

# fresh perspectives



FreshkillsPark Newsletter — Summer/Fall 2012



## A diversity of birds flock to Freshkills Park's unique ecological offerings

Though the Fresh Kills Landfill was once iconic for the chaotic activity of the tens of thousands of gulls and raptors it attracted when still active, the site is now becoming a much more significant nexus of avian activity than its relative tranquility might indicate.

Even as habitat restoration plans continue to transform Freshkills Park into a growing ecological asset, the site's present features already provide rich value for birdlife. The sweeping scale and unique siting of Freshkills Park, coupled with its existent and planned range of habitats and ecological communities, provide great value for a number of long-distance Neotropical migrants and resident bird species within the context of the largest urbanized region in the United States. As a large open space buffered by mature woodlands, freshwater wetlands, and a major estuary, the park is currently home to over 100 identified species throughout the year. As the park's development over the next 30 years continues to enhance connectivity to the Staten Island Greenbelt, including the nearby William T. Davis Wildlife Refuge and Arden Heights Woods, even more species can be expected to visit, forage, nest, breed, and roost throughout much of the park's 2,200 acres.

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**Above: (Left)** Gulls swarm over the open Fresh Kills Landfill. Archival photo courtesy of DSNY; **(Right)** Visitors with binoculars scan the landscape at a bi-monthly birdwatching tour of Freshkills Park.

# Freshkills Park serves as an important stopover for bird life

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## A MIGRATORY STOPOVER

Freshkills Park is a stopover along the Atlantic Migratory Flyway, providing birds with safe opportunities for resting and refueling between taxing stretches of long-distance flights. The Atlantic Flyway extends in a wide band across the east coast from Florida to Nova Scotia, and Freshkills Park is primed to take advantage of its geographical context to serve as an appealing avian destination.

Throughout their spring and fall migrations to breeding and wintering areas, birds make use of foraging resources at stopovers to replenish body mass and energy reserves lost overnight, often spending between one and three days before continuing onward. Birds also function as important pollinators and maintainers of insect and rodent populations during their journeys. Due to immense constraints on the time and energy birds have during migration, which can last up to 3 or 4 months, landbirds make use of a variety of available forested and vegetative cover types along the way. In regions defined or punctuated by urban land, this flexibility renders vital even fragmentary urban forest patches like graveyards and recreation areas, and particularly more expansive and robust habitats such as at Freshkills Park.

Ornithologists classify migratory stopovers and bird habitats in a number of ways, and the best way to understand how Freshkills Park functions is to consider it a “convenience store.” This refers to habitable land that is structurally heterogeneous – physically and ecologically diverse – with internal and nearby sources of fresh water and a multiplicity of accessible food resources. The park’s wooded and reed-filled edges alongside open grassland fields provide great protection from surprise predator attacks after exhausting nights of migration. Other large urban parks such as Central Park also fit this important classification. Because available green

space is the primary limiting factor for birds in migration, the status of Freshkills Park as a sizable stopover allows the site to serve a wide variety of birdlife well before habitat restoration plans are complete.

## A FORMER 'SINK'

Based on archival photos, it may seem like the former landfill used to be a better destination for birds when it was active. Fresh Kills Landfill was once teeming with Herring Gulls (*Larus argentatus*) and Great Black-backed Gulls (*Larus marinus*) – a record 30,000 in a 1998 census taken as part of the Audubon Society’s “Christmas Bird Count” – as well as starlings, pigeons, and crows. Swarms of these few species were a marker of a highly predictable food source within an otherwise poor-quality habitat. The biggest attractor of this activity was something rare among most ecological communities: birds would rely on a food source of rats, voles, and black flies that would feed on the continual influx of exposed organic garbage, becoming drawn into an ecological trap, or ‘sink.’ Though the actual numbers within specific species are lower now than when the landfill was open, there has been a measurable and significant increase in the overall diversity and safety of species as habitat and food sources have expanded.

