# 2011 Sustainable Streets Index

New York City Department of Transportation


**10%**

**NYC residents primarily commute to work by walking, the highest figure among the ten largest U.S. cities.**

*Source: U.S. Census Bureau*

**27K**

**Pedestrians during a weekday 3-hour period in Herald Square.**

*Source: NYCDOT*

**14K**

**Pedestrians during a weekday 3-hour period in Flushing.**

*Source: NYCDOT*


**37%**

**Reduction in traffic fatalities in New York City from 2000 to 2011.**

*Source: NYCDOT*

**1.5%**

**Decline in citywide traffic volumes from 2000 to 2010.**

*Source: NYCDOT*

**289%**

**Increase in commuter cycling in New York City from 2000 to 2011.**

*Source: NYCDOT*

# Contents


E 187 ST
Mr. Joseph Zinzi
Full Moon Pizzeria
Full Moon Pizzeria
ONE WAY
-3451

# Letter from the Commissioner

Dear Fellow New Yorkers:

I am very pleased to release the 2011 edition of the *Sustainable Streets Index*, New York City DOT's annual report on transportation trends and conditions.

Since 2007, NYCDOT has taken extraordinary steps to document the City's transportation policies, with publications such as *Sustainable Streets*, the Department's strategic plan, and *World Class Streets* and the *New York City Street Design Manual*, which defined the City's approach to updating and improving the functions and appearance of our streetscape. We also continually report on the outcomes of key policies and projects, from Select Bus Service corridors to pedestrian safety initiatives and Midtown in Motion, our signal- and sensor-based project to make street travel through Midtown Manhattan as reliable as possible.

The *Sustainable Streets Index* is a key component of this work to communicate transportation policy goals and outcomes, and to make the Department of Transportation's work as transparent as possible. It provides a regular update of key city-wide transportation trends, and reviews the performance of a diverse set of DOT projects in each edition.

The general usage patterns of major transportation modes, especially viewed against over the decade since the 2000 Census, is promising from mobility, sustainability and efficiency points of view. Over the past decade, public transit use is up 10 percent. In the same period, city-wide traffic levels are one percent lower, while traffic into the Central Business District is down five percent.

Nonetheless, declining bus usage since the recession of 2008-2009 and soaring demand for new mobility options such as cycling and river ferries point to the need for ongoing creativity and adaptation in the city's transportation efforts. DOT works hard to deliver such innovation. Select Bus Service, for example, has attracted new riders in every corridor it has been implemented, as we detail for the East Side of Manhattan in the Index's project section. Other new programs being developed by the Bloomberg Administration and DOT, such as Boro Taxis and Citi Bike, will add to the transportation choices New Yorkers already enjoy.

The projects reviewed in this year's Index indeed span an impressive range of transportation modes and initiatives. Changes to signals and traffic regulations improved travel times by 51% northbound and 26% southbound on Hoyt Avenue in Queens. 86% of merchants reported an increase in sales during a locally-initiated weekend pedestrian street on Montague Street in Brooklyn. Bus travel times improved by 12-14% as a result of extended bus lanes and bus-priority signal improvements on Brooklyn's Livingston Street.

Common themes across our set of projects are an intensive focus on safety, and a solid commitment to outreach and consultation. One reason that the City has been able to register several new record lows in annual traffic fatalities in recent years is DOT's effort to build enhanced safety features into streets slated to undergo any substantial work. Lower crash and injury rates are documented across the board for the streetscape projects reviewed here.

A key factor in public acceptance of new designs and approaches to city streets is DOT's commitment to dialogue and flexibility in developing projects. Taken together, the "outreach" sections of each project profile provide a broad narrative of locally-identified problems, give-and-take over specific design elements, and favorable final response by Community Boards and other stakeholders.

Intensive scrutiny of City government is a hallmark of the Bloomberg administration. Under Mayor Michael Bloomberg's leadership, New Yorkers have had continually increasing access to agency performance reports, 311 response times, customer service metrics and a host of specific departmental reports. The New York City Department of Transportation reports on its activities in publications like the Mayor's Management Report. But the ultimate test of DOT's work is the City's transportation systems themselves. The Sustainable Streets Index is a public window on how those systems perform.

Sincerely,

Janette Sadik-Khan
Commissioner

# Executive Summary

Reflecting improvements in the economy, subway ridership and traffic volumes in New York City grew in both 2010 and 2011. In 2011, citywide employment and traffic levels reached – and subway ridership surpassed – their pre-financial crisis peaks. Commuter bike riding, which has been growing rapidly since the early 2000s, continued to increase. The exception to these upward trends was bus ridership, which, with the exception of new Select Bus Service routes, has declined annually since 2008.

The key citywide trends, based on comprehensive data available for 2010 and the more limited data available for 2011, are:

- Citywide weekday subway ridership rose by 1.4% in 2010, and an additional 2.5% in 2011, surpassing the previous peak in 2008.
- Weekday bus ridership fell by 2.5% citywide in 2010 and by another 4.3% in 2011. Weekday bus ridership is down 9.4% since the pre-financial crisis peak in 2008.
- Traffic volumes increased 0.9% citywide in 2010, reaching the pre-financial crisis level. Based on preliminary data, traffic levels appeared to flatten out in 2011.
- Commuter bike riding increased 13% in 2010, and an additional 7% in 2011. Since 2000 there has been over a 250% surge in commuter cycling in New York City.

Looking at the Manhattan Central Business District (CBD—the area from 60th Street to the Battery), employment, traffic levels and transit ridership all declined more sharply in the CBD than citywide in the wake of the financial crisis. As of 2010, traffic entering the CBD has returned to the pre-recession level, while employment and transit ridership have not. (Data for 2011 are not yet available.) Notably, after having been flat between 2003 and 2007, vehicular traffic using the Holland and Lincoln Tunnels from New Jersey decreased by 4.5% from 2007 to 2010, while traffic entering the CBD across 60th Street and from Brooklyn and Queens has been flat or slightly declining.

A comparison back to 2000 – the previous decennial census milestone – shows that overall transit use is up 10% citywide, including a nearly 9% gain for bus ridership in the outer boroughs, despite recent declines. Over the ten-year period, the peak citywide transit use was observed in 2008, prior to the effects of the recession. Citywide traffic is 1% lower than it was in 2000, with a similar trend for traffic outside the CBD. Traffic into the CBD has had a greater decline – over 5% – since 2000, with the lowest points in 2001 and more recently in 2008.

This fourth annual Sustainable Streets Index reviews traffic and transit trends in New York City, reports CBD traffic speeds based on taxi Global Positioning System (GPS) data, and reports indicators for eleven major projects involving changes in street operations. An extension of the taxi GPS section highlights the distance and path of taxi trips of similar travel time at various times of day and areas in Manhattan, Brooklyn and Queens. A new section to the report profiles walking patterns for commute trips and other travel purposes throughout the city.

Highlights from the performance indicators sections are:

- Bus speeds improved by 15-18% while ridership gained 12% on the M15 line with Select Bus Service. With the addition of new bus and bike lanes on First Avenue and Second Avenue, cycling volumes rose by 18-177%, and crashes were reduced by up to 37%.
- Bus speeds along Livingston Avenue between Flatbush Avenue and Boerum Place improved by 12-14% following the extension of exclusive bus lane operation to 7 a.m.-7 p.m. on weekdays and implementation of signal enhancements.
- Travel speeds improved by 35% in the evening rush hour while crash incidence fell at Crames

Square in the Bronx after the redesign simplified traffic movements and shortened crosswalks.

- The incidences of speeding on West 6th Street in Brooklyn were cut in half after the conversion of a surplus travel lane in each direction into a striped median, exclusive turn lanes and wider parking lanes.
- Total injuries from vehicular crashes decreased by 26%, and injuries to motor vehicle occupants by 65%, at Union Square after the one-way conversion of East 17th Street, lane reduction on Broadway, bike lane installation and creation of pedestrian plaza space and safety islands.
- Injuries to pedestrians from vehicular crashes decreased by 67% along East 180th Street between Webster Avenue and Boston Road following lane narrowing and installation of a center median, turn bays and high-visibility markings at crosswalks at Boston Road.
- 86% of merchants reported an increase in sales and 76% of merchants reported an increase in foot traffic during the Montague Street Weekend Walks when compared to other typical weekend summer days.
- The car sharing program in Lower Manhattan saw a reduction in parking impacts of 14% during weekdays and 68% during weekends.

**Reflecting improvements in the economy, subway ridership and traffic volumes in New York City grew in both 2010 and 2011.**

# Traffic and Transit Trends

As New York City emerged from economic recession that began in 2008, both employment levels and travel activity shared in signs of recovery. Employment, traffic volumes and transit ridership all showed changes of less than 1% in 2010; citywide employment and traffic volumes increased by 0.6% and 0.9% respectively, and subway ridership increased by 1.4% citywide while bus ridership fell by 2.5% in the wake of significant service cuts that were implemented in June 2010. Available data for 2011 show healthier increases in employment (up 2.0% citywide) while transit ridership grew slightly (up 0.2%) and preliminary data on traffic volumes show virtually no change.

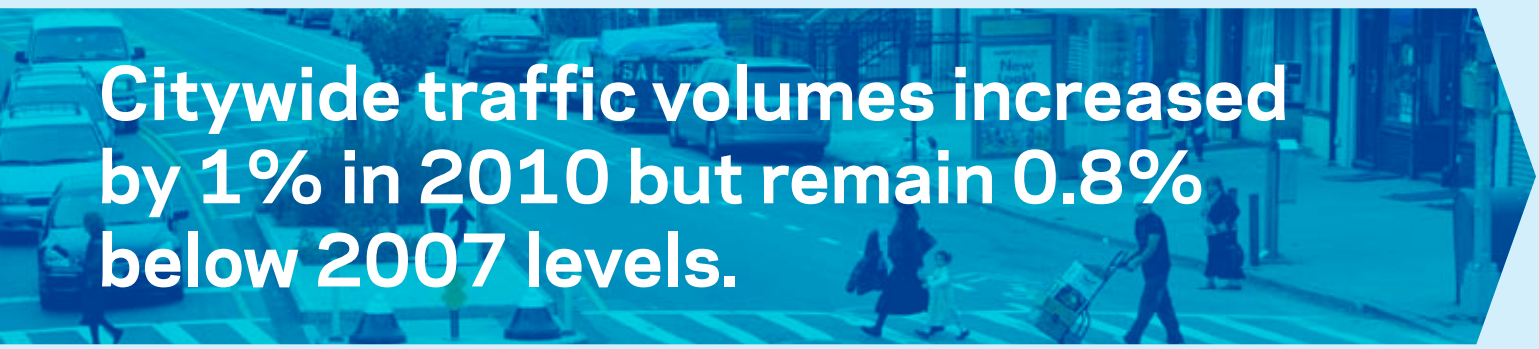
By the end of 2011, employment levels regained their pre-recession level, while traffic levels were about the same and transit ridership remained below the 2008 peak. While subway ridership surpassed 2008 ridership in 2011, bus ridership continued a slide that began in 2009.

### Traffic

Citywide traffic increased by nearly 1% in 2010, marking the second consecutive annual increase since a recent low in 2008. Despite the increase, citywide traffic remains 0.8% below 2007 levels. A look at 2011 counts based on DOT's Citywide Traffic Index shows essentially no change in traffic volumes in the outer boroughs in 2011.

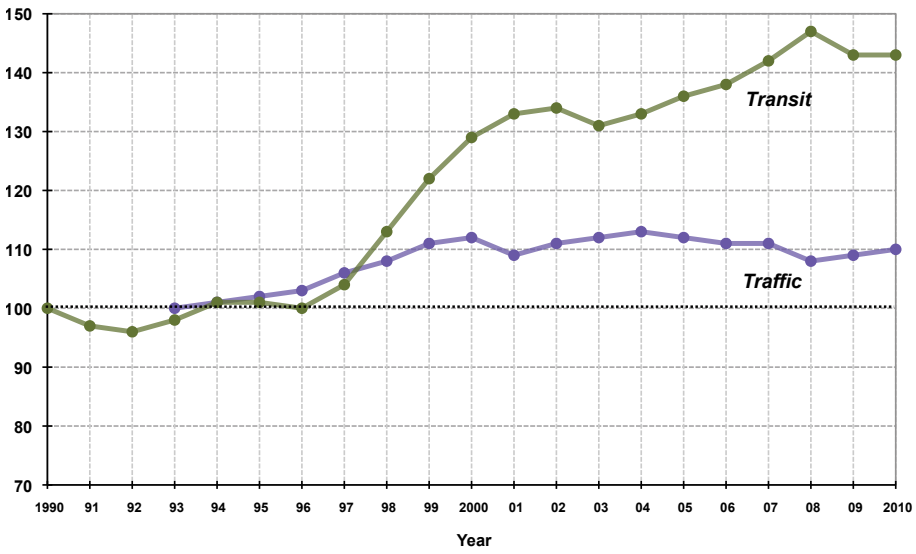
Traffic into the Manhattan Central Business District (CBD—the area from 60th Street to the Battery), grew by 0.9% in 2010. Still, since 2007, traffic into the CBD is down by 1.7%. Over this period, traffic volumes from New Jersey fell by 4.5% while volumes from Brooklyn dropped by 2.8% and by less than 1% from Queens and across 60th Street. These trends have mostly continued from earlier in the last decade; from 2000 to 2007 traffic volumes from New Jersey, Brooklyn and at 60th Street all decreased by 2% or more, while traffic entering from Queens increased by about 4%.

Traffic volumes outside the CBD were up slightly between 2009 and 2010 with an observed increase of about 1%. Similarly, the Citywide Traffic Index, which measures traffic in the four outer boroughs at locations apart from the roadways and crossings normally counted to monitor non-CBD traffic, also showed a generally flat trend with an increase of 0.4%. Most of the inter-borough boundary counts (excluding those into the CBD) were up as well as the inter-city crossings along Westchester and Nassau counties. The exception was the Bronx-Queens crossings, where the Bronx-Whitestone Bridge was down another 8.5% due to on-going roadway repair work.



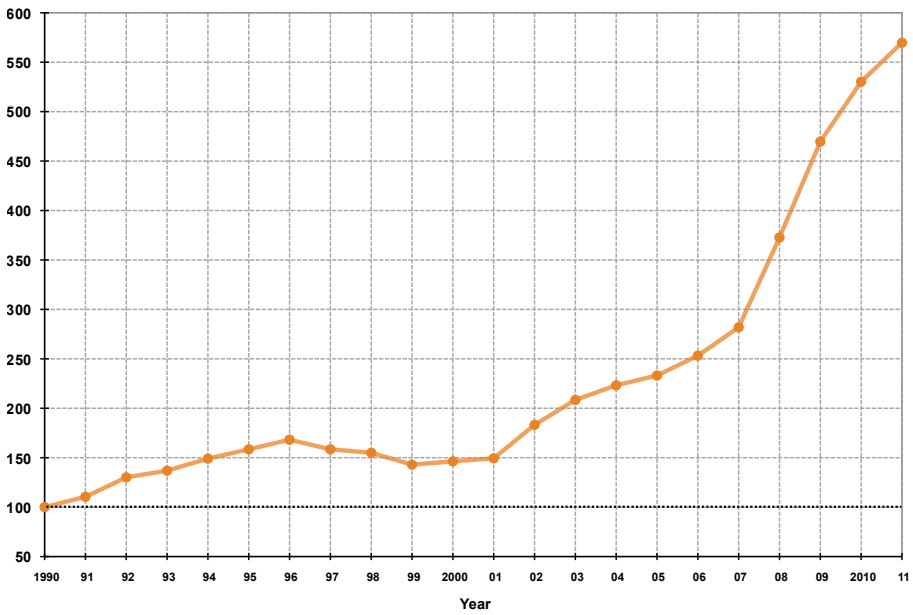
- 0.4% decrease in citywide bus and subway ridership in 2010.
- 0.9% increase in citywide weekday traffic volumes in 2010.
- 10.1% increase in citywide bus and subway ridership since 2000.
- 1.5% decline in citywide weekday traffic volumes since 2000.

**Citywide Transit and Traffic**
*(Traffic indexed to 1993/Transit indexed to 1990)*




- Additional 13% increase in bicycle commuting from 2009 to 2010, and 7% in 2011.
- 289% increase in bicycle commuting into the CBD since 2000.

**Bicycle Commuting** *(Indexed to 1990)*



## Transit

Overall subway and bus ridership fell 0.4% in 2010 and increased slightly in 2011. These small changes mask significant differences by mode, with the subway showing recent gains but bus ridership declining.

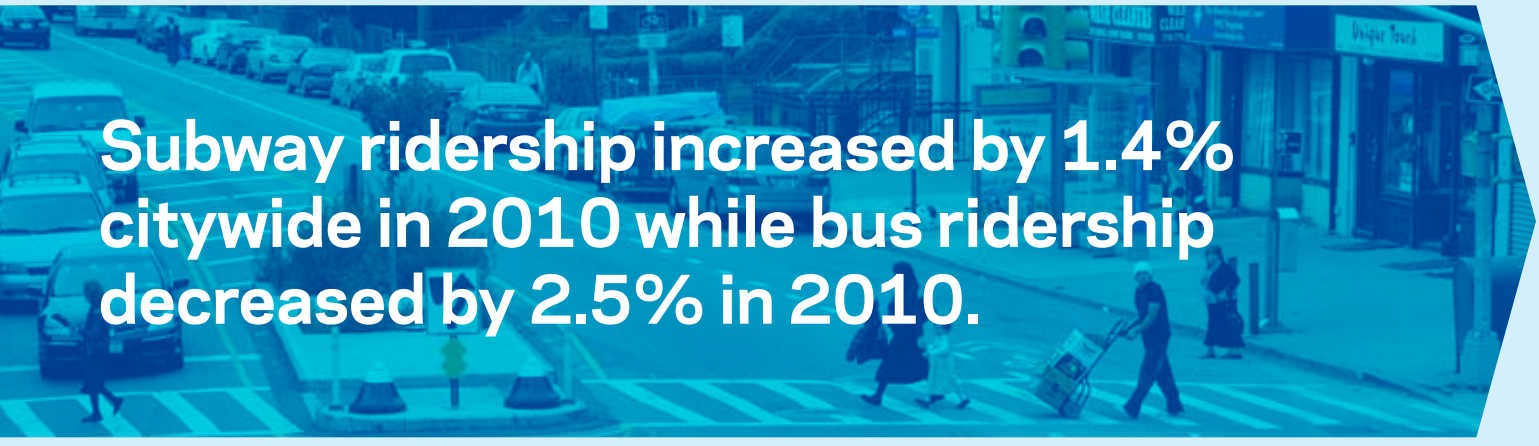
Subway ridership increased by about 1.4% citywide in 2010, and by 3.6% for CBD-bound trips. These gains continued in 2011, with a 2.5% increase in weekday subway ridership. Weekends also had increases, though to a less extent than weekdays.

Bus ridership experienced historic increases between the mid-1990s and 2008, but has since declined annually. Citywide bus ridership fell roughly 2.5% on an average weekday in 2010 and a further 4.3% in 2011.

In contrast to the overall declines in citywide bus ridership, routes with Select Bus Service (SBS) have gained riders. The M15 line with SBS was nearly 12% higher in July 2011 compared to the same month in 2010, prior to SBS implementation in October 2010. Similarly, the first full, 12-month period following the introduction of SBS on the Bx12 line in June 2008 marked over a 6% increase in ridership, and the route has steadily maintained that ridership level since.

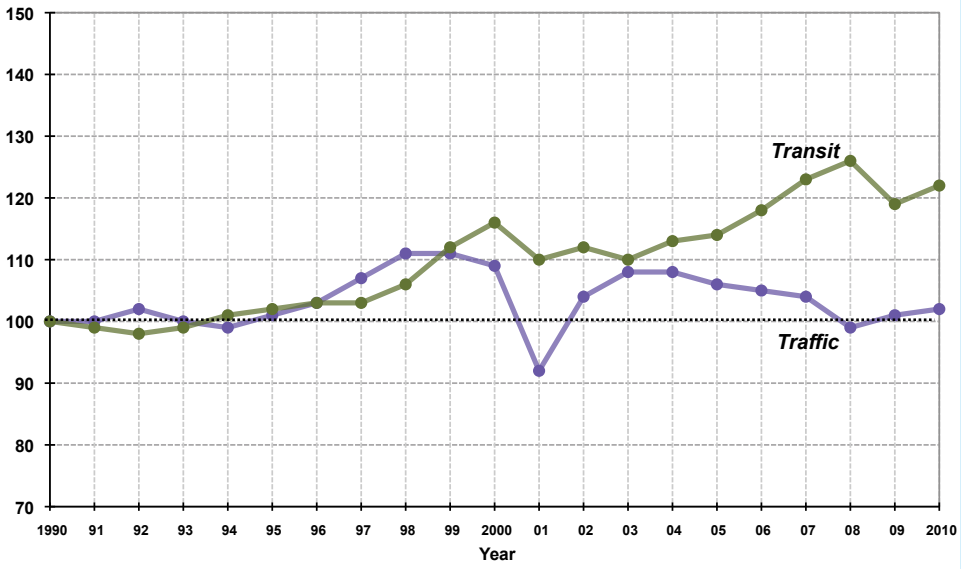
Bus services experienced a set of routing and service changes implemented in June 2010. Each borough experienced a discontinuation or merging of routes, with partial replacement of discontinued service in some cases, but not all. Moreover, although overall subway service showed a modest increase from 2009 – nearly 1.4% – two major service changes implemented in June 2010 affected the system. The Broadway local W was discontinued, replaced by the N on the local line north of Canal Street, and the Q was extended to the terminus at Ditmars Boulevard in Astoria, Queens. The V was also discontinued, replaced by the M between Middle Village and Forest Hills, Queens.

With 2010 marking the end of the decennial census period, a comparison back to 2000 shows that overall transit use is up 10% citywide, with the largest gain for bus ridership in the outer boroughs – nearly 9% – despite recent declines. Over the ten-year period, the peak citywide transit use was observed in 2008, prior to the effects of the recession.



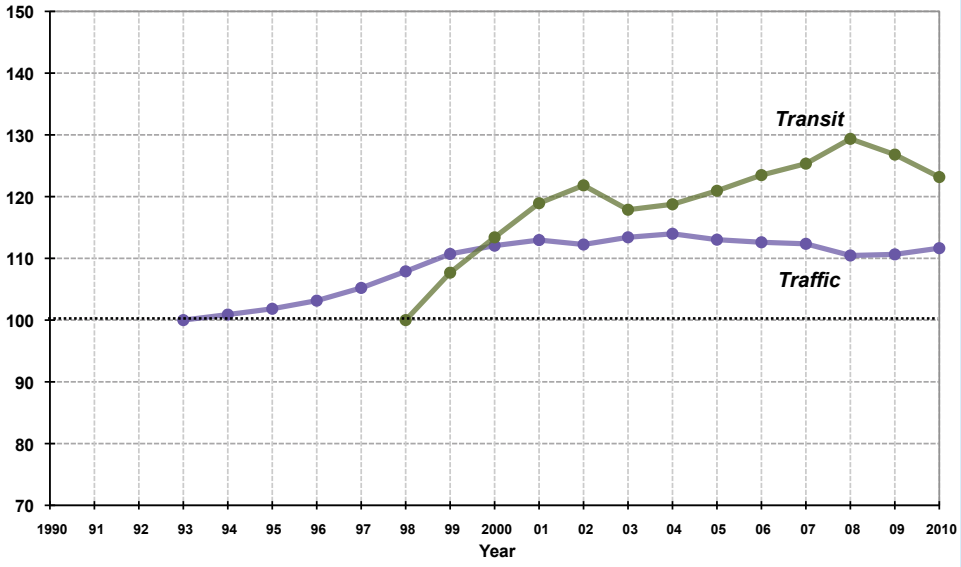
- **2.9% increase in bus and subway ridership into the CBD in 2010, while traffic also increased by 0.9%.**
- **5.7% increase in bus and subway ridership into the CBD since 2000, while traffic into the CBD decreased by 6.4%.**

## Transit and Traffic into the CBD *(Indexed to 1990)*




- **2.9% decrease in bus and subway ridership outside of the CBD in 2010, while traffic increased by 0.9%.**
- **8.6% increase in bus and subway ridership outside of the CBD since 2000, while traffic decreased by 1.2%.**

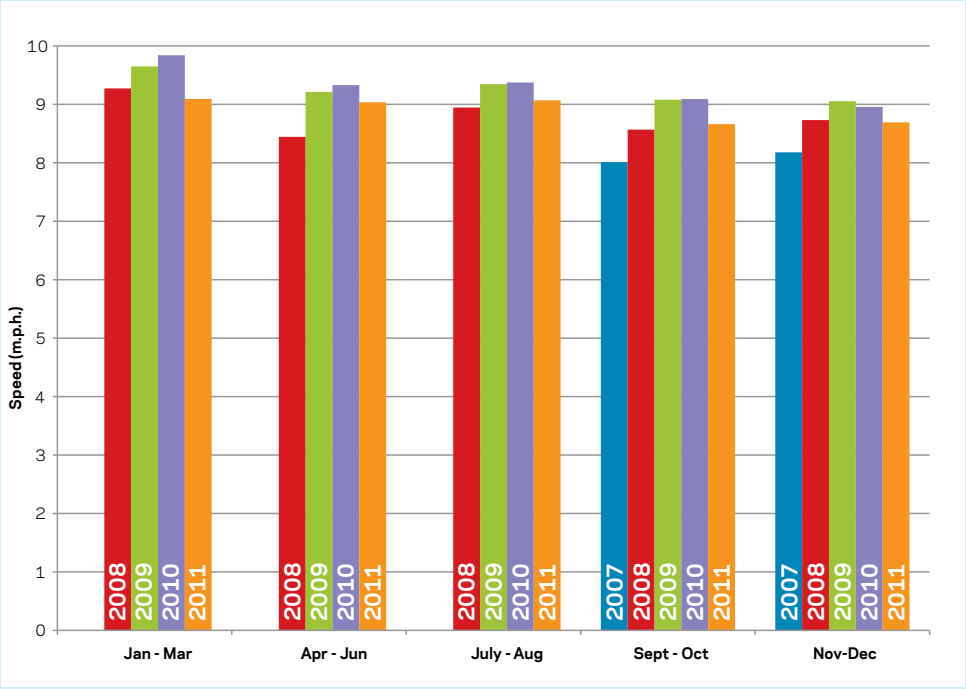
## Transit and Traffic Outside the CBD
*(Traffic indexed to 1993/Transit indexed to 1998)*




Note: Borough-level bus ridership is not available prior to 1998. Subway ridership is not shown because data for subway trips made exclusively outside the CBD cannot be separated from data for trips beginning or ending inside the CBD. Note that a large majority of subway trips that begin outside the Manhattan CBD are CBD-bound.

