



Mobility

Introduction


44

acres of painted
bus lanes since
2007


141

acres of new bike
lanes since 2007

New York's rapid population and economic growth during the 1990s and 2000s presented City government with major challenges. Prosperity and vitality are obviously desirable, but how to improve the City's basic systems, including transportation, while serving more people and activity? PlaNYC's answer was to take much greater advantage of the City's historic orientation to walking and public transit.

Although New York City's renaissance was in large measure built upon the reconstruction of the subway system beginning in the 1980s, there had been few City policies put in place to reinforce and support this investment. The Bloomberg Administration changed that, taking active steps such as rezoning targeted areas to direct growth rather than respond to it after the fact. In transportation, PlaNYC emphasized improved performance and efficiency from assets that had long gone overlooked, especially City streets and NYC's huge bus system.

New York's density makes it a natural walking and cycling city. These options are also strong complements to the City's public transit systems, provided people regard them as safe and convenient. NYCDOT's work to implement the transportation policies of PlaNYC have reinvented bus service, made bicycling a mainstream option for navigating the City and made pedestrians the focus of traffic planning and engineering. Delivering these results and implementing "complete streets" that safely and efficiently promote the travel of bus riders, cyclists, pedestrians and motorists has required numerous design and engineering innovations.

These are now well documented and are being increasingly adopted by cities across the United States and the world. One key to their success has been the ongoing update of traffic engineering and traffic management technology to ensure that street changes do not increase vehicular congestion. NYCDOT has shown that creating complete streets is not a zero sum exercise between different types of street users.

The development of better bus service, better cycling and walking conditions and the availability of CitiBikes, along with other options the Bloomberg Administration has created or promoted such as East River Ferry service and borough “green” taxis adds many new elements to the City’s already-rich menu of transportation options. People are increasingly embracing transportation choice and variety, from new intercity bus services to car-sharing companies.



Chapter 5

Better Bus Service

New York City's bus system offers tremendous potential for efficient and environmentally friendly movement of people. Buses serve 2.6 million riders each weekday citywide. But with an average speed of eight miles per hour, many routes are frustratingly slow. Improving bus speeds and customer experience is one of the quickest ways to build mass transit capacity in the city, especially in areas far from subway stops and in dire need of speedier transit options.

Since 2007, NYCDOT has worked closely with its partners at NYC Transit to unlock the potential of streets. A new model of bus service has laid the foundation for a citywide bus rapid transit network to supplement subway service.



50

hours saved
annually for each
SBS rider

SPEEDING BUSES IN A THRIVING CITY

In 2007, PlaNYC gave a clear mandate to vastly improve bus service to give New Yorkers more sustainable transit options and prepare for future population and economic growth. Mayor Bloomberg appointed top NYCDOT officials who embraced his vision and had experience in transit planning and management. New DOT management revamped bus rapid transit and instituted an extensive outreach processes to effectively engage communities along transit routes. New directors at the MTA and at NYCTransit were similarly committed to improving bus service—a strategic alliance developed between the agencies. Within months, bus projects started to move forward quickly.

The result was NYCDOT and NYC Transit's Select Bus Service (SBS) program, which improves speed, reliability, and customer experience for bus riders. SBS uses elements of bus rapid transit (BRT), a cost-effective approach to transit service that cities around the world have used to make

riding the bus more like riding rail transit. Off-board fare collection, designated bus lanes, safer, more attractive station areas, and signals that prioritize buses over other vehicles are combined along each route. Development of the service involved unprecedented collaboration with the MTA NYC Transit and intense partnership with local community boards and civic groups.

The first Select Bus Service started in 2008 along Fordham Road in the Bronx. Since then, five other routes have launched, including 34th Street and 1st and 2nd Avenues in Manhattan, Nostrand Avenue in Brooklyn, Webster Avenue in the Bronx, and Hylan Boulevard in Staten Island. A seventh route, along 125th Street in Harlem and travelling to LaGuardia, will begin in 2014.

By the end of 2013, these SBS routes will serve 215,000 bus riders daily and lay the groundwork for a more extensive five borough bus rapid transit network.



Community planning for Select Bus



98%

of riders satisfied
with Fordham Road
Select Bus Service

Fordham Road Bus Service

The Fordham Road-Pelham Parkway Bx12 Select Bus Service (SBS) replaced Bx12 Limited service from the Inwood neighborhood in Manhattan to Co-Op City in the Bronx in June 2008. New York City's first SBS route, the Bx12 SBS offers transfer opportunities to all of the subway lines and Metro-North lines in the Bronx as it travels east-west through the borough.

The project resulted in 20% improvement in travel times, with 98% of riders "satisfied" or "very satisfied" with the service. The new route experienced a 10% increase in ridership.

23%

decline in bus travel
times along 34th
Street

34th St Select Bus Service

The 34th SBS project improved traffic, transit speeds, pedestrian safety and curb access on a corridor that extends for two miles from the 34th Street Ferry Terminal on the East River to Twelfth Avenue. 34th Street is a key transit corridor, accommodating over 33,000 bus trips a day.

The 34th St SBS project has been implemented in phases. Bus lanes were implemented first in 2008, followed by more extensive sidewalk improvements.

Since initial improvements in 2008, bus travel times on 34th Street have declined 23% or by over 7½ minutes, and ridership is up over 12%.



10%

increased ridership
on the M15 Select
Bus

1st/2nd Avenues Select Bus Service

NYCDOT and MTA/ NYC Transit launched Select Bus Service along First Avenue/Second Avenue SBS (M15 SBS) in October 2010 serving riders between South Ferry and 125th St. The project was implemented in phases—off board fare collection machines and red bus lanes were installed first, followed by transit signal priority and the construction of 12 bus bulbs along the corridor in 2013. This route was the first to have bus enforcement cameras to help keep lanes clear. A separated bicycle path was implemented concurrently along portions of the corridor greatly improving safety for all users.

This service has since increased ridership on the M15 by 10% and improved speeds by 15 to 18%. Further, as part of the project, offset and curbside bus lanes were paired with pedestrian and bicycling safety enhancements. For those sections with the full treatments, we've seen a 21% decline in traffic injuries.



Select Bus Service in the Bronx, Manhattan and Staten Island has improved local and express bus travel time and reliability, traffic flow at congested intersections, and enhanced safety for all corridor users



BEFORE: Webster and Tremont Ave.



AFTER: Webster and Tremont Ave.

Hylan Boulevard Select Bus Service

S79 SBS started in September 2012, connecting Hylan Boulevard, Richmond Avenue, and Bay Ridge, Brooklyn. The project improved local and express bus travel time and reliability, traffic flow at congested intersections, and safety for all corridor users. As part of the study, DOT and NYCT analyzed through and turning traffic on the corridor, surveyed parking activity, analyzed

transit ridership, surveyed local merchants and conducted extensive public outreach for feedback from stakeholders. The project corridor includes bus lanes in certain areas, including two miles of bus lanes to the Verrazano Bridge, extended medians, and transit signal priority. Travel times have improved by 12% since SBS was introduced.

Nostrand Avenue Select Bus Service

The Nostrand Avenue SBS project extends 9.3 miles across Brooklyn from Sheepshead Bay to Williamsburg and offers a cost-effective way to improve bus service for 44,000 daily riders. The project includes dedicated bus lanes, transit signal priority, construction of bus bulbs, and off-board fare collection. These improvements will reduce travel time and attract additional riders who currently avoid bus service due to slow speeds and a lack of reliability. The service started in November 2013.

Webster Avenue Select Bus Service

Webster Avenue is a major residential and commercial corridor in the Bronx, yet it has been underserved by transit, with most of the corridor a long walk from the subway. MTA and DOT identified this project due to high ridership on existing bus routes—serving 69,000 trips a day—and community support. After an extensive public engagement process, the project was implemented in June 2013.

Additional Bus Priority Projects

Elements of the bus rapid transit, such as painted bus lanes and traffic signals that speed buses through traffic, have also been used to improve bus service in selected corridors throughout the city including the ones listed below.

LaGuardia Airport Access:

DOT worked with the MTA to help plan the new Q70 bus. The new limited service speeds trips to the airport from Jackson Heights and Woodside commuter and subway stations by up to 40%.

Livingston Street:

Through the addition of upgraded bus lanes and signal changes, DOT and MTA improved bus speeds 12%-14% along this corridor in Downtown Brooklyn.

Jamaica:

DOT worked with MTA to improve and extend bus lanes along Archer and Jamaica Avenues, realign intersections, move bus stops and change parking to improve bus speeds and reliability.

Queensboro Bridge:

Operational changes on the Ed Koch Queensboro Bridge made travel between the boroughs quicker and more efficient. These included reconfiguring 60th Street to provide additional bus lanes and stops, and changing signal timing to reduce pedestrian and bus conflicts.

Utica Avenue:

DOT and NYC Transit are planning the addition of bus lanes from St Johns Ave to Church Ave, and the addition of signal changes including transit signal priority.

The screenshot shows the MTA website's promotional page for the new Q70 Limited-Stop Service. At the top, there is a navigation bar with links for Accessibility, Text-only, Customer Self-Service, and FAQs/Contact Us. Below this is a search bar and a main menu with links for Home, Schedules, Fares & Tolls, Maps, Planned Service Changes, MTA Info, Doing Business With Us, and Transparency. The main content area features a large blue banner with the text "New Q70 Limited-Stop Service to LaGuardia Airport" and a "NEW" starburst. Below the banner is a diagram showing a bus labeled "Q70" with arrows pointing to "LGA" (LaGuardia Airport), "LIRR", and "Subway". Text below the diagram reads: "Introducing faster, more convenient service PLUS subway and rail connections to LaGuardia Airport." Further down, it says "Get your trip off to a flying start! With Q70 Limited-Stop Service." and "The Q70 Limited (LTD) provides faster service: up to 40% faster.* Because the Q70 LTD travels on highways instead of narrow, congested streets and makes fewer stops, your travel time from Jackson Heights can be reduced by up to 40%." At the bottom, it notes: "*Compared to the former Q33 route between Jackson Heights and LaGuardia Airport. The Q70 LTD provides direct subway and rail connections to LaGuardia Airport. The Q70 LTD provides direct, full-time, limited-stop service between the Jackson Heights-Roosevelt." To the right of the main banner is a vertical sidebar with a "Try it Free" button, a quote from John Becker, CEO of GoToMeeting, and another "Try it Free" button.

