waste by not generating it

Increase the recovery of resources from the waste stream

Improve the efficiency of our waste management system

Reduce the City government’s solid waste footprint

Organic waste can easily be turned into what gardeners refer to as “black gold” or compost to revitalize depleted urban soils. Composting is a self-empowering and scalable process, requiring a pair of hands and a patch of open space. We can put compost to use in our green infrastructure, from the street trees, to public and private gardens, to green roofs.

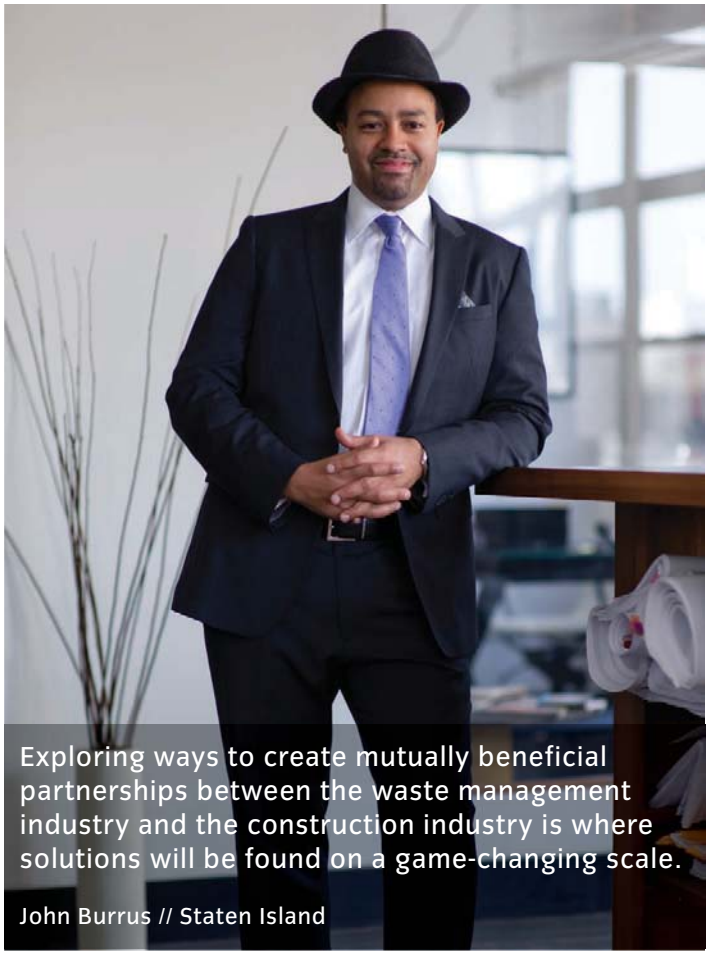
Christine Datz-Romero // Manhattan

In today’s world, waste is produced in substantial quantities. Our actions have a huge effect on the environment and climate. Unfortunately, not many people recycle. In addition, people are ill-informed about what can be recycled. Knowledge and awareness can be the keys to a cleaner community.

Jhishan Khan // Queens

I run a couple of green bakeries and we’re trying to create a new paradigm for a sustainable food business. Every day we are trying to reconfigure the operation towards sustainability. We’re composting and asking vendors and suppliers to take tangible steps towards greening their own businesses and we’re talking everyday about how to create consciousness on the consumer and the industry side.

Maury Rubin // Manhattan



Exploring ways to create mutually beneficial partnerships between the waste management industry and the construction industry is where solutions will be found on a game-changing scale.

John Burrus // Staten Island

Solid Waste

Divert 75% of our solid waste from landfills

Every year, we generate more than 14 million tons of waste and recyclables in our homes, businesses, schools, streets, and construction sites. It takes a fleet of more than 2,000 City government and 4,000 private trucks to collect it all from across the five boroughs. Once these trucks are full, they are emptied or "tipped" at recycling facilities or transfer stations, where the materials are transferred to long-haul trucks, barges, or railcars for processing or final disposal. This complex system has an enormous impact on our environment, communities, and economy.

We estimate that the city's entire solid waste system creates 1.66 million metric tons of greenhouse gas (GHG) emissions annually, representing 3% of the city's total GHG emissions. As our city grows, and we meet the challenges posed by climate change, we must reduce the amount of waste we generate and its related impacts.

Solid waste management in New York City has dramatically evolved. Until the 1930s, much of our waste was simply dumped into the ocean or onto city streets. The persistent problem of waste-strewn streets and associated public health concerns led the City to create the Department of Street Cleaning in 1881—the precursor to the current Department of Sanitation—to systematically collect our waste.

Through the 1980s, we relied on a network of thousands of apartment building and City-operated incinerators as well as 89 City-owned landfills for disposal including Fresh Kills in Staten Island, which at one point was the world's largest landfill. Opposition to incineration and landfilling increased and new regulations forced the upgrade or closure of many such facilities. By the mid 1990s, incineration had ceased, and the City instituted mandatory recycling requirements. Only one of the City's landfills, Fresh Kills, remained in operation. By the late 1990s, all disposable waste collected by the City—from households, non-profit institutions, government agencies, parks, and street baskets—ended up at Fresh Kills, transported largely by barge from a network of City-run marine transfer stations.

Most private carters disposed commercial waste at Fresh Kills until the early 1990s, when higher disposal fees at the landfill drove them to a growing number of private transfer stations around the city. In 2001, the City closed Fresh Kills and began sending the majority of City-collected waste to private transfer stations concentrated in a handful of neighborhoods in the Bronx, Queens, and Brooklyn.

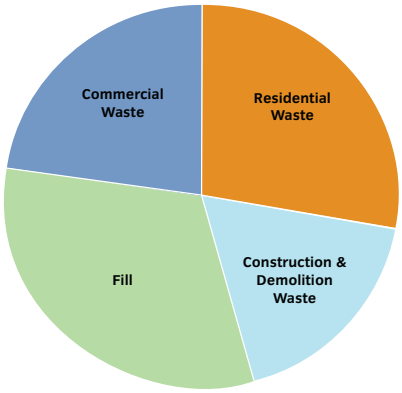
To create a more equitable system, we worked with the City Council, environmental organizations, and community groups to develop a new Solid Waste Management Plan (SWMP) in 2006. The plan charts a strategic path toward "borough equity." It minimizes the impacts of the system on over-burdened neighborhoods by ensuring that City-collected waste from one borough is not sent to another borough for disposal and by establishing specific transfer stations for residential wastesheds in every borough.

The SWMP also reduces traffic congestion, noise, and related air pollution by maximizing the use of rail and barge to transport (or "export") waste outside the city. Full implementation will reduce City-collection truck travel by nearly 3 million miles, private long-haul truck travel on city streets by 2.8 million miles, and long-haul truck travel outside the city by 55 million miles. We estimate this shift will reduce GHG emissions by approximately 38,000 metric tons.

The SWMP similarly addresses the impacts from commercial waste collection and export by encouraging a shift to rail and barge. In addition, we committed to expanding recycling programs and piloting emerging solid waste conversion technologies that can dispose of waste more sustainably and further reduce GHG emissions.

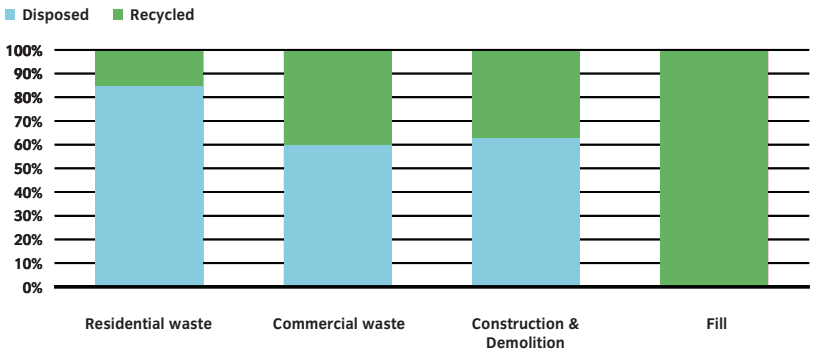
Since 2006, we have made significant progress: approximately 30% of City-collected waste now leaves the city by rail, and two refuse marine transfer stations are under construction. In addition, a new large-scale recycling processing facility in Brooklyn is scheduled to open by 2013.

New York City's Waste
14 Million Tons per Year



Source: NYC Dept. of Sanitation, NYC Mayor's Office

Diversion Rate by Waste Stream



Source: NYC Dept. of Sanitation, NYC Mayor's Office

Solid waste management practices have improved substantially. We no longer dump our waste at sea, burn it in unregulated incinerators, or dump it in unregulated landfills. Overall, despite a growing population, waste generation citywide and per capita has decreased over the past 10 years, reflecting nationwide trends. But managing our waste in an equitable, sustainable, and cost-effective manner is increasingly challenging.

While we are continuously researching alternative methods for disposal and working to increase our diversion rate (the percentage of materials recovered from the general waste stream), we will likely maintain our reliance on landfills far from the city. Together, transportation and methane emissions from these landfills (despite methane capture systems) compose a significant portion of total GHG emissions. We currently spend more than $1 billion a year to manage solid waste including $300 million to export 3.3 million tons of City-collected waste. These costs are projected to rise exponentially. We must take aggressive steps to make our waste management system more environmentally and economically sustainable.

Our Plan

We must make changes at every stage of our waste system–reducing the amount we generate, reusing more of it, recovering more resources from it, and more efficiently disposing of what we can't eliminate. We must also change how we think about our waste–not as a by-product to be disposed, but as a resource that can generate energy, create jobs, and spur economic development.

The most effective way to minimize the impacts of our solid waste is to reduce the amount of waste we generate. We will encourage individuals to adopt waste prevention practices and promote opportunities for businesses, institutions, and individuals to reuse materials. Working with the business community, we will pursue ways to reduce packaging and hazardous materials in products, eliminating waste at its source, and expand product stewardship programs in which manufacturers take responsibility for the disposal of their products.

While we currently recycle approximately half the waste generated in the city, including construction and demolition debris, fill, commercial and residential waste, we can recover even more resources from our wastestream. We will incentivize recycling and make it easier, more cost-effective, and more accessible. We will develop recognition programs for businesses that reduce their solid waste footprint and continue to encourage new markets for recycled materials.

To reduce the amount of organic material we send to landfills, we will expand opportunities for community-based composting and encourage commercial food waste recovery operations. Advances in technology will also allow us to pursue alternative disposal methods by safely and efficiently converting our waste into a source of clean energy.

Our plan for solid waste:

Reduce waste by not generating it

1 Promote waste prevention opportunities
2 Increase the reuse of materials

Increase the recovery of resources from the waste stream

3 Incentivize recycling
4 Improve the convenience and ease of recycling
5 Revise City codes and regulations to reduce construction and demolition waste
6 Create additional opportunities to recover organic material
7 Identify additional markets for recycled materials
8 Pilot conversion technologies

Improve the efficiency of our waste management system

9 Reduce the impact of the waste system on communities
10 Improve commercial solid waste management data
11 Remove toxic materials from the general waste stream

Reduce the City government's solid waste footprint

12 Revise City government procurement practices
13 Improve the City government's diversion rate

Even as we increase recycling rates and generate less waste for disposal, there will always be waste that can't be reused or recycled. We will continue to implement the SWMP and decrease the impacts of our waste management system on local communities.

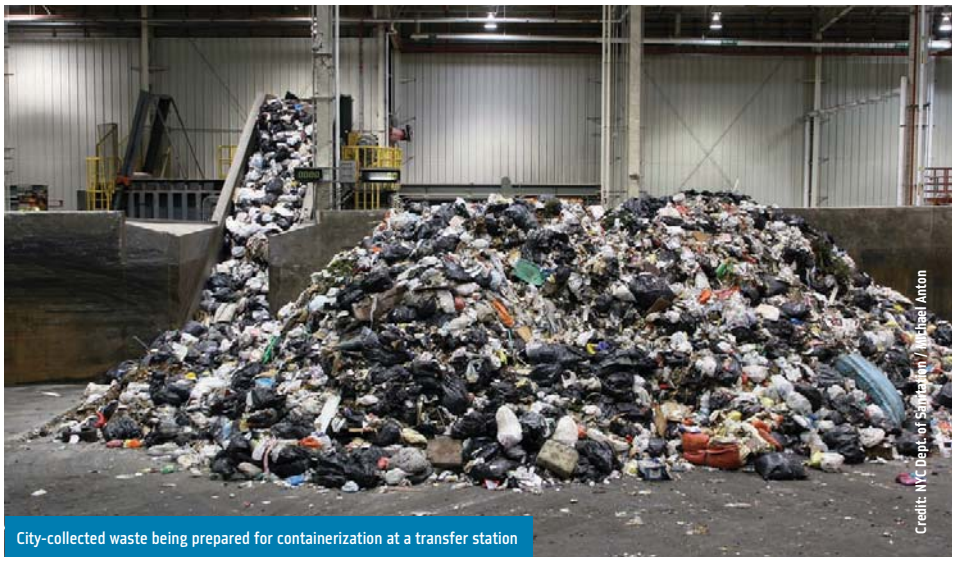
We recognize that to reduce waste generated in the city, we must engage New Yorkers to change their behavior. Through a series of GreeNYC public education campaigns we will educate and empower the public to reduce, reuse, and recycle more.

In asking New Yorkers to reduce their solid waste footprint, City government must lead the way. We will improve diversion at City agencies by improving recycling in our offices and operations. We will seek to minimize waste through informed decisions about the goods we purchase. In short, we will set an example that companies, institutions, and individuals can emulate.

Diverting 75% of our solid waste from landfills will require several actions. We will need to reduce the amount of waste we produce, encourage technologies to recover resources from our waste, encourage new markets for recovered materials, increase recycling at home and in our businesses, and improve our waste management infrastructure. If we do this, we can drastically reduce the impact of our city's waste on taxpayers, the environment, and our communities.

Reduce waste by not generating it

The most effective way to reduce the amount of solid waste generated in the city is to not create it in the first place. This means empowering the public to make choices that reduce their waste and making it easier for businesses and individuals to reuse materials. Targeted public education campaigns will inform the public about opportunities to reduce plastic bottle waste by drinking tap water, to reduce the number of disposable bags in our waste stream by using reusable bags, to reduce paper consumption by opting out of unwanted subscriptions, and to donate reusable goods instead of discarding them. By eliminating waste at its source, we can save energy and reduce GHG emissions and costs to residents, businesses, and the City.



City-collected waste being prepared for containerization at a transfer station

INITIATIVE 1
Promote waste prevention opportunities

In many cases, we generate unnecessary waste without even thinking about it. For example, New York City has high quality drinking water from the tap, yet millions of bottles of water are consumed in the city each year. While water bottles are recyclable, only 13% statewide are actually recycled.

Increasing the availability of tap water and redesigning water fountains to better accommodate reusable water bottles will make it easier for New Yorkers to avoid unnecessary consumption. We will encourage the use of reusable water bottles by installing redesigned water fountains in public spaces and parks. We will educate the public about the benefits of drinking tap water, and we will expand partnerships with non-profit organizations and businesses to increase tap water consumption as an alternative to bottled water.

Another pervasive form of waste we can reduce is the ubiquitous disposable bag. The City collects approximately 5.2 billion plastic and 200 million paper bags each year. These bags represent 3% of our residential waste stream, including street basket collection, and weigh approximately 110,000 tons, costing the City $10 million a year to export. We estimate that private waste haulers collect another 300 million bags, representing approximately 6,000 tons of waste each year. And the bags that are not captured by our waste collection system clog our waterways and our wastewater treatment systems, get caught in trees, and litter parks and streets. Despite recent laws requiring large retail stores and shopping malls to accept and recycle plastic bags, only a small percentage of plastic bags are recycled through this program.

We will launch a public education campaign to reduce litter, expand the use of reusable bags, and improve awareness of the effects of disposable bags on our environment and communities. Cutting disposable bag consumption in half could eliminate approximately 58,000 tons from our general waste stream and reduce GHG emissions by approximately 12,000 metric tons.

New Yorkers generate more than 2.5 million tons of paper annually and recycle less than half of what is recyclable. Therefore, we will develop a public education campaign to reduce paper consumption and increase recycling. We will also develop an easily accessible tool for New Yorkers to opt-out of receiving unsolicited mail.

Finally, we will work with the city's 24,000 restaurants and food-related businesses to identify and adopt practices that reduce waste. These could include minimizing packaging for food products and giving customers the option to opt out of receiving all the disposable materials that often accompany take-out food.

INITIATIVE 2
Increase the reuse of materials

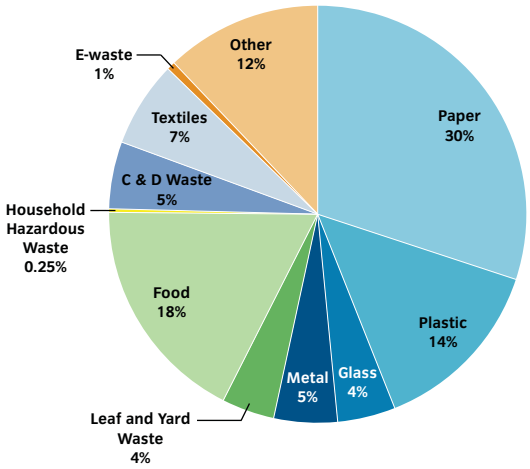
Reusing products and materials is one of the most cost-effective and practical ways to reduce waste. A number of City-funded programs encourage households and businesses to reuse materials.

The NYC WasteMatch program helps businesses and organizations find used or surplus commercial goods and equipment that others no longer need. Since 1997, the program has diverted more than 25,000 tons of materials from landfills.

Materials for the Arts provides supplies to thousands of New York City's arts and cultural organizations, public schools, and community arts programs. Since 1997, the program has facilitated the reuse of over 8,000 tons of materials donated by companies and individuals and redistributed to artists and educators.

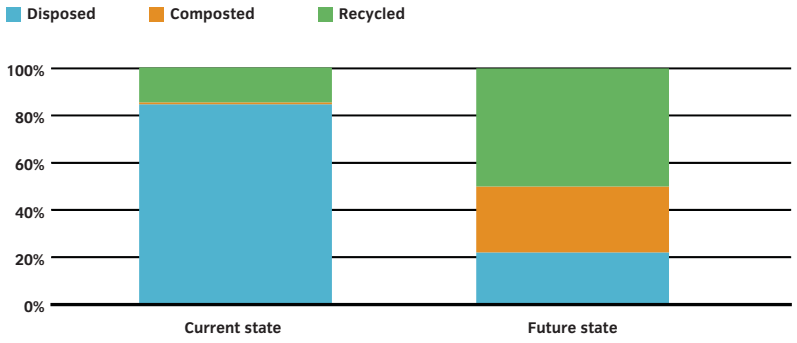
GrowNYC, a non-profit organization created by the City dedicated to improving the environment, also sponsors "Stop N Swap" community

Residential and Street Basket Waste



Source: NYC Dept. of Sanitation, NYC Mayor's Office

Potential for Diversion of Residential and Street Basket Waste



Source: NYC Dept. of Sanitation, NYC Mayor's Office

events. These allow individuals to discard unwanted but reusable items, which people may take home for free, whether or not they have brought something in exchange.

One challenge to increasing reuse efforts is the rising cost of storage and transportation of materials. Therefore, online forums to facilitate the reuse of materials are crucial. We will promote and enhance the City's online portal, the NYC Stuff Exchange. This portal offers an exhaustive list of organizations and businesses where residents can donate, buy, or sell gently used items. Through the NYC Materials Exchange Development Program (MEDP), we will continue to foster relationships between reuse organizations, provide capacity building training, and increase public awareness and access to these innovative waste prevention services.

These efforts will divert thousands of tons of waste from landfills and save individuals, nonprofits, and schools millions of dollars.

Increase the recovery of resources from the waste stream

We currently recycle half of all waste generated in New York City. A majority of this recycled material, however, is fill and construction and demolition debris. And while one-third of our residential waste stream could be recycled through current curbside collection, less than half of all recyclable materials are properly sorted by residents. In addition, there is no curbside collection of organic materials, such as food and textiles, and only limited collection of yard waste, which together compose nearly a third of our residential waste and could be diverted.

We can increase the amount of our waste that is recycled by expanding the items we designate as recyclable, creating new markets for recyclables, and making it easier for individuals and businesses to recycle. We can also recognize businesses and institutions for adopting more sustainable waste management practices, including increased diversion rates and the use of recycled materials.

INITIATIVE 3
Incentivize recycling

New Yorkers have long recognized the value of recycling. Recycling was introduced in 1895, when household waste was separated into three categories–food, rubbish, and ash. Food waste was processed into grease for soap products and into fertilizer. Rubbish was sorted to salvage paper and other marketable materials. And ash, along with the nonsalable rubbish, was landfilled.

Today, although recycling can save money or even generate revenue, we are not recycling as much as we could. After 22 years of mandatory residential recycling programs in the city, residents still properly sort less than half of what could be recycled, throwing away valuable materials. Though we have limited information about commercial recycling in the city, we know that most businesses do not capture as much as they could for recycling. In order to further understand commercial recycling and make informed policy decisions, the City has embarked on a study of the entire commercial waste system.

Until this study is complete, we will develop new recognition and award programs or build on existing models such as LEED and the Green Restaurant Association to incentivize businesses and institutions to expand recycling and use recycled and recyclable materials. While many businesses in the city have already recognized the importance of sustainable solid waste practices, these incentive programs would encourage broader adoption of these practices. Leveraging the buying power of local businesses will also help support emerging markets for recycled materials.

We will also set recycling goals for City government and challenge corporations and institutions to meet or exceed those goals. We will recognize standout performance and collect and publish best practices for even broader adoption.

For residential waste, we will pursue strategic reward programs to incentivize household recycling. We know that increasing our residential diversion rates would have a significant impact on GHG emissions and reduce the City's cost of exporting our waste. For example, if we diverted 60% of the amount of paper, metal, glass, and plastic that is already suitable for curbside recycling, we could reduce GHGs by approximately 100,000 metric tons.

In addition, we will improve access to recycling performance information by making it easier to find community board diversion rate data online. This will enable community-based organizations to monitor the effects of their recycling and outreach initiatives. And while we expand recycling awareness, we will also enforce the recently increased penalties for large buildings that don't comply with recycling rules.

INITIATIVE 4
Improve the convenience and ease of recycling

While most New Yorkers want to recycle, the system can sometimes be confusing. There are different rules and bins at home, on the subway platform, and at work. There are detailed rules about what types of plastics can and can't be recycled. Recycling bins on the streets and in parks are scarce. We must make recycling easier and more convenient.

To improve access to recycling and create a more consistent system, we will deploy 500 recycling receptacles in public spaces across the city and seek to increase that number over time. In addition, we will establish recycling in 25% of all City parks.

CASE STUDY

Policies to Incentivize Waste Reduction

Today New Yorkers pay for waste collection through local taxes regardless of how much —or how little—they generate. A growing number of cities have taken a different approach and implemented a fee-based system known as "Pay As You Throw" or "Save As You Throw" (SAYT) that varies based on how much waste a household generates.

In communities with these programs, household trash collection charges are based on the amount thrown away, while recycling collection is free. This creates a direct economic incentive to recycle more and generate less waste. By increasing recycling rates and decreasing disposal volumes, SAYT can have environmental and economic benefits. It's also fairer: those who generate more, pay more; those who generate less, pay less.

SAYT treats waste collection just like electricity, gas, phone, and other utilities; households pay a variable rate depending on the amount of service they use. As of 2006, 30 of the 100 largest U.S. cities used a SAYT system.

Of course, implementing this approach in New York City, which has a high percentage of high density, multi-family housing, would present special challenges. Although there is no directly comparable U.S. city that has implemented SAYT, other cities may offer lessons.

Seoul, South Korea, with a population of over 10.5 million, instituted a SAYT system in 1995. Trash bags of 20, 50, and 100 liters each are provided for a fee to residents and businesses. Smaller bags cost less than the larger bags. In addition, the cost of disposal varies by district and is based on actual costs which are assessed and passed to residents.

We will review relevant SAYT research as well as the experiences of other densely-populated cities with similar systems to clarify how a SAYT approach might work to incentivize recycling and decrease waste generation in New York City.

Recycling in households, particularly in multi-family residential buildings, is often difficult due to a lack of space to store and sort recyclables. Without this dedicated space, it is challenging for residents or superintendents to keep recycling separated. Many other cities and the Battery Park City Authority require new residential buildings to provide a waste and recycling room. We will work with the City Council to require new multi-family residential buildings to provide sufficient space for recycling receptacles.

Recycling education is central to improving recycling rates. We already conduct recycling education in many forums, including websites, direct mail, and outreach programs for multi-family buildings and schools. The New York City Housing Authority (NYCHA) has also successfully expanded recycling education by organizing Resident Green Committees, which provide neighbors with specific information about what and how to recycle. Reinforcing the importance of recycling with the 1.1 million children in our public schools is an ideal way to increase recycling at home. We will encourage teachers to incorporate recently created recycling education modules into their curriculum.

INITIATIVE 5

Revise City codes and regulations to reduce construction and demolition waste

The New York City construction industry is one of the largest consumers of materials and generates more than 7 million tons of waste annually. Construction and demolition (C&D) waste consists of the debris generated during the construction, renovation, and demolition of buildings, roads, and bridges. It includes fill such as dirt and rocks, of which nearly all is recycled, and building materials such as concrete, wood, metals, glass, carpets, and furniture, of which less than 40% is recycled. While the New York City construction industry is a leader in recycling C&D debris, it has the potential to recycle and/or reuse even more through improved handling and separation of materials.

Several C&D materials, including old growth lumber, carpet, ceiling tiles, new gypsum, and gypsum tiles, are optimal candidates for recycling. Several recycling options currently exist for carpet, ceiling tiles, and old growth lumber, but there are few or no local resources to effectively recycle clean gypsum scrap that is used for gypsum wallboard. We will work with the business community and the City Council to enact mandatory recycling for certain C&D materials and encourage cost-effective recycling options for these materials.

INITIATIVE 6

Create additional opportunities to recover organic material

Approximately 30% of what we throw away in our homes is organic material. The majority is from food scraps, but also includes leaf and yard waste and textiles, such as used clothes.

On the commercial side, we estimate that organics represent 18% of the total waste stream, the majority of which is food waste from businesses and institutions. Paying to transport these organics to distant landfills is not only expensive due to the high water content of these materials, but it is also a key driver of our GHG emissions. We know that when food is disposed of in a landfill it quickly rots and becomes a significant source of methane.

Yet with proper separation and treatment, food waste can be converted into a valuable resource for agricultural applications and energy generation. Other organic materials, such as leaf and yard waste and textiles, can also be composted or recycled. Diverting organics from the general waste stream could save the City and its businesses millions of dollars by avoiding expensive disposal costs. It could also reduce transportation impacts such as congestion, noise, and air emissions.

Residential organics

New Yorkers have several options to compost their food waste. Many community-based organizations accept food waste for small-scale composting. GrowNYC hosts drop-off locations for organics at select Greenmarkets, and residents with yards can use small containers to compost kitchen scraps along with their yard waste. For nearly 18 years, the City has also operated the NYC Compost Project, which offers outreach and education about composting for residents, non-profit organizations, and businesses at botanical gardens and non-profits in each borough.