# Manhattan Traffic Speeds

## Weekday CBD Taxi Speeds from 8:00 a.m. - 6:00 p.m.




### Speed Trends

#### Methodology

All yellow taxicabs are equipped with GPS devices which create electronic trip sheets for all customer-carrying taxi trips 24 hours a day, seven days a week. The data included time and location of trip origin and trip destination, time elapsed, distance traveled, and fare. The system records approximately 13 million trips per month. DOT receives the taxi GPS data from the Taxi and Limousine Commission (TLC) in order to study travel patterns and analyze vehicle traffic speeds to support agency policymaking and operations. The taxi speed data are based on the distance and duration of the entire trip for customer-carrying taxi rides within CBD. Speeds reflect both time in motion and time spent stopped in traffic or at red lights. DOT has usable data from fall 2007 to the present.

# New York Minute
# Where can a taxi take you in 7 minutes?

## Traffic Speeds and Distances

Excluding trips to and from the region's airports, the typical (most frequent) duration of a taxi ride in New York City is 7 minutes. The map shows a sample of 7-minute trips made in May 2011, which represents a typical month of the year. The taxi GPS data only provide pick-up and drop-off locations; likely travel routes based on the distance traveled are shown.

### During the daytime (7 a.m. and 7 p.m.), 7-minute trips average:

- 10.9 mph
- 1.3 miles
- Trips primarily on Manhattan avenues* average 12.1 mph and cover 1.4 miles
- Trips primarily on crosstown streets* average 8.5 mph and cover 1.0 mile
- Trips outside Manhattan average 12.4 mph and cover 1.5 miles

### Evening and Overnight (7 p.m. and 7 a.m.), 7-minute trips average:

- 13.3 mph
- 1.6 miles
- Trips primarily on Manhattan avenues* average 15.1 mph and cover 1.8 miles
- Trips primarily on crosstown streets* average 9.9 mph and cover 1.2 miles
- Trips outside Manhattan average 15.8 mph and cover 1.9 miles

* "Primarily" for avenues and crosstown streets means 80% or more of the trip length is on an avenue(s) or crosstown street(s), respectively.

# Manhattan Traffic Speeds Day By Day

## JANUARY

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| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | 31 | | | | | |

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## OCTOBER

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| MARCH | | | | | | |
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| JUNE | | | | | | |
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| SEPTEMBER | | | | | | |
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| DECEMBER | | | | | | |
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| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

This calendar shows average daily speeds in the Manhattan CBD, 6 a.m. to 6 p.m.

**Key:**

The 25 fastest days (average speed between 16.3 m.p.h. and 11.9 m.p.h.). Most occur on major holidays or on Sundays in January or July.

The next 75 fastest days (average daily speed between 11.7 m.p.h. and 10.5 m.p.h.). Most occur on weekends during spring or fall seasons, or immediately before or after holidays.

Between the 100 fastest days and 100 slowest days are the 165 days with average daily speeds between 10.5 m.p.h. and 9.2 m.p.h. Most are weekdays during spring and summer seasons.

The next 75 slowest days (9.2 to 8.6 m.p.h.) fall into mid-week weekdays late in the year.

The 25 slowest days (8.6 to 6.9 m.p.h.) mostly occur in the latter part of the year and all are weekdays. The heaviest concentrations are in late September during the United Nations General Assembly, and in November and December.

**Fastest Day**

- 2008: Sunday, June 1 (15.1 m.p.h.)
- 2009: Thursday, January 1 (13.9 m.p.h.)
- 2010: Sunday, July 4 (14.2 m.p.h.)
- 2011: Sunday, August 28 (16.3 m.p.h.)

**Fastest Non-Holiday Weekday**

- 2008: Friday, May 11 (12.4 m.p.h.)
- 2009: Monday, September 28 (11.9 m.p.h.)
- 2010: Monday, January 4 (11.8 m.p.h.)
- 2011: Monday, January 3 (11.6 m.p.h.)

**Slowest Day**

- 2008: Wednesday, September 24 (7.0 m.p.h.)
- 2009: Monday, December 21 (8.0 m.p.h.)
- 2010: Wednesday, December 29 (6.4 m.p.h.)
- 2011: Friday, January 28 (6.9 m.p.h.)

**2011 Holidays**

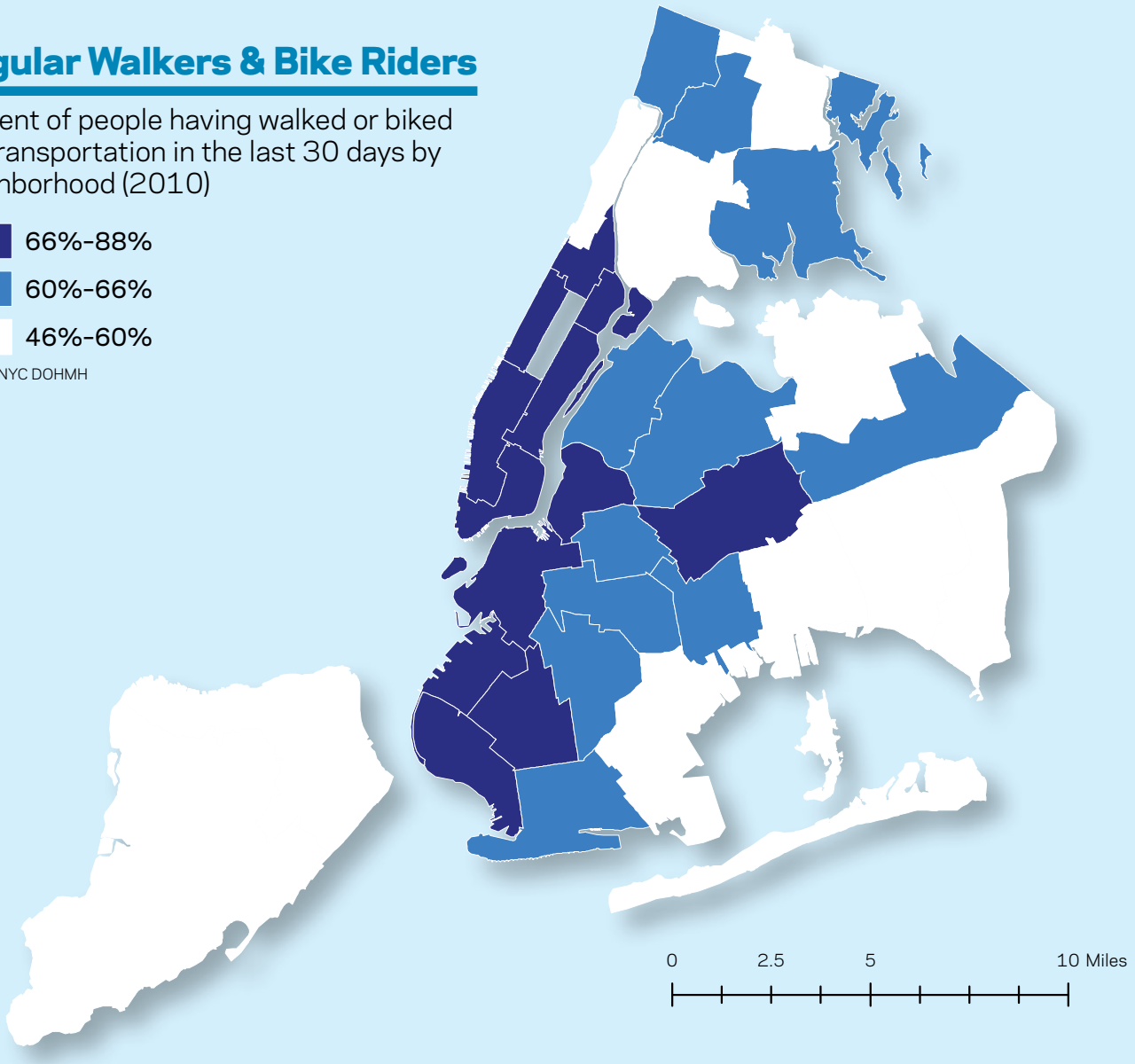
| | |
|---|---|
| January | New Year's Day (1) |
| | Martin Luther King Jr. Day (17) |
| February | President's Day (21) |
| April | Easter Sunday (24) |
| May | Memorial Day (30) |
| July | Independence Day Observed (4) |
| September | Labor Day (5) |
| October | Columbus Day (10) |
| November | Veteran's Day (11) |
| | Thanksgiving (24) |
| December | Christmas Day (25) |

## Regular Walkers & Bike Riders

Percent of people having walked or biked for transportation in the last 30 days by neighborhood (2010)

- 66%-88%
- 60%-66%
- 46%-60%

Source: NYC DOHMH




## Walking Facts

High pedestrian volumes are found throughout NYC. Pedestrian traffic for 12 hours (8 a.m.-8 p.m.) was counted in 2007 at major commercial centers. The following weekday pedestrian volumes were observed:

- Times Square- Broadway and 7th Avenue at 44th Street (MN): 118,000
- 8th Avenue between 33rd and 34th Streets (MN): 100,740
- Flushing Main Street (QN): 97,290
- 34th Street near 6th Avenue (MN): 94,730
- East Fordham Road (BX): 80,570
- 14th Street between 5th Avenue and University Place (MN): 51,580
- Flatbush Avenue (BK): 12,520

Pedestrian counts are taken by DOT at 100 intersections within retail corridors twice a year to track long-term trends. The counts are taken in the morning and evening rush hours as well as on Saturday afternoons. A sampling of some of the highest counts in each borough during the evening rush hour (4-7 p.m.) in September 2011 is shown below:

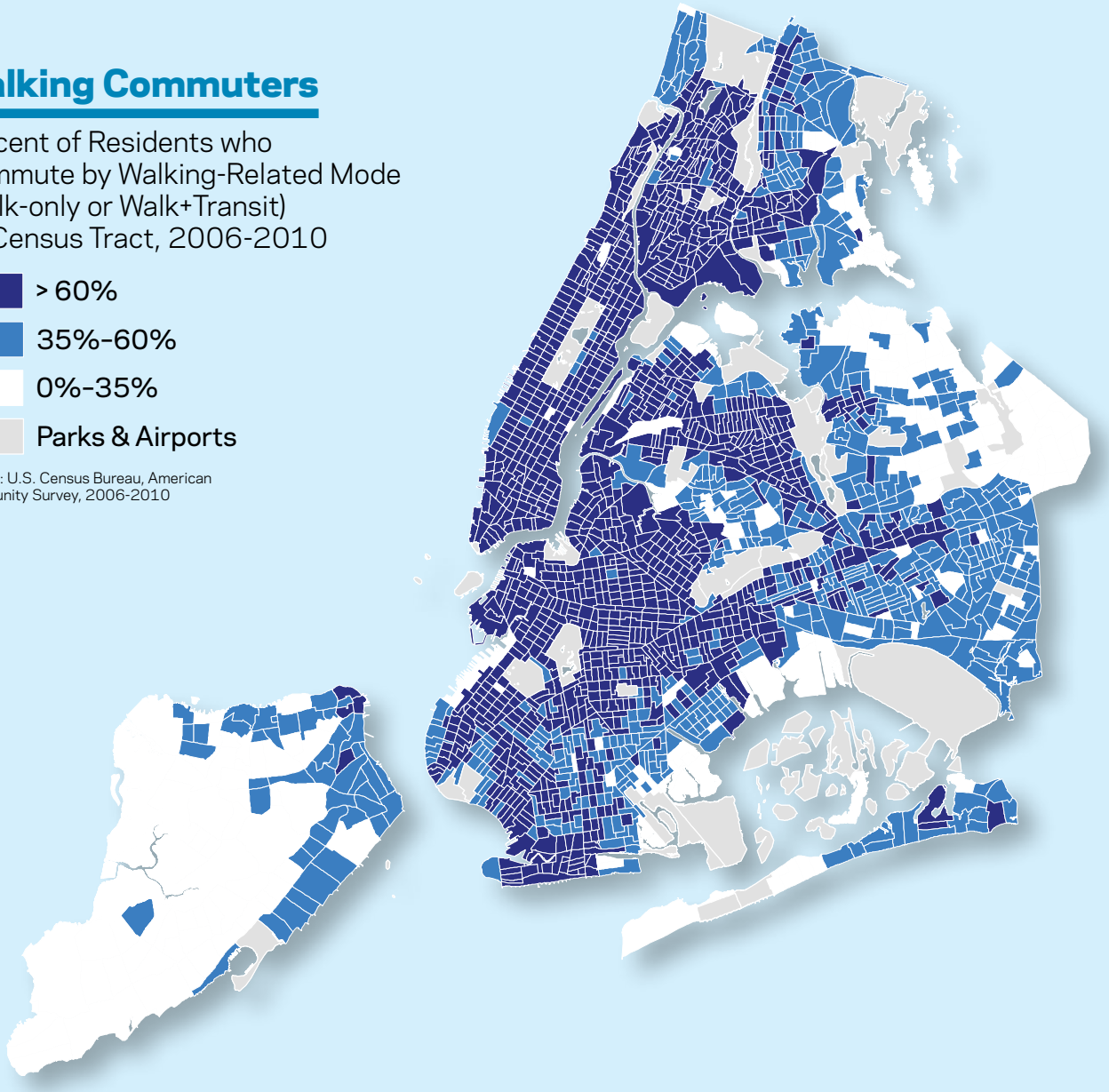
- West 34th Street from Broadway to 7th Avenue (MN): 27,249
- 7th Avenue from West 32nd Street to West 33rd Street (MN): 23,015
- 5th Avenue from East 54th Street to East 55th Street (MN): 18,993
- Roosevelt Avenue from Main Street to Union Street (QN): 14,081
- East Fordham Road from Valentine Avenue to Tiebout Avenue (BX): 13,548
- Jamaica Avenue from 162nd Street to Guy R. Brewer Boulevard (QN): 13,426
- 82nd Street from 37th Avenue to Roosevelt Avenue (QN): 9,941
- Fulton Street from Lawrence Street to Bridge Street (BK): 8,732
- 5th Avenue from 51st Street to 52nd Street (BK): 8,170
- Third Avenue from East 150th Street to East 151st Street (BX): 7,050
- 86th Street from 4th Avenue to 5th Avenue (BK): 6,226
- East Tremont Avenue from Prospect Avenue to Clinton Avenue (BX): 5,859
- Pedestrian walkway from Staten Island Ferry Terminal (SI): 1,407

# Walking Commuters

Percent of Residents who Commute by Walking-Related Mode (Walk-only or Walk+Transit) by Census Tract, 2006-2010

- > 60%
- 35%-60%
- 0%-35%
- Parks & Airports

Source: U.S. Census Bureau, American Community Survey, 2006-2010



## Census Walking Facts

65% of NYC residents primarily commute to work by walking and public transportation, the highest figure among the ten largest U.S. cities:

- Philadelphia: 35%
- Chicago: 32%
- Los Angeles: 15%
- San Diego: 7%
- Houston: 7%
- Dallas: 6%
- Phoenix: 5%
- San Antonio: 5%
- San Jose: 5%

NYC residents commuting by walking and public transportation by borough is as follows:

- Manhattan :79%
- Brooklyn: 69%
- Bronx: 65%
- Queens: 57%
- Staten Island: 34%

### Other Walking Facts:

- Walking is by far the most popular form of physical activity in the United States.
- Although 41% of all trips made in the United States are one mile or less, fewer than 10% of all trips nationally are made by walking and biking.
- Among students, ages five to 15, living within one mile of school, the percentage of walkers fell from 90% to 31% between 1969 and 2001, according to the Federal Environmental Protection Agency.

(source: http://americawalks.org/resources/walking-facts/)

## Safety, Pedestrian & Bicycle Improvements

1. West 6th Street
2. East 180th Street
3. Southern Boulevard
4. Broadway: Union Square
5. Queens Boulevard at Broadway
6. Luten Avenue

## Transit Mobility Improvements

7. Livingston Street Transit Priority
8. First Avenue / Second Avenue Select Bus Service

## Congestion Reduction

9. Car Sharing
10. Hoyt Avenue

## Public Spaces

11. Weekend Walks - Montague Street

# Project Indicators

To fulfill provisions of Local Law 23 of 2008 (Intro 199), this section reports performance indicators for major roadway projects involving "changes in street operations, such as lane reapportionments, lane reconfigurations, significant adjustments in traffic and parking regulations and changes in traffic signal timing." The performance indicators are formulated to assess the effectiveness of DOT projects in improving system performance and encouraging more sustainable means of transportation.

This section reports on 11 major DOT projects that were implemented in 2010. DOT collected before and after performance indicators for each of the 11 projects. The indicators measure safety, usage levels for motor vehicles, cyclists, pedestrians and bus riders, and/or travel times through the project area.

The 11 projects selected for evaluation reflect the multimodal character of DOT's projects. They include safety, pedestrian and bicycle improvements; transit mobility improvements; congestion reduction; and public spaces enhancements. The projects are distributed throughout the five boroughs, and reflect a range of conditions from the dense Manhattan core to streets in low-rise Brooklyn and Staten Island neighborhoods.

The projects also illustrate a range of different design treatments.

Along East 180th Street safety improvements and traffic calming measures such as narrowing the travel lanes, simplifying turning movements, and installing pedestrian refuge islands have proven to significantly reduce crashes and speeding along the corridor. Similar treatments were made along West 6th Street, Luten Avenue and Southern Boulevard. The Southern Boulevard project also included expansion of the pedestrian plaza space at Crames Square which provides a safer environment for pedestrians.

Another project that incorporated changes for all roadway users was implemented on Broadway at Union Square. This project included new pedestrian space, the addition of bike lanes, pedestrian refuge islands, and turn lanes.

Other projects improve the operation of a street by modifying traffic signal timing or phasing. On Southern Boulevard in the Bronx, DOT changed the timing of the signals to improve traffic flow and pedestrian safety. Likewise, in Queens on Hoyt Avenue at the RFK Bridge, signal timing changes and rush-hour turn bans were implemented to improve traffic flow and pedestrian safety. Signal timing changes were also completed to give priority treatment to buses accessing the RFK Bridge on Hoyt Avenue at 29th Street.

Signal timing changes and bus priority treatments were also used to improve bus travel times on Livingston Street and First and Second Avenues in Manhattan. Along with the bus lanes, other project elements included pedestrian refuge islands and protected bicycle paths on First and Second Avenues.

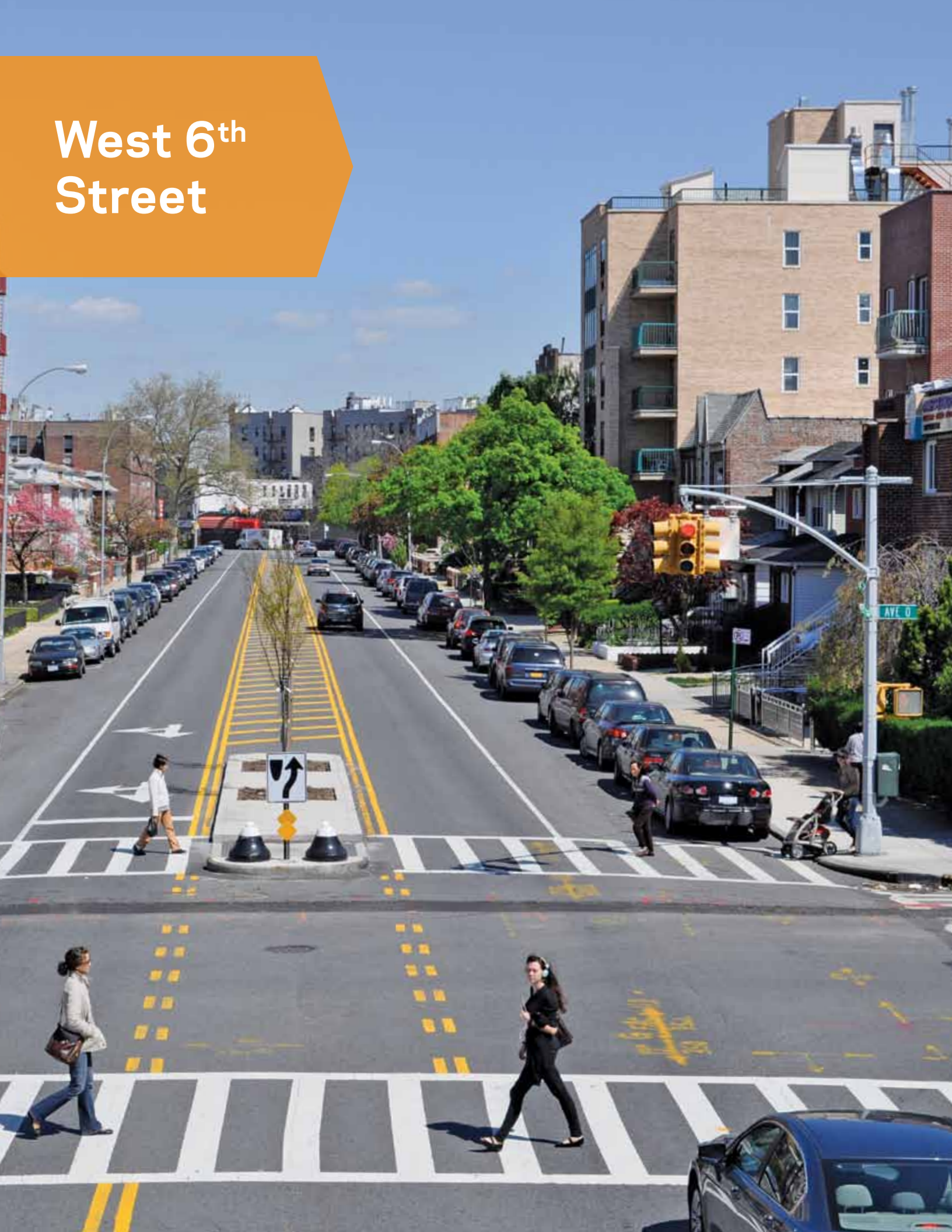
In the Car Share pilot in Lower Manhattan, DOT was able to maintain agency operations with a reduced fleet size while also reducing its carbon and parking footprint.

Goals can often be accomplished simply by changing the way a street is used. On Montague Street in Brooklyn, two blocks of the roadway were closed on three weekend days to provide a neighborhood street fair which promoted local businesses and healthy, safe recreation.

Highlights from the project performance indicators are:

- The incidence of speeding on West 6th Street in Brooklyn fell by more than half as a result of reassigning space from an unneeded general travel lane to turn lanes, a median and a wider parking lane.
- Adding a median and left-turn bays and narrowing travel lanes on East 180th Street in the Bronx led to a 67% reduction in crashes involving pedestrians and reduced speeding.
- Travel speeds on Southern Boulevard in the Bronx improved by 35% in the evening rush hour while crash incidence fell after the redesign simplified traffic movements and shortened crosswalks.
- New bus lanes on Livingston Street in Brooklyn improved bus speeds by 12 - 14%.
- New bus and bike lanes on First and Second Avenues in Manhattan improved bus speeds by 15-18%, increased bus ridership by 12% and cycling volumes by 18-177%, and reduced crashes by up to 37%.
- A comprehensive redesign of Broadway at Union Square in Manhattan dramatically reduced crashes, increased bike usage and improved business conditions.
- Safety improvements increased pedestrian comfort and reduced crashes on Queens Boulevard at the intersection with Broadway in Queens.
- Adding crosswalks and a median and narrowing travel lanes on Luten Avenue in Staten Island reduced speeding, eased crossing the street and reduced crashes.
- Travel times on Hoyt Avenue in Queens near the RFK Bridge improved by up to 51% after implementation of signal timing adjustments, a new signal and crosswalk, turn bans and related changes.
- 86% of merchants surveyed reported an increase in sales and 76% reported an increase in foot traffic during the Montague Street Weekend Walks in Brooklyn when compared to other typical weekend summer days.
- DOT parking impact was reduced in Lower Manhattan by 14% during weekdays and by 68% during weekends after implementation of a car sharing program at DOT in Lower Manhattan.