Q70 information on mta.info

15%

fewer obstructions
in bus lanes with
enforcement
cameras

Transit Signal Priority

Transit signal priority (TSP) gives precedence to buses at traffic lights. By keeping signals green or turning them green when buses approach, TSP speeds buses through traffic and improves travel time for riders. By allowing buses to move at a more consistent speed, TSP reduces times a bus has to stop and accelerate. In turn, fuel consumption and emissions reduction savings are achieved.

Transit signal priority is part of Select Bus Service routes, but the technology has the ability to be more widely used, and speed buses on routes throughout the city. In addition to SBS routes, NYCDOT has worked with the MTA NYC Transit to install TSP on three corridors with a goal of reaching at least 17 routes—including SBS—in all five boroughs. Along Victory Boulevard in Staten

Transit signal priority along Victory Blvd in Staten Island reduced travel time by 16% during the morning rush

Island, a TSP test on 300 buses successfully cut travel time by 16% during the morning peak and 11% during the evening peak. The program was funded by the US Department of Transportation and supported by the Staten Island Borough President's Transportation Task Force. In fall 2012, NYC Transit started a TSP pilot on 50 buses along the M15 Select Bus Service route on 1st and 2nd Aves.

Widespread application of TSP has the potential to greatly improve bus service throughout the five boroughs, with limited cost and physical infrastructure.

Bus Lane Enforcement Cameras

Enforcement of bus lanes is necessary to keep bus lanes clear and buses moving quickly. To supplement NYPD officers, the city sought state legislative approval for enforcement cameras.

In summer of 2010, New York City and the MTA were given authorization to begin operating a camera-based bus lane enforcement system. The legislation allows camera-based enforcement on specifically named Select Bus Service (SBS) corridors, six in total, and also names specific restrictions regarding the time, day of week, and methods of enforcement. Based on this authority, the City and

the MTA initiated implementation of a camera-based enforcement system beginning in November, 2010. 1st and 2nd Avenue was the first route to receive the cameras, with 34th St and Fordham Road and Hylan Boulevard following. The city is currently authorized to install them along Nostrand Ave and another unnamed route in Queens. People driving in bus lanes receive tickets of \$115.

The bus cameras have worked to keep buses moving. In bus lane segments where cameras were installed, bus lanes were obstructed 15% less than segments without cameras.

This brochure is also available in Spanish, Pycckий, 中文, 한국어, and Italiano.

La Ciudad de Nueva York ha aumentado la vigilancia y el control de los carriles de autobuses, incluso utilizando cámaras. Los carriles de autobuses están marcados claramente y son sólo para autobuses. Si conduce, se estaciona o se detiene en un carril de autobuses durante las horas de servicio, se arriesga a ser multado de \$115 a \$150. Para más información, incluso para una versión de este folleto en español, por favor visite www.nyc.gov/bt o llame al 311.

Bus Lane Enforcement

If you drive, park, or stand in a bus lane during hours of operation you face a fine ranging from \$115 to \$150. NYC enforces bus lanes in two ways:

Bus Lane Cameras: The City has installed cameras along bus lanes to catch violators. Signs are posted along routes that have bus lane cameras as an extra warning for drivers to keep out of bus lanes, except for allowed right turns and passenger pick up/drop off.

Police Enforcement: NYPD regularly patrols bus lanes, and issues both moving and parking violations to bus lane violators.

For more information, visit:
Para obtener más información visite:
Более подробную информацию:
자세한 내용은 다음 사이트를 방문하십시오:
Použijte prosím infomasyon, vizite:
Per ulteriori informazioni visitate:

www.nyc.gov/bt

NYC 311

NEW YORK CITY DOT

MTA New York City Transit



Benjamin
Moore

SCHOOL BUS

NEED A BUS ?
CALL US !
718 444 - 4200

PC-19

BALKAN

105
111

REYNOLDS
GLASS CUT
TOOL RE-TRAIL

SELECT BUS SERVICE PHASE II

- IMPLEMENTED
- PLANNED BRT PHASE II



NYCDOT identified dozens of potential bus rapid transit corridors, and with NYC Transit, selected 16 routes for implementation

Planning for Bus Rapid Transit

In 2009, once planning was underway for the initial five Select Bus Service projects, NYCDOT and MTA launched a citywide planning process to map out the next round of bus rapid transit routes. MTA and NYC Transit identified over 30 potential corridors for bus service improvements based on proximity to existing transit, potential population growth areas, subway and bus crowding, and difficult trips. The agencies then held seven workshops with over 300 people to solicit additional feedback. In the workshops, 74% of survey respondents said that they supported implementation of BRT in New York City. The agencies then narrowed the list down to 16 priority corridors.

30 BUS RAPID TRANSIT CORRIDORS

The Bronx

Fordham Road
 Webster Ave/Third Ave
 South Bronx/East West Corridor (Hunts Point/Soundview)
 Bruckner Expressway
 Major Deegan Expressway

Brooklyn

Nostrand Ave
 Utica Ave
 Southern Brooklyn East West Corridor
 Bushwick to Downtown Brooklyn
 Flatbush Ave
 Central Brooklyn East West Corridor
 Williamsburg East River Waterfront
 Gowanus Expressway

Manhattan

34th St
 1st/2nd Ave
 125th Street Crosstown Corridor
 Upper West Side/Upper East Side Crosstown Corridor
 14th Street Crosstown Corridor
 West Side Corridor

Queens

LaGuardia Airport/East Elmhurst
 Manhattan to Northern Blvd
 Hillside Avenue Corridor
 Jamaica to Flushing
 Woodhaven Blvd

Southeast Queens

Middle Village
 Utopia/Fresh Meadows
 Long Island Expressway
 Long Island City East River waterfront

Staten Island

Hylan Boulevard
 North Shore
 West Shore
 Staten Island Expressway

 IMPLEMENTED
 PLANNED BRT PHASE II
 OTHER POTENTIAL ROUTES

Community Advisory Committees are crucial to designing and planning Select Bus Service

Community Advisory Groups

Community boards, civic groups, and the public are heavily involved in the planning process for Select Bus Service routes. Each SBS route has involved dozens of meetings with stakeholders, along with walk-throughs and focused workshops to develop community based solutions to particular challenges along a route. Part of the public engagement process includes the creation of a Community Advisory Committee (or CACs) to allow a more detailed discussion of the proposal and address traffic, street design, commercial delivery and other issues along a corridor. CACs generally include representatives from community boards, elected officials offices, business associations, and civic groups.

The public process for the Webster Ave Select Bus Service in the Bronx led to a more aggressive

and better project. Members of the Community Advisory Committee brought up pedestrian safety concerns during meetings with the NYCDOT and NYCTransit, especially at the intersection of Webster and Tremont Avenues. These concerns reinforced DOT's data that showed this intersection as a high crash corridor in the Bronx. In response to community suggestions, DOT's transit and pedestrian safety groups worked together to redesign the Webster Tremont intersection to add additional pedestrian amenities including the addition of two pedestrian refuge islands, the closure of a slip lane, extension of the sidewalk to shorten crossing distances. Thanks to community involvement through the Community Advisory Committees, DOT was able to design a project that addressed transportation challenges in a more holistic way.



Community Advisory Committee

REGULATING INTERCITY BUSES

The intercity bus industry has grown significantly over the last fifteen years, becoming an increasingly popular option for people traveling into and out of New York City. While such buses provide good, efficient, intercity transportation, they can cause serious disruption to the local traffic network through increased congestion and abuse of the city's curbside spaces. NYCDOT had

attempted to limit the negative impacts of intercity buses by working closely with operators to designate locations where buses can pick up and drop off passengers. Unfortunately, this system was voluntary and NYCDOT had no authority to prevent intercity buses from pulling up to almost any curbside space. Communities and elected officials, especially in Midtown, were increasingly

frustrated with sidewalk and traffic congestion that resulted from certain bus stops.

In 2012 and 2013, the city worked with state elected officials to pass legislation that would give the NYCDOT new powers to regulate the intercity bus industry. The law sponsored by New York Senator Martin Golden and Speaker Sheldon Silver granted the City of New York authority to

set up a permitting system for intercity bus operators. Through a formal online application process, NYCDOT now designates bus stops for all intercity buses, limiting disruptions to the local transportation network.



Megabus Northeast, LLC pick up stop at seventh avenue and 28th St



Eastern Coach Inc. Pick up stop at Seventh Avenue and 33rd St



DEPT. OF TRANSPORTATION

Staten Island Ferry

NEW YORK, N.Y.

Chapter 6

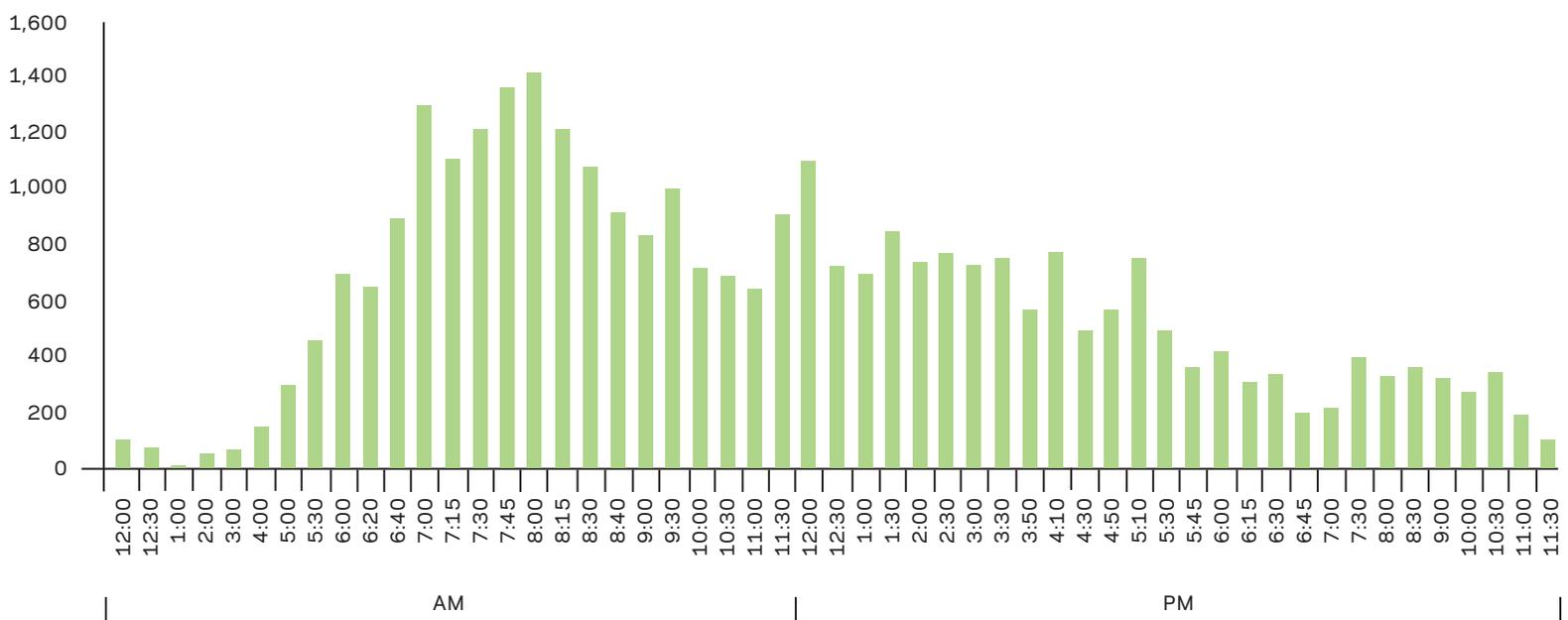
A City of Rivers and Islands

New York is a waterfront city and a city of islands. As a result, ferries have always played a critical role in moving people and goods around the five boroughs. Today, the Staten Island Ferry, which carries 22 million people annually between Manhattan and Staten Island, is the largest commuter ferry route in the country, and ridership continues to grow.