We will expand outreach and education efforts, benchmark and quantify current community-based composting efforts, and work with community and government partners to increase the number of available drop-off locations for food waste. In addition, we will launch a grant program for small-scale composting to encourage diversion of food waste.

To capture the roughly 4% of residential waste made up of leaf and yard trimmings, we will reinstate leaf and yard waste collection for composting in the city. This will create a high-quality soil product for use by City agencies and non-profits in parks and natural resource programs.

CASE STUDY

Grease to Fuel

As business winds down at restaurants throughout the city, commercial carters arrive to pick up their waste. But a new kind of waste collector is becoming a more common visitor to restaurants at closing time: commercial grease trucks using long hoses to extract used cooking oil, also known as yellow grease, from kitchens. This burgeoning market is driven by an increasing demand for yellow grease as the base material for a valuable fuel—biodiesel.

Although biodiesel can be made from several feedstocks including soybeans, entrepreneurs in New York City are making it from used cooking oil, harvested from our city's 24,000 restaurants. Biodiesel has substantial environmental benefits. Compared with standard diesel, it creates fewer greenhouse gas, particulate matter, and carbon monoxide emissions, without sacrificing performance. The fuel can fulfill many of our needs—from powering our cars and trucks to heating our buildings.

In 2010, the City passed a local law requiring heating fuel to contain 2% biodiesel by October 2012. With heating oil combustion accounting for nearly 14% of local PM 2.5 emissions, the adoption of biodiesel can help meet our air quality goal.

A yellow grease hauler prepares to collect used cooking oil from a restaurant kitchen

Currently, restaurants and institutions with large kitchens must properly dispose of yellow grease by placing it in the appropriate containers and setting it out on the curb for waste collection, however, some may just dump it down the drain. The grease solidifies in our sewers and can create backups that disrupt service and are expensive to clear.

Companies that collect and process yellow grease into biodiesel have begun turning New York City into a model of sustainable business development and are helping the city achieve several PlaNYC goals: transforming waste into a valuable commodity, stimulating the local economy, and reducing air pollution and greenhouse gas emissions.

We will also expand composting of leaf and grass clippings generated by our City parks. Specifically, we will install one small-scale composting unit in each borough. We will also expand the use of mowing equipment that mulches leaves and other organic matter so that nutrients seep into the soil.

The City piloted curbside collection for organics in the early 1990s and found that while it did increase diversion rates in lower-density neighborhoods, it was not a cost-effective collection method. Although the disposal costs were lower for organics than refuse, each collection truck only picked up a small amount of organics on their route, which resulted in a high collection cost per ton. Since 20 years have passed, we will reexamine this issue and complete a new study to determine the feasibility of curbside organics recycling.

Textiles, a key component of our organic waste, represent almost 7% of our residential waste stream. Nearly 190,000 tons of textiles are disposed each year. Since 2007, GrowNYC has collected textiles at select Greenmarkets. In Fiscal Year 2009, they collected and recycled approximately 150 tons from almost 20,000 New Yorkers. The City will launch a new public-private partnership to provide 50 new permanent drop-off locations in each borough for textiles that will be reused or recycled.

Commercial food waste

The Hunts Point Food Distribution Center is situated on 329 acres of City-owned property in the Bronx and is the largest food distribution center in the U.S. It generates approximately 27,400 tons of waste per year, roughly 75% of which is organic and all of which is being hauled away in trucks for disposal. The distribution center is an ideal candidate for an on-site organics recovery operation. Such a facility could lower waste disposal costs, generate a clean source of energy, reduce truck traffic and related impacts both locally and regionally, decrease congestion, and reduce air pollution. We will pursue the establishment of an on-site organics recovery facility at the Hunts Point Food Distribution Center.

Yellow grease, which is essentially used cooking oil, is another organic resource in our commercial waste stream with significant value and energy potential. It can be processed locally into biodiesel, a fuel that generates comparatively lower air pollutants and GHG emissions than traditional diesel. However, when it is improperly disposed of in drains, yellow grease solidifies and can clog the sewer system. In Fiscal Year 2010, the City received more than 14,000 sewer back-up complaints.

Because of its potential as a cleaner fuel, yellow grease is now a coveted commodity. Over the last decade, yellow grease has significantly increased in value and entrepreneurial haulers and biodiesel processors now collect it for free. Today, commercial carters pick up yellow grease from more than half of the city's restaurants.

The City has helped spur this market by requiring that all heating oil used to heat our buildings include a 2% blend of biodiesel. We will continue to support this developing industry through outreach and education to businesses and institutions. We will also streamline the licensing for grease haulers and the permitting process for yellow grease transfer stations.

Every year, more than 24,000 restaurants, 5,000 grocery stores, 4,000 hospitals, 5,000 cultural and educational institutions, and numerous hotels and sports arenas, throw away approximately 600,000 tons of food. In many cases, this waste could effectively be separated at its source and diverted from landfills. While some companies and institutions have recognized the growing importance of diverting food waste and the opportunity to be recognized as a "sustainable business," participation in commercial composting efforts remains limited.

Approximately 12,000 tons of food waste per year in the city, including waste from Yankee Stadium and Citi Field, is currently sent to commercial processing facilities for composting and resource recovery. However, these sites are located far outside the city, with the closest more than 150 miles away. The lack of commercial processing facilities in close proximity to the

city poses a challenge to fostering the market for commercial food waste recovery. We will promote commercial organics recovery as part of our proposed business recognition and award program to encourage sustainable solid waste management practices.

New technologies have the potential to reduce the impacts created by the traditional disposal of our commercial food waste. On-site dewatering units can remove the water from food waste and use odorless aerobic digestion in which bacteria eat food scraps. This process significantly reduces the weight and volume of food waste. These units can substantially reduce collection truck trips, in turn reducing air and noise pollution, GHG emissions, and congestion.

There are currently several dewatering pilot programs underway in the city, including one at a large Manhattan department store. We will continue to evaluate pilots of new technologies and encourage businesses and institutions to adopt them as a means to increase diversion rates.

Biosolids

New York City produces approximately 450,000 tons of biosolids from its wastewater treatment plants every year. While these biosolids are generally landfilled, they also can be harnessed as an energy source either directly or indirectly for heat, transportation fuel, or power production. Since sludge is organic material, it may also be used as fertilizer or soil conditioner for parks, farms, lawns, and golf courses, and in asphalt-paving mixes. We will pursue sustainable and economical opportunities to process and market sludge for beneficial reuse through pilot projects and partnerships with utilities and private investors.

INITIATIVE 7

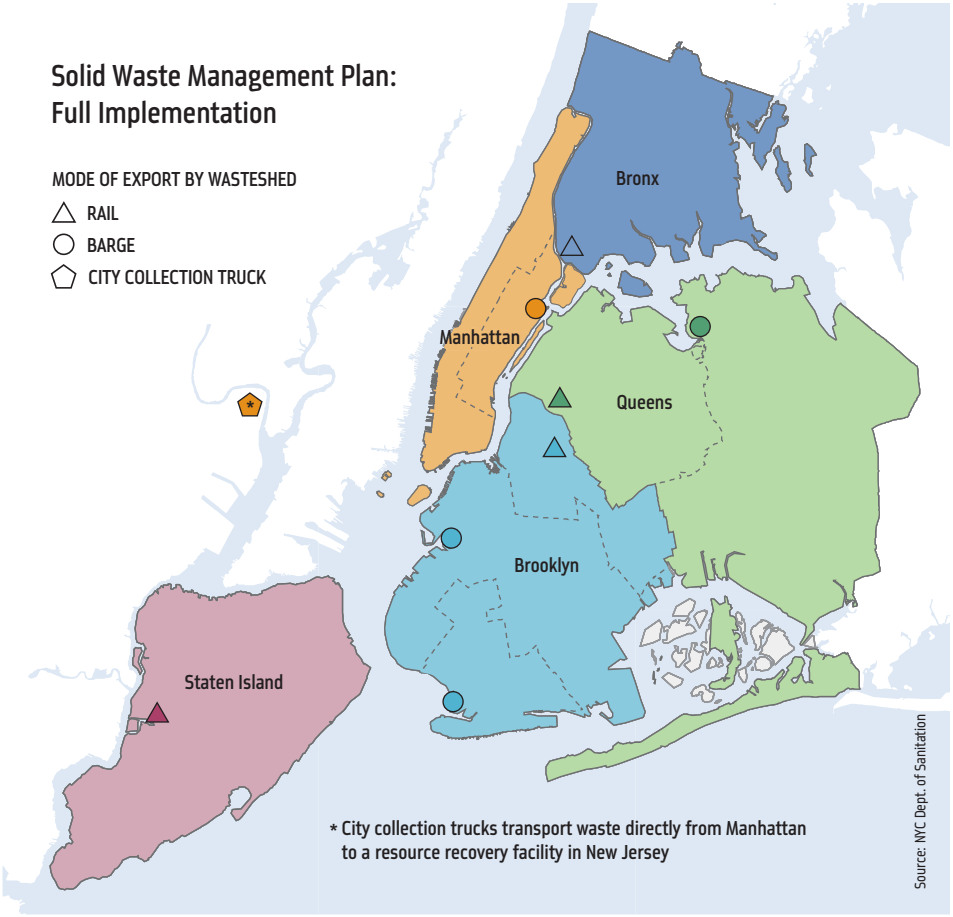
Identify additional markets for recycled materials

When the City began mandatory curbside recycling in 1989, plastic recycling had just begun to emerge. In response to legislation being implemented in municipalities and states across the nation, the plastics industry developed sorting technologies to separate and process the diverse types of plastics collected and make new products out of them.

Decisions about what is mandated to recycle is largely based on the market—we designate those materials for which there is an established and relatively constant demand. Today, nearly a third of our residential waste stream is designated as recyclable through curbside collection. This includes paper and cardboard, metal and glass containers, and plastic bottles and jugs. Only 2% of our entire residential waste stream is comprised of plastics designated for curbside collection. However, 11% is comprised of other types of plastics, including types that are more difficult to recycle and have limited or no markets. As recycling technologies and markets evolve, we will revisit the expansion of plastics designated for recycling and work to encourage markets for plastics that aren't currently collected.

Some of our greatest potential for recovering materials from the waste stream comes from the dredge material excavated from our harbor and the detritus from road work. We already recycle more than 45% of the asphalt removed when fixing a road, at City-owned recycling plants, and turn it into new asphalt to repave our streets and fill potholes. While we are experimenting with the use of even higher concentrations of recycled asphalt in our streets, we will also encourage its use in city construction projects.

Regionally, we dredge 4.49 million cubic yards of material a year from our harbors to maintain navigation channels and provide access to waterfront businesses. This material could be used in multiple applications instead of being landfilled. This type of beneficial reuse and recycling would conserve raw materials in quarries, reduce energy use and pollution from transportation, and reduce construction costs. We will encourage applications for the local beneficial reuse of dredge material.



INITIATIVE 8

Pilot conversion technologies

The SWMP sets out a clear path to reduce the GHG impact of exporting our waste by shifting from truck transport to barge and rail. A more equitable distribution of waste volumes at transfer stations means that collection trucks travel fewer in-city miles. The results are improved air quality and the benefits of lower congestion.

Even with these changes, we still rely largely on landfills for disposal. In order to identify alternative disposal methods that further reduce methane emissions and transportation impacts, we have studied new and emerging technologies that convert solid waste into either electricity or fuel that can then be sold as a revenue-generating product. These alternatives must be part of a citywide solid waste strategy that includes robust recycling programs.

Conversion technologies are used in Europe and Asia and are gaining greater appeal in the United States. Two specific technologies, anaerobic digestion and thermal processing, are the most-widely used and have the greatest potential for commercial applicability in New York City.

Loading containerized waste onto railcars at the City's Staten Island transfer station

Transportation Modes for City-Collected Waste

MODE OF TRANSPORT FROM CITY	CURRENT	FUTURE
Rail	32%	41%
City collection truck	23%	12%
Long-haul truck	45%	0%
Barge	0%	47%

Source: NYC Dept. of Sanitation, NYC Mayor's Office

Anaerobic digestion uses microorganisms to break down waste. It produces a biogas that can be combusted to generate electricity and a compost that can be used as a soil enhancer and fertilizer. Thermal processing technologies use heat to process solid waste and produce a synthesis gas ("syngas") that is then combusted to produce electricity.

Compared to landfilling or conventional waste-to-energy technology such as incineration, these new conversion technologies could offer economic and environmental advantages. Combustion of a gas as part of anaerobic digestion or thermal processing produces less air pollution, particularly dioxins and heavy metals, than the incineration of solid waste. Because the end-products could be beneficially reused and sold, these technologies could result in significantly less waste being disposed in landfills, reducing GHG emissions. Finally, with pre-processing equipment to recover recyclable items from the waste stream, these technologies would complement the City's curbside recycling program and increase diversion rates.

We will analyze opportunities to use new conversion technologies as commercially-viable alternatives to landfilling. In addition, we will solicit proposals to pilot these technologies in New York City for the disposal of our solid waste.

Improve the efficiency of our waste management system

The SWMP provides a roadmap for the sustainable management of the waste and recyclables generated in New York City. It addresses the management of City-collected waste from households, non-profit institutions, government agencies, and public spaces, as well as commercial waste collected by the private carting industry.

INITIATIVE 9
Reduce the impact of the waste system on communities

Over the past 30 years, a small number of communities in the city have borne the brunt of impacts from our waste management system. Those most affected live in neighborhoods in close proximity to high concentrations of transfer stations where thousands of tons of waste are transferred from collection trucks to long-haul trucks or railcars.

To address these impacts, the City worked with the City Council, environmental advocates, environmental justice organizations, and affected communities to develop the SWMP. A central tenet of the SWMP is borough equity—that each borough manage collection and export of the waste that is generated within its boundaries. The SWMP also set a goal of exporting the majority of City-collected waste by rail and barge, eliminating the need for long-haul trucks. This will reduce the noise, pollution, and congestion caused by the long-haul trucks exporting waste out of the city.

The SWMP leverages existing and new infrastructure to maximize the use of the city's waterways and rails to move waste off our streets and highways. As part of the SWMP, the City will use long-term contracts with private waste haulers to manage the export and disposal of City-collected waste from specific sites in each borough.

To date, we have signed long-term contracts for the export of waste by rail from Staten Island, the Bronx, and northern Brooklyn, representing more than 30% of waste collected by the City. By 2013, we will substantially complete the construction of two key marine transfer stations for exporting waste out of the city by barge. The City's collection fleet has also significantly improved emission controls, and more stringent regulations have decreased the public health and environmental impacts from existing transfer stations.

The SWMP also reduces the impacts of recycling collection and infrastructure. The Sims Municipal Recycling Facility at the South Brooklyn Marine Terminal, which will open by 2013, will facilitate the expansion of barge transport for recyclables throughout the city. This facility will reduce City collection truck traffic by approximately 230,000 miles per year.

To reduce the environmental impacts of commercial waste management, the long-term contracts identified through the SWMP will facilitate export of commercial waste by rail and barge. Specifically, our long-term contracts at the marine transfer stations will include pricing incentives to attract commercial waste carters. Several of the long-term contracts at transfer stations with rail access also require that all commercial waste processed at those locations be exported by rail. In addition, we will work with other private transfer stations to facilitate greater access to rail and barge infrastructure.

INITIATIVE 10
Improve commercial solid waste management data

New York City generates more than 3 million tons of commercial waste a year, approximately 40% of which is recycled. One of the major obstacles to decreasing impacts from the commercial waste system and increasing diversion of commercial waste is our limited insight into its organization and management. While the City's 2004 commercial waste characterization study provided some baseline information, we still lack a detailed picture of how private carters operate.

CASE STUDY

South Brooklyn Marine Terminal Recycling Facility

Since the beginning of our curbside household recycling program in the late 1980s, the City has relied on short term contracts with private companies to receive, process, and market our recyclables. While the contracts provided a certain amount of flexibility in the early days of the recycling program, the short duration of the agreements limited private sector investment in infrastructure and resulted in significant fluctuations in the program's costs. To ensure greater economic security for the recycling program and incentivize investment in recycling infrastructure, the City signed a long-term contract with Sims Metal Management in September 2008 to handle approximately 250,000 tons per year of City-collected metal, glass, and plastic, and a portion (150,000 tons per year) of City-collected mixed paper.

In October 2010, the City, in partnership with Sims, broke ground on a new, state-of-the-art recycling facility at the South Brooklyn Marine Terminal in Sunset Park, Brooklyn that will transform how the City's recyclables are managed. The City is investing more than $48 million in revitalizing the waterfront site and Sims is investing $44 million to create the new 100,000 square foot facility, which will include processing and storage buildings as well as a Visitor Education Center where school groups and visitors can learn about recycling.

A rendering of the new Sims recycling facility at the South Brooklyn Marine Terminal

In line with the City's Solid Waste Management Plan, the new facility will allow us to reduce our reliance on truck transport by using barges at the Marine Terminal. Brooklyn recycling collection trucks will need to travel shorter distances between collection locations and recycling facilities. Sims will also be able to expand its barge-based transport system, receiving recyclables by barge instead of truck from the Bronx and Queens. The facility will eliminate over 260,000 in-city vehicle miles traveled by City recycling collection trucks annually. These changes will reduce roadway congestion and associated noise and air emissions, create 100 new jobs by 2013, and enhance the efficiency and economics of the City's recycling program.

We know anecdotally that the city's 150 commercial waste carter companies develop their routes based on their respective customer needs and locations. As a result, a vast fleet of commercial trucks often drive long distances to pick up waste from a constellation of customers across the city.

To further understand this system, we will conduct a comprehensive study of commercial waste collection, focused on the logistics, types, and quantity of commercial waste collected throughout the city. Based on our findings, we will work with the private carting industry to develop recommendations to decrease impacts, increase commercial recycling, and identify potential efficiencies.

We will also improve access to more detailed information about private carters and their disposal practices. Businesses can then make more informed decisions based on how their waste would be managed and disposed. We will work with the commercial waste industry to make this information more accessible through outreach and an enhanced website.

INITIATIVE 11

Remove toxic materials from the general waste stream

Though a decidedly small portion by weight—less than 1% of the residential waste stream—toxic materials represent one of the most substantial threats to the environment and public health and safety in our garbage. Toxins such as lead can leach and leak when landfill liners fail, damaging aquifers below. When burned, they can release harmful particles into the air. Ignitable wastes such as solvents and corrosive wastes such as acids can injure sanitation workers.

Household Hazardous Waste (HHW) includes paint, batteries, automotive fluids, and mercury-containing devices such as thermostats. Many New Yorkers do not know that these items shouldn't go out with their regular trash. We send more than 9,000 tons of HHW to landfills every year. To properly handle more HHW, we will expand opportunities for the public to drop-off these materials, including an annual event in every borough.

We estimate that nearly 30% of HHW is composed of paint that is disposed of in the general waste stream. In 2010, the City established a pilot program for paint manufacturers and retailers to voluntarily take back paint. We will complete the pilot program and evaluate expanding it to a citywide industry paint stewardship program.

Electronic waste or "e-waste," from computers to cell phones, contains both high-value recyclable materials such as gold and copper and highly toxic items such as lead and bromide fire retardants. The State's new e-waste law requires manufacturers to collect and recycle or reuse e-waste. In 2015, disposing e-waste in the general waste stream will be illegal. Through education and outreach, we will improve the public's awareness of and participation in e-waste recycling programs, diverting these products from landfills.

Both the e-waste law and the paint stewardship program are based on the premise that manufacturers are best equipped to handle products at the end of their useful lives. Also known as product stewardship, these programs encourage manufacturers to plan for disposal issues when designing their products and to reduce the disposal costs to local governments. We will explore product stewardship policies for other toxic products that place a significant burden on our waste management system.

A sanitation worker loading cardboard into a City collection truck

Reduce the City government's solid waste footprint

If New York City intends to be a leader in solid waste management practices, City government must be at the forefront. With more than 300,000 employees and more than 300 million square feet of real estate, we estimate City agencies generate roughly 200,000 tons of waste every year. There is great potential for improvement.

INITIATIVE 12
Revise City government procurement practices

The City currently spends approximately $2.2 billion on goods every year, ranging from paper to computer monitors to public school food trays. In January 2007, the City began implementing environmentally preferable purchasing (EPP) laws that require agencies to consider the human health and environmental impacts of goods in procurement decisions.

This EPP program addresses waste generation, energy and water use, GHG emissions, indoor air quality, recycled and reused content, and the presence of hazardous substances. In order to ensure that the EPP program comprehensively addresses solid waste management considerations, we will develop best practices for procurement and work to incorporate these into the EPP rules.

In the short-term, we will establish packaging reduction guidelines for City contracts and improve agency accountability for the solid waste impacts of products we purchase. We will also create incentives for vendors to recover and reuse products when they are no longer in use. These actions will not only reduce our solid waste footprint but also reduce agency expenditures.

INITIATIVE 13
Improve the City government's diversion rate

One of the biggest challenges to reducing solid waste generated by City government is a lack of information. City offices are housed in a combination of private and public buildings. This means that some of our waste is collected by private carters as part of regular commercial collection routes, and some of it is collected by the City, integrated with residential collection routes. Since each building and agency doesn't track the amount of waste generated, we are unable to accurately measure and monitor our solid waste footprint.

We will develop a pilot program to measure solid waste generation at targeted City-owned buildings and develop a baseline for how much waste is generated by City agencies. Once we are able to benchmark our waste generation and identify opportunities in our procurement practices for improvement, we will set targets to increase our diversion rate.

We have already made strides toward this goal. With 1.1 million students and more than 1,000 schools, the City is tackling recycling in our education system on a comprehensive scale. By 2013, every public school will have a sustainability plan that identifies a strategy for greening its operations and maintenance and includes a clear recycling plan. Along with the plan, each school will designate a sustainability coordinator. This person will be responsible for leading recycling efforts, educating teachers, and ensuring that students are following recycling rules.

One strategy to increase diversion rates for City buildings and operations is to identify products that are used in large volumes and sponsor design competitions to develop alternative products that are more easily recycled and/or have fewer toxic materials. Working with the significant design and engineering talents in New York City, we will drive innovation in packaging design and product materials.

Another way to improve our diversion rate is to create financial incentives for government agencies to decrease their solid waste generation. Long-term, we will hold agencies accountable for waste generation and give credit to those that are taking quantifiable steps to reduce their solid waste footprint. Motivating agencies to reduce the City's costs by benefiting from the savings will create a strong financial incentive for those agencies to increase recycling rates and decrease solid waste generation.

Conclusion

New York City has the opportunity to significantly reduce the environmental and economic impacts of the solid waste management system by changing consumer behavior, improving infrastructure, investing in new technologies, and increasing recycling. Through individual actions and shifts in the operations of institutions and businesses, we can reach our goal of increasing diversion from landfills to 75% by 2030. Implementing these strategies will also reduce GHG emissions by 1 million metric tons, decreasing the share of the city's GHG emissions from solid waste management, and reducing the impacts of the system on our communities.

Climate Change

Credit: AP Worldwide Photos/Bebeto Matthews

Together we can

Reduce and track greenhouse gas emissions

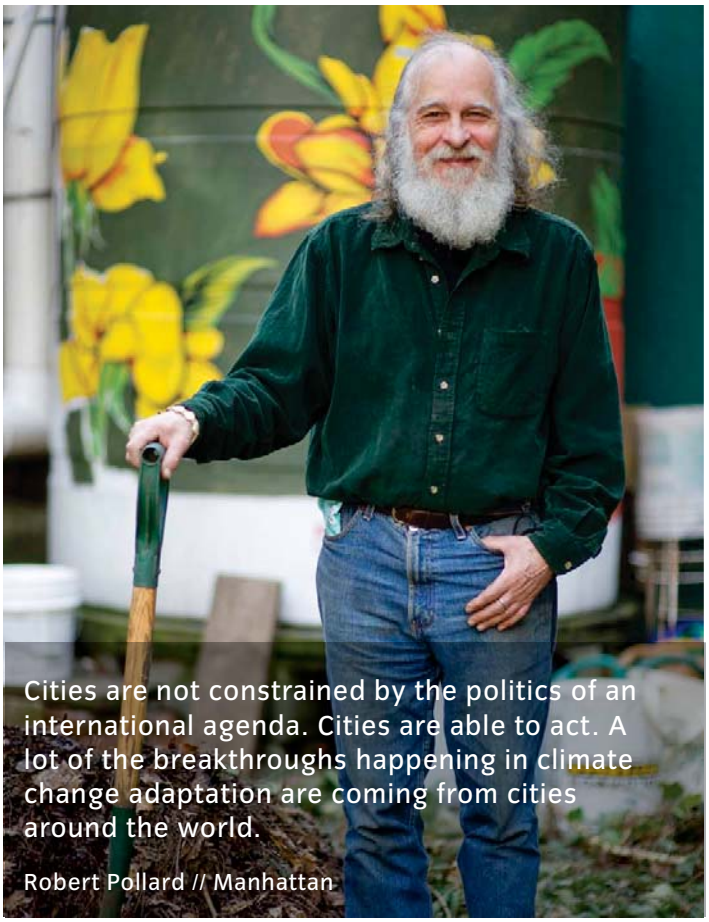
Assess vulnerabilities and risks from climate change

Increase the resilience of the city's built and natural environments

Protect public health from the effects of climate change

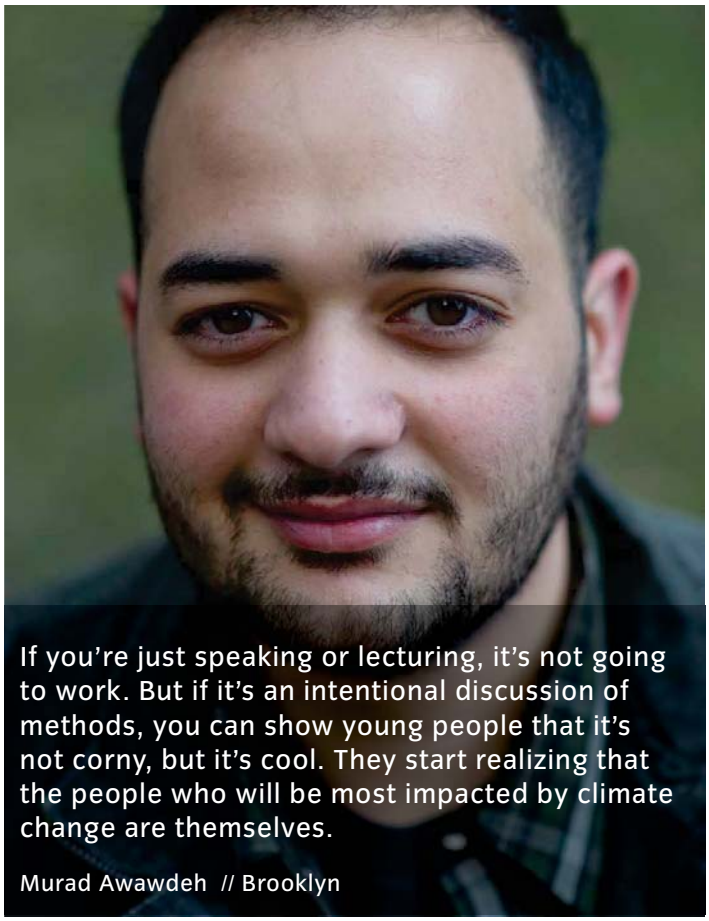
Increase the city's preparedness for extreme climate events

Create resilient communities though public information and outreach



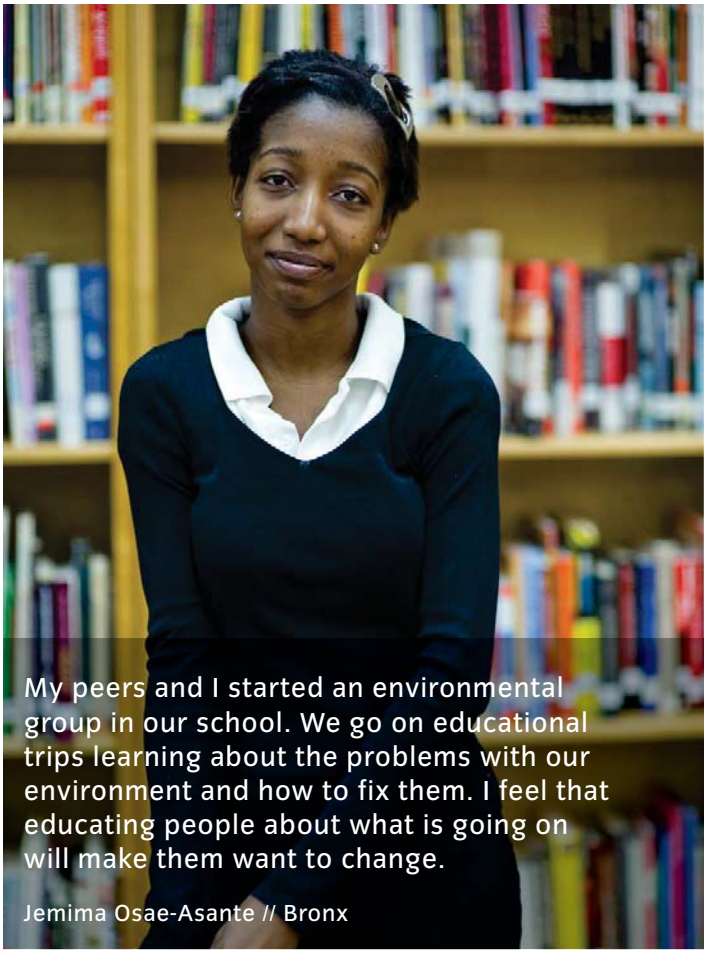
Cities are not constrained by the politics of an international agenda. Cities are able to act. A lot of the breakthroughs happening in climate change adaptation are coming from cities around the world.

