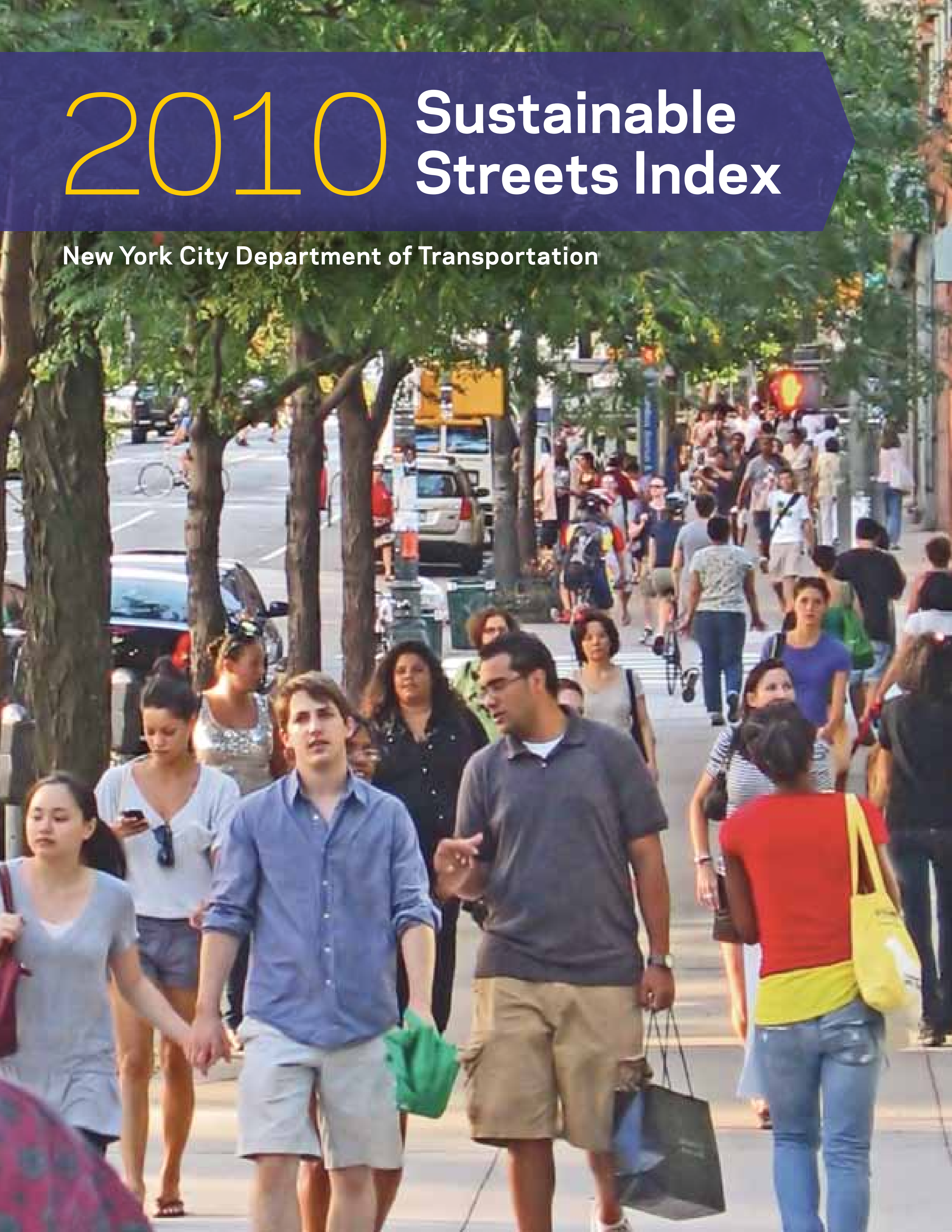
2010 Sustainable Streets Index

New York City Department of Transportation



30% reduction in traffic fatalities in New York City from 2000 to 2010.

Source: NYCDOT

10% growth in bus and subway ridership in New York City from 2000 to 2010.

Source: NYC Transit

262% increase in commuter cycling in New York City from 2000 to 2010.

Source: NYCDOT

5%
reduction in motor vehicle registrations in New York City from 2000 to 2010.
Source: NYS Dept. of Motor Vehicles

2.4%
decline in citywide traffic volumes from 2000 to 2009.
Source: NYCDOT

520k
adult New Yorkers bike at least several times a month.
Source: NYC Dept. of Health

Contents


CLINICA
CENTRAL

Letter from the Commissioner

Dear New York City Council Members and fellow New Yorkers:

Welcome to the 2010 Sustainable Streets Index. The Index represents NYCDOT's abiding commitment to the people of New York City to report annually on transportation conditions, trends and changes that affect both daily life and the City's long-term health. Additionally, it reviews the performance of a set of DOT street improvement projects implemented in recent years.

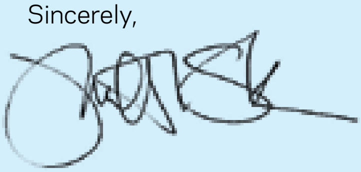
Continual evaluation of trends, data and performance is essential to 21st Century governance, planning and democracy. For example, early editions of the Index highlighted the unparalleled role of public transit in absorbing travel demand during the City's population and economic expansion during the 1990s and 2000s. This year, we note that 80% of new housing units built in the city in the past decade are within walking distance of a subway station or Select Bus Service stop. These findings both point to higher demand for transit in the future, and challenge Albany to resolve the problem of transit funding. Strong patronage of new Select Bus routes provides a counterpoint to our finding that citywide bus ridership is shrinking, underscoring the importance of continued innovation and new models of service.

This third edition of the Index also adds a compilation of travel surveys from neighborhoods around the Five Boroughs. They demonstrate that the City's rich array of transportation choices is not confined to the Manhattan business district, but is without question a city-wide fact of life. In particular, the findings spotlight New York as one of the world's pre-eminent walking cities. Local trips on foot are as prevalent on Fordham Road and in Astoria as they are in Union Square. Pedestrian safety and connectivity feature prominently in all of DOT's work on city streets, including several of the projects we review in detail in this report's Project Indicators section.

The range of projects we examine this year reflects the many dimensions of travel in the city, as well as the Bloomberg Administration's efforts to deliver increased performance from a wide variety of transportation assets. From measures to improve bus speeds and collaboration with businesses to reduce delivery delays, to the addition of greenery and more space for pedestrians in a variety of streetscape settings, NYCDOT is striving to meet the challenges of a growing, 21st Century New York.

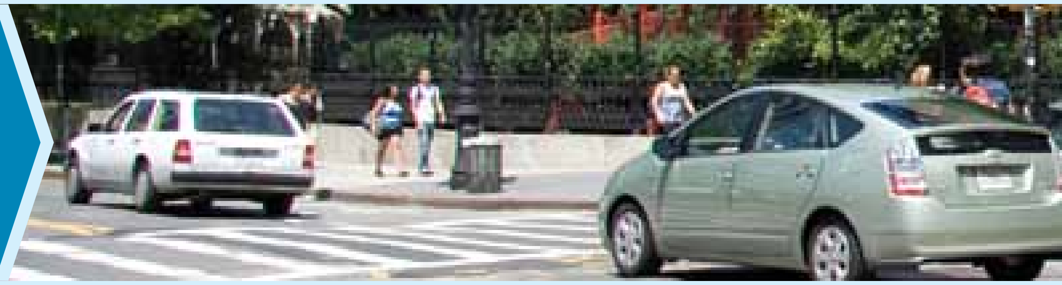
The Sustainable Streets Index provides NYCDOT and all of the stakeholders in the City's transportation system with up to date information and insight into the workings, challenges and successes of travel in New York City, at both city-wide and local scales. Its essential feedback allows for ongoing update and refinement of the City's policies and priorities.

Sincerely,



Janette Sadik-Khan
Commissioner

Executive Summary



Traffic and transit indicators were significantly affected by the economic recession and resumption of job growth that occurred in New York City over the past two-plus years. Initially, transit ridership fell sharply due to job losses, budget cuts and increased fares, while traffic levels edged upward. As the city's economy began to emerge from the recession in 2010, however, subway (though not bus) ridership began to increase while traffic levels flattened out. The key trends, based on comprehensive data available for 2009 and the more limited data available for 2010, are:

- Subway and bus ridership fell 2.5% citywide from 2008 to 2009. The declines were more severe for transit ridership into the Manhattan Central Business District (CBD – defined as 60th Street to the Battery), which experienced more rapid job losses than did the city as a whole; CBD-bound transit ridership fell 5.7% in 2009.
- Traffic levels increased 0.3% citywide and 1.1% for traffic entering the Manhattan CBD from 2008 to 2009.
- Subway ridership began to grow in the spring of 2010 and finished with a 1.5% increase for the year as a whole, while bus ridership declined throughout 2010.
- Citywide traffic levels were not significantly changed in 2010 compared with 2009, based on traffic data from tolled bridges and tunnels and New York City Department of Transportation (DOT) traffic counts at a randomly selected sample of locations throughout the city. (Note that CBD-bound traffic and transit data are not yet available for 2010.)
- The one consistent trend involved bike riding, which continued a pattern of rapid increases. Commuter cycling increased 26% from 2008 to 2009, and an additional 13% from 2009 to 2010.

The available data for 2010 thus suggest that New York City may be positioned to resume the trends seen during the economic expansion of the last decade. From 2003 until the 2008 recession, New York City experienced a period of fully transit-centered economic and population growth in which non-auto modes absorbed all the growth of travel in the city. Vehicle traffic levels declined slightly while subway and bus ridership rose 12% from 2003 to 2008 and commuter cycling increased 79%. These trends were consistent with the transportation and sustainability goals of encouraging mass transit, walking, cycling and ferries established in PlaNYC, the City's sustainability plan for 2030, and Sustainable Streets, DOT's strategic plan.

Looking beyond the recession, sustainable modes of transportation will likely absorb increased travel generated by economic and population growth – but only if the City and the Metropolitan Transit Authority (MTA) commit the resources to support these modes. The importance of investing in transit and other transportation improvements is illustrated by the two bright spots in the overall picture in the last several years. First, while the bus system as a whole was losing ridership, new Select Bus Services (SBS) in the Bronx and Manhattan attracted increased bus ridership. In a similar vein, continued expansion of the bike network spurred large increases in cycling both into the Manhattan core, and in other areas of the city.

The good news looking ahead is that the City and the MTA are continuing to innovate in these areas. DOT and the MTA are continuing the roll-out of SBS routes and developing plans for improved transit service to LaGuardia Airport, the only major airport in the region without rapid transit access. DOT continues to expand the bike network and is exploring a bike share system that would make cycling a more convenient option for point-to-point trips.

These initiatives will be further supported by patterns in population growth in the city. Over the last decade, 80% of new housing units were built within walking distance of a subway station or SBS route, focusing population growth in transit-oriented areas of the city. Increases in population are thus likely to continue to lead to increased use of sustainable modes of transit, biking and walking.

The big if, however, lies in the area of overall bus and subway service. Given continued State budget shortfalls and pressures on the MTA budget, it is unclear whether the recent pattern of MTA service cuts and fare increases can be broken. In addition, the current MTA Capital Program remains only partially funded. Without firmer financing of the city's transit system, the gains of the past decade are clearly at risk.

This third annual Sustainable Streets Index reviews transit and transportation trends in New York City, reports CBD traffic speeds based on taxi Global Positioning System (GPS) data and reports performance indicators for eleven major roadway projects involving changes in street operations. A new section to the report profiles transportation patterns at the neighborhood level. Based on field interviewing in eight neighborhoods, the neighborhood-level data show that overwhelmingly, most people shopping, going to restaurants, running errands and going to and from their homes have traveled to the neighborhood by walking or transit:

- In six diverse neighborhoods (from the Bronx, Brooklyn, Manhattan and Queens) 85-93% of people arrived by transit, biking or walking.
- In two neighborhoods (Astoria, Queens and New Dorp, Staten Island), 60-77% of people arrived by transit, biking or walking.

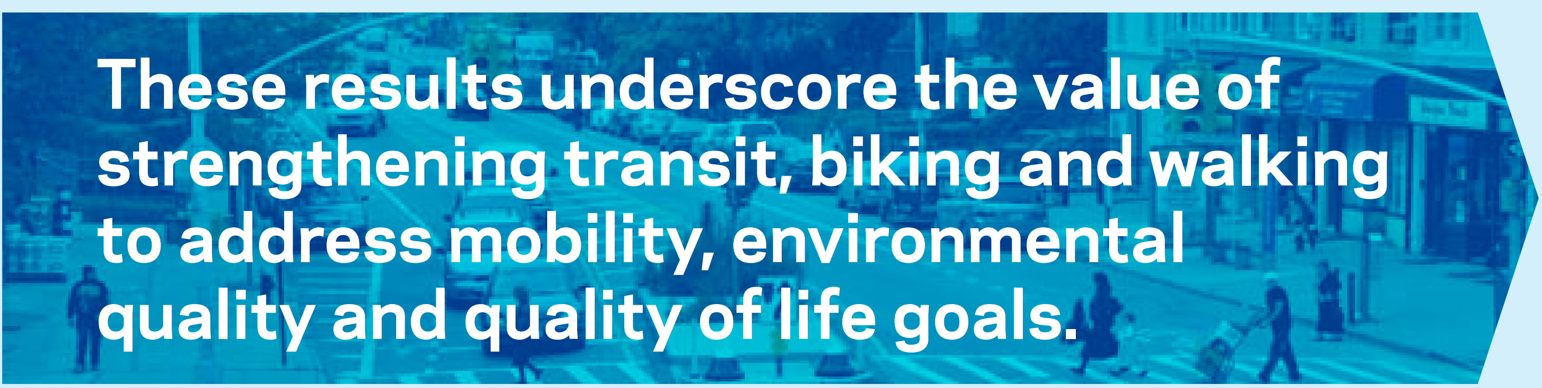
These results underscore the value of strengthening transit, biking and walking to address mobility, environmental quality and quality of life goals.

The neighborhood-level section also shows the broad-based and increasing role that cycling plays in the city's transportation system:

- 520,000 adult New Yorkers bike at least several times a month.
- On key bike routes in Manhattan, bike riders comprise up to one-third of those using the street for transportation – for example, 37% of those traveling on Prince Street in the evening rush period and 32% of those traveling on East 10th Street.
- Installation of improved bike lanes and protected bike paths led to 46% to 268% growth in bike volumes, helping to fuel the overall growth in biking in the city. Examples are the 69% increase on Ninth Avenue in Manhattan, 97% increase on Kent Avenue in Brooklyn and 268% increase on Rockaway Boulevard in Queens.

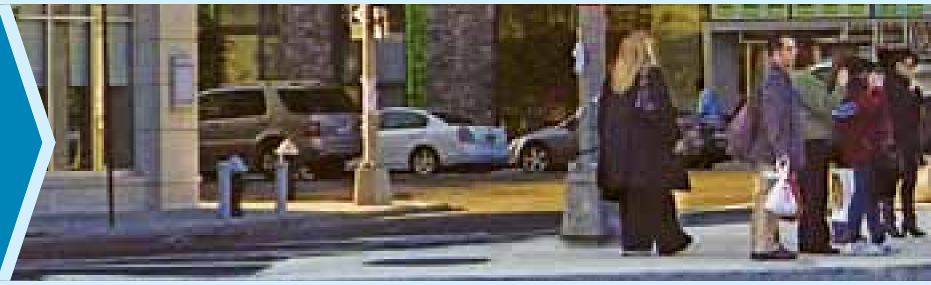
Highlights from the taxi GPS and project-specific performance indicators sections are:

- Traffic speeds in the Manhattan CBD improved by 6% between the fall of 2008 and fall of 2009, and then leveled off in 2010.
- Bus ridership on 34th Street in Manhattan increased by 3-6% after implementation of bus countdown clocks and related improvements to bus service, even as other crosstown bus routes experienced an average drop of 5%.
- Injuries from vehicular crashes decreased by 48% along Gerritsen Avenue in Brooklyn after narrowing the roadway and implementing left-turn bays, a painted median, a pedestrian refuge island and other improvements.
- Injuries from vehicular crashes decreased by 24% along Houston Street in Manhattan after implementation of lane reconfigurations, dedicated left-turn bays, new medians, pedestrian refuge islands and other improvements.
- Injuries to motor vehicle occupants and bicyclists both decreased by 35% along Allen and Pike Streets in Manhattan after implementation of lane reconfigurations, dedicated left-turn bays, pedestrian plazas, pedestrian refuge islands and other improvements.
- Delivery companies' vehicles saw travel times improve 130% from a pilot of off-hour deliveries, based on a comparison of evening and midday travel speeds.
- Traffic delay fell by 70% for northbound vehicles coming off the Pulaski Bridge turning right onto Jackson Avenue in Queens after lane reconfigurations and signal timing changes.
- Parking duration fell by 20% in Park Slope, Brooklyn due to the PARK Smart peak rate pricing pilot, enabling more drivers to find metered spaces and reducing overall traffic volumes on the neighborhood's main commercial avenues.



These results underscore the value of strengthening transit, biking and walking to address mobility, environmental quality and quality of life goals.

Traffic and Transit Trends



In recent years, New York City travel patterns have been marked by generally flat traffic growth and increasing transit ridership and cycling. Concurrently, the city's population and employment have grown. However, the economic recession beginning in 2008 and continuing into 2010 resulted in employment losses and related shifting travel patterns during 2009.

Employment in New York City rose by 7.3% from 2003 to 2008, but then declined by 2.7% in 2009 as a whole, and 3.6% from fall 2008 to fall 2009. Among the five boroughs, employment in Manhattan was down the most in 2009, by 4.8% from 2008, after five straight years of growth. Employment in the outer boroughs was a mix of positive, negative, and no growth. The Bronx was up while Queens and Staten Island were down, and Brooklyn was flat. The city's population climbed slightly by 0.3% in 2009.

Travel costs such as gasoline prices, tolls and transit fares also underwent noticeable changes in 2009. After reaching an all-time high of over $4 per gallon in mid-2008, gasoline prices fell to an average of $2.36 in 2009. Even with a modest price rebound in late 2009, on average the year's gasoline prices were at the lowest level since 2005.

While gasoline prices were down, MTA Bridges & Tunnels tolls increased, affecting tolled crossings within the five boroughs. Following an approximately 11% increase for cash tolls for passenger vehicles on major crossings in March 2008, there was an additional 10% increase in July 2009 to $5.50. Hudson River tolls remained at levels set in 2008.

In June 2009 the transit fares for single rides, the bonus fare and the 30-Day Unlimited pass increased. The single ride fare increased by 12.5% from $2.00 to $2.25 while the 30-Day Unlimited pass – first introduced in 1998 – increased by 9.9% from $81.00 to $89.00. The pay-per-ride bonus still provided an additional ride with a 15% bonus, however with a minimum purchase of $8.00 instead of $7.00. Additionally, with the single ride base fare increase the average bonus fare climbed from $1.74 to $1.96.

Traffic

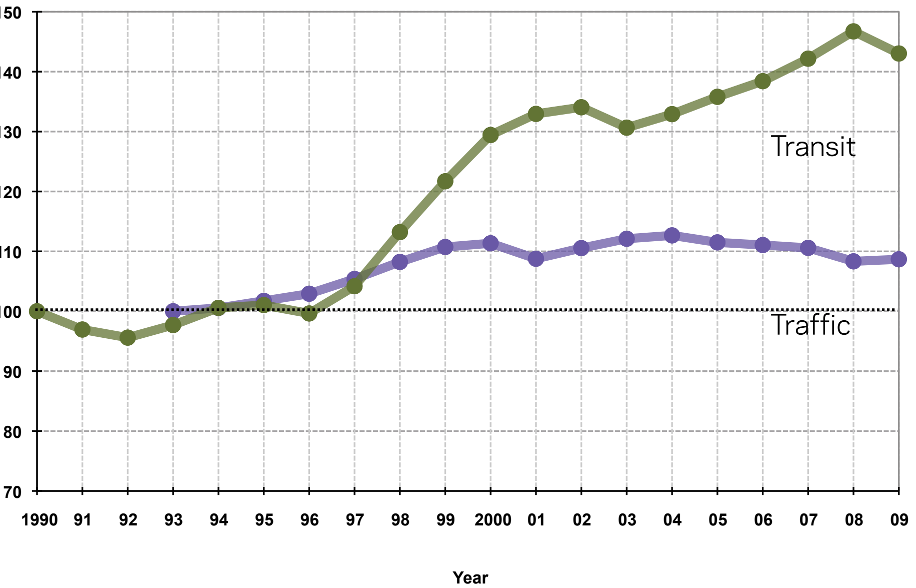
Citywide traffic increased slightly by 0.3% but overall still remained 1.7% below 2007 levels. Citywide travel levels are down by just over 3% since 2003.