In the last several decades, a robust network of privately-operated ferry services has also been established in New York City. The services carry Yankee fans to the Bronx, commuters to New Jersey, tourists to the Statue of Liberty and Ellis Island, and beachgoers to the Rockaways. Over the past five

years, the city has worked to encourage and expand the use of our waterways for commuter and recreational transportation. In 2011, Mayor Bloomberg and the City Council released Vision 2020, the New York City Comprehensive Waterfront Plan which called for improving waterfront transportation and access to the waterfront. In addition to this long-term vision, the Mayor and Council also released the Waterfront Action Agenda, a series of 125 near term initiatives to make the most of our waterways. Expansion of ferries was a key element of both plans.

STATEN ISLAND FERRY 24-HOUR WEEKDAY RIDERSHIP, STATEN ISLAND TO MANHATTAN



FRIDAY JUNE 24, 2011



Staten Island Ferry

CITY OF NEW YORK

SEN. JOHN J. MARCHI

STATEN ISLAND FERRY

STATEN ISLAND FERRY ON TIME PERFORMANCE

% ON TIME	FY 2011	FY 2012	FY 2013
	91%	89%	89%

NYCDOT operates and maintains the nine Staten Island vessel fleet as well as the St. George Ferry Terminal on Staten Island, Whitehall Ferry Terminal in Manhattan, the City Island and Hart Island Facilities, and The Battery Maritime Building.

Service on the Staten Island Ferry is free and runs 24 hours a day, in 15 minute intervals during rush hours. It is the only non-vehicular transportation between Manhattan and Staten Island. The ride is a vital commuter service for millions of New Yorkers, but the 5-mile, 25 minute ride also provides a majestic view of New York Harbor for tourists from all over the world. Staten Island Ferry ridership

reached an all-time high in 2012, serving 22 million people, and ridership continues to grow. The agency has been successful at keeping service reliable despite declining city resources. Finding innovative ways to use state and federal resources, the agency has been able to plug holes in the city budget and keep boats running frequently and on-time. At the same time, it has kept on time performance steady and found ways to green the ferry fleet. Chapter 16 of the Infrastructure section below details agency's efforts to make the Staten Island Ferry fleet one of the greenest in the nation.

EAST RIVER FERRY

Started in 2011, the East River Ferry commuter service has been wildly successful and offered a new transportation option for waterfront neighborhoods. The service, which connects Long Island City, Greenpoint, North and South Williamsburg and DUMBO with Downtown and Midtown Manhattan, has significantly outperformed the City's original expectations. In May 2013, the service recorded its 2 millionth rider, more than twice the ridership that was projected for the full three-year pilot period that ends in the summer of 2014. Summer ridership increased 43% from the summer of 2011 to the summer of 2012. The East River Ferry has proven so popular that in May 2012, the City announced that larger boats—carrying as many as 399 passengers per trip—would be added to the East River Ferry fleet.

The city is working to find a long term operator for the ferry service to make it a permanent option for New Yorkers.

The East River Ferry is managed by the city's Economic Development Corporation, but DOT plays an important role in siting ferry docks and improving access to the service. Safety improvements at the India Street pier in Greenpoint and traffic calming and pedestrian improvements on Old Fulton St in DUMBO and Brooklyn Heights ensured safe passage to ferry landings. The initial roll out of DOT's CitiBike system included stations at four of the seven East River Ferry landings and the remaining three ferry landings will receive CitiBike stations in bike share's next phase. Additionally, CityRacks have been placed at all ferry stops.

Left:
The launch of the Senator John J. Marchi vessel



Chapter 7

Streets for All: Improving Choices for Short Trips



365
miles of new bike
lanes since 2007

New York City is ideally suited to walking and cycling. The city's dense design means many trips are short. Of auto trips in New York, 10% are under one-half mile, 22% are under one mile and 56% are under three miles—distances that can easily be covered on foot or on a bike. Shifting even a small number of these trips to bicycles or walking results in significant benefits.

Cycling and walking have clear health and environmental benefits, and also create broad mobility gains. Making cycling viable and walking more attractive adds choice to the transportation menu, and can dramatically increase the utility and flexibility of public transportation for city dwellers. PlaNYC and *Sustainable Streets* laid out clear goals for bringing cycling into the transportation mainstream. A very strong emphasis on public health, traffic safety and an improved public realm by the Bloomberg Administration also put the pedestrian at the center of transportation and streetscape planning, constituting a comprehensive pro-walking strategy for the entire city.

New York City has made dramatic strides in creating modern, safe streets that are attractive for cycling and walking. At the core of this progress are programs to overhaul the design of streets so they are more balanced and inviting for all users. This work re-made dangerous intersections, opened new walking routes, helped pedestrians and cyclists orient themselves and created a cycling network that connects the city. Since 2007, NYCDOT has created over 350 miles of bike lanes and launched the largest and most heavily-used bike share system in the Western Hemisphere. To address a further barrier to bicycle transportation, DOT has added 16,000 bicycle parking racks to City streets, and begun to transform 12,000 old parking meter poles into additional bike parking.

With the City Council, DOT defined and enacted a groundbreaking office building bike parking program that DOT administers.

CAR JOURNEY LENGTHS, NYC

10%	10%	12%	15%	19%	34%
LESS THAN .5 MILES	3-5 MILES	.5-1 MILE	MORE THAN 1.0 MILES	5-10 MILES	1-3 MILES

The results have been staggering. Cycling has become much safer and attractive for people of all ages. The city reached its *Sustainable Streets* goal of doubling DOT bike counts on commuter routes from 2007 to 2012 in 2011, a year early. Until recently few children and older adults were seen riding bikes in New York. Now bike paths and protected bike lanes are enjoyed by families and cyclists of all ages and abilities. As described in depth in the Safety Section, there was a 73% decrease in the average risk of a serious injury while bicycling in New York between 2001 and 2011.

New plazas, pedestrian wayfinding maps, public seating and the broad range of safety and traffic calming improvements described in the chapters above on public safety have provided a broad improvement in the space and safety afforded to pedestrians. Innovative projects like Broadway Boulevard/Greenlight for Midtown, 6.5 Avenue and the remake of streets around Brooklyn's Grand Army Plaza have made walking routes more direct, generated new foot trips and improved safety.



63%

increase in bike
volumes on 9th
Avenue since 2007

CYCLING

Where it was a fairly intimidating place to bicycle just a few years ago, New York City has become the most bike-friendly big city in America. New Yorkers voted with their pedals for the increasingly interconnected bike lane network and the design innovation that created protected bike lanes on major avenues. CitiBike removed additional barriers for those who face problems storing or parking their own bikes, and has fully unlocked New York's potential as a cycling city.

New York City's density, interconnected street networks and flat terrain have always given it the potential to be an ideal bicycling city. PlaNYC and Sustainable Streets were both crystal clear in their intentions to finally leverage this latent advantage. The policies said clearly that city streets would become increasingly welcoming to bicycles—PlaNYC set the goal of adding 200 miles of new bike lanes within three fiscal years, while Sustainable Streets looked ahead to a doubling of documented bicycle volumes on key routes.

To help spur cycling, NYCDOT's strategy has been to develop bike lanes as a network that is useful for the trips New Yorkers need to make, rather than tucking disconnected bike lanes away in disparate areas. Much of the post-2006 network improvements were initially focused in the lower half of Manhattan and the northern half of Brooklyn where cycling rates were relatively high, where it was plausible that additional people would respond to improved cycling conditions. Tremendous increases in cycling volumes in these areas in 2007–2009 supported the strategy. DOT was subsequently able to expand the network on this basis of very strong usage and response. In more recent years, very strong additions have been made to the network across the City, including the South Bronx, Midtown Manhattan and Western Queens.

Design innovation has been a critical factor in making the cycling network attractive to more people. In 2007, NYCDOT pioneered the practice of protecting bike lanes by setting them off from



moving vehicle traffic with “floating” parking lanes that were no longer located along the physical curb. Manhattan's 9th Avenue saw the first of these projects, which also features a bicycle signal phase where cross-streets turned across the bike lane. The 9th Avenue approach quickly won acclaim—including the Institute for

In corridors like Kent Avenue and Prospect Park West, weekday bicycle use has tripled

INDIVIDUAL 2011 PROJECT GENERATED CYCLING GROWTH IN 2012

STREET	BEFORE	AFTER	CHANGE
W.29TH STREET	258	371	44%
W.30TH STREET	260	339	30%
FIRST AVENUE	583	1072	84%
SECOND AVENUE	842	1286	53%

Transportation Engineers' Transportation Planning Council's Best Program award in 2008—and was expanded to other streets and avenues.

The protected lanes helped fuel substantial growth in cycling. Bike volumes on 9th Avenue are 63% higher than before the new bike lane was implemented in 2007. Wide avenues, like 1st, 2nd, 8th and 9th Avenues in Manhattan that were previously inhospitable to bikes now have a steady flow of cyclists of all ages using the protected lanes. As of summer 2013, there were 30 miles of protected bicycle lanes in New York, with additional miles such as Vernon Boulevard along the East River in Queens still undergoing implementation.