# West 6th Street



## Purpose

- Reduce speeding
- Provide safer pedestrian crossings
- Enhance the streetscape

## Outreach

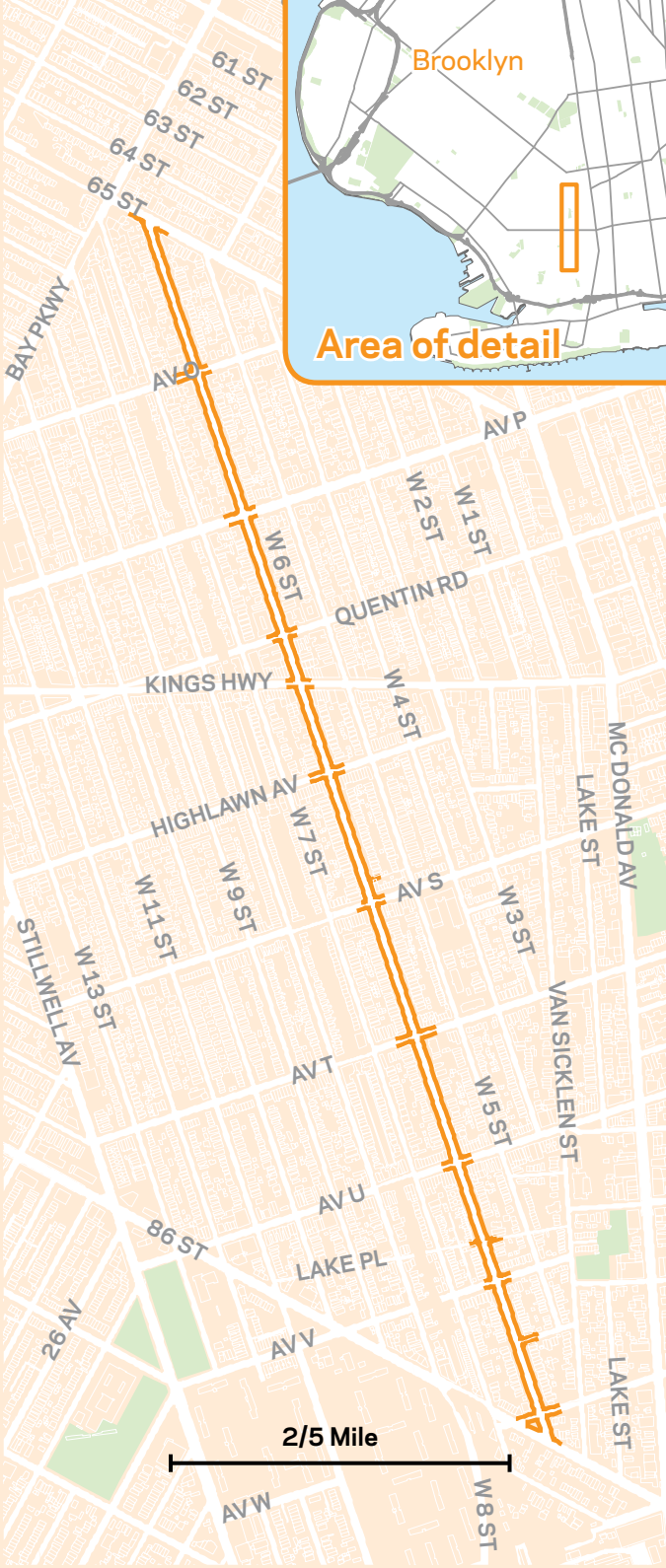
- Brooklyn Community Board 11 (CB11) asked DOT to explore traffic calming measures on West 6th Street in November 2009 following three pedestrian fatalities
- DOT presented plans to the CB11 Transportation Committee and local elected officials in April and May 2010 and received feedback
- DOT presented the modified plans to the CB11 Transportation Committee and local elected officials in May 2010 and received support for the plan

## Approach

- Narrowed roadway from two moving lanes to one in each direction from 65th Street to 86th Street
- Installed a wide center, painted median
- Installed pedestrian refuge islands and left-turn bays at key intersections
- Marked wide parking lanes and maintained all parking
- Installed high visibility markings for crosswalks at three intersections

## Results

- Vehicles traveling over the speed limit decreased by 42% on southbound West 6th Street and by 29% on northbound West 6th Street
- Total number of crashes involving injuries and number of crashes involving injuries to motor vehicle occupants and pedestrians lower than the average for the three prior years
- Shorter pedestrian crossing distances
- Greened the corridor




West 6th Street is a north-south arterial that runs through the Bensonhurst and Gravesend neighborhoods of Brooklyn. The project corridor is primarily a residential neighborhood. West 6th Street runs parallel to the N subway train just one block to the west and there are four subway stops within the project corridor: Bay Parkway, Kings Highway, Avenue U, and 86th Street.

# West 6th Street

A north-south thoroughfare, West 6th Street carried fast through-moving traffic along its two moving lanes in each direction. The 1.5 mile-length corridor connects 65th Street to 86th Street in Bensonhurst and Gravesend, Brooklyn, one block east of the N train. West 6th Street has numerous pedestrians crossing the street to reach the subway stations located at Bay Parkway, Kings Highway, Avenue U, and 86th Street.

DOT began studying West 6th Street at the request of CB11 in November 2009. At the time of the request, there had been three pedestrian fatalities; one at the intersection with Avenue O, Kings Highway and Avenue T. Another pedestrian was killed at Avenue O in early 2010. DOT met with local elected officials in April and presented plans to the CB11 Transportation Committee in May 2010 and received feedback. CB11 approved the revised project plans in May 2010. Project implementation began in late May and was completed in June 2010.

Based on observations and data collected by DOT, West 6th Street had excess capacity, a high incidence of speeding, long crossing distances for pedestrians and great distance between crosswalks which led to jaywalking midblock.

In order to calm traffic and improve safety, DOT narrowed West 6th Street to one moving lane in each direction, installed a wide parking lane and a 12-foot painted median with left-turn bays at key intersections. The one lane of traffic in each direction readily accommodates existing traffic volumes. The left-turn bays help organize traffic movements by moving vehicles waiting to turn out of the way of through traffic. The wide parking lane allows the occupants of parked cars to more safely open car doors.

At the three locations where there was a high frequency of pedestrian crashes, Avenue O, Quentin Road, and Kings Highway, DOT installed pedestrian refuge islands and high visibility crosswalk markings. The refuge islands provide pedestrians with a safe space to wait in the center of the street if they did not make it all the way across during their signal phase. Installing the pedestrian refuge islands required banning left turns in the direction with the lowest existing left-turn volume at the three locations. Banning the left turns ensures that cars making turns would not interfere with pedestrians in the safety refuge or with opposing left turners. Installing pedestrian refuges also provides the opportunity to beautify the street with trees in the center of the street. Six trees were planted, two in each of the three new pedestrian refuge islands.

Speeding decreased markedly as a result of the project. Radar spot speed studies were performed on West 6th Street between Avenue V and Avenue W before and after the project was implemented. On average, in the northbound direction, the percentage of vehicles traveling over the speed limit of 30 mph decreased 29% from 53% to 24%. In the southbound direction, the percentage of vehicles traveling over the speed limit decreased 42% from 60% to 18%. Average speeds between Avenue V and Avenue W decreased in the northbound direction from 30.4 mph to 27.9 mph, an 8% decrease and in the southbound direction speeds were reduced by 12% from 31.3 mph to 27.7 mph.

**A refuge island, high visibility crosswalk markings and landscaping in the north crosswalk of West 6th Street at Avenue O provides a safer crossing and improves the streetscape.**

**Traffic calming measures applied on West 6th Street included the narrowing of the roadway from two lanes in each direction to one and the addition of painted center medians.**

# The incidence of speeding fell by more than half as a result of converting an unneeded through lane into turn lanes, a median and a wider parking lane.

Analysis of the New York City Police Department crash data shows total crash rates and crash rates for motor vehicle occupants and pedestrians after implementation were lower than the average for the three prior years. In addition, the annualized crash rate involving injuries to motor vehicle occupants after implementation was lower than the number of crashes in any of the 10 prior years (for crash analysis methodology, see page 68).

The safety improvements along West 6th Street benefits both pedestrians and drivers by calming traffic, simplifying turning movements, installing pedestrian refuge islands, while not negatively affecting the flow of traffic.

**Crashes with Injuries along West 6th Street 65th Street to 86th Street**

| | Before* (three previous years) | | | After |
|---|---|---|---|---|
| **Total Crashes with Injuries** | 36 | 22 | 27 | 21.5 |
| **Number of Crashes with Injuries to:** | | | | |
| **Motor Vehicle Occupants** | 15 | 11 | 14 | 8.8 |
| **Pedestrians** | 20 | 10 | 9 | 10.1 |
| **Bicyclists** | 1 | 1 | 4 | 2.5 |

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through January 2012) at annual rate. See page 68 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

**West 6th Street Average Traffic Speeds (in m.p.h.) Avenue V to Avenue W**

| | Before | After | % Change |
|---|---|---|---|
| **Northbound** | 30.4 | 27.9 | -8% |
| **Southbound** | 31.3 | 27.7 | -12% |

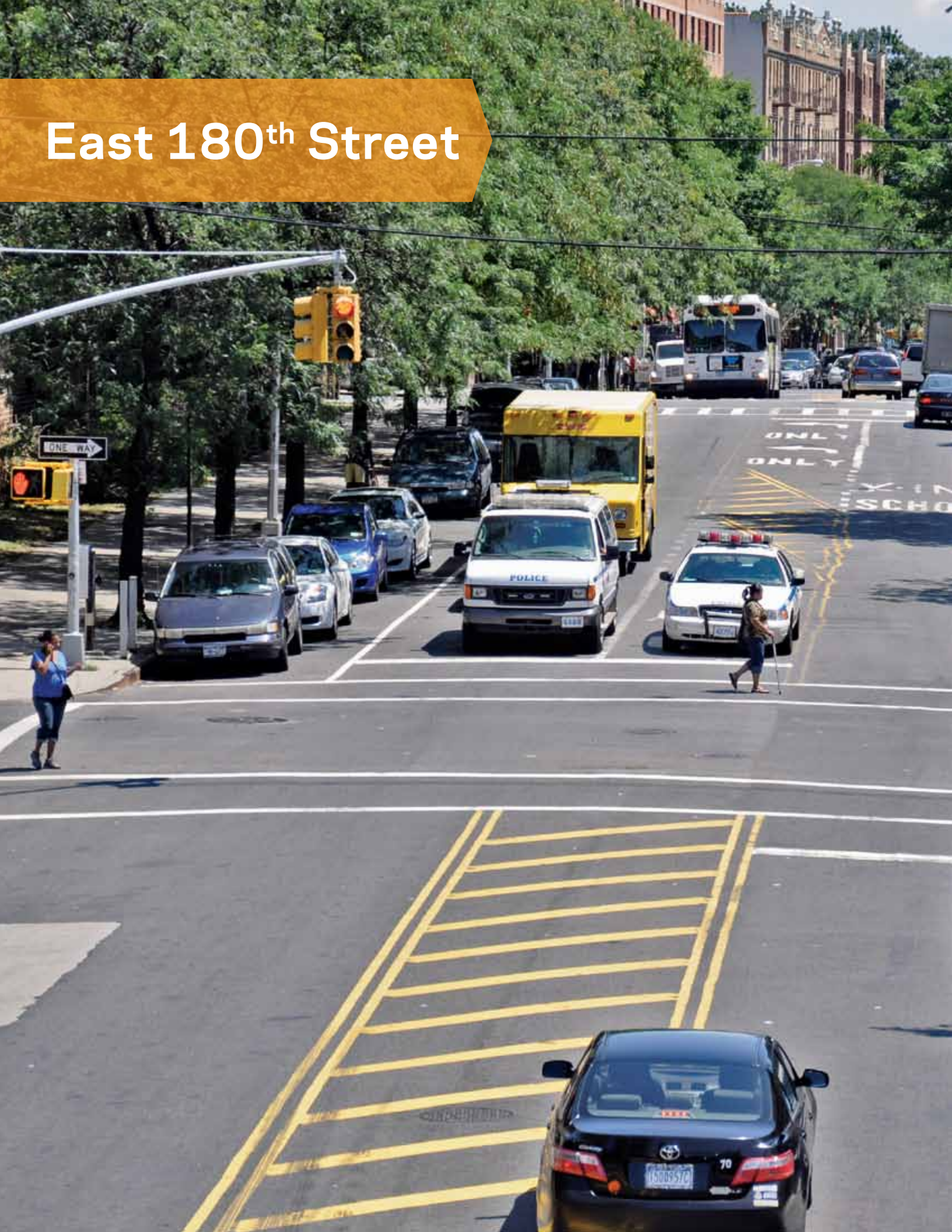
Data collected between 12 -2 p.m. on a weekday. Before data collected in August 2009. After data collected in January 2011.

**Percentage of Vehicles Over the Speed Limit on West 6th Street Avenue V to Avenue W**

| | Before | After | % Change |
|---|---|---|---|
| **Northbound** | 53% | 24% | -29% |
| **Southbound** | 60% | 18% | -42% |

Data collected between 12 -2 p.m. on a weekday. Before data collected in August 2009. After data collected in January 2011.

# East 180th Street



## Purpose

- Improve pedestrian and driver safety
- Reduce speeding
- Provide safer pedestrian crossings
- Improve traffic operations

## Outreach

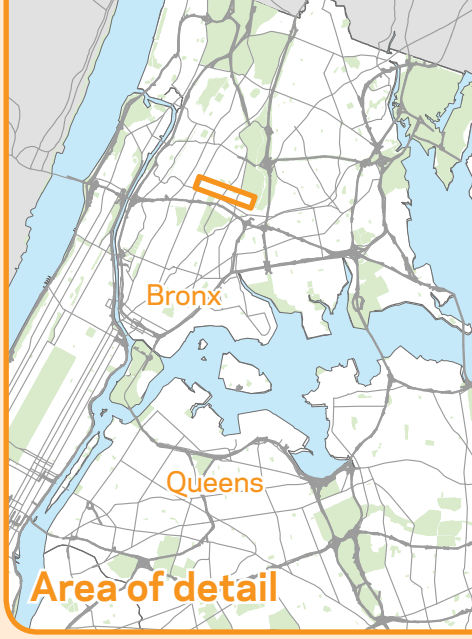
- DOT presented plans to the Bronx Community Board 6 (CB6) Full Board in September 2010
- CB6 voted to support the project plans in September 2010

## Approach

- Narrowed travel lanes from 17 feet to 11 feet from Webster Avenue to Boston Road to calm traffic
- Installed a wide center, painted median
- Marked wide parking lanes and maintained all parking
- Installed high visibility markings at the crosswalk at East 180th Street and Boston Road
- Installed left-turn bays to improve safety for pedestrians and motorists and to decrease delay for motorists

## Results

- 67% reduction in pedestrian crashes involving injuries along East 180th Street from Webster Avenue to Boston Road
- Percentage of vehicles traveling over the speed limit decreased by 32% along westbound East 180th Street and by 29% along eastbound East 180th Street




East 180th Street is an east-west arterial located in the Tremont neighborhood of the Bronx. The majority of the corridor is comprised of low-level retail and densely-populated residential land uses. Just north of the project area are Saint Barnabas Hospital and the Bronx Zoo. The corridor is served by the Bx36 and Bx39 bus lines.

# East 180th Street

East 180th Street is an east-west roadway located in the Tremont neighborhood of the Bronx. The project corridor extends 1.2 miles from Webster Avenue to Boston Road. East 180th Street is approximately 50-feet wide and has one moving lane in each direction. The project corridor is lined with pedestrian retail, schools (PS3, PS57), and densely populated housing complexes.

DOT began studying East 180th Street in 2009. There were 19 severe injuries or fatalities to pedestrians in the study area between 2004 and 2008, making it the fifth highest accident location in the Bronx for crashes per mile. A bicyclist was killed at the intersection with Park Avenue in 2005 and a pedestrian was killed at the Third Avenue intersection in 2004.

The travel lanes on East 180th Street are 17-feet wide, well in excess of the standard 11-foot lanes. East 180th Street also has low traffic volumes. The combination of wide lanes and low volumes provides an opportunity for motorists to speed. DOT developed a plan to improve safety in the corridor. DOT presented the plan to the Full Board of CB6 in September 2010 and CB6 voted in support of the plan that same month. The project was implemented in October 2010.

In order to calm traffic, DOT narrowed each of the moving lanes from 17 feet to 11 feet. The excess space was converted to a 10-foot wide painted, center median with left-turn bays and wide parking lanes. A total of 21 left-turn bays were added along the corridor. The left-turn bays improve safety and reduce delay for through motorists who no longer have to wait for a left-turning vehicle to make the turn. The wide parking lane improves safety by providing a buffer for motorists exiting their vehicles. Additionally, DOT upgraded the crosswalk at East 180th Street and Boston Road with high visibility markings.

Speeding decreased dramatically as a result of the East 180th Street project. Radar spot speed studies were performed on East 180th Street between Clinton Avenue and Prospect Avenue before and after the project was implemented. On average, in the westbound direction, the percentage of vehicles traveling over the speed limit of 30 mph decreased from 40% to 8%. In the eastbound direction, the percentage of vehicles traveling over the speed limit decreased from 30% to 1%. Average speeds between Clinton Avenue and Prospect Avenue decreased in the westbound direction from 28.9 mph to 25.6 mph, an 11% decrease and in the eastbound direction speeds were reduced by 18% from 27.4 mph to 22.6 mph.

The total number of crashes involving pedestrian injuries along East 180th Street from Webster Avenue to Boston Road decreased by 67% from an average of 14.3 per year during the three years prior to implementation to an annual rate of 4.8 since the project was completed. This decline represents a statistically significant reduction in crashes (for crash analysis methodology, see page 68). In addition, the annualized crash rate involving injuries to pedestrians after implementation was lower than the number of crashes in any of the 10 prior years.

The safety improvements along East 180th Street benefit both pedestrians and drivers by calming traffic, reducing the incidence of speeding, and better organizing the traffic while maintaining capacity.

**Traffic calming measures applied on East 180th Street included the narrowing of the travel lanes from 17 feet to 11 feet and the addition of painted center medians and parking lanes.**

**Left-turn lanes were added at 21 locations along the East 180th Street corridor to improve safety and traffic operations.**

# Adding a median and left-turn bays and narrowing travel lanes led to a 67% reduction in crashes involving pedestrians and reduced speeding.

### Crashes with Injuries along East 180th Street Webster Avenue to Boston Road

| | Before* (three previous years) | | | After |
|---|---|---|---|---|
| **Total Crashes with Injuries** | 40 | 29 | 45 | 32.8 |
| **Number of Crashes with Injuries to:** | | | | |
| **Motor Vehicle Occupants** | 20 | 17 | 30 | 26.4 |
| **Pedestrians** | 18 | 12 | 13 | 4.8 |
| **Bicyclists** | 2 | 0 | 2 | 1.6 |

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through January 2012) at annual rate. See page 68 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

### East 180th Street Average Traffic Speeds (in m.p.h.) Clinton Avenue to Prospect Avenue

| | Before | After | % Change |
|---|---|---|---|
| **Westbound** | 28.9 | 25.6 | -11% |
| **Eastbound** | 27.4 | 22.6 | -18% |

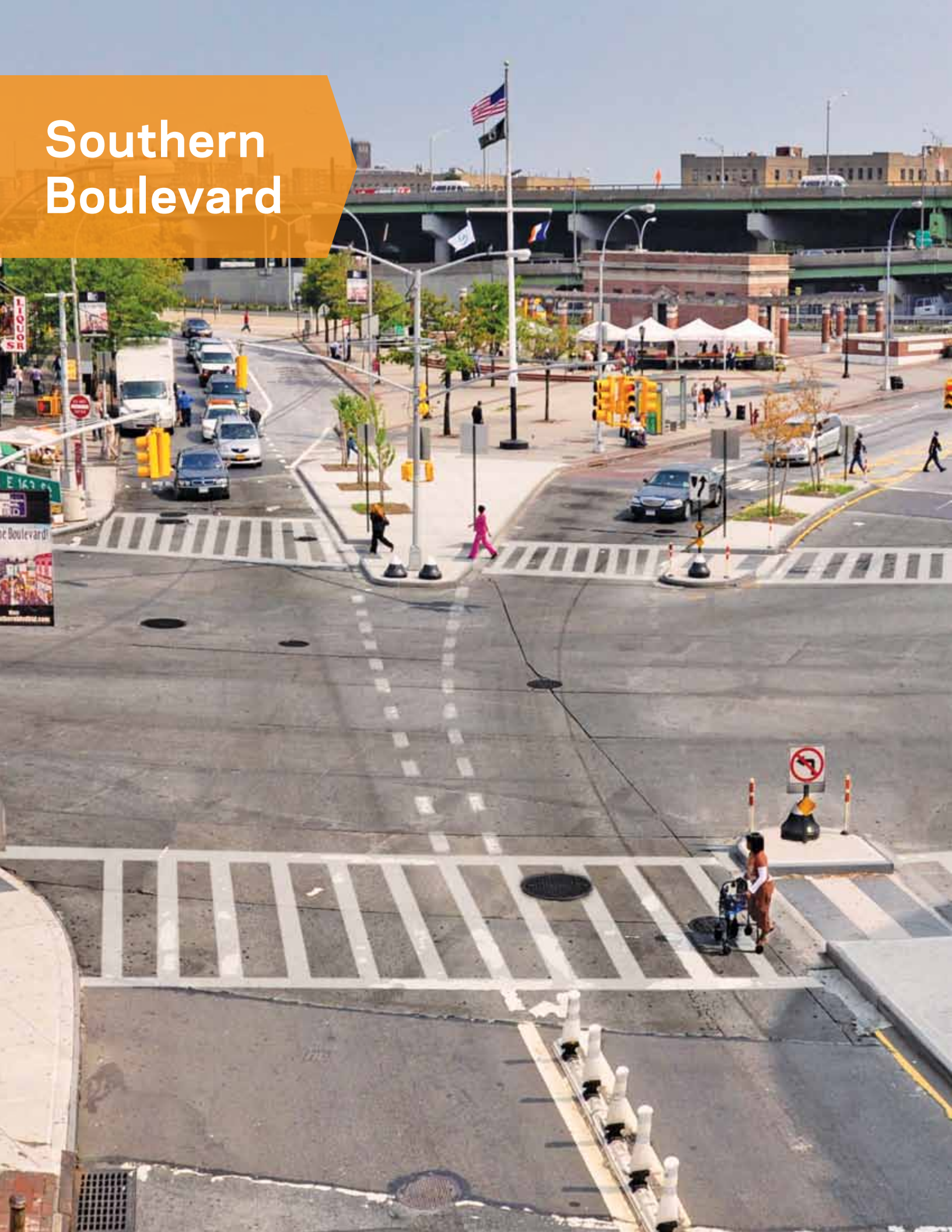
Data collected between 10 a.m.-3 p.m. on a weekday. Before data collected in December 2009. After data collected in January 2011.

### Percentage of Vehicles Over the Speed Limit on East 180th Street Clinton Avenue to Prospect Avenue

| | Before | After | Change |
|---|---|---|---|
| **Westbound** | 40% | 8% | -32% |
| **Eastbound** | 30% | 1% | -29% |

Data collected between 12-12:30 p.m. on a weekday. Before data collected in April 2009. After data collected in September 2009.

# Southern Boulevard



## Purpose

- Improve safety for pedestrians and drivers
- Reduce traffic congestion and simplify complex intersection at Crames Square
- Shorten crossing distances between bus stops, subway entrances and retail land uses
- Enhance streetscape

## Outreach

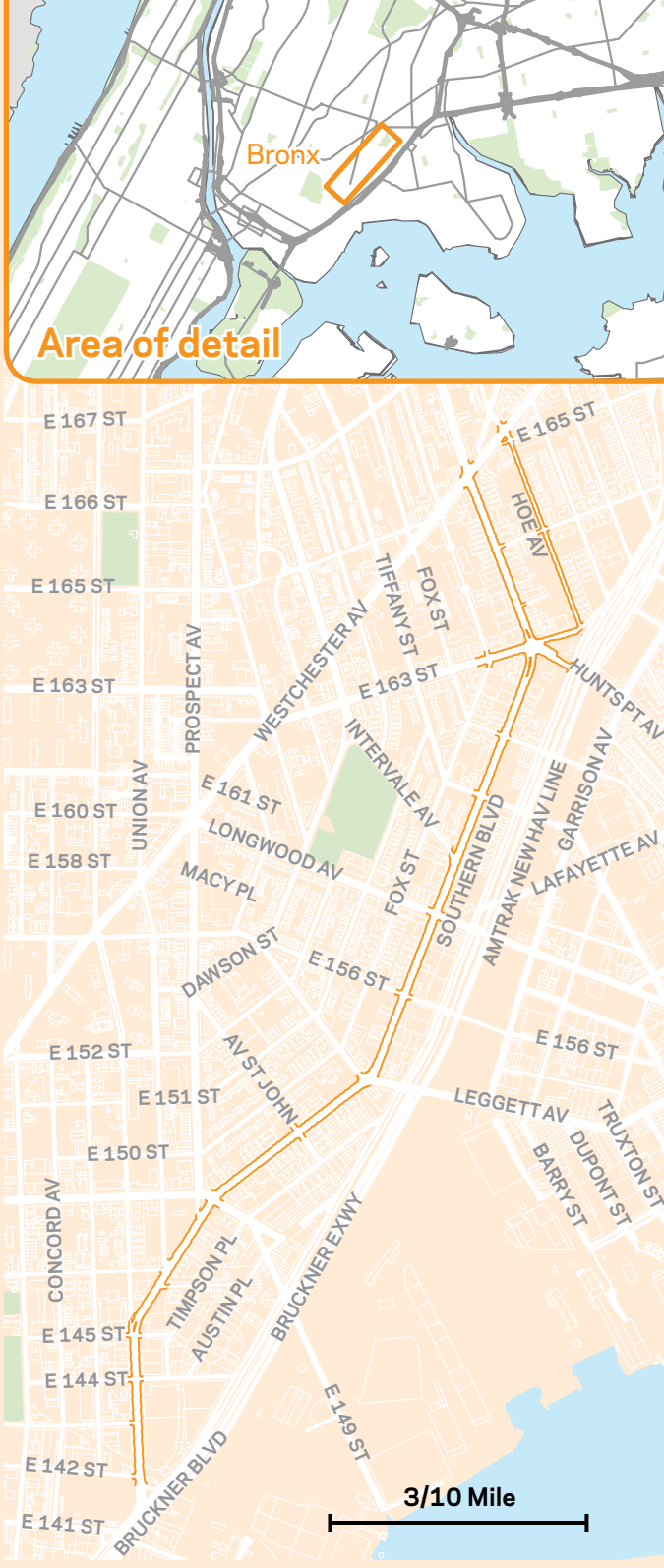
- Bronx Community Board 2 (CB2) requested improvements and Crames Square was identified as a High Pedestrian Crash Location
- DOT and CB2 held a workshop in March 2010 to identify issues in the project area
- DOT developed plans addressing the community generated issues and presented them at the CB2 meeting in May 2010
- CB2 voted to support the project in July 2010

## Approach

- Narrowed Southern Boulevard from two moving lanes to one moving lane in each direction between Westchester Avenue and East 142nd Street
- Installed a painted median, pedestrian refuge islands and left-turn bays at key intersections
- Expanded pedestrian plaza space at Crames Square, adding new islands and shortening crosswalks
- Eliminated low-volume turns and simplified signal phasing at Crames Square intersection to improve traffic flow
- Reversed direction of Hoe Avenue from East 163rd Street to Westchester Avenue to reduce traffic volume at Crames Square
- Added landscaping to new public spaces

## Results

- 14% reduction in total crashes involving injuries within the Southern Boulevard project area
- Fewer lanes have not caused congestion
- Average travel speeds through the Crames Square intersection improved 4% in the morning peak period and 35% in the evening peak period




Southern Boulevard from Westchester Avenue to East 142nd Street, one block west of Bruckner Boulevard and the Bruckner Expressway, is lined with medium density residential buildings with ground floor retail. The project is located in the Longwood neighborhood of the Bronx. The corridor is served by the #6 subway train and the Bx4, Bx19 and Bx6 bus lines.