Like employment, traffic volumes have been more volatile for vehicles entering the CBD than for non-CBD traffic. CBD-bound traffic, which had declined from 2004 to 2008, ticked upward by 1.1% in 2009, but is still 2.7% below 2007 levels. Traffic increases ranged from 1%-2% for the 60th Street and Brooklyn Sectors and 4.8% for Queens, while traffic from New Jersey dropped by nearly 6%. Furthermore, crossing 60th Street into the CBD, traffic increases were observed along the periphery, east of Park Avenue and west of Eighth Avenue. Traffic levels in the core of Manhattan – which is better served by transit – were generally down.

Traffic volumes outside the CBD were generally flat between 2008 and 2009 with an observed increase of only 0.2%. The Citywide Traffic Index – a new collection of

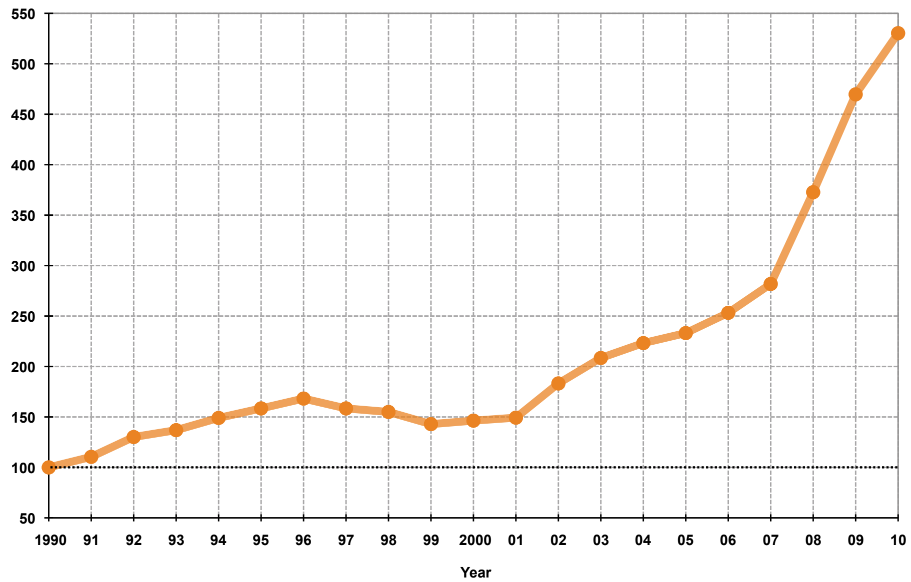
- 2.5% decline in bus and subway ridership in 2009, but remained higher than 2007 level.
- 9.5% increase in bus and subway ridership since 2003.
- 0.3% increase in weekday traffic volumes in 2009, but still below 2007 level.
- 3.1% decline in weekday traffic volumes since 2003.

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



- 26% increase in bicycle commuting into the Manhattan core from 2008 to 2009.
- Additional 13% increase in bicycle commuting from 2009 to 2010.
- 154% increase in bicycle commuting since 2003.

Bicycle Commuting *(Indexed to 1990)*



traffic counts in the four outer boroughs – showed a generally flat trend, mirroring the other counts that monitor non-CBD traffic. Some river crossings had declines with the largest decreases observed at the Bronx-Queens boundary, due to on-going roadwork on the Bronx-Whitestone Bridge (down 3.4%) and the Throgs Neck Bridge (down 6.1%).

Transit

Due to a combination of the economic recession and employment losses and, to some extent, increased fares and lower gas prices, gains in transit ridership during previous years were reversed in 2009. Transit ridership decreased 2.5% in 2009 compared with 2008, with both subway and bus ridership numbers falling. Reduced ridership was likely not due to service changes, which were minor in 2009 for MTA New York City Transit (NYCT) bus routes and subways.

As with job losses and traffic levels, transit ridership into the CBD was more affected by the recession than was the case with citywide ridership. Transit ridership into the CBD declined by 5.7% in 2009 to a level observed between 2006 and 2007. CBD-bound transit ridership from all four sectors was down, especially for the 60th Street crossing, which declined by approximately 9% to a pre-2006 level. Transit ridership from Queens and Brooklyn were each down about 5%, and just under 1% crossing the Hudson River from New Jersey. CBD-bound ridership was up 2.5% from Staten Island due to gains on the ferry.

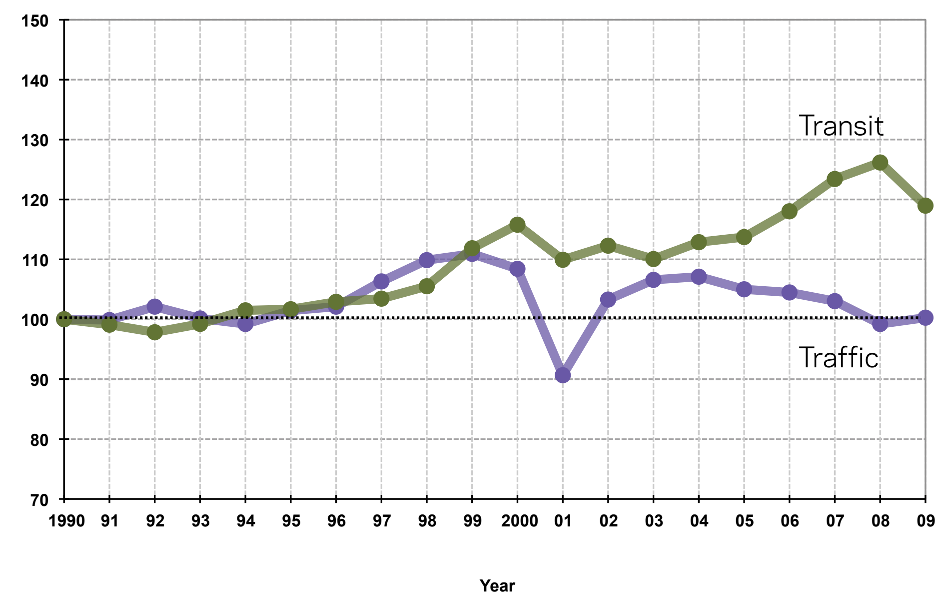
In the outer boroughs and Manhattan north of 60th Street, bus ridership was down 2% overall from 2008 to 2009. Queens, Brooklyn, and Staten Island local bus ridership were down by a similar percentage, while the Bronx and upper Manhattan were each down by about 1.5%. However, the 2009 bus ridership outside the CBD still remained up 1.2% from 2007.

Preliminary subway ridership data through October 2010 show a rebound of 1-2% from the 2009 figures, though not back to 2008 levels. Local bus ridership continues to decline across all boroughs, although Queens figures are approximately flat from 2009 led by growth along routes that the MTA took over from private operators several years ago. Significant service modifications and cuts for bus routes and subway lines were put into effect during the summer of 2010, and the fare was increased at the very end of 2010. The complete 2010 data and 2011 ridership data will be needed to determine the impacts of the service cuts and fare increase.

Due to the recession and fare increases, transit ridership decreased 2.5% in 2009 compared with 2008, with both subway and bus ridership numbers falling.

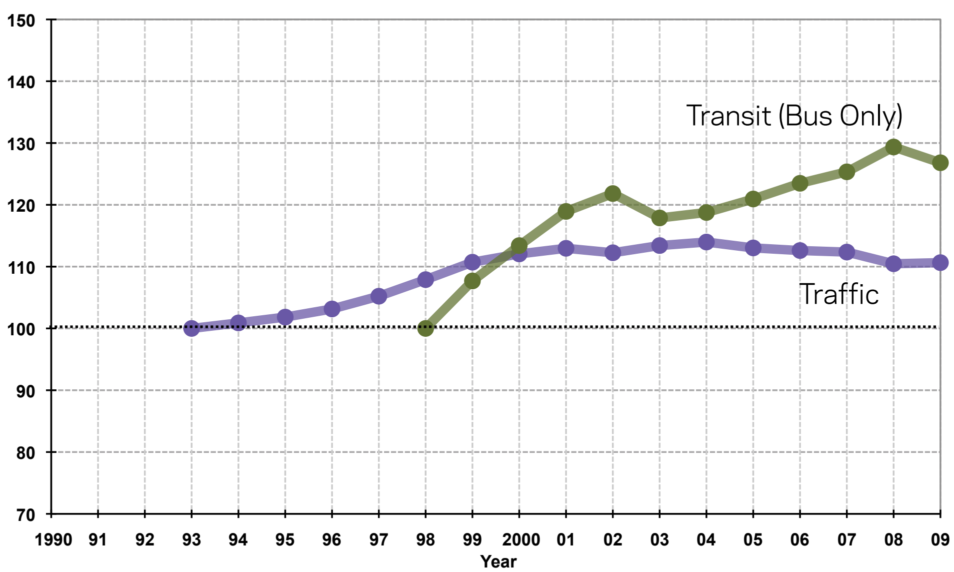
- **5.7% decline in transit (bus and subway) ridership in 2009.**
- **8.1% increase in transit ridership since 2003.**
- **1.1% increase in traffic volumes into the CBD in 2009, but remained lower than 2007 level.**
- **5.9% decrease in traffic volumes since 2003.**

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



- **2.0% decrease in bus ridership outside the CBD in 2009, but still above the 2007 level.**
- **7.6% increase in bus ridership outside the CBD since 2003.**
- **0.2% increase in traffic volumes outside the CBD in 2009.**
- **2.4% decrease in traffic volumes since 2003.**

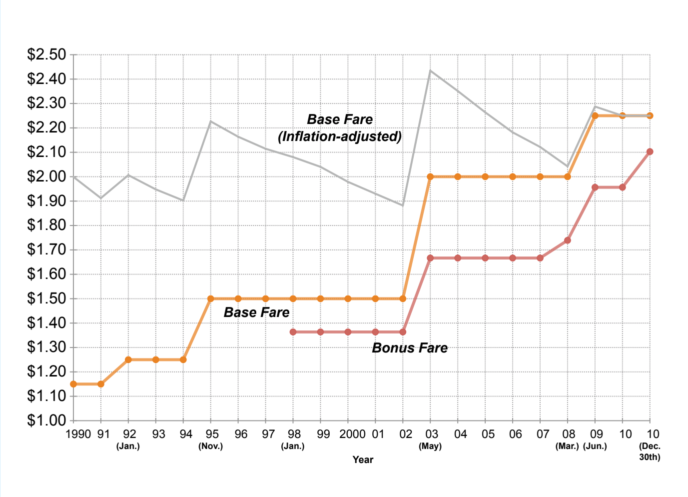
Transit and Traffic Outside the CBD
(Traffic indexed to 1993/Transit indexed to 1998)



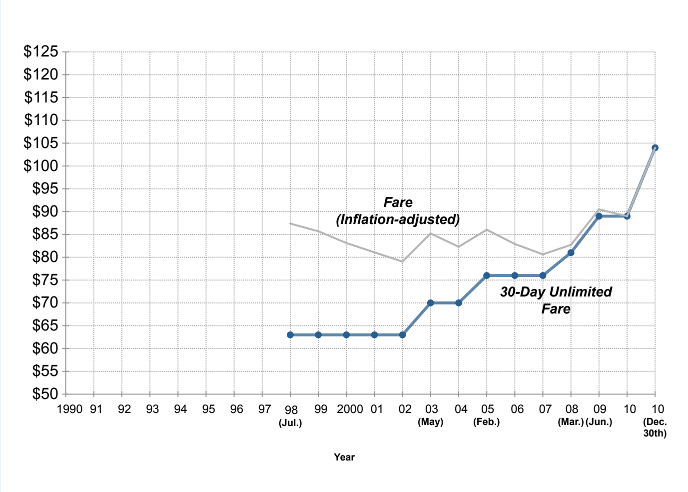
Note: Borough-level bus ridership is not available prior to 1998. Subway ridership is not shown because data for subway trips made exclusively outside the CBD cannot be separated from data for trips beginning or ending inside the CBD. Note that a large majority of subway trips that begin outside the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

Regional Transportation System

MTA/NYCT Fares



MTA/NYCT 30-Day Unlimited Pass



Timeline

1992

New direct bus service between Manhattan and LaGuardia Airport

1993

DOT launches the Red Light Program which takes pictures of the license plates of vehicles that run red lights

1994

1995

E-ZPass introduced in New York City

NYC Transit's bus fleet becomes 100 percent accessible to customers with disabilities

1996

NJ Transit opens Kearny Connection, beginning Midtown Direct service

1997

E-ZPass accepted at all regional crossings

Full integration of MetroCard on Subway and Bus System & Free transfers

1998

1-day, 7-day, 30-day and Bonus MetroCards introduced

NYC Transit introduces hybrid-electric buses

1999

First MetroCard vending machines introduced

2000

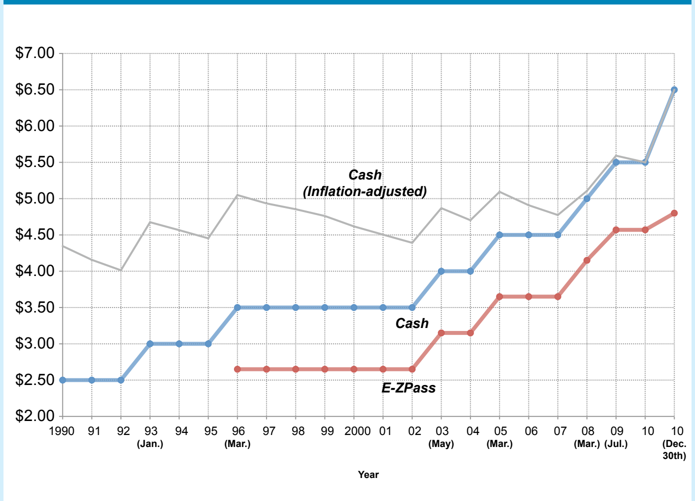
Articulated buses begin service in Manhattan. They have 22 more seats than standard buses and can carry almost twice as many customers

2001

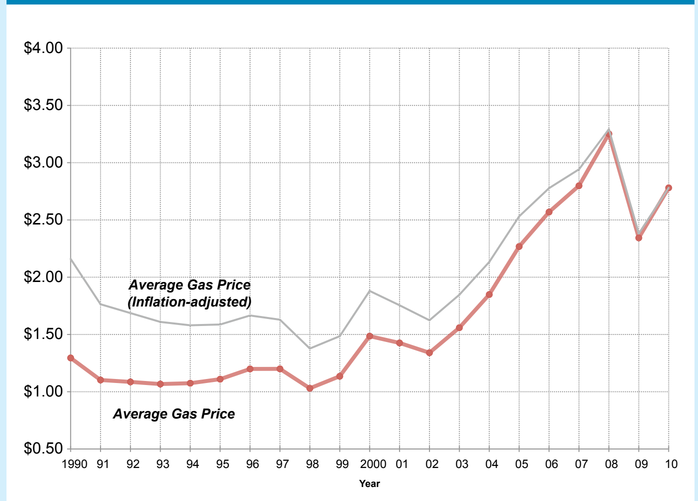
63rd Street Tunnel opens to Qns. Blvd. IND Service

Travel restrictions implemented post-9/11 on major roadways (Single-Occupant Vehicle Ban, No Commercial Vehicles)

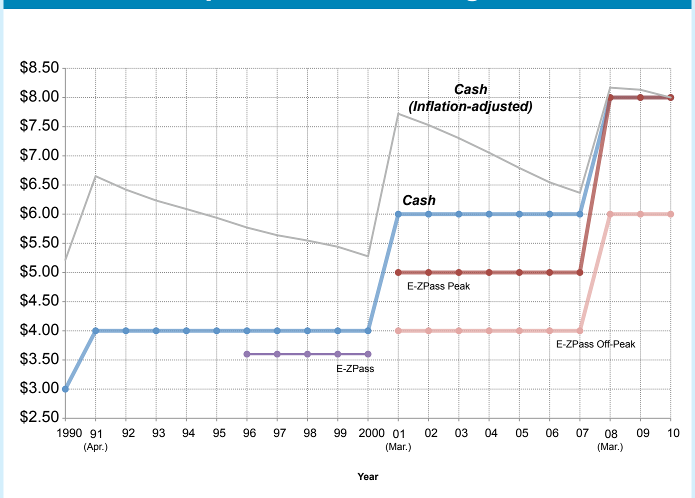
MTA Bridges & Tunnels Passenger Car Toll



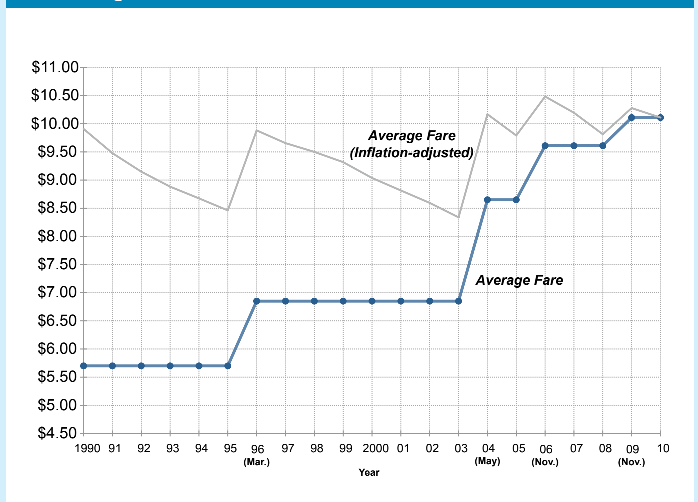
Average Gas Price



Port Authority of NY & NJ Passenger Car Toll



Average Taxi Fare



2002

All city curbs are ADA-compliant

2003

Opening of Secaucus Junction in December

PATH service restored to Lower Manhattan in November

JFK AirTrain begins service

2004

Central Park High-Occupant Vehicle (HOV) restriction introduced in November on West Drive

Full subway service restored on the Manhattan Bridge

2005

2006

2007

Manhattan Bridge peak hour HOV lane put in place

2008

Select Bus Service debuts on Fordham Road, Bronx, and 34th Street Bus Priority, Manhattan

2009

DOT completes implementation of 200 miles of bike lanes in three years

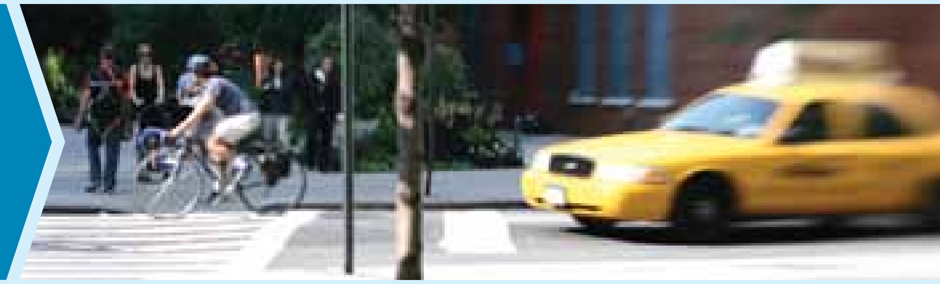
DOT creates pedestrian plazas in Herald Square and Times Square