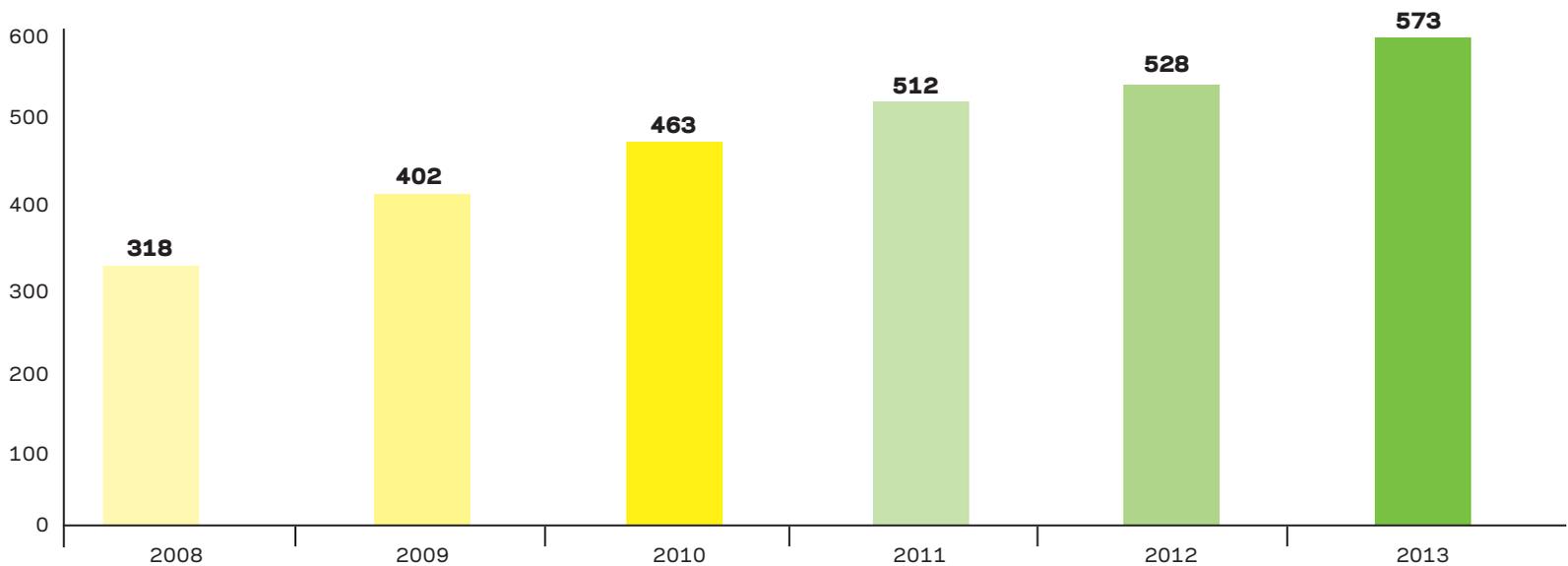
Additional bike-friendly design innovations are extensive. The protected design was adapted to two-way bikeways or interim greenways in "edge" environments such as waterfronts and park boundaries where the volumes of crossing traffic are low. In such corridors, like Kent Avenue and Prospect Park West in Brooklyn weekday bicycle use has grown by nearly 300%. DOT has also made extensive use of the buffered lane design (extra width for safety) that it pioneered as long ago as the 1990s, and has introduced short contra-flow bike lane and shared bike-pedestrian space segments to make key network connections. Extensive use of "bike boxes" gives cyclists more room at intersections.

In total, NYCDOT has added over 350 miles of new and enhanced bicycle routes from 2007 to 2013, and our steady pace of expansion continues. DOT reached its strategic goal of doubling bike commuting in five years, a year early. In 2013, the tremendous response of New Yorkers to Citi Bike calls for revisiting the City's cycling targets, revising them substantially upward and harnessing them to bike-sharing expansion strategy.

The rapid expansion of bicycle lanes generated much discussion and media coverage, but public opinion polls have consistently shown very strong support for bicycle lanes and for the Citi Bike program. The latest poll, by the New York Times in August 2013, found 64% of New Yorkers backing expansion of bike lanes, with strong support from many backgrounds, boroughs and political leanings. Support for Citi Bike has registered in the mid-seventies.

DOT has also improved and simplified the realm of bicycle parking. Working with Cooper Hewitt Design Center and cycling groups, DOT launched a design competition for a new type of City-provided bike rack, and received over 200 submissions from around the world. The winning design is now seen throughout the city. Approximately 19,000 total City-provided racks have been installed to date. NYCDOT is now dramatically accelerating the provision of on-street bike parking facilities by converting old parking meter poles into

GROWTH OF NYC'S ON STREET CYCLING NETWORK



bicycle racks, targeting installation of 12,000 “meter racks” by 2015.

To add further to bike parking capacity, which is outstripped by demand in many places, DOT in 2012 launched an application-based program for bike “corrals” for businesses interested in accommodating cycling customers. The corrals are multi-bike-rack installations situated in parking lanes rather than sidewalks. Over 30 have been installed, with more to come. The program is designed to give community boards input in the installation location. In other areas, DOT, in coordination with our street furniture franchisee, Cemusa, has installed bicycle parking shelters. Each shelter contains stainless steel bike racks for

eight bikes. The design closely resembles the city’s bus shelter, using the same high-quality materials. Panels on the shelters display the annual NYC Cycling Map and other cycling materials. Under the current contract, 36 will be installed.

The city also worked with the City Council in 2009 on legislation that increases bike parking in private garages and office buildings. Under the new laws, garages that accommodate 100 or more motor vehicles are required to provide bicycle parking and office buildings must allow access or parking for bicycles upon request by a tenant. As a result, an ever-expanding set of large office buildings in the densest sections of the City now accommodate bicycle parking access.



VILLAGE
CIGARS

STRINGR

23

capital projects
planned for the
14 mile Brooklyn
Waterfront
Greenway

ON-STREET PROTECTED BICYCLE PATHS IMPLEMENTED SINCE 2007:

1st Avenue: most of East 1st St to 124th St

2nd Avenue: 2nd St to 34th St, and 104th to 125th

Bruckner Blvd: Bryant Ave to Concrete Plant Park Greenway

Columbus Avenue: West 68th St to W110th

Grand Concourse: Cortland Ave to E Moshula Parkway

8th Avenue: Bank St to 56th St

9th Avenue: W 16th St to 59th St

Columbia Street & Atlantic Avenue
Pier 6 to Congress St

Fort Hamilton Parkway: Park Circle to East 5th Street

St. Nicholas Avenue: Amsterdam Ave to West 163rd St

Prospect Park West: Grand Army Plaza to Bartell-Pritchard Sq

Broadway: Most of Columbus Circle to East 18th St

Flushing Ave: Williamsburg St West to Washington Ave

East 17th Street: Broadway to Park Ave South

Allen Street: Division Street to East Houston Street

Pike Street: South Street to Division Street

Kent Avenue: Clymer St to North 14th Street

Sands Street: Navy St to Jay St

Williamsburg Street West:
Flushing Ave to Kent Ave

Delancey Street Median Bike Path:
Suffolk St to Clinton St

Park Circle: Prospect Park Southwest to Ocean Parkway

Grand Street: Varick St to Chrystie St

Canal Street: Forsyth St to Chrystie St



BEFORE: Columbia Street



AFTER: Columbia Street



BIKE LANE EXPANSION

- 2007-2012
- PRE-2007

For more bike lane expansion maps, see sustainablestreets.info



BUILDINGS THAT ALLOW ACCESS FOR BICYCLISTS, MIDTOWN MANHATTAN





5

million trips in first
150 days since
Citi Bike launch



Annual members receive a “key to the City,” allowing them to quickly unlock a Citi Bike

CITIBIKE

The launch of CitiBike on May 27, 2013 in the Manhattan Central Business District and adjacent parts of Brooklyn dramatically expanded the use of bicycles for basic transportation in the heart of the City. CitiBike has seen the most rapid uptake of subscriptions and usage of any bike share system in the world. As of mid-October 2013, just 150 days since the system’s launch, the 6,000 CitiBikes had generated nearly 5 million additional cycling trips—about 31,000 trips per day on average, within a relatively compact section of the city, with this average rising over 35,000 in August, September and October. Over 92,000 people have

subscribed as annual members of the system.

Within just a few months, New Yorkers have fully integrated CitiBike into the city’s transportation system. The initial network of 330 bike share stations was planned to create maximum utility within the service area, with stations scaled to match the surrounding areas and generally only 1,000 feet from other nearby stations. Some cities have spread bike share stations out and thus made bike share use less convenient than it could be. The tremendous user response to CitiBike indicates that DOT’s station network planning is on the right track. Without CitiBike, users

CITIBIKE RIDERSHIP OFF THE CHARTS

AUGUST 2013	RIDES/BIKE/DAY
NYC	5.96
PARIS	5.0
WASHINGTON	4.14
LONDON	3.64

would have taken the subway or walked, with some bike share trips replacing bus and car trips. Without the bike share system, Citi Bike riders would have:

Although bike share systems across the world often have unique characteristics in terms of scale, design, pricing and equipment, one way to compare systems is by usage, examining daily rides per installed bike. By this measure,

New York’s CitiBike is clearly one of the most successful and readily adopted bike share system in the world. New York’s built-out bike network, with 152 bike lane-miles within the initial bike share operating area, is certainly a big part of New Yorkers’ tremendous reception of CitiBike.