# Southern Boulevard

Crames Square--the five-legged intersection of Southern Boulevard, Hunts Point Avenue, and East 163rd Street--lies at the heart of the Southern Boulevard project. This active intersection is within the Southern Boulevard Business Improvement District (BID), serves as a transportation hub, and features a central plaza, Del Valle Square. However, the long crossing distances and vehicle-pedestrian conflicts within the complicated intersection made pedestrian access between these destinations difficult. Being well served by transit, the project area has stops on the Southern Boulevard Bx19 and Bx4 bus lines and the Hunts Point Avenue Bx6 line. The subway stop for the # 6 line serves both the retail district and surrounding Longwood and Hunts Point communities. In addition to accommodating high pedestrian use, the project location plays an important role in the Bronx street network and East 163rd Street is a key east-west corridor. Streets in the area serve traffic going to and from Hunts Point, traffic accessing Bruckner Boulevard and a ramp to the Sheridan Expressway. Additionally, Southern Boulevard, lined with residential buildings with ground floor retail, is sometimes used as an alternative to Bruckner Boulevard and the Bruckner Expressway.

In response to community concerns about pedestrian safety, DOT worked with CB2 to host a workshop where the public was invited to identify problems and desired changes. They were eager to see safety and traffic improvements. Based on the workshop and analysis of existing conditions, DOT developed a plan for the area and presented it to CB2, which issued a letter in support of the project.

DOT's analysis showed that Southern Boulevard between Westchester Avenue and East 142nd Street had excessive width for the traffic volumes it served. The width averaged 60 feet wide with two lanes in each direction plus parking lanes along each curb, creating long crosswalks. Southern Boulevard was reduced to one lane in each direction with a painted median and left-turn bays where needed while maintaining parking. DOT installed landscaped concrete pedestrian safety islands at the intersections with Leggett Avenue, Hunts Point Avenue and East 163rd Street. At Prospect Avenue between Southern Boulevard and East 149th Street, an existing Greenstreets triangle was extended with raised concrete pedestrian space by eliminating an un-used bus-only lane. At the intersection of Intervale Avenue at Southern Boulevard, and at East 163rd Street at Bruckner Boulevard, beige colored-coating and flexible delineators were installed to create protected pedestrian space and slow the speeds of turning vehicles. On Bruckner Boulevard at the intersection with Hunts Point Avenue, the median was extended into the crosswalk to provide safer pedestrian crossings.

Crames Square was the most complex intersection in the project area with significant traffic flow and safety problems. Del Valle Square Park was extended at this intersection with landscaped, raised concrete pedestrian space, reducing the length of the pedestrian crossing by 40 feet. In order to improve traffic flow DOT eliminated low-volume turns and modified signal phasing. The prohibited turns included the left turns from East 163rd Street in both directions at Southern Boulevard and the right turns from Hunts Point Avenue onto Southern Boulevard. These turn bans and the relocation of a bus stop from Hunts Point Avenue to East 163rd Street allowed the westbound East 163rd Street movement and Hunts Point Avenue movement to be combined into a single signal phase which provided more signal time for all movements. To improve westbound traffic flow on East 163rd Street at Southern Boulevard, DOT reversed the direction of Hoe Avenue between East 163rd Street and Westchester Avenue from southbound to northbound.

The design resulted in faster travel times and reduced congestion for vehicles traveling through Crames Square while removing lanes and shortening crosswalks. Average vehicle-weighted travel times for the approaches into Crames Square improved by 4% in the morning peak period and 35% in the evening peak period. The turn prohibitions distributed traffic throughout the network reducing the number of vehicles traveling through Crames Square's multi-legged intersection during both the morning and evening peak periods. Travel times have also improved because of the new signal timing and phasing changes.


**The Greenstreets triangle at Southern Boulevard and Prospect Avenue was extended by removing an un-used bus-only lane.**

**An extended, landscaped Del Valle Square at Crames Square enhances the neighborhood and improves safety for pedestrians.**

# Travel speeds improved by 35% in the evening rush hour while crash incidence fell after the redesign simplified traffic movements and shortened crosswalks.

The total number of crashes involving injuries within the Southern Boulevard project area decreased by 14% from an average of 77.3 crashes per year during the three years prior to implementation to an annual rate of 66.5 since the project was completed. This decline represents a statistically significant reduction in crashes (for crash analysis methodology, see page 68). In addition, the total number of crashes involving injuries is lower than any of the 10 prior years.

This project demonstrates how relatively inexpensive materials and infrastructure such as signal timing, pavement markings and carefully placed concrete have improved pedestrian access and safety. The project area today provides inviting and safe public spaces. Since the project's completion, DOT's Plaza Program accepted the Southern Boulevard BID's proposal for further improvements to Del Valle Plaza. DOT will transfer funds to the Department of Parks and Recreation, which owns this parkland property, for the capital transformation.

**Crashes with Injuries for the Southern Boulevard Project Area**

| | Before* (three previous years) | | | After |
|---|---|---|---|---|
| **Total Crashes with Injuries** | 75 | 73 | 84 | 66.5 |
| **Number of Crashes with Injuries to:** | | | | |
| **Motor Vehicle Occupants** | 47 | 34 | 53 | 39.7 |
| **Pedestrians** | 27 | 37 | 23 | 22.2 |
| **Bicyclists** | 1 | 2 | 8 | 4.6 |

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through January 2012) at annual rate. See page 68 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

**AM Weekday Traffic Volumes (average vehicles per hour) Crames Square Intersection (Southern Boulevard/Hunts Point Avenue/East 163rd Street)**

| Approach | Before | After | % Change |
|---|---|---|---|
| **Eastbound East 163rd Street** | 420 | 425 | 1% |
| **Westbound East 163rd Street** | 660 | 450 | -32% |
| **Westbound Hunts Point Avenue** | 465 | 350 | -25% |
| **Northbound Southern Boulevard** | 290 | 305 | 5% |
| **Southbound Southern Boulevard** | 455 | 445 | -2% |

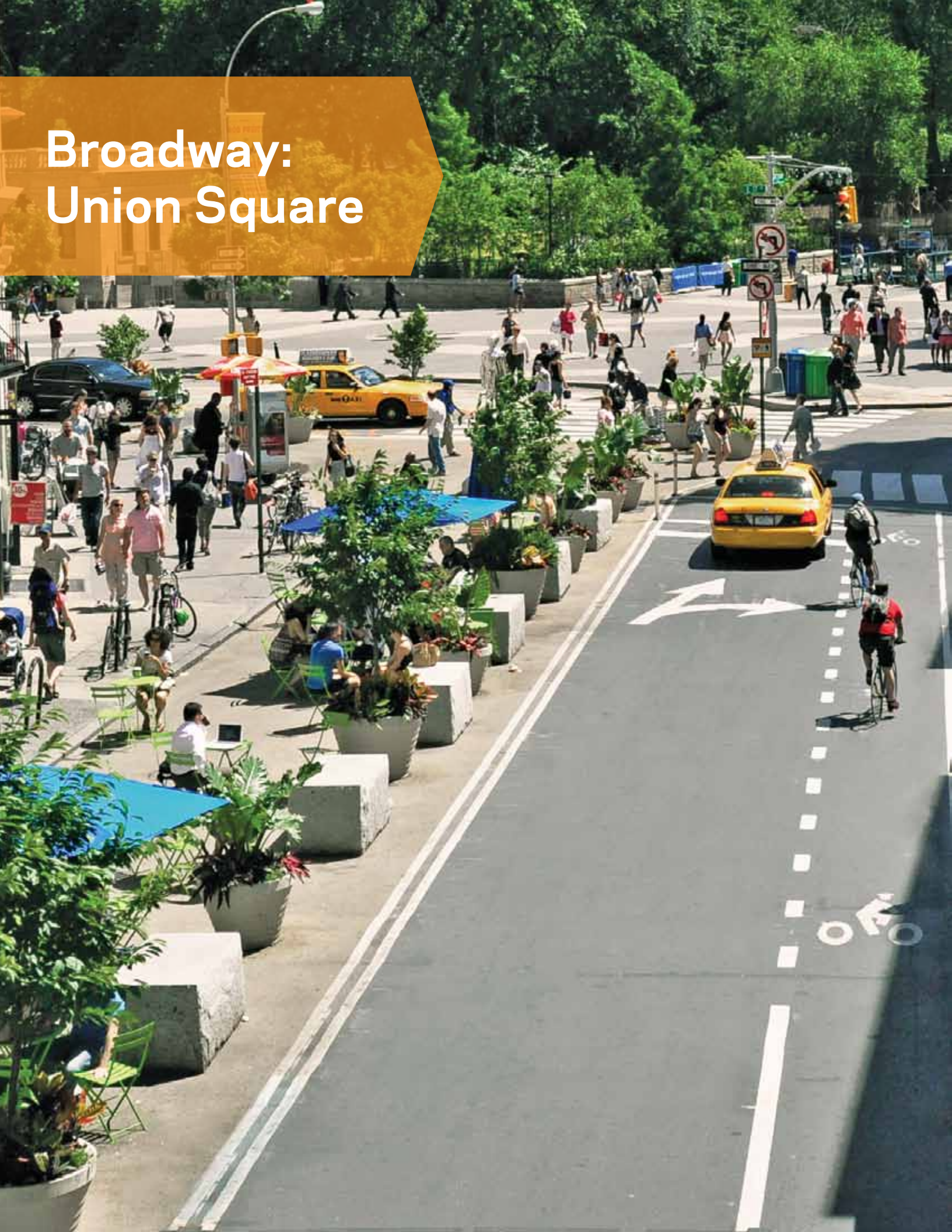
Before data collected in May 2009. After data collected in March 2011. Volumes shown in average vehicles per hour.

**PM Weekday Traffic Volumes (average vehicles per hour) Crames Square Intersection (Southern Boulevard/Hunts Point Avenue/East 163rd Street)**

| Approach | Before | After | % Change |
|---|---|---|---|
| **Eastbound East 163rd Street** | 420 | 470 | 12% |
| **Westbound East 163rd Street** | 540 | 480 | -11% |
| **Westbound Hunts Point Avenue** | 440 | 320 | -27% |
| **Northbound Southern Boulevard** | 410 | 380 | -7% |
| **Southbound Southern Boulevard** | 435 | 425 | -2% |

Before data collected in May 2009. After data collected in March 2011. Volumes shown in average vehicles per hour.

# Broadway: Union Square



## Purpose

- Increase safety at complex intersections
- Reduce vehicle speeds
- Provide safer pedestrian crossings
- Accommodate pedestrian desire lines
- Improve bicycle lanes
- Increase seating areas and public space

## Outreach

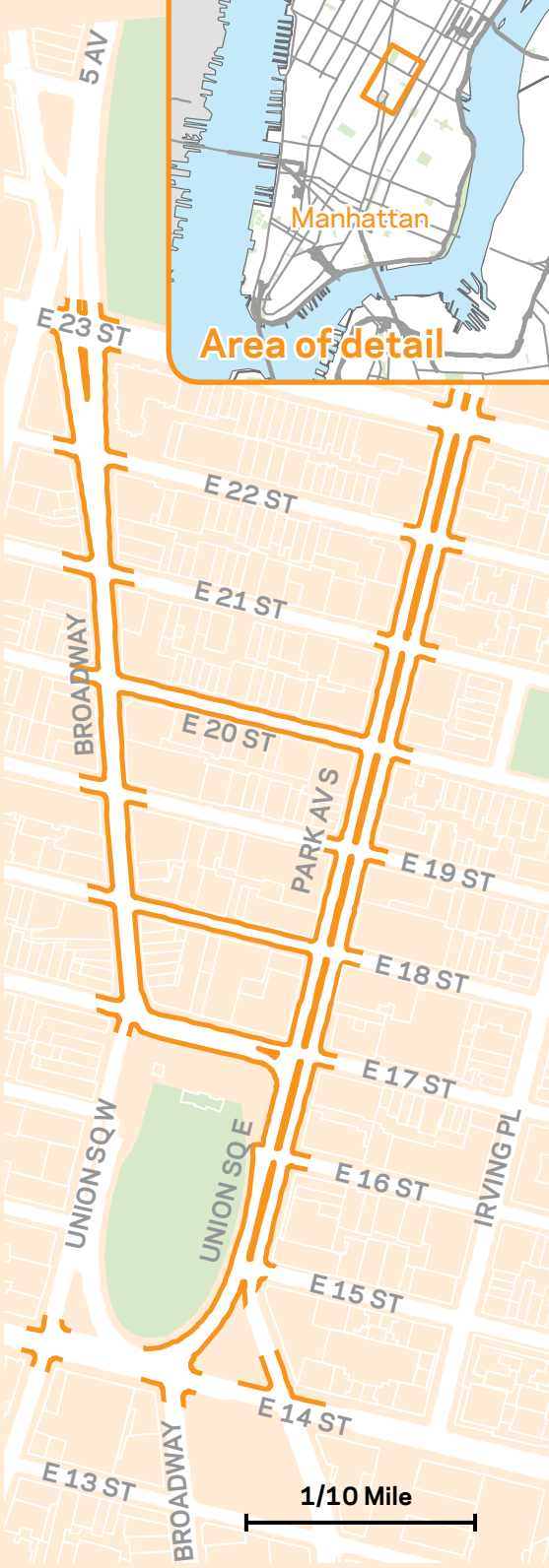
- The community had expressed concerns about safety at Broadway and East 17th Street for many years
- DOT presented an initial safety, greening, and traffic network modification plan to the Manhattan Community Board 5 (CB5) Transportation Committee in April 2010, and modified plans in May and June based on earlier comments
- The refined plan was presented to the Full CB5 Board in July where it voted to support the proposal, noting that DOT had responded to community concerns
- The Union Square Partnership became a strong partner, and is maintaining and programming the new public spaces
- DOT presented a post evaluation study to CB5's Transportation Committee in August 2011

## Approach

- Converted East 17th Street from two-way to westbound-only between Union Square West and Park Avenue South
- Eliminated head-on condition at Union Square West at 14th Street by forcing southbound and northbound traffic right-turn only
- Reduced Broadway from two travel lanes to one travel lane plus turn-bays between 23rd Street and 18th Street
- Added pedestrian safety islands between Madison and Union Squares on Broadway
- Positioned the bicycle path between the sidewalk and "floating parking"
- Clarified travel lanes on Union Square East and added southbound bicycle lane between East 17th Street and East 14th Street
- Created pedestrian plaza space in reclaimed roadbed

## Results

- 65% reduction in crashes involving motor vehicle occupants and 26% reduction in total crashes involving injuries within the project area
- Percentage of vehicles traveling over the speed limit decreased by 16% on Broadway
- Bicycle ridership on Broadway increased by 18% on weekdays and 49% on weekends
- 74% of respondents to a recent Union Square Partnership survey reported that they like the new traffic configuration
- 20% of store owners and managers report that the plaza spaces have improved business and none have reported a negative impact




The project area is located in the Flatiron neighborhood of Manhattan bounded to the south by Union Square and Madison Square to the north. The land uses are predominantly high rise mixed-use with ground floor retail. The area is a major transportation hub with access to the L, N, Q, R, 4, 5 & 6 subway trains and the M1, 2, 3, 5, 14 and 23 bus lines.

# Broadway: Union Square

Union Square, one of New York City's most important and historic public places, received safety and quality of life improvements during summer 2010. The changes not only addressed safety issues and enhanced public space in the area but they also completed a continuous corridor of improvements on Broadway that stretches to Columbus Circle.

Improving safety, mobility and economic vitality were the main goals while developing the new design which extends from East 23rd Street to East 14th Street on Broadway, Park Avenue South and Union Square West. The majority of changes were focused around East 17th Street and Broadway, a previously confusing intersection with a history of traffic safety issues. Working with the local Business Improvement District (BID), the Union Square Partnership, and the community, DOT proposed a major reconfiguration of the area that benefits residents, workers and visitors alike.

Project plans were presented to the community several times to explain the project and address issues raised by residents and business owners. DOT modified the initial plan to avoid diverting all southbound Broadway traffic onto 18th Street. Also, DOT kept Union Square West open to traffic at the behest of local business owners. Other changes made in response to the community included shifting the Broadway bicycle facility to the west curb and making improvements to 18th Street to ensure it could handle any traffic diverted from East 17th Street that would no longer have an eastbound movement.

After many meetings with elected officials, business owners, the BID and the CB5 Transportation Committee, the Full CB5 Board voted to endorse the plan with the caveat that DOT make adjustments as needed to ensure the project's success and present a project update within a year of implementation. Adhering to these requests, several small changes were made post-implementation: one at the request of the New York City Fire Department and one the Flatiron BID. Also, DOT reported the results of the project to CB5 in August 2011.

In order to meet the goals of the project a wide range of factors were considered, ultimately resulting in the following changes to the streets around Union Square. Prior to implementation, southbound Broadway traffic was diverted onto East 17th Street eastbound then continued on Park Avenue South which became Union Square East until Broadway began again at East 14th Street. The project removed the eastbound traffic from East 17th Street allowing the signal phasing at Broadway to be simplified and crossing distances here and at Park Avenue South to be shortened, while giving more time to process westbound traffic on East 17th Street. The removal of the eastbound movement also provided space for a continuous sidewalk along the south curb of 17th Street in line with adjacent sidewalks. It also helped to reduce congestion for westbound traffic, and provided space for farmer's market truck parking off of the new plaza.

North of East 17th Street, Broadway's striped bicycle lane was converted to a parking protected path with landscaped pedestrian safety islands. The changes reduced speeding, provided safer pedestrian crossings and greened the corridor. New landscaped plaza spaces were created in the reclaimed roadbed on Broadway between East 18th and East 17th Streets. The unique needs of the four days a week Greenmarket were incorporated in the new plaza designs to ensure flexibility that accommodated daily use as well as public events and Union Square Partnership programming.

Improvements were also made to crosstown streets in the project area to ensure they would be able to handle diverted southbound Broadway traffic and to reduce congestion that pre-dated this project. These improvements included curb-side turn-lanes and modified parking regulations. Turn restrictions were implemented at various locations in the project area including left-turns off Park Avenue South to increase mobility and a new forced right-turn off of southbound Union Square West at East 14th Street eliminating a head-on condition.

**17th Street between Union Square West and Park Avenue South was converted from two-way to one-way westbound. New sidewalk connections, a bike lane and farmers' market parking were added to improve safety, mobility and curb-side access.**

**A parking protected bicycle path and landscaped, pedestrian safety islands were added along Broadway between 23rd Street and 18th Street.**

# A comprehensive redesign dramatically reduced crashes, increased bike usage and improved business conditions.

The implementation evaluation study assessed traffic safety, mobility and public perception. Overall positive results were found. Most importantly safety for all users in the project area improved. Total crashes with injuries were reduced by 26% and crashes involving injuries to motor vehicle occupants decreased by 65%. Both declines represent statistically significant reductions in crashes and the number of crashes for both injury types was lower than any of the 10 prior years (for crash analysis methodology, see page 68). Crashes with pedestrian injuries went down by 10% when compared to the three years prior to implementation. Injuries to bicyclists decreased by 5% while bike riding rose 18% on weekdays and 49% on weekends.

DOT measured speeds on Broadway using a radar gun during off-peak hours to evaluate speeding. The number of motorists speeding during the off-peak time periods decreased. Before project implementation, 28% of users exceeded the 30-mph speed limit between East 20th and 19th Streets while after implementation only 12% exceeded the limit.

Taxi Global Positioning System (GPS) data indicated that travel speeds throughout the project area were not affected. Internal DOT travel time studies showed a slow down for users using East 23rd Street to Park Avenue South for southbound travel to East 14th Street. Even though there was a 15% reduction in travel time along this route it still takes drivers less time to get to East 14th Street than it did prior to project implementation if the driver used the Broadway to 17th Street route.

Taxi GPS data also showed that pick-ups and drop offs in the area remained relatively unchanged, indicating that new traffic patterns have not impacted local businesses. In fact, 20% of businesses surveyed by the Union Square Partnership indicated that the new plaza spaces improved their business. None reported a negative effect. Additionally, 74% of all survey takers reported that they liked the new traffic configuration.

Overall the project fulfilled its goals of improving safety, mobility and economic vitality of the area.

### Crashes with Injuries within Union Square Project Area

| | Before* (three previous years) | | | After |
|---|---|---|---|---|
| **Total Crashes with Injuries** | 62 | 71 | 66 | 48.8 |
| **Number of Crashes with Injuries to:** | | | | |
| **Motor Vehicle Occupants** | 12 | 28 | 24 | 7.5 |
| **Pedestrians** | 34 | 28 | 28 | 27 |
| **Bicyclists** | 16 | 15 | 14 | 14.3 |

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through January 2012) at annual rate. See page 68 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

### Broadway Traffic Speeds 20th Street to 19th Street (Southbound)

| | Before | After | % Change |
|---|---|---|---|
| **Average Traffic Speeds (in m.p.h.)** | 27 | 25 | -7% |
| **Percentage of Vehicles Over the Speed Limit** | 28% | 12% | -16% |

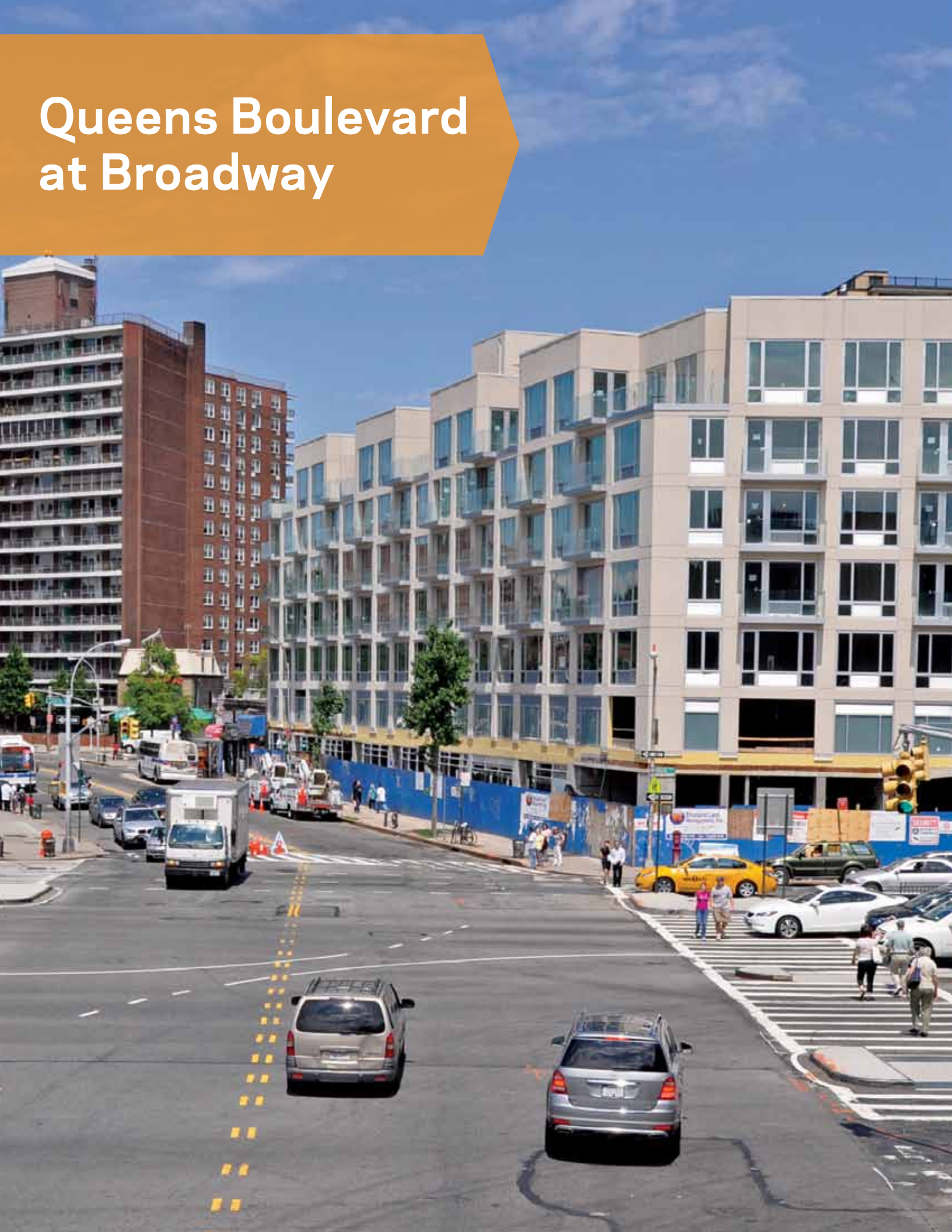
Data collected between 7-9 a.m. and 8-10 p.m. on a weekday. Before data collected in July 2010. After data collected in October 2010.