2010

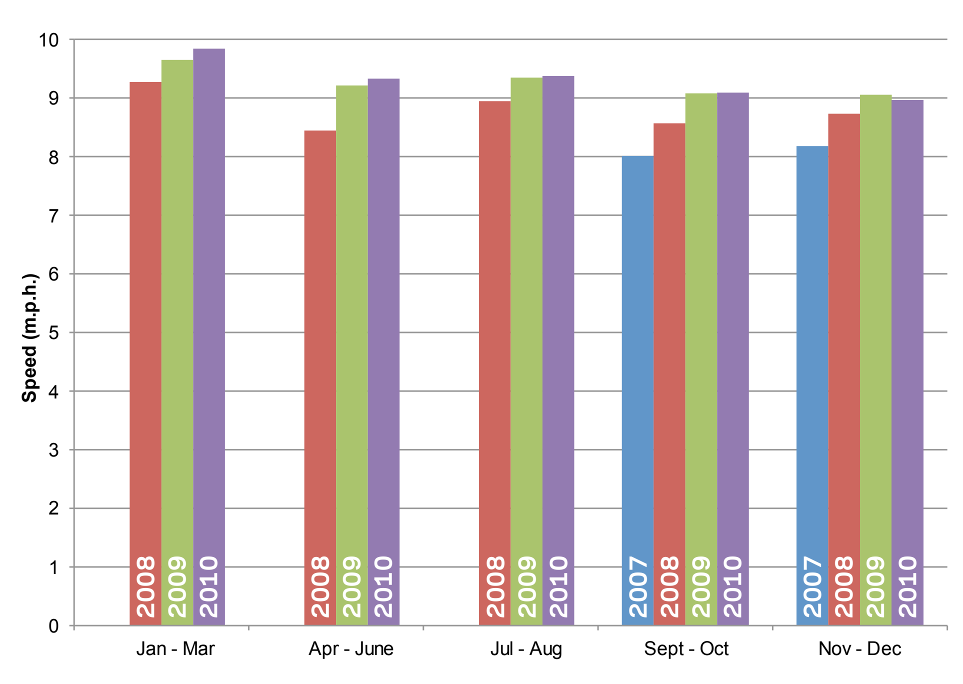
Select Bus Service begins on 1st and 2nd Avenues in Manhattan

MTA eliminates service on 2 subway lines and 37 bus routes

Manhattan Traffic Speeds



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



Speed Trends

Methodology

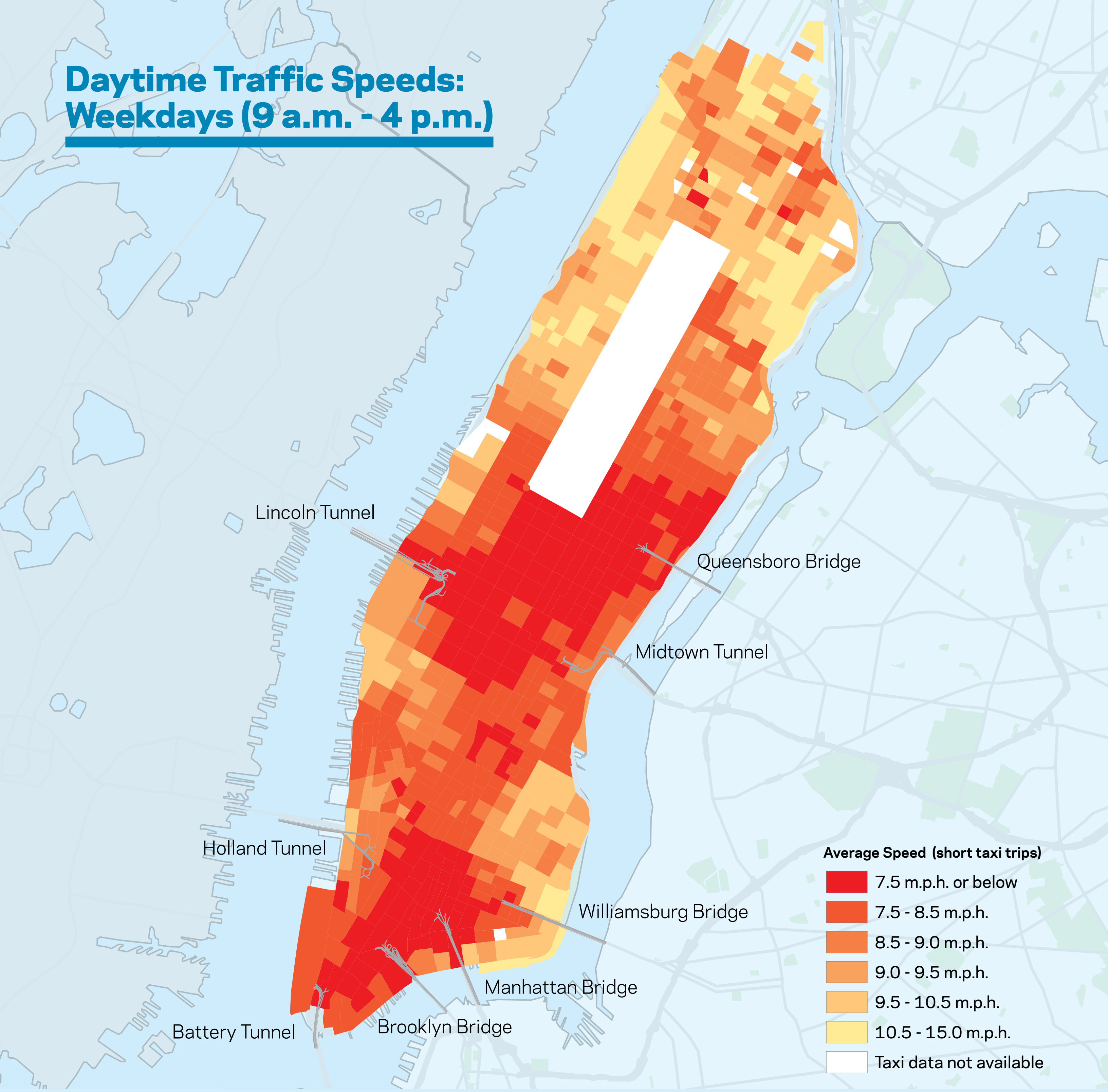
All yellow taxicabs are equipped with GPS devices which create electronic trip sheets for all customer-carrying taxi trips 24 hours a day, seven days a week. The data includes time and location of trip origin and trip destination, time elapsed, distance traveled, and fare. The system records approximately 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. DOT has usable data from fall 2007 to the present.

Findings

The taxi GPS dataset provides the first comprehensive view of network-wide traffic speeds in Manhattan. The taxi speed data are based on the distance and duration of the entire trip for customer-carrying taxi rides. Speeds reflect both time in motion and time spent stopped in traffic or at red lights. The data can be used to track shifts in traffic speeds across time (from year to year, from day to day, or from hour to hour within the typical day), and for trips in different geographic areas. Findings from the data include:

- Traffic speeds in the Manhattan CBD improved by 6% between the fall of 2008 and fall of 2009
- Speeds leveled off in 2010
- Weekday speeds average 9.3 mph for CBD trips between 8 a.m. and 6 p.m. in 2010
- Speeds during January, February and March are on average 5% faster compared to the rest of the year
- January is the fastest month and December is the slowest
- One-third of the top 100 fastest days are in January, February and March

Daytime Traffic Speeds: Weekdays (9 a.m. - 4 p.m.)



Daytime Traffic Speeds

Methodology

The data shown in the map are based on GPS data for short-distance trips (up to a half mile) from typical weekdays (excluding major holidays) between 9 a.m. and 4 p.m. between November 2009 and October 2010. Speeds are calculated for small zones using the median speed for taxi trips in each zone. Data reflect these average zonal speeds, not speeds for individual streets. Zones with insufficient number of taxi trips are not included.

Findings

- Daytime speeds are slowest in Midtown and Lower Manhattan; these areas also have the largest amount of taxi pickups and drop offs
- Speeds are somewhat similar to Midtown on the west side up to about 76th Street and up to 86th Street on the east side
- The average speed for short distance trips on the map is 6.8 m.p.h.

Manhattan Traffic Speeds Day By Day

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12	13	14	15	16	17	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 14.2 m.p.h. and 12.0 m.p.h.). Most occur on major holidays or on Sundays in January or July.

The next 75 fastest days (average daily speed between 12.0 and 10.8 m.p.h.). Most occur on weekends, or immediately before or after holidays, especially early in the year.

Between the 100 fastest days and 100 slowest days are the 165 days with average daily speeds between 10.8 and 9.6 m.p.h. Most are weekdays, though most Saturdays in the last quarter of the year also fall into this group.

The next 75 slowest days (9.6 to 9.1 m.p.h.). Most are mid-week weekdays scattered throughout the year, with visible blocks in the spring and late in the year.

The 25 slowest days (9.1 to 6.4 m.p.h.). Most occur in the latter part of the year and all are weekdays. The heaviest concentration are in late September during the United Nations General Assembly, and in 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.)

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.)

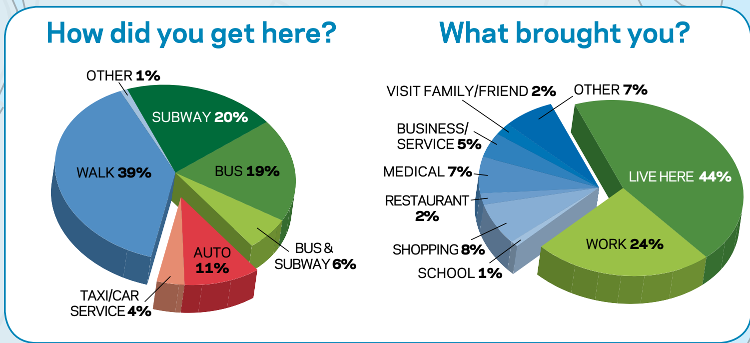
Slowest Day

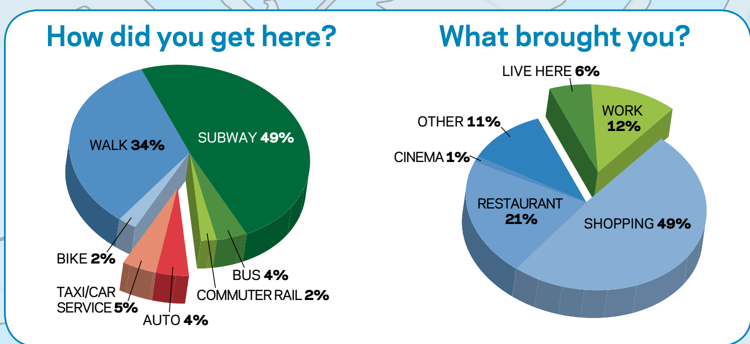
- 2008: Wednesday, September 24 (7.0 m.p.h.)
- 2009: Monday, December 21 (8.0 m.p.h.)
- 2010: Wednesday, December 29 (6.4 m.p.h.)

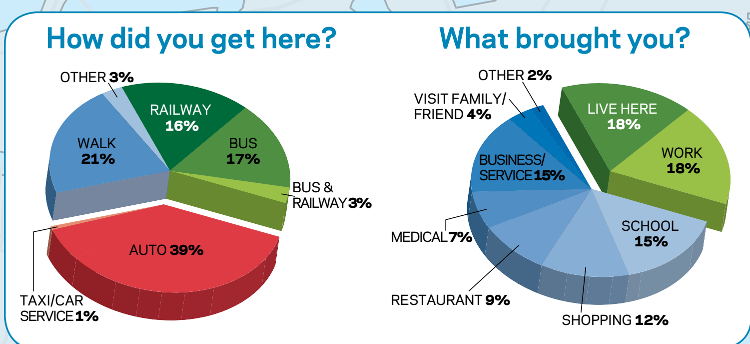
2010 Holidays

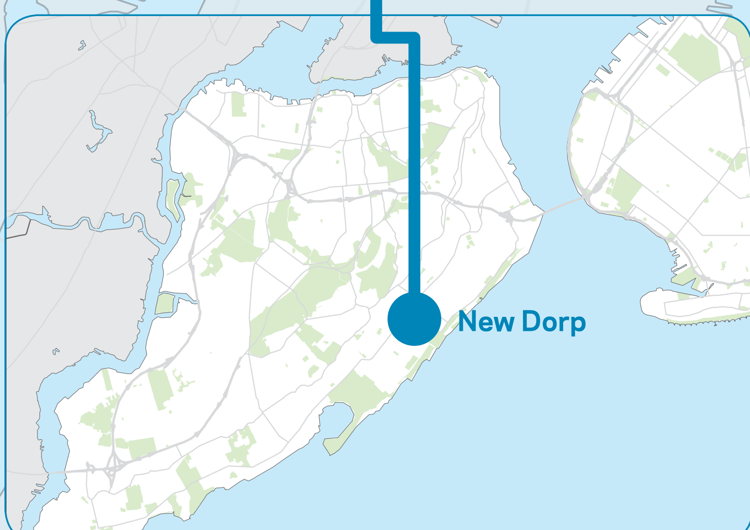
January	New Year's Day (1)
	Martin Luther King Jr. Day (18)
February	President's Day (15)
April	Easter Sunday (4)
May	Memorial Day (31)
July	Independence Day Observed (5)
September	Labor Day (6)
October	Columbus Day (11)
November	Veteran's Day (11)
	Thanksgiving (25)
December	Christmas Day (25)

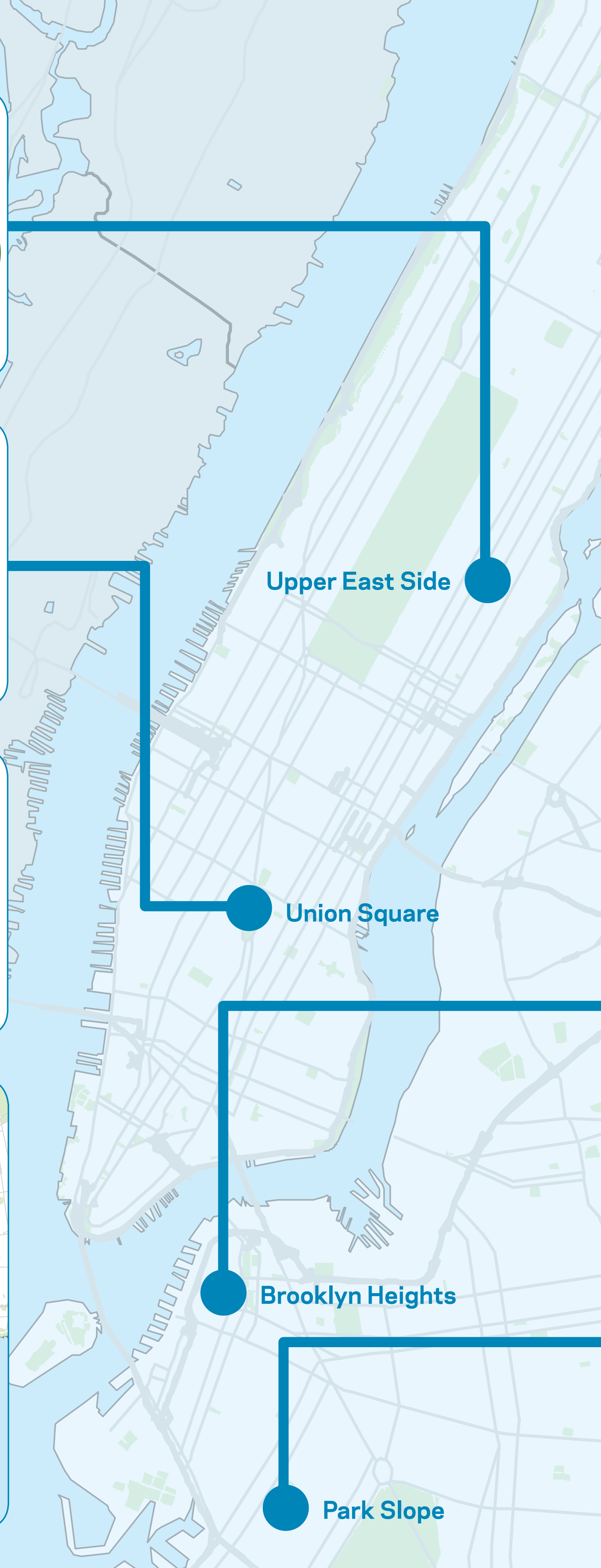
A substantial majority of people interviewed in eight diverse neighborhoods arrived by walking or transit.

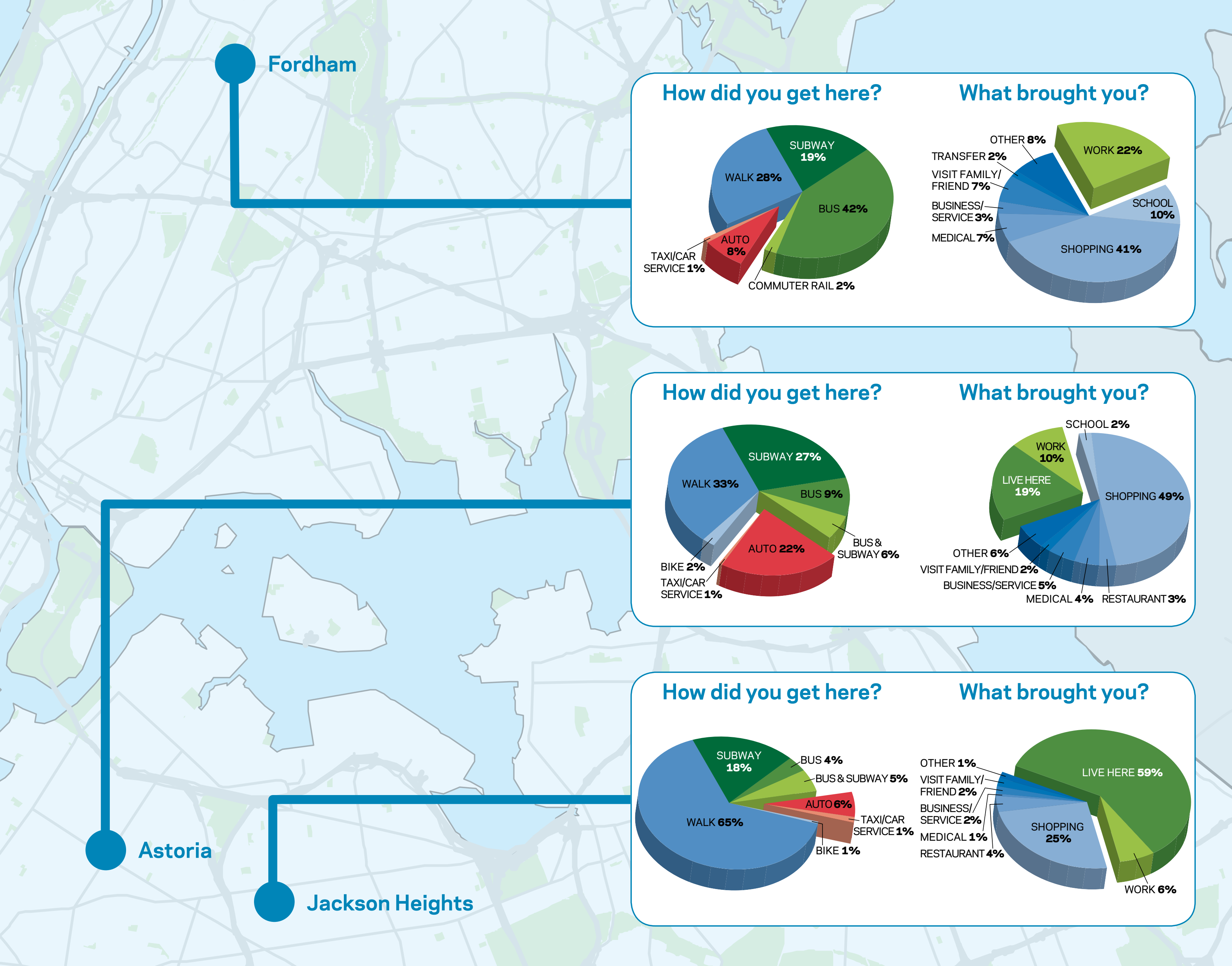


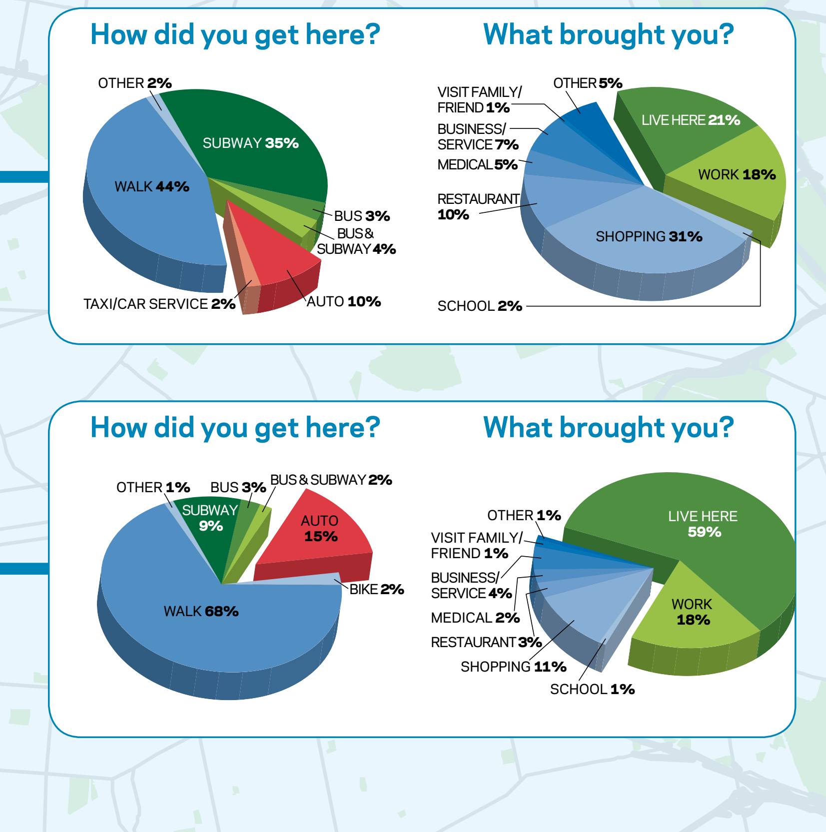












DOT staff conducted intercept surveys at eight locations for various projects between December 2008 and March 2011. While each survey was completed for different types of DOT projects such as Select Bus Service and PARK Smart, all the surveys were designed to better understand people's travel behavior. The surveys were conducted in areas with a high concentration of shopping and during peak shopping times on weekdays and weekends. For all eight surveys, respondents were asked how they got to the area and their reason for making the trip.