## HABITAT OPTIONS

The mosaic of habitat types now found at Freshkills Park offers a benefit to several distinct orders of birds. Passerines – also known as songbirds – such as the Indigo Bunting (*Passerina cyanea*) and Savannah Sparrow (*Passerculus sandwichensis*) take advantage of the foraging opportunities in the upland grassland and successional woodland. Songbirds comprise the majority of Neotropical migratory birds observed at the park. Raptors such as the Red-tailed Hawk

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### Freshkills Park Team

#### Parks & Recreation Commissioner

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#### Land Use Review & Outreach Mgr.

Carrie Grassi

#### Landscape Architect

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#### Outreach Coordinator

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#### Interns

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Greg Golding

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### Mission

As Freshkills Park moves from the planning stages to implementation, we strive to keep community members informed of the progress in bringing this innovative project to reality. Building this park requires many coordinated activities, including the planning and design of the park, engineering for roads and other technical aspects of the park design, environmental assessment and regulatory permitting. The purpose of the Fresh Perspectives newsletter is to provide updates about the project’s progress as well as information about the site’s history and some of its unique features, resources and complexities.



**Right:** Geese spotted on a recent birding tour.  
**Below: (right)** Diagram of bird types commonly found in the existing habitats within Freshkills Park.



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(*Buteo jamaicensis*) and Northern Harrier (*Circus cyaneus*) are frequently spotted foraging and nesting in the open fields and meadows. Waterbirds like the Pied-billed Grebe (*Podilymbus podiceps*) and Hooded Merganser (*Lophodytes cucullatus*), as well as a range of other wading birds, shorebirds, and gulls are frequent winter residents in the tidal waters and freshwater wetlands throughout the site.

An even greater array of migratory and resident birdlife can be expected at the park as substantial new habitat is created. Based on surveys of nearby habitats, a total of 215 bird species may one day make their home at the park. A larger palette of native plant communities will be cultivated in restored wetlands and marsh, grasslands, and expanded woodlands as a key aspect of the park plan, connecting to surrounding Staten Island habitats and drawing in the many species occurring on these parcels.

## UNIQUE GEOGRAPHY

From the local scale to the regional, Freshkills Park provides a distinctive setting for birdlife. Many marsh islands like Prall's Island contained within the abutting Arthur Kill and its tributaries have historically been home to the largest nesting colonies of wading birds within the New York/New Jersey Harbor Estuary. A variety of significant protective buffer zones for breeding songbirds and foraging wading birds have also been identified nearby, creating important linkages in the area. Mature woodland areas surround the park, including Willowbrook Park, LaTourette Park, and Arden Heights Woods. Abundant birdlife is known to occur in these wooded areas, including Screech Owl (*Otus asio*), Blue-winged Warblers (*Vermivora cyanoptera*), Bank Swallow (*Riparia riparia*), and Hermit

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### WETLAND



TIDAL WETLAND

FRESHWATER WETLAND

MUDFLAT

### GRASSLAND



UPLAND GRASS FIELD

SCRUB SHRUB

WET MEADOW

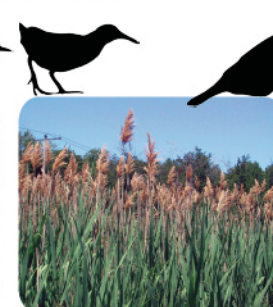
### WOODLAND



SUCCESSIONAL WOODLAND



PALUSTRINE FORESTED WETLAND



PHRAGMITES FIELD (INVASIVE SPECIES)

### OTHER



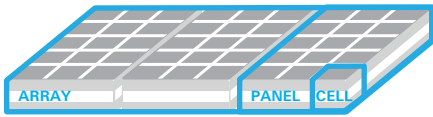
### KEY



① Songbird (e.g. Indigo Bunting); ② Bird of prey (e.g. Red-tailed Hawk); ③ Waterbird (e.g. Mallard); ④ Wading bird (e.g. Great Blue Heron); ⑤ Marsh bird (e.g. Water Rail); ⑥ Grassland bird (e.g. Palm Warbler)

# Small-scale solar at Freshkills Park: how it will work

## Photovoltaic unit terminology



An **ARRAY** is a complete power generating unit made up of panels electrically connected to produce one electrical output.