### Bike Volumes on Broadway Between 20th Street and 19th Street

| | Before | After | % Change |
|---|---|---|---|
| **Weekday** | 1,150 | 1,362 | 18% |
| **Weekend** | 372 | 554 | 49% |

Before data collected in June 2010. After data collected in July 2010. Volumes shown are for time period 7 a.m.-7 p.m.

# Queens Boulevard at Broadway



## Purpose

- Provide safer pedestrian crossings and enhance overall safety
- Improve traffic operations

## Outreach

- DOT presented plans to the Queens Community Board 4 (CB4) in March 2010 and received feedback
- DOT modified the plans based on community input and received support for the plan
- Construction began in April 2010 and was completed in May 2010
- DOT discussed progress and results with CB4 in April and May 2010

## Approach

- Extended all six medians at the intersection to improve pedestrian safety
- Widened three service road medians to improve safety by slowing turning vehicles
- Retimed signals at the intersection to give pedestrians more time to cross the street
- Removed parking on the westbound service road to enable vehicles to make safer turns
- Aligned north crosswalk with new extensions

## Results

- Total number of crashes involving injuries and crashes involving injuries to pedestrians lower than the average for the three prior years
- Shorter pedestrian crossing distances


The intersection of Queens Boulevard and Broadway/ Grand Avenue is located in the Elmhurst neighborhood of Queens. The M and R subway trains have a stop at this intersection and the roadways are served by the Q53 and Q58 bus lines. The area has primarily commercial and residential land uses. Priority School PS13 and the Queens Center mall are nearby.

# Queens Boulevard at Broadway

The intersection of Queens Boulevard and Broadway was identified by DOT as a 2008 Top 20 High Pedestrian Crash Location. DOT analyzes the Top 20 High Pedestrian Crash Locations to fulfill the provisions of Local Law 11 in which DOT identifies the twenty highest crash locations based upon a ranking of the total number of crashes involving pedestrians killed or seriously injured over a five-year period. As such, DOT began investigating measures to provide safer pedestrian crossings, enhance overall safety and improve vehicular operations.

DOT developed and presented a project plan to CB4 in March 2010 and received feedback on the plans. The comments were incorporated into the plans, after which, DOT received support for the plan. Construction began in April 2010 and was completed in May 2010. DOT discussed progress with CB4 throughout the implementation process. Following completion, the project results were also discussed with CB4 in May 2010.

Based on observations and data collected by DOT, the intersection had heavy pedestrian activity, a high incidence of speeding, double parking on service roads, skewed crosswalks, long crossing distances and substandard crossings for pedestrians. In order to calm traffic and improve safety, DOT extended all six medians at the intersection to offer pedestrians who cannot make it across the nearly 200-foot roadway a safe refuge. DOT widened three service road medians, two in the west crosswalk and one in the east crosswalk, to improve safety by slowing turning vehicles. Traffic signals were retimed at the intersection to give pedestrians more time to cross the street. On the north crosswalk, DOT aligned crosswalks with the new extensions.

The Queens Boulevard westbound service road approaching Broadway has two travel lanes and is 33-feet wide. On the other side of the Broadway/Queens Boulevard westbound service road intersection, the service road widens to almost 50 feet. At this point the service road still has two travel lanes but there was also a parking lane. This roadway design created a dangerous situation as motorists often drove in the parking lane when it wasn't fully occupied. As a result, DOT removed parking spaces near this intersection on the westbound service road. DOT also painted channelization lines on the westbound service road to encourage drivers to stay in their lanes when traveling through the Queens Boulevard westbound service road intersection with Broadway.

**Extending and widening the median tips at Queens Boulevard and Broadway reduced crossing distance for pedestrians.**

**DOT increased pedestrian walk time to cross Queens Boulevard at Broadway to help pedestrians safely cross the wide street.**

# Safety improvements increased pedestrian comfort and reduced crashes on Queens Boulevard.

Analysis of the New York City Police Department crash data shows total crash rates and crash rates for pedestrians after implementation were lower than the average for the three prior years (for crash analysis methodology, see page 68).

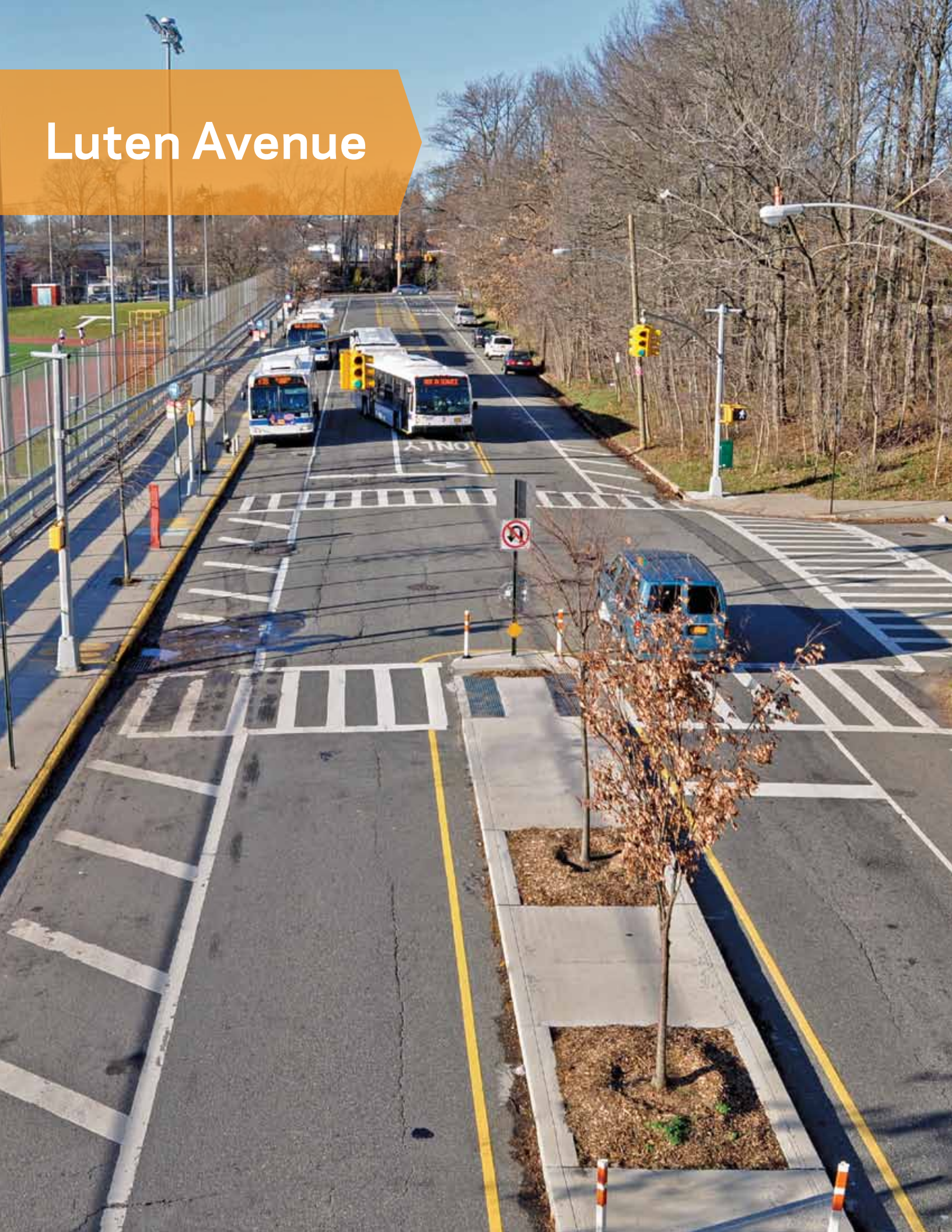
The safety improvements at Queens Boulevard and Broadway have benefited both pedestrians and drivers by providing pedestrian refuge space while not impacting traffic flow.

**Crashes with Injuries at Queens Boulevard and Broadway**

| | Before* (three previous years) | | | After |
|---|---|---|---|---|
| **Total Crashes with Injuries** | 10 | 11 | 11 | 10.2 |
| **Number of Crashes with Injuries to:** | | | | |
| **Motor Vehicle Occupants** | 4 | 7 | 4 | 6 |
| **Pedestrians** | 6 | 3 | 5 | 2.4 |
| **Bicyclists** | 0 | 1 | 2 | 1.8 |

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through January 2012) at annual rate. See page 68 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

# Luten Avenue



## Purpose

- Reduce excessive vehicle speeds
- Provide safer pedestrian crossings

## Outreach

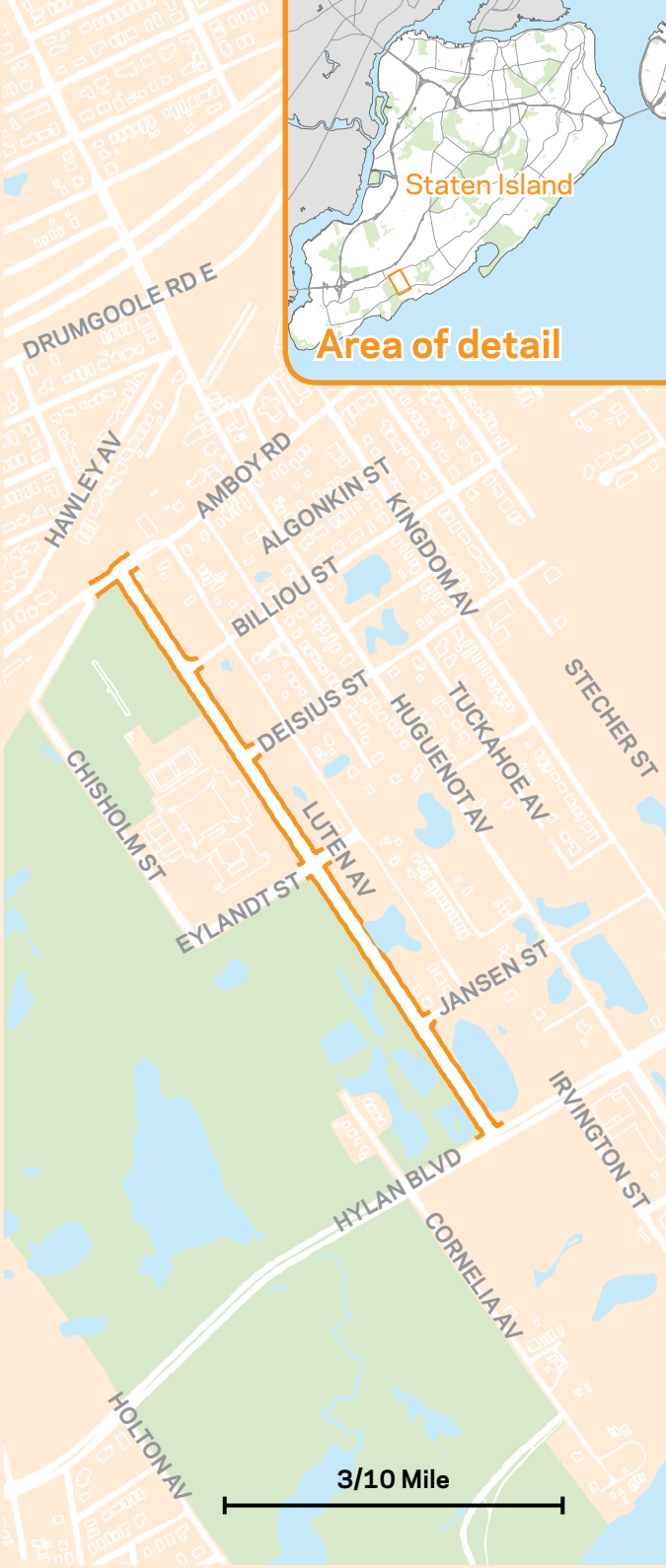
- Improvements requested by Staten Island Community Board 3 (CB3) and Tottenville High School
- DOT met with CB3 and local officials in November 2009 to gather community concerns regarding the project area
- DOT presented plans to CB3 and local officials in March 2010 and received support for the plan

## Approach

- Installed a painted center median with parking lane stripes to narrow the roadway and calm traffic
- Installed pedestrian refuge islands and crosswalks to improve pedestrian safety
- Installed left-turn lanes to improve pedestrian and vehicular safety and to decrease delay for vehicles
- Installed new signal at the intersection of Deisius Street and Luten Avenue to improve traffic operations and pedestrian safety

## Results

- Percentage of vehicles traveling over the speed limit decreased by 34% along southbound Luten Avenue and by 21% along northbound Luten Avenue
- Number of crashes involving injuries to motor vehicle occupants and pedestrians lower than the average for the three prior years
- Shorter pedestrian crossing distances




Luten Avenue is a wide roadway, with one lane in each direction and parking along each side. It parallels Tottenville High School and Wolfes Pond Park and has heavy pedestrian activity, particularly during school peak hours. The S55 and S56 operate on Luten Avenue and the S56 terminus is one block south at Eylandt Street.

# Luten Avenue

Luten Avenue is a five-block, 50-feet wide street with one moving lane in each direction, connecting Amboy Road and Hylan Boulevard. The east side of the roadway has dense vegetation and access to residential land uses. The west side of Luten Avenue fronts Tottenville High School.

DOT began investigating Luten Avenue at the request of the Staten Island Borough Commissioner, CB3 and Tottenville High School in the wake of the November 6, 2009 fatality of a Tottenville High School student crossing Luten Avenue just north of Deisius Street. DOT met with the Staten Island Borough President, the New York City Police Department (NYPD), CB3, local officials, Tottenville High School Principal and Parent Teacher Association officials in late November 2009 to solicit community input. DOT took feedback from the community to develop the proposal and presented the updated project plan in March 2010. The Borough President, local Councilmembers and elected officials, local NYPD and Tottenville High School officials all supported the proposed safety improvements. CB3 passed a resolution in support of the project in March 2010.

Based on observations and data collected by DOT, the roadway had excess traffic capacity, a high incidence of speeding, long crossing distances for pedestrians and inadequate number of crossings for pedestrians. DOT also observed a high instance of high-school students crossing Luten Avenue mid-block, not at intersections where drivers anticipate seeing pedestrians.

In order to calm traffic and improve safety, DOT narrowed Luten Avenue by painting a 10-foot center median and nine-foot parking lane stripes on both sides of Luten Avenue. DOT installed four new crosswalks to improve pedestrian safety along the corridor. DOT also installed three pedestrian refuge islands in the south crosswalk of Billiou Street, the south crosswalk of Deisius Street, and the north crosswalk of Eylandt Street to improve pedestrian safety by shortening the crossing distances for pedestrians. A left-turn lane was added at six locations to improve pedestrian and vehicular safety and to decrease delay for vehicles. DOT installed a new signal at the intersection of Deisius Street and Luten Avenue to improve traffic operations and improve pedestrian safety by giving pedestrians safer opportunities to cross.

Most segments along the corridor experienced a decrease in speed due to the traffic calming improvements. The percentage of drivers traveling above the speed limit on northbound Luten Avenue on the segment between Deisius Street and Billiou Street decreased from 42% to 21% and from 63% to 29% in the southbound direction. Average speeds between Deisius Street and Billiou Street decreased in the northbound direction from 29.9 mph to 26.5 mph, an 11% decrease and in the southbound direction speeds were reduced by 16% from 32.8 mph to 27.5 mph.

Analysis of NYPD crash data shows crash rates for motor vehicle occupants and pedestrians after implementation were lower than the average for the three prior years.

**A painted center median with left-turn bays and pedestrian safety islands were installed along Luten Avenue from Amboy Road to Hylan Boulevard to calm traffic and enhance safety for all road users.**

**A pedestrian safety island was installed in the north crosswalk of Luten Avenue at Eylandt Street to improve safety specifically for the Tottenville High School students and all pedestrians at this intersection.**

# Adding crosswalks and a median and narrowing travel lanes reduced speeding, eased crossing the street and reduced crashes.

The safety improvements along Luten Avenue have benefited both pedestrians and drivers by providing traffic calming treatments, simplifying turning movements, installing pedestrian safety islands, and installing appropriate traffic controls within this corridor, while not impacting traffic flow.

### Crashes with Injuries along Luten Avenue Amboy Road to Hylan Boulevard

| | Before* (three previous years) | | | After |
|---|---|---|---|---|
| **Total Crashes with Injuries** | 6 | 2 | 2 | 2.3 |
| **Number of Crashes with Injuries to:** | | | | |
| **Motor Vehicle Occupants** | 5 | 1 | 0 | 1.7 |
| **Pedestrians** | 1 | 1 | 2 | 0.6 |
| **Bicyclists** | 0 | 0 | 0 | 0 |

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through January 2012) at annual rate. See page 68 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

### Luten Avenue Average Traffic Speeds (in m.p.h.) Deisius Street to Billiou Street

| | Before | After | % Change |
|---|---|---|---|
| **Northbound** | 29.9 | 26.5 | -11% |
| **Southbound** | 32.8 | 27.5 | -16% |

Data collected between 11 a.m.-12 p.m. on a weekday. Before data collected in December 2009. After data collected in September 2010.

### Percentage of Vehicles Over the Speed Limit on Luten Avenue Deisius Street to Billiou Street

| | Before | After | Change |
|---|---|---|---|
| **Northbound** | 42% | 21% | -21% |
| **Southbound** | 63% | 29% | -34% |

Data collected between 11 a.m.-12 p.m. on a weekday. Before data collected in December 2009. After data collected in September 2010.

# Livingston Street Transit Priority

# Purpose

- Improve bus speeds and reliability on five major bus routes that converge on Livingston Street
- Reduce congestion
- Better organize roadway use among buses, general traffic, and deliveries/parking

# Outreach

- Project was developed in response to request from the Metropolitan Transportation Authority (MTA) for bus lane improvements to assist with its operations on Livingston Street
- DOT worked cooperatively with Court-Livingston-Schermerhorn Business Improvement District (CLS BID) to gain support of corridor businesses and adjusted plan to accommodate legitimate delivery needs
- DOT presented the project to Brooklyn Community Board 2 (CB2) in April 2010 and garnered its support

# Approach

- Expanded hours of existing bus lanes from peak-hour peak-direction only to Monday through Friday 7 a.m. to 7 p.m.
- Implemented signal enhancements to speed bus travel, including longer cycle lengths and a leading bus interval at the intersection of Livingston Street and Flatbush Avenue
- Increased visibility of bus lanes with red paint and large overhead signage
- Offset eastbound bus lane from curb to allow for additional parking and curbside activity and further discourage bus lane infractions

# Results

- Bus travel times within the corridor improved by an average of 12% westbound and 14% eastbound
- Overall bus lane infractions during the morning peak hour (general traffic driving, standing, or parking in the bus lanes) decreased by over 50%


Livingston Street is an important east-west corridor in Downtown Brooklyn that connects Boerum Place and Flatbush Avenue, both of which provide direct access to Manhattan via the Brooklyn and Manhattan bridges. Three local and two limited buses use the corridor, resulting in up to 40 buses per hour at peak times. Livingston Street, which has a significant amount of institutional, commercial retail and office uses, is also within one block of multiple subway lines (2, 3, 4, 5, A,C,F,G) and the high volume Fulton Mall commercial district.

# Livingston Street Transit Priority

Livingston Street between Boerum Place and Flatbush Avenue is a significant commercial east-west corridor in Downtown Brooklyn that also hosts three local and two limited stop MTA- New York City Transit (NYCT) bus routes. In 2010 DOT in collaboration with MTA significantly upgraded the existing bus lanes and added other transit priority measures to promote faster and more reliable trips for the tens of thousands of daily bus riders in the corridor.

Planned improvements were developed with MTA input and shared with both the CLS BID and CB2. The CLS BID helped DOT share the proposal with Livingston Street merchants, who generally recognized the need for better bus operations. In April 2010 the proposal was presented to the CB2 transportation committee, which voted in support. Implementation occurred in early summer 2010. The immediate benefit was to allow NYCT to initiate its diversion of all Fulton Mall bus routes while a new concrete roadway was constructed on that important transit corridor. With the improvements, Livingston Street was able to accommodate twice the number of buses as normal for several months without major incident. The end of the Fulton Mall bus diversion allowed MTA and DOT to measure the impact of new changes under normal bus operating conditions.

In 2009 the DOT began to investigate the potential for improved bus priority on Livingston Street, which hosts more than 40 buses per hour at peak times. MTA had expressed concerns about the effectiveness of the existing curbside bus lanes, which at the time were in effect during only three hours per weekday in each direction. The curbside signs designating the bus lanes were small and some were missing, and markings were worn. Because of this there was a general perception that the lanes were not being respected by motorists and not as effective as they could be. In addition, five other bus routes would be diverted to Livingston Street for several months during the reconstruction of Fulton Mall.

DOT studied options to enhance Livingston Street's ability to efficiently accommodate and process buses, both during the Fulton Mall work and after construction was complete. The existing 50-foot, two-way roadway was marked with a single wide 13-foot general travel lane and a 12-foot parking/part-time bus lane in each direction. Reducing lane widths allowed for an increase from four to five total lanes. In the westbound direction the bus lane would remain at the curb, but eastbound the bus lane would be offset eight feet from the south curb, allowing for fulltime curbside parking. It was recommended that the bus lanes be painted red for greater visibility and extended from their former limited hours to 7 a.m. to 7 p.m., Monday through Friday.

Several additional bus priority measures were implemented. The cycle lengths on Livingston Street signalized intersections were increased from 60 seconds to 90 seconds, providing more continuous green light time for buses. Two closely spaced stops were consolidated into one to reduce bus delay. Finally, at the critical eastbound approach to Flatbush Avenue right turning vehicles were segregated from the bus lane by a barrier of flexible bollards. In coordination, a "leading bus interval", or dedicated bus signal, now provides vehicles in the bus lane with a five-second head start over general traffic.

The project also took into account commercial business loading and parking concerns. One large department store which received deliveries on the north side was concerned that the curbside bus lane hours on that side would be expanded from 7-10 a.m. to all day. A solution was to create a "delivery window" between 10 a.m. and 4 p.m. in a small section of the corridor, allowing for deliveries to take place in the bus lane during those non-peak hours. Livingston Street merchants were pleased that parking would now be available all day on the south side of the street.


**Bus lanes were painted red and large overhead signs were installed along the corridor to increase the visibility of the bus lanes.**

**Right-turning vehicles were separated from buses on eastbound Livingston Street at Flatbush Avenue by bollards and a dedicated bus signal was installed to allow buses a five second head start to make the turn onto Flatbush Avenue.**

# New bus lanes improved bus speeds by 12 - 14%.

DOT conducted observations of bus lane infractions, including illegal driving, standing or parking and compared them with similar observations conducted before the project was implemented. In the morning peak period, overall bus lane infraction decreased by 50%, and stopped vehicles completely blocking the bus lane as a proportion of overall infractions also decreased. Although the evening peak period saw about the same amount of overall bus lane infractions, the most deleterious type of illegal bus lane use - standing and parking - decreased by 44%. The one area where the new changes have not had a positive impact has been in violations by Dollar Vans. The drivers of these vans do not appear to be influenced by clearer signage and markings but rather deliberately drive in the bus lanes to pick up and transport passengers.

Bus travel times within the corridor improved by an average of 12% westbound and 14% eastbound. The changes provide concrete benefits, in the form of travel time saved, to tens of thousands of bus riders every day.

**Westbound Livingston Street Bus Lane Infractions - Morning Peak Flatbush Avenue to Boerum Place**

| | Before | After | Change | % Change |
|---|---|---|---|---|
| **Parking** | 18 | 3 | -15 | -83% |
| **Standing/Stopping** | 25 | 13 | -12 | -48% |
| **Driving** | 1 | 5 | 4 | 400% |
| **Total** | 44 | 21 | -23 | -52% |

Before data collected in April 2009. After Data collected in November 2010. Data collected by MTA-NYCT.

**Eastbound Livingston Street Bus Lane Infractions - Evening Peak Flatbush Avenue to Boerum Place**

| | Before | After | Change | % Change |
|---|---|---|---|---|
| **Parking** | 8 | 1 | -7 | -88% |
| **Standing/Stopping** | 26 | 19 | -7 | -27% |
| **Driving** | 10 | 26 | 16 | 160% |
| **Total** | 44 | 46 | 2 | 5% |

Before data collected in April 2009. After Data collected in November 2010. Data collected by MTA-NYCT.

**Average Eastbound Livingston Street Bus Travel Times Flatbush Avenue to Boerum Place**

| | Before | After | Change | % Change |
|---|---|---|---|---|
| **AM Peak** | 05:15 | 05:32 | 00:16 | 5% |
| **Midday Peak** | 07:46 | 06:01 | -01:45 | -23% |
| **PM Peak** | 05:10 | 04:33 | -00:37 | -12% |
| **All Times** | 06:26 | 05:32 | -00:54 | -14% |

Before data collected in March 2010. After Data collected in March 2011. Times shown in minutes, seconds. Data collected by MTA-NYCT.