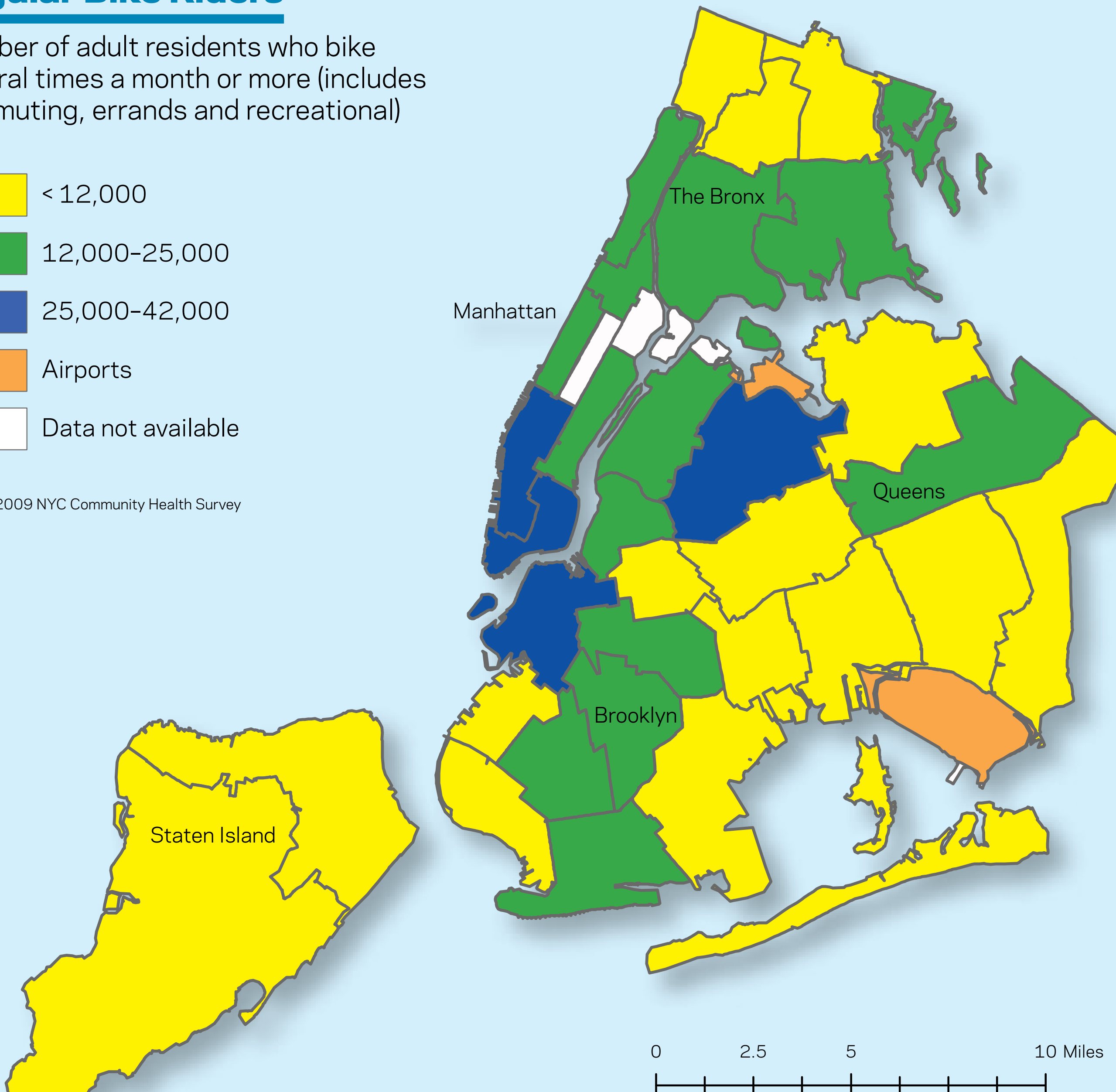
The survey results indicate that 85-93% of respondents walked, rode a bicycle or used public transportation to get to their destination except in Astoria and New Dorp where the figures were 77% and 60%, respectively. Auto and taxi use accounted for only 7-15% of trips except in Astoria (23%) and New Dorp (40%). The trip purposes for over 60% of respondents were shopping, live here and work except for the New Dorp neighborhood in Staten Island. Forty-eight percent of respondents were on New Dorp Lane to shop or work or because they lived in the neighborhood, 15% were there for school and 15% were taking care of personal business such as going to the bank or library. The category "live here" represents survey respondents that live in the survey neighborhood but did not have a specific trip purpose. The survey conducted along Fordham Road did not have a "live here" category for respondents to select.

Regular Bike Riders

Number of adult residents who bike several times a month or more (includes commuting, errands and recreational)

- < 12,000
- 12,000–25,000
- 25,000–42,000
- Airports
- Data not available

Source: 2009 NYC Community Health Survey

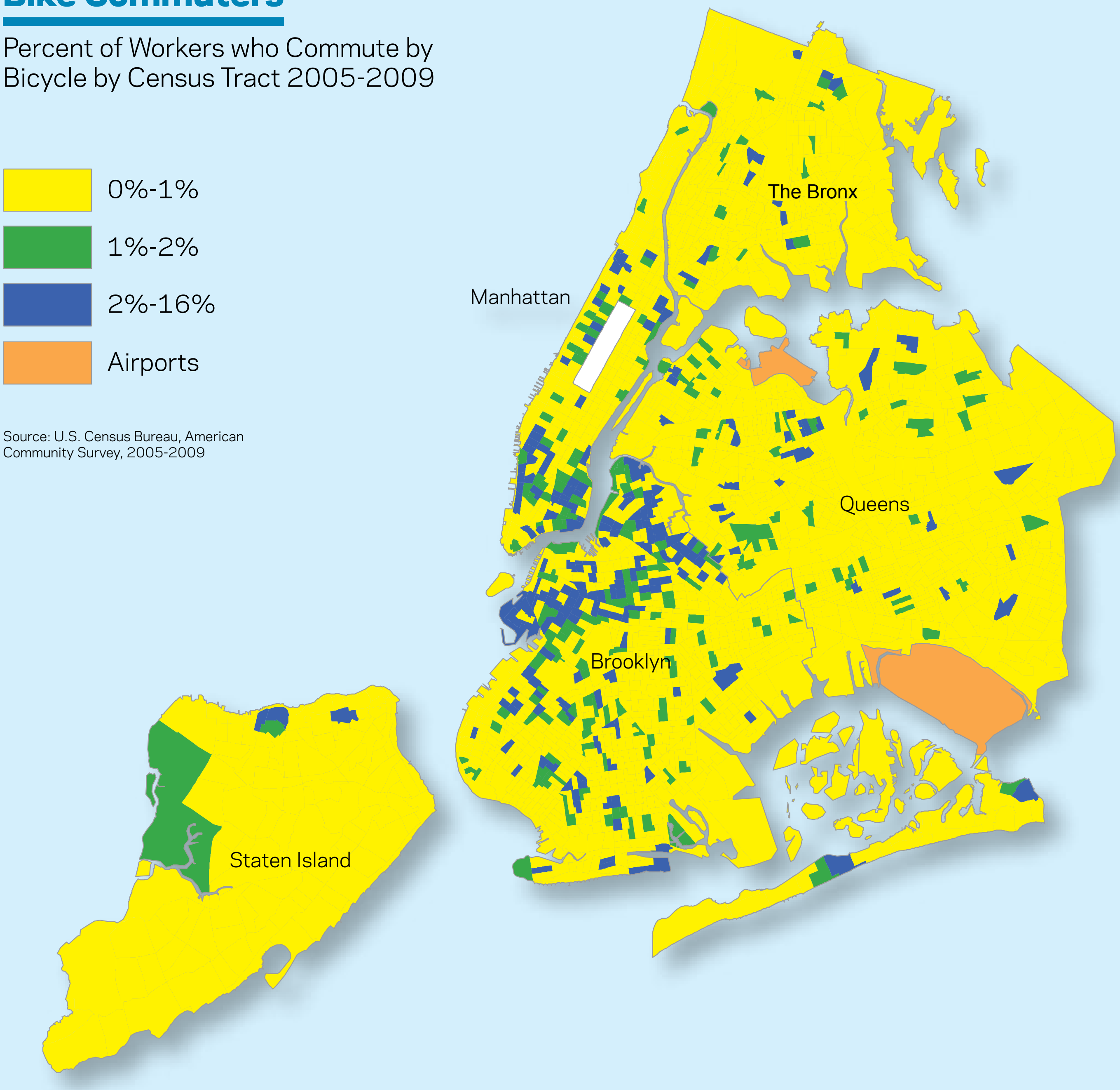


Bicycle Facts

- 520,000 NYC adults are regular bike riders
- Commuter cycling has doubled since 2006
- In the evening rush hour, cyclists are:
  - 37% of traffic on Prince Street (Mn)
  - 32% of traffic on East 10th Street (Mn)
  - 26% of traffic on Bleecker Street (Mn)
  - 22% of traffic on Hoyt Street (Bk)
  - 12% of traffic on Prospect Park West (Bk)
- Cycling increases after installation of bike lanes:
  - Kent Avenue (Bk) 97% increase
  - Grand Street (Mn) 56% increase
  - 9th Avenue (Mn) 69% increase
  - Prospect Park West (Bk) 199% increase
  - Vernon Avenue (Qn) 46% increase
  - Rockaway Boulevard (Qn) 268% increase
  - 28th Street (Qn) 77% increase
  - Smith Street (Bk) 46% increase
  - Manhattan Avenue (Bk) 66% increase

Bike Commuters

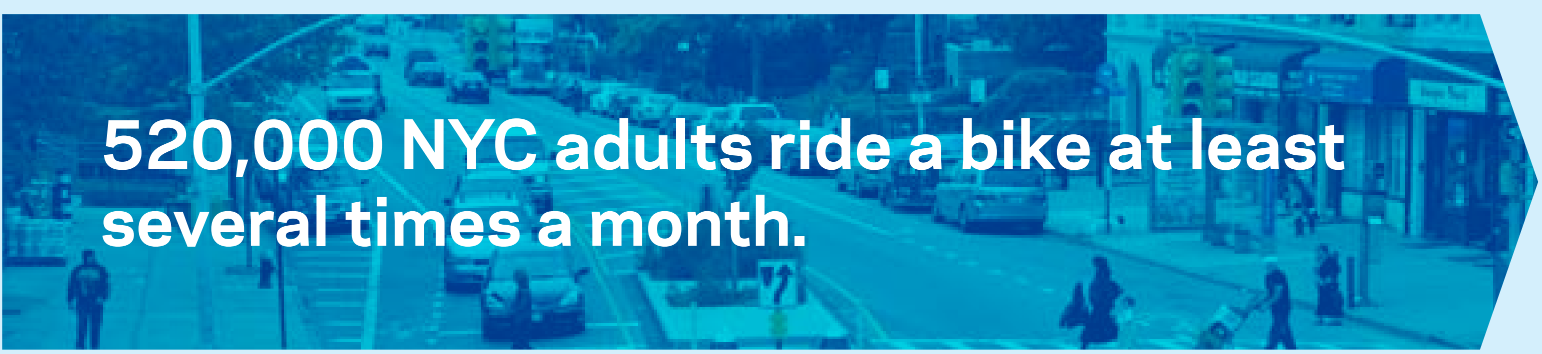
Percent of Workers who Commute by Bicycle by Census Tract 2005-2009



Source: U.S. Census Bureau, American Community Survey, 2005-2009

"Regular Bike Riders" data covers all NYC adults, and all trip purposes.

"Bike Commuters" data covers workers who report bicycling as their "usual" mode of travel to work for the week prior to the survey. It excludes workers who bike to work a few times a week as well as non-commuter trips (e.g., shopping, leisure, personal appointments), which comprise 82% of all trip-making.



Safety, Pedestrian & Bicycle Improvements

1. Gerritsen Avenue
2. West Houston Street
3. Allen and Pike Streets
4. Jackson Avenue
5. Park Circle
6. Allerton Avenue

Transit Mobility Improvements

7. 34th Street Bus Priority

Congestion Reduction

8. Belt Parkway Access/Egress Improvements
9. Amboy Road
10. Off-Hour Deliveries*

Parking

11. PARK Smart - Park Slope Pilot

* Citywide

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 encouraging more sustainable means of transportation.

This section reports on 11 major DOT projects that were implemented by the end of 2009. In each case, DOT collected before and after performance indicators. 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, bus and bicycle enhancements; traffic calming; congestion reduction; and parking and truck regulation. 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 Gerritsen Avenue, safety improvements, traffic calming measures such as reducing the number of travel lanes, simplifying turning movements, and installing a pedestrian refuge island have proven to significantly reduce crashes along the corridor while not causing congestion with fewer lanes. The Jackson Avenue/Pulaski Bridge project helped transform an old industrial neighborhood to meet the needs of new residential development for safe pedestrian routes through the area and to public transportation. Pedestrian safety and connectivity was also paramount to the Park Circle and Allen Street/Pike Street projects. Changes at Park Circle provide safe pedestrian, bike and equestrian routes to and from the park and surrounding area. At Allen and Pike Streets, pedestrian plazas were created to provide an enjoyable space for the public.

Other projects improve the operation of a street by modifying traffic signal timing or phasing. On Amboy Road in Staten Island, DOT changed the timing of the signals to improve traffic flow. In Brooklyn at the intersection of Bay Parkway and Cropsey Avenue, signal timing changes were implemented to reduce conflicts between pedestrians and vehicles making left turns. Signal timing changes were also completed to give priority treatment to buses turning left from 34th Street onto Seventh Avenue in Manhattan.

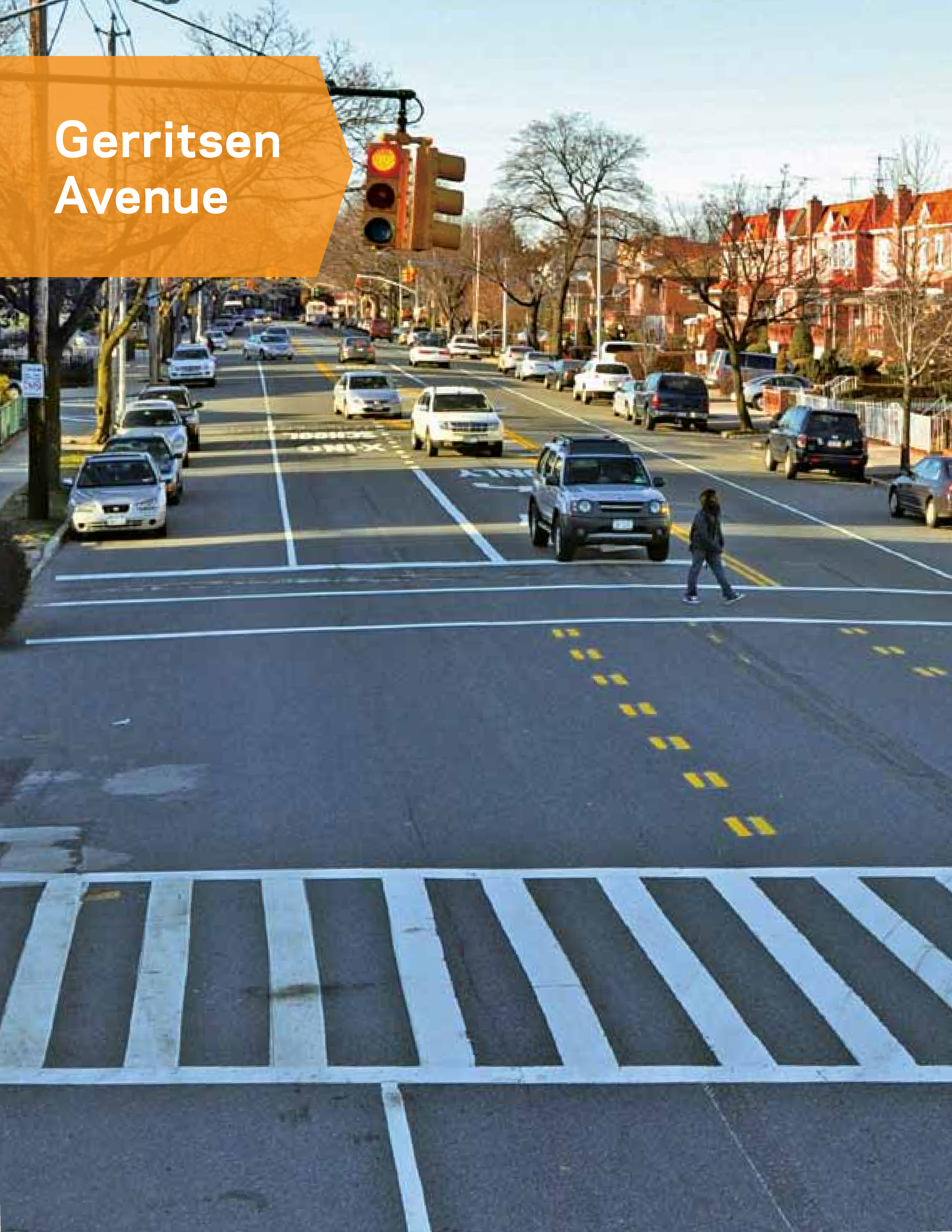
Goals can often be accomplished simply by adding streetscape enhancements. On West Houston Street, benches, trees and a landscaped median were installed throughout the project area along with historic-style lamp posts, tinted sidewalks and granite curbs. A new park was created by simplifying the intersection at Sixth Avenue and Bedford Street.

In the PARK Smart pilot in Park Slope, DOT adjusted meter rates to encourage turnover of parking spaces, thus enabling more people to park in a given space for the purpose of shopping, going to medical appointments and the like.