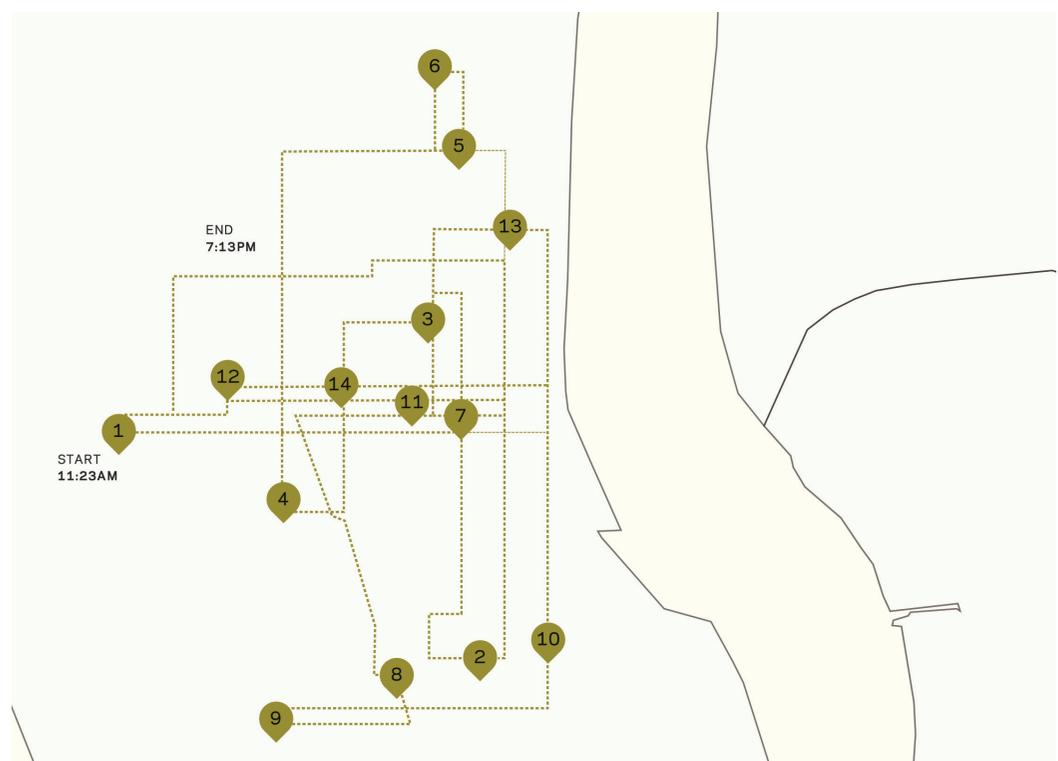
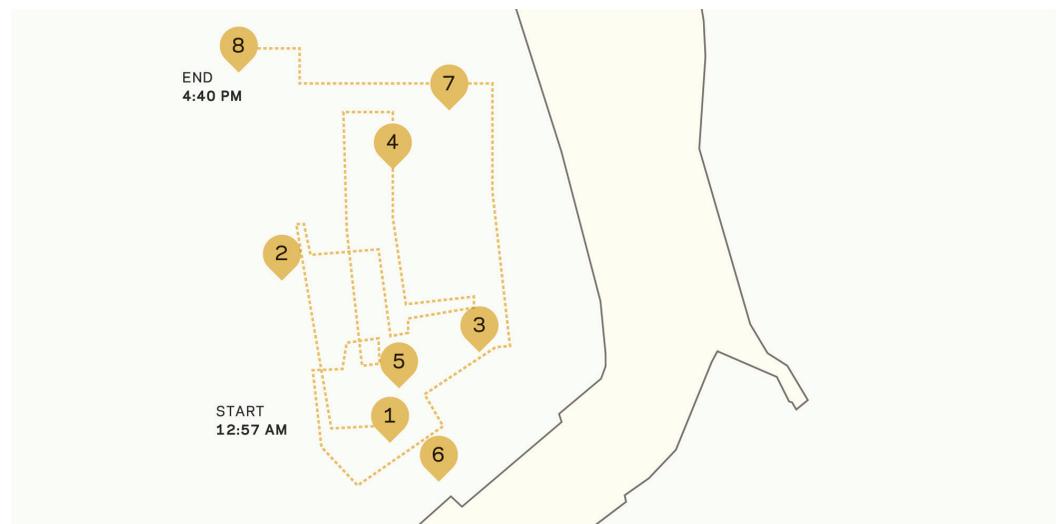
45% of CitiBike users said the system allowed them to travel to new places

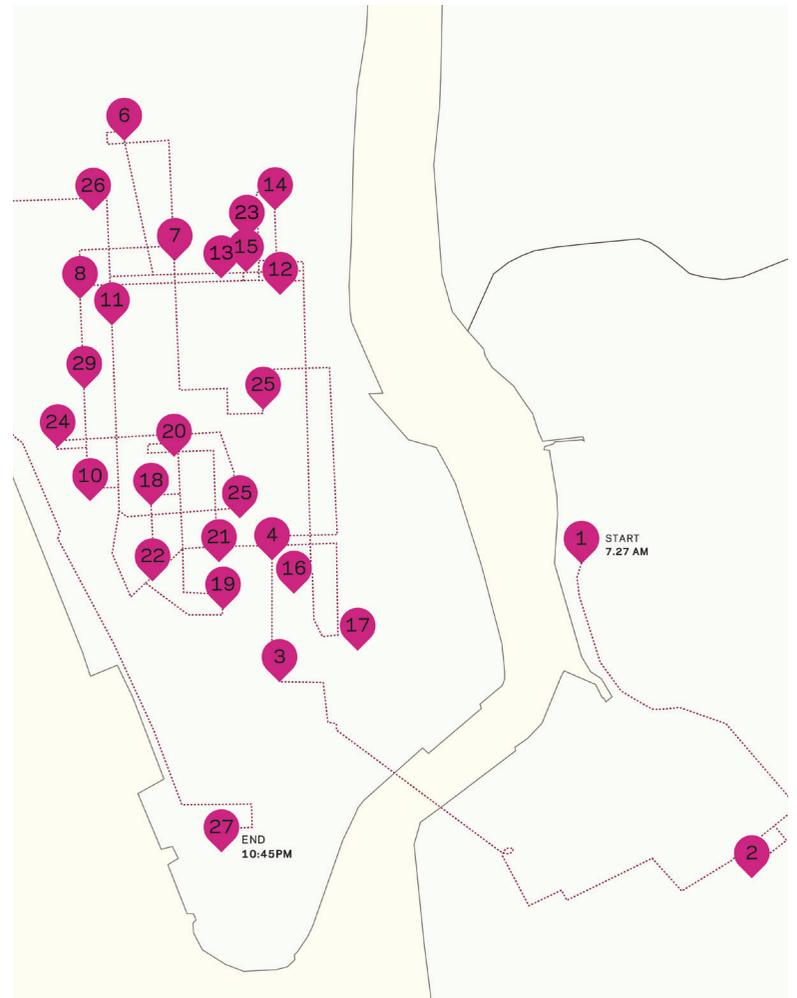
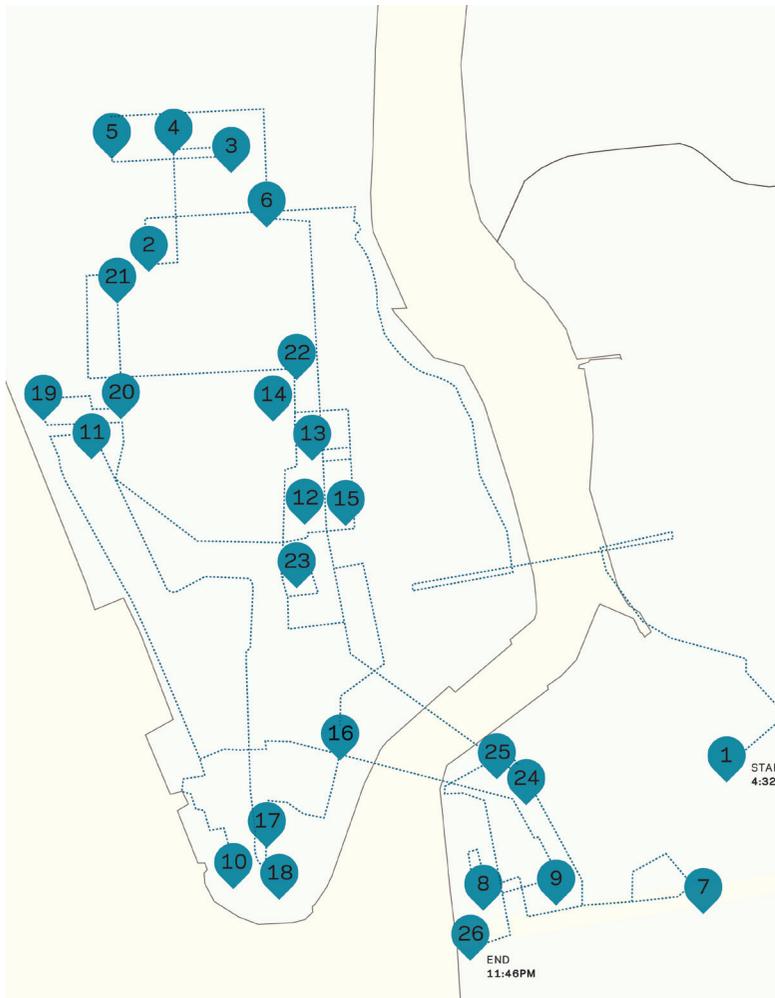
Daily average CitiBike ridership by month

A DOT survey of over 1,000 CitiBike users from August, 2013 confirms that New Yorkers have largely adopted the system for practical transportation. It found that 46% of CitiBike trips are for work purposes, including commuting, while 28% are for errands, personal business and shopping.

53% said that they combine CitiBike travel with other forms of transportation, with nearly one-third of all respondents saying they did this “most of the time.” The survey also indicated that virtually all CitiBike trips are new bike trips.