Robert Pollard // Manhattan



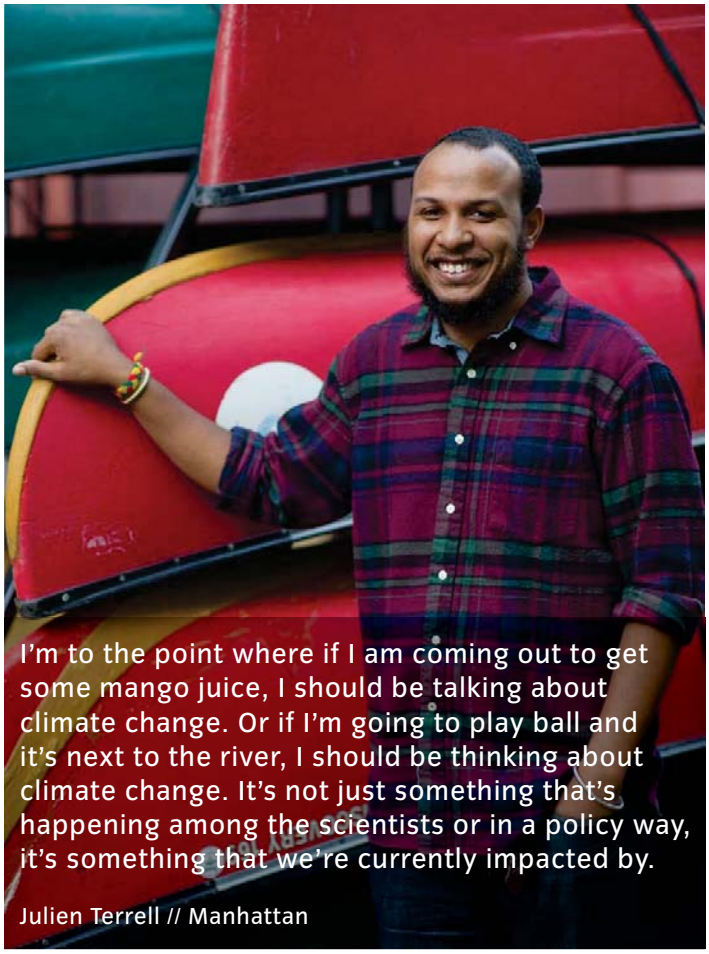
If you're just speaking or lecturing, it's not going to work. But if it's an intentional discussion of methods, you can show young people that it's not corny, but it's cool. They start realizing that the people who will be most impacted by climate change are themselves.

Murad Awawdeh // Brooklyn



My peers and I started an environmental group in our school. We go on educational trips learning about the problems with our environment and how to fix them. I feel that educating people about what is going on will make them want to change.

Jemima Osae-Asante // Bronx



I'm to the point where if I am coming out to get some mango juice, I should be talking about climate change. Or if I'm going to play ball and it's next to the river, I should be thinking about climate change. It's not just something that's happening among the scientists or in a policy way, it's something that we're currently impacted by.

Julien Terrell // Manhattan

Climate Change

Reduce greenhouse gas emissions by more than 30%

Increase the resilience of our communities, natural systems, and infrastructure to climate risks

Cities are at the forefront of both the causes and effects of climate change. Urban areas are estimated to be the source of approximately 80% of global greenhouse gas (GHG) emissions. At the same time, urban areas located on a coast like New York City face increased climate risks. Accordingly, cities have a responsibility to deal with both the causes and effects of climate change.

New York City has always faced climate risks, including heat waves, snow storms, high winds, tropical storms, storm surges, lightning, and torrential downpours. These events affect every New Yorker, and as our climate changes, they will become more frequent and severe.

In addressing climate change, we must be guided by the best available science. In 2008, we convened the New York City Panel on Climate Change (NPCC) to advise the City on climate change. The NPCC projects that by mid-century, New York City's average temperatures will rise by three to five degrees Fahrenheit, and sea levels could rise by more than two feet. By the end of the century, the city's climate may be more similar to North Carolina than present-day New York City. While New Yorkers currently experience an average of 14 days a year with temperatures over 90 degrees Fahrenheit, by the 2080s it could be more than 60 days.

We can reduce our local contributions to climate change by reducing our GHG emissions, which today account for about one-sixth of one percent of global emissions annually—roughly the same amount as Switzerland. While New Yorkers already have one of the lowest per capita carbon footprints among major global cities, we are taking aggressive action to reduce citywide GHG emissions further. A significant reduction in the carbon intensity of our electricity supply—driven by a shift in the fuels used to generate our electricity—has been chiefly responsible for a 13% drop in emissions from 2005 levels. Achieving our target of a 30% reduction in GHG emissions from 2005 levels by 2030, however, will require considerable effort in the coming years.

Reducing our emissions and slowing climate change will yield tremendous environmental and economic benefits, but even if global GHG emissions are reduced, some climate change is inevitable. The scientific evidence is irrefutable; GHG mitigation efforts can reduce the severity of climate change, but they cannot completely prevent it from happening. As a result, not only must GHG emissions be curbed, but we must increase the city's climate resilience—our ability to withstand and recover from extreme events and environmental changes.

Even as our understanding of climate change and its impacts evolves, we have already taken several actions to increase our resilience. We have identified likely impacts to the city's critical infrastructure. We are reducing buildings' contribution to high summer temperatures. We are preparing vulnerable populations for coastal storms and heat waves. And we are working with cities around the globe that recognize the importance of national and international leadership on climate change. As the Chair of the C40 Cities Climate Leadership Group, which brings together the leading largest cities in the world to work collectively to reduce GHG emissions, Mayor Bloomberg is shaping the global dialogue and action on climate change in cities.

Our Plan

No single action can achieve our GHG reduction goal or prevent climate change from impacting the city. We must make a number of strategic investments in our infrastructure and operations to reduce our contribution to global GHG emissions and our exposure to climate risks. This Plan provides details about our strategies for mitigating our GHG emissions and increasing our climate resilience.

In our Housing and Neighborhoods plan, we are directing new development to areas well-served by transit, reducing reliance on cars. We are

providing homeowners and developers with information on how they can reduce their energy consumption. We are also incorporating energy efficiency standards into specifications for our City-financed rehabilitation and construction projects.

In our Parks and Public Space plan, we are planting one million trees and creating a network of green corridors. Greening the city will reduce GHG emissions, help combat the urban heat island effect, and enhance stormwater management.

In our Waterways plan, we are increasing our ability to capture and retain stormwater. Our Green Infrastructure Plan, capital investments in our wastewater treatment plants and sewer system, and modifications to codes and standards will all allow us to better cope with intense downpours. We are also protecting existing wetlands, as well as creating new areas that could serve as natural barriers for coastal storms.

In our Transportation plan, we are providing New Yorkers with more sustainable transportation options. These include improved and expanded bus, subway, and commuter rail service, expanded ferry service, and enhanced bicycle and pedestrian safety, as well as convenience. These will all reduce GHG emissions related to transportation. In our Air Quality plan, we are switching to less-polluting, more efficient fuels, and reducing emissions from taxis, black cars, and for-hire vehicles.

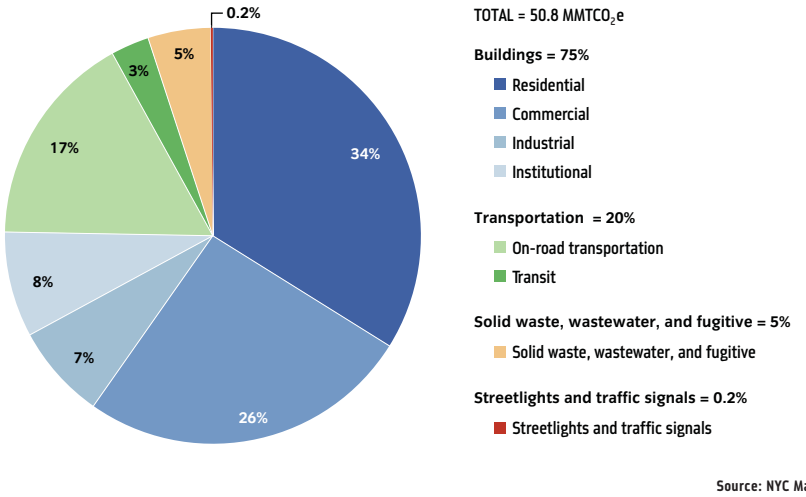
In our Energy plan, we are reducing energy consumption in buildings and investing in our energy infrastructure to lessen our dependence on fossil fuels. The City government will also continue to lead by example by modifying operations and investing in cost-effective retrofits and upgrades. Through these efforts and others, we will reduce our GHG emissions from government operations by more than 30% below Fiscal Year (FY) 2006 levels by 2017.

In our Solid Waste plan, we are reducing the amount of garbage we export to landfills, where it decomposes and emits methane, a harmful GHG. We are also making our solid waste management system more efficient. Together these measures will reduce GHG emissions by 2%.

Through all these efforts, we will reduce citywide GHG emissions by more than 30% below 2005 levels by 2030. We will increase our climate resilience. And we will enhance our city's quality of life, save New Yorkers money, and create economic opportunities.

These efforts alone, however, are not enough. We must continue to measure and track our progress toward our carbon reduction goal, even as we begin to chart a course to an 80% reduction in GHG emissions by 2050.

2009 Citywide GHG Emissions by Sector



Source: NYC Mayor's Office

To increase our resilience even further, we will build upon many of the planning efforts already underway. This will ensure that the knowledge we have gained is put to use on the most cost-effective risk reductions. We will create a climate risk assessment tool to prioritize our actions and evaluate the effectiveness of our decisions.

Building on our existing knowledge, we will update critical planning tools and regulations to increase the resilience of our buildings, infrastructure, and natural assets. To expand our understanding of resilience, we will identify potential measures to protect coastal areas from storm surges. We will complete a comprehensive

Our plan for climate change:

Reduce and track greenhouse gas emissions

1 Release an annual inventory of greenhouse gas emissions

2 Assess opportunities to further reduce greenhouse gas emissions by 80% by 2050

Assess vulnerabilities and risks from climate change

3 Regularly assess climate change projections

4 Partner with the Federal Emergency Management Agency (FEMA) to update Flood Insurance Rate Maps

5 Develop tools to measure the city's current and future climate exposure

Increase the resilience of the city's built and natural environments

6 Update regulations to increase the resilience of buildings

7 Work with the insurance industry to develop strategies to encourage the use of flood protections in buildings

8 Protect New York City's critical infrastructure

9 Identify and evaluate citywide coastal protective measures

Protect public health from the effects of climate change

10 Mitigate the urban heat island effect

11 Enhance our understanding of the impacts of climate change on public health

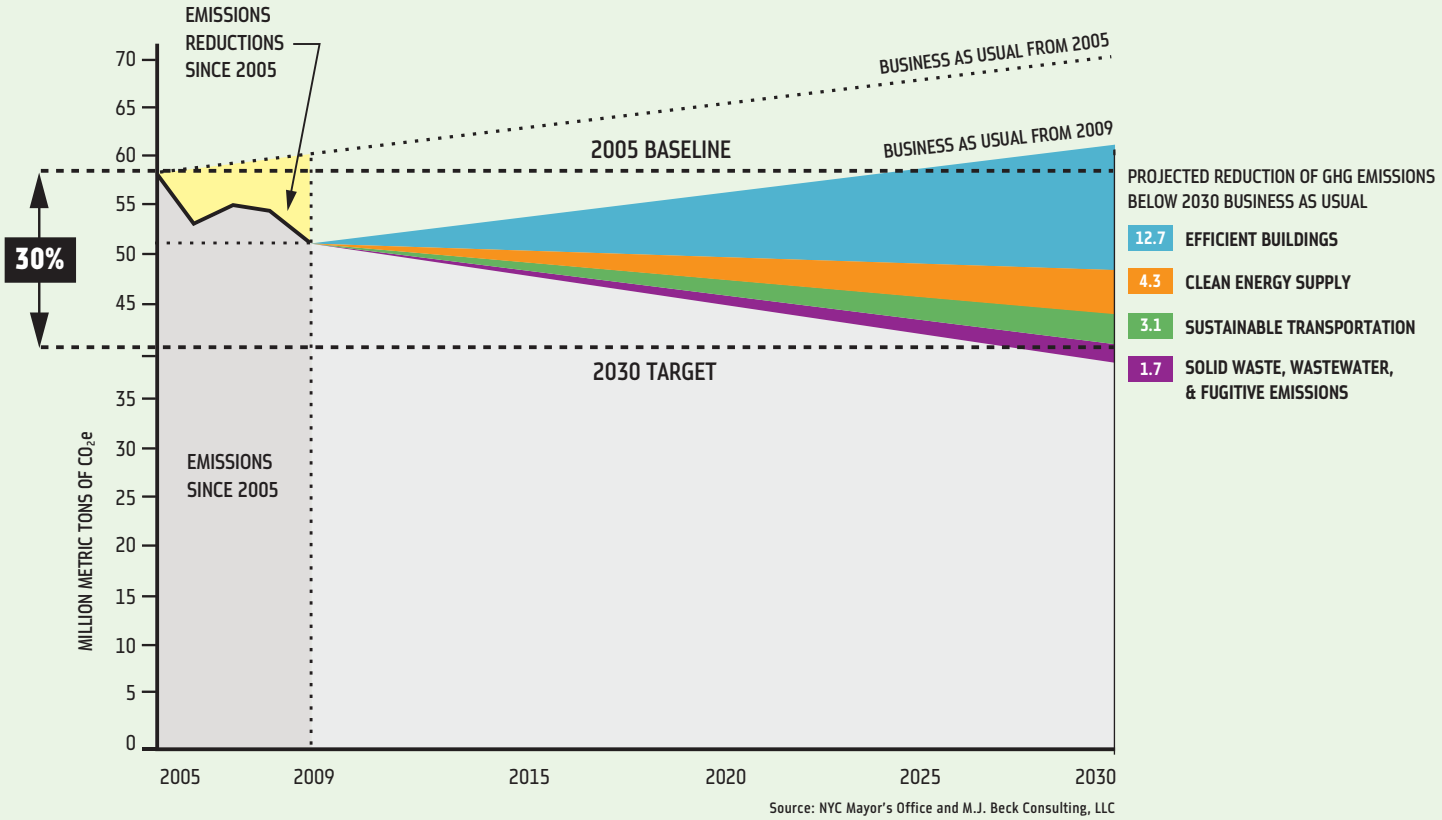
Increase the city's preparedness for extreme climate events

12 Integrate climate change projections into emergency management and preparedness

Create resilient communities though public information and outreach

13 Work with communities to increase their climate resilience

Projected Impacts of Our Greenhouse Gas Reduction Strategies



Source: NYC Mayor's Office and M.J. Beck Consulting, LLC

EFFICIENT BUILDINGS

- Foster the creation of Greener, Greater Communities
- Increase the sustainability of City-financed and public housing
- Implement the Greener, Greater Buildings Plan
- Improve our codes and regulations to increase the sustainability of our buildings
- Improve compliance with the energy code and track green building improvements citywide
- Improve energy efficiency in smaller buildings
- Improve energy efficiency in historic buildings
- Provide energy efficiency financing and information
- Provide energy efficiency leadership in City government buildings and operations
- Expand the Mayor's Carbon Challenge to new sectors

CLEAN ENERGY SUPPLY

- Increase planning and coordination to promote clean, reliable, and affordable energy
- Support cost-effective repowering or replacement of our most inefficient and costly in-city power plants
- Encourage the development of clean distributed generation
- Foster the market for renewable energy in New York City
- Develop a smarter and cleaner electric utility grid for New York City
- Promote the use of cleaner-burning heating fuels

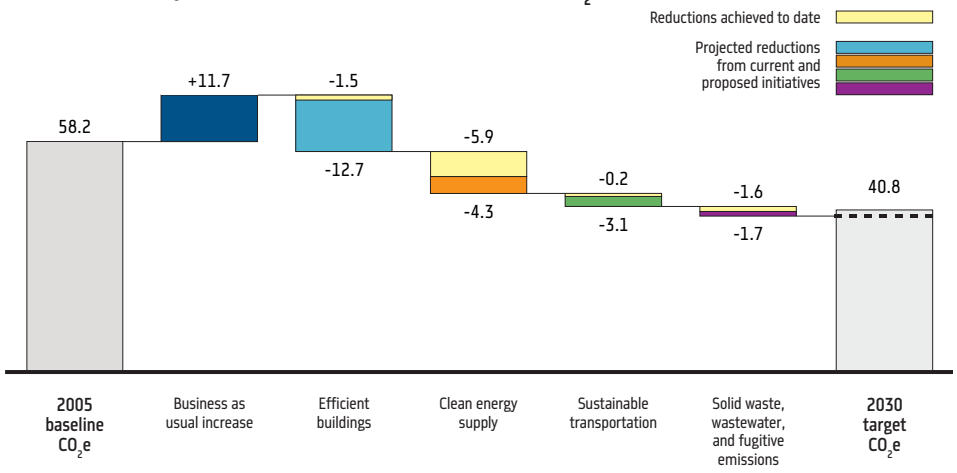
SUSTAINABLE TRANSPORTATION

- Continue transit-oriented rezonings
- Promote walkable destinations for retail and other services
- Improve and expand bus service throughout the city
- Improve and expand subway and other commuter rail
- Promote car sharing
- Expand and improve ferry service
- Make bicycling safer and more convenient
- Enhance pedestrian access and safety
- Reduce, replace, retrofit, and refuel vehicles
- Facilitate the adoption of electric vehicles
- Reduce emissions from taxis, black cars, and for-hire vehicles
- Work with the Port Authority to implement the Clean Air Strategy for the Port of New York and New Jersey

SOLID WASTE, WASTEWATER, & FUGITIVE EMISSIONS

- Promote waste prevention opportunities
- Increase the reuse of materials
- Incentivize recycling
- Improve the convenience and ease of recycling
- Revise City codes and regulations to reduce construction and demolition waste
- Create additional opportunities to recover organic material
- Identify additional markets for recycled materials
- Pilot conversion technologies
- Improve the City government's diversion rate

Achieved and Projected GHG Emissions Reductions ($MMTCO_2e$)



Source: NYC Mayor's Office

study on the health impacts of all climate-related events. We will also continue to keep New Yorkers safe through our extensive emergency preparedness and response programs and active engagement with vulnerable communities.

Reduce and track greenhouse gas emissions

New York City's GHG emissions are largely the result of fossil fuel energy consumed by buildings and transportation. Roughly 75% of our GHG emissions are related to heating, cooling, powering, and lighting buildings. 20% of our GHG emissions are related to transportation.

In 2009, New York City emitted 50.8 million metric tons of carbon dioxide equivalent, a 13% reduction from 2005 levels. This drop is attributed to less carbon-intensive and more efficient electricity generation, reduced per capita energy consumption, and reduced emissions of sulfur hexafluoride, a potent GHG. While this puts us on track to meet our goal of a 30% reduction in emissions by 2030, we must do more, as we cannot ensure the same annual reduction due to uncertain factors we do not control, such as weather.

Regular, accurate GHG emissions inventories allow us to focus our policy initiatives—such as improving the energy efficiency of existing large buildings through landmark green buildings legislation. These updates ensure that we are implementing the most effective GHG mitigation strategies. They also provide transparent data for New Yorkers to use in holding us accountable.

INITIATIVE 1
Release an annual inventory of greenhouse gas emissions

We are already seeing significant reductions in our GHG emissions. These are mostly due to a reduction in the carbon intensity of our electricity supply and other factors beyond the City's direct control. To meet our ambitious goals, we need accurate data to measure our progress. Annual inventory updates provide valuable information on emissions trends in New York City, as well as the impacts that weather, population, infrastructure investments, policy decisions, and consumer behavior have on GHG emissions levels.

Our initiatives to reduce energy demand and the carbon intensity of our electricity supply, to increase opportunities for more sustainable transportation, and to improve solid waste management will all contribute toward achieving our GHG reduction goal. We will continue to measure and report GHG emissions annually from both City government operations and from the city as a whole to ensure we remain on track toward achieving our reduction goals for each of these sectors. We will also expand our GHG inventory to include neighborhood-level emissions. This will help us better understand the energy intensity of our neighborhoods, target policies to carbon-intensive areas, and provide communities with critical information to help them reduce their emissions.

While extending our practice of GHG measurement to the neighborhood level, we will also collaborate with other cities to refine the methods of GHG measurement and reporting. The science of estimating GHG emissions is an evolving one, with a variety of models and practices in use around the globe. New York City will remain at the forefront of that discipline, learning from practitioners in other cities while also sharing our own expertise.

CASE STUDY
Greenhouse Gas Mitigation

New York City is already one of the most energy efficient cities in the U.S. Each New Yorker is responsible for the emission of a third of the GHG generated by the average American. Our energy efficiency is due to both the high density of our built environment and our extensive public transit network. Despite this, we have the opportunity and responsibility to further reduce our energy consumption and GHG emissions.

In 2007, we set the goal of reducing the city's GHG emissions by 30% below 2005 levels by 2030. Our annual GHG inventory demonstrates that we are currently on-track to achieve that goal, having reduced citywide GHG emissions by 13% below 2005 levels in just four years.

Much of the reduction in our GHG emissions can be attributed to external effects. The carbon intensity of our electricity supply has decreased 26% since 2005. This decrease is due to new, more efficient power plants and an increase in the importation of renewable power made possible by a new electricity transmission line. Together, these changes to our electricity supply system are responsible for reducing our annual GHG emissions by 10%. Significant investment by Con Edison to reduce leaks of fugitive sulfur hexafluoride in its electricity transmission and distribution system has also lowered our emissions by 3%.

While external effects have been responsible for most of our GHG reductions to date, we also have seen that per capita electricity and heating fuel consumption have decreased. This means that New Yorkers are becoming more energy-efficient. However, to remain on track to achieve our GHG reduction goal, we must continue making significant reductions in per capita energy use. We cannot meet our goals by relying on the continued benefit of external effects such as weather or the carbon intensity of our electricity supply.

Our GHG mitigation strategies include measures to further reduce emissions from our energy supply, including fuel switching and increased use of renewables and cogeneration. Continued reduction of energy demand, reductions from new solid waste management strategies, and more sustainable transportation will ensure we meet our 30% reduction goal and continue on a path toward additional future reductions.

Climate Change Projections for New York City[1]

	BASELINE 1971-2000	2020s	2050s	2080s
Air Temperature[2]	55°F	+ 1.5 to 3°F	+ 3 to 5°F	+ 4 to 7.5°F
Precipitation[2]	46.5 in	+ 0 to 5%	+ 0 to 10%	+ 5 to 10%
Sea Level Rise[2,3]	NA	+ 2 to 5 in	+ 7 to 12 in	+ 12 to 23 in
Rapid Ice-Melt Sea Level Rise[4]	NA	+ 5 to 10 in	+ 19 to 29 in	+ 41 to 55 in
Number of Days Per Year With Temperature Over 90°F	14	23 to 29	29 to 45	37 to 64
1-in-100 Year Flood to Reoccur, On Average[5]	once every 100 years	once every 65 to 85 years	once every 35 to 55 years	once every 15 to 35 years

1 Based on 16 Global Climate Models (GCMs) (7 GCMs for Sea Level Rise) and three emissions scenarios. Baseline is 1971-2000 for temperature and precipitation and 2000-2004 for sea level rise. Data from National Weather Service (NWS) and National Oceanic and Atmospheric Administration (NOAA). Temperature data are from Central Park; precipitation data are the mean of the Central Park and La Guardia Airport values; and sea level data is from the Battery at the southern tip of Manhattan (the only location in NYC for which comprehensive historic sea level rise data are available).

2 Projections represent the middle 67% of values from model-based probabilities; temperatures ranges are rounded to the nearest half-degree, precipitation to the nearest 5%, and sea level rise to the nearest inch.

3 The model-based sea level rise projections may represent the range of possible outcomes less completely than the temperature and precipitation projections.

4 Rapid ice-melt scenario is based on acceleration of recent rates of ice melt in the Greenland and West Antarctic Ice sheets and paleoclimate studies.