Highlights from the project performance indicators are:

- Injuries from vehicular crashes decreased by 48% along Gerritsen Avenue in Brooklyn after narrowing the roadway and implementing left-turn bays, a painted median, a pedestrian refuge island and other improvements.
- Injuries from vehicular crashes decreased by 24% along Houston Street in Manhattan after implementation of lane reconfigurations, dedicated left-turn bays, new medians, pedestrian refuge islands and other improvements.
- Injuries to motor vehicle occupants and bicyclists both decreased by 35% along Allen and Pike Streets in Manhattan after implementation of lane reconfigurations, dedicated left-turn bays, pedestrian plazas, pedestrian refuge islands and other improvements.
- Pedestrian safety and connectivity improved in the area of Jackson Avenue and the Pulaski Bridge in Queens, Park Circle in Brooklyn, and Allen and Pike Streets in Manhattan, with installation of pedestrian refuge islands, signal-protected crosswalks and related changes.
- Bus ridership along 34th Street in Manhattan increased by 3-6% after implementation of bus countdown clocks and related improvements to bus service, even as other crosstown bus routes experienced an average drop of 5%.
- Delivery companies' vehicles saw travel times improve 130% from a pilot of off-hour deliveries, based on a comparison of evening and midday travel speeds.
- Travel times improved by up to 2 minutes on Amboy Road in Staten Island, after implementation of signal timing adjustments, lane reconfigurations, left-turn bays and other improvements.
- Traffic delay fell by 70% for northbound vehicles coming off the Pulaski Bridge making a right onto Jackson Avenue in Queens after lane reconfigurations and signal timing changes.
- Parking duration fell by 20% in Park Slope, Brooklyn due to the PARK Smart peak rate pricing pilot, enabling more drivers to find metered spaces and reducing overall traffic volumes on the neighborhood's main commercial avenues.

Gerritsen Avenue



Purpose

- Reduce excessive vehicle speeds
- Improve pedestrian and driver safety

Outreach

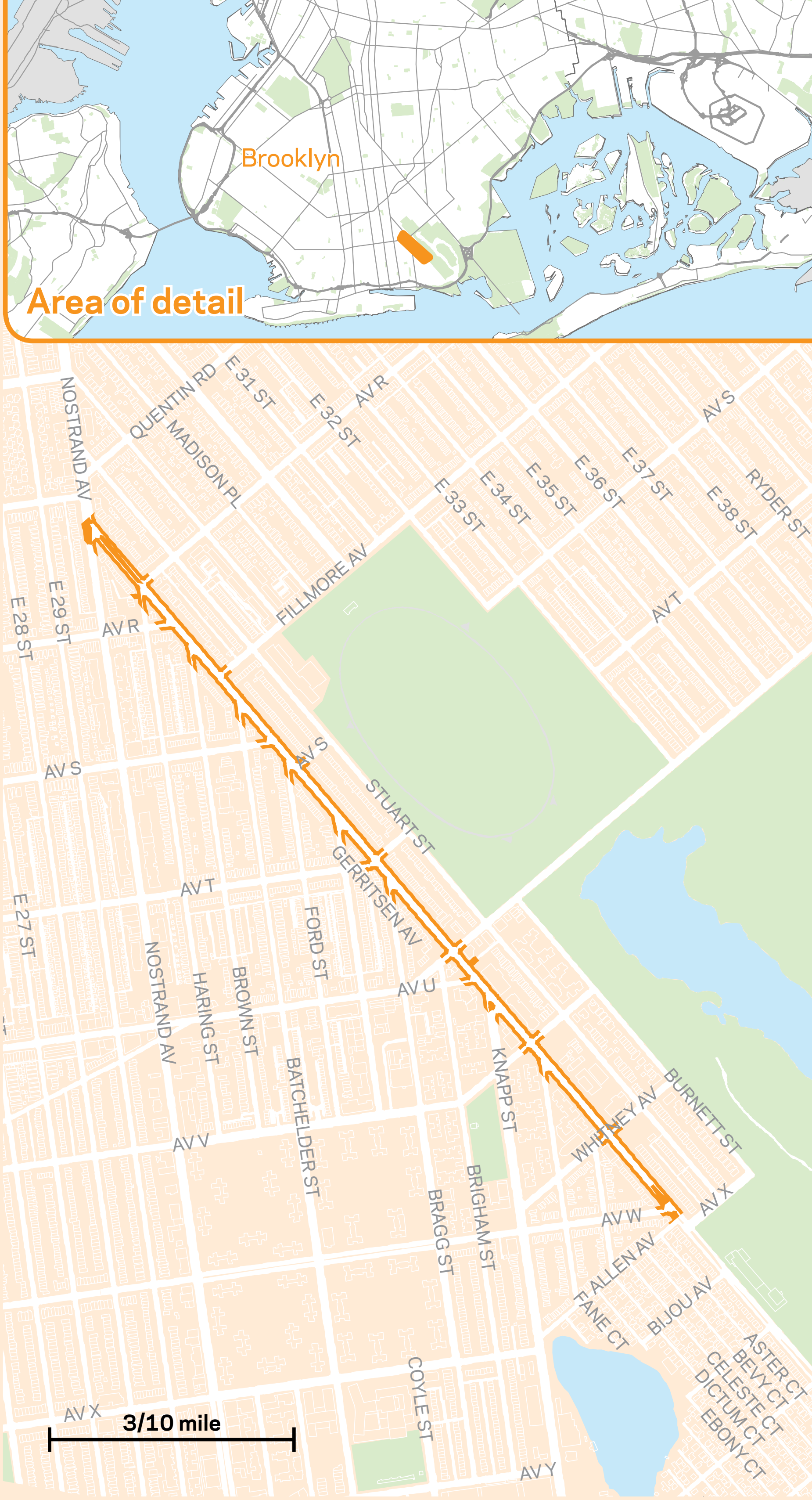
- DOT studied potential safety improvements in response to community concerns
- DOT met with the Brooklyn Community Board 15 Transportation Committee (CB15) and elected officials in July 2009 to present a safety and traffic calming proposal
- DOT presented plans to CB15 and elected officials in October 2009 and received feedback
- DOT modified the plans based on community input

Approach

- Narrowed the roadway from two moving lanes to one moving lane in each direction from Nostrand Avenue to Avenue W
- Installed a painted median and left-turn bays at key intersections
- Installed turn lanes at the Gerritsen Avenue and Avenue U intersection and the Gerritsen Avenue and Knapp Street intersection to improve safety and to reduce traffic delay
- Installed a pedestrian refuge island at the Gerritsen Avenue and Avenue U intersection to improve safety for pedestrians

Results

- 48% reduction in total crashes involving injuries along Gerritsen Avenue from Nostrand Avenue to Whitney Avenue
- Percentage of vehicles traveling over the speed limit decreased by 30% along northbound Gerritsen Avenue and by 10% along southbound Gerritsen Avenue
- Fewer lanes have not caused congestion



Gerritsen Avenue parallels Marine Park in the southeastern, Brooklyn neighborhood of Gerritsen Beach. The corridor is served by the B31 bus and the BM4 express bus. Gerritsen Avenue is predominantly residential in character with small pockets of commercial areas and schools.

Gerritsen Avenue is a wide roadway, approximately sixty feet, with two moving lanes and parking in each direction. In 2005, DOT implemented safety improvements along Gerritsen Avenue, from Avenue W to the southern terminus of the roadway at the edge of Plumb Beach Channel. The improvements in this southern section of Gerritsen Avenue consisted of roadway narrowing from two lanes to one lane in each direction and installing a painted median. The improvements resulted in a 10% decrease in speed which brought the daily average speed for vehicles traveling in both directions under the 30 m.p.h. speed limit.

The community and elected officials voiced their concern to DOT over safety issues along the northern and central sections of Gerritsen Avenue, specifically at and around the Avenue U intersection. As a result of these concerns, DOT collected speeds, traffic volumes and crash data along Gerritsen Avenue between Nostrand Avenue and Avenue W. DOT recorded a high incidence of speeding, especially in the residential area north of Avenue U where vehicles were traveling 45 m.p.h. on the 30-m.p.h. roadway. The corridor was also found to have excess traffic capacity based on the traffic volumes collected. As a result of the findings, DOT began to develop safety improvements for Gerritsen Avenue from Nostrand Avenue to Avenue W.

DOT presented the project plans to CB15 in October 2009. The board suggested removing bike lanes from the corridor. DOT made the modifications recommended by the board. Project implementation was completed in November 2009.

In order to calm traffic and improve pedestrian and driver safety, DOT narrowed Gerritsen Avenue to one moving lane in each direction and installed a wide center median along with left-turn bays at key intersections. 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 Gerritsen Avenue decreased from 37% to 7%. Along southbound Gerritsen Avenue, the incidence of speeding decreased from 26% to 16%.

Weekday traffic volumes were virtually unchanged for morning peak traffic in both directions. There was a small decrease of 8-9% for the evening peak hour traffic in both directions, most likely due to seasonal variation. However, the decrease in traffic volumes shows that removing one lane maintained capacity for existing traffic levels.

The project also included modifications to the intersections on Gerritsen Avenue at Avenue U and Knapp Street to improve safety and reduce traffic delay. The improvements at the Gerritsen Avenue and Avenue U intersection included installing a left-turn lane on westbound Avenue U and southbound Gerritsen Avenue as well as installing a pedestrian refuge island on the south-side crosswalk along with bollards and trees. DOT provided a southbound right-turn lane on Gerritsen Avenue approaching Knapp Street and added green time to the signal for these right-turning vehicles.

The total number of crashes involving injuries along Gerritsen Avenue from Nostrand Avenue to Whitney Avenue decreased by 48% from an average of 16.7

A pedestrian refuge island was installed in the south crosswalk at the intersection of Gerritsen Avenue and Avenue U to improve safety for pedestrians.

Traffic calming and safety measures applied on Gerritsen Avenue included the narrowing of the roadway from two lanes in each direction to one and the addition of painted center medians and left-turn bays.

The total number of crashes involving injuries along Gerritsen Avenue from Nostrand Avenue to Whitney Avenue decreased by 48%, a statistically significant reduction in crashes.

per year during the three years prior to implementation to an annual rate of 8.7 since the project was completed. This decline represents a statistically significant reduction in crashes (for crash analysis methodology, see page 72). In addition, the total number of crashes involving injuries is lower than any of the 10 prior years.

The safety improvements along Gerritsen Avenue have benefited pedestrians and drivers by providing traffic calming measures, simplifying turning movements, and installing a pedestrian refuge island while not causing congestion with fewer lanes.

Northbound Gerritsen Avenue Traffic Volumes At Avenue U (average vehicles per hour)

Time	Before	After	% Change
7 - 10 a.m.	509	514	1%
4 - 7 p.m.	642	593	-8%
Daily	379	380	0%

Before data collected in February 2009. After data collected in November 2010. Volumes shown in average vehicles per hour.

Crashes with Injuries along Gerritsen Avenue Nostrand Avenue to Whitney Avenue

	Before* (three previous years)			After
Total Crashes with Injuries	17	16	17	8.7
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	14	10	11	6.5
Pedestrians	2	6	6	1.1
Bicyclists	1	0	0	1.1

*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 October 2010) at annual rate. See page 72 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.

Southbound Gerritsen Avenue Traffic Volumes At Avenue U (average vehicles per hour)

Time	Before	After	% Change
7 - 10 a.m.	425	426	0%
4 - 7 p.m.	512	467	-9%
Daily	299	291	-3%

Before data collected in February 2009. After data collected in November 2010. Volumes shown in average vehicles per hour.

Gerritsen Avenue Average Traffic Speeds (in m.p.h.) Avenue U to Knapp Street

	Before	After	% Change
Northbound	29.5	22.9	-22%
Southbound	26.1	25.9	-1%

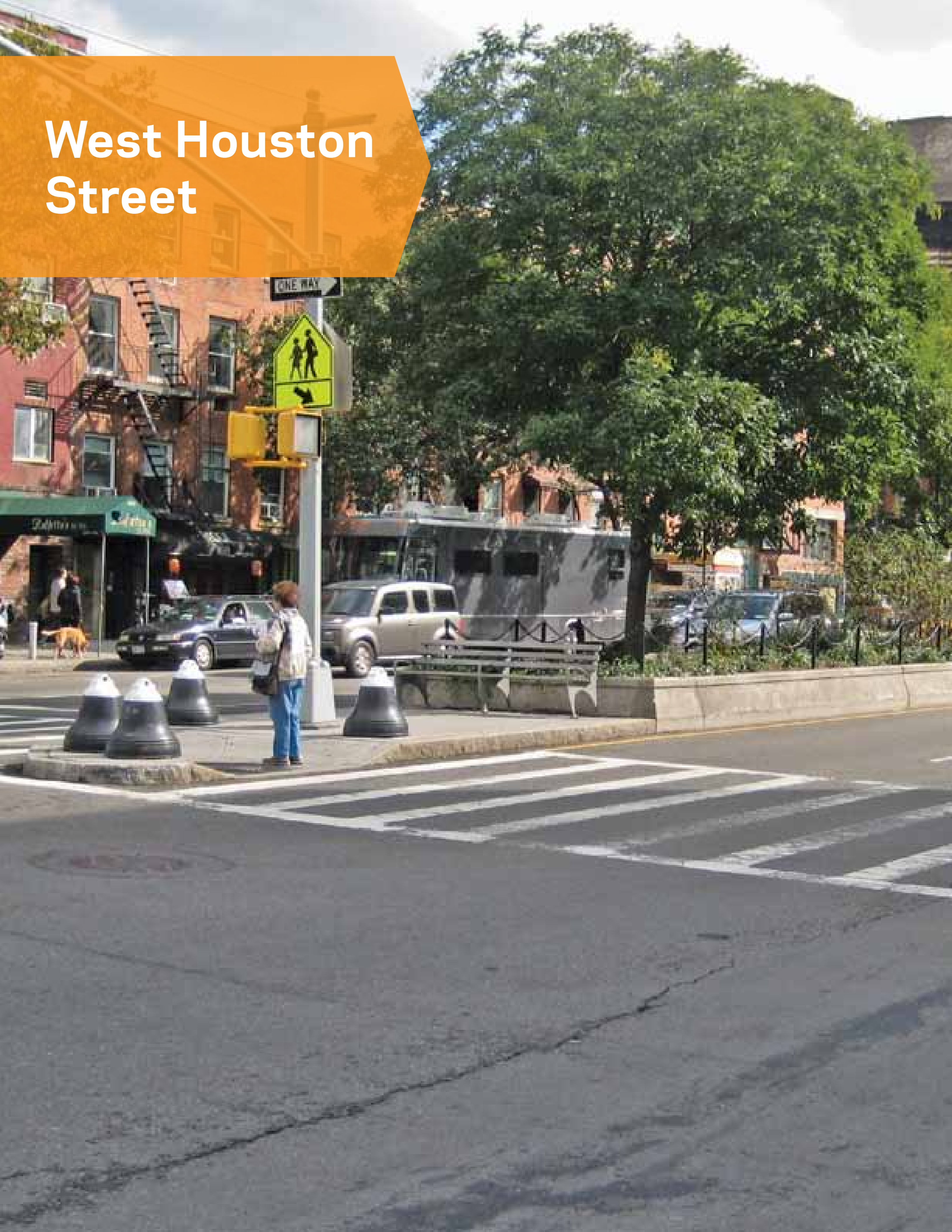
Data collected between 3:40-4:00 p.m. on a weekday. Before data collected in February 2009 and after data collected in May 2010.

Percentage of Vehicles Over the Speed Limit on Gerritsen Avenue Avenue U to Knapp Street

	Before	After	% Change
Northbound	37%	7%	-30%
Southbound	26%	16%	-10%

Data collected between 3:40-4:00 p.m. on a weekday. Before data collected in February 2009 and after data collected in May 2010.

West Houston Street



Purpose

- Improve pedestrian and motorist safety
- Simplify complex intersections
- Enhance streetscape

Outreach

- Project recommendations developed from NYU-Wagner Graduate School of Public Service report in late 1990's
- DOT and Department of Design and Construction (DDC) met with the Transportation Committees of Manhattan's Community Boards 2 and 3 (CB2 and CB3) from 2001 to 2004 to present project plans, receive feedback, and to address community concerns
- CB2 passed resolution in support of project in June 2004
- Construction began in August 2005 and finished in June 2009

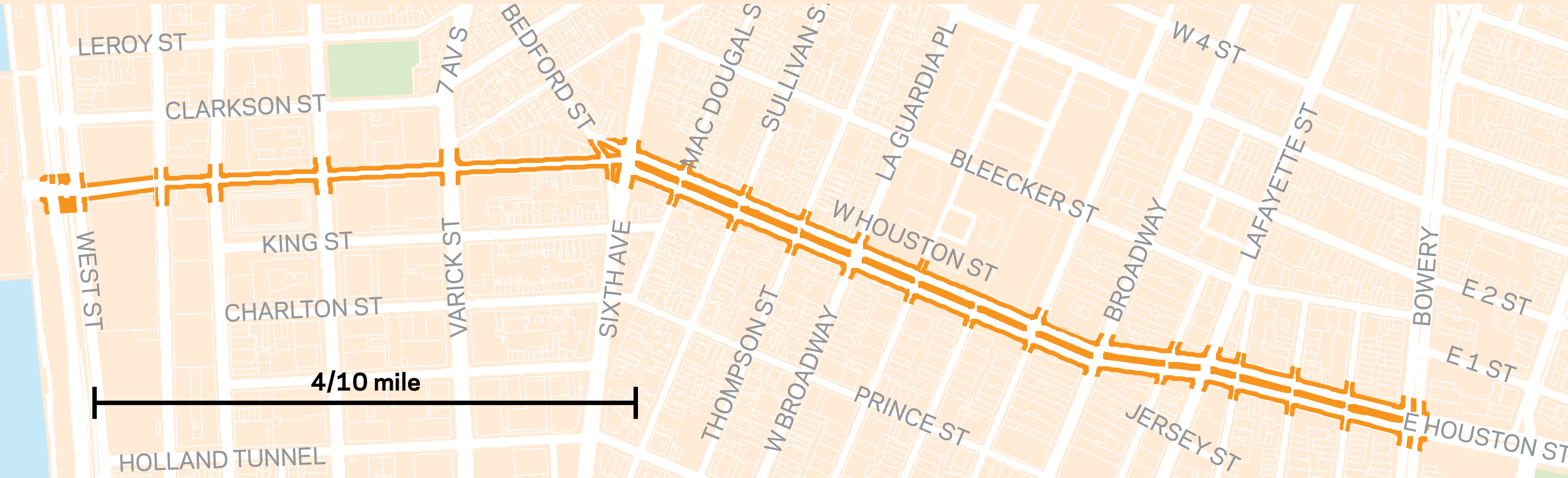
Approach

- Installed pedestrian refuge islands, pedestrian ramps, bell bollards and corner extensions to improve pedestrian safety
- Built raised, widened, landscaped median along Houston Street from Sixth Avenue to Broadway to allow for inclusion of left-turn bays to reduce crashes and to discourage mid-block crossings by pedestrians
- Widened sidewalks on the south side of Houston Street from Varick Street to West Broadway
- Created Bedford Triangle Park by eliminating slip road at Houston Street and Bedford Street intersection
- Installed benches and trees throughout the project area
- Selected amenities and materials to enhance the historic characteristics of the project area

Results

- 24% reduction in total crashes involving injuries along Houston Street from West Street to Bowery
- Travel times decreased by as much as three and half minutes during the weekday afternoon peak in the westbound direction and increased by as much as one minute and twenty-four seconds during the weekday afternoon peak in the eastbound direction
- Fewer lanes have not caused congestion
- Improved street aesthetics through landscaping and use of historical materials

Houston Street is a major east-west corridor connecting the FDR Drive to West Street (West Side Highway) in Manhattan and is used by motorists to access the Holland Tunnel via Varick Street. Houston Street passes through several neighborhoods such as SoHo, Greenwich Village and the East Village. Each neighborhood has its own unique style and history while all are popular destinations for shopping, eating and nightlife.



West Houston Street

Houston Street is one of Manhattan's busiest crosstown roadways. Between West Street and Sixth Avenue, Houston Street is one-way westbound with two lanes and parking along most blocks. The rest of Houston Street is bidirectional with three travel lanes in each direction separated by a median. Parking is also permitted on most blocks. In partnership with the DDC, DOT reconstructed Houston Street from West Street to Bowery. The reconstruction included transportation improvements, utility upgrades and landscape enhancements.