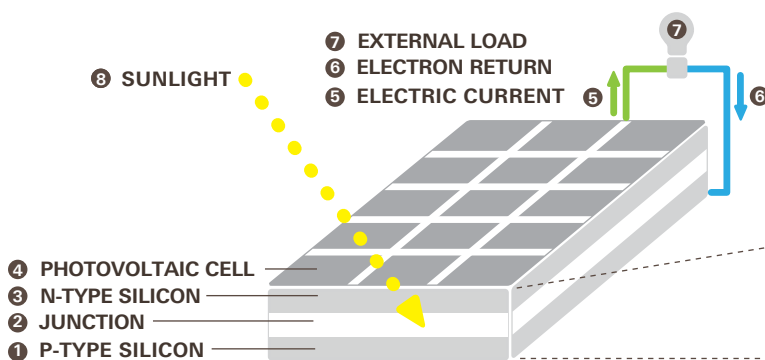
A **PANEL** or module is a group of photovoltaic cell circuits linked together.

A **CELL** is one complete photovoltaic circuit.

The Freshkills Park master plan calls for the use of renewable energy throughout the park. Various types of renewable energy, including energy captured from the sun, will be used to power many Freshkills Park facilities. Harnessing energy from the sun reduces the need for conventionally produced energy, thus reducing the negative impacts associated with those types of energy production. There are multiple ways to convert sunlight into usable energy, such as solar water heating or by designing structures to optimize the passive solar heating and cooling of space. Another way to convert sunlight into usable energy is by directly converting it to power through the use of photovoltaics (PVs).

Photovoltaic cells get their name from the combination of the word photo, meaning light, and voltaic, meaning electricity. The cells are made of semiconductors such as silicon. When sunlight strikes a PV cell, photons are transferred to the cell, energizing the electrons and enabling them to escape their position in a given atom to join the current in the electrical circuit (see diagram below). The built-in electrical field in the PV cell, due to the adjacency of the P-type and N-type silicon (charge gradients) that are sandwiched together, provides the right amount of voltage needed to drive the current through an external load. Currently, several structures are planned for Freshkills Park that will use PVs to convert sunlight into power. Solar gates will use an array of PV panels to power lighting in the North Park and South Park parking lots. In addition, lighting for the North Park and South Park comfort stations will be powered by PV panels on the roofs of those structures.

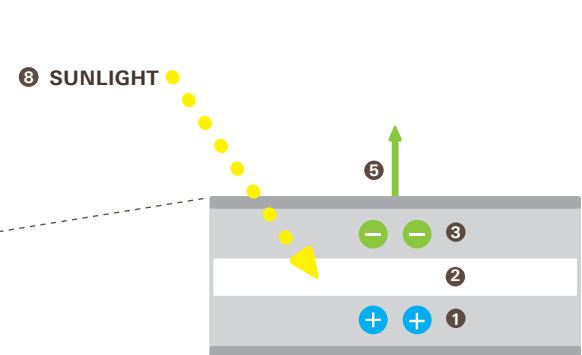
## PHOTOVOLTAIC PANEL



This diagram illustrates a unit similar to that which will be used to harness power in Freshkills Park.

PV cells are made up of a series of layers. The first layer of silicon, P-type silicon ①, is designed to attract electrons. The junction ②, an electric field created by the movement of extra electrons and protons in the two layers of silicon, is created by the adjacency of the P-type silicon and N-type

## DETAIL VIEW OF PHOTOVOLTAIC CELL



silicon ③, the next layer of silicon. The junction forces electrons to flow from the P-type side to the N-type side, but not the other direction. When light in the form of photons ⑧ hits the cell, each photon with enough energy will free electrons, further disrupting the cell's electrical neutrality. A rear metal contact is located on the under side of the P-type silicon layer, through which electrons return to the cell to complete the

circuit path. By providing a way for the electrons to return ⑥ to the P-type silicon, an electrical current ⑤ is produced and the cell's electric field causes a voltage, thus creating power, the product of current and voltage. An external load ⑦, an electrical circuit's output terminal, is a light bulb in the case of the lighting at Freshkills Park.