**Average Westbound Livingston Street Bus Travel Times Flatbush Avenue to Boerum Place**

| | Before | After | Change | % Change |
|---|---|---|---|---|
| **AM Peak** | 04:31 | 04:04 | -00:27 | -10% |
| **Midday Peak** | 06:44 | 06:11 | -00:33 | -8% |
| **PM Peak** | 06:42 | 05:17 | -01:25 | -21% |
| **All Times** | 06:11 | 05:26 | -00:45 | -12% |

Before data collected in March 2010. After Data collected in March 2011. Times shown in minutes, seconds. Data collected by MTA-NYCT.

# First Avenue / Second Avenue Select Bus Service

# Purpose

- Improve the speed and reliability of bus service
- Improve pedestrian safety
- Expand bicycle lane network
- Maintain traffic speeds and curb access

# Outreach

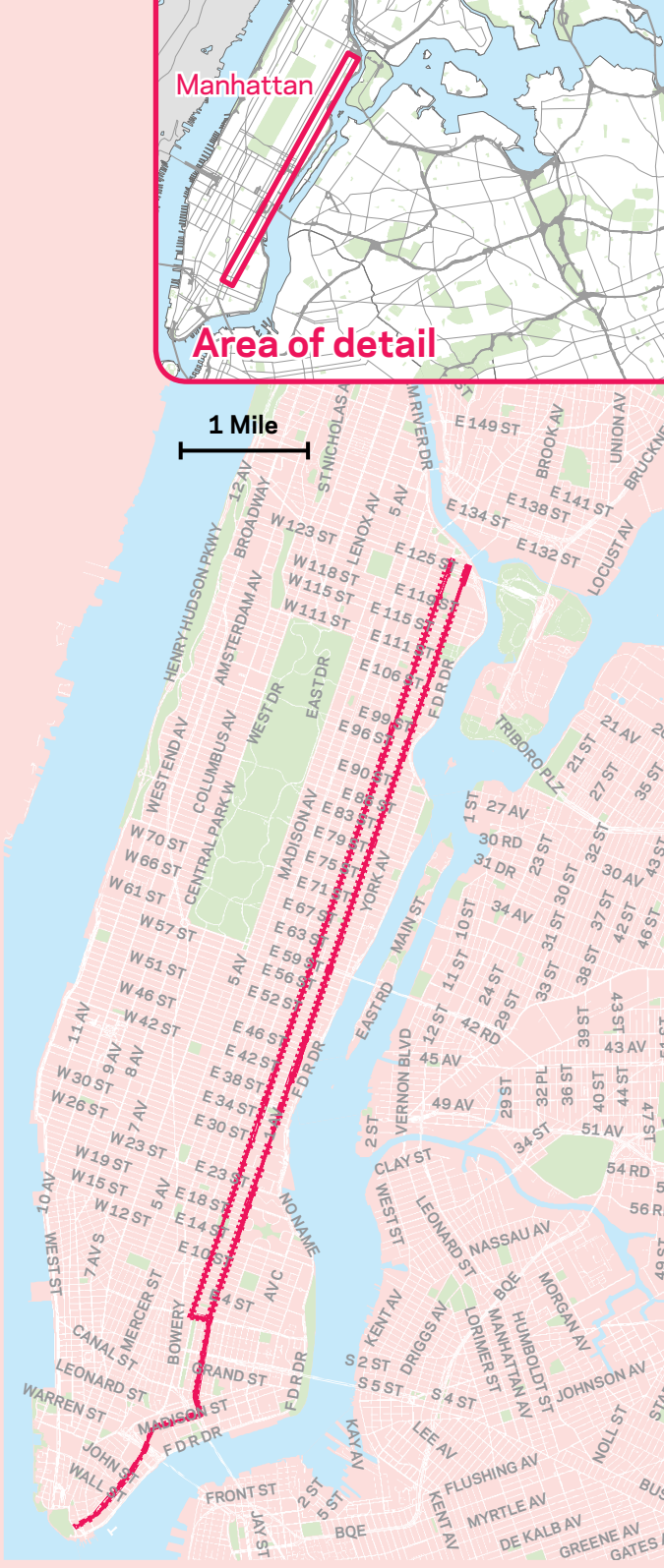
- DOT and New York City Transit (NYCT) convened a Community Advisory Committee (CAC) comprised of key stakeholders along the corridor including Community Board members, which met six times between May 2009 and April 2011
- DOT and NYCT met two or more times with the Transportation Committees of Manhattan Community Boards 1,3,6,8 and 11 (CBs) to present project plans and to address questions and concerns from November 2009 to September 2010
- DOT and NYCT modified plans based on community input and received support for the final plan
- DOT and NYCT held two public open houses in March 2010 and two more in September 2010 to solicit input from the community and stakeholders

# Approach

- Installed a combination of curbside and offset bus lanes from Houston Street to 125th Street on First Avenue and Second Avenue (except within Second Avenue Subway construction zone from 68th Street to 101st Street)
- Installed pedestrian refuge islands next to protected bicycle paths
- Installed first phase of protected bicycle paths on First Avenue and Second Avenue between Houston Street and 34th Street
- Implemented midday delivery windows on blocks with curbside bus lane
- Installed bus shelters where feasible at Select Bus Service (SBS) stations

# Results

- Improved travel time for the M15 service by 15-18%
- Increased ridership on the M15 by 12%
- 37% reduction in pedestrian crashes involving injuries along First Avenue from 1st Street to 34th Street; 27% reduction for motor vehicle occupants involving injuries and 22% reduction in total crashes involving injuries on the same segment of First Avenue
- Increased cycling volumes by 18-177% in areas where bicycle lanes were upgraded




First and Second Avenues are major north-south corridors in Manhattan, several blocks from the nearest subway. There are numerous distinct districts along these avenues from the East Village to East Harlem, including high-density office-retail uses in East Midtown, a major hospital corridor in Kips Bay, and mixed-use retail-residential uses in the East Village, Turtle Bay, the Upper East Side and East Harlem.

DOT together with NYCT implemented a set of improvements to make bus service faster and more reliable on First and Second Avenues under the agencies' joint SBS initiative, launching the new service on October 10, 2010. The M15 bus route that operates on these avenues serves over 50,000 passengers daily between South Ferry and 125th Street, making it one of the busiest bus routes in the City.

Planning for the M15 SBS service included detailed study of traffic and parking conditions along the corridor, as well as extensive public involvement from area stakeholders throughout the process. The CAC comprised all of the CBs along the route, as well as all of the local, state, and federal elected officials and other key stakeholders such as medical institutions and community groups.

During the course of project planning, the CAC convened six times, on topics that followed the sequence of project planning, including station locations, street design, and parking regulations. In addition to the CAC meetings, four open houses were held along the corridor, as well as a total of 37 meetings with CBs and other stakeholders between 2009 and 2011.

For M15 SBS, two types of bus lanes were implemented: offset bus lanes and curbside bus lanes. Offset bus lanes are located in the second lane from the right curb of each avenue and are in effect at all times. This arrangement preserves curbside parking or loading activity in the curb lane while also providing a travel lane for buses and right-turning vehicles. Offset lanes were installed on First Avenue from 1st Street to 40th Street, and from 79th Street to 125th Street, as well as on Second Avenue from 115th Street to 112th Street and from 108th Street to 106th Street. Where the second lane is needed for general traffic flow, curbside bus lanes are provided. These lanes are typically in effect from 7–10 a.m. and 2–7 p.m.; the 10 a.m.–2 p.m. period is reserved for commercial vehicle loading in most locations. Both offset and curb bus lanes are painted terra cotta red, and are identified with overhead gantry-mounted signs, as well as supplementary signs mounted on signal mast arms and at the side of the road. Non-bus vehicles are allowed to enter bus lanes to make the next available right-turn, to quickly pick-up/dropoff passengers, or to access a parking spot or driveway.

In the summer of 2010, the New York State Legislature authorized DOT and NYCT to begin using video cameras to help enforce bus lanes along SBS routes, augmenting in-person New York City Police Department enforcement. DOT uses cameras mounted on poles along each avenue, while NYCT has piloted cameras using both bus-mounted cameras, and mobile cameras mounted on cars. Overall, DOT and NYCT have issued over 30,000 violations as of July 2011. This automated enforcement helps reinforce the clear message that bus lanes should be kept clear for buses.

Following a successful pilot on the Bx12 SBS along Fordham Road in the Bronx, NYCT instituted a proof-of payment system on the M15 SBS. Riders pay their fare before boarding, using MetroCard or coin fare machines located at each station to obtain a receipt. When the bus arrives, riders can then board the bus through any of the three doors. The bus can therefore load and leave significantly faster. Overall, dwell time on the M15 SBS was reduced by 40% thanks to the new payment system. Enforcement of the payment system is performed by NYCT security personnel.

A key element of SBS implementation was to add bicycle paths and lanes to First Avenue and Second Avenue, as part of the overall expansion of the bicycle network. Parking protected bicycle paths, where the bicycle facility is located on the left side of the street between parked cars and the sidewalk, were installed in 2010 on First Avenue from 1st Street to 34th Street, and on Second Avenue between 34th and 23rd Streets, and between 14th and Houston Streets. In other locations, buffered bike lanes, along the right side of parked cars, were installed or enhanced along both avenues. Protected lanes were extended further north to 46th Street on First Avenue in 2011.

Implementation of the protected bicycle lanes also creates an opportunity to construct pedestrian safety islands, in line with the "floating" parking lane. These islands improve pedestrian safety by reducing the

**M15 SBS allows riders to board the bus from all three doors, thanks to fare pre-payment at on-street fare machines.**

**Pedestrian refuge islands on First Avenue between Houston and 34th Streets shorten crossing distances and provide physical protection for the bicycle lane.**

# New bus and bike lanes improved bus speeds by 15-18%, increased bus ridership by 12% and cycling volumes by 18-177%, and reduced crashes by up to 37%.

crossing distance of these wide avenues, and also create a location to plant trees. Pedestrian islands were constructed at selected intersections on First Avenue from Houston Street to 34th Street, and on Second Avenue from 34th Street to 23rd Street.

Over the first several months of M15 SBS service, ridership steadily increased. Overall M15 ridership was nearly 12% higher in July 2011 compared to July 2010. For March to July 2011, M15 SBS weekday ridership was 42% higher than on the previous Limited service a year previous. By comparison, overall Manhattan bus ridership declined 5-8% in this period.

The SBS service operates 15% faster than the M15 Limited service it replaced, reducing a one-way trip from about 81 minutes on the Limited to about 69 minutes on the SBS (average of northbound and southbound trips). During the peaks, when boardings are heavier and all bus lanes are in effect, the travel time savings are approximately 18%. The improved and extended bus lanes help to reduce in-motion time by nearly five minutes per trip. Likewise, off-board fare collection helps to save almost seven minutes per trip. It is anticipated that the rollout of Transit Signal Priority in 2012 will contribute to reductions in time spent at red lights as well.

Taxi Global Positioning System data from November 2009 and November 2010 showed minimal change in traffic speeds on First and Second Avenues. Traffic counts showed little significant change in traffic levels at most intersections. Traffic flow was maintained due to better traffic organization, including reducing illegal parking, and providing turn lanes in the bus and bike lane designs.

The protected bicycle paths installed as part of the SBS project have stimulated significant bicycle ridership gains in the corridor. Based on DOT counts of bike activity at four locations where protected bike lanes were installed, bike ridership increases ranged from 18% on Second Avenue between East 33rd and East 34th Streets to 177% at First Avenue between St. Marks Place and East 9th Street.

The project also led to decreases in crashes and injuries in the area where the full package of improvements was installed. The number of crashes involving injuries to pedestrians on First Avenue decreased by 37%, a statistically significant reduction in crashes. Statistically significant reductions were also realized for the number of total crashes and the number of crashes involving motor vehicle occupants on First Avenue (for crash methodology, see page 68).

**Bike Volumes on First and Second Avenue**

| Location | | Before | After | % Change |
|---|---|---|---|---|
| First Avenue | St Marks Place to East 9th Street | 787 | 2183 | 177% |
| | 33rd St to 34th St | 740 | 1004 | 36% |
| Second Avenue | St Marks Place to East 9th Street | 1226 | 1883 | 54% |
| | 33rd St to 34th St | 967 | 1141 | 18% |

Before data collected in April - September 2010. After data collected in April - September 2011. Volumes shown are for time period 7am-7pm on a weekday.

**Crashes with Injuries along First Avenue 1st Street to 34th Street**

| | Before* (three previous years) | | | After |
|---|---|---|---|---|
| **Total Crashes with Injuries** | 106 | 117 | 120 | 89.1 |
| **Number of Crashes with Injuries to:** | | | | |
| **Motor Vehicle Occupants** | 41 | 30 | 39 | 26.6 |
| **Pedestrians** | 48 | 61 | 55 | 34.3 |
| **Bicyclists** | 17 | 26 | 26 | 28.3 |

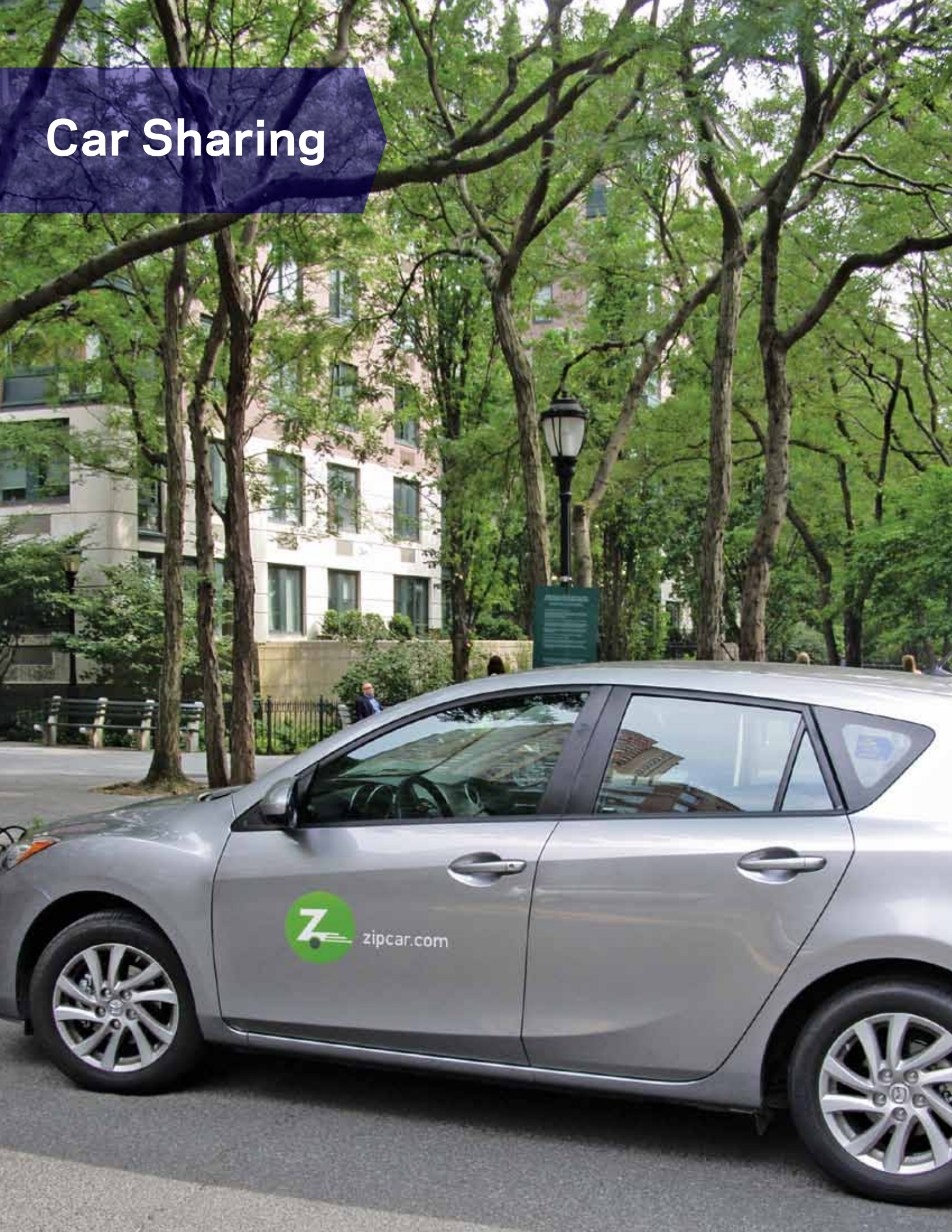
*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through January 2012) at annual rate. See page 68 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

**Crashes with Injuries along Second Avenue 1st Street to 34th Street**

| | Before* (three previous years) | | | After |
|---|---|---|---|---|
| **Total Crashes with Injuries** | 129 | 119 | 114 | 129.4 |
| **Number of Crashes with Injuries to:** | | | | |
| **Motor Vehicle Occupants** | 44 | 32 | 30 | 33.4 |
| **Pedestrians** | 56 | 58 | 46 | 65.1 |
| **Bicyclists** | 29 | 29 | 38 | 30.9 |

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through January 2012) at annual rate. See page 68 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

# Car Sharing



## Purpose

- Evaluate the potential for car sharing for DOT employees traveling for official city business
- Reduce parking footprint of DOT vehicles in Lower Manhattan
- Improve efficiency of vehicle use at DOT
- Improve ease of vehicle use for DOT employees
- Reduce cost of vehicle use at DOT

## Outreach

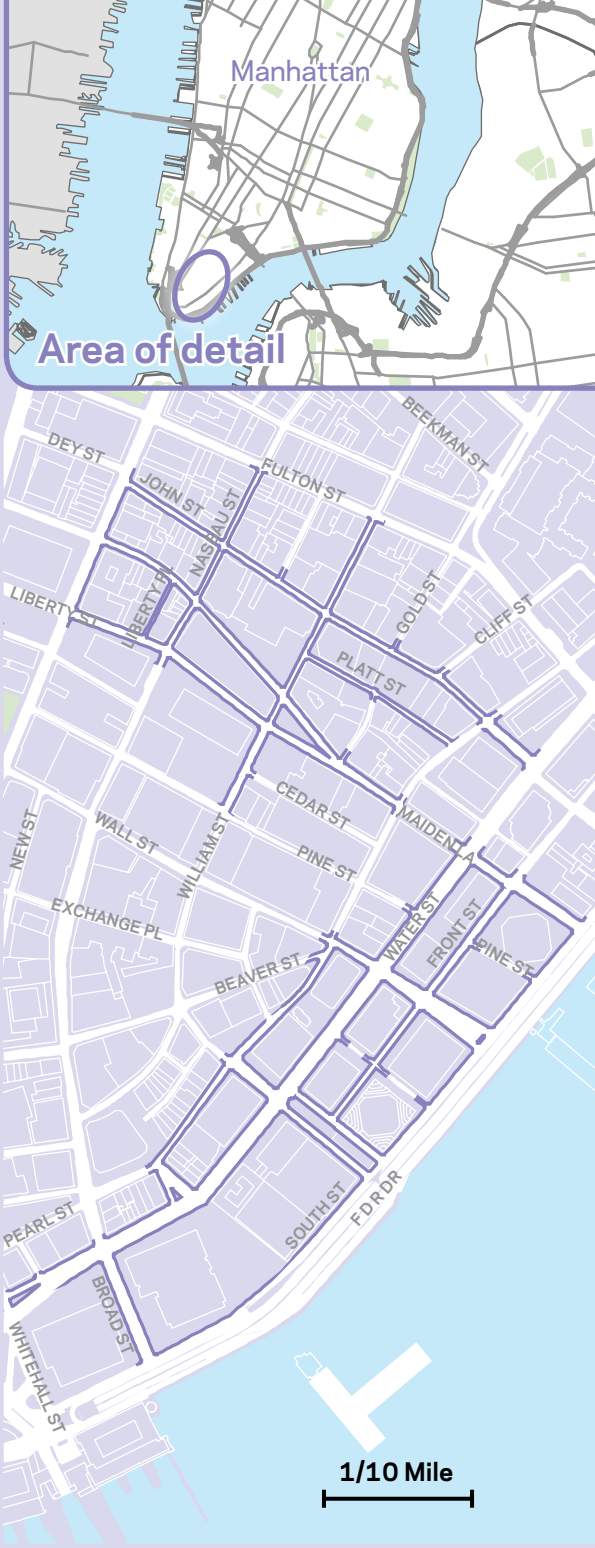
- DOT released a low-bid Request for Proposal to pilot the car share program in October 2009
- DOT selected and trained staff for participation in the pilot in summer 2010
- Surveyed participating DOT staff in June 2010, October 2010 and February 2011

## Approach

- Removed 25% of DOT vehicles from the Lower Manhattan fleet
- Trained 350 DOT employees to participate in the car sharing pilot
- Collected before and after data to evaluate the effectiveness of the program

## Results

- Reduced DOT parking impact in Lower Manhattan by 14% during weekdays and by 68% during weekends
- Reduced DOT's Vehicle Miles Traveled by 11%
- Improved vehicular reservation process, vehicular availability and ease of finding parking when returning vehicles
- Continued use of program results in cost savings to DOT




The Financial District is located in Lower Manhattan at the southernmost part of the island. While most of the land uses are high-density office-retail, the Financial District has seen considerable growth since 2008 in full-time residents as office spaces convert to apartments and condominiums.

DOT launched a pilot car sharing program in September 2010 to reduce the agency's fleet size while also reducing the department's carbon and parking footprint in Lower Manhattan. Car sharing provides participants access to a fleet of shared vehicles. Unlike car rental services, it is typically intended for shorter duration trips and more frequent use. City agencies in Philadelphia and Washington DC have shown that car sharing can reduce the size of city-owned fleets and decrease costs while maintaining staff access to autos. DOT is the first agency in New York City to implement car sharing to replace city vehicles. Its success could lead to the adoption of car sharing by other agencies and potentially a citywide municipal car sharing system. Implementing a car-share program to reduce the agency's use and size of its fleet is part of DOT's strategic plan, Sustainable Streets.

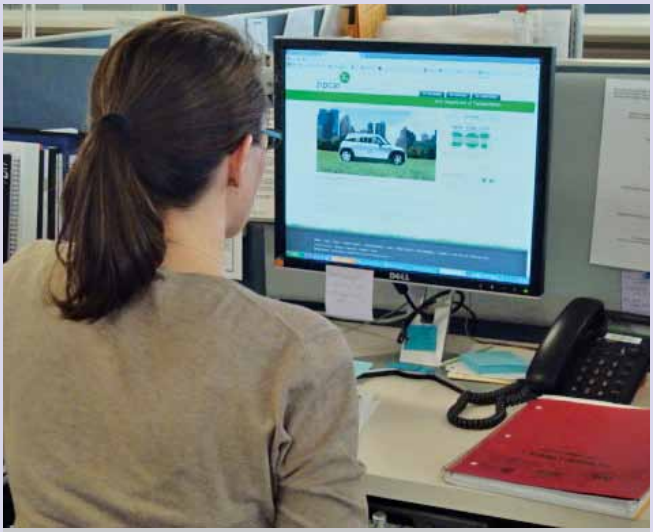
In the pilot, DOT removed 50 vehicles from its Lower Manhattan fleet and provided 350 employees with access to car share vehicles located in Lower Manhattan. Zipcar was awarded the low-bid contract and launched the agency's car sharing pilot program in September 2010. 350 DOT employees from divisions based in Lower Manhattan were selected to participate in the car sharing pilot based on their job responsibilities and need for vehicle access. The program allows these employees to reserve Zipcar vehicles through the company's website for a set hourly rate that is billed to DOT. The Zipcars may be used for agency business that is not accessible or feasible to reach using public transportation, including field visits, community meetings and activities that require equipment or materials to be transported. The vehicles are parked in off-street garages and accessible to participating employees using a key-card activation system. Employees are able to reserve parking placards for city business through a separate internal system of reservations and returns.

The evaluation period for the pilot program ran from program launch through December 2010. The program evaluation focused on four main areas: on-street parking near DOT offices in Lower Manhattan measured through parking surveys conducted in June and October 2010; utilization of DOT fleet vehicles based in Lower Manhattan and of car sharing vehicles; employee feedback using survey tools; and cost incurred by DOT based on the Zipcar contract and actual costs incurred by the agency for gas, maintenance, tolls and depreciation.

DOT surveyed on-street parking on weekdays and weekends before and after the program was in place for more than one month. The total number of hours that DOT vehicles occupied on-street parking spaces during the week was reduced by 14% on weekdays and by 68% on weekends. It should be noted that DOT vehicles from outside Lower Manhattan were likely included in the observations in addition to vehicles based in Lower Manhattan.

Zipcar-use reports and a sample of fleet logbooks were analyzed to understand vehicle usage patterns both before and during the pilot. The results, including both reduced usage of vehicles in the DOT fleet and use of car share vehicles, showed decreases of 21% in miles traveled and 17% for vehicle hours. Thus, combined use of car sharing and DOT fleet showed an overall vehicle utilization decline across all metrics. It should be noted that the evaluation period occurred in late fall and early winter, which could contribute to fewer trips in general.

