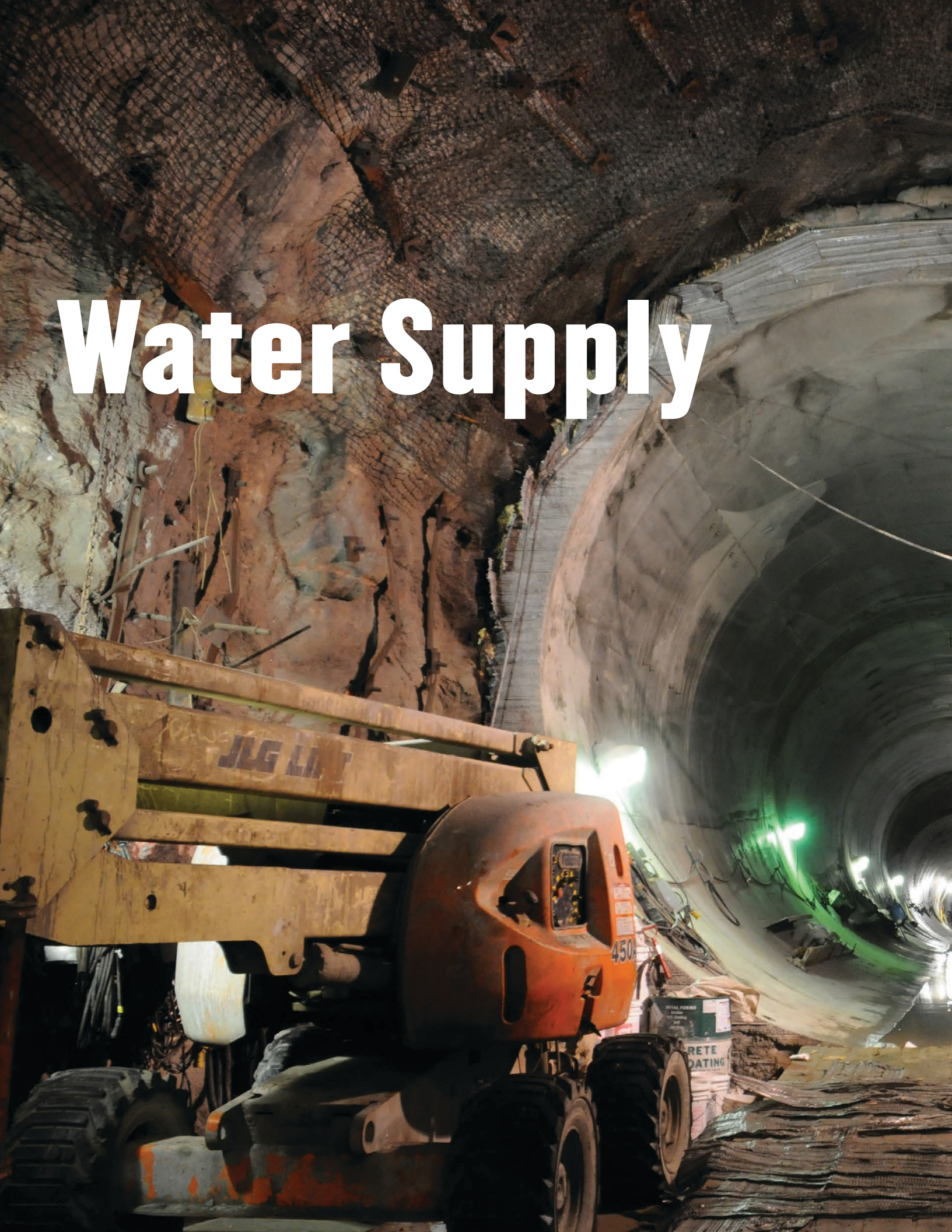


Water Supply





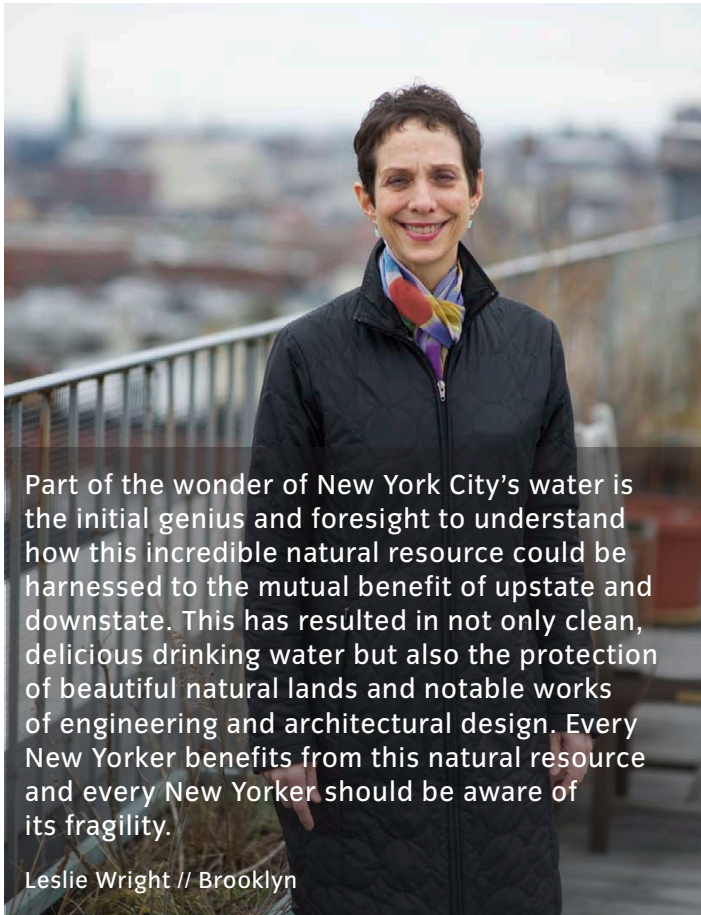
Together we can

Ensure the quality of our drinking water

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

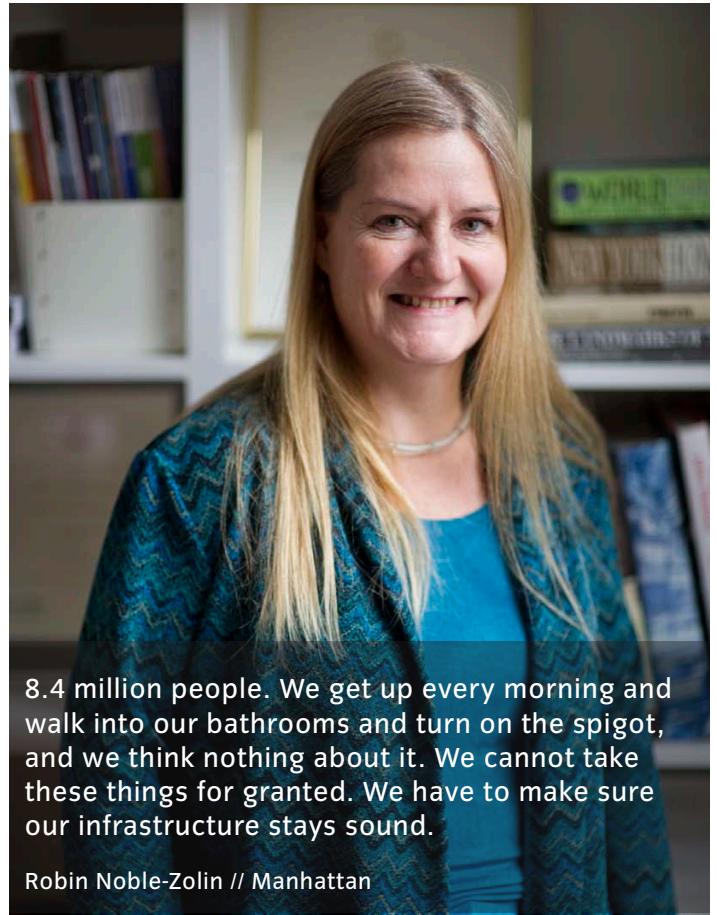
Modernize in-city distribution

Improve the efficiency of the water supply system