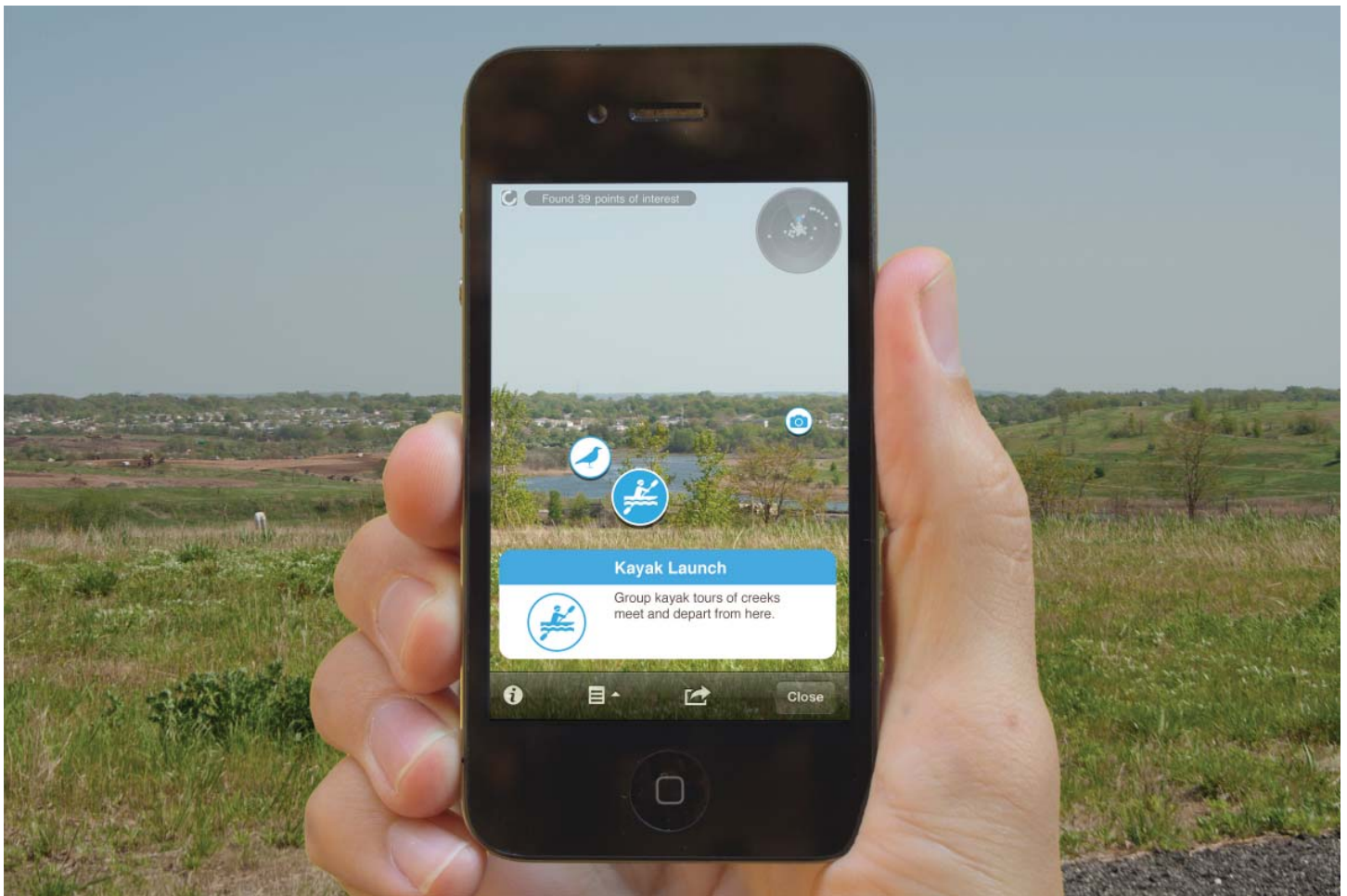




**Above:** A rendering of the future solar gate in North Park that will use photovoltaics to power lighting in the North Park parking lot.  
**Below:** A rendering of the future comfort station in North Park, with photovoltaic panels on the roof.