A DAY IN THE LIFE OF 4 CITIBIKES





Some CitiBikes are used dozens of times a day and travel the entire system territory

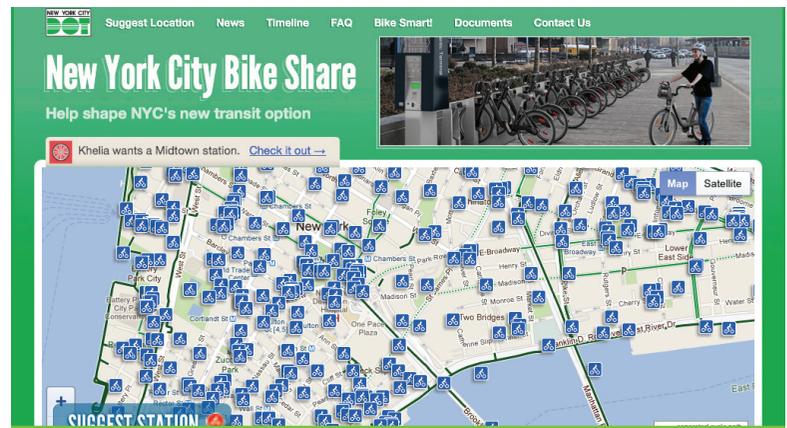
NYC Bike Share: Designed By New Yorkers



Community planning workshop to select station sites

Another key to Citi Bike's popularity is the deliberate, extensive 18-month planning process undertaken by NYCDOT and other stakeholders. Bike share lends itself to a collaborative local planning because it relies primarily on a dense network of stations rather than on the specific placement of any particular station. The planning process for Citi Bike sought and received heavy input from citizens from its inception. Beginning in September of 2011, immediately following the program's announcement, nearly 400 meetings and events were held with community boards, elected officials, civic groups and property owners to describe the program, discuss station siting and demonstrate how the system would work. NYCDOT staff conducted twenty-one field demonstrations of

bike share equipment to introduce the public to program and begin the planning process. Community planning workshops were held in each community board within the program area with the specific goal of educating about the program and eliciting feedback on where bike share stations should be placed, both generally in the New York City streetscape, and specifically on particular blocks and streets. Community members and participating community groups had the opportunity to ask questions and voice support for, or opposition to specific potential Citi Bike station locations. DOT launched a virtual planning tool to open another avenue into Citi Bike station planning. The nyc.gov/bikeshare web portal with its interactive "suggest-a-station"



DOT received 10,000 suggested station sites on its interactive map

feature garnered over 10,000 station suggestions and over 55,000 "supports" for those suggestions.

The process was inclusive and meant to draw in New Yorkers from a range of backgrounds and incomes. Bilingual meetings were held as a result of community board request. DOT worked with the NYC Housing Authority and resident advisors to help site stations near housing campuses. It also developed two discounted annual membership programs for low income New Yorkers. NYC Housing Authority and members of participating Community Development Credit Unions can receive 40% discounts on annual memberships.

After the meetings, workshops and demonstrations were completed, NYCDOT undertook the task of

synthesizing all of the feedback, suggestions and data. DOT used Geographic Information Systems (GIS) to create a predictive model outlining the size of stations for each neighborhood based on surrounding uses and transit. Using technical siting criteria, the information garnered from the public and the GIS demand model, DOT narrowed almost 3,000 potential station locations in the initial program area to just 331, which were presented back to the community boards and stakeholders as draft plans for additional rounds of feedback. DOT has worked closely with all stakeholders though Citi Bike launch as well as post-launch. In total 43% of the stations initially proposed in DOT's draft plan were moved due to additional community feedback and requests.



86%

increase in winter
cycling since 2008

BETTER DATA ON CYCLING

NYCDOT has greatly improved data collection and analysis to more accurately track the growth in cycling.

DOT conducts regular bicycle counts on all roadways crossing 50th Street in Manhattan, plus the Hudson River Greenways, the Staten Island Ferry at Whitehall, and the Queensboro, Williamsburg, Manhattan and Brooklyn Bridges. The counts began in 1980 and have been conducted annually since 1984.

In 2007, DOT added two cycling counts to track cycling ridership three times a year, in May, August and September. It also started tracking cycling over an 18-hour period (6 am–midnight) during these counts. Traditionally, counts were only done for the 12 hour period from 7am to 7pm.

DOT also began counting cyclists in winter months in 2008. Off-season cycling has seen

significant growth—indicating that more and more New Yorkers are cycling year round as part of their transportation routine.

Individual counts have also started to track results of specific projects. These numbers show that new bike paths result in more cycling.

The new tracking methods allow DOT to produce the agency's In-Season Cycling Indicator and the Cycling in the City report which explains the growth in cycling with simple charts and visuals. The updated numbers also provide more accurate data for regional transportation planning documents.

As of late 2013, DOT's bike counting methods are again under revision to account for the launch of CitiBike and the millions of new cycling trips the system has added to NYC bike lanes, pathways and streets.



Tribeca

Civic Center

Chinatown

You



Chambers St
A C

New Amsterdam Library

Warren Street

Chambers Street

Broadway

City Hall
R

City Hall Park

City Hall

Tweed Courthouse

Brooklyn Bridge City Hall
4 5 6

Pedestrian and bike access

Park Row

Chambers St
J Z

Manhattan Municipal Building

St. Andrew's Plaza

5 in 1 Sculpture

Thurgood Marshall United States Courthouse

Catholic Church of St. Andrew

1 Police Plaza

James Madison Plaza

St. James Place

101 165

17 287

12 177

62 199

4 211

→ Trimble Place

Tribeca Towers Plaza

Duane Street

Thomas Street

Worth Street

Sun Building

African Burial Ground National Monument

Jacob K. Javits Federal Building

Jacob Javits Plaza

United States Court of International Trade

Manhattan Sentinels Sculpture

American Sentinels Sculpture

Surrogate's Court

Elk Street

Lafayette Street

Thomas Paine Park

Foley Square

Manhattan Municipal Building

St. Andrew's Plaza

5 in 1 Sculpture

Thurgood Marshall United States Courthouse

Catholic Church of St. Andrew

1 Police Plaza

James Madison Plaza

St. James Place

New York State Supreme Court

Daniel Patrick Moynihan United States District Courthouse

Pearl Street

Park Row

Chatham Green

St. James Place

St. James Triangle

First Shearith Israel Cemetery

Kimlau Square

Mariners' Temple Baptist Church

St. James Church

Oliver Street

Chatham Square

Lin Zai Xu Statue

Kimlau War Memorial

241

253

275

293

313

339

355

371

391

407

Franklin Street

White Street

Walker Street

Artists Space

Franklin Place

White Street

Walker Street

Benson Place

New York County Family Court

New York County Civil Court

Engine Company 31

Collect Pond Park

New York County Civil Court

Engine Company 31

Worth Street

Leonard Street

White Street

Walker Street

Canal St
N Q R J Z 6

J Z

Criminal Courts Building

Louis J. Lefkowitz State Office Building

Columbus Park

Dr. Sun Yat-sen Statue

Chen Dance Center

Chinese Community Center

Confucius Plaza

Confucius Statue

Chatham Square

Mott Street

Elizabeth Street

Citizens Savings Bank Building

Pedestrian access to Manhattan Bridge

Bowery

Confucius Plaza

Mulberry Street

Mott Street

Bayard Street

Chatham Square

Mott Street

Elizabeth Street

Citizens Savings Bank Building

Pedestrian access to Manhattan Bridge

Bowery

Confucius Plaza

NYCDOT has found walking rates in New York City are on the rise—10% of New York City residents walk to work



WALKING

Streets that welcome people and encourage walking are a crucial element of a sustainable city. Streets made for people are inviting, safe, and easy to navigate. NYCDOT has used treatments outlined in the Safety and World Class Streets sections of this book, including traffic calming, intersection engineering, signal timing, public plazas and street seating as part of a comprehensive effort to make streets inviting and attractive for walking. Additionally, NYC has developed a number of key projects designed to foster easier walking connections, and to provide information to New Yorkers and visitors alike that many trips within the City can be easily and perhaps most conveniently and quickly accomplished on foot.

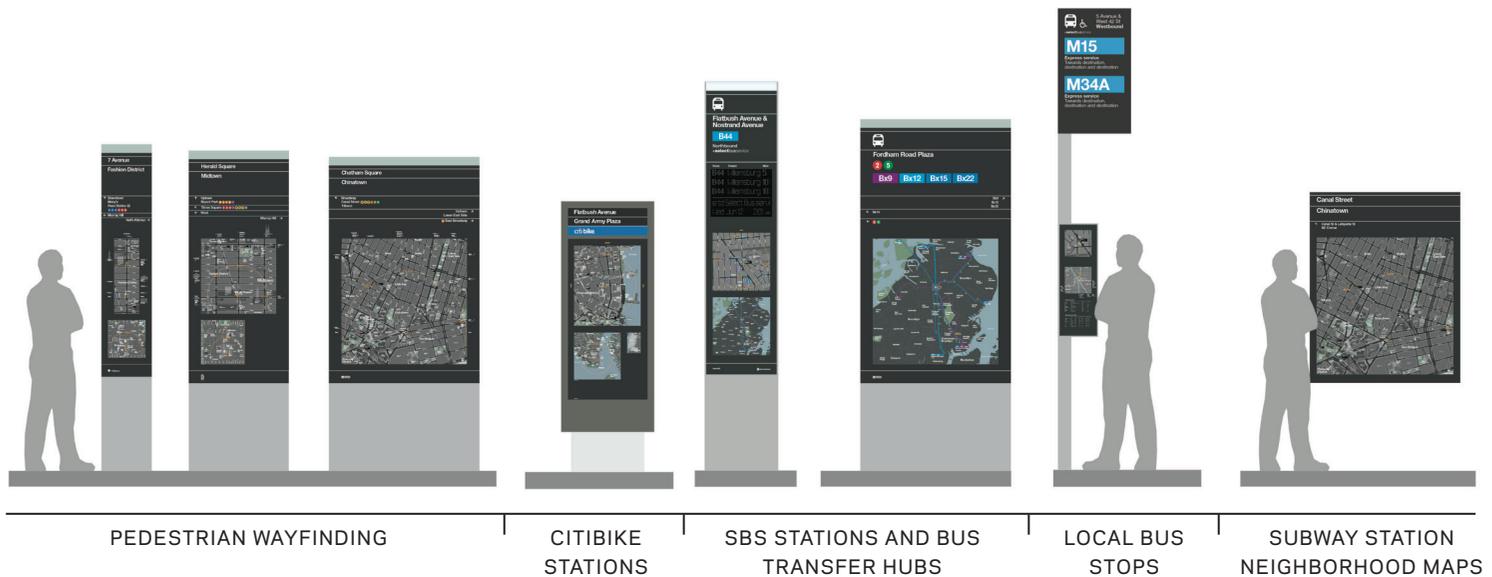
NYCDOT has found walking rates in New York City are on the rise. 10% of New York City residents walk to work (2005–2007), some of the highest rates in the country (The Green Dividend, NYCDOT, April 2010). The city's pedestrian volume index (see box, next page) tracks walking rates at locations throughout the city and tracks a 12.9% increase in walking since 2007. The growth in public transit usage highlighted earlier in this chapter also points to more walking in the city—nearly all subway or bus riders start or end their trips by walking.

More walking is good for health, mobility and the economic bottom line. Research in the United Kingdom has found a direct relationship between the way in which people travel around city centers and the amount of money they spend. The weekly expenditure of consumers who walk was 42% higher than those who drive. (Economic Value of Livability, Todd Littman, Victoria Transport Policy Institute, 2010). Real estate in areas with above average levels of walkability command a premium between \$4,000 and \$34,000 over houses in areas with average levels of walkability. (Walking the Walk: How Walkability Raises Home Values in US Cities, CEOs for Cities, 2009).