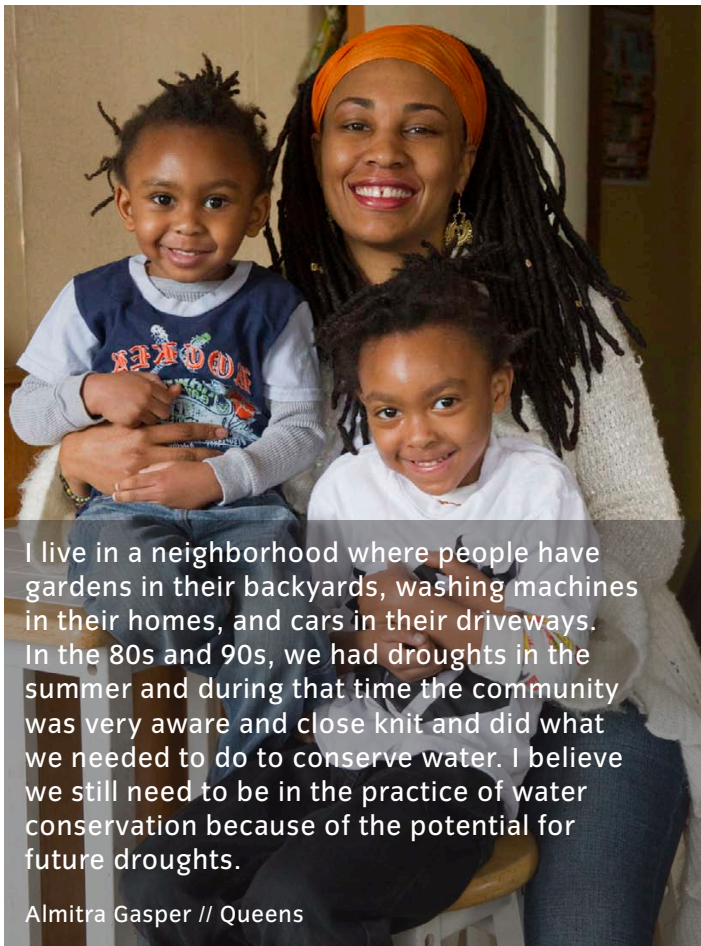
Part of the wonder of New York City's water is the initial genius and foresight to understand how this incredible natural resource could be harnessed to the mutual benefit of upstate and downstate. This has resulted in not only clean, delicious drinking water but also the protection of