5 Does not include the rapid ice-melt scenario.

Source: New York City Panel on Climate Change

Other Initiatives That Will Increase Our Climate Resilience

HOUSING AND NEIGHBORHOODS

- Foster the creation of Greener, Greater Communities
- Increase the sustainability of City-financed and public housing

PARKS AND PUBLIC SPACE

- Create a network of green corridors
- Plant one million trees
- Support ecological connectivity
- Incorporate sustainability through the design and maintenance of all public space

WATERWAYS

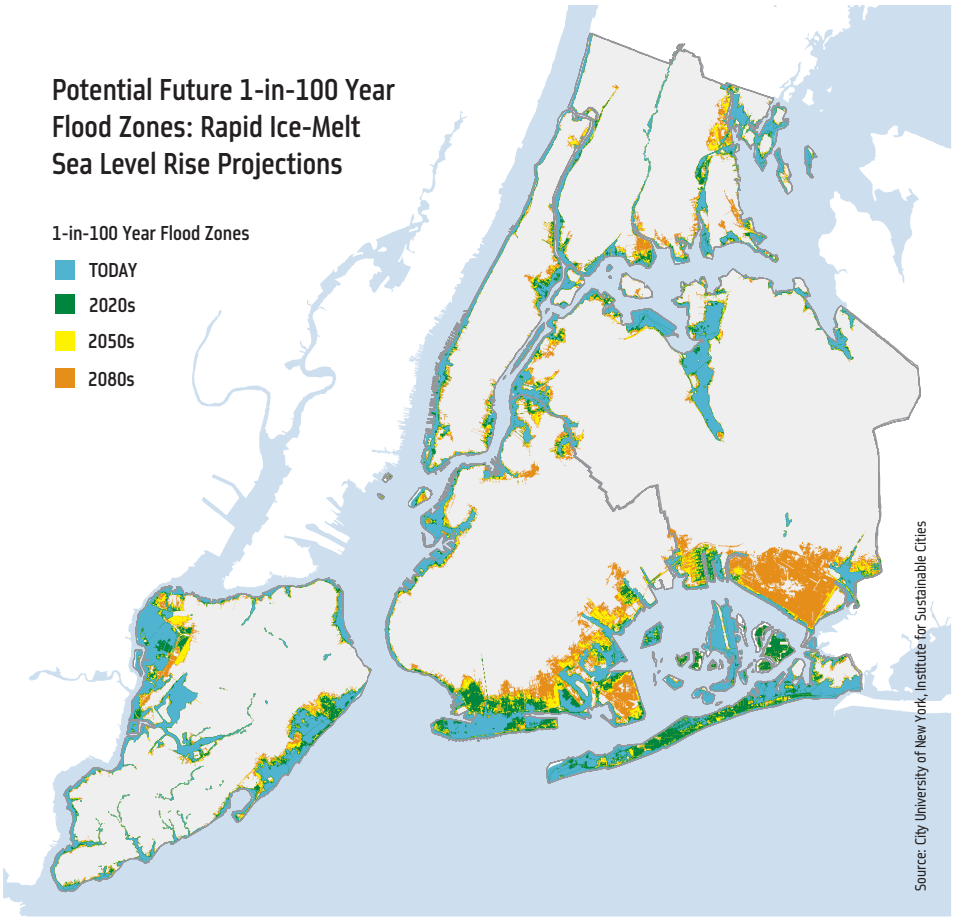
- Complete cost-effective grey infrastructure projects to reduce CSOs and improve water quality
- Expand the sewer network
- Optimize the existing sewer system
- Expand the Bluebelt program
- Build public green infrastructure projects
- Engage and enlist communities in sustainable stormwater management
- Provide incentives for green infrastructure
- Enhance wetlands protection
- Restore and create wetlands

WATER SUPPLY

- Maintain and upgrade dams
- Increase operational efficiency with new technology
- Increase water conservation

ENERGY

- Implement the Greener, Greater Buildings Plan
- Improve our codes and regulations to increase the sustainability of our buildings
- Improve compliance with the energy code and track green building improvements citywide
- Improve energy efficiency in smaller buildings
- Improve energy efficiency in historic buildings
- Provide energy efficiency financing and information
- Support cost-effective repowering or replacement of our most inefficient and costly in-city power plants
- Encourage the development of clean distributed generation
- Foster the market for renewable energy in New York City
- Ensure the reliability of New York City power delivery
- Develop a smarter and cleaner electric utility grid for New York City



INITIATIVE 2

Assess opportunities to further reduce greenhouse gas emissions by 80% by 2050

Our GHG reduction goal is ambitious, but it can be achieved using existing technology. The Intergovernmental Panel on Climate Change (IPCC) has determined that global GHG emissions need to be reduced by 60 to 80% below 1990 levels by 2050 to avoid the catastrophic effects of climate change. New York City can lead by example and demonstrate how to achieve this goal. That is why we will complete a study to determine potential strategies to reduce citywide GHG emissions by 80% below 2005 levels by 2050.

Assess vulnerabilities and risks from climate change

Even without longer-term climate change, New York City faces climate-related risks today. As currently mapped, more than 200,000 New Yorkers live within the Federal Emergency Management Agency (FEMA)-designated 1-in-100 year flood zone. Almost half a million New Yorkers live within the 1-in-500 year flood zone. These zones contain vibrant neighborhoods, critical infrastructure, natural resources, historical and cultural landmarks, and nearly 300,000 jobs.

Heat waves also have an impact on public health. People who are older, have heart or lung disease, and who are unable to escape the heat are at an increased risk of death during prolonged periods of hot and humid weather. We must act now to reduce the risks we face today and increase our resilience to climate change.

To do so, we must have a full understanding of the risks we face and the costs and benefits associated with efforts to build resilience. This will allow us to pursue and implement the most effective initiatives to protect our city, and ensure we remain able to prepare for, withstand, and respond to climate events and long-term changes. The information generated by this regular process will also allow us to monitor the effectiveness of our resilience strategies.

INITIATIVE 3

Regularly assess climate change projections

In 2008, we convened the New York City Panel on Climate Change (NPCC) to ensure that our climate resilience efforts were based on state-of-the-science information. Modeled on the IPCC, the NPCC consists of leading climate and impact scientists, academics, economists, and risk management, insurance, and legal experts.

The NPCC developed the first official climate change projections for New York City. A host of City, state, and federal agencies, public authorities, and private companies have adopted these projections to inform operations and infrastructure investments. The panel also developed recommendations on how to foster an effective, ongoing, and iterative climate resilience program. As our climate and the state of climate science continue to evolve, it is essential to re-evaluate our projections. We will institutionalize the NPCC and establish a process to regularly update its climate projections.

INITIATIVE 4

Partner with the Federal Emergency Management Agency (FEMA) to update Flood Insurance Rate Maps

FEMA's Flood Insurance Rate Maps (FIRMs) determine which properties participate in the National Flood Insurance Program (NFIP) and where new buildings must comply with floodproofing standards. These flood maps have not been significantly revised since 1983. We need to develop flood maps that better represent our current climate exposure to improve the risk management available through the NFIP. To support this need and other planning efforts, we acquired the most detailed three-dimensional elevation data ever gathered for New York City, known as LiDAR (light detection and ranging) data. We will work with FEMA to update our Digital Flood Insurance Rate Maps (DFIRMs) using these LiDAR data. The updated maps will reflect changes to our shoreline, built environment, and sea levels—which have already risen three inches since 1983.

INITIATIVE 5

Develop tools to measure the city's current and future climate exposure

We need to better evaluate the scope and scale of the risks we face, and measure the cost-effectiveness of various options for improving our resilience. We will create a climate risk assessment tool that quantifies our exposure and vulnerability to climate risks today and over time to prioritize investments, develop cost-benefit estimates for impacts and actions, and track our progress.

Just as our mitigation efforts to reduce our contribution to global GHG levels are driven by our GHG inventory, our resilience efforts to reduce our vulnerability to climate change will be driven by an assessment tool that allows us to take an informed, risk-based approach.

CASE STUDY

Governors Island

Situated in the heart of New York Harbor, Governors Island stood guard over New York City for almost 200 years. But this 172-acre island that has served as a fort and former U.S. Coast Guard base will need a new type of protection, not from hostile invaders but from a changing climate. The Trust for Governors Island (TGI) has developed and adopted a multi-phase, mixed-use development strategy to reactivate the island with the creation of a new 87-acre park and improved public spaces. These spaces have been designed specifically to increase the island's resilience to climate change.

The key challenge for TGI and the design team was addressing existing site conditions to ensure that the new green spaces could thrive for generations. Much of the site is flat landfill and lies below the elevation of where the NPCC projects the 1-in-100-year flood level could be in 2100.

Rising sea levels, along with intensified coastal storms, are expected to cause more severe and more frequent flooding. This poses a particular threat to the trees on Governors Island that depend on salt-free groundwater. The design addresses this danger by raising the root levels of the island's new trees above projected flood zones using both subtle and dramatic changes in topography. A significant portion of the new parkland will be raised and shaped around the elevation of the projected 1-in-100-year flood.

Areas of the new parkland left at-grade in the projected flood zone will feature plants that can thrive on brackish groundwater, and more than 1,300 new trees will be planted. Plant and tree selection will focus on both native and locally adapted species expected to thrive as temperature ranges in the region rise.

Replacing more than 19 acres of impervious paved surface with lawn, plantings, and permeable paving will improve stormwater management on the site. The reduction of asphalt area and the substantial planting of trees will also help decrease the city's urban heat island effect.

Visitors to Governors Island will experience this integrated design in a park enhanced with harbor views, shade, and natural habitat that will ensure its longevity.

Rendering of future Governors Island Park

The development of models and flood maps that reflect likely sea level rise scenarios will be a key step in this effort. We will develop an updated digital elevation model using our new LiDAR data to promote more accurate sea level rise modeling. We will also launch an effort to develop publicly-available projected flood maps that incorporate sea level rise projections for planning purposes. These maps will help government agencies, private companies, and communities begin planning for sea level rise.

Increase the resilience of the city's built and natural environments

New York City faces real and significant risks from climate change. As a city with more than 520 miles of coastline—the most of any city in America—the potential for more frequent and intense coastal storms with increased impacts due to a rise in sea level is a serious threat to New York City. This threat, in various forms, touches every part of the city, not just waterfront areas.

Our population density can often amplify the impacts of climate events, such as flooding and heat waves. Our extensive physical infrastructure—including more than 700 miles of subways, 90,000 miles of underground power cables, 14 wastewater treatment plants, and 2,000 bridges and tunnels—is aging. It is often immovable and was built for different environmental conditions than it is likely to face in the future.

Our natural systems, including the 5.2 million trees and more than 6,000 acres of wetlands in the city, are already stressed from being in an urban environment. They will be further strained by rising temperatures, precipitation changes, and rising sea levels.

By updating our codes and standards, working with regional infrastructure operators to implement resilience strategies, and partnering with the insurance industry to promote flood protection, we can create a more resilient city.

INITIATIVE 6

Update regulations to increase the resilience of buildings

Our existing building stock was not built to standards that anticipated changes to our climate. However, as new buildings are constructed, we can ensure that they are able to better withstand flooding, temperature extremes, and other conditions by updating local laws and zoning regulations.

Our current building code requires that new buildings in the FEMA 1-in-100-year flood zone elevate occupied space above the FEMA-designated flood level (the base flood elevation). Significantly lower federal flood insurance rates are available to buildings that further raise this space by one or two feet—an approach known as "freeboard." We currently require freeboard for critical buildings in flood zones such as hospitals, utility facilities, public safety facilities, and schools. For other types of buildings, use of freeboard is voluntary, though in some locations zoning height limits can restrict a building from providing freeboard.

More extensive use of freeboard can help property owners manage risk, but may also change the character of buildings and the streetscape. We will conduct a study of the urban design and streetscape implications of freeboard to ensure we can maintain the city's active street life and vibrant character while enhancing our resilience.

On the basis of this analysis, we will explore amendments to the Zoning Resolution. We will also pursue amendments to the Building Code to require freeboard for a wider range of buildings to reduce risks associated with sea level rise and more intense coastal storms.

New York City's Waterfront Revitalization Program (WRP) establishes policies for the development and use of the city's waterfront. It provides a framework for evaluating whether certain

CASE STUDY

DEP's Climate Change Program

Climate change may have an impact on our water supply and treatment systems as more frequent and intense storms may increase the amount of sediment that washes into our unfiltered water supply and place additional burdens on our drainage and wastewater treatment systems. Warmer weather could affect the amount of snowpack and timing of snowmelt, which could change the flow of water into our reservoirs.

Today, the Department of Environmental Protection (DEP) is actively implementing its Climate Change Program Assessment and Action Plan, assessing the potential impact of climate change on our water infrastructure and identifying areas that need further study. The projections developed by the NPCC are being used to formulate climate change impact scenarios that can help agencies like DEP determine which parts of the system will be most impacted.

Some of the investments DEP is making now—such as the Croton Water Filtration Plant—will filter the sediments that enter our water supply after storms. Other projects—such as the repair of the Delaware Aqueduct—will increase system redundancy and operational flexibility.

Bowery Bay Wastewater Treatment Plant

DEP is also improving the efficiency of the sewer system, especially in areas prone to flooding, sewer backups, and combined sewer overflows. The agency is developing a stormwater drainage strategy to ensure that design criteria and infrastructure investments minimize the risks associated with population growth and increased rainfall intensity. This study will consider impacts at wastewater treatment plants and strategies to make our infrastructure more resilient to climate change, such as raising elevations of equipment above projected flood heights.

The initiatives DEP is pursuing maximize synergies and minimize tradeoffs among energy, air, water, land, and climate policies. As such, infrastructure investments and programs that achieve multiple benefits—including climate resilience—have become central to DEP's decision-making process.

actions in the coastal zone, the area between the shoreline and approximately 500 feet inland, are consistent with City policies. To ensure that such actions are consistent with our resilience efforts, we will incorporate consideration of climate change within the policies of the WRP.

The projected effects of sea level rise and coastal flooding demand concerted attention. However, our buildings are also at risk from many other climate change effects. To increase our resilience to climate change effects other than coastal flooding, we will launch a study of the effects of rising water tables, inland flooding, wind, and extreme heat events on buildings.

INITIATIVE 7

Work with the insurance industry to develop strategies to encourage the use of flood protections in buildings

Developing new FEMA flood insurance maps will allow us to provide the most current, accurate assessments of properties in New York City that are at risk of flooding. However, climate change projections indicate that future flood risks may extend well beyond FEMA's flood zones. To increase our resilience to current and future flood risks, we will work with the insurance industry to explore measures to promote flood protection in areas that may be subject to flooding based on climate forecasts. An important focus of this effort will be to understand the current state of flood insurance protection in the city, both within and outside current flood zones.

INITIATIVE 8

Protect New York City's critical infrastructure

The city's infrastructure systems—the transportation of people and goods, the delivery of energy and water, the handling of wastewater and solid waste—are vast and complex. They are critical to our ability to function effectively, and they require constant investment to maintain as the city grows and undertakes new development projects.

In 2008, we launched the New York City Climate Change Adaptation Task Force (Task Force), which is composed of 40 public and private entities that operate or regulate critical infrastructure in the city. The Task Force's mission is to assess how climate change could impact our infrastructure and to develop measures to increase the city's climate resilience.

The Task Force identified more than 100 types of transportation, energy, water and sewer, solid waste, telecommunications, and natural infrastructure that climate change could impact. The Task Force will use this initial assessment to develop coordinated strategies to increase the resilience of the region's infrastructure. These strategies include changes to standard capital and maintenance processes.

We will work with the Task Force to complete its assessment and begin to implement its recommendations. As our understanding of climate change and its impacts is always evolving, we will expand the focus of the Task Force to include public health and safety services and periodically reassess our inventory of at-risk infrastructure and resilience strategies.

In addition, changes to the design specifications and standards that govern our infrastructure will ensure that all elements of these systems are built to be as climate-resilient as possible. As a first step in this process, we will assess the opportunities for the incorporation of climate change projections into design specifications and standards for critical infrastructure.

INITIATIVE 9

Identify and evaluate citywide coastal protective measures

As a city with a high density of population living in coastal areas, we must reduce our exposure to coastal storms and flooding. Many possible solutions exist to increase our resilience.

Both structural and non-structural measures protect buildings or shorelines from erosion, prevent flooding, or reduce wave and tidal action. In the Netherlands, Rotterdam has built a system of massive sea walls and storm surge barriers that work in conjunction with a network of dykes, levees, pumping facilities, and building-scale measures to protect the city from flooding. In Germany, Hamburg has developed HafenCity, a neighborhood that is designed to flood periodically to accommodate rising water without causing substantial damage or inconvenience. The approaches used in different cities address both their specific vulnerabilities and the specific opportunities available to them.

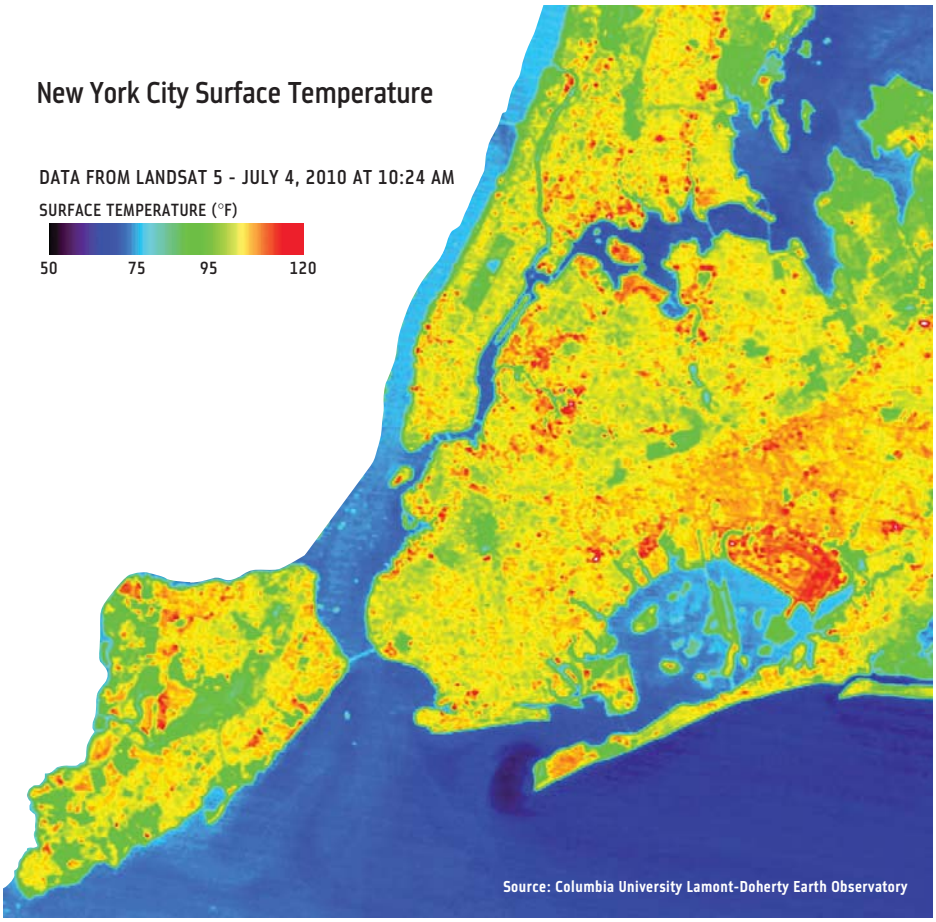
Increasing our climate resilience in coastal areas will require us to consider both traditional and new, more creative solutions. One example is the *On the Water: Palisade Bay* project by Guy Nordenson, Catherine Seavitt, and Adam Yarinsky, which examined options for storm surge attenuation in Upper New York Harbor using soft infrastructure such as constructed wetlands. We will create an inventory of strategies, from wave attenuators to soft edges, to enhance climate resilience on New York City's extensive and varied waterfront. We will work with academic institutions, scientists, engineers, and designers to develop pilot projects and evaluate their potential costs and benefits.

Protect public health from the effects of climate change

Increasing the resilience of our built and natural environments will help protect New Yorkers, but climate change poses risks beyond our infrastructure and buildings. Warmer temperatures, more frequent and intense heat waves, intense precipitation, and coastal flooding all have significant impacts on public health. This is particularly true for populations with pre-existing health conditions. We must better understand the health risks posed by climate change for New Yorkers and take steps to mitigate these risks.

INITIATIVE 10
Mitigate the urban heat island effect

In densely built cities such as New York City, pavement and the surfaces of buildings produce what is known as the urban heat island effect. Both store and radiate the sun's heat energy, leading to conditions in which air temperatures are often several degrees warmer in cities than in the surrounding suburbs. In some instances, New York City's air temperature can be more than seven degrees Fahrenheit warmer than in neighboring counties.



We are already taking many steps to cool New York City. We are increasing our vegetated surface area through planting one million more trees, constructing green infrastructure to manage stormwater, and incentivizing the installation of green roofs.

A contributing factor to the urban heat island effect is the city's many dark-colored roofs, which absorb the sun's heat. A white or "cool" roof reflects much of the sun's energy, reducing air temperatures and the energy required to air condition the building. Cool roofs can lower air pollution and GHG emissions by reducing electricity demand, and often save building owners and tenants money through reduced energy bills. They also prolong the life expectancy of the building's roof and cooling equipment.

Through the NYC °CoolRoofs program, we have already coated more than one million square feet of roofs white, largely through the efforts of NYC Service volunteers. We will expand this effort to coat an additional two million square feet of roofs with cool coating by 2013, further mitigating the urban heat island effect. We will also pursue a cool roof requirement for existing buildings, resulting in all flat roofs in the city having a cool coating by 2030.

The urban heat island effect is not uniform throughout the city. Models using remote sensing technology data have demonstrated that air temperatures in areas with a higher percentage of paved surfaces, such as airports, can be almost nine degrees Fahrenheit warmer than areas with greater vegetated cover, such as parks. Because some communities are more affected by the urban heat island effect than others, we will work with neighborhoods most impacted to develop and implement community-specific strategies. Similar to our Trees for Public Health program, which focuses tree planting efforts on neighborhoods with low tree cover and high asthma rates, this approach will ensure that our efforts target communities most in need.

INITIATIVE 11
Enhance our understanding of the impacts of climate change on public health

The effects of climate change—including rising temperatures and declining air quality—have the potential to significantly affect New Yorkers' health. Recognizing this, we launched a program in 2010 funded by the United States Centers for Disease Control and Prevention (CDC) to assess the impacts of climate change on public health, including impacts to our public health system infrastructure.

Mayor Bloomberg and NYC Service volunteers applying a cool roof coating

Through this program, we will evaluate the public health impacts of climate-related events. We will identify opportunities and gaps in adapting to a changing climate, outline strategies for fostering climate resilience (particularly among vulnerable New Yorkers), and devise outreach strategies to protect communities from the public health impacts of climate change.

Increase the city's preparedness for extreme climate events

Many effects of climate change may be gradual and occur over the long-term. However, the NPCC projects that extreme events are likely to become more frequent and intense in the near future. Within the next 20 years, we could face twice as many heat waves as we do now, and the current 1-in-100 year flood could reoccur on average once every 65 to 80 years.

New York City already has one of the world's leading local emergency management departments, capable of planning for and responding to climate-related events. Ensuring the continued ability to plan for and respond to these emergencies requires that climate change be considered in all relevant emergency management planning decisions.

INITIATIVE 12
Integrate climate change projections into emergency management and preparedness

Recognizing that New York City faces climate-related risks today that are likely to get worse, we have already developed a number of plans to prepare for and respond to extreme climate events, including our Natural Hazard Mitigation Plan, Coastal Storm Plan, Heat Emergency Plan, Debris Management Plan, Power Disruption Plan, Winter Weather Emergency Plan, and Flash Flood Emergency Plan. To continue to prepare for and respond to climate-related emergencies as effectively as possible, we will integrate climate change projections into our emergency management and preparedness plans and procedures as they are regularly updated. We will also launch a process to include climate change as a hazard assessed under the Natural Hazard Mitigation Plan, which will be updated in 2014.

Create resilient communities though public information and outreach

New York City is a large, complex city that has demonstrated its ability to remain strong in the face of adversity. The effects of climate change will bring new challenges to our city in coming decades and require that our communities are well-informed and prepared to accommodate and respond to climate change effects. To accomplish this, we will develop and implement a public information and outreach program.

INITIATIVE 13
Work with communities to increase their climate resilience

Increasing the climate resilience of our communities requires developing information and making it publicly available. We can both communicate the risks communities face and inform them of opportunities to reduce their risk exposure.

We will increase climate resilience by ensuring that current outreach efforts target appropriate communities and provide up-to-date climate risk information. In fact, Ready New York is a program that already provides information to residents at more than 500 events per year, and Notify NYC, a public warning system, sends emergency alerts directly to residents by email, text message, or telephone. We are helping people prepare for and respond to emergencies, including coastal storms, flash flooding, and extreme heat. We will incorporate the risks posed by climate change into these efforts and continue to engage New Yorkers to enhance their resilience to extreme events. We will also create an online portal and other materials that will include the latest NPCC climate projections, projected flood maps, and tools to increase the climate resilience of homes and businesses.

Flooding from coastal storms presents many risks, including structural damage to buildings and infrastructure. This damage can be made worse if structures containing hazardous materials are breached by floodwaters. To better enable community resilience planning, we will improve access to publicly available data on the locations of hazardous material storage in flood zones throughout the city.

Conclusion

New York City is one of the most energy-efficient cities in the world. We have made significant progress toward increasing this energy efficiency and further reducing our GHG emissions. We have also begun preparing our city for the serious consequences of climate change.

The promise of a greener, greater New York will only be met if we recognize the seriousness of the challenges before us and our responsibility to meet them. A comprehensive climate change strategy requires equal attention to both mitigating GHG emissions and building climate resilience. Together, our efforts to address climate change on both fronts will allow us to remain strong for many years to come.

Reducing the risks posed by climate change will not be achieved through a single plan or action—it must be achieved through an ongoing planning process that is responsive to the latest scientific information and a thorough understanding of the potential costs and benefits of our actions. Our strategy will remain flexible so it can be adapted to changing needs, but we are taking steps now that have tangible benefits today and will have even greater benefits as the climate changes.

Cross-Cutting Topics

The elements of a greener, greater New York can't all be pigeon-holed neatly into the distinct chapters of this document. Indeed that's the value of an integrated plan: all the elements are related, and taken together add up to more than the sum of its parts—just like New York City does.

For example, more efficient green buildings are part of our energy strategies because buildings are the largest component of New York's demand for energy. Yet green buildings also have a positive impact on stormwater capture, so they're part of our strategies to make our waterways cleaner too. Likewise, our initiatives to improve water quality also have positive implications for swimming and kayaking, healthy pastimes which relate to our parks and public space initiatives—and those initiatives, just like our transportation initiatives encouraging more walking and biking or our air quality initiatives to reduce particulate matter emissions, will improve public health. Finally, of course, everything we do should contribute to our residents' financial well-being. It's all related.

In this section we highlight some of the topics that you've already found woven throughout other chapters of the Plan.