NYCDOT research also confirms that improvements in the walking and public space environment are good for business. The expanded public and pedestrian space near Union Square resulted in 49% fewer commercial vacancies (compared to 5% more borough-wide). Pedestrian plazas and walkability improvements in Pearl Street in Brooklyn resulted in a 172% increase in retail sales at locally-based businesses, compared to 18% borough-wide.

With these numbers in mind, NYCDOT has created innovative projects to encourage walking and build a safer, easier to navigate walking network.

WALKNYC WAYFINDING SYSTEM FAMILY OF ELEMENTS



Pedestrian Volume Index

NYCDOT's developed a Pedestrian Volume Index to track walking rates throughout the city and to help the city accommodate and encourage growth in walking. It also provides necessary data for DOT projects and programs, regional planning documents, and grant applications. Data collection began in 2007 and has been included in the Mayor's Management Report since 2008. The counts are conducted twice a year, in May and September, and taken at

114 locations, including 100 on street locations (primarily retail corridors), 13 East River and Harlem River bridge locations, and the Hudson River Greenway. After the data is collected, DOT indexes 50 of the locations to 2007 numbers to show growth or declines in pedestrian volumes over time.

Pedestrian and public life surveys

In addition to the citywide counts, NYCDOT has done a series of intercept studies to get a better understanding of how and why people are traveling to commercial corridors. DOT staff conducted intercept surveys at nine locations for various projects between December 2008 and November 2010. While each survey was completed for different types of DOT projects, all the surveys were designed to better understand people's behavior. The surveys were

conducted in areas with a high concentration of shopping and during peak shopping times on weekdays and weekends. For all nine surveys, respondents were asked how they got to their destination (mode) and their reason for making the trip (purpose). The study results show the importance of walking in the city, and underscore how improvements to the walking network and pedestrian environment can benefit local businesses.

WalkNYC provides user-friendly maps including walking times to nearby destinations

WAYFINDING: WHY NOT WALK?

New York has provided ubiquitous directional signage for drivers for decades. However, few signs are oriented toward pedestrians, despite walking being the universal mode of urban travel. Pedestrian wayfinding is a navigational tool to guide residents and visitors in planning walking routes and connections to transit and other modes of travel.

Wayfinding is not simply a system that helps tourists find major landmarks. Instead, it offers a host of interconnected benefits to the life and economy of the city. Research has shown that even residents of New York do not know places as well as they think. By increasing people's real knowledge of New York City, and providing information at key locations so that it is available to people on the go, a wayfinding system can encourage people to explore their city, revealing hidden shopping streets, local attractions parks and walking routes.

DOT has developed "WalkNYC", a standard wayfinding system, to encourage residents and visitors to walk more and to explore

Many People are lost in NYC, a DOT survey found:

13% of locals are not familiar with area in which they were surveyed

48% of visitors could not give directions to a local landmark

27% of visitors can't name the borough they are in

24% of visitors did not know how to get to their next destination

33% of visitors did not know which way north was

areas of the City that may be new to them. The attractive signs provide user-friendly maps and information, including walking times, the location of other forms of transportation, building addresses, area attractions and public facilities. The design of the signs and maps has been



Pedestrian wayfinding, Canal Street

widely acclaimed. A recent review proclaimed the system a "Feat of Design, Data and Diligence" [Mashable, Oct. 24 2013]. The design draws text and color from ubiquitous NYC Subway signage, adopting a look already familiar to users of transportation in City, and extends it. The initial roll out of wayfinding signs and maps in 2013 included Chinatown, the 34th Street/Herald Square area and Garment District in Midtown,

Prospect and Crown Heights and Long Island City, with the goal to expand to neighborhoods across the city.

The WalkNYC maps have also been incorporated into the Citi Bike station design, and will be found in additional parts of the City as the bike share program expands. DOT is also working with the Metropolitan Transportation Authority (MTA) to develop a Select Bus Service (SBS) wayfinding signage in transit stops.

6 1/2 AVENUE

DOT created a new pedestrian avenue in the heart of Midtown called 6 1/2 Avenue to encourage more New Yorkers to walk and to decongest busy avenues. The route takes advantage of existing plazas at the bases of buildings between 51st and 57th Streets and 6th and 7th Avenues, known as Privately Owned Public Spaces (or POPS), and includes the addition of new crosswalks, signage, and traffic interventions.

The POPS that comprise 6 1/2 Avenue were created between 1984 and 1990 and include commercial, hotel and residential buildings, with public spaces ranging from open plazas and atria to wide lobbies and enclosed corridors.

In 2011, Manhattan's Community Board 5 requested that DOT study the possibility of pedestrian crosswalks to link these disconnected spaces. A

DOT analysis found up to 1,200 pedestrians an hour already crossing 51st Street alone at midblock without the benefit of crosswalks, passing from between parked trucks and other vehicles.

The new crossings shorten trips eliminating the need for pedestrians to travel back and forth to the main avenues to reach midblock locations, without affecting traffic. At each crossing the sidewalks were extended using

crushed gravel and furnished with benches in some locations, further establishing them as pedestrian areas. Adjacent property owners will clean the newly enlarged pedestrian areas, with the businesses maintaining planters and benches.





Chapter 8

Vehicles and Parking



10%

improvement in travel
times from Midtown in
Motion

All of the bicycle and pedestrian improvements mentioned above haven't come at the expense of drivers. Traffic volumes are down and traffic speeds are up in the Manhattan central business district, a reflection of a growing trend toward other forms of transportation.

In fact, the economic and population growth in New York City over the past decade has largely been accommodated on the city's transit system, not via private automobile. While use of our transit system into the central business district grew by 11% since 2003, traffic growth has declined. There has been a 6.5% decline in traffic entering the central business district since 2003. This trend has even accelerated in recent years—in 2011, there was a 1.8% decrease in citywide weekday traffic volumes and a growth of transit use by 2.5% in 2011 and 1.8% in 2012.

But that doesn't mean roads and highways in New York aren't congested. Many key arteries, including cross town routes, the East River and Hudson River crossings, and highways throughout the five boroughs, remain over capacity. This traffic is bad for our economy, our environment, our health, and our quality of life.

MIDTOWN IN MOTION

In 2011, DOT implemented an innovative congestion management program called Midtown in Motion to reduce congestion by adjusting traffic signals in real time. The system uses 100 microwave sensors, 32 traffic video cameras and E-ZPass readers at 23 intersections to measure traffic volumes, congestion and record vehicle travel times in the approximately 110-square block area bound by Second to Sixth Avenues and 42nd to 57th streets. The combined data is transmitted wirelessly to the City's Traffic Management Center in Long Island City, allowing engineers to quickly

identify congestion choke points as they occur and remotely adjust Midtown traffic signal patterns to clear traffic jams. The real-time traffic flow information is available to motorists and to app developers for use on PDAs and smart phones.

Earlier generations of traffic signals could only be reliably set to preset signal patterns based on the time of day, leaving limited ability to respond to crashes, construction, and special events that cause backups. Midtown in Motion allows Department of Transportation engineers to conduct real-time analysis and change signal patterns at the touch of a button, helping

to alleviate congestion before it worsens.

Depending on the traffic situation, traffic lights are adjusted to provide a more even distribution of traffic entering Midtown so that already congested areas do not become oversaturated, or priority can be given to clearing isolated backups resulting from breakdowns, fender-benders or double-parked vehicles. On the avenues, engineers can switch more easily between a simultaneous signal pattern, where all the signals on the avenue turn green or red at the same time, and a traffic signal progression, which lets

vehicles traveling at the speed limit encounter green lights as they drive along a corridor. The system lets engineers use the more effective pattern based on measured traffic conditions.

Preliminary results of the first phase of Midtown in Motion showed a 10% improvement in travel times along the avenues of the 110-block service area, which marks a considerable improvement to traffic in the heart of Manhattan's Central Business District. In September 2013, DOT doubled the Midtown in Motion service area to cover 1st to 9th Avenues from 42nd to 57th Streets.

BROOKLYN BRIDGE RAMPS

DOT widened access ramps to and from the Brooklyn Bridge to accommodate two traffic lanes and simplify traffic patterns. The project eased notorious traffic bottlenecks for many of the 120,000 vehicles that cross the bridge daily. By 2014, three ramps, connecting the exit from the bridge's Manhattan-bound

lanes with the FDR Drive, will be expanded from one to two lanes, easing backups that often extend across the bridge. These changes expand capacity and enhance safety and are part of a \$508 million project to repaint the Brooklyn Bridge and rehabilitate its approach ramps.

HOYT AVE RFK BRIDGE

The RFK Bridge touches down into the bustling heart of Astoria with connections to the Grand Central Parkway and local streets. This crossroads serves subway and La Guardia Airport bus passengers, as well as locals moving to and from various neighborhood destinations. DOT shortened crosswalks, tweaked traffic patterns, modified

signal timing and phasing, added green elements, and created new public space in an area that sees hundreds of pedestrians a day. This resulted in a 51% improvement in travel times northbound and 26% southbound. The project reduced queuing, simplified traffic patterns and made the area safer for all users.

NYCDOT converted 13,000 meters to muni meters resulting in \$9.1 million savings annually

PARKING

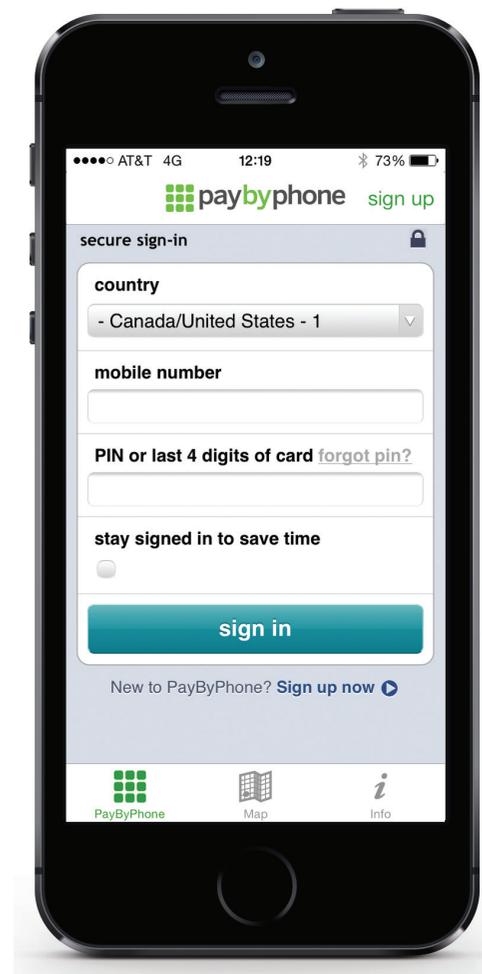
Curbside space is a valuable commodity in New York City and NYCDOT has implemented innovative solutions to simplify and modernize parking and increase turnover at parking spaces, making it more likely that drivers can find spots when they want them.