beautiful natural 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



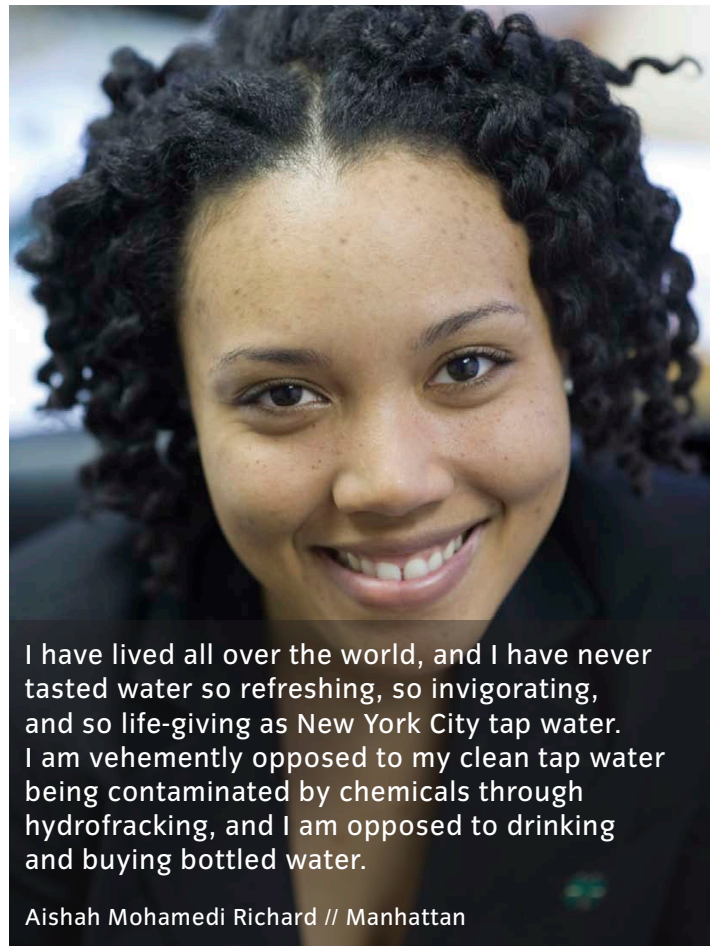
8.4 million people. We get up every morning and walk into our bathrooms and turn on the spigot, and we think nothing about it. We cannot take these things for granted. We have to make sure our infrastructure stays sound.