**Above:** A view of the app that was developed by Carlos J. Gómez de Llerena from New York based media architecture studio Med44.

## Freshkills Park+ : A digital guide to Freshkills Park

### How to get the app

The app is free and easy to download.  
<http://www.layar.com/layers/freshkills>

To get the Freshkills Park+ layer on your smartphone follow these steps:

**DOWNLOAD** the free Layar app on your smartphone.

**OPEN** the Layar app on your smartphone and search for Freshkills Park in the finder box.

**TAP** on the 'free' button to download the Freshkills Park+ layer.

**TAP** launch on the next screen and start exploring the next time you visit Freshkills Park on a public tour.

Freshkills Park+ is part of the Layar smartphone application (app), which allows Freshkills Park visitors to use their mobile device to explore various features of the site, including projects under construction, nearby bodies of water, buildings, bird sanctuaries, activities and panoramic views of the park.

The transformation of the former landfill into a park presents a unique challenge for visitors since the installation of many informational and educational signs and wayfinding components will come as the park continues to develop. The solution this app provides is a virtual information system that consists of descriptive icons and texts overlaying the camera view of a user's mobile device. Visitors see only the relevant information based on where the device is pointing, acting like a smart compass that helps them virtually navigate the park and learn about recent developments.

Additional videos, photos, sounds and articles related to these sights can be accessed while Freshkills Park visitors walk around the diverse areas of the site. Step-by-step directions to reach any of the locations by foot or bike can also be provided in real time, making it useful for those who want to find their way to the nearest facility or learn more about what they are seeing within the vast, 2,200-acre landscape.

For a full schedule of upcoming opportunities to visit the park, please visit the Freshkills Park home page and click on the 'Tours and Events' tab.

The app was developed by Carlos J. Gómez de Llerena from New York-based media architecture studio Med44.

# Wildlife Spotlight: Killdeer find new ideal habitat at Freshkills Park



PHOTO COURTESY OF ALLAN CLAYBON

## Killdeer *Charadrius vociferous*

**Range:** Both coasts and the southern half of the U.S. into central Mexico and the Caribbean. Summer range extends north into Canada. Winter range extends south into northern South America, including the coastal regions of Ecuador and Peru.

**Size:** A slender and long bird with a large head. On average about 7-11 inches long with a 20-inch wingspan.

**Preferred habitat:** Killdeer are usually found in open, low lying areas in close proximity to a body of water such as grasslands, pastures, wetlands, golf courses, and parking lots.

**Life span:** Though known to live as long as 10 years, most live for 3-6 years.

A common sight throughout much of the United States, the Killdeer derives its name from the *kill-dee* sound of their call. It is a member of the *Charadriidae* family. With a brown back and wings, two black bands across its white chest, a white stripe along its brown head and small white “eyebrows,” the Killdeer is easy to identify. Males and females look alike.

To attract a mate, males will claim a breeding ground and perform a song and dance. Once paired, a couple will produce 3-5 eggs biannually, and participate equally in the 25-30 day incubation. Chicks are precocial upon hatching, meaning they are covered in down and able to run as soon as their feathers dry. Unlike many birds, Killdeer lead their young to feeding areas rather than feed them directly. Chicks will stay with their parents for up to 30 days.

The Killdeer’s diet consists of invertebrates, seeds, frogs and small fish. As a result of their tendency to nest in open areas, Killdeer are exposed to various threats, have developed unique defense mechanisms, and are quick and nervous. The “broken-wing” act draws predators away from the nest as the bird limps around until flying away. To ward off larger animals like cows and horses the Killdeer raises its tail, puffs up its chest, and charges.