The planning process for reconstructing Houston Street extended over a decade and involved significant community outreach and participation. Recommendations from the planning study were published by the NYU-Wagner Graduate School of Public Service in the late 1990's and were incorporated into the design and reconstruction of Houston Street. Community outreach for the design portion of the project began in July 2001 and culminated in June 2004 with CB2 passing a resolution in support of the project. DOT and DDC met with CB2 and CB3 many times to present project plans, address community concerns and receive feedback. In September 2002; DOT and DDC met with CB2 to discuss a new park planned at the intersection of Bedford Street and Houston Street, and follow-up meetings were held in February and August 2003. The New York City Landmarks Preservation Commission also provided input to the project since historic districts are located within the project limits. Construction for the project began in August 2005 with a phased approach that finished in June 2009.

The roadway geometry of Houston Street underwent significant transformations. The number of moving lanes was changed from three to two along eastbound Houston Street between Sixth Avenue and West Broadway to accommodate wider medians and wider sidewalks on the south side of Houston Street. DOT removed parking along westbound Houston Street from Bedford Street to Varick Street to provide an additional moving lane and widened sidewalks on the south side of Houston Street.

Prior to reconstruction, there was a significant number of rear-end crashes to vehicles waiting to make a left turn from Houston Street. As a result, a raised, widened median was built along Houston Street between Sixth Avenue and Broadway to allow for the inclusion of left-turn bays. The median also improves safety for pedestrians by discouraging mid-block crossings and provided an opportunity for landscaping.

Bedford Triangle Park was created at the intersection of Houston Street and Bedford Street to improve the aesthetics and safety of the intersection. The intersection, which also crosses Sixth Avenue, was simplified by eliminating the one-way slip road between Bedford Street and Houston Street. The new park includes historic-style lamp posts, tinted sidewalks, and granite curbs. These historic amenities are also located throughout the project area.

Other safety improvements included the installation of pedestrian refuge islands, bell bollards, pedestrian ramps, and neck-downs. Pedestrian refuge islands were created by extending the median into crosswalks. Bell bollards were added at each pedestrian refuge island to block vehicles from entering the pedestrian area. Ramps were installed at corners throughout the project area to improve mobility for older pedestrians and those using strollers or wheelchairs. Neck-downs (or corner extensions) were implemented along the project corridor to shorten pedestrian crosswalk distances and to slow motorists turning onto side-streets.

Enhancements along the corridor included the installation of benches in each pedestrian refuge area and extensive landscaping in the medians. Seventy-four trees were planted within the project area to green the corridor and improve the street aesthetics.

Before and after traffic volumes were collected at several locations along Houston Street in both directions. The before and after volume comparison may be influenced by several factors such as changes in land use and travel patterns over the years of construction along Houston Street or the new construction ongoing along the eastern section of Houston Street. The additional westbound lane between Bedford Street and Varick Street did not induce more vehicular volume as that particular section saw a decrease or no change in volumes during all time periods except the morning peak. The roadway capacity was reduced along eastbound Houston Street between

Typical safety improvements along Houston Street included the installation of pedestrian refuge islands, bell bollards, pedestrian ramps, and left-turn bays.

Bedford Triangle Park was created at the intersection of Houston Street and Bedford Street and includes historic amenities such as lamp posts, tinted sidewalks, and granite curbs.

The total number of crashes involving injuries along Houston Street from West Street to Bowery decreased by 24%, a statistically significant reduction in crashes.

Thompson Street and West Broadway yet volumes were down during all peak periods in this section. And thus, the removal of one travel lane did not create congestion.

Travel time runs were completed along the corridor in both directions before and after project implementation. Westbound travel times improved in the morning and afternoon peak periods. Travel time savings in the afternoon peak period were more than three and a half minutes. Travel times during the westbound weekday evening and weekend afternoon peak periods increased by over one minute and by 21 seconds, respectively. In the eastbound direction, travel times increased during the weekday peak periods and decreased during the weekend afternoon peak period. The increase in travel time was not due to the reduction of capacity as the volumes in this section decreased. The increase was most likely due to construction.

The crash analysis for the reconstruction of Houston Street includes the three years before construction began – July 2002 to June 2005. Crash data from July 2005 through June 2009 were not included in the analysis because it coincided with the construction period. The total number of crashes involving injuries along Houston Street from West Street to Bowery decreased by 24% from an average of 84.3 per year during the three years prior to construction to an annual rate of 63.8 since the project was completed. This decline represents a statistically significant reduction in crashes (for crash analysis methodology, see page 72). In addition, the annualized crash rate after implementation was lower than the number of crashes in any of the seven prior years.

The eastern section of Houston Street from Bowery to the FDR Drive is currently undergoing reconstruction as a DOT/DDC capital project. Project completion is scheduled for 2013.

Crashes with Injuries along Houston Street
West Street to Bowery

	Before* (three previous years)			After
Total Crashes with Injuries	107	77	69	63.8
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	63	36	33	30.8
Pedestrians	27	29	20	24
Bicyclists	19	12	17	11.3

*Before columns show the crash history for each of the three years immediately prior to project construction. After column shows number of crashes since implementation (through October 2010) at annual rate. See page 72 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.

Eastbound Houston Street Average Peak Period Travel Times
Sixth Avenue to Bowery

	Before	After	Change	% Change
Weekday 7-10 a.m.	03:24	03:44	00:20	10%
Weekday 12-2 p.m.	03:43	05:07	01:24	38%
Weekday 4-7 p.m.	04:13	05:03	00:50	20%
Saturday 11 a.m.-2 p.m.	07:47	06:23	-01:24	-18%

Before data collected in October 2004. After data collected in November 2010. Times shown in minutes, seconds.

Westbound Houston Street Average Peak Period Travel Times
Bowery to West Street

	Before	After	Change	% Change
Weekday 7-10 a.m.	08:52	08:34	-00:18	-3%
Weekday 12-2 p.m.	11:00	07:28	-03:32	-32%
Weekday 4-7 p.m.	08:28	09:45	01:17	15%
Saturday 11 a.m.-2 p.m.	08:40	09:01	00:21	4%

Before data collected in October 2004. After data collected in November 2010. Times shown in minutes, seconds.

Allen and Pike Streets

Purpose

- Improve safety for pedestrians, drivers and cyclists
- Expand and connect pedestrian mall spaces
- Enhance and improve bicycle connections
- Enhance streetscape

Outreach

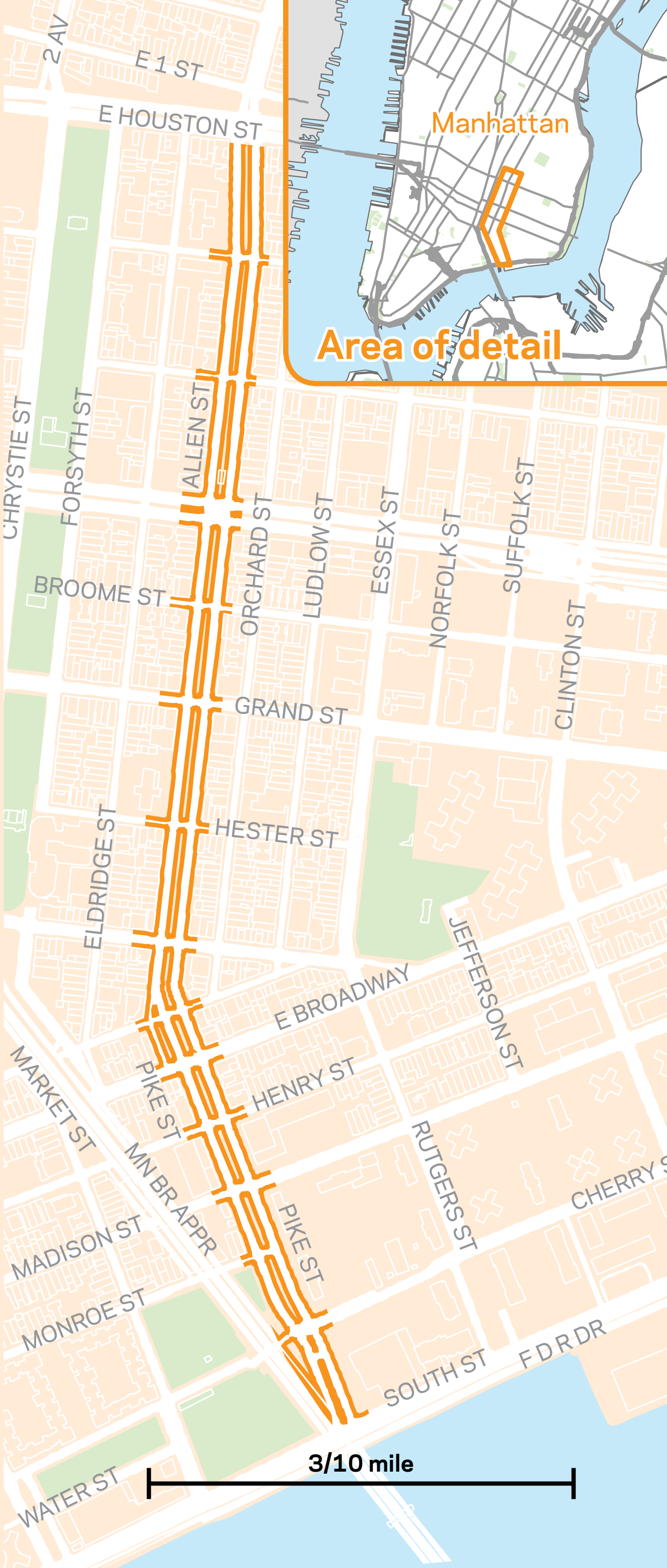
- The community initiated and participated in design workshops that called upon DOT and the New York City Department of Parks and Recreation (Parks) to transform Allen and Pike Streets into a pedestrian-friendly boulevard
- DOT presented plans to the Manhattan Community Board 3 Transportation Committee (CB3) in February 2009
- DOT met with CB3 in March 2009 to address questions and concerns and received support for the plans along with specific recommendations from CB3
- DOT modified plans based on community input and presented the final plan to CB3 in April 2009
- DOT distributed notices regarding project implementation to community businesses and residences in August 2009
- DOT updated CB3 on project progress in September 2009

Approach

- Narrowed the roadway from three moving lanes to two moving lanes in each direction
- Installed left-turn bays and added a dedicated signal phase for vehicles turning left
- Created pedestrian plazas and widened malls
- Installed new crosswalks to connect pedestrian malls
- Relocated bicycle lane from right-side curb to left-side curb next to mall; provided nine-foot buffer between bicycle lane and travel lanes; provided connection to East River Greenway

Results

- 35% reduction in both motor vehicle crashes and bicycle crashes involving injuries along Allen and Pike Streets from Houston Street to South Street
- Daily traffic volumes decreased by 18% for northbound and 23% for southbound traffic
- Bike ridership increased by 43% in the northbound direction and by 60% in the southbound direction from 7 a.m. – 7 p.m.



Allen and Pike Streets run north and south from Houston Street to South Street at the East River waterfront in Manhattan. Located in the Lower East Side and Chinatown, the corridor has a diverse mix of people and businesses and a long history as home to various immigrant groups.

Members of the Lower East Side and Chinatown communities contacted DOT about the need for pedestrian and traffic safety changes in the area and the opportunity to create a landscaped promenade to the waterfront along Allen and Pike Streets. Allen Street and Pike Street had concrete malls separating northbound and southbound traffic, a legacy from demolition of the Second Avenue elevated train line and several blocks of tenement housing, a stark contrast to the park space between Chrystie and Forsyth Streets to the west. The Allen and Pike Street malls were underutilized and presented an opportunity to significantly improve pedestrian access and safety in both Chinatown and the Lower East Side.

In response to requests from the Lower East Side BID and community organizations, DOT began to look for specific areas of improvement along the corridor. Although few neighborhood residents own cars, the area is a major conduit for vehicular traffic due to the proximity of the Williamsburg and Manhattan Bridges. Both bridges also attract many cyclists, though the existing bicycle lanes on Allen and Pike Streets were frequently blocked by double-parked vehicles and delivery trucks.

The northern portion of the project area has a concentration of restaurants and stores while the land uses in the southern area of the project are a mix of retail and residential. The street configuration was three lanes in each direction plus bicycle and parking lanes on both sides, divided by malls that are 20 or more feet wide. Due to the wide roadway, vehicles would weave through the three lanes and make unpredictable movements. The road width also made for longer crosswalks. Another safety issue resulted when left-turning vehicles queued between the malls blocking traffic and pedestrians.

DOT met with CB3 to outline the project plans in February 2009, and started a dialogue that continued in the following months. In March, DOT addressed questions and concerns and the committee voted to support the overall project. DOT modified the plans based on community feedback and presented the changes to CB3 in April. In August DOT distributed notifications of the project and its implementation to local businesses and residences along the entire corridor.

DOT removed a travel lane in each direction, narrowing the roadway from three lanes in each direction to two. The bicycle lane was relocated from the curb adjacent to parking to the interior space next to the mall. A nine-foot buffer was installed between the bicycle lane and the travel lanes to protect cyclists. The newly protected bicycle lane provides a connection to the East River Greenway and adds 1.9 miles to the City's bicycle network.

Left-turn bays and dedicated left-turn signal phases were added to separate left-turning vehicles from pedestrians and cyclists. Crosswalks were installed between malls where cross streets remain open to traffic. At four cross streets with low traffic volumes, pedestrian plazas were created along the corridor by connecting the malls. The pavement at the plazas was colored to differentiate the space from the roadway. Planters, additional signage and flexible bollards were also installed to help reduce driver confusion and keep vehicles out of the new plazas. Plants and benches were added at each plaza to enhance the new public spaces.

A bird's eye view of the project showing the new bicycle lane, buffer space and a pedestrian plaza created by connecting the malls.

Safety for cyclists was improved by moving the bike lane next to the mall and providing a nine-foot buffer between the bike lane and vehicle travel lanes.

Injuries from vehicular crashes and bicycle crashes along Allen and Pike Streets both decreased by 35%, a statistically significant reduction in crashes.

Vehicular volumes decreased for all time periods in both northbound and southbound directions. Daily northbound volumes decreased by 18% and southbound volumes declined by 23%. Bike volumes increased on this corridor in response to the protected bike lane. From 7 a.m. to 7 p.m., bike volumes increased by 43% for the northbound direction and 60% in the southbound direction.

The number of crashes involving injuries to motor vehicle occupants decreased by 35% from an average of 22.7 crashes per year during the three years prior to implementation to an annual rate of 14.7 since the project was completed. This decline represents a statistically significant reduction in crashes. 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 72).

In the three years prior to implementation there was an average of 12.3 crashes per year involving injuries to bicyclists. Since the project was completed, that number has been reduced by 35% to an annual rate of eight crashes, a statistically significant reduction.

This project demonstrates how relatively inexpensive materials and infrastructure such as signals, pavement markings and planters have vastly improved pedestrian and bicycle access and safety. The project area today provides inviting and safe public spaces and a welcoming connection to the East River Greenway. The mall construction has begun at the south end of the project between Henry Street and South Street. When funding has been secured the temporary treatments will be built with permanent materials and landscaping along the entire project corridor.

One of the new pedestrian plazas located at Hester Street. Plants and benches were added at each plaza to enhance the new public space.

Bike Volumes on Allen Street
Grand Street to Hester Street

	Before	After	% Change
Northbound	309	443	43%
Southbound	199	318	60%

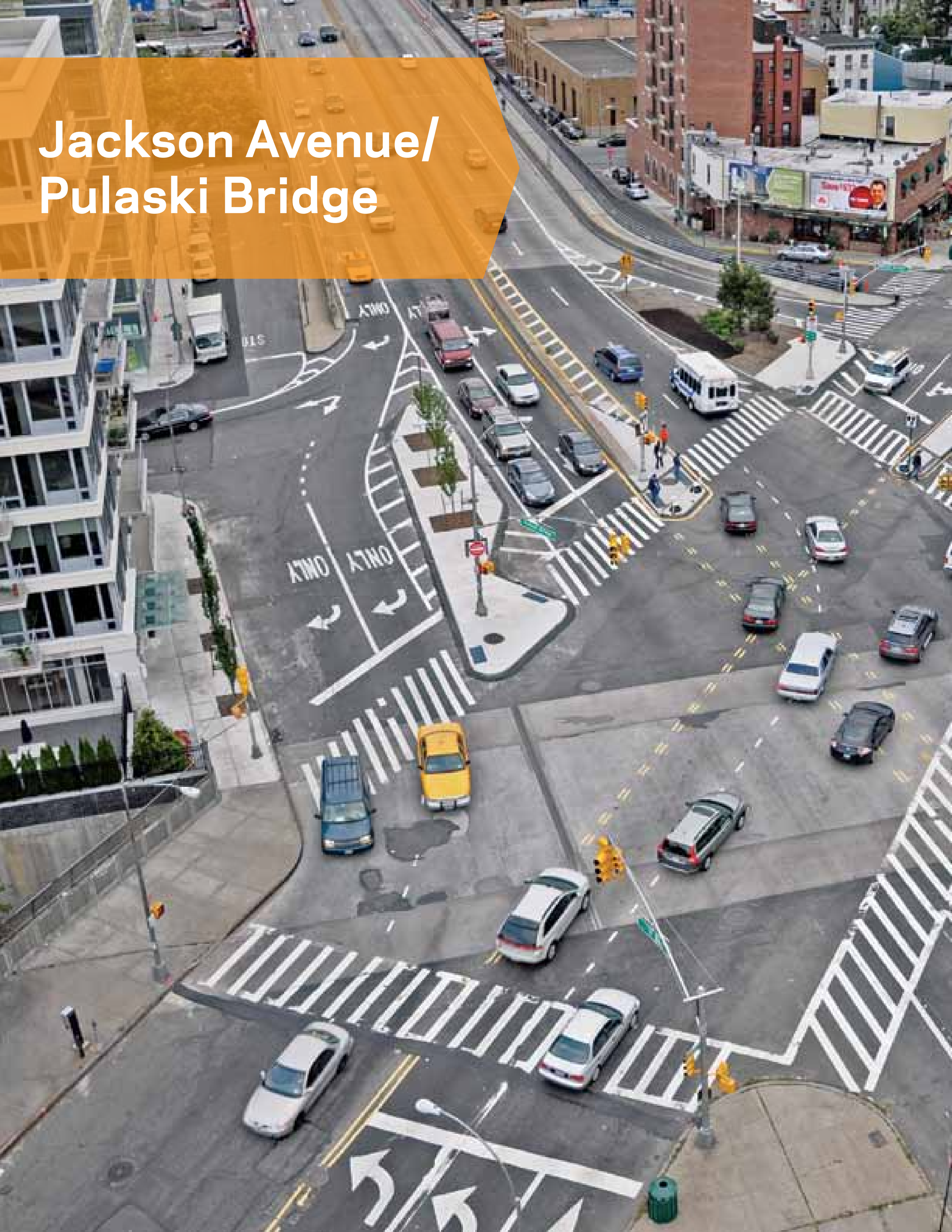
Before data collected in June 2009. After data collected in August 2010. Volumes shown are for time period 7 a.m.-7 p.m. on a weekday.

Crashes with Injuries along Allen and Pike Streets
Houston Street to South Street

	Before* (three previous years)			After
Total Crashes with Injuries	56	53	45	45.3
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	25	23	20	14.7
Pedestrians	22	15	14	22.7
Bicyclists	11	15	11	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 October 2010) at annual rate. See page 72 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.

Jackson Avenue/ Pulaski Bridge



Purpose

- Provide safer pedestrian crossings
- Improve pedestrian access between bus stops and subway entrance and new apartment buildings
- Reduce crashes
- Reduce traffic congestion and improve intersection operation
- Enhance the streetscape

Outreach

- DOT studied potential safety improvements for the area in response to community and developers' concerns
- DOT presented proposed changes to the Queens Community Board 2 Transportation Committee (CB2) in January 2009 and received feedback
- DOT made adjustments to the plan and received support from CB2 in March 2009

Approach

- Installed new signal-protected crosswalk at the foot of the Pulaski Bridge, as well as new and expanded pedestrian refuge islands
- Reconfigured and retimed the intersections of Pulaski Bridge/ Jackson Avenue/11th Street and 11th Street/49th Avenue
- Landscaped new/expanded refuge islands for aesthetic and sustainability purposes

Results

- Improved pedestrian safety and connectivity – no pedestrian or bicyclist injuries since implementation (17+ months)
- Reduced delay for traffic traveling from Pulaski Bridge to eastbound Jackson Avenue by 70%
- Landscaped refuge areas added for safety, aesthetic quality and sustainability

Located at the foot of the Pulaski Bridge in Long Island City, the intersection of Jackson Avenue and 11th Street is a key intersection, serving motorists travelling to and from major roadways in the City and providing a direct connection between Queens and Brooklyn via the Pulaski Bridge. The area is served by the #7 local and express subway trains and the B62 bus line, and is a major transfer point between these two modes. The area was recently rezoned to include residential high-rise buildings and is experiencing growth as are surrounding neighborhoods.