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

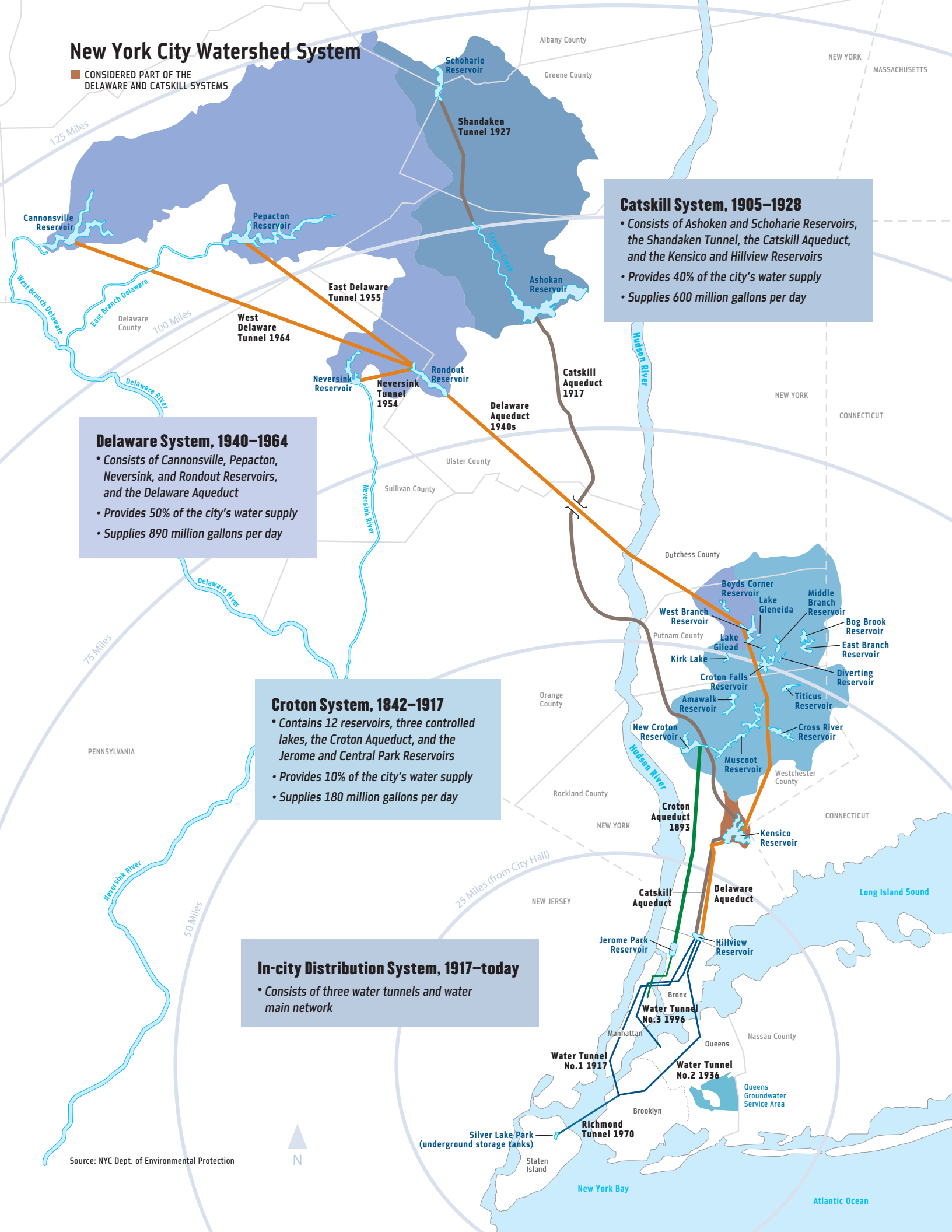
- 9 Complete City Water Tunnel No. 3
- 10 Build a backup tunnel to Staten Island
- 11 Upgrade water main infrastructure

Improve the efficiency of the water supply system

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

New York City Watershed System

■ CONSIDERED PART OF THE DELAWARE AND CATSKILL SYSTEMS



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

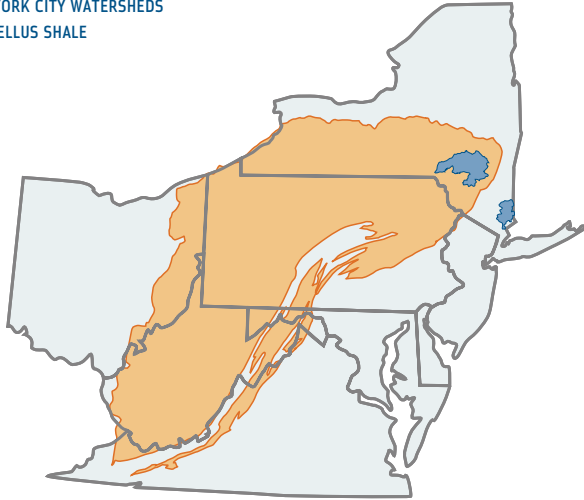
- Consists of three water tunnels and water main network