Being able to maintain agency operations while reducing vehicle use and costs was a critical aspect in evaluating the effectiveness of the car sharing pilot. To evaluate these impacts, employees were surveyed before, during and after the pilot evaluation period using an online



**Reservations for car sharing vehicles can be made on-line at any time.**

**Once a reservation is made, DOT employees access car share vehicles by tapping the bar code on the car with their Zipcar key-card.**

# Reduced DOT parking impact in Lower Manhattan by 14% during weekdays and by 68% during weekends after implementation of a car sharing program at DOT in Lower Manhattan.

tool to evaluate how the system impacted employees and whether their behavior changed due to the introduction of car sharing. Specific topics included reservation process, typical time required for reservations, typical availability of vehicles, frequency of changes to reservations, and occurrences of correct and incorrect reservations. Employees reported that the car sharing system made it easier to reserve vehicles including reducing the time to confirm a reservation; increased the availability of vehicles while reducing occurrences of reservations being changed by others; and made it easier to find a parking space at the end of the reservation. Employees reported that it was easier to report a damaged vehicle in the fleet system than in the car sharing program. This may be attributable to personal relationships between employees who drive and employees responsible for vehicle maintenance, compared to contacting an anonymous representative.

A cost analysis was performed and showed that continued use of the program results in cost savings to DOT, taking into account vehicle fleet reduction and not needing to purchase new vehicles. Results show the car sharing pilot program was a success in the measures of reduced utilization and parking demand. The results of the evaluation led to the renewal of the contract for an additional year.

**Vehicle Fleet & Car Sharing Utilization Before and During the Pilot**

| Average Vehicle Utilization | Fleet Pre-Pilot (196) | Fleet Pilot (146) | Change in Fleet Use | Car Sharing Pilot | Overall Reduction |
|---|---|---|---|---|---|
| **Average Vehicle Sessions Per Week** | 518 | 408 | -21% | 49 | -12% |
| **Average Vehicle Miles per Week** | 17,072 | 13,736 | -20% | 1,420 | -11% |
| **Average Vehicle Hours per Week** | 3,428 | 2,661 | -22% | 296 | -14% |

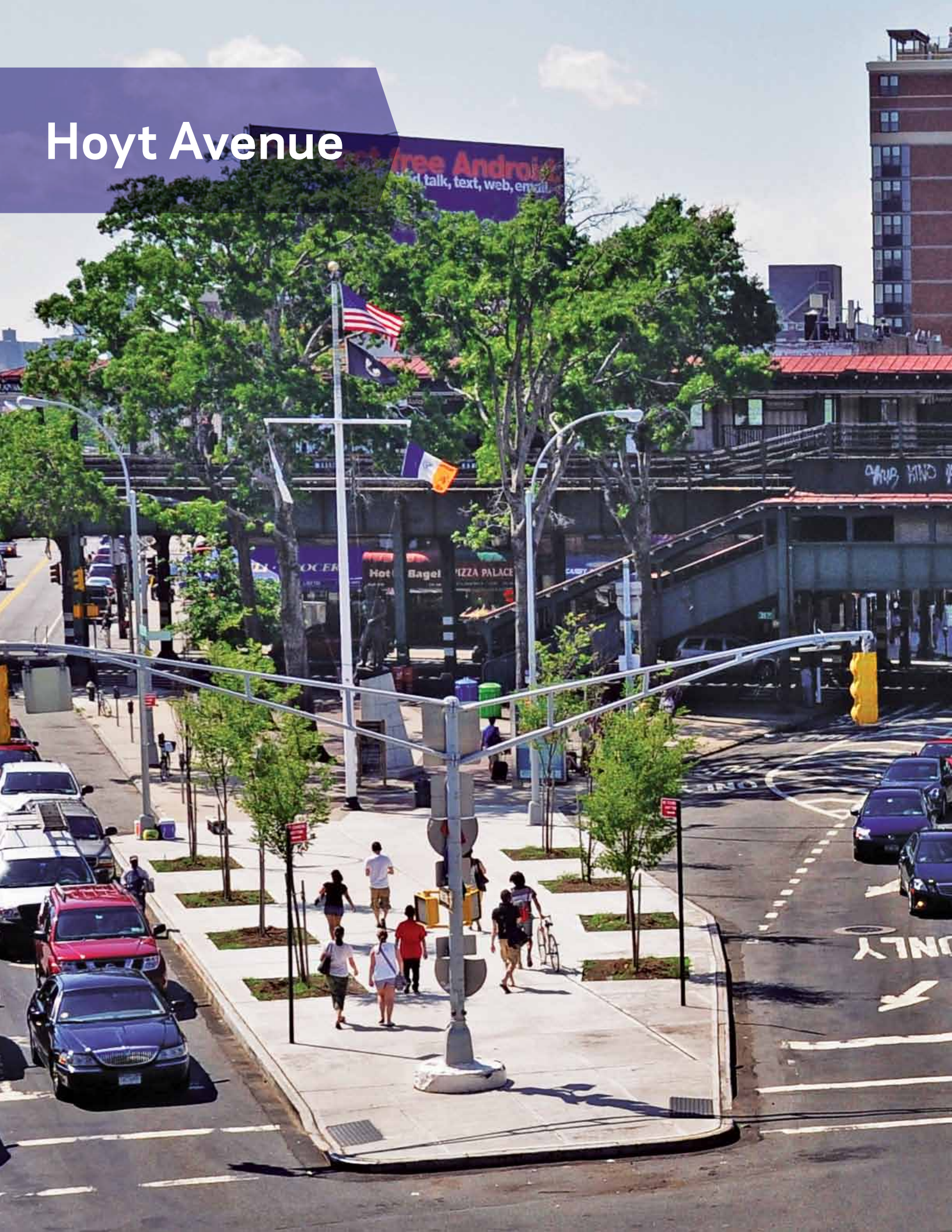
Pre-Pilot data collected in May - August 2010. Pilot data collected in September - December 2010.

**Intensity of Use DOT Fleet Vehicles**

| Vehicle Utilization/ Week | Fleet Pre-Pilot (196) | Fleet Pilot (146) | Change in Fleet Use |
|---|---|---|---|
| **Average Miles per Week per Vehicle** | 124.6 | 150.9 | 21% |
| **Average Hours per Week per Vehicle** | 25.0 | 29.2 | 17% |

Pre-Pilot data collected in May - August 2010. Pilot data collected in September - December 2010.

# Hoyt Avenue



## Purpose

- Reduce traffic congestion and delays
- Enhance and improve pedestrian and bicycle connections
- Improve travel times for bus riders to/from LaGuardia Airport
- Improve pedestrian and motorist safety
- Green streets to enhance neighborhood

## Outreach

- Community requested pedestrian improvements around Astoria Boulevard subway station and RFK Bridge exit at 29th Street
- New York Metropolitan Transportation Council (NYMTC) sponsored Walkable Community Workshop held in spring 2009 with New York City Police Department (NYPD) precinct, members of Queens Community Board 1 (CB1), local parks associations, and DOT officials
- DOT presented plans to the CB1 Transportation Committee and local elected officials in May 2010 and received feedback
- DOT attended CB1 Full Board meeting to answer questions about project plans in June 2010 and received support for the plan via letter in July 2010

## Approach

- Modified signal timing and phasing to improve traffic flow, including a new bus-only phase for westbound buses
- Installed traffic signal and crosswalk at 29th St exit from RFK Bridge
- Installed rush-hour turn bans
- Built new landscaped concrete pedestrian spaces and neckdowns
- Installed bicycle lanes connecting existing lanes east and west of project area
- Added angle parking and new metered parking to support neighborhood businesses and residents

## Results

- Travel times improved on 31st Street between Astoria Boulevard South and 24th Road by 51% in the northbound direction and by 26% in southbound direction
- Bike ridership increased by 19% during weekdays and 37% during weekends on Astoria Boulevard South between 31st Street and 32nd Street
- Total number of crashes involving injuries and crashes involving injuries to motor vehicle occupants lower than any of the 10 prior years


The project is located in a section of Astoria in Queens that consists of a small commercial center surrounded by a low- and medium-rise residential neighborhood. The corridor serves as a gateway to Queens and receives Hoyt-RFK Bridge traffic bound for either the Bronx-Queens Expressway (BQE) or the Ed Koch Queensboro Bridge to Manhattan. It also provides intermodal connections from the N & Q subway stop at Astoria Boulevard to the M60 bus to La Guardia airport. The Q19 local buses connect this neighborhood to Flushing.

# Hoyt Avenue

Located at the foot of the RFK Bridge in Astoria, the complex intersection of Hoyt Avenue North and South from 29th Street to 31st Street and Astoria Boulevard between 31st and 33rd Streets is traversed by thousands of pedestrian, transit, and vehicle commuters a day as well as travelers from LaGuardia Airport who transfer here from the bus to the subway. It serves as a transit node for two bus routes and two subway lines as well as an interchange with the Grand Central Parkway and Brooklyn-Queens Expressway. Within this complex intersection, Hoyt Avenue South and 29th Street is a key node serving motorists exiting from the bridge onto local neighborhood streets.

The intersection had several long crosswalks, unclear pedestrian pathways and erratic driving due to excess roadway capacity. Prior to implementation, pedestrians crossed multiple lanes of traffic from the subway and bus to the nearby residential neighborhoods. The south leg of the intersection of Hoyt Avenue South and 29th Street, where a senior housing facility was built in 2009, was unsignalized, creating problems for pedestrians crossing at this location as well as drivers approaching on Hoyt Avenue South looking for a gap in traffic. Astoria Boulevard between 31st and 33rd Streets lacked adequate connectivity between the subway station, bus stops, and crosswalks to the adjacent intersections. Pedestrians were walking on roadway channelization markings instead of sidewalks to reach their destinations. In addition, the Manhattan-bound M60 bus was forced to weave across several lanes of traffic to access the RFK Bridge.

As a result of these conditions, the intersection had the highest crash rate in northwestern Queens. Primary accident causes included speeding, vehicle weaving/merging, long pedestrian crossings, poor intersection geometry, and heavy vehicle and pedestrian volumes.

A "Walkable Communities" workshop, sponsored by NYMTC in November 2009, brought together local stakeholders, including members of Queens CB1, Friends of Astoria Park and Transportation Alternatives plus NYPD and DOT staff to identify pedestrian and traffic issues. During the workshop many concerns about safety were raised, and several interesting ideas were suggested. DOT then initiated a study to develop a comprehensive redesign.

DOT met with Metropolitan Transportation Authority Bridges & Tunnels on-site several times to discuss adding a new traffic signal and pedestrian crosswalk at 29th Street. Additionally, the Department of Parks & Recreation collaborated on the addition of trees to new and expanded pedestrian safety islands. DOT then presented its findings and recommendations to elected officials as well as Queens CB1's Transportation Committee, and made changes to the project design based on their comments. At a Queens CB1 Full Board meeting DOT answered questions and responded to earlier concerns. CB1 sent a letter approving the project and thanked DOT for including some of the Board's suggestions in the final plan.

Project implementation began in July 2010. Improvements included signalizing the intersection of Hoyt Avenue and 29th Street with corresponding changes to the bridge signage and markings and a new crosswalk with a pedestrian signal. Two new landscaped concrete pedestrian spaces were added on Astoria Boulevard between 31st Street and 33rd Street to provide sidewalks along the existing desire lines and to humanize the intersections with 15 new street trees. Two concrete "neckdowns" were also constructed to make crossings shorter and safer on 31st Street at Hoyt Avenue North and Hoyt Avenue South. Also, a right-turn signal from northbound 31st Street to eastbound Astoria Boulevard was added to give pedestrians a vehicle-free crossing.

Lane widths were narrowed to calm traffic and turn lanes were designated with markings and signage to facilitate through traffic safely moving past turning vehicles. Signal timing was modified to improve pedestrian crossing time while better organizing the signal phasing to improve traffic flow. Rush-hour left-turn bans were implemented


**Two new landscaped crosswalk connections were added on Astoria Boulevard between 31st Street and 33rd Street to improve safety and enhance the streetscape.**

**A new signal and crosswalk were added at the intersection of Hoyt Avenue South and 29th Street to improve safety in front of a newly constructed senior housing facility.**

# Travel times improved by up to 51% after implementation of signal timing adjustments, a new signal and crosswalk, turn bans and related changes.

to improve travel flow on 31st Street. A bus-priority signal was added so that buses no longer had to cross several lanes of moving traffic to access the RFK Bridge to Manhattan.

Vehicular travel times remained steady on Astoria Boulevard and on Hoyt Avenue North and South. Travel times on 31st Street between Astoria Boulevard and 24th Road improved by 51% in the northbound direction and by 26% in the southbound direction. Evening and afternoon travel times saw the most improvement.

Travel speeds on Hoyt Avenue South where the bridge exits into Astoria have improved by 13% between 7 a.m. and 7 p.m. The queue exiting the bridge is of a reasonable length. MTA staff have reported improved travel time speeds and increased service reliability to La Guardia Airport on M60 bus.

DOT installed 1.8 miles of bicycle lanes to safely connect residents to Astoria Park and the waterfront. Bicycle facilities were added on Hoyt North and South, Astoria Park South, 21st Street from Hoyt South to 20th Avenue, and Ditmars Boulevard from 21st Street to Shore Boulevard. Since the project was installed there has been a 19% increase in ridership on Astoria Boulevard South between 31st Street and 32nd Street during weekdays and a 37% increase in ridership on weekends for the same segment. The lanes calmed traffic while completing the planned bicycle network for the Astoria neighborhood.

Angle parking was added on Hoyt Avenue South between 29th Street and Crescent Street. The additional parking helped to reduce speeding on this previously overly wide corridor. The new angle parking and new metered parking added at Columbus Triangle help to supported local businesses and residents.

Analysis of NYPD crash data shows crash rates for all crashes involving injuries, as well as those involving injuries to motor vehicle occupants and bicyclists after implementation were lower than the average for the three prior years. In addition, the annualized crash rate involving total injury crashes and crashes involving motor vehicle occupants after implementation was lower than the number of crashes in any of the 10 prior years (for crash analysis methodology, see page 68).

Overall these improvements have knitted together separate sections of the Astoria community, improved pedestrian and bicyclist safety and connectivity, provided clearer traffic patterns and better transit connections, clarified vehicular paths for motorists, and added landscaped areas in support of the City's sustainability goals.

**Crashes with Injuries for the Hoyt Avenue Project Area**

| | Before* (three previous years) | | | After |
|---|---|---|---|---|
| **Total Crashes with Injuries** | 49 | 49 | 54 | 39.7 |
| **Number of Crashes with Injuries to:** | | | | |
| **Motor Vehicle Occupants** | 41 | 38 | 42 | 28.6 |
| **Pedestrians** | 3 | 11 | 8 | 8.3 |
| **Bicyclists** | 5 | 0 | 4 | 2.8 |

*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through January 2012) at annual rate. See page 68 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

**Bike Volumes on Astoria Boulevard South Between 31st Street and 32nd Street**

| | Before | After | % Change |
|---|---|---|---|
| **Weekday** | 89 | 106 | 19% |
| **Weekend** | 73 | 100 | 37% |

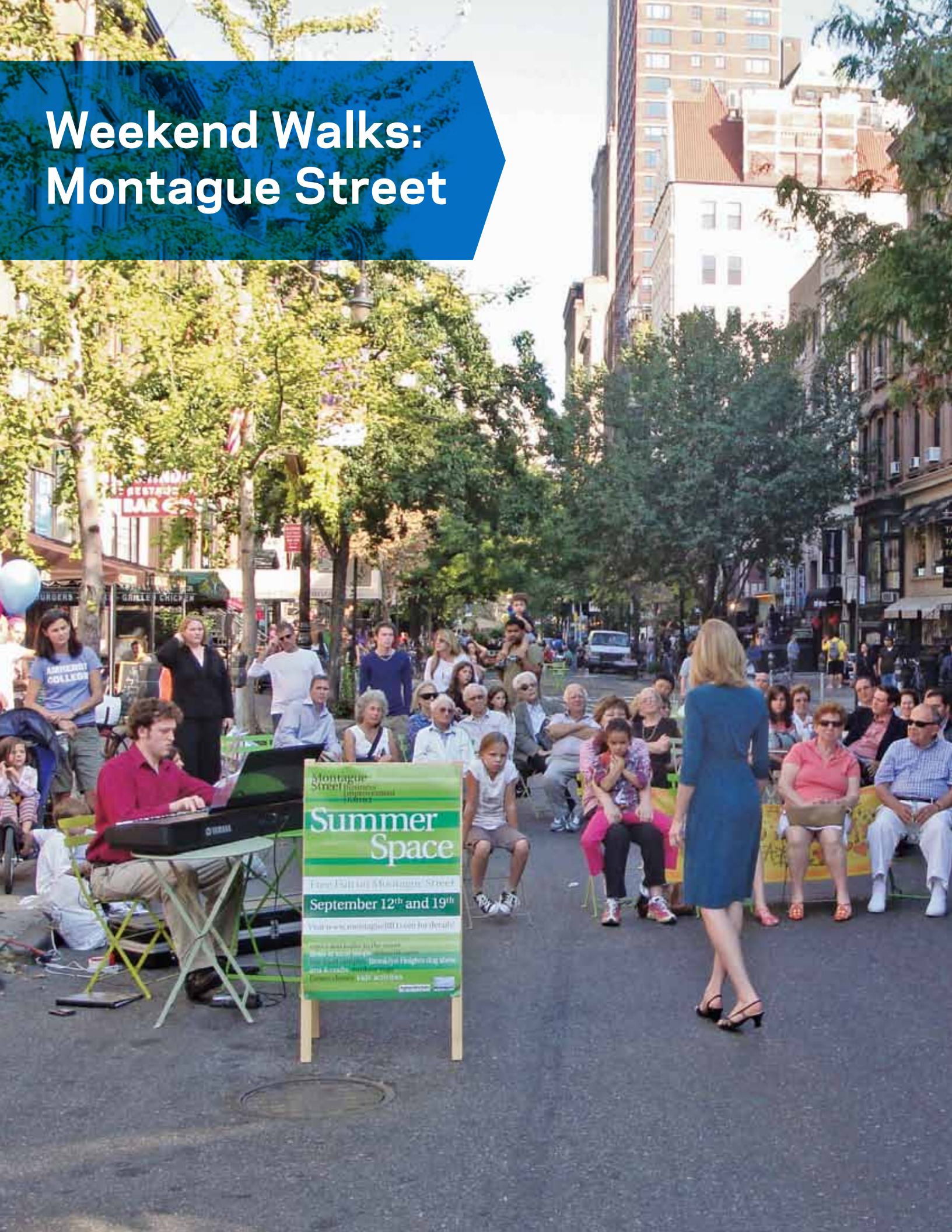
Before data collected in June 2010. After data collected in June 2011. Volumes shown are for time period 7am-7pm.

**Weekday Travel Times (7 a.m. - 7 p.m.) Astoria Boulevard/Hoyt Avenue and 31st Street**

| Corridor | Before | After | Change | % Change |
|---|---|---|---|---|
| **WB Astoria Boulevard to Hoyt Avenue North (33rd Street to 27th Street)** | 1:34 | 1:32 | -00:02 | -3% |
| **EB Hoyt Avenue South to Astoria Boulevard South (27th Street to 35th Street)** | 2:05 | 1:51 | -00:13 | -11% |
| **EB Astoria Boulevard South (27th Street to 35th Street)** | 3:02 | 3:04 | 00:02 | 1% |
| **WB Astoria Boulevard at 33rd Street to 31st Street at Astoria Boulevard South** | 1:40 | 1:46 | 00:06 | 6% |
| **NB 31st Street (Astoria Boulevard South to 24th Road)** | 1:31 | 0:45 | -00:46 | -51% |
| **SB 31st Street (24th Road to Astoria Boulevard South)** | 0:57 | 0:42 | -00:15 | -26% |

Before data collected in June 2010. After data collected in March 2011. Times shown in minutes, seconds.

# Weekend Walks: Montague Street



## Purpose

- Create unique, temporary, multi-block, multi-day pedestrian streets as alternatives to standard street fairs
- Incubate new community groups and strengthen existing organizations
- Promote local businesses
- Support community and economic development
- Promote healthy and safe recreation

## Outreach

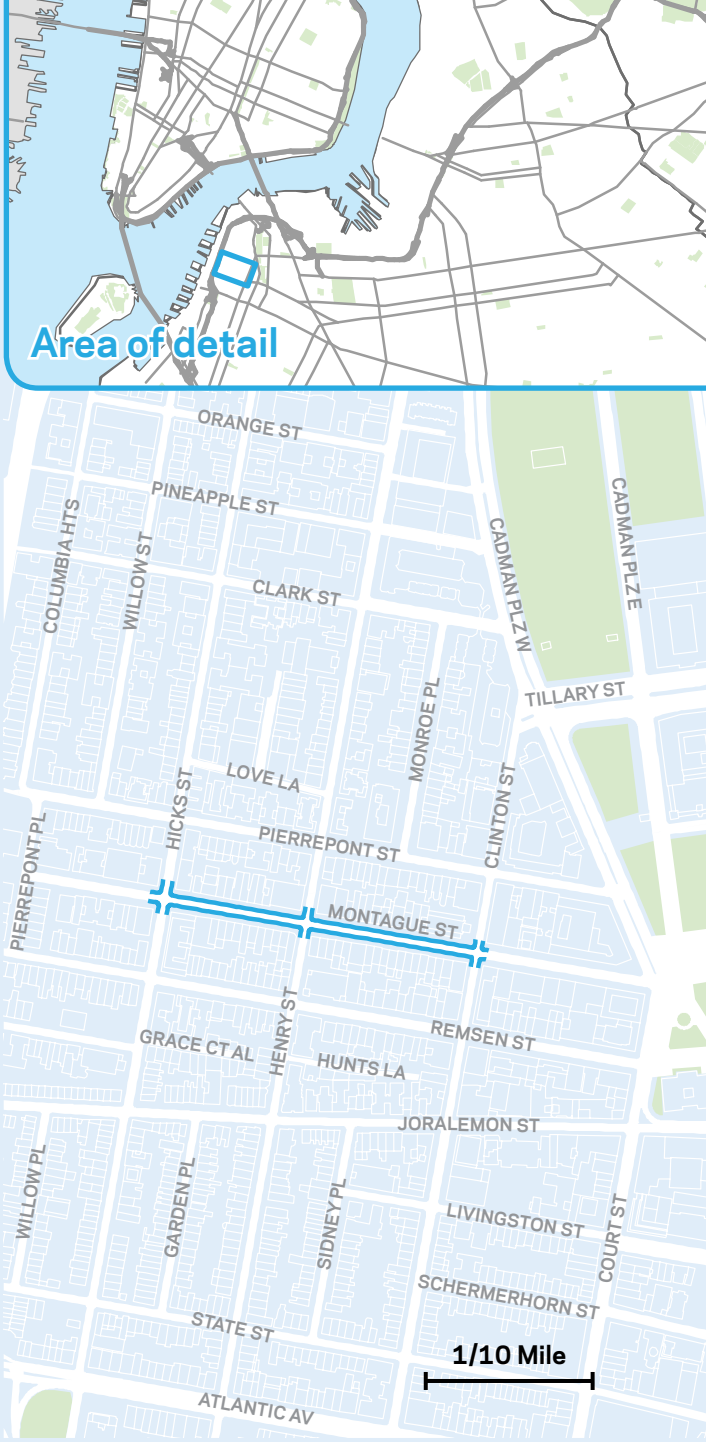
- DOT sent a Request for Expressions of Interest (RFEI) to NYC Department of Small Business Services' (SBS) mailing list of Business Improvement Districts (BIDs) and other community groups in October 2009
- The Montague Street BID responded to the RFEI in November 2009 and was selected by DOT to participate in Weekend Walks
- DOT submitted the Montague Street BID application to the Street Activity Permit Office (SAPO) in December 2009 and received approval and all necessary permits for the Montague Street Weekend Walk

## Approach

- DOT closed Montague Street to vehicular traffic between Clinton Street and Hicks Street for three Sundays in September 2010 from 10 a.m. to 5 p.m.
- DOT provided the Department of Sanitation (DSNY) with the event information so that DSNY could provide extra garbage pickup service after the event

## Results

- Overwhelming support by merchants for organizing the event in 2011
- 76% of merchants reported an increase in foot traffic over a typical weekend day in the summer, up from 2010, when 65% of the merchants saw increased foot traffic
- 86% of merchants reported an increase in sales over a typical weekend day in the summer, up from 44% in 2010




Montague Street Weekend Walks occurs on a two-block stretch of Montague Street, one of Brooklyn Heights' commercial corridors, between Clinton and Hicks Streets, in late September. The site is near the Court Street stop on the N/R train and the Borough Hall stop on the 2/3 train. Montague is a medium-density, mixed-use corridor.

# Weekend Walks: Montague Street

Weekend Walks is an application-based, temporary pedestrian-street program that DOT developed in 2008 as an alternative to the standard street fair. Local merchants' associations, community groups, and BIDs in all five boroughs host Weekend Walks from May through October. The events highlight local businesses and cultural institutions, foster a sense of community, help participants see their streets and neighborhoods in a new way, and promote healthy and safe recreation. Each event features activities ranging from music performances to arts and crafts, classes, and youth programming. Altogether, there were 17 Weekend Walks in 2010, up from 13 the year before and three in 2008. Each Weekend Walk had unique programming that reflects its local character, and the events ranged from two to eight blocks in length.

Weekend Walks are strictly non-commercial – money cannot change hands in the street during the events, with the exception of restaurants, which can provide outdoor seating and full table service. Weekend Walks organizers have told DOT that this policy has actually helped make their events more interesting and more beneficial to their merchants.

DOT sends a Weekend Walks RFEI to SBS' mailing list of BIDs and other community groups each October. Groups must complete their forms and return them to DOT by mid-November. DOT then submits event applications to SAPO, a division of the Office of Citywide Event Coordination & Management, by December 31st; the Weekend Walks organizers complete the applications, but DOT is technically the applicant. SAPO enters the applications into its system and follows up with DOT should it have any questions. Before each Weekend Walk, SAPO issues a permit to each organizer upon receipt of payment of $15 per block per event day.