SIMPLIFYING PAYMENT AND THE SEARCH FOR PARKING

Online real time parking information and pay-by-phone technology are two ways DOT has used technology to make it easier for New Yorkers to park. A pilot program in the Bronx allows motorists to pay for metered parking via a smartphone app, the internet or by telephone for 264 spaces along 18 block faces, as well as at the Department's Belmont Municipal Parking Field. This system eases parking in New York City and comes with no additional fees for drivers or changes to parking rates. The technology also warns motorists when their time is about to expire via e-mail or text messages, and

allow them to pay for additional time easily and quickly, up to the posted time limit.

The parking availability pilot uses innovative sensors embedded in the roadway to produce a real-time parking availability map viewable on the internet, smartphones and tablet devices. After reviewing the map before starting their trips or working with a passenger, motorists can head directly toward blocks with available spaces, reducing the time needed to hunt for spaces and the associated congestion as drivers circle for parking.



Pay-by-phone allows drivers to pay for parking with smartphones

PARK SMART

NYCDOT's PARK Smart program makes parking easier while reducing congestion. The first Park SMART program in Greenwich Village included portions of Sixth and Seventh Avenues and all meters on streets between these avenues. It was made permanent in 2009. The meter rate was increased from noon to 4 pm when demand for parking was greatest, and not changed at all other times that meters are in effect.

The PARK smart program has increased turnover at parking spots, accommodating 20% more parkers during peak periods.

Parking space occupancy declined from 77% to 71% on Tuesdays and from 75% to 69% on Fridays from 12pm to 4pm

Motorists were parking for a shorter amount of time; the frequency of those who parked for less than hour increased by 12%. This improves turnover and benefits local businesses.

Based on this success, additional programs were started in Park Slope, Boerum Hill, Upper East Side and Jackson Heights. Overall, the ParkSMART program has increased turnover at parking spots, accommodating 20% more parkers during peak periods.



New technology lets you pay for parking with a smartphone

JACKSON HEIGHTS NEIGHBORHOOD TRANSPORTATION IMPROVEMENTS

Jackson Heights, Queens is a diverse and vibrant neighborhood in Northern Queens, containing historic areas, residential streets and a destination shopping and dining district with a considerable amount of vehicular and pedestrian activity. Local residents and merchants asked DOT to explore changes to help create safer, less congested streets and better transit access for this vibrant community.

In 2009, DOT started a community driven planning process, funded in part by Congressman Joseph Crowley. The study was a model of DOT's

inclusive approach to neighborhood transportation studies as guided by PlaNYC. Local residents, business owners and civic leaders worked with DOT to identify their most pressing concerns and guide the development of solutions. DOT created a range of opportunities for public participation, including community workshops, neighborhood walk-throughs, an innovative web portal that allowed DOT staff to receive and respond to comments at any time, and a Community Advisory Committee to facilitate ongoing involvement of key stakeholders.

The project addressed traffic

safety, sidewalk crowding, vehicle congestion, parking availability, slow bus service and a lack of public open spaces. Focused on the area where 73rd Street, 37th Road, Broadway and Roosevelt Avenue converge, the core improvements were carried out in the second half of 2011. Updated curb regulations were introduced in spring 2012, offering a better use of space for deliveries and customer parking. Further parking improvements were implemented in 2013 with the introduction of the variable-rate PARK Smart program.

The project also resulted in a popular plaza. 37th Road between

73rd Street and 74th Street was closed to traffic to provide additional open space in this dense, international neighborhood. The plaza brings pedestrian-scale lighting, new surfaces, and amenities to support the plazas daily activities and cultural and seasonal events.

As a result of the changes, there are fewer injury-causing crashes; problematic traffic bottlenecks have been eliminated; buses are faster and more efficient; and the 37th Road plaza is a popular gathering spot year-round, home to frequent public events and a boon to adjacent businesses.



Jackson Heights Diversity Plaza



Jackson Heights Diversity Plaza



20%

decrease in peak-hour
truck traffic on
residential Grand
Avenue

OFF-HOUR TRUCK DELIVERY—MIDTOWN

Truck deliveries made during busy times of day can exacerbate already congested streets and increase costs for businesses and the consumers that buy their produces. DOT worked with Rensselaer Polytechnic Institute (RPI) to implement an Off-Hour Truck Delivery Pilot program, which ran from late 2009 through 2010. Twenty participants agreed to shift their delivery windows to between 7 pm and 6 am. Receivers found that fewer deliveries during normal business hours allowed them to

focus more on their customers and that their staff was more productive because they waited around less for deliveries that were tied up in traffic. Carriers found that their trucks could make more deliveries in the same amount of time; they saved money on fuel costs and could use a smaller fleet by balancing daytime and nighttime deliveries, and that legal parking was more readily available. Their drivers reported feeling safer and less stressed.

MASPETH BYPASS

Trucks are critical to the economic life of the city, especially in industrial areas like the Maspeth Industrial Business Zone (IBZ) in Queens. However, the IBZ is adjacent to residential neighborhoods where heavy truck traffic impairs quality of life. In Maspeth, DOT redesigned streets and legal truck routes in Maspeth to direct trucks away from residential streets while maintaining truck access to important industries

Prior to 2011, Grand and Flushing Avenues were designated as through truck routes between the Queens–Midtown Expressway/ Long Island Expressway (I-495) and the Brooklyn line. While this routing provided a connection from I-495 to the IBZs along Newtown Creek, it channeled regional truck traffic through the heart of residential Maspeth. In response to requests from the community and

elected officials, DOT assessed alternative routes that could be less disruptive to residents while serving the needs of truckers and local businesses, and led an in-depth outreach program with all stakeholder groups.

The resulting plan shifts truck traffic from Grand and Flushing Avenues to a preferred bypass route that connects to the LIE without passing through residential Maspeth. DOT also made changes to the street network to ensure that the Maspeth Bypass was as direct and convenient as possible so that truckers would make the switch. DOT reconfigured the multi-legged intersection of Maspeth Avenue and Maurice Avenue to safely accommodate truck through movements and turns, and converted several streets to one-way operation.



NO STANDING
EXCEPT
COURTESY PARKING
RETIRED PERSONS
3 HR LIMIT
7AM - 7PM
EXCEPT SUNDAY

Pay at m

220181

Swire



Looking Ahead

Demand is growing for the changes outlined in this chapter. Communities all over the city are clamoring for bike share, bus improvement projects, and safer and more expansive walking routes. A changing climate and continued population and economic growth will create an even greater sense of urgency for these projects going forward. Future leaders will have to respond.

This will challenge government to accelerate the pace of implementation and expand the breadth and scope of mobility projects. Bike share systems will need to be deployed in new neighborhoods and the blossoming bike lane network will need to extend to all reaches of the city, including eastern sections of Queens and southern Brooklyn. The second phase of Select Bus Service projects, such as those along Woodhaven Boulevard in Queens, through central Brooklyn and across Manhattan, will need to be completed. Eventually, transportation officials will have to experiment with new street designs that are part of bus rapid transit in other cities, such as physically separated bus lanes and transit-only ways. A variety of treatments should also come to large state-managed highways to provide additional express bus routes.

A faster pace of project implementation will require bold ideas and new approaches. Expansion of programs at a time of dwindling city, state, and federal resources means that new revenue will be needed, and discussions about congestion pricing or East River tolls are certain to be part of the conversation. In 2008, a congestion pricing plan to charge vehicles entering the central business district won popular and City Council support in the New York City but died at the hands of the State Legislature. The proposal would have raised hundreds of millions annually for the transit system and bridge and road repair, resources desperately needed to expand mobility options in the city. A year later, a similar proposal to toll the East River Bridges again died

at the hands of the State. The MTA's next multi-billion dollar construction program provides the legislature with an opportunity to change its stance on the proposal. City leaders may also decide to pursue other new financing ideas, such as taxing large development projects or creating broad districts where zoning bonuses result in transit and public realm enhancements.

Additional attention to resiliency post Hurricane Sandy may bring a new perspective to revenue discussions. The storm was wake-up call that the region needs to protect its transportation assets, and build a stronger, more resilient network. Such fortification will require a significant investment both at the city and state levels.

Specific zones for the city are also ripe for courageous ideas. The pedestrian environment near Penn Station is abysmal, and is only likely to get worse as the Hudson Yards development increases the number of people who frequent the area. Closure of certain streets for pedestrians or creating designated transit ways (along 33rd or 31st street, for example) could help accommodate an influx of residents and visitors.

The city's waterfront will also have to be transformed and given additional resources. The Brooklyn Waterfront Greenway and Manhattan's East Side greenway will need to be completed, and planning for better use of Queens waterfront for bike mobility will have to begin.

Technology will also provide new opportunities to enhance mobility. Paying for parking meters and tracking parking space availability on smart phones, changing signals in real time in response to fluctuating traffic patterns, and automating signals on bus routes to speed buses are other opportunities that will bring substantial benefits. Using technology and sensors to better enforce against overweight trucks and help keep trucks on designated routes could also produce mobility gains.

- Expand bike share and bike lane network to new communities
- Build on Manhattan bike network with additional Midtown bike lanes
- Implement congestion pricing or East River Bridge tolls and consider other financing mechanisms to fill transportation funding shortfalls
- Complete next round of Select Bus Service projects and experiment with more ambitious street designs like physically separated bus lanes and bus only streets
- Complete Brooklyn waterfront greenway and expand through Queens
- Improve streetscapes and prioritize the pedestrian experiences near Penn Station and Grand Central
- Use real time information to manage congestion and improve bus speeds
- Allow drivers to remotely track parking availability and pay for parking using smart phones
- Leverage technology and curb regulations to make off-hour deliveries a standard practice for freight receivers

POSSIBLE BUS RAPID TRANSIT SYSTEM IN 2025