Source: NYC Dept. of Environmental Protection



New York City's Watersheds and the Marcellus Shale

- NEW YORK CITY WATERSHEDS
- 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 Filtration 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.

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

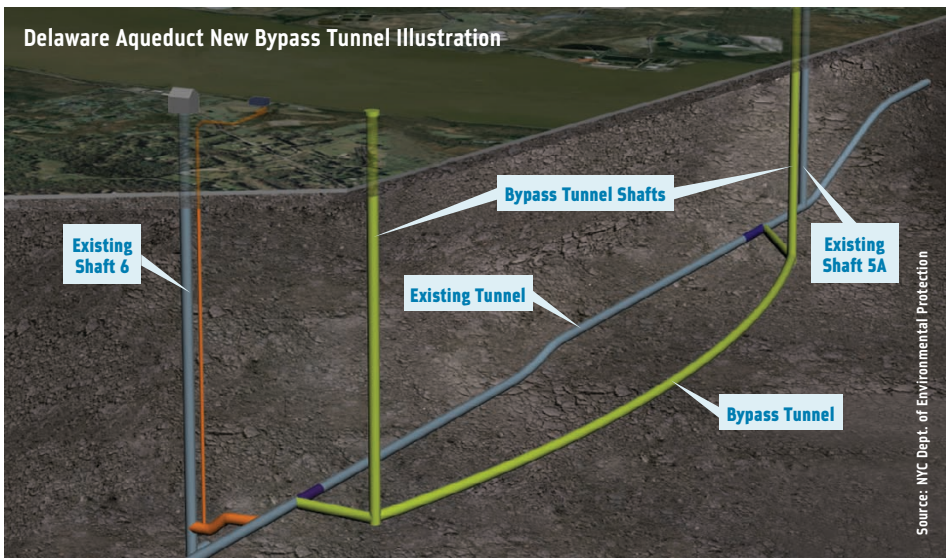
The 85-mile Delaware Aqueduct, completed in 1944, conveys approximately half of the city's drinking water—more than 500 mgd—from four upstate reservoirs. Since 1992, we have been monitoring stable, yet continuous leaks at two locations on the 45-mile section that carries water from the Rondout Reservoir 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.



Installation of shafts for City Water Tunnel No. 3

Credit: NYC Dept. of Environmental Protection



City workers repairing a water main

Credit: NYC Dept. of Environmental Protection

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.

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.

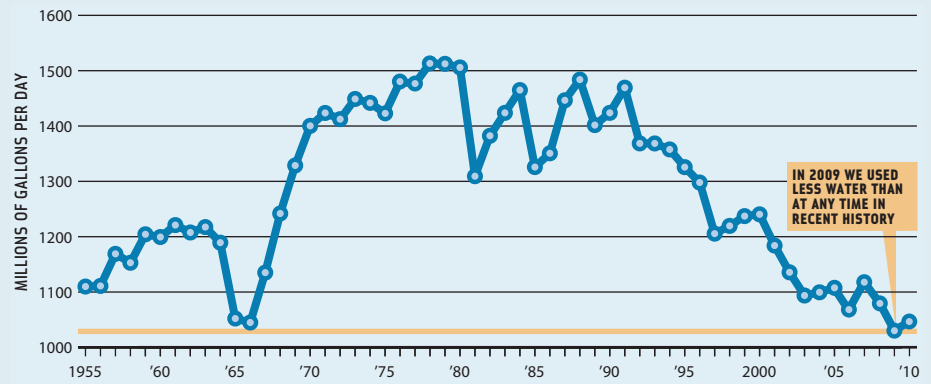
Finally, we will develop next-generation forecasting technology to ensure the optimal use of the entire reservoir system for New Yorkers and other stakeholders. This new technology will enable us to more precisely anticipate storms, forecast the impact of weather events on water quantity and quality, 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%.

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.

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.