The intersection of Jackson Avenue and 11th Street at the Pulaski Bridge is a major connection between the boroughs of Queens and Brooklyn. The design and operation of streets at this intersection, a relic from Long Island City's manufacturing origins, were in need of a substantial update. This Queens neighborhood was recently rezoned to attract residential high-rise buildings, and the Brooklyn neighborhood of Greenpoint - just south of Pulaski Bridge – has also experienced significant growth in recent years. With the resulting increase in pedestrian activity, the importance of configuring the intersection to function for all users and modes has been highlighted by local residents and businesses.

Safety concerns regarding this intersection were raised by the community and residential developers. As a result of these concerns, DOT presented plans to CB2 in January 2009. DOT received feedback from the board and after DOT modified the plan, CB2 supported the project in March 2009.

One of the key changes made at the intersection of Jackson Avenue and the Pulaski Bridge was the addition of a crosswalk at the base of the bridge and a pedestrian signal phase to make the intersection safer and more inviting for pedestrians. The crosswalk connects a busy B62 bus stop on one side with a subway station for the #7 line on the other. In building this crosswalk, DOT also added two refuge islands, expanded an existing one, and added a signal phase dedicated solely for pedestrians to cross. This set of improvements replaced a long and difficult pedestrian crossing with three shorter and safer crossing segments. Other crosswalks were improved by upgrading crosswalk markings. Several refuge islands were planted with trees to improve the landscape, adding to the creation of a sustainable and welcoming gateway between the boroughs.

Pedestrian changes at the intersection were accompanied by changes in the traffic patterns as well. Previously right turns from Pulaski Bridge onto Jackson Avenue were being made from both sides of a concrete island; the new configuration designates that only vehicles in the two lanes to the right of the expanded refuge island can make this turn. By isolating this two-lane channel for right turns only, a separate signal phase was dedicated to these turns allowing pedestrians to cross conflict free in the east crosswalk. It also ensures that vehicles move through the intersection in a more predictable manner, thus enhancing safety for all.

These changes produced a 70% reduction in delay for a turning movement which had previously experienced excessive delays – the northbound right turn in the morning peak hour from Pulaski Bridge to Jackson Avenue. As a result of this improvement, travel times for vehicles making this turn from the Pulaski Bridge and traveling eastbound along Jackson Avenue to 47th Avenue decreased by 32 seconds, a decrease of 20%.

Another modification completed as part of this project was the lane realignment at the base of the Pulaski Bridge for both directions of travel. The right-most northbound lane on the bridge was striped as a right-turn only lane and directs vehicles to the 11th Street service road and the channelized right-turn lanes at the Jackson Avenue approach. The merging point for southbound vehicles accessing the bridge was eliminated by removing one lane at the entry point from 11th Street so the 49th Avenue slip ramp can access the bridge with a dedicated lane. These changes were made to improve safety by delineating vehicular movements and to provide additional space for the new pedestrian refuge islands. In making these changes, delays for all approaches at the Jackson Avenue and 11th Street intersection were kept within acceptable levels.

On westbound Jackson Avenue, an additional left-turn lane was installed to accommodate heavy left-turn volumes from Jackson Avenue onto the Pulaski Bridge via 11th Street. The westbound left-turn signal phase was also paired with the northbound right-turn phase detailed above, as the two could be paired together to efficiently operate the intersection. The necessary road space for the additional westbound left-turn lane was obtained by removing several on-street parking spaces, a move supported by CB2. After the changes were implemented, travel time for westbound vehicles on Jackson Avenue declined by 29% in the morning peak and 23% in the evening peak.

An expanded, landscaped refuge island/median was added at the southwest corner of Jackson Avenue and 11th Street to improve safety for motorists and pedestrians and to enhance the streetscape.

The new crosswalk at the base of the Pulaski Bridge makes the intersection safer and more inviting for pedestrians and provides a safe connection between the B62 bus stop and the #7 subway station.

Pedestrian safety and connectivity improved at Jackson Avenue and the Pulaski Bridge with the installation of signal-protected crosswalks, pedestrian refuge islands and upgraded crosswalk markings.

Other traffic changes included converting 49th Avenue from a two-way to a one-way eastbound street from the intersection of the Pulaski Bridge exit and the 11th Street service road to 11th Place. This modification eliminates vehicular conflict since all traffic from the service road is directed onto 49th Avenue instead of merging with bridge traffic to make a right turn at Jackson Avenue. Also, the left turn from southbound 11th Street to eastbound Jackson Avenue was prohibited, as a more efficient route was already available by using 47th Road two blocks to the north.

Analysis of the New York City Police Department (NYPD) crash data shows there were no statistically significant changes in the number of crashes involving injuries in the project area, although crash rates after implementation were lower than the average for the three prior years. In 17 months since changes were installed, there have been no bicycle or pedestrian injuries, compared with 18 such injuries in the 10 years prior.

Following the project's completion and observation during the summer of 2009, minor adjustments were made to several signals and markings. The overall changes have improved pedestrian safety and connectivity, supported new economic development and residential growth, clarified paths and movements for motorists, and expanded landscaped area of the intersection.

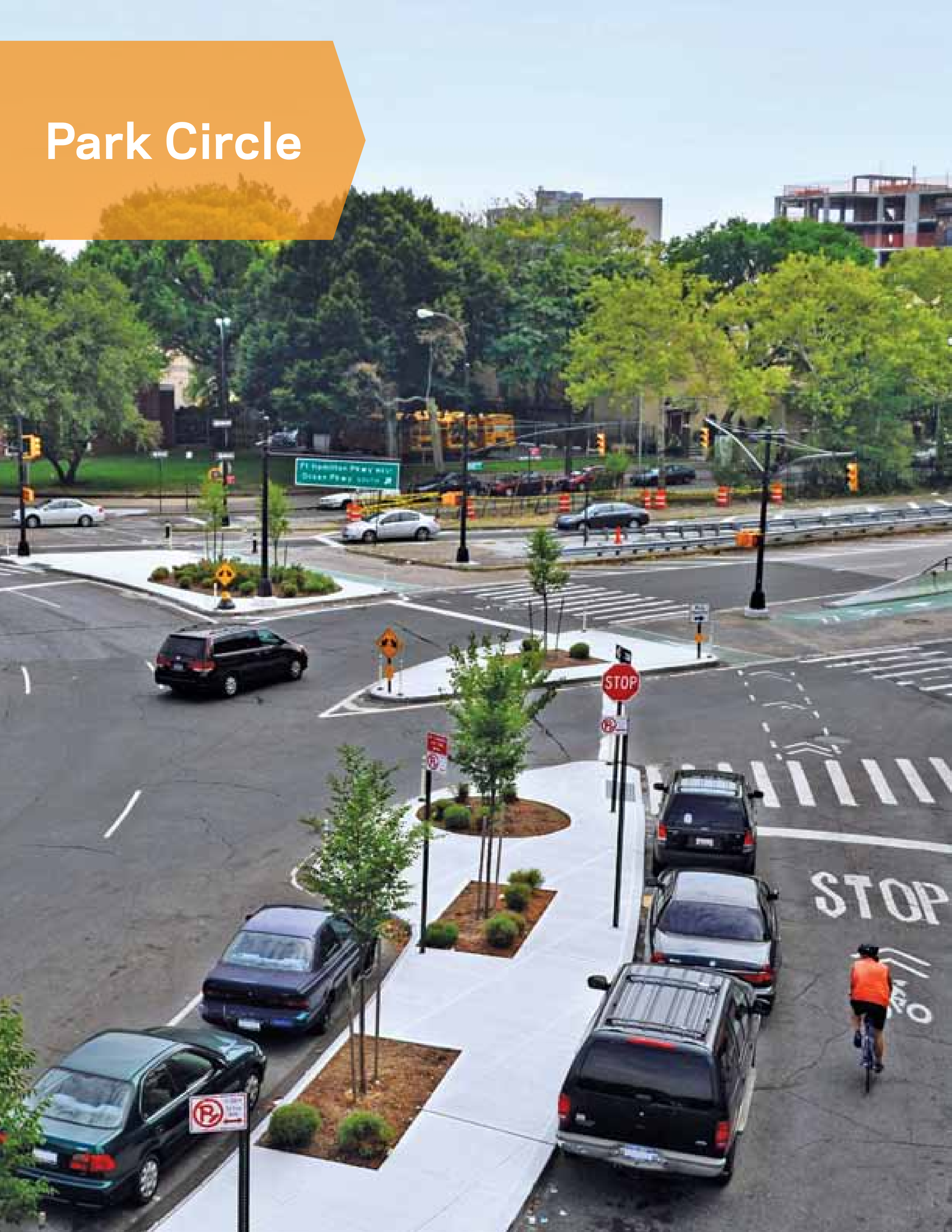
Vehicles at the foot of the Pulaski Bridge can only turn right from the designated right-turn lanes.

Crashes with Injuries at Jackson Avenue and Pulaski Bridge

	Before* (three previous years)			After
Total Crashes with Injuries	9	6	5	5.6
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	8	4	5	5.6
Pedestrians	0	1	0	0
Bicyclists	1	1	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 October 2010) at annual rate. See page 72 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.

Park Circle



Purpose

- Calm traffic and reduce driver confusion
- Provide safer pedestrian, bicyclist and equestrian crossings
- Expand pedestrian and bicycle network
- Enhance the streetscape

Outreach

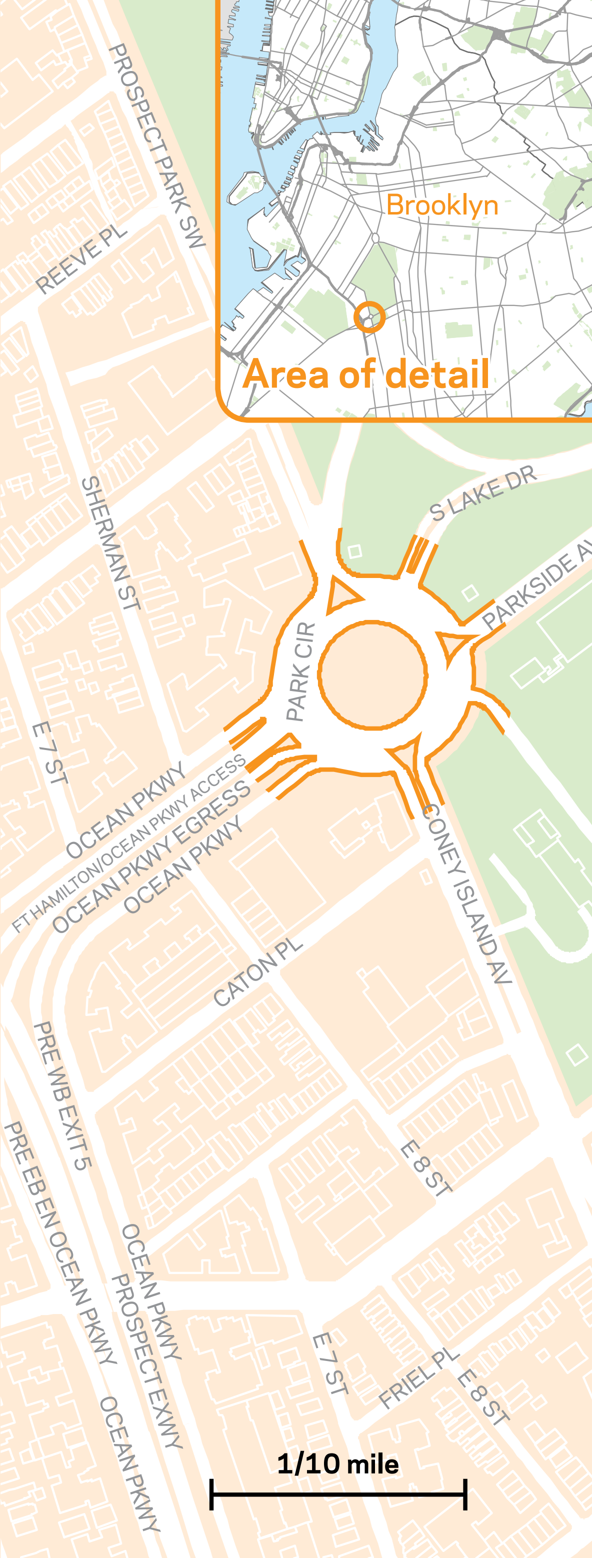
- Brought to DOT's attention by Stable Brooklyn, a neighborhood community group
- DOT held a design workshop in February 2009 for the Transportation Committees of Brooklyn's Community Boards 7, 12 and 14 (CB7, CB12 and CB14)
- DOT presented plans addressing community goals and concerns to CB7, CB12 and CB14 in June 2009 and received support from all the boards for the project; CB7 passed a resolution unanimously in favor of the improvements
- DOT conducted a project walk-through for the public after implementation to refine the project improvements

Approach

- Installed new signage and pavement markings for motorists
- Reconfigured intersections to calm traffic
- Installed new crosswalks and added pedestrian refuge islands
- Installed two new signals and relocated two signals to provide shorter pedestrian crossings across Prospect Park Southwest and the Ocean Parkway and Fort Hamilton/Ocean Parkway access ramps
- Installed a protected bridle path
- Installed a new bicycle path around the circle and along Fort Hamilton Parkway and completed a bicycle connection to the existing Ocean Parkway Greenway

Results

- Reduced driver confusion and calmed traffic through signage, signal and geometry changes
- Travel times decreased for all directions during the morning and evening peaks except trips entering the circle from the northbound approach at Coney Island Avenue
- Outer ring of circle made fully accessible to pedestrians with safe and short crosswalks
- Improved bicycle connectivity
- Added significant landscaping around the circle to visually knit the neighborhoods together and improved neighborhood appearance by transforming the 'expressway' look of the Ocean Parkway and Fort Hamilton/Ocean Parkway access ramps to a 'city street' look



Park Circle is located at the southernmost entrance to Prospect Park in Brooklyn. The traffic circle provides access to the park, major arterials, and Ocean Parkway and Fort Hamilton Parkway. It is a unique location with a myriad of users ranging from motorists to pedestrians and cyclists, and equestrians. Besides the park, most of the land uses around Park Circle are residential.

Park Circle

Park Circle is a high-volume, five-legged traffic circle located in the Windsor Terrace and Kensington neighborhoods of Brooklyn. Park Circle is an historic landmark. This grand entrance to Prospect Park was designed by the famous architect Stanford White and is flanked by the Horse Tamers, bronze sculptures designed by Brooklyn artist Frederic MacMonnies in 1889. Park Circle is also noted as the terminus of the oldest greenway in the United States, the Ocean Parkway Greenway which was designed by Olmsted and Vaux and opened in 1895.

Stable Brooklyn, a neighborhood community group also representing the needs of Kensington Stables, the only remaining horse stable serving Prospect Park, brought safety and access concerns at Park Circle to DOT's attention. In February 2009, DOT held a design workshop for the public and CB7, CB12 and CB14. After a short presentation of DOT's operational tools, participants gathered around tables with existing plans and markers. Each table assigned a representative to report at the end of the meeting their most urgent problems and hopes for Park Circle. DOT used the input from the workshop to help develop the project improvements. DOT held another public workshop in June 2009 to present a summary of the issues along with recommended improvements. This workshop gave the community the opportunity to comment on and refine the recommendations. The project received support from all three community boards and CB7 passed a resolution unanimously in favor of the improvements. In addition to the workshops and presentations, DOT conducted a project walk-through for the public in November 2009 to refine the project improvements.

In order to address the community's concerns regarding the lack of safe connectivity around the circle and to the park, DOT constructed a protected bridle path and bike path around Park Circle. DOT added bike paths on Fort Hamilton Parkway and along Ocean Parkway to provide a connection to the Ocean Parkway Greenway. DOT also installed new crosswalks: one across the access ramp to Ocean Parkway; one across the Fort Hamilton/Ocean Parkway access ramp; and one from the inner part of the circle to a pedestrian refuge island at Parkside Avenue.

Other changes made at the Ocean Parkway and Fort Hamilton/Ocean Parkway access ramps included the transformation of unused roadbed through landscaping and markings, the installation of two new signals just prior to the circle exit, the addition of landscaped pedestrian refuge islands, and the relocation of large highway overhead gantry signs to a nearby bridge. These changes made the intersections safer by shortening the crosswalks for pedestrians, decreased driver confusion by delineating the road space, and enhanced the streetscape.

Driver confusion and speeding were two vehicular issues identified by the community and DOT throughout the Park Circle study area. DOT added new signage and pavement markings to help reduce driver confusion. Signal timings were adjusted around the circle to improve flow and wide entry and exit curves were redesigned to calm traffic.

The park exit at Prospect Park Southwest was closed and relocated to South Lake Drive. The existing signals at Prospect Park Southwest were relocated closer to the circle and a new signal was added at South Lake Drive for vehicles exiting the park. The intersection reconfiguration at Prospect Park Southwest made it possible to shorten the crossing distance for pedestrians.

Travel time runs were completed for each movement around the circle before and after project implementation. The average travel times are based on the direction that the drivers enter the circle and were calculated for the morning peak (7:30-8:30 a.m.) and the evening peak (4:30-5:30 p.m.). All average travel times decreased or had little change for both time periods except for

The park exit for vehicles was relocated from this location at Prospect Park Southwest to South Lake Drive.

A protected bridle path was constructed around Park Circle to provide a safe route for equestrians accessing Prospect Park.

Pedestrian safety and connectivity improved at Park Circle with the installation of pedestrian refuge islands, signal-protected crosswalks and related changes.

drivers entering the circle in the northbound direction from Coney Island Avenue. Travel times improved the most in the evening peak for westbound drivers; drivers entering the circle from Parkside Avenue saved 37 seconds. Drivers entering the circle from the southbound direction at Prospect Park Southwest experienced a decrease in travel time of 31 seconds in the morning peak and 20 seconds in the evening peak.

DOT examined crash data from the NYPD for the period before and after project implementation. The intersections around Park Circle have not seen significant changes in the overall number of crashes, nor in the number of crashes involving injuries to pedestrians. The number of crashes involving injuries to pedestrians after implementation is lower than the average for the three prior years. This location does not see a high volume of pedestrians so the sample size for pedestrian injuries is small. It is hoped that the changes will encourage more residents to enjoy walking between neighborhoods and through Park Circle in the future.

The overall safety and access for pedestrians, cyclists, drivers and equestrians was improved. This project provides the only horse path on New York City streets and enhances the street aesthetics for all users of this multi-modal area.

A bicycle lane was added on Fort Hamilton Parkway to expand the bicycle network and provide connections to existing bicycle lanes to the west of Prospect Park.