Public Health

INITIATIVES **Water Supply** • Continue the Watershed Protection Program • Protect the water supply from hydrofracking for natural gas | **Transportation** • Make bicycling safer and more convenient • Pilot technology and pricing-based mechanisms to reduce traffic congestion • Enhance pedestrian access and safety • Reduce truck congestion on our streets • Improve freight movement | **Energy** • Implement the Greener Greater Buildings Plan • Improve our codes and regulations to increase the sustainability of our buildings • Support cost-effective re-powering of our most inefficient and costly in-city power plants • Increase natural gas transmission capacity to improve reliability, reduce prices, and encourage conversion from dirty fuels • Develop a smarter and cleaner utility grid for New York City | **Air Quality** • Reduce emissions from taxis, black cars, and for-hire vehicles • Facilitate the adoption of electric vehicles • Reduce, replace, retrofit, and refuel vehicles • Monitor and model neighborhood-level air quality • Reduce illegal Idling • Retrofit ferries and promote the use of cleaner fuels • Work with the Port Authority to implement the Clean Port Strategy for the Port of New York and New Jersey • Promote the use of cleaner-burning heating fuels • Update our codes and regulations to improve indoor air quality • Update our air quality code | **Solid Waste** • Remove toxic materials from the general waste stream • Reduce the impact of the waste system in communities by shifting to rail and barge export | **Climate Change** • Develop tools to measure the city's current and future climate exposure • Protect New York City's critical infrastructure • Mitigate the urban heat island effect • Enhance our understanding of the impacts of climate change on public health • Integrate climate change projections into emergency management and preparedness • Work with communities to increase their climate resilience

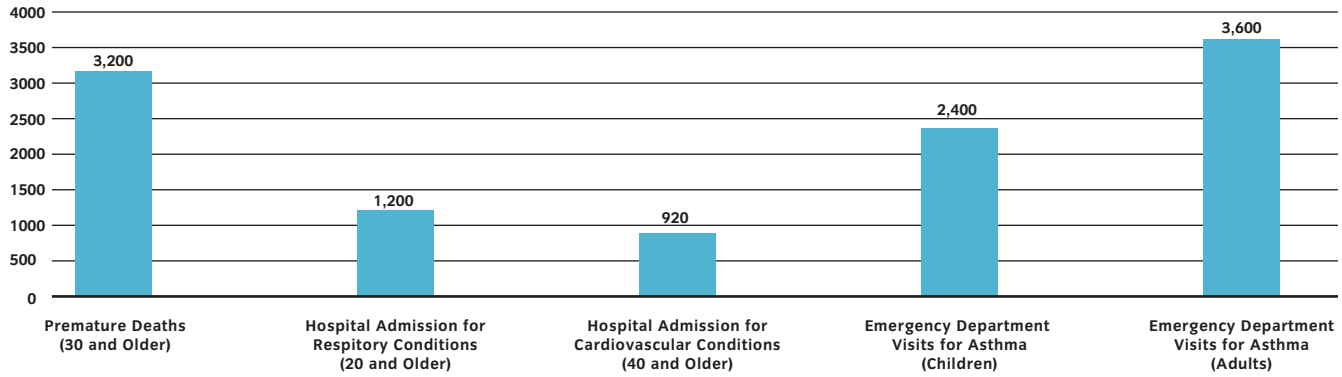
New York City is one of the healthiest cities in the United States, with a life expectancy that exceeds the national average. This achievement is the result of visionary planning and sustained investment. New York City passed the nation's first zoning ordinance to separate people from noxious land uses; led the nation's sanitary movement to bring air, light, and indoor plumbing to housing; and mandated street and waste sanitation. The City built a water supply system that ensures the purity of our drinking water and a public transportation system that substantially reduces our air pollution.

Despite these successes, health challenges remain—and new ones are emerging—that require creative, modern shifts in how the city operates. Many of PlaNYC's initiatives advance the cause of public health by improving our air, water, and buildings and enable us to live healthier lives, building upon and supporting Take Care New York, the City's action plan to promote health.

Our goal to achieve the cleanest air quality of any big U.S. city targets one of the greatest threats to public health in New York City: air pollution. Particulate matter from dirty heating oil combustion, vehicle engines, power plants, and other building sources contribute substantially to respiratory and cardiovascular illness and premature death each year. And the burden is borne disproportionately by the city's oldest and youngest, lower-income, and more vulnerable populations. By cleaning our heating fuels and power supply; expanding public transit access and use; shifting vehicles to natural gas, hybrid, or electric propulsion; and enhancing our natural environment with more trees; we will improve our air quality and reduce the threat it poses to public health. Achieving our air quality goal will save more than 700 lives, 500 hospitalizations, and 1,400 emergency room visits each year.

Cities can be healthier than suburbs and rural communities, but they are also hotter. Our paved surfaces, tarred roofs, and densely clustered buildings retain heat, creating an urban heat island effect; in some cases our city's temperature can be

Number of Events Attributable to PM 2.5 Levels Per Year



Source: NYC Dept. of Health and Mental Hygiene

up to 7 degrees hotter than the surrounding counties. Climate change is also expected to bring more frequent and severe heat waves. Heat, especially for residents already weakened by illness, age, or immobility, can be deadly. Climate change also threatens to increase the risk of mosquito and other insect-borne illnesses, the frequency and severity of flooding, and the decay of critical infrastructure. We will plan for these emerging threats by studying their impacts, implementing measures to reduce the urban heat island effect, and improving the City's preparedness for extreme climate events.

A good part of being able to protect and improve our health depends on the choices we make as individuals. Healthy and moderate eating, active living, and regular physical activity prolong both the quality and duration of life. But in some neighborhoods, the opportunities to make these healthy choices are restricted—where access to healthy food or safe exercise and play space is limited.

To improve food access, we will promote the creation of healthy food retail options in targeted neighborhoods, facilitate the development of new grocery stores through land use policy, identify sites with potential for urban agriculture, and encourage the development of community gardens.

We will improve access to quality exercise and play space by targeting under-served neighborhoods with Schoolyards to Playground sites, continuing to improve the quality of sports fields and extending their operating hours, and developing destination-level parks in every borough, on former landfills, and along our waterfront.

We can also improve health in the way we get around our city. By promoting public transportation, pedestrian plazas, safe walking routes, and calming and reducing vehicular traffic, we will encourage more and safer walking and physical activity. By piloting a bike-sharing program, improving bicycle parking, and completing our citywide bike route network, more people will enjoy the health benefits of safe cycling.

PlaNYC sets out a comprehensive plan to make New York's land, water, and air cleaner and safer. By building a more sustainable city, PlaNYC also advances the goal of maintaining and improving the health of New Yorkers.

Food

INITIATIVES **Housing and Neighborhoods** • Promote walkable destinations for retail and other services | **Parks and Public Space** • Facilitate urban agriculture and community gardening | **Brownfields** • Promote green space on remediated brownfield properties | **Water Supply** • Continue the Watershed Protection Program | **Transportation** • Improve freight movement | **Solid Waste** • Promote waste prevention opportunities • Create additional opportunities to recover organic material • Revise City procurement practices to reduce solid waste • Improve the City government's diversion rate

Healthy, sustainable food systems are critical to the well-being of our communities and central to our ability to accommodate a growing population. Yet food presents a unique planning challenge; unlike sewers or streets, much of New York City's food systems infrastructure is privately owned and shaped by the tastes and decisions of millions of individual consumers. These complicated and inter-related subsystems aren't easily understood or influenced, even by concerted municipal interventions. Furthermore, many of food's most significant climate and environmental impacts are associated with food production, most of which takes place outside the city, and shaped by federal policy. Nonetheless, our food systems intersect with several areas addressed by PlaNYC. Improving the distribution and disposal of food within New York City and increasing access to healthy food will not only benefit the environment, it can also have positive public health and economic impacts.

We are developing a multi-faceted strategy to increase access to affordable and healthy foods and reduce the environmental and climate impacts of food production, distribution, consumption, and disposal.

On food production, we will survey municipal lands to identify underutilized properties that may be suitable for urban agriculture or community gardens. We will continue facilitating agriculture projects at publicly-owned sites by planting 129 new community gardens on New York City Housing Authority land and promoting school gardens through Grow to Learn NYC, our citywide school gardens initiative. We will also review existing regulations and laws to identify and remove unnecessary barriers to creating community gardens and urban farms. In some cases, remediated brownfield sites also present an opportunity for community gardens, and we will design state-of-the-art protective measures that allow community gardens to grow on remediated sites. Through our Watershed Protection Program we will continue to work with farmers in our watershed to minimize the use of fertilizer and adopt sustainable agriculture practices.

We are working to better understand how we can improve the distribution of food into and around the city. As a first step, we will work with the City Council to analyze our foodshed and evaluate the environmental effects of our food systems. Redeveloping the Hunts Point Terminal Produce Market, the largest wholesale produce distribution center in the world, will significantly impact food distribution, so we will work to facilitate the re-design of the Hunts Point Terminal Produce Market to improve its functionality.

Our strategies to create more sustainable communities will promote access to, and consumption of, fresh and healthy food. We will facilitate the creation of 300 healthy food retail options in underserved areas of the city and identify additional zoning amendments to expand the FRESH program to incentivize the development of grocery stores in neighborhoods with food access needs. We will continue using City-owned land to foster entrepreneurship in food retail and processing.

Better management of food waste can save money and reduce the environmental cost of food disposal. Food scraps make up 18% of New York City's residential solid waste stream, and we estimate that food waste composes 11% of commercial solid waste not including construction and demolition fill. We will create additional opportunities to recover organic materials including food scraps, yellow grease, and yard waste at community and commercial levels. We will also pursue energy-generating projects such as food waste diversion at the Hunts Point Food Distribution Center.

In addition to its work supporting the initiatives in PlaNYC, our Office of the Food Policy Coordinator facilitates other citywide programs to improve our food environment, address diet-related diseases, and combat food insecurity. New York City has led public health initiatives like calorie labeling on menus and banning trans fats in restaurants. We have also set pioneering nutritional standards for food served in City agencies and schools.

We cannot create a greener, greater New York without systems that make healthy food available to residents and dispose of food waste in ways that reduce its environmental impact. The food-related initiatives within the Plan will improve the long-term health of individual New Yorkers while strengthening our economy and environment.

Natural Systems

INITIATIVES **Parks and Public Space** • Facilitate urban agriculture and community gardening • Create a network of green corridors • Plant one million trees • Conserve natural areas • Support ecological connectivity • Incorporate sustainability through the design and maintenance of all public space | **Brownfields** • Promote green remediation in the NYC Brownfield Cleanup Program • Promote green space on remediated brownfield properties | **Waterways** • Expand the Bluebelt program • Build public green infrastructure projects • Engage and enlist communities in sustainable stormwater management • Modify codes to increase the capture of stormwater • Provide incentives for green infrastructure • Enhance wetlands protection • Restore and create wetlands • Improve wetland mitigation • Improve habitat for aquatic species | **Water Supply** • Continue the Watershed Protection Program • Protect the water supply from hydrofracking for natural gas | **Energy** • Improve our codes and regulations to increase the sustainability of our buildings | **Solid Waste** • Create additional opportunities to recover organic material | **Climate Change** • Identify and evaluate citywide coastal protective measures

Situated on a great tidal estuary, sculpted with gentle hills and rocky outcroppings, and conditioned by four distinct seasons, the natural biodiversity of New York City is sometimes hidden in plain sight. We might not even notice the gull-billed tern pausing for rest in Jamaica Bay, or the red-tailed hawk browsing for prey in Riverdale, but the clean water and hospitable trees they depend on are basic elements of our quality of life. The beaver or alewife herring tentatively returning to the Bronx River may be a modern novelty, but their presence can become a living lesson for school children in adjoining neighborhoods, who are also starting to explore that waterway for the first time in generations.

Building New York involved leveling hills, filling wetlands, burying springs and streams, and felling trees and vegetation. One of the most productive oyster beds in the world was eradicated by pollution in our harbor. While we built a great city, in some cases we also paid an unknown price for burying nature beneath our streets and buildings. Many of the natural systems that we discarded performed essential functions. The trees and vegetation allowed the rain to percolate into the soil; now we spend billions of dollars on concrete detention tanks and grey infrastructure to prevent flooding. The wetlands protected our coasts, cleaned our waters, and provided habitat for fish and shellfish; now our coastline is developed with seawalls and jetties, and we import our fish from ever-distant waters. The trees and vegetation provided shade and free cooling; now we dash from air-conditioned space to air-conditioned space to escape the sweltering summer heat.

Yet our forbearers also replicated fragments of nature in manicured patches which are today among our most cherished places in the city. And in recent decades, our view of the relationship between city and nature has begun to shift and the edges blur. We have a better understanding of how natural systems moderate climate, manage water, and protect our coasts. We also have a greater ability to engineer such systems within an urban setting. We now place a higher value on preserving and reconstructing native habitats and species and on the importance of human contact with nature.

New York City will always be a decidedly urban place, but increasingly we will discover that fragments and functions of nature are not always a contradiction to urbanity. Nature is finding a new place in the city, not only in parks or yards, but if we stop, breathe, and look in the trees along our streets, perhaps in the vegetation which increasingly caps our roofs, and in the waters along our shore. Narrow strands of continuous natural fabric are being woven into one of the most densely-settled human habitation in the nation. This new recognition of urban nature represents a continuum, from areas that are truly wild, to highly engineered bio-systems that recreate the functions of old natural systems within the constraints of the modern city.

Regenerating our natural systems is a strategy that crosses traditional bureaucratic and jurisdictional boundaries and provides multiple, overlapping benefits. Infrastructure like advanced tree pits, Greenstreet plantings, and porous pavements will help restore the ecological health of our harbor by allowing rain water to seep into the soil or evaporate instead of flowing into our wastewater treatment plants. Replacing asphalt and concrete infrastructure where it's practical to do so also provides natural cooling, accessible recreation spaces, and a more pleasant pedestrian experience. Similarly, restoring our wetlands and providing habitat for birds, fish, and other aquatic life will restore the ability of these ecosystems to retain storm water, clean our waterways, and protect us from storm surges.

The more than nine million people and the uncounted other species who will share our city in 2030 deserve the range of natural and recreational experiences provided by programs like MillionTreesNYC, our green infrastructure plan, and the expansion and enhancement of our parks and rooftops. We have learned that protecting and enhancing the natural systems, visible and invisible, within our city are critical to achieving our goals for a greener, greater New York. But these systems will do more than clean our harbor and provide us with parkland. They will transform the urban experience into one that includes a rich interaction with nature, which in turn reminds us that we are human.

Green Building

INITIATIVES **Housing and Neighborhoods** • Increase the sustainability of City-financed and public housing • Preserve and upgrade affordable housing | **Parks and Public Space** • Support ecological connectivity • Incorporate sustainability through the design and maintenance of all public space | **Waterways** • Build public green infrastructure projects • Engage and enlist communities in sustainable stormwater management • Modify codes to increase the capture of stormwater • Provide incentives for green infrastructure | **Water Supply** • Increase operational efficiency with new technology • Increase water conservation | **Energy** • Implement the Greener, Greater Buildings Plan • Improve our codes and regulations to increase the sustainability of our buildings • Improve compliance with the energy code and track green building improvements citywide • Improve energy efficiency in smaller buildings • Improve energy efficiency in historic buildings • Provide energy efficiency financing and information • Create a 21st century energy efficiency workforce • Make New York City a knowledge center for energy efficiency and emerging energy strategies • Provide energy efficiency leadership in City government buildings and operations • Expand the Mayor's Carbon Challenge to new sectors | **Air Quality** • Promote the use of cleaner-burning heating fuels • Update our codes and regulations to improve indoor air quality | **Solid Waste** • Promote waste prevention opportunities • Improve the convenience and ease of recycling • Revise City codes and regulations to reduce construction and demolition waste • Identify additional markets for recycled materials • Remove toxic materials from the general waste stream | **Climate Change** • Assess opportunities to further reduce greenhouse gas emissions by 80% by 2050 • Partner with the Federal Emergency Management Agency (FEMA) to regularly update Flood Insurance Rate Maps • Update regulations to increase the resilience of buildings • Work with the insurance industry to develop strategies to encourage the use of flood protection in buildings • Protect New York City's critical infrastructure • Mitigate the urban heat island effect

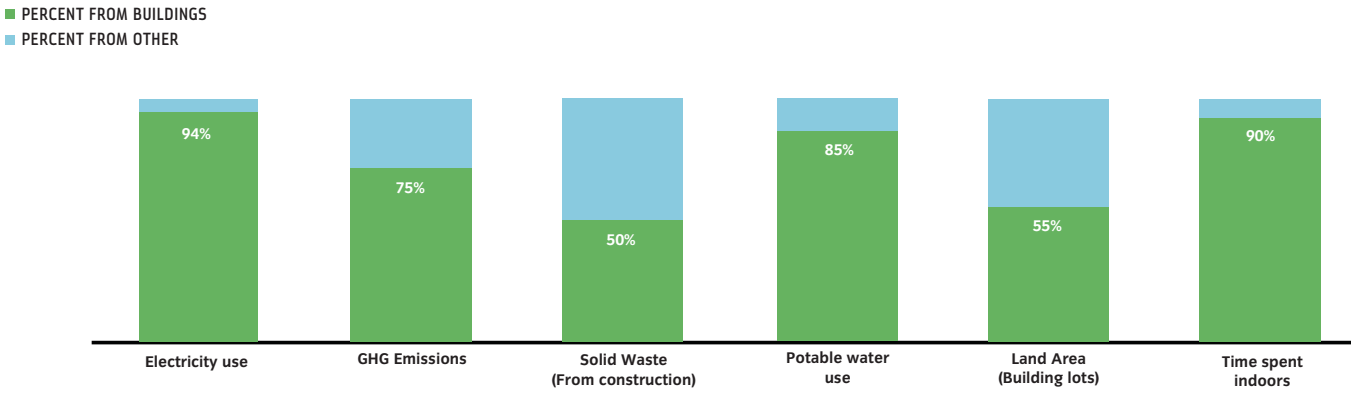
In days past, buildings were made out of natural, locally available materials and designed to take advantage of daylight and natural ventilation. Abundant cheap energy, electric lighting, plentiful water supplies, and innovative new building products dramatically changed building design and construction. Inexpensive energy made it possible to design buildings without considering the direction of the sun, winds, or other local conditions.

Because of these changes, the construction and operation of our buildings now strain much of our energy and water supplies, generate much of our waste, and sometimes expose us to toxic materials. In New York City, energy used in buildings accounts for 75% of our greenhouse gas emissions and 85% of our water use. At least half of our solid waste is construction and demolition debris, some of which we throw away even as new buildings are requiring the use of newly-mined or harvested resources. By finding better ways to use and reuse materials in buildings, from construction to demolition, we can significantly improve our environment.

Green building, a discipline that has emerged over the last several decades, aims to improve the impact of buildings on the environment and our health. An integrated design process that considers the interaction between form, climate, site, and building systems, green building practices have multiple benefits. They include improving indoor and outdoor air quality, increasing water conservation, and reducing waste.

Implementing green building practices throughout New York City's one million buildings takes the commitment of both the public and private sectors. For the 6.5% of the building square footage that is owned and operated by the City, we will pilot

Impact of Buildings in New York City



Source: Mayor's Office; NYC Dept. of Environmental Protection; NYC Dept. of Sanitation; U.S. Environmental Protection Agency

new strategies and establish more stringent standards for ourselves. To bring green building practices to private buildings, we will use the City's building codes and regulations to raise standards across the board.

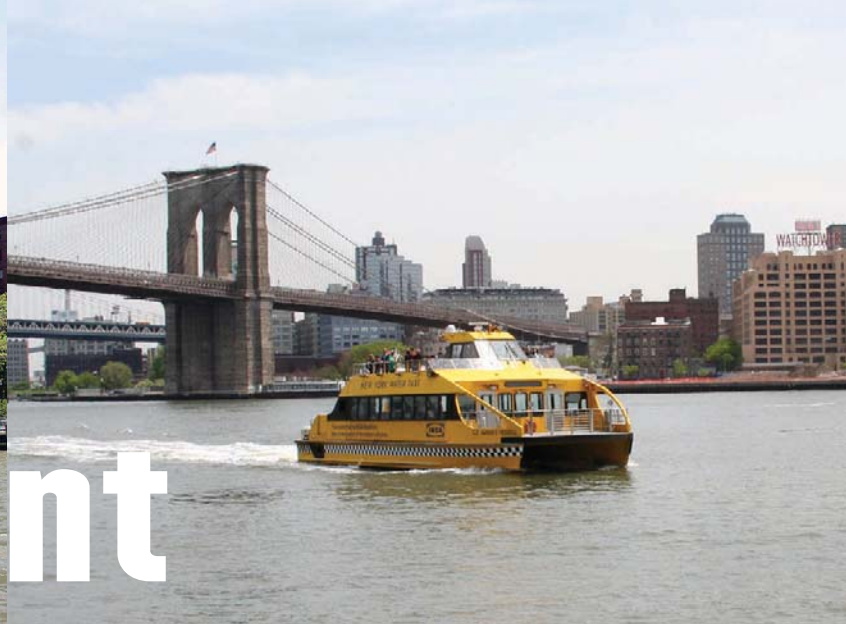
The New York City Green Codes Task Force, composed of over 200 building experts, reviewed the City's codes and regulations. The task force developed proposals on topics from site design to energy and water conservation, as well as new issues like making our buildings more resilient to climate change. Many of PlaNYC's initiatives to improve the efficiency of our buildings are derived from this task force's ideas.

Through many other initiatives ranging from piloting deep energy retrofits in City projects to the comprehensive tracking of progress in greening the city's buildings, we will make our buildings more energy-efficient, reduce operating expenses, and cut our greenhouse gas emissions.

Green building practices improve the relationship between buildings and their surroundings, thereby reducing the impact of buildings on municipal infrastructure. Our initiatives for handling stormwater, increasing recycling, improving indoor air quality, accommodating more active transportation, and expanding the city's vegetative cover all align with various green building techniques.

To achieve many of our objectives, we must keep New York's buildings industry at the forefront of innovation and address the life cycle of our buildings—how they are constructed, how they are operated and what happens when they are torn down. In addition to the initiatives in the plan, the City recently released the Active Design Guidelines to encourage the inclusion of physical activity in our neighborhoods, streets, and buildings.

Just as integrated design can produce better buildings, integrating green building strategies throughout the City's sustainability efforts can contribute significantly toward the achievement of PlaNYC's goals.



Waterfront

INITIATIVES **Housing and Neighborhoods** • Develop new neighborhoods on underutilized sites • Create new units in existing neighborhoods | **Parks and Public Space** • Create and upgrade flagship parks • Convert former landfills into public space and parkland • Increase opportunities for water-based recreation • Improve collaboration between City, state, and federal partners • Create a network of green corridors • Conserve natural areas • Support and encourage stewardship • Incorporate sustainability through the design and maintenance of all public space | **Brownfields** • Increase participation in the NYC Brownfield Cleanup Program by partnering with lenders and insurers • Enable the identification, cleanup and redevelopment of brownfields | **Waterways** • Upgrade wastewater treatment plants to achieve secondary treatment standards • Upgrade treatment plants to reduce nitrogen discharges • Complete cost-effective grey infrastructure projects to reduce CSOs and improve water quality • Expand the sewer network • Optimize the existing sewer system • Expand the Bluebelt program • Build public green infrastructure projects • Engage and enlist communities in sustainable stormwater management • Modify codes to increase the capture of stormwater • Provide incentives for green infrastructure • Actively participate in waterway clean-up efforts • Enhance wetlands protection • Restore and create wetlands • Improve wetlands mitigation • Improve habitat for aquatic species | **Transportation** • Expand and improve ferry service • Improve freight movement | **Air Quality** • Retrofit ferries and promote the use of cleaner fuels • Work with the Port Authority to implement the Clean Air Strategy | **Solid Waste** • Reduce the impact of the waste system on communities | **Climate Change** • Regularly assess climate change projections • Partner with the Federal Emergency Management Agency (FEMA) to regularly update Flood Insurance Rate Maps • Develop tools to measure New York City's current and future climate exposure • Update regulations to increase the resilience of buildings • Work with the insurance industry to develop strategies to encourage the use of flood protections in buildings • Protect New York City's critical infrastructure • Identify and evaluate citywide coastal protective measures • Integrate climate change projections into emergency management and preparedness • Work with communities to increase their climate resilience

New York is a waterfront city. Four of our five boroughs are on islands, and the fifth is a peninsula. That translates into 520 miles of shoreline, which is more than Seattle, San Francisco, Chicago, and Portland have combined. Our water's edge is home to a maritime industry that supports 31,000 jobs and generates $1.3 billion in tax revenue. It is the location for critical infrastructure such as power plants, airports, and wastewater treatment plants. Our shoreline includes a diverse mix of commercial and residential developments, natural habitats for hundreds of species of birds and fish, and 220 miles of public space.

Our waterfront is an invaluable asset, but for decades New Yorkers have had access to too little of it. Recently, we have engaged in a wide-ranging effort to reclaim our waterfront. We have opened access to miles of shoreline that had been closed to the public, developed new parks in all five boroughs, built thousands of units of new housing, created new maritime jobs, and cleaned our waterways. To continue this revitalization, we released *Vision 2020: New York City Comprehensive Waterfront Plan* in 2011 to establish a long-range vision for the entire shoreline. Vision 2020 built on the initiatives first presented in PlaNYC in 2007. In turn, this update of PlaNYC builds on *Vision 2020*.

We will enhance areas along the water and increase access to the water itself. By reducing Combined Sewer Overflows (CSOs), decreasing nitrogen discharges, removing contaminated sediments, and restoring wetlands, we will strengthen our coastal ecosystems and provide more opportunities to use our waterways not only for people but for blue heron and bass as well. We will also transform underutilized areas along the water into destination parks in all five boroughs, including Brooklyn Bridge Park, Governors Island, Soundview Park, Rockaway Beach Park, and Freshkills Park.

We will continue to enliven the waterfront with a range of attractive uses. We will build new residential neighborhoods at Hunter's Point South and Willets Point. We will explore zoning changes for under-utilized areas to create opportunities for more productive uses. Development along our shores can help meet the need for housing and other services for a growing population as well as provide jobs, generate tax revenues, and bring more people to the water. To make more underutilized land available for redevelopment, we will implement programs to ensure a more effective process for cleaning up contaminated land.

Our waterways will remain increasingly important blue highways for moving goods and people. An increase in waterborne transportation will relieve the burden on our streets and transit system. Ferry service on the East River will give more people a sustainable transportation alternative, while increasing tug-and-barge use to move solid waste out of the city will improve air quality and reduce congestion by taking trucks off the road. We will achieve cleaner air for waterfront communities by increasing the use of cleaner fuels in maritime vessels and reducing emissions from the ships, trains, and trucks that use our ports.

We will assess and respond to the impacts that sea level rise, storm surge, and increased precipitation levels will have on our coastal areas. By developing tools to measure New York City's current and future climate risks, we will make more informed decisions in terms of how we design and adapt critical pieces of coastal infrastructure and other elements of our built environment.

Our effort to revitalize New York City's waterfront extends beyond the initiatives in PlaNYC. *Vision 2020* seeks not only to create new residential areas and parks where opportunities exist but also to maintain a vibrant working waterfront where water-dependent industries can grow and thrive. We are developing waterfront infrastructure to enable the expansion of critical economic activities such as port commerce and shipping.

Our waterfront is a crucial component of our physical, economic, and social fabric. We will revitalize our city's edge to reconnect New Yorkers and visitors to the water and reclaim New York City's standing as a premier waterfront city. With smart and sensitive planning, we will create a waterfront that will be cherished for generations to come.