Despite many potential human-related threats, their proclivity for human modified habitats has enabled them to live in changing environments, including semi-urban areas; their nests are often found in yards and gravel roofs. As a result they are a successful species and are not considered threatened.

## Native flowering plants at Freshkills Park: How many can you identify?



**Top row (left to right):** Smooth Blue Aster (photo by John Beetham), Flat-top Goldenrod (photo by Betsy McCully), Common Evening Primrose (photo by Kelvin Chau);  
**Bottom row (left to right):** Red Columbine (photo by Gregory Paul Johnston), New England Aster (photo by Bill Rogers), Butterfly Milkweed (photo by Peter C. Gorman).

# Park hosts opportunities for birds and birdwatchers

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Thrush (*Catharus guttatus*). Over 117 bird species have been recorded at the William T. Davis Wildlife Refuge, adjacent to the site to the north.

This local diversity presents exciting opportunities for the occurrence of these species within Freshkills Park in the future. Staten Island is known as a borough of parks and open space, making for particularly safe space for birdlife given the right habitats.

Because migrating birds make decisions from an aerial perspective, the addition of green space within the urban mosaic is particularly beneficial: there is likely a strong connection between Freshkills Park, Jamaica Bay, the Meadowlands, and Long Island Sound due to the tendency of birds to “prospect,” or shift over 10-20 miles during migration, often because of changing tidal regimes in coastal zones. The nearby Long Island Sound is a major focal point along the flyway, as well as a popular wintering destination, channeling transient birds to and from Freshkills Park along the Connecticut and Long Island sides of the sound.

## BIRDING AT FRESHKILLS

The park currently hosts bi-monthly bird watching tours, co-led by naturalists from the Staten Island Museum. Future park developments include a dedicated bird observation tower

overlooking the wildlife refuge to the north, and a host of other great outlooks for birdwatching. A study of bird populations at Freshkills Park is underway by Hunter College, and is gathering data on resident bird diversity and breeding success.

Continued urban development has made functional, non-fragmented habitats for birdlife along migratory routes increasingly uncommon. The generation of new migratory stopover sites and protection of existing habitats are therefore increasingly crucial in providing space for successful cycles of avian migration, as well as accruing the ecological benefits bird species provide. As a coastal stopover within an urban-industrial context, Freshkills Park is primed to be vital in the support and promotion of migratory patterns and other behaviors of land-dwelling and coastal bird species alike. The many species already found at Freshkills Park attest to its unique capacity among other open spaces within New York City and other metropolitan areas to serve these critical ecological needs.

*Seth Wollney, Program Associate at the Staten Island Museum, and Dr. Mark Hauber, Professor of Psychology at Hunter College and the Graduate Center of CUNY, contributed to the reporting of this story.*

## More about birding tours at Freshkills Park

For more information about future birding tours at Freshkills Park, visit the official park website, [nyc.gov/parks/freshkillspark](http://nyc.gov/parks/freshkillspark), and sign-up for our e-blast.



**Top:** A bald eagle soars above Freshkills Park.  
**Above:** One of the bird boxes in use for a bird population study at the park by Hunter College.

# FreshkillsPark

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Parks & Recreation  
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Adrian Benepe, Commissioner

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[www.nyc.gov/parks/freshkillspark](http://www.nyc.gov/parks/freshkillspark)  
[www.freshkillspark.wordpress.com](http://www.freshkillspark.wordpress.com)

**Project Partners**  
Department of Sanitation  
[www.nyc.gov/dsny](http://www.nyc.gov/dsny)

Department of City Planning  
[www.nyc.gov/dcp](http://www.nyc.gov/dcp)

**Related City Initiatives**  
PlaNYC 2030  
[www.nyc.gov/planyc2030](http://www.nyc.gov/planyc2030)

MillionTreesNYC  
[www.milliontreesnyc.org](http://www.milliontreesnyc.org)

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