DOT supports the Weekend Walks organizers with technical assistance, but its main role is to coordinate with other agencies. For instance, each spring, DOT provides DSNY and New York City Transit (NYCT) with the full list of upcoming Weekend Walks events so that DSNY can provide extra garbage pickup service post-event and NYCT can plan bus re-routes, if necessary.

The Montague Street BID organized a Weekend Walk as one of many ways to pursue economic and community development. Also, because the event demonstrates that the businesses value their customers and are active members of the community, it engenders a very strong sense of goodwill between residents and businesses and fosters customer loyalty.

Branded as "Summer Space", the Weekend Walk on Montague Street, one of Brooklyn Heights' commercial corridors, took place between Clinton Street and Hicks Street on three Sundays in 2010. As it does each year, the BID conducted extensive outreach to its community board, merchants, New York City Police Department precinct, and other stakeholders to encourage participation. The BID also arranges programming with arts and cultural institutions, and distributes sign-up forms to BID businesses soliciting their participation.

The merchants along Summer Space overwhelmingly support the event. Out of 21 merchants surveyed in 2011, 76% saw an increase in foot traffic over a typical weekend day in the summer; 14% saw no change, and 10% reported a decrease. These numbers are up from 2010, when 65% of the merchants saw increased foot traffic, 25% reported no change, and 10% said it was down compared to a normal weekend day.


**Montague Street Summer Space and other Weekend Walks provide a diverse array of participatory and spectator programming that helps people reconceive the street and build community.**


**Merchants use Weekend Walks for creative on-street promotions.**

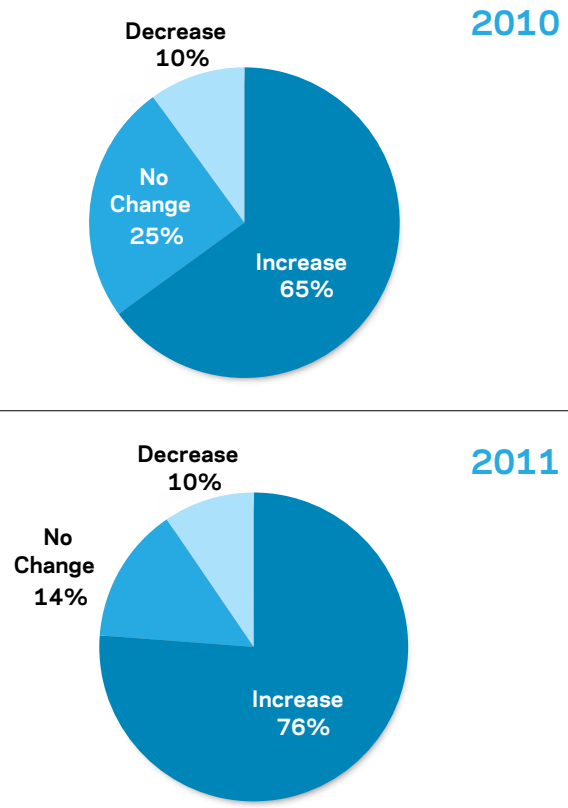
# 86% of merchants reported an increase in sales and 76% reported an increase in foot traffic during the Montague Street Weekend Walks when compared to other typical weekend summer days.

In 2011, 86% of the merchants surveyed reported an increase in sales during the event and 14% reported a decrease in sales. In 2010, 44% of surveyed merchants saw an increase in sales, 38% reported no change, and 18% experienced a decrease.

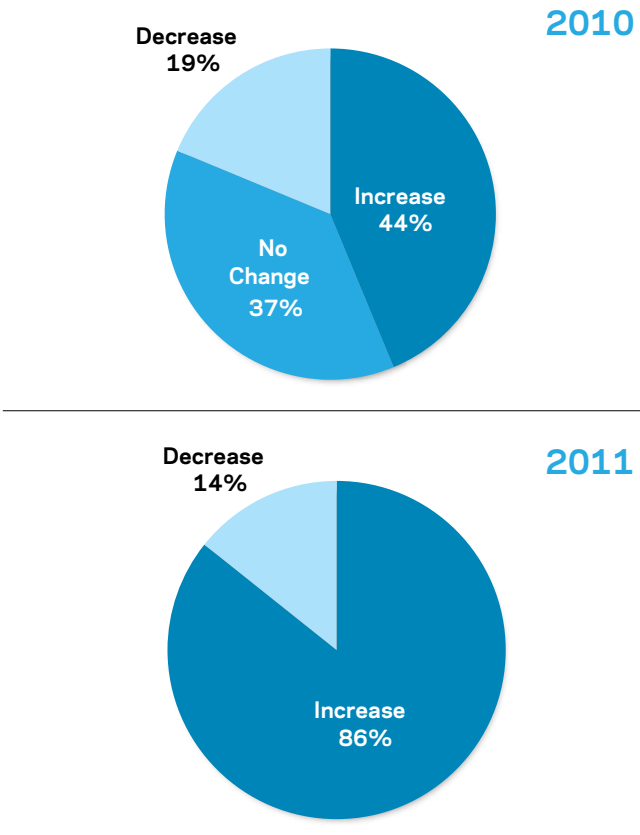
Twenty merchants, or 95% – up from 70% the previous year – wanted the BID to organize Summer Space in 2012. This is up from 2010, when 70% said they wanted Summer Space to happen again the following year, 20% had no opinion, and 10% did not want to do it again.

Weekend Walks is a powerful tool to incubate nascent community groups and strengthen existing organizations. The Montague Street BID, in existence for 10 years when it created Summer Space, found that the event series strengthened this vital retail corridor and helped the BID develop new relationships with area arts and culture organizations.

**Foot Traffic from Survey Results on Montague Street Clinton Street to Hicks Street**




**Sales Figures from Survey Results on Montague Street Clinton Street to Hicks Street**



# Appendix: Traffic and Transit Trends

## Citywide trends
*(All data in thousands)*

| Year | New York City population* | New York City employment | Citywide traffic** | Transit ridership*** |
|---|---|---|---|---|
| **1990** | 7,336 | 3,564 | | 5,206 |
| **1991** | 7,375 | 3,373 | | 5,047 |
| **1992** | 7,429 | 3,280 | | 4,977 |
| **1993** | 7,506 | 3,289 | 4,066 | 5,086 |
| **1994** | 7,570 | 3,320 | 4,089 | 5,236 |
| **1995** | 7,633 | 3,337 | 4,137 | 5,259 |
| **1996** | 7,698 | 3,367 | 4,192 | 5,187 |
| **1997** | 7,773 | 3,440 | 4,292 | 5,424 |
| **1998** | 7,858 | 3,527 | 4,408 | 5,893 |
| **1999** | 7,948 | 3,619 | 4,503 | 6,335 |
| **2000** | 8,018 | 3,718 | 4,535 | 6,737 |
| **2001** | 8,071 | 3,689 | 4,430 | 6,921 |
| **2002** | 8,094 | 3,581 | 4,502 | 6,979 |
| **2003** | 8,144 | 3,531 | 4,566 | 6,801 |
| **2004** | 8,184 | 3,549 | 4,589 | 6,919 |
| **2005** | 8,214 | 3,602 | 4,541 | 7,069 |
| **2006** | 8,251 | 3,666 | 4,523 | 7,205 |
| **2007** | 8,275 | 3,745 | 4,505 | 7,401 |
| **2008** | 8,364 | 3,790 | 4,407 | 7,638 |
| **2009** | 8,392 | 3,687 | 4,428 | 7,446 |
| **2010** | **8,175** | **3,708** | **4,468** | **7,419** |

* Populations for interim years between the decennial census (1990, 2000, 2010) are estimates, which may trend higher than populations ultimately reported by the decennial census.
** Sum of all daily weekday traffic volumes at Borough and City boundaries
*** Sum of average daily boardings on NYCT subways and buses, MTA Bus Co. local routes, and privately operated local buses

## Travel into the CBD
*(All data in thousands)*

| Year | Ferry ridership in NYC | Daily vehicles entering the CBD | Daily transit riders entering the CBD | CBD commuter cycling* |
|---|---|---|---|---|
| **1990** | 87 | 760 | 2,174 | 3.3 |
| **1991** | 84 | 759 | 2,154 | 3.6 |
| **1992** | 81 | 776 | 2,127 | 4.3 |
| **1993** | 81 | 761 | 2,157 | 4.5 |
| **1994** | 82 | 754 | 2,206 | 4.9 |
| **1995** | 82 | 771 | 2,210 | 5.2 |
| **1996** | 84 | 782 | 2,237 | 5.6 |
| **1997** | 84 | 814 | 2,249 | 5.2 |
| **1998** | 85 | 842 | 2,294 | 5.1 |
| **1999** | 103 | 843 | 2,431 | 4.7 |
| **2000** | 85 | 831 | 2,517 | 4.8 |
| **2001** | n/a | 696 | 2,390 | 4.9 |
| **2002** | 129 | 792 | 2,441 | 6.0 |
| **2003** | 119 | 817 | 2,392 | 6.9 |
| **2004** | 102 | 822 | 2,454 | 7.4 |
| **2005** | 100 | 805 | 2,472 | 7.7 |
| **2006** | 97 | 801 | 2,566 | 8.4 |
| **2007** | 101 | 791 | 2,683 | 9.3 |
| **2008** | 105 | 756 | 2,743 | 12.3 |
| **2009** | 105 | 771 | 2,586 | 15.5 |
| **2010** | **110** | **778** | **2,662** | **17.5** |

* This figure is for cyclists entering and leaving the Manhattan core at the East River bridges, Hudson River Greenway at 50th Street, and on the Staten Island Ferry, weekdays from 7 a.m. to 7 p.m. The values for 1990 until 2006 are based on a three year rolling average; the value for 2007 is the average of 3 counts taken in May, August and September of that year; the values for 2008 and 2009 are the average of 10 counts taken between April and October.

## Daily vehicle traffic into the CBD, by sector of entry
*(All data in thousands)*

| Year | New Jersey | 60th Street | Queens | Brooklyn |
|---|---|---|---|---|
| **1990** | 101 | 349 | 104 | 206 |
| **1991** | 98 | 357 | 104 | 200 |
| **1992** | 101 | 382 | 108 | 185 |
| **1993** | 102 | 370 | 107 | 182 |
| **1994** | 104 | 358 | 107 | 185 |
| **1995** | 104 | 361 | 117 | 189 |
| **1996** | 106 | 375 | 119 | 182 |
| **1997** | 107 | 377 | 131 | 199 |
| **1998** | 109 | 389 | 138 | 206 |
| **1999** | 112 | 393 | 135 | 203 |
| **2000** | 112 | 387 | 131 | 201 |
| **2001** | 67 | 369 | 127 | 133 |
| **2002** | 104 | 377 | 133 | 178 |
| **2003** | 110 | 383 | 139 | 185 |
| **2004** | 110 | 384 | 133 | 195 |
| **2005** | 108 | 377 | 133 | 187 |
| **2006** | 110 | 364 | 141 | 186 |
| **2007** | 110 | 353 | 136 | 192 |
| **2008** | 103 | 341 | 132 | 180 |
| **2009** | 104 | 346 | 138 | 183 |
| **2010** | **105** | **351** | **135** | **187** |

## Daily transit riders into the CBD, by sector of entry
*(All data in thousands)*

| Year | New Jersey | 60th Street | Queens | Brooklyn |
|---|---|---|---|---|
| **1990** | 264 | 754 | 521 | 598 |
| **1991** | 257 | 764 | 522 | 579 |
| **1992** | 250 | 747 | 503 | 594 |
| **1993** | 254 | 755 | 515 | 601 |
| **1994** | 272 | 790 | 521 | 593 |
| **1995** | 269 | 800 | 525 | 587 |
| **1996** | 283 | 799 | 525 | 601 |
| **1997** | 299 | 785 | 534 | 601 |
| **1998** | 292 | 795 | 552 | 624 |
| **1999** | 312 | 866 | 571 | 645 |
| **2000** | 332 | 877 | 596 | 682 |
| **2001** | 325 | 843 | 553 | 668 |
| **2002** | 335 | 869 | 559 | 645 |
| **2003** | 333 | 857 | 526 | 647 |
| **2004** | 350 | 864 | 535 | 674 |
| **2005** | 356 | 876 | 553 | 656 |
| **2006** | 372 | 911 | 557 | 695 |
| **2007** | 390 | 926 | 597 | 738 |
| **2008** | 388 | 977 | 596 | 746 |
| **2009** | 385 | 889 | 565 | 711 |
| **2010** | **405** | **902** | **580** | **738** |

## Travel outside the CBD
*(All data in thousands)*

| Year | Daily vehicle traffic outside the CBD * | Daily bus ridership ** |
|---|---|---|
| 1990 | | |
| 1991 | | |
| 1992 | | |
| 1993 | 3,305 | |
| 1994 | 3,335 | |
| 1995 | 3,366 | |
| 1996 | 3,410 | |
| 1997 | 3,478 | |
| 1998 | 3,566 | 1,749 |
| 1999 | 3,660 | 1,883 |
| 2000 | 3,704 | 1,983 |
| 2001 | 3,734 | 2,080 |
| 2002 | 3,710 | 2,131 |
| 2003 | 3,749 | 2,062 |
| 2004 | 3,767 | 2,077 |
| 2005 | 3,736 | 2,115 |
| 2006 | 3,722 | 2,160 |
| 2007 | 3,714 | 2,192 |
| 2008 | 3,651 | 2,262 |
| 2009 | 3,657 | 2,218 |
| 2010 | **3,690** | **2,154** |

* Sum of all daily traffic volumes at borough and city boundaries, excluding volumes at points entering the Manhattan CBD.
** Sum of all average daily boardings on local bus routes operated by NYCT, MTA Bus Co., and private operators. During years for which complete data are only available for NYCT local routes (2002-2005), private and MTA Bus Co. local route data are estimates.

## Daily vehicle traffic outside the CBD, two-way vehicle volumes at borough or city boundaries *(All data in thousands)*

| Year | Nassau-Queens | The Bronx-Manhattan | The Bronx-Queens * | Verrazano Narrows Bridge |
|---|---|---|---|---|
| 1990 | | 540 | | |
| 1991 | | | | |
| 1992 | | 537 | 272 | 183 |
| 1993 | 892 | 542 | 266 | 178 |
| 1994 | 897 | 526 | 274 | 181 |
| 1995 | 893 | 522 | 277 | 185 |
| 1996 | 896 | 531 | 273 | 185 |
| 1997 | 907 | 547 | 272 | 183 |
| 1998 | 920 | 560 | 286 | 195 |
| 1999 | 947 | 563 | 291 | 195 |
| 2000 | 940 | 579 | 295 | 203 |
| 2001 | 947 | 569 | 294 | 219 |
| 2002 | 944 | 552 | 300 | 212 |
| 2003 | 969 | 550 | 299 | 206 |
| 2004 | 966 | 552 | 312 | 206 |
| 2005 | 959 | 561 | 297 | 194 |
| 2006 | 935 | 557 | 309 | 207 |
| 2007 | 952 | 558 | 304 | 201 |
| 2008 | 952 | 539 | 309 | 204 |
| 2009 | 956 | 544 | 299 | 202 |
| 2010 | **964** | **550** | **298** | **204** |

* Sum of two-way daily traffic on the Throgs Neck, Bronx-Whitestone, and Triboro Bridge (Bronx toll plaza only)

## Daily bus ridership outside the CBD, by borough*
*(All data in thousands)*

| Year | Upper Manhattan ** | The Bronx | Queens | Brooklyn | Staten Island |
|---|---|---|---|---|---|
| 1990 | | | | | |
| 1991 | | | | | |
| 1992 | | | | | |
| 1993 | | | | | |
| 1994 | | | | | |
| 1995 | | | | | |
| 1996 | | | | | |
| 1997 | | | | | |
| 1998 | 96 | 453 | 515 | 602 | 83 |
| 1999 | 109 | 483 | 556 | 648 | 89 |
| 2000 | 116 | 505 | 589 | 680 | 93 |
| 2001 | 122 | 528 | 614 | 721 | 96 |
| 2002 | 128 | 535 | 623 | 749 | 96 |
| 2003 | 126 | 515 | 599 | 728 | 93 |
| 2004 | 131 | 523 | 593 | 737 | 93 |
| 2005 | 132 | 529 | 620 | 741 | 94 |
| 2006 | 130 | 543 | 647 | 744 | 96 |
| 2007 | 130 | 545 | 685 | 736 | 97 |
| 2008 | 130 | 567 | 725 | 740 | 100 |
| 2009 | 128 | 558 | 710 | 723 | 98 |
| 2010 | **126** | **545** | **707** | **683** | **94** |

* Average daily boardings on NYCT, MTA Bus Co., and private local bus routes.
** Includes data only from routes that operate exclusively north of 60th Street in Manhattan.

## Daily vehicle traffic outside the CBD, two-way vehicle volumes at borough or city boundaries *(All data in thousands)*

| Year | George Washington Bridge | Westchester-The Bronx | Staten Island-New Jersey | Queens-Brooklyn |
|---|---|---|---|---|
| 1990 | 273 | | | |
| 1991 | | | | |
| 1992 | 268 | | 145 | |
| 1993 | 261 | 506 | 141 | 519 |
| 1994 | 260 | 516 | 144 | 537 |
| 1995 | 266 | 532 | 144 | 547 |
| 1996 | 275 | 548 | 147 | 554 |
| 1997 | 282 | 555 | 152 | 580 |
| 1998 | 297 | 566 | 157 | 587 |
| 1999 | 318 | 584 | 167 | 595 |
| 2000 | 318 | 591 | 165 | 614 |
| 2001 | 309 | 607 | 177 | 612 |
| 2002 | 311 | 620 | 179 | 592 |
| 2003 | 319 | 620 | 175 | 612 |
| 2004 | 315 | 627 | 174 | 615 |
| 2005 | 304 | 633 | 172 | 615 |
| 2006 | 312 | 625 | 176 | 601 |
| 2007 | 291 | 636 | 170 | 601 |
| 2008 | 293 | 599 | 166 | 590 |
| 2009 | 290 | 609 | 166 | 592 |
| 2010 | **292** | **617** | **168** | **597** |

# Appendix: Methodology for Crash Data

Crash (accident) data reported in the Project Indicators section is derived from accident reports filed with the New York City Police Department (NYPD). Accident reports are primarily completed by police officers at the scene although they may also be filed by private citizens, generally those involved in the accident. Information from crash reports is entered into an NYPD database. The NYPD database includes the location, time, and number of injuries in all crashes reported to the NYPD. No distinctions of severity are made among the reported injuries. "Non-reportable" crashes, which by definition involve no personal injuries and property damage of less than $1,000, are included in the NYPD database. There is also no distinction between intersection and midblock crashes, so data on all the crashes along a corridor may include midblock crashes on the adjacent perpendicular blocks, thereby slightly overestimating the total number of crashes on the corridor. Before-and-after analyses of NYPD crash data is considered reliable since the same methodology is used for all data.

The tables in the Project Indicators section show the number of crashes in each of the three years prior to project implementation and after implementation. The "after" data is generally for 12 to 18 months, up through January 2012. "After" data is reported at an annual rate.

In analyzing crash data, DOT took account of the annual variability in crashes over the 10 years prior to project implementation, and trends in the number of crashes citywide. The result of the analysis shows whether differences between the pre- and post-implementation crash rates are statistically significant, using a 90% level of confidence. The text notes where statistically significant changes occur.

The analysis of crash data comprises an initial assessment of project impacts. A more definitive analysis requires several years of post-implementation data to determine whether a significant change in the crash rate occurred after implementation. Note that in many cases, the post-implementation rate based on about one year of data is not statistically significant, but would be statistically significant if the post-implementation crash rate is sustained over several years.

**List of Abbreviations**

| | |
|---|---|
| **BID** | Business Improvement District |
| **CAC** | Community Advisory Committee |
| **CB** | Community Board |
| **CBD** | Central Business District |
| **CLS BID** | Court-Livingston-Schermerhorn Business Improvement District |
| **DOT** | New York City Department of Transportation |
| **DSNY** | New York City Department of Sanitation |
| **GPS** | Global Positioning System |
| **MTA** | Metropolitan Transportation Authority |
| **NYCT** | New York City Transit |
| **NYMTC** | New York Metropolitan Transportation Council |
| **NYPD** | New York City Police Department |
| **RFEI** | Request for Expressions of Interest |
| **SAPO** | Street Activity Permit Office |
| **SBS** | Select Bus Service |
| **SBS** | Small Business Services' |
| **TLC** | New York City Taxi and Limousine Commission |

# New York City Department of Transportation

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Commissioner

**Bruce Schaller**
Deputy Commissioner
Traffic and Planning

This report was developed by the New York City Department of Transportation's Division of Traffic and Planning. Deputy Commissioner Bruce Schaller directed the project team which consisted of Sophia Choi, Mike Marsico, Catherine Matera, Stanislav Parfenov, and Andrew Weeks. Ben Killen and David Moidel of Creative Services are responsible for all the graphic elements and general production of the 2011 Sustainable Streets Index.

In addition, the following DOT officials and staff members provided content and input in the creation of this document:

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New York City Department of Transportation


**12%**

Increase in bus ridership on M15 Select Bus Service after implementation of new bus lanes.

*Source: NYCDOT*

**67%**

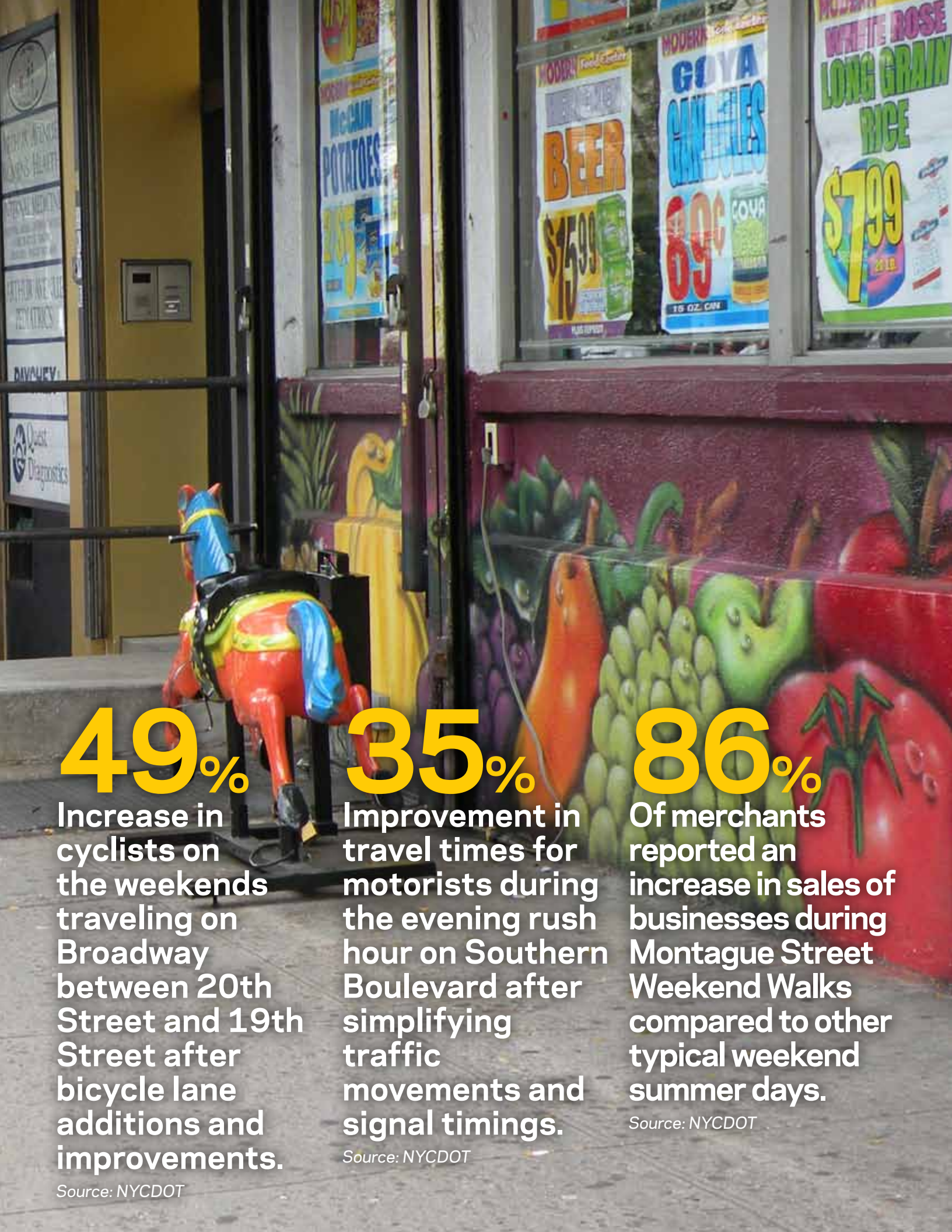
Reduction in crashes involving injuries to pedestrians along East 180th Street from Webster Avenue to Boston Road after narrowing travel lanes and adding turn lanes.

*Source: NYCDOT*

**42%**

Reduction in speeding along southbound West 6th Street from 65th Street to 86th Street after narrowing the roadway and adding turn lanes.

*Source: NYCDOT*




**49%**

Increase in cyclists on the weekends traveling on Broadway between 20th Street and 19th Street after bicycle lane additions and improvements.

*Source: NYCDOT*

**35%**

Improvement in travel times for motorists during the evening rush hour on Southern Boulevard after simplifying traffic movements and signal timings.

*Source: NYCDOT*

**86%**

Of merchants reported an increase in sales of businesses during Montague Street Weekend Walks compared to other typical weekend summer days.

*Source: NYCDOT*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