Economic Opportunity

INITIATIVES **Housing and Neighborhoods** • Explore additional areas for new development • Develop new neighborhoods or underutilized sites • Create new units in existing neighborhoods | **Parks and Public Space** • Facilitate urban agriculture and community gardening | **Brownfields** • Increase participation in the NYC Brownfield Cleanup Program by partnering with lenders and insurers • Enable the identification, cleanup, and redevelopment of underutilized land • Build upon existing State and Federal collaborations to improve the City's brownfield programs • Study the economic value of brownfield redevelopment in New York City • Leverage City programs to establish funding and other incentives for cleanup and redevelopment • Increase the transparency and accessibility of brownfield cleanup plans | **Water Supply** • Increase operational efficiency with new technology | **Transportation** • Improve freight movement • Invest in airport infrastructure • Seek funding to maintain and improve our city's mass transit network | **Energy** • Provide energy efficiency financing and information • Create a 21st century energy efficiency workforce • Make New York City a knowledge center for energy efficiency and emerging energy strategies • Encourage the development of clean distributed generation • Foster the market for renewable energy in New York City • Develop a smarter and cleaner electric utility grid for New York City | **Solid Waste** • Create additional opportunities to recover organic material • Identify additional markets for recycled material • Pilot conversion technologies

New York City is an engine of economic growth. Our globally-significant harbor and transportation system move goods and people around the city and far beyond; our financial services industry supports entrepreneurship; our universities, museums, and theaters draw talented and hard-working people from around the world. But today's global economy is tougher than ever. We are vying with cities as near as Stamford and as far as Shanghai to be the city of opportunity in a world where people and capital investment flows are highly portable.

Our policies to make New York a greener and greater city are part of a larger strategy to make us a more competitive one. We will spur new industries, drive innovative practices and technology, maintain critical infrastructure, create a skilled workforce, and improve the quality of life which is critical to attracting companies and talent. PlaNYC policies will contribute to our economic transformation by driving new markets for businesses. We will support renewable energy generation by exploring the development of utility-scale renewable energy at our former landfills. Recovering organic materials such as yellow grease from our waste stream will create opportunities for new markets like biodiesel and is already supporting local jobs. Our cogeneration projects will reduce greenhouse gas emissions and encourage the market for clean energy technologies. Energy efficiency can also reduce costs for both businesses and household consumers alike.

Removing key regulatory or financing barriers and providing good information helps businesses grow faster. Streamlining the requirements for cleaning contaminated properties creates incentives for their development, ultimately creating jobs and opportunities for new housing and businesses. Similarly, removing zoning and building code impediments to rooftop clean energy technologies and supporting expanded generation and use of renewable energy will create new entrepreneurial opportunities. Improving access to energy efficiency financing by the strategic use of federal dollars blended with commercial dollars will also put more money in the pockets of New Yorkers through lower utility bills.

Our Greener, Greater Buildings Plan will require skill enhancements throughout the building industry and create employment opportunities in emerging fields like energy auditing, retro-commissioning, and energy management. We will build a 21st century energy efficiency workforce by creating an energy efficiency education center for building professionals, adopting standards for energy efficiency professionals, and training electricians in the energy code. By preparing our workforce with the skills it needs, we will make New York City into a center of energy efficiency practice and technology.

Our economy depends on a reliable transportation system for people and freight. We will seek to improve freight movement by increasing rail and waterborne freight deliveries to our Brooklyn waterfront and improve landside access to the New York Container Terminal. Working with the Port Authority of New York and New Jersey, neighboring states, and the federal government, we will seek to improve our gateways to the rest of the nation and the world, so that arriving or departing from New York City becomes the world-class experience it should be. We must also continue improving how people move around the city by maintaining our mass transit system and network of roads and bridges.

Whether it is installing automated meter reading systems to measure water use, re-thinking how we transport solid waste, improving the efficiency of government buildings, or investing in green infrastructure to supplement more expensive grey infrastructure, we will also be conscious that our initiatives to make New York a greener, greater city also have the potential to lower the cost of municipal government and make City services more efficient and cost-effective.

Our city has always evolved through tough economic times by transforming challenges into opportunities. We will use the challenges of building a greener, greater New York to propel our economy into the future. By investing in our infrastructure, creating policies that foster new markets and businesses, removing barriers that hinder existing ones, and building a workforce with cutting-edge skills, we will strengthen our economic foundation so that we can continue being the city where people want to be.

Public Engagement

INITIATIVES **Housing and Neighborhoods** • Foster the creation of Greener, Greater Communities • Increase the sustainability of City-financed and public housing | **Parks and Public Space** • Open underutilized spaces as playgrounds or part time public spaces • Facilitate urban agriculture and community gardening • Plant one million trees • Support and encourage stewardship | **Brownfields** • Support community-led planning efforts • Support local and area-wide community brownfield planning efforts • Increase the transparency and accessibility of brownfield cleanup plans | **Waterways** • Engage and enlist communities in sustainable stormwater management | **Energy** • Improve energy efficiency in smaller buildings • Expand the Mayor's Carbon Challenge to new sectors • Foster the market for renewable energy in New York City | **Air Quality** • Facilitate the adoption of electric vehicles • Reduce illegal idling • Promote the use of cleaner-burning fuels | **Solid Waste** • Promote waste prevention opportunities • Increase the reuse of materials • Incentivize recycling • Improve the convenience and ease of recycling • Create additional opportunities to recover organic material | **Climate Change** • Integrate climate change projections into emergency management and preparedness • Work with communities to increase their climate resilience

PlaNYC describes a comprehensive list of initiatives the City government will undertake to create a greener, greater New York over the next 20 years. But our plan is also intended to enable individuals and civic organizations to take initiative as well.

The City plays many key roles: managing streets and water pipes, operating services such as solid waste collection and recycling, and enforcing regulations like the Building Code. While the City is making big choices about funding subway lines or improving parks, the countless choices that over 8 million New Yorkers make every day will determine whether New York truly becomes a greener and greater place. Individuals make decisions, large and small, that add up to big impacts: what type of car we drive; what we throw out or recycle; what appliances we purchase; and what types of fuels heat our homes. Just as New York's past success has been the product largely of a combination of individual action, civic stewardship, and government programs, a greener, greater New York will be realized both by decisions in City Hall and by the ingenuity and commitment of the people who live throughout the city. New Yorkers recognize this shared responsibility. When asked in a recent survey to identify who has the most potential for improving the city's environment, the top two responses were "local government" and "people like me / ordinary residents."

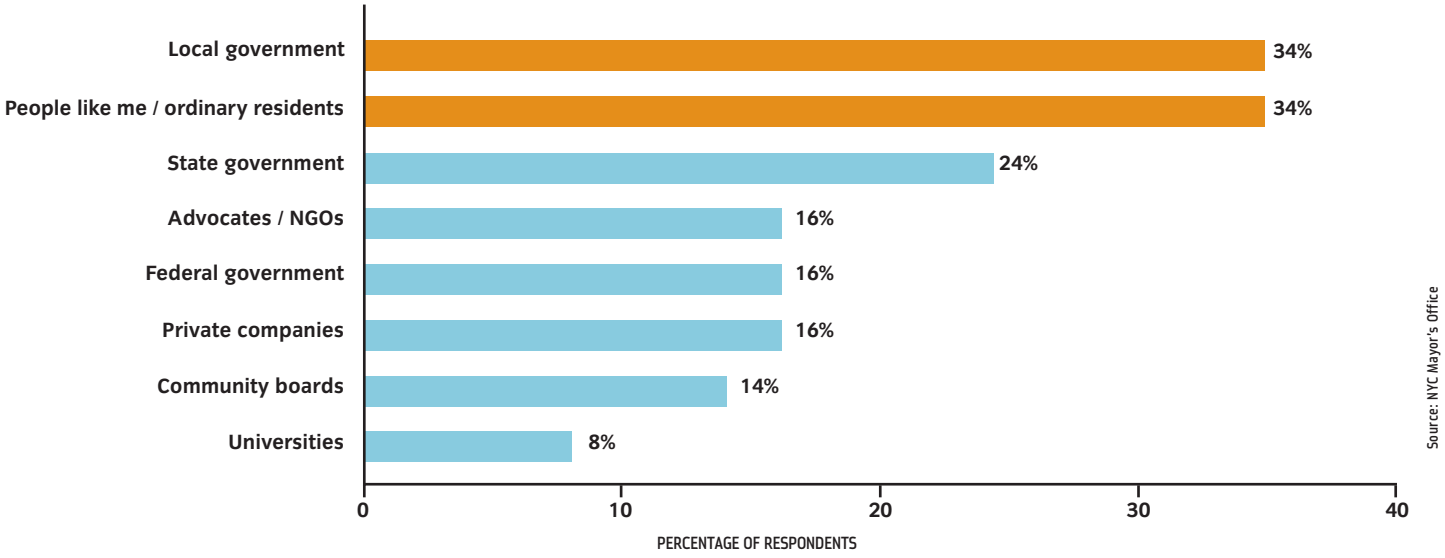
This response reinforces our commitment to educate, empower, and engage New Yorkers, support neighborhood-based sustainability efforts, link New Yorkers with volunteer opportunities, and integrate sustainability lessons into our public schools.

GreeNYC

Individual New Yorkers will be provided with information on how to lead more sustainable lifestyles through GreeNYC, our public education program which informs New Yorkers about what they can do to make New York a greener and greater place. GreeNYC's informational material provides compelling facts and easy actions that New Yorkers can take to make a difference. To generate recognition and consistency, GreeNYC has created its own brand, fronted by the recognizable 'Birdie' mascot. Birdie accompanies all of the messaging in GreeNYC's media campaigns and appears at events throughout the city. GreeNYC appeals to New Yorkers with several motivators like the potential to save money, help the environment, or improve personal health. Encouraging people to make good choices of their own accord is a necessary supplement to conventional government action.

Top Agents of Environmental Change as Seen by New Yorkers

Responses to the question: *Which of the following have the most potential to help improve the overall quality of the environment in New York City?*



Source: NYC Mayor's Office

A recent GreeNYC study of New Yorkers' attitudes toward sustainability and the likelihood of changing their behaviors found that individual actions like purchasing a hybrid or electric vehicle, acting on the recommendations of a home energy audit, or switching to energy-efficient lighting could result in a 9% drop in our greenhouse gas (GHG) emissions. This reduction, the potential sum total of millions of individuals' actions, is a larger percentage reduction than any single public policy action or proposal included in this Plan.

We will continue to engage with New Yorkers through GreeNYC about how they can reduce their GHG emissions in meaningful, measurable ways. Many of these are related directly to the policy goals put forward in PlaNYC. The behavioral impact study we conducted in 2010 showed that energy, air quality, and solid waste are the sectors where education campaigns can have the most impact. We will be guided by that data.

Because energy use in buildings is responsible for almost 80% of our GHG emissions, we will concentrate on energy efficiency. To reduce energy consumed in residential buildings, GreeNYC efforts will encourage owners of one-to-two family homes to weatherize their buildings by insulating walls and sealing windows, install monitoring systems and programmable thermostats, and act on the recommendations of home energy audits. We will promote using appliances more efficiently, switching to energy-efficient lighting, and adjusting thermostats to consume less energy to all New Yorkers, regardless of the type of dwelling they live in. To help clean the energy supply, we will educate New Yorkers about their options for purchasing renewable energy with their utility provider.

GreeNYC not only focuses on reducing GHG emissions but also improving our environmental quality, including reducing tonnage of solid waste. To make meaningful reductions in solid

waste, we will promote paper recycling, provide individuals with tools to eliminate unsolicited junk mail, offer resources for donating used goods, and encourage New Yorkers to reduce plastic bottle waste by drinking tap water.

Greener, Greater Communities

While we are working to provide useful information to individuals, we will increase our efforts to work with community-based groups as well. New York has always been blessed with residents who are willing to act to make the world a better place, often starting with their own block. Today, they are banding together in community-based organizations to plant trees, manage local compost centers, create community gathering places, or organize residents to weatherize their homes. The City already works directly with many of these local initiatives, through programs like the Weekend Walks, Safe Routes to School, or green infrastructure grants.

To accelerate those partnerships between the City and local neighborhood efforts, we will take a Greener, Greater Communities approach to supporting community-based efforts that improve our neighborhoods in ways consistent with our PlaNYC goals. We will provide community groups with technical assistance, tools, and grants to clean up contaminated land, consistent with local vision for the intended outcomes.

We will expand opportunities for park stewardship and the creation of new public spaces. And we will invite local and private property-owner participation in community-planned green infrastructure projects through a competitive grant program. We will also partner with building owners and privately-owned utilities to accelerate the early phase out of dirty Number 4 and 6 heating oils and conversion to cleaner-burning fuels.

NYC Service

Many New Yorkers are also working to create a greener, greater New York through NYC Service, the Mayor's initiative to facilitate volunteer action and address the city's greatest needs. NYC Service connects volunteers to thousands of environmental projects run by hundreds of neighborhood-based organizations.

To support PlaNYC, NYC Service will continue recruiting volunteers for MillionTreesNYC, a program that is crucial to our meeting our Parks and Public Space and Waterways goals. To date, more than one third of the 430,000 trees planted as part of this campaign have been planted by more than 8,000 volunteers. NYC Service has also provided more than 120 grants to neighborhood-based "Love Your Block" cleanup programs.

We will also expand the NYC °CoolRoofs program, which uses volunteers to coat rooftops with a reflective coating to reduce the urban heat island effect and energy use. More than one million square feet of roofs have been coated through this program, which leveraged 1,600 volunteers and corporate donations.

Sustainability in Schools

PlaNYC will help ensure that the next generations of New Yorkers live in an even greener, greater city than we have today. But that generation is already here and ready to make that city now, rather than just inheriting it when they grow up. Over one million students in City schools are being educated in and out of the classroom. Many efforts are already underway to incorporate sustainability into the classroom. The Department of Education (DOE) joined the Green Cup Challenge, an international competition among schools to achieve the greatest energy conservation improvements. The leading City school in 2010 reduced their energy use by 35% during the competition. The DOE is also partnering with several non-profits, including SolarOne, to incorporate sustainability into classroom curriculum.

Enhancing these efforts is critical to our success. We will ensure that every school has a sustainability coordinator, who will lead recycling efforts, educate teachers, and ensure that students grow up with the ethic of recycling. Our children will learn about how food grows through our Grow to Learn program. We will register 25 new school gardens per year and retain at least 75% of registered school gardens year to year.

The promise of a greener, greater New York belongs to every New Yorker—and it will be achieved only if we work together. PlaNYC is ambitious. And it should be, because New York is the most ambitious city in the world. But we're not just aspirational about what we are going to do—adapt to new technology, build new infrastructure, plant trees, and clean the water and air—we are also ambitious about how we are going to do it. We're going to create a greener, greater New York through a combination of strong municipal leadership and inventive, committed residents throughout the five boroughs.

Sustainability Indicators

If we are going to meet our goals in 2030, we need to track our progress every step along the way. Since the launch of PlaNYC in 2007 we have been transparent and accountable, issuing annual reports on what milestones we have accomplished—and just as candidly reporting on those milestones that have not yet been accomplished.

This update to PlaNYC contains over 400 milestones to be met by December 31, 2013, pointing the way to our ultimate goals for the year 2030. We will continue to issue annual findings on our progress, using these milestones as our measure.

We have also identified 29 Sustainability Indicators which we use to track our progress toward our long-term goals. These indicators are designed to provide a quantifiable bellweather for each component of a PlaNYC goal, so that one can tell, for example, if we are achieving one part of a goal but not another.

The indicators help us assess whether changes to the plan are needed and are part of our ongoing commitment to transparency and accountability. The Sustainability Indicators are a subset of the New York City Department of Health and Mental Hygiene's Environmental Public Health Tracking Portal.

CATEGORY	METRIC	2030 TARGET	FIGURE FOR MOST RECENT YEAR	TREND SINCE BASE YEAR
HOUSING AND NEIGHBORHOODS	**Create homes for almost a million more New Yorkers while making housing and neighborhoods more affordable and sustainable**			
	Increase in new housing units from 2007	314,000	98,924 [2]	↗
	Total units of housing in NYC	INCREASE	3,328,395 [4]	↗
	% of housing affordable to median-income NYC household	INCREASE	64.1% [4]	↘
	Vacancy rate of least expensive rental apartments	INCREASE	0.98% [4]	↘
	% of new units within a 1/2 mile of transit	>70%	78% [2]	↗
	Residential building energy use per capita (MMBTU) (3 yr rolling avg)	DECREASE	2.13 [3]	NEUTRAL
PARKS AND PUBLIC SPACE	**Ensure all New Yorkers live within a 10-minute walk of a park**			
	% of New Yorkers that live within a 1/4 mile of a park	85%	74% [1]	↗
BROWNFILEDS	**Clean up all contamined land in New York City**			
	Number of vacant tax lots presumed to be contaminated	DECREASE	1,500 – 2,000 [2]	NEUTRAL
	Number of tax lots remediated in NYC annually	INCREASE	0 [2]	NEUTRAL
WATERWAYS	**Improve the quality of our waterways to increase opportunities for recreation and restore coastal ecosystems**			
	Fecal coliform rates in New York Harbor (Cells/100mL) (5 yr rolling avg)	DECREASE	21.1 [2]	↘
	Dissolved oxygen rates New York Harbor (mg/L) (5 yr rolling avg)	INCREASE	6.71 [2]	↗
WATER SUPPLY	**Ensure the high quality and reliability of our water supply system**			
	Number of drinking water analyses below maximum contaminant level	INCREASE	99.995% [2]	NEUTRAL
	Water usage per capita (gallons per day) (3 yr rolling avg)	DECREASE	124.67 [2]	↘
TRANSPORTATION	**Expand sustainable transportation choices and ensure the reliability and high quality of our transportation network**			
	Sustainable transportation mode share (Manhattan CBD bound commute)	INCREASE	73.5% [3]	NEUTRAL
	Change in transit volume minus change in auto traffic volume	POSITIVE	-2.8% [3]	↗
	Vehicle revenue miles (Miles transit vehicles travel in revenue service)	INCREASE	945,912,801 [3]	↗
	% of bridges meeting a state of good repair (FY)	100%	41% [3]	NEUTRAL
	% of roads meeting a state of good repair (FY)	100%	72% [2]	↗
	% of transit station components meeting a state of good repair	100%	72% [2]	NEUTRAL
ENERGY	**Reduce energy consumption and make our energy systems cleaner and more reliable**			
	GHG emissions per unit of electrical power (lbs CO_2e/MWh)	DECREASE	692.25 [3]	↘
	System reliability SAIFI (System Average Interruption Frequency Index)	DECREASE	69.72 [3]	↘
	Energy use per capita (MMBTU) (3 yr rolling avg)	DECREASE	102.55 [3]	NEUTRAL
AIR QUALITY	**Achieve the cleanest air quality of any big U.S. city**			
	City ranking in average PM 2.5 (3 yr rolling avg)	#1 (LEAST)	7 [3]	↘
	Change in average PM 2.5 (3 yr rolling avg)	DECREASE	-3.5% [3]	↘
SOLID WASTE	**Divert 75% of our solid waste from landfills**			
	Percentage of waste diverted from landfills	75%	51% [2]	NEUTRAL
CLIMATE CHANGE	**Reduce greenhouse gas emissions by more than 30%**			
	Increase the resilience of our communities, natural systems, and infrastructure to climate risks			
	Greenhouse gas emissions ($MTCO_2e$)	DECREASE 30%	49,301,948 [3]	↘
	Greenhouse gas emissions, (100% = 2005 GHG emissions)	70%	87.06% [3]	↘
	Greenhouse gas emissions ($MTCO_2e$) per GCP ($M)	DECREASE	91.07 [3]	↘
	Greenhouse gas emissions ($MTCO_2e$) per capita	DECREASE 30%	5.87 [3]	↘

1 Results are a snapshot taken in March 2011
2 Results are for FY or CY 2010
3 Results are for FY or CY 2009, data is only available with a lag
4 Resuts are for CY 2008, data comes from HVS a triennial survey

Implementation

In the four years since PlaNYC was released, we've tracked annual progress on our initiatives. Although this Plan addresses long-term challenges, there is much we must do in the near-term to achieve our goals. Keeping our eyes on that twenty-year horizon, we also need to measure how we are doing year-by-year.

Implementing this Plan requires the collective action and resources of City government, the City Council, the State Legislature, state agencies, public authorities, the private and non-profit sectors, and individual New Yorkers. Here we have outlined the responsibilities, milestones, and the City budget commitments as a guide to how the Plan will continue to be implemented.

Many projects have been underway since the Plan's initial release. Others are being launched or modified with this update. The majority take multiple phases and years to complete. In this table, we have identified 2013 milestones for each initiative, so that in two years we can judge (and be judged by) how much progress we have made toward our goals for 2030.

Acronyms and Abbreviations

AEA	ASSOCIATION FOR ENERGY AFFORDABILITY
AEE	ASSOCIATION OF ENERGY ENGINEERS
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR-CONDITIONING ENGINEERS
BBPDC	BROOKLYN BRIDGE PARK DEVELOPMENT CORPORATION
BIC	BUSINESS INTEGRITY COMMISSION
BOA	BROWNFIELD OPPORTUNITY AREA
CBO	COMMUNITY-BASED ORGANIZATION
CDC	COMMUNITY DEVELOPMENT CORPORATION
CDFI	COMMUNITY DEVELOPMENT FINANCIAL INSTITUTION
CMAQ	CONGESTION MITIGATION AND AIR QUALITY
CUNY	CITY UNIVERSITY OF NEW YORK
DCA	NYC DEPARTMENT OF CONSUMER AFFAIRS
DCAS	NYC DEPARTMENT OF CITYWIDE ADMINISTRATIVE SERVICES
DCP	NYC DEPARTMENT OF CITY PLANNING
DDC	NYC DEPARTMENT OF DESIGN AND CONSTRUCTION
DEP	NYC DEPARTMENT OF ENVIRONMENTAL PROTECTION
DOB	NYC DEPARTMENT OF BUILDINGS
DOE	NYC DEPARTMENT OF EDUCATION
DOF	NYC DEPARTMENT OF FINANCE
DOHMH	NYC DEPARTMENT OF HEALTH AND MENTAL HYGIENE
DOT	NYC DEPARTMENT OF TRANSPORTATION
DPR	NYC DEPARTMENT OF PARKS & RECREATION
DSNY	NYC DEPARTMENT OF SANITATION
EDC	NYC ECONOMIC DEVELOPMENT CORPORATION
EDF	ENVIRONMENTAL DEFENSE FUND
EPA	U.S. ENVIRONMENTAL PROTECTION AGENCY
FERC	FEDERAL ENERGY REGULATORY COMMISSION
FHL	FRIENDS OF THE HIGH LINE
HDC	NYC HOUSING DEVELOPMENT CORPORATION
HPD	NYC DEPARTMENT OF HOUSING PRESERVATION AND DEVELOPMENT
HRF	HUDSON RIVER FOUNDATION
HRPT	HUDSON RIVER PARK TRUST
HYDC	HUDSON YARDS DEVELOPMENT CORPORATION
LAW	NYC LAW DEPARTMENT
LDC	LOCAL DEVELOPMENT CORPORATION
MOCS	NYC MAYOR'S OFFICE OF CONTRACT SERVICES
MTA	METROPOLITAN TRANSPORTATION AUTHORITY
NRDC	NATIONAL RESOURCES DEFENSE COUNCIL
NREL	NATIONAL RENEWABLE ENERGY LAB
NYCHA	NEW YORK CITY HOUSING AUTHORITY
NYISO	NEW YORK INDEPENDENT SYSTEM OPERATOR
NYNJBK	NEW YORK/NEW JERSEY BAYKEEPER
NYPA	NEW YORK POWER AUTHORITY
NYPD	NYC POLICE DEPARTMENT
NYSERDA	NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY
OEC	NYC OFFICE OF ENVIRONMENTAL COORDINATION
OER	NYC OFFICE OF ENVIRONMENTAL REMEDIATION
OFPC	NYC OFFICE OF THE FOOD POLICY COORDINATOR
OLTPS	NYC MAYOR'S OFFICE OF LONG-TERM PLANNING AND SUSTAINABILITY
PANYNJ	PORT AUTHORITY OF NEW YORK AND NEW JERSEY
PSC	NY STATE PUBLIC SERVICE COMMISSION
REBNY	REAL ESTATE BOARD OF NEW YORK
SBS	SELECT BUS SERVICE
SCA	NYC SCHOOL CONSTRUCTION AUTHORITY
STATE DEC	NY STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
STATE DOH	NY STATE DEPARTMENT OF HEALTH
STATE DOS	NY STATE DEPARTMENT OF STATE
STATE PARKS	NY STATE OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION
TGI	TRUST FOR GOVERNORS ISLAND
TLC	NYC TAXI AND LIMOUSINE COMMMISSION
TPL	TRUST FOR PUBLIC LAND
UAHS	URBAN ASSEMBLY HARBOR SCHOOL
UGC	URBAN GREEN COUNCIL
USACE	U.S. ARMY CORPS OF ENGINEERS
USGBC	U.S. GREEN BUILDING COUNCIL
US DOE	U.S. DEPARTMENT OF ENERGY
US DOT	U.S. DEPARTMENT OF THE INTERIOR
US FWS	U.S. FISH AND WILDLIFE SERVICE
US NPS	U.S. NATIONAL PARK SERVICE
US NRC	U.S. NUCLEAR REGULATORY COMMISSION

MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
HOUSING AND NEIGHBORHOODS			
CREATE CAPACITY FOR NEW HOUSING			
1 Continue transit-oriented rezonings			
Continue to create opportunities for denser development in transit-accessible areas, in large rezonings including Sunnyside/Woodside, Bedford-Stuyvesant North, West Harlem, West Clinton, and East Fordham Road	DCP		City operating
Continue to apply Inclusionary Housing Program in rezonings that encourage substantial new housing development	DCP / HPD		City operating and/or federal funding
2 Explore additional areas for new development			
Advance development and open space plans for the Staten Island North Shore	DCP / DPR / EDC		City operating
Identify additional potential infill opportunities on NYCHA grounds citywide	NYCHA / DCP / HPD		NYCHA / City operating and/or federal funding
Explore opportunties for transit-oriented development and related improvements around Metro-North stations in the Bronx	DCP	MTA	City operating
Explore opportunities for the use of underutilized MTA properties to create housing, economic development, open space, or other opportunities to enhance surrounding communities	DCP	MTA	City operating
Implement improvements in Hudson Yards to catalyze development	HYDC / DPR	MTA	City capital
Unlock development potential of underutilized Seward Park sites	EDC / HPD / DCP		IDA
Reduce City government leased or owned space by 1.2M square feet	DCAS / EDC		City operating
3 Enable new and expanded housing models to serve evolving population needs			
Explore regulatory and legislative changes to allow the creation of safe and legal additional units in existing housing	HPD / DCP / DOB / FDNY		City operating
Explore new housing models to promote smart growth and serve smaller households	HPD / DCP / DOB		City operating
FINANCE AND FACILITATE NEW HOUSING			
4 Develop new neighborhoods on underutilized sites			
Begin construction on 900 units of housing in Hunter's Point South, Queens	HPD / EDC	HDC	City capital / Federal funding
Begin infrastructure construction and remediation for Willets Point Phase I, a mixed-use development including 400 housing units	EDC / HPD	HDC	City capital / Federal funding
Complete construction on 1,300 units and begin construction on 900 units in Arvene, Queens; Complete construction on 400 units and start construction on 80 units in Gateway, Brooklyn	HPD		City capital / Federal funding
5 Create new units in existing neighborhoods			
Develop 20,000 new units by 2014 under the New Housing Marketplace Plan	HPD	HDC	City capital and/or federal funding
Complete construction of over 3,000 units in Melrose Commons Urban Renewal Area	HPD	HDC	City capital and/or federal funding
Complete construction on 1,640 units and begin and finish construction on 1,800 affordable units in NYCHA sites	NYCHA / HPD / DCP	HDC	City capital / NYCHA / Federal funding
Explore modification of parking requirements for affordable housing to lower construction costs and facilitate housing creation	DCP / HPD		City operating
6 Develop new housing units in existing City properties			
Start construction of housing units in the former PS 109 in East Harlem	HPD		City capital and/or federal funding
Start construction of affordable housing on underutilized DSNY facility on West 20th Street in Manhattan	HPD		City capital and/or federal funding
ENCOURAGE SUSTAINABLE NEIGHBORHOODS			
7 Foster the creation of Greener, Greater Communities			
Launch Greener, Greater Communities pilot	OLTPS		City operating
Conduct Sustainable East New York study, incorporating community sustainability in addition to land use objectives	DCP		City operating / Federal funding
8 Increase the sustainability of City-financed and public housing			
Certify 40 affordable housing projects with Enterprise Green Communities every year	HPD		City operating and/or federal funding
Provide financing for over 30,000 units with energy efficiency and sustainability requirements by 2014	HPD		City capital and/or federal funding

	MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
HOUSING AND NEIGHBORHOODS	Promote and expand NYC Green House education intiaitive to encourage multifamily buliding owners to retrofit their buildings	HPD		City operating and/or federal funding
	Conduct six Green Owners Nights annually for small and medium-sized building owners on best practices on green energy, water, materials, and community issues	HPD		City operating and/or federal funding
	Create multi-phase Energy Performance Contracting Program to scale up energy efficiency measures	NYCHA		NYCHA
	Perform a pilot Green Physical Needs Assessment on a NYCHA property	NYCHA		NYCHA
	Increase the amount of NYCHA Resident Green Teams from 37 to 43 and better connect them with surrounding communities	NYCHA		NYCHA
	Explore incorporating more stormwater retention efforts into NYCHA sites	NYCHA / DEP		City operating
	9 Promote walkable destinations for retail and other services			
	Promote neighborhood shopping districts	DCP / EDC / Dept. of Small Business Services		City operating
	Facilitate the creation of 300 more healthy food retail options in targeted underserved neighborhoods	DOHMH		City operating
	Identify additional amendments to zoning to facilitate grocery stores in communities with food access needs	DCP		City operating
	Facilitate food retail and production opportunities on City-owned spaces in underserved areas by graduating a total of 40 new clients in La Marqueta and 25 new clients in E-Space	EDC	City Council	City operating
	10 Preserve and upgrade existing affordable housing			
	Preserve 34,000 affordable units by 2014 under the New Housing Marketplace Plan	HPD	HDC	City capital and/or federal funding
	Perform 148 capital rehabiliations in 189 NYCHA developments	NYCHA		NYCHA
	Provide legal advice and counsel to over 2,000 New Yorkers and assist 1,800 individuals in getting mortgage modifications in order to avoid foreclosure of their homes through CNYCN	HPD		City capital and/or federal funding
	11 Proactively protect the quality of neighborhoods and housing			
	Proactively conduct field studies in 1,000 buildings at risk for distress or decline	HPD		City operating and/or federal funding
PARKS AND PUBLIC SPACE	TARGET HIGH IMPACT PROJECTS IN NEIGHBORHOODS UNDERSERVED BY PARKS			
	1 Create tools to identify parks and public space priority areas			
	Develop matrix assessment and mapping tools to assist in targeting high priority areas	DPR		City operating
	2 Open underutilized spaces as playgrounds or part-time public spaces			
	Complete construction and open for community use an additional 53 schoolyards to playgrounds sites bringing the total number open for public use to 230	DPR / SCA / DOE	TPL	City operating / City capital
	Conduct Summer Streets for three Saturdays each year	DOT		City operating
	Conduct Weekend Walks at 20 locations annually	DOT		City operating
	Expand the number of schools with access to Play Streets by 40	DOHMH / NYPD		City operating
	Conduct 15 Community Play Streets each year	DOHMH / NYPD		City operating
	3 Facilitate urban agriculture and community gardening			
	Launch study to identify potential urban agriculture or community garden sites on City-owned properties unsuitable for other development	DPR / DCAS		City operating
	Plant 129 new community gardens on NYCHA sites	NYCHA		NYCHA
	Create one urban farm on a NYCHA site	NYCHA		NYCHA
	Establish five additional farmers markets at community garden sites	DPR	GrowNYC	City operating
	Increase number of community volunteers registered with GreenThumb by 25%	DPR	GreenThumb	City operating
	Expand support for community gardens into new underserved neighborhoods	DPR	GreenThumb	City operating
	Register 25 new school gardens with Grow to Learn NYC per year, and retain at least 75% of registered school gardens year to year	Mayor's Fund / DOE	GrowNYC	City operating

MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
Reduce impediments to agriculture in relevant laws and regulations	DCP / DOB / DPR		City operating
4 Continue to expand usable hours at existing sites			
Complete 26 multi-purpose fields	DPR		City operating / City capital
Complete 19 new lighting installations	DPR		City operating
CREATE DESTINATION-LEVEL SPACES FOR ALL TYPES OF RECREATION			
5 Create and upgrade flagship parks			
Highland Park: Complete renovations including reservoir perimeter lighting, path restoration, and new entry points	DPR		City capital
McCarren Park: Complete construction of pool and year-round recreation center	DPR		City capital
Ocean Breeze Park: Complete 2,500-seat field house	DPR		City capital
Highbridge Park: Restore bridge and add new entry points for wheelchair users to improve connectivity between Northern Manhattan and the Bronx	DPR / DDC		City capital / CMAQ / Federal funding / Private funding
The High Line: Construct Section 2 (20th to 30th streets) and pursue acquisition of Section 3	DPR / EDC	FHL	City capital / Private funding
Calvert Vaux Park: Construct new sports fields, lighting, and pedestrian paths as part of phase 1 construction	DPR		City capital / State funding
Fort Washington Park: Complete phase I construction	DPR		City capital / State funding / CMAQ
Soundview Park: Complete construction of Metcalf Playground, Rosedale Amphitheater, and Metcalf Track & Field	DPR		City capital
Rockaway Park: Complete construction of phase I	DPR		City capital
Brooklyn Bridge Park: Complete Pier 5, reopen Empire Fulton Ferry Park and Squibb Bridge	DPR	BBPDC	City capital / Private funding
Transmitter Park: Construct 1.5-acre site, including a playground, benches, and trees	EDC / DPR		City capital / State funding / Grants
East River Park Esplanade: Substantially complete park elements	EDC	GreenThumb	Federal funding
East River Park: Complete reconstruction of seawall and esplanade	DPR		City capital
Governors Island: Commence parkland and infrastructure development	TGI		City capital
Hunter's Point: Complete construction of a new five-acre park	EDC		City capital
Bushwick Inlet Park: Continue phased acquisition, remediation, and development of parks	DPR		City capital
Stapleton: Begin construction of six-acre waterfront esplanade	EDC		City capital / State capital
Steeplechase Park: Complete construction of Steeplechase plaza and restoration of carousel	EDC		City capital
Orchard Beach: Replenish with clean sand, and expand the South Jetty	DPR		City capital
Anable Basin: Complete design and reconstruction of pier	DCAS		City capital
Hudson River Park: Construct an upland esplanade in Tribeca, reconstruct Pier 97	HRPT		State capital
Bush Terminal: Complete remediation of open space and advance phase I of park	DPR / EDC		City capital / State funding / Federal funding
6 Convert former landfills into public space and parkland			
Freshkills Park: Develop the first public access areas overlooking Main Creek and continue capping and closing of east and west mounds	DPR		City capital / State funding
Pelham Landfill: Open to the public	DPR		City capital
Ferry Point Park: Complete Community Park	DPR		City capital

PARKS AND PUBLIC SPACE

PARKS AND PUBLIC SPACE

MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
7 Increase opportunities for water-based recreation			
Develop multi-agency task force to assess opportunities for expanding the blue network across the city for water-based recreation	DPR / DCP / DEP		City operating
Complete expansion of launch platform at Hunts Point-Riverside Park	DPR		City capital
Complete repair and replacement of floating docks at Dyckman Street Marina	DPR		City capital
Activate West Harlem Piers Park's excursion boat pier and ferry barge	EDC		City capital
RE-IMAGINE THE PUBLIC REALM			
8 Activate the streetscape			
Complete construction of 13 plazas	DOT		City operating / City capital / State funding / Federal funding
Install 500 benches throughout the city	DOT		City operating / Federal funding
Approve the urbanSHED Design Competition winning design and work with City agencies, buildings owners, contractors, and professionals on adoption of the new design	DOB		City operating
Release recommendations to further streamline the permitting process for sidewalk cafés	DCAS / MOCS		City operating
Amend zoning to facilitate revitalization of underutilized arcades in Lower Manhattan with new active uses	DCP		City operating
Open four new pop-up cafés	DOT		City operating
9 Improve collaboration between City, state, and federal partners			
Conduct five joint research projects via the NYC Urban Field Station	DPR	U.S. Forest Service	City operating / Federal funding
Align pathways, hours of operation, and bicycling rules on neighboring park sites	DPR	State Parks / US NPS	City operating
10 Create a network of green corridors			
Continue to build and expand greenway waterfront network including Brooklyn Waterfront Trail, Queens East River Trail, Soundview Greenway, South Bronx Greenway, Staten Island South Shore Greenway, and Manhattan Waterfront Greenway	DPR / DOT / EDC	BBPDC	City capital / state funding / CMAQ / federal funding
Release update to Streets Design Manual that contains guidance on landscaping and the use of other sustainable elements	DPR / DOT / DEP / DCP	Design Trust for Public Spaces	Private grants
PROMOTE AND PROTECT NATURE			
11 Plant one million trees			
Plant a total of 650,000 trees	DPR	New York Restoration Project	City capital / private funding
Explore methods to ensure long-term survival of existing urban forest	DPR		City operating
12 Conserve natural areas			
Explore the establishment of a natural area conservancy to preserve the city's remaining wild lands	DPR		City operating
13 Support ecological connectivity			
Complete 80 greenstreets per year	DEP / DPR / DOT		Water and sewer bond proceeds
Conduct a study to determine best practices for promoting biodiversity in green roof design and construction	DPR		City operating
Restore parkway landscapes to improve landscape connectivity	DPR		City capital
Develop a framework to comprehensively address landscape issues on buildings sites in City codes and regulations	OLTPS		City operating
Create green standards for City government building site development and renovations	DDC		City operating
ENSURE THE LONG-TERM HEALTH OF PARKS AND PUBLIC SPACE			
14 Support and encourage stewardship			
Expand access to free tree care workshops and tool kits to stewardship groups across the five boroughs	DPR	Mayor's Fund	City operating
Institute DPR's network meetings for four parks in every borough	DPR		City operating

	MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
PARKS AND PUBLIC SPACE	Increase training activities and networking forums at catlyst parks	DPR		City operating
	Increase attendance at programming to more than 15,000 across all catalyst parks annually	DPR		City operating
	15 Incorporate sustainability through the design and maintenance of all public space			
	Develop digital library tracking system for cataloging sustainable aspects of capital projects	DPR		City operating
	Develop sustainable design checklist to be used with all DPR capital projects that complies with national Sustainable Sites standards	DPR		City operating
	Develop indicators to measure existing and new sustainability initiatives at DPR related to water, material resources, energy, fuel, and partnerships	DPR		City operating
	Release first version of the Sustainable Parks Plan to promote accomplishments, train and educate DPR staff in best practices, and improve sustainability initiatives across the agency	DPR		City operating
BROWNFIELDS	DEVELOP PROGRAMS TO ACCELERATE BROWNFIELD CLEANUP AND REDEVELOPMENT			
	1 Increase participation in the NYC Brownfield Cleanup Program by partnering with lenders and insurers			
	Establish programs for financial institutions to increase lending for properties in the NYC BCP	OER	Community banks and other financial institutions	City operating
	Establish programs with the insurance industry to deliver preferred insurance policies for properties in the NYC BCP	OER	Insurance companies and brokers	City operating
	2 Increase the capacity of small businesses and small- and mid-size developers to conduct brownfield cleanup and redevelopment			
	Establish a brownfield *pro bono* referral program to provide inexperienced developers with advice on how to conduct investigations and cleanups	OER	NYC Brownfields Partnership	City operating
	3 Enable the identification, cleanup, and redevelopment of brownfields			
	Establish flexible NYC BCP provisions to allow for land preparation for resale	OER		City operating
	Perform market outreach to improve the SPEED real estate search engine to promote brownfield cleanup and redevelopment	OER		City operating
	Collaborate with community development corporations to advance the cleanup and redevelopment of property across the city	OER	CDFIs / LDCs / CDCs / CBOs	City operating
	Establish a web-based application that automates and streamlines the navigation of City cleanup programs	OER		City capital
	In partnership with the EPA, implement approaches and improve Triad tools to accelerate property investigation and cleanup	OER	EPA	Federal funding
	Encourage cleanup and redevelopment of waterfront sites by proposing amendments to the Zoning Resolution that would allow greater flexibility for non-residential uses and floor area	DCP		City operating
	4 Build upon existing state and federal collaborations to improve the City's brownfield programs			
	Develop stronger liability protection at the state level	OER	State DEC	City operating
	Develop stronger liability protection at the federal level	OER	EPA	City operating
	Develop a pilot program for environmental lien forgiveness	OER		City operating
	STRENGTHEN INCENTIVES FOR BROWNFIELD CLEANUP AND REDEVELOPMENT			
	5 Study the economic value of brownfield redevelopment in New York City			
	Assess the fiscal and employment benefits of brownfield redevelopment in New York City	OER / EDC		City operating
	6 Leverage the NYC Brownfield Cleanup Program to establish funding and other incentives for cleanup and redevelopment			
	Develop programs that align incentives for neighborhood housing or infrastructure revitalization with brownfield incentives	OER		City operating
	Establish brownfield redevelopment financial counseling program	OER		City operating
	Develop a web-based brownfield financial assistance search tool	OER		City operating
	DEEPEN OUR COMMITMENT TO COMMUNITIES FOR COMMUNITY BROWNFIELD PLANNING, EDUCATION, AND SERVICE			
	7 Support community-led planning efforts			
	Establish 25 NYC Community Brownfield Planning Districts (CBPDs)	OER		City operating
	Provide focused City assistance and services to designated CBPDs for brownfield and sustainability planning	OER		City operating

	MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
BROWNFIELDS	Pilot incorporation of brownfield planning into early stages of redevelopment planning with East New York Sustainable Communities project	DCP / OER	BOA Groups	City operating
	Identify 8-12 new Brownfield Opportunity Area (BOA) projects in neighborhoods disproportionally impacted by clusters of brownfields	OER	State DOS	State funding
	8 Support local and area-wide community brownfield planning efforts			
	Conduct a study to identify best management practices for community planners undertaking community brownfield planning efforts	OER	BOA Groups	State funding
	Establish training and other programs to build the capacity of community-based organizations in brownfield redevelopment, planning, and implementation	OER	BOA Groups	Federal funding
	Develop online community planning portal to provide cutting edge tools to community brownfield planners	OER	State DOS	State funding
	Support pilot program established by New York State Department of State for area-wide community brownfield planning and cross-government collaboration	OER	State DOS / BOA Groups	State funding
	9 Increase the transparency and accessibility of brownfield cleanup plans			
	Establish an online document repository for NYC BCP project information	OER	New York Public Library	City operating
	Establish advanced methods for the communication of brownfield project information to New York City communities	OER		City operating
	Develop web-based educational tools to help all stakeholders understand brownfield cleanup and redevelopment processes	OER / Mayor's Office	New York Public Library	Private funding
	Expand the NYC BrownfieldWORKS! training program	OER	NYC Brownfield Partnership	State funding
	EXPAND THE USE OF GREEN REMEDIATION			
	10 Promote green remediation in the NYC Brownfield Cleanup Program			
	Establish the Sustainability Statement in all cleanup plans	OER		City operating
	Accelerate adoption of green remediation practices by establishing a program for green remediation audits of cleanup plans under the NYC BCP	OER		City capital
	Encourage the use of recycled concrete aggregate (RCA) as substitute for conventional backfill material	OER / DSNY		City operating
	Develop tree-based phytoremediation approach for end-of-cleanup polishing, also promoting the MillionTreesNYC program	OER / DPR		City operating
	Establish green remediation stormwater management approaches on remedial sites and expand green infrastructure implementation as part of redevelopment	OER / DEP		City operating
	11 Promote green space on remediated brownfield properties			
	Create three Pocket Parks in collaboration with community planning organizations	OER / DPR	BOA Groups	State funding
	Create design for state-of-the-art community gardens on remediated brownfields	OER / DPR	NYRP	City operating
WATERWAYS	CONTINUE IMPLEMENTING GREY INFRASTRUCTURE UPGRADES			
	1 Upgrade wastewater treatment plants to achieve secondary treatment standards			
	Certify that the Newtown Creek WWTP meets secondary treatment standards	DEP	State DEC / EPA	Water and sewer bond proceeds
	2 Upgrade treatment plants to reduce nitrogen discharges			
	Complete upgrades at the Wards Island WWTP	DEP	State DEC	Water and sewer bond proceeds
	Complete upgrades at the Tallman Island WWTP	DEP	State DEC	Water and sewer bond proceeds
	Complete upgrades at the Bowery Bay WWTP	DEP	State DEC	Water and sewer bond proceeds
	3 Complete cost-effective grey infrastructure projects to reduce CSOs and improve water quality			
	Complete Paerdegat Basin CSO Facility	DEP	State DEC	Water and sewer bond proceeds
	Complete Alley Creek CSO Facility	DEP	State DEC	Water and sewer bond proceeds
	Complete Avenue V Pumping Station	DEP	State DEC	Water and sewer bond proceeds
	Complete upgrades to the Gowanus Canal Pumping Station	DEP	State DEC	Water and sewer bond proceeds
	Complete upgrades to the Gowanus Canal Flushing Tunnel	DEP	State DEC	Water and sewer bond proceeds

	MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
WATERWAYS	Construct an aeration system for Lower English Kills in Newtown Creek	DEP	State DEC	Water and sewer bond proceeds
	Complete a destratification facility at Shellbank Creek	DEP	State DEC	Water and sewer bond proceeds
	4 Expand the sewer network			
	Complete 60 miles of new or rehabilitated sewers	DEP		Water and sewer bond proceeds
	5 Optimize the existing sewer system			
	Inspect all tide gates in the city and repair as needed	DEP		Water and sewer revenue
	Complete Alley Creek CSO Facility	DEP		Water and sewer revenue
	Clean 138 miles of interceptor sewers	DEP		Water and sewer revenue
	USE GREEN INFRASTRUCTURE TO MANAGE STORMWATER			
	6 Expand the Bluebelt program			
	Expand Bluebelt system into Queens	DEP		Water and sewer bond proceeds
	7 Build public green infrastructure projects			
	Complete 30 green infrastructure pilot projects, collect monitoring data, and publish findings	DEP / DPR		Water and sewer bond proceeds
	Capture the first inch of runoff from 70 additional acres of impervious surface	DEP	State DEC	Water and sewer bond proceeds
	8 Engage and enlist community stakeholders in sustainable stormwater management			
	Implement a green infrastructure grant program	DEP		Water and sewer bond proceeds
	Seek input through the Green Infrastructure Citizens Group	DEP		Water and sewer revenue
	9 Modify codes to increase the capture of stormwater			
	Require greater on-site detention and infiltration for new development and redevelopment	DEP		Water and sewer revenue
	Require greater stormwater runoff controls from construction sites	DOB		City operating
	Study potential code changes to incorporate blue roofs on existing buildings	OLTPS / DOB / DEP		City operating / Water and sewer revenue
	Develop new design standards for sidewalks	OLTPS		City operating
	Study improved regulation of open industrial uses to reduce runoff	DCP		City operating
	10 Provide incentives for green infrastructure			
	Evaluate the feasibility of using price signals to reduce stormwater runoff	DEP		Water and sewer revenue
	Evaluate the efficacy of the green roof tax abatement	OLTPS / DOB / DOF		City operating
	REMOVE INDUSTRIAL POLLUTION FROM WATERWAYS			
	11 Actively participate in waterway clean-up efforts			
	Participate in the Superfund investigation and feasibility study in the Gowanus Canal	DEP / OER / Law	EPA / USACE	Water and sewer revenue
	Participate in the Superfund investigation in Newtown Creek	DEP / OER / Law	EPA / USACE	Water and sewer revenue
	Submit application to dredge CSO mounds for Gowanus Canal and Fresh Creek	DEP		Water and sewer revenue
	Begin CSO dredging in Paerdegat Basin	DEP		Water and sewer bond proceeds
	Complete dredging in Hendrix Creek	DEP		Water and sewer bond proceeds

MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
WATERWAYS			
PROTECT AND RESTORE WETLANDS, AQUATIC SYSTEMS, AND ECOLOGICAL HABITAT			
12 Enhance wetlands protection			
Transfer at least five City-owned wetlands to DPR	DPR / DCAS		City operating
Work with state and federal partners to update wetlands maps	OLTPS / DEP / DPR	State DEC	Water and sewer revenue
Modify the Waterfront Revitalization Program to designate additional sites of ecological importance	DCP	State DOS	State funding
Evaluate the vulnerability of salt marshes through additional monitoring	DPR	State DEC / U.S. Geological Survey	City operating / State funding
Develop a comprehensive strategy for wetlands	OLTPS		City operating
13 Restore and create wetlands			
Complete Paerdegat Basin restoration	DEP		Federal funding
Complete Pugsley Creek Park restoration	DPR	State DOS	City capital / State funding
Complete Soundview Park restoration	DPR	USACE / State DOS	City capital / State funding
Complete Bronx River restoration	DPR	State DOS	City capital / State funding / Federal Funding
Complete Randall's Island shoreline restoration	DPR	Randall's Island Sports Foundation	City capital / State funding
Complete Calvert Vaux Park restoration	DPR	State DOS	City capital / State funding
Complete Meadow Lake restoration	DPR	State DEC	City capital / State funding
Complete Freshkills North Park restoration	DPR	State DOS	City capital / State funding
Invest $15 million in wetlands restoration in Jamaica Bay	DEP	State DEC / USACE	Water and sewer bond proceeds / Federal funding
14 Improve wetlands mitigation			
Establish a wetland mitigation banking or in-lieu fee program	OLTPS / DPR / DEP / EDC	State DEC	City operating
15 Improve habitat for aquatic species			
Expand oyster pilot project and conduct additional research	DEP	USACE / UAHS / HRF / NYNJBK / EPA	Water and sewer bond proceeds / City operating / Federal funding / Private fundiing
Develop a strategy to advance restoration efforts	OLTPS / DEP	USACE / UAHS / HRF / NYNJBK / EPA	Water and sewer bond proceeds / City operating / Federal funding / Private fundiing
Complete ribbed mussel bed pilot	DEP		Water and sewer bond proceeds
Complete eel grass pilot	DEP		Water and sewer bond proceeds
WATER SUPPLY			
ENSURE THE QUALITY OF OUR DRINKING WATER			
1 Continue the Watershed Protection Program			
Maintain the city's Filtration Avoidance Determination (FAD)	DEP	State DOH / EPA / State DEC / Upstate stakeholders	Water and sewer bond proceeds / Water and sewer revenue
Seek to acquire land by contacting the owners of at least 50,000 acres of land every year	DEP		Water and sewer bond proceeds
2 Protect the water supply from hydrofracking for natural gas			
Work with the State to secure the prohibition of hydrofracking within the city's watersheds	DEP	State DEC / EPA	Water and sewer bond proceeds
3 Complete the Catskill/Delaware Ultraviolet (UV) Disinfection Facility			
Complete construction	DEP		Water and sewer bond proceeds
4 Complete the Croton Water Filtration Plant			
Complete construction	DEP		Water and sewer bond proceeds

	MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
WATER SUPPLY	**MAINTAIN AND ENHANCE THE INFRASTRUCTURE THAT DELIVERS WATER TO NEW YORK CITY**			
	5 Repair the Delaware Aqueduct			
	Break ground on the aqueduct bypass	DEP		Water and sewer bond proceeds
	Complete upgrades to the Cross River Pumping Station	DEP		Water and sewer bond proceeds
	Complete design for the upgrades to the Croton Falls Pumping Station	DEP		Water and sewer bond proceeds
	Complete rehabilitation of the New Croton Aqueduct	DEP		Water and sewer bond proceeds
	Begin design for the upgrades to the Jamaica groundwater system	DEP		Water and sewer bond proceeds
	6 Connect the Delaware and Catskill Aqueducts			
	Start construction	DEP		Water and sewer bond proceeds
	7 Pressurize the Catskill Aqueduct			
	NA	DEP		Water and sewer bond proceeds
	8 Maintain and upgrade dams			
	Begin rehabilitation of the Gilboa Dam	DEP		Water and sewer bond proceeds
	Begin engineering assessments for dams as required by the State	DEP		Water and sewer bond proceeds
	MODERNIZE IN-CITY DISTRIBUTION			
	9 Complete City Water Tunnel No. 3			
	Activate Stage 2 in Manhattan	DEP		Water and sewer bond proceeds
	10 Build a backup tunnel to Staten Island			
	Begin construction	DEP	USACE / PANYNJ	Water and sewer bond proceeds
	11 Upgrade water main infrastructure			
	Replace 80 miles of water mains	DEP / DDC		Water and sewer bond proceeds
	IMPROVE THE EFFICIENCY OF THE WATER SUPPLY SYSTEM			
	12 Increase operational efficiency with new technology			
	Complete the installation of AMR devices citywide	DEP		Water and sewer bond proceeds
	Replace 10,000 large water meters	DEP		Water and sewer bond proceeds
	Optimize delivery by integrating forecasting models into operations	DEP	National Weather Service	Water and sewer revenue
	13 Increase water conservation			
	Release a design manual for water conservation in buildings	DDC		Water and sewer revenue
	Pilot advanced strategies for water conservation in City buildings	DDC / DCAS		Water and sewer bond proceeds
	Launch a process to replace all old, inefficient toilets in City buiilidings	DEP / DCAS / DOE		Water and sewer bond proceeds
	Analyze the costs and benefits of widespread replacements of inefficient toilets and develop a strategy to achieve an optimal flow	DEP		Water and sewer revenue
	Develop comprehensive greywater reuse standards	OLTPS / DOB / DOHMH	State DOH	Water and sewer revenue
TRANSPORTATION	**IMPROVE AND EXPAND SUSTAINABLE TRANSPORTATION INFRASTRUCTURE AND OPTIONS**			
	1 Improve and expand bus service throughout the city			
	Launch Nostrand Ave., Brooklyn SBS Corridor	DOT	MTA	MTA
	Launch 34th Street, Manhattan SBS Corridor	DOT	MTA	MTA
	Launch Hylan Blvd., Staten Island SBS Corridor	DOT	MTA	MTA

	MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
TRANSPORTATION	Launch initial Woodhaven Blvd. and LaGuardia, Queens SBS corridors	DOT	MTA	MTA
	Implement bus operations improvements, with transit signal prioritization, on eleven routes in five boroughs	DOT	MTA	MTA
	Improve bus priority of Ed Koch Queensboro Bridge and approaches	DOT	MTA	MTA
	Install Bus Time on all 31 bus routes in Staten Island and B63 in Brooklyn	DOT	MTA	MTA
	2 Improve and expand subway and commuter rail service			
	Complete construction of 7 Line extension to the Hudson Yards area of far west Midtown		MTA	HYDC
	Continue construction of first phase of Second Avenue Subway (2015)		MTA	Federal funding
	Continue construction of East Side Access, the LIRR's direct service to Grand Central Terminal		MTA	Federal funding
	Complete analysis for North Shore Transportation Improvements, Staten Island	EDC	MTA	City operating
	3 Expand for-hire vehicle service throughout our neighborhoods			
	License additional vehicles in those areas that are currently underserved	TLC		City operating
	4 Promote car-sharing			
	Assess car-sharing potential for City fleet vehicles	DCAS		City operating
	5 Expand and improve ferry service			
	Launch East River service pilot to support the continued redevelopment of the East River waterfronts	EDC		City operating
	6 Make bicycling safer and more convenient			
	Double bike commuting from 2007 levels	DOT		City operating
	Establish pilot bike-sharing program with third-party operator	DOT		Private funding
	Install bike racks near 15 subway stations	DOT	MTA	City operating
	7 Enhance pedestrian access and safety			
	Install countdown pedestrian signals at 1,500 intersections	DOT		City capital
	Adopt new guidelines for public parking garages that promote pedestrian safety	DOT		City operating
	Continue to implement Safe Routes to Transit projects, including nine "Bus Stops Under the Els"	DOT	MTA	City operating
	Implement 32 Safe Routes to School projects	DOT		Federal funding
	Design a standardized, consistent pedestrian wayfinding system	DOT / NYC & Co.		City operating
	REDUCE CONGESTION ON OUR ROADS, BRIDGES, AND AT OUR AIRPORTS			
	8 Pilot technology and pricing-based mechanisms to reduce traffic congestion			
	Expand ParkSmart program to three new neighborhoods (2013)	DOT		City operating
	Install 4,500 Muni-Meters	DOT		City operating
	Install Intelligent Transportation Systems (ITS) approach to reducing congestion in selected areas	DOT	Business Improvement Districts	City operating
	9 Modify parking regulations to balance the needs of neighborhoods			
	Explore modifications to Manhattan Core parking regulations	DCP		City operating
	Explore revisions to off-street parking requirements in areas close to the Manhattan Core	DCP		City operating
	10 Reduce truck congestion on city streets			
	Implement new peak and off-peak delivery windows in congested areas	DOT	Business Improvement Districts	City operating

	MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
TRANSPORTATION	Implement commercial paid parking at high-demand loading zones citywide	DOT	Business Improvement Districts	City operating
	Improve landside access to the New York Container Terminal	EDC / DOT	PANYNJ	City capital
	11 Improve freight movement			
	Study the Sheridan Corridor in the Bronx	DCP / DOT / OLTPS		Federal funding
	Launch a study of New York City's food distribution pathways	OLTPS / OFPC / DOT / EDC	City Council	City operating / Private funding
	Accommodate more inbound freight trains at Hunts Point	EDC		City operating
	Establish new rail transfer hubs in Brooklyn and Staten Island	EDC	PANYNJ	City operating
	Increase rail and waterborne freight deliveries to the South Brooklyn Marine Terminal	EDC		City capital
	12 Improve our gateways to the nation and the world			
	Advocate for federal investment in NE Corridor passenger rail and improved aviation traffic control	EDC	PANYNJ	City operating
	Launch study of JFK air cargo industry	EDC	PANYNJ	City operating
	Improve truck access to JFK Airport	EDC / DOT	PANYNJ / State DOT	City capital and/or state funding
	MAINTAIN AND IMPROVE THE PHYSICAL CONDITION OF OUR ROADS AND TRANSIT SYSTEM			
	13 Seek funding to maintain and improve our mass transit network			
	Fund MTA Capital Program beyond 2011		MTA	State funding / Federal funding
	14 Maintain and improve our roads and bridges			
	Seek opportunities to improve bridge conditions	DOT		City capital
	Seek opportunities to improve the state of repair of the city's streets	DOT		City capital
	Seek legislation for joint bidding of public works projects	Mayor's Office	State Legislature	City operating
ENERGY	IMPROVE ENERGY PLANNING			
	1 Increase planning and coordination to promote clean, reliable, and affordable energy			
	Work with multiple energy stakeholders to encourage clean energy supply investments, effective incentive programs, shared data collection and management, and coordinated energy forecasting	OLTPS / DEP	Energy Policy Task Force (Con Ed / National Grid / NYSERDA / Governor's Office)	City operating
	INCREASE OUR ENERGY EFFICENCY			
	2 Implement the Greener, Greater Buildings Plan			
	Complete the development of rules and guidelines and fully enforce the Greener, Greater Buildings Plan	OLTPS / DOB / DOF / DEP		City operating
	Complete an annual analysis and report on benchmarking results	OLTPS / DCAS		City operating
	3 Improve our codes and regulations to increase the sustainability of our buildings			
	Complete the incorporation of the Green Codes Task Force proposals into law	OLTPS / DOB / DCP / Law / DCA	City Council	City operating
	Propose amendments to the Zoning Resolution and City codes to remove the barriers to energy-efficient building envelopes and the siting of clean energy on buildings	OLTPS / DCP		City operating
	Work with the International Code Council and ASHRAE to bring New York City's codes and the model codes into greater alignment	OLTPS / DOB	ICC / ASHRAE	City operating
	4 Improve compliance with the energy code and track green building improvements citywide			
	Aim to achieve compliance by 2017	OLTPS / DOB		City operating
	Develop a "green report card" and an online tracking tool for green building improvements	OLTPS / DOB		City operating
	5 Improve energy efficiency in smaller buildings			
	Develop a strategy to increase the energy efficiency of smaller buildings	OLTPS / DOB / DOF		City operating
	Execute GreeNYC public education campaigns to encourage New Yorkers to reduce energy consumption at home	GreeNYC	NYSERDA / Con Ed / National Grid	Private funding

	MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
ENERGY	Launch an energy efficiency competition between residential neighborhoods throughout the five boroughs	OLTPS / CAU		Private funding
	6 Improve energy efficiency in historic buildings			
	Work with historic preservation societies and energy code councils to reconcile the energy codes with preservation requirements	OLPTS / LPC	NYSERDA / CUNY / ASHRAE / UGC / AEA / AEE / BCA	Federal stimulus / Private funding
	Partner to create a handbook of energy efficiency strategies for historic buildings	OLPTS / LPC		Federal stimulus / Private funding
	7 Provide energy efficiency financing and information			
	Create a not-for-profit corporation, the New York City Energy Efficiency Corporation (NYCEEC), to provide energy efficiency financing	OLTPS / DEP / DCAS		Federal stimulus / Private funding
	Create an information center to provide comprehensive, updated information on energy efficiency funding and tax incentives	OLTPS / DEP / DCAS	NYSERDA / PSC / Con Ed / National Grid	Federal stimulus / Private donors / Partnerships
	8 Create a 21st century energy efficiency workforce			
	Work with Amalgamated Green to ensure that we have a qualified workforce to implement our sustainability policy	OLTPS	NYSERDA / CUNY / ASHRAE / AEA / AEE	State funding
	Partner to launch Green Light New York, an energy efficiency education center for building professionals	OLTPS	NYSERDA / NYPA / ConEd	State funding
	Incorporate Energy Code trainining into licensing and continuing education requirements for electricians	DCAS / DDC / DOB		City operating
	Adopt national standards for energy efficiency professionals	OLTPS / DOB	US DOE / NREL	City operating
	Develop and implement a sustainable contractors designation program for electricians, plumbers, and general contractors	DOB	UGC / ASHRAE	City operating
	9 Make New York City a knowledge center for energy efficency and emerging energy strategies			
	Work with an academic partner to create a world-class energy efficiency engineering and building science program	OLTPS / DCAS / DDC / DEP		City operating
	Partner with an academic institution to develop a standardized energy database and make this data widely available	DCAS / OLTPS / DEP	NYSERDA / USGBC	City operating
	Partner with our cultural institutions to showcase the best new building strategies	OLTPS		City operating
	10 Provide energy efficiency leadership in City government buildings and operations			
	Pursue a variety of procurement mechanisms for 30 x 17, including Energy Savings Performance Contracting	DCAS		City operating
	Incentivize City agencies to reduce energy consumption by improving opertations and maintenance	DCAS		City operating
	Create standards and a handbook for high performance, green renovations of typical space types	DCAS / DDC		City operating
	Create a board to review new technologies and pilot them in City buildings	OLTPS / DCAS	City Council	City operating
	Incorporate energy-aligned lease language in City government leases, and promote energy-aligned leases in the private sector	DCAS		City operating
	New York City government to pilot a net-zero school, a Passive House project, and a deep energy retrofit project	SCA / DDC / HPD		City capital
	11 Expand the Mayor's Carbon Challenge to new sectors			
	Continue to support the University and Hospital Challenges, and develop "stretch goals"	OLTPS / EDC	NYSERDA	City operating
	Launch at least two new Mayor's Carbon Challenges	OLTPS	NYSERDA	NYSERDA
	PROVIDE CLEANER, MORE RELIABLE, AND AFFORDABLE ENERGY			
	12 Support cost-effective repowering or replacement of our most inefficient and costly in-city power plants			
	Advocate for a wholesale energy market design that does not discourage sensible repowering and new generation projects	OLTPS / DEP	NYISO / FERC	City operating
	13 Encourage the development of clean distributed generation			
	Examine the feasibility of developing clean DG at various City-owned sites and assets	DEP / DCAS	NYPA / National Grid / Con Ed / NYSERDA	City operating
	Work with utilities and project developers to streamline permitting and interconnection processes and to improve coordination of electric and gas distribution planning	DEP / DCAS	National Grid / Con Ed	City operating
	Advocate for cost-effective ratepayer-funded incentives to catalyze clean DG development	DEP / OLTPS	Con Ed / PSC	City operating

	MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
ENERGY	**14 Foster the market for renewable energy in New York City**			
	Work with stakeholders to explore ways to pool consumer purchasing power and demand for locally produced renewable energy	DEP / OLTPS		City operating
	Work with Energy Service Companies to conduct greenhouse gas accounting for local purchases of Renewable Energy Credits	DEP / OLTPS		City operating
	Develop an online solar map and a solar PV performance monitoring network to promote market growth and improve integration with utility planning	OLTPS	CUNY / Con Ed	Federal funding
	Work with Con Edison and other parties to explore the development of a one-stop, centralized website for permit application and tracking	OLTPS / DEP / DOB / FDNY	CUNY / Con Ed / NYSERDA	Con Ed / Federal funding
	Install small-scale solar PV and solar thermal projects at City-owned sites	DEP / DCAS	Con Ed / NYPA	City operating
	Explore public-private partnerships to develop utility-scale solar energy projects at capped municipal landfills	DEP	Con Edison	City operating
	Work with state and federal regulators to support cost-effective proposals for both public and private offshore wind projects that will benefit New York City	DEP / OLTPS	Con Ed / NYPA / US DOI / US DOE	City operating
	Explore the feasibility of developing small scale hydroelectric projects at upstate reservoirs and in water and wastewater distribution systems in a cost-effective and environmentally sensitive manner	DEP	State DEC / US FWS / FERC	City operating
	Undertake waste-gas-to-grid and cogeneration projects at City-owned buildings and infrastructure sites	DEP / DCAS / DPR	National Grid / Con Ed	Private funding
	Reuse as an energy resource 60% of anaerobic digester gas produced in our wastewater system by 2017	DEP	Con Ed / National Grid / NYPA / Private developers	City operating
	MODERNIZE OUR TRANSMISSION AND DISTRIBUTION SYSTEM			
	15 Increase natural gas transmission and distribution capacity to improve reliability and encourage conversion from highly polluting fuels			
	Work with pipeline developers, regulators, and community stakeholders to facilitate the permitting and development of appropriately sited natural gas transmission lines	DEP / OLTPS / DPR / DSNY / DOT / OEC	FERC / PANYNJ	City operating
	Work with utilities, regulators, and stakeholders to accelerate natural gas distribution upgrades in the areas where they can have the most impact in reducing residual fuel usage and improving air quality	DEP / OLTPS	Con Ed / National Grid	City operating
	Advocate for improved regulations and safety standards for natural gas production and transmission nationwide	DEP / OLTPS		City operating
	16 Ensure the reliability of New York City power delivery			
	Support the continued safe operation and relicensing of the Indian Point Energy Center	OLTPS / DEP / DCAS	NYISO / US NRC	City operating
	Explore more robust interconnection with neighboring power systems such as the Pennsylvania-New Jersey-Maryland (PJM) grid	DEP / DCAS / EDC		City operating
	Continue to evaluate the costs, benefits, and feasibility of other transmission line proposals that could deliver cleaner energy to New York City	DEP / DCAS / EDC		City operating
	Increase ability of City buildings to shed load during peak demand periods and emergency events to 50 MW	DEP / DCAS	Con Ed / State DEC / EPA	City operating
	17 Develop a smarter and cleaner electric utility grid for New York City			
	Lay the foundation for a smarter grid by deploying an Energy Enterprise Metering System (EEMS) in thousands of City-owned buildings	DEP / OLTPS / DCAS	Con Ed / NYSERDA	City operating
	Explore opportunities to leverage city wireless communication assets to assist utilites in conducting automated meter reading for power and gas customers	DoITT / DEP	Con Ed	City operating
	Partner with utilities, the private sector, and academic institutions to demonstrate the viability of "virtual generation" to allow buildings to sell energy curtailment services on wholesale electricity markets	EDC / DEP	Con Ed	City operating
	Support Con Edison's efforts to capitalize on lessons learned in smart-grid demonstration projects and to scale up cost-effective technologies that will help reduce consumption or improve grid reliability	DEP / OLTPS / DCAS	Con Ed / NYSERDA	City operating
	Work with regulators, utilities, building owners, and energy companies to encourage deeper participation by commercial and industrial consumers in market-based programs to reduce peak demand	DCAS / DEP	Con Ed / NYSERDA	City operating
AIR QUALITY	UNDERSTAND THE SCOPE OF THE CHALLENGE			
	1 Monitor and model neighborhood-level air quality			
	Maintain a street-level air monitoring network to track neighborhood air quality differences over time	DOHMH	CUNY	City operating
	Expand the methods and pollutants measured to look more closely at specific types of emission sources and exposure settings	DOHMH	CUNY	City operating
	REDUCE TRANSPORTATION EMISSIONS			
	2 Reduce, replace, retrofit, and refuel vehicles			
	Reduce the City's fleet by at least 5%	DCAS / Mayor's Office		City operating

	MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
AIR QUALITY	Implement the Clean Fleet Transition Plan	DCAS		City capital
	Install over 60 electric vehicle charging units at City-owned facilities and garages	DCAS		Federal funding
	Expand the use of biodiesel in the City's fleet	DCAS / DPR / DSNY		City operating
	Complete upgrades of 400 vehicles through existing Congestion Mitigation and Air Quality (CMAQ) and other funding sources	OLTPS / DOT / EDC		CMAQ
	Install Diesel Particulate Filters (DPFs) on 685 buses	DOE		CMAQ / Federal funding
	3 Facilitate the adoption of electric vehicles			
	Work with Con Edison and auto manufacturers to streamline the installation process for home EV chargers	OLTPS / DOB	Con Ed	Private funding
	Work with parking garage owners, co-op boards, consumers, and Con Edison to ensure that each group understands the technical and consumer needs associated with EV chargers	OLTPS / DOT / DCAS	Con Ed	Private funding
	Work with private and non-profit parties to inform New Yorkers about the benefits and use of EVs	OLTPS		Private funding
	4 Reduce emissions from taxis, black cars, and for-hire vehicles			
	Work with Congress to pass legislation to explicitly allow state and local governments to incentivize fuel-efficient vehicles	OLTPS / TLC	U.S. Congress	City operating
	Launch an electric vehicle taxi pilot program	TLC		City operating
	5 Reduce illegal idling			
	Improve compliance of existing anti-idling laws through targeted enforcement and education	OLTPS / NYPD		City operating
	6 Retrofit ferries and promote the use of cleaner fuels			
	Complete engine upgrades on four Staten Island ferries	DOT		CMAQ / Federal funding
	Retrofit 20 private ferry boats with Diesel Oxidation Catalysts (DOCs) and repower nine additional vessels to improve fuel efficiency	DOT		CMAQ / Federal funding
	Work with the State to repeal the exemption on Petroleum Business Tax for bunker fuel	OLTPS	State Legislature	City operating
	7 Work with the Port Authority to implement the Clean Air Stategy for the Port of New York and New Jersey			
	Work with the Port Authority and other partners to implement the actions outlined in the Clean Air Stategy for the Port of New York and New Jersey	OLTPS / DOHMH / DEP / DOT / EDC	PANYNJ / EPA	City operating
	Install shore-power capability at the Brooklyn Cruise Terminal	OLTPS / DEP	PANYNJ / NYPA	City operating
	Look for additional opportunities at other facilities to connect ships to the city's grid	OLTPS / DEP	PANYNJ / NYPA	City operating
	REDUCE EMISSIONS FROM BUILDINGS			
	8 Promote the use of cleaner-burning heating fuels			
	Launch a program to encourage and support the early phase-out of Numbers 4 and 6 heating oil	OLTPS / DEP / NYC Service	Con Ed / National Grid	Private funding
	Release Requests for Proposals to enter into energy performance contracts for City schools	DCAS		City operating
	Complete boiler conversions at 15 schools	SCA / DOE		City capital
	UPDATE CODES AND STANDARDS			
	9 Update our codes and regulations to improve indoor air quality			
	Propose regulations to reduce exposure to toxins released by building materials	DOB / DCA / DOHMH / OLTPS	City Council	City operating
	10 Update our air quality code			
	Update the NYC Air Code	DEP		City operating

MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
SOLID WASTE			
REDUCE WASTE BY NOT GENERATING IT			
1 Promote waste prevention opportunities			
Install redesigned drinking fountains in public spaces and parks to encourage adoption of reusable water bottles	OLTPS / DPR / DEP / DOT		City capital
Implement public education campaigns to reduce litter, encourage switching to reusable bags and reusable water bottles for tap water, and to encourage New Yorkers to reduce paper consumption	OLTPS / DSNY		Private funding
2 Increase the reuse of materials			
Implement public education campaign and leverage online platforms to encourage and increase reuse of materials	DSNY / OLTPS		Private funding
Encourage businesses, institutions, and individuals to reuse materials	OLTPS / DSNY	GrowNYC	City operating / Private funding / Partnerships
INCREASE THE RECOVERY OF RESOURCES FROM THE WASTE STREAM			
3 Incentivize recycling			
Encourage businesses to recycle, and use recyclable and recycled materials through corporate challenges, partnerships, or recognition programs	OLTPS/DSNY		Private donors / Partnerships
Improve access to residential waste generation and diversion rate data	OLTPS / DSNY		City operating
Implement new residential recycling penalties	DSNY		City operating
4 Improve the convenience and ease of recycling			
Increase recycling in public spaces and parks	DSNY / DPR		City operating
Require new residential buildings to provide space for recycling	DOB / DCP / DSNY	City Council	City operating
Expand recycling education programs	OLTPS / DOE / DSNY	GrowNYC	City operating
5 Revise City codes and regulations to reduce construction and demolition waste			
Require use of recycled content in building materials	DOB / DOT / DDC / DEP	City Council	City operating
Require recycling of building materials	DOB / BIC / DSNY	City Council	City operating
6 Create additional opportunities to recover organic material			
Expand opportunities for communities to compost food waste	DSNY / OLTPS	GrowNYC	City operating
Expand leaf and yard waste composting	DSNY / DPR		City operating
Complete the curbside organics feasibility study	DSNY / OLTPS		City operating
Implement a public-private textiles recycling program in every borough	DEP / OLTPS		Private funding
Encourage use of new technologies to increase recovery of commercial food waste	DCAS / DEP		City operating
Pursue on-site food recovery facility at the Hunts Point Food Distribution Center	EDC / DSNY / OLTPS		City operating
Encourage in-city opportunities to recover yellow grease and convert it to biofuel	DEP / BIC / DSNY	State DEC	City operating
Pursue opportunities to recover energy from biosolids	DEP		City operating
7 Identify additional markets for recycled materials			
Explore expansion of designated plastics	DSNY / OLTPS		City operating
Promote beneficial use of dredge and road renovation spoils	EDC / DSNY / OLTPS		City operating
8 Pilot conversion technologies			
Solicit proposals to develop conversion technology facilities to dispose of waste	DSNY / EDC / OLTPS		City operating

MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
SOLID WASTE			
IMPROVE THE EFFICIENCY OF THE WASTE MANAGEMENT SYSTEM			
9 Reduce the impact of the waste system on communities			
Achieve significant progress toward completion of the Hamilton (Brooklyn) and North Shore (Queens) Marine Transfer Stations	DSNY		City capital
Open the Sims recycling facility	DSNY		City capital
Promote export of commercial waste by barge and rail	DSNY / BIC / OLTPS		City operating
10 Improve commercial solid waste management data			
Complete the Comprehensive Commercial Waste System Study and implement recommendations	DSNY / BIC / OLTPS		City operating
Improve access to commercial carter information and disposal practices	BIC / OLTPS		City operating
11 Remove toxic materials from the general waste stream			
Expand Household Hazardous Waste collection program	DSNY		City operating
Enhance the public's access to information about and participation in the NYS e-waste program	DSNY / OLTPS	State DEC	City operating
Promote product stewardship programs for high toxicity products	DSNY / OLTPS		City operating
REDUCE THE CITY GOVERNMENT'S SOLID WASTE FOOTPRINT			
12 Revise City government procurement practices			
Develop best practices that address solid waste reduction for procurement and incorporate into Environmentally Preferable Purchasing	DSNY / MOCS / OLTPS		City operating
Incentivize city vendors to recover and reuse products	DSNY / MOCS / OLTPS		City operating
13 Improve the City government's diversion rate			
Improve quality of and access to City government solid waste generation data	DSNY / OLTPS		City operating
Develop pilot at targeted City buildings to measure diversion rate	DCAS / DSNY / OLTPS		City operating
Ensure all DOE schools have sustainability plans (including recycling) and designate a sustainability coordinator	DOE / DSNY		City operating
Sponsor packaging contest with design schools and corporate sponsors for products with high city agency consumption	OLTPS		City operating
CLIMATE CHANGE			
REDUCE AND TRACK GREENHOUSE GAS EMISSIONS			
1 Release an annual inventory of greenhouse gas emissions			
Expand GHG inventory to include neighborhood level analysis and reporting	OLTPS		City operating
2 Assess opportunities to further reduce greenhouse gas emissions by 80% by 2050			
Complete study to determine strategies to reduce citywide GHG emissions by 80% below 2005 levels by 2050	OLTPS		City operating
ASSESS VULNERABILITIES AND RISKS FROM CLIMATE CHANGE			
3 Regularly assess climate change projections			
Institutionalize New York City Panel on Climate Change (NPCC) and establish process to regularly update its climate projections	OLTPS		City operating
4 Partner with the Federal Emergency Management Agency (FEMA) to update Flood Insurance Rate Maps			
Release draft updated Digital Flood Insurance Rate Maps (DFIRMS) for public comment	OLTPS / DCP / DOB	FEMA	Federal funding
5 Develop tools to measure the city's current and future climate exposure			
Develop a climate risk assessment tool	OLTPS		City operating
Develop an updated digital elevation model using LiDAR data to promote more accurate sea level rise modeling	OLTPS / OEM / DoITT		City operating
Launch effort to develop publicly available projected flood maps that incorporate sea level rise projections for planning purposes	OLTPS / DOB / DCP / OEM		City operating

CLIMATE CHANGE	MILESTONES TO COMPLETE BY DECEMBER 31, 2013	LEAD AGENCY	OTHER PARTNERS	FUNDING SOURCE
	INCREASE THE RESILIENCE OF THE CITY'S BUILT AND NATURAL ENVIRONMENT			
	6 Update regulations to increase the resilience of buildings			
	Conduct study of the urban design implications of enhanced flood protection for buildings	DCP / DOB / OLTPS		Federal funding
	Pursue amendments to freeboard requirements to require freeboard for wider range of buildings to account for climate change projections	DCP / OLTPS		City operating
	Incorporate consideration of climate change within the policies of the City's Waterfront Revitalization Program (WRP)	DCP / OLTPS		City operating
	Launch study of effects of rising water tables, inland flooding, wind, and extreme heat events on buildings	DCP / OLTPS		City operating
	7 Work with the insurance industry to develop strategies to encourage the use of flood protections in buildings			
	Explore measures to promote flood protection in areas that may be subject to flooding based on climate forecasts	OLTPS / DOB / DCP	Private insurers	City operating
	8 Protect New York City's critical infrastructure			
	Complete Climate Change Adaptation Task Force assessment and report and begin to implement its recommendations	OLTPS		City operating
	Maintain the Climate Change Adaptation Task Force with an expanded focus on public health and safety services	OLTPS		City operating
	Assess the opportunities for the incorporation of climate change projections into design specifications and standards for critical infrastructure	OLTPS / DCP		City operating
	9 Identify and evaluate citywide coastal protective measures			
	Develop an inventory of best practices for enhancing climate resilience in coastal areas	OLTPS / DCP		Federal funding
	Coordinate with academic institutions, scientists, engineers, and designers to develop pilot projects to test potential strategies and evaluate their costs and benefits	OLTPS		City operating
	PROTECT PUBLIC HEALTH FROM THE EFFECTS OF CLIMATE CHANGE			
	10 Mitigate the urban heat island effect			
	Coat an additional two million square feet of cool roofs	OLTPS / NYC SERVICE / DOB		Private funding
	Pursue a cool roof requirement for existing buildings	OLTPS / DOB	City Council	City operating
	Work with neighborhoods most impacted by the urban heat island effect to develop and implement community-specific strategies	OLTPS / DOB / DCP		Federal funding
	11 Enhance our understanding of the impacts of climate change on public health			
	Complete study on the impact of climate change on public health	DOHMH		Federal funding
	INCREASE CITY'S PREPAREDNESS FOR EXTREME CLIMATE EVENTS			
	12 Integrate climate change projections into emergency management and preparedness			
	Integrate climate change projections into the City's emergency management and preparedness plans and procedures	OEM		City operating
	Launch a process to include climate change as a hazard assessed under the Natural Hazard Mitigation Plan	OEM		City operating
	CREATE RESILIENT COMMUNITIES THOUGH PUBLIC INFORMATION AND OUTREACH			
	13 Work with communities to increase their climate resilience			
	Ensure that outreach efforts target appropriate communites and provide up-to-date climate risk information	OLTPS		City operating
	Improve the access to publicly available data on the locations of hazardous material storage in flood zones throughout the city	OLTPS / DEP / OER		City operating

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