Park Circle Average Peak Hour Travel Times

Direction of Travel	Time Period	Before	After	Change	% Change
Northbound	AM	00:47	01:09	00:22	46%
	PM	00:55	01:25	00:30	53%
Southbound	AM	01:53	01:22	-00:31	-28%
	PM	01:49	01:29	-00:20	-18%
Westbound	AM	01:18	01:19	00:01	2%
	PM	01:48	01:11	-00:37	-34%
Eastbound	AM	01:54	01:38	-00:16	-14%
	PM	02:01	02:01	00:00	0%

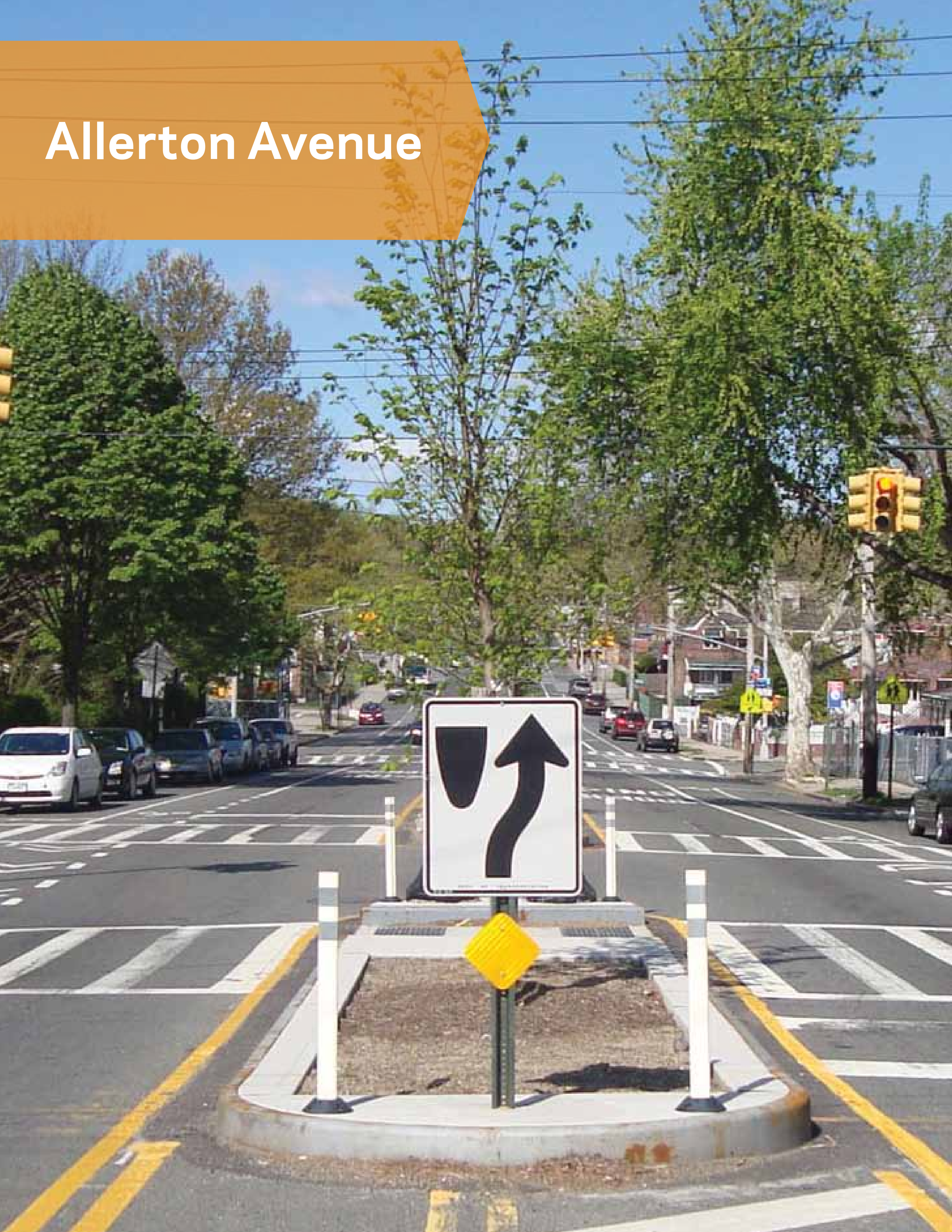
Before data collected in May 2008. After data collected in June 2010. All data collected weekdays between 7:30-8:30 a.m. and 4:30-5:30 p.m. Time shown in minutes, seconds.

Crashes with Injuries at Park Circle

	Before* (three previous years)			After
Total Crashes with Injuries	7	7	3	6.5
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	4	5	1	4.4
Pedestrians	0	0	2	0
Bicyclists	3	2	0	2.2

*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 October 2010) at annual rate. See page 72 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.

Allerton Avenue



Purpose

- Reduce excessive vehicle speeds
- Provide safer pedestrian crossings
- Enhance the streetscape
- Improve bicycle connections

Outreach

- DOT identified the need for safety improvements as part of the Pelham Gardens Safe Streets for Seniors (SFSS) project
- DOT presented plans to the Bronx Community Board 11 Transportation Committee (CB11) and local elected officials in June 2009 and received feedback
- DOT presented the modified plans to CB11 and local elected officials in July 2009 and received support for the plan
- DOT distributed flyers along Allerton Avenue immediately before implementation to provide project information and to notify the community of the upcoming improvements

Approach

- Narrowed the roadway from two moving lanes to one moving lane in each direction from East Gun Hill Road to Boston Road
- Installed a wide center, painted median
- Installed pedestrian refuge islands and left-turn bays at key intersections
- Installed a new bike lane from Boston Road to Kingsland Avenue in both directions
- Intersection improvements at Bronx Park East and Allerton Avenue to reduce traffic delay and improve flow

Results

- Vehicles traveling over the speed limit decreased by 7% along eastbound Allerton Avenue and by 4% along westbound Allerton Avenue
- Shorter pedestrian crossing distances
- Greened the corridor
- Bicycle connectivity improved and ridership increased by over 25%

Allerton Avenue is an east-west corridor located in the Pelham Gardens and Bronxwood neighborhoods of the Bronx. East of Laconia Avenue is predominantly residential while to the west, the corridor has more commercial shopping areas. At the west end of the project is Bronx Park, home of the New York Botanical Garden and the Bronx Zoo.

Early in 2009, DOT started the Pelham Gardens SSFS project to address pedestrian issues for senior citizens along Allerton Avenue from Fish Avenue to Eastchester Road and along portions of Eastchester Road. During the course of the project, DOT identified a high incidence of speeding along Allerton Avenue and in spring 2009, began a separate safety study along a larger portion of Allerton Avenue. The Allerton Avenue project extended from Boston Road to East Gun Hill Road and also examined the intersection of Allerton Avenue and Bronx Park East.

The project area is mostly residential. Allerton Avenue is a wide roadway, approximately sixty feet, with two moving lanes and parking in each direction. Based on observations and data collected by DOT, the roadway had excess traffic capacity, a high incidence of speeding and long crossing distances for pedestrians. Additionally, heavy turn volumes typically occurred at the Allerton Avenue intersection with Bronx Park East, and large queues were observed at the Bronx River Parkway exit ramp and at Dr. Kazimiroff Boulevard.

DOT began outreach with the community through the Pelham Gardens SSFS project. DOT presented the project plans to CB11 and elected officials in June 2009. The board suggested removing the commercial section of Allerton Avenue from Boston Road to Barker Avenue from the study. DOT made the modifications recommended by the board and in July 2009, returned to meet with the board and elected officials. After presenting the updated plan, DOT received support for the project from the board and elected officials. Project implementation began at the end of July 2009 and was completed in mid-August. Prior to implementation, DOT distributed flyers to the community to provide project information regarding the upcoming implementation and improvements.

In order to calm traffic and improve pedestrian safety, DOT narrowed Allerton Avenue to one moving lane in each direction and installed a wide center median along with pedestrian refuge islands at key intersections and left-turn bays at signalized intersections. 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 eastbound Allerton Avenue between Hering Avenue and Tenbroeck Avenue decreased from 64% to 57%. Along the same segment of westbound Allerton Avenue, there are also fewer drivers speeding now that the project has been implemented. The number of drivers speeding decreased from 62% to 58%.

Weekday traffic volumes were virtually unchanged for westbound traffic. There was a small increase of 9% in the eastbound daily vehicle volumes, most likely due to seasonal variation. However, the small increase in traffic volumes shows that removing one lane maintained capacity for existing traffic levels.

Refuge islands and a landscaped median provide safer crossings and improve the streetscape along Allerton Avenue.

Traffic calming measures applied on Allerton Avenue included the narrowing of the roadway from two lanes in each direction to one and the addition of painted center medians.

DOT installed a bike lane from Boston Road to Kingsland Avenue in both directions. The bike lane provides a connection to the Bronx River Greenway. Bike volumes along Allerton Avenue increased by more than 25% for weekdays and weekends.

The project also included modifications to the intersection of Bronx Park East and Allerton Avenue to reduce traffic delay and improve flow. The improvements included widening the exit ramp from one to two lanes to reduce queuing on the Bronx River Parkway; providing more green time to Dr. Kazimiroff Boulevard; and providing a right-turn lane for southbound Bronx Park East.

Crashes with Injuries along Allerton Avenue
Boston Road to East Gun Hill Road and Bronx Park East

	Before* (three previous years)			After
Total Crashes with Injuries	44	36	34	36
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	31	24	23	26.6
Pedestrians	10	7	11	6.9
Bicyclists	3	5	1	2.6

*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 October 2010) at annual rate. See page 72 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.

Analysis of the NYPD crash data shows there were no statistically significant changes in the number of crashes involving injuries on Allerton Avenue in the project area, although crash rates for pedestrians and bicyclists after implementation were lower than the average for the three prior years.

In addition to calming traffic, providing safer crossings and facilitating bike travel along the corridor, the improvements along Allerton Avenue enhanced the street aesthetics through the use of green pedestrian refuge islands and created a more attractive street environment for all users.

Bike Volumes on Allerton Avenue
Westervelt Avenue to Kingsland Avenue

	Before	After	% Change
Weekday	47	59	26%
Weekend	62	79	27%
Daily	390	376	-4%

Before data collected in June 2009. After data collected in July 2010. Volumes shown are for time period 7 a.m.-7 p.m..

Allerton Avenue Average Traffic Speeds (in m.p.h.)
Tenbroeck Avenue to Hering Avenue

	Before	After	% Change
Eastbound	32.0	31.4	-2%
Westbound	31.8	31.6	-1%

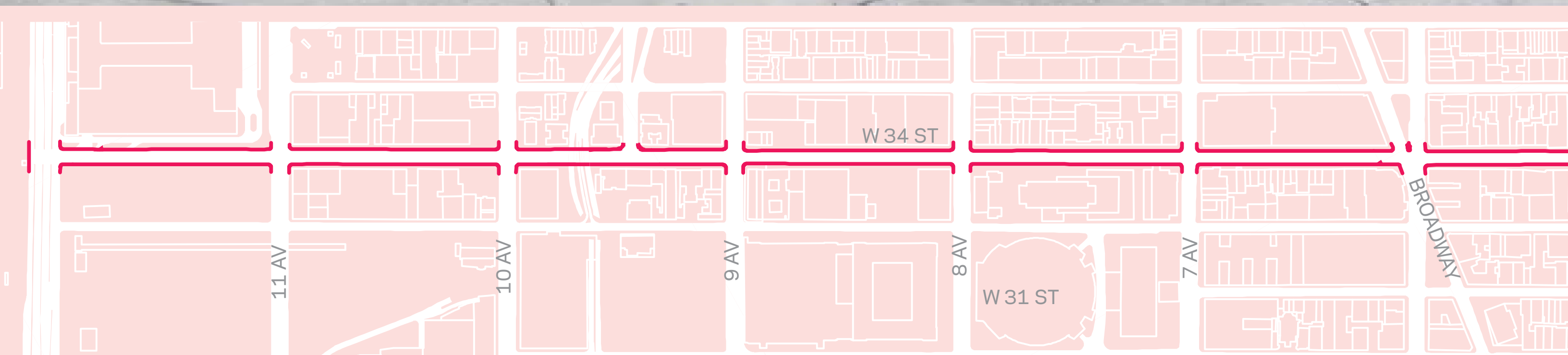
Data collected between 12-12:30 p.m. on a weekday. Before data collected in April 2009. After data collected in September 2009.

Percentage of Vehicles Over the Speed Limit on Allerton Avenue
Tenbroeck Avenue to Hering Avenue

	Before	After	Change
Eastbound	64%	57%	-7%
Westbound	62%	58%	-4%

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

34th Street Bus Priority



Purpose

- Improve travel times for bus riders
- Improve customer service information for bus riders
- Test bus lane enforcement and signal priority technology prior to large-scale implementation

Outreach

- DOT presented plans to the Transportation Committees of Manhattan's Community Boards 4, 5, and 6 (CB4, 5, and 6) and held public workshops and open houses in spring 2008 for initial phase of project
- Outreach for the next project phase includes community advisory committee formed for this project, community boards in the project area and residents and businesses

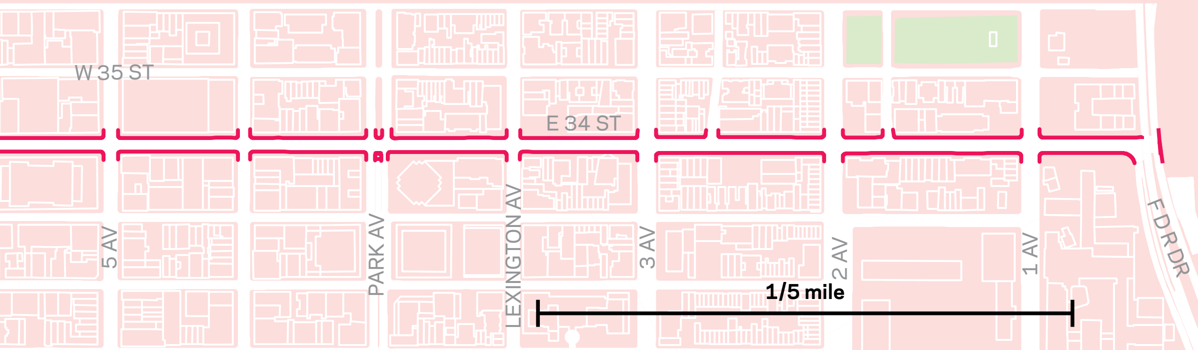
Approach

- Provided real time bus arrival information at eight locations on 34th Street
- Installed left-turn signal priority for buses on 34th Street at Seventh Avenue
- Implemented video camera enforcement for bus lane violations by medallion taxi drivers

Results

- Bus ridership increased on M16 and M34 routes, while other crosstown bus routes experienced ridership declines
- Demonstrated feasibility of signal priority system and improved safety for buses using the system
- Successfully tested and operated camera enforcement technology and adjudicated violations by taxi drivers; State Legislature subsequently authorized use of camera enforcement for all vehicles
- Total number of crashes involving injuries to motor vehicle occupants lower than any of the 10 prior years

34th Street is a major east-west corridor in Manhattan. Some of the most popular destinations in the city including Penn Station, Madison Square Garden, NYU Medical Center, the Empire State Building, Herald Square and the Javits Center are located on or near 34th Street. These attractions and connections contribute to the high volumes of people and vehicles that travel to, and along, this street every day.



DOT together with the MTA are implementing street and bus service improvements on 34th Street to make bus service faster, more reliable and more attractive in this growing corridor under the agencies' joint SBS initiative. The 34th Street SBS project corridor extends for two miles from the East River/34th Street ferry terminal to Twelfth Avenue. It is served by crosstown M16 and M34 bus routes, which together carry over 17,000 passengers per day, and is also used by commuter buses that carry over 16,000 passengers per day. During rush-hour, over 100 transit buses an hour currently traverse 34th Street, and hundreds of additional tour buses use the street over the course of the day.

In September 2008, DOT implemented the first stage of the 34th Street SBS. This initial work included curbside lanes painted in bright terra cotta red with high visibility overhead signage. It also included restriping the street to create wider lanes between Third Avenue and Ninth Avenue and new left-turn lanes. Outreach for the initial phase included presentations to CB4, 5, and 6 and public open houses. This initial phase led to improved bus travel times for the 33,000 bus riders using the street, as reported in the 2008 Sustainable Streets Index.

Further enhancements were made in late 2008 and 2009 to improve travel times and customer service information. These included left turn signal priority, camera enforcement of bus lane violations by taxis and real-time bus arrival information. DOT continues outreach efforts with CB4, 5, and 6; the community advisory committee specifically created for this project; the 34th Street Partnership, the local Business Improvement District (BID); and other businesses and residents.

In November 2008, DOT and the MTA began testing technology and management systems to enable the use of a bus-only signal priority system. Devices with radio-frequency identification (RFID) emitters were installed in buses departing from several different bus depots on the M4 and Q32 routes, and an RFID reader was installed on 34th Street to recognize an approaching bus. After a successful testing period, a turn-signal priority system was activated at 34th Street and Seventh Avenue which gives buses an exclusive signal phase to turn left onto southbound Seventh Avenue. This change provided a safer turn for buses at this busy intersection. Additionally, this allowed DOT to test the use of this technology and evaluate it for potential use at other specific locations.

In order to address the issue of vehicles blocking the bus lane, DOT began a pilot program in February 2009 to enforce bus lane violations by taxi drivers. New York City traffic rules provide that vehicles (including taxis) are permitted to enter a bus lane only to make the next right turn or to expeditiously pick-up or drop-off passengers. DOT and TLC developed a program to use video evidence of a violation for TLC to issue a summons to the taxi medallion owner, who under TLC rules is responsible for violations committed using their licensed taxicabs. DOT submitted images to TLC to show video evidence of a violation, along with an affidavit from the video reviewer. TLC then issued a summons based on the images. TLC summonses were adjudicated before TLC administrative law judges. Medallion owners found to be in violation are subject to a $150 fine. This method of camera enforcement is permissible under the TLC adjudicatory process and did not require legislative approval. The first violations were sent to TLC in May 2009 and hearings began in August 2009.

During the pilot, DOT tested various cameras along the corridor. This technical testing time allowed DOT to select and implement the best possible video enforcement technology for bus lane violations. The full operation of the system for the purpose of issuing TLC summonses began in April 2010.

In June 2010, New York State enacted legislation enabling camera enforcement for all vehicles, on all SBS routes in New York City. DOT and MTA have installed bus lane enforcement cameras along 34th Street and elsewhere, which automate the enforcement process by issuing violation notices to all vehicles that illegally drive or park in the bus lane.

A left-turn signal priority system was activated at 34th Street and Seventh Avenue which gives buses an exclusive signal phase to turn left onto southbound Seventh Avenue making it safer for buses turning at this busy intersection.

Electronic signs displaying real-time bus arrival information were installed at eight bus stops on 34th Street to improve customer service information.

Bus ridership increased on 34th Street by 3-6% after implementation of bus countdown clocks and related improvements to bus service, even as other crosstown bus routes experienced an average drop of 5%.

To improve customer service information, electronic signs displaying real-time bus arrival information were installed at eight bus stops on 34th Street in August 2009. The signs show the projected number of minutes until the next three buses arrive. The eight locations with real-time bus information are: westbound at First Avenue, Second Avenue, Third Avenue and Lexington Avenue and eastbound at Park Avenue, Eighth Avenue, Ninth Avenue and Tenth Avenue. The information is also available on the MTA website, and can be accessed on mobile devices at http://bustime.mta.info/bustime/home.jsp.

Since the bus arrival signs were installed, ridership along the corridor has increased 3% during the weekday and 6% on weekends, substantially better performance than other crosstown routes. By comparison, crosstown routes on 14th, 23rd, 42nd and 57th Streets showed an average ridership loss of 4% on weekdays and 6% on weekends.

The number of crashes involving injuries to motor vehicle occupants for the two years after implementation is lower than the 10 prior years, although the change was not statistically significant based on two years of "after" data (for crash analysis methodology, see page 72).

DOT is investigating the feasibility of implementing the final stage of the 34th Street SBS by 2012. DOT is consulting extensively with a community advisory committee formed for this project, the three community boards and area residents and businesses in the planning and design of this project.

Crashes with Injuries along 34th Street River to River

	Before* (three previous years)			After1	After2
Total Crashes with Injuries	166	154	149	135	150
Number of Crashes with Injuries to:					
Motor Vehicle Occupants	76	82	60	58	55
Pedestrians	72	56	72	58	75
Bicyclists	18	18	20	21	21

*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 October 2010) at annual rate. See page 72 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.

Crosstown Bus Ridership

	Day	Before	After	% Change
34th St (M34+M16)	Weekday	17,156	17,753	3%
	Weekend	13,211	13,968	6%
Other Crosstown Buses (M14, M23, M42, M57 and M31)	Weekday	91,027	86,959	-4%
	Weekend	86,398	80,988	-6%

Real time information implemented in August 2009. Before data includes ridership from August 2008 - July 2009. After data includes ridership from August 2009 - July 2010.

Belt Parkway Access/ Egress Improvements

Purpose

- Reduce traffic congestion and delays
- Improve traffic operations
- Improve pedestrian and motorist safety

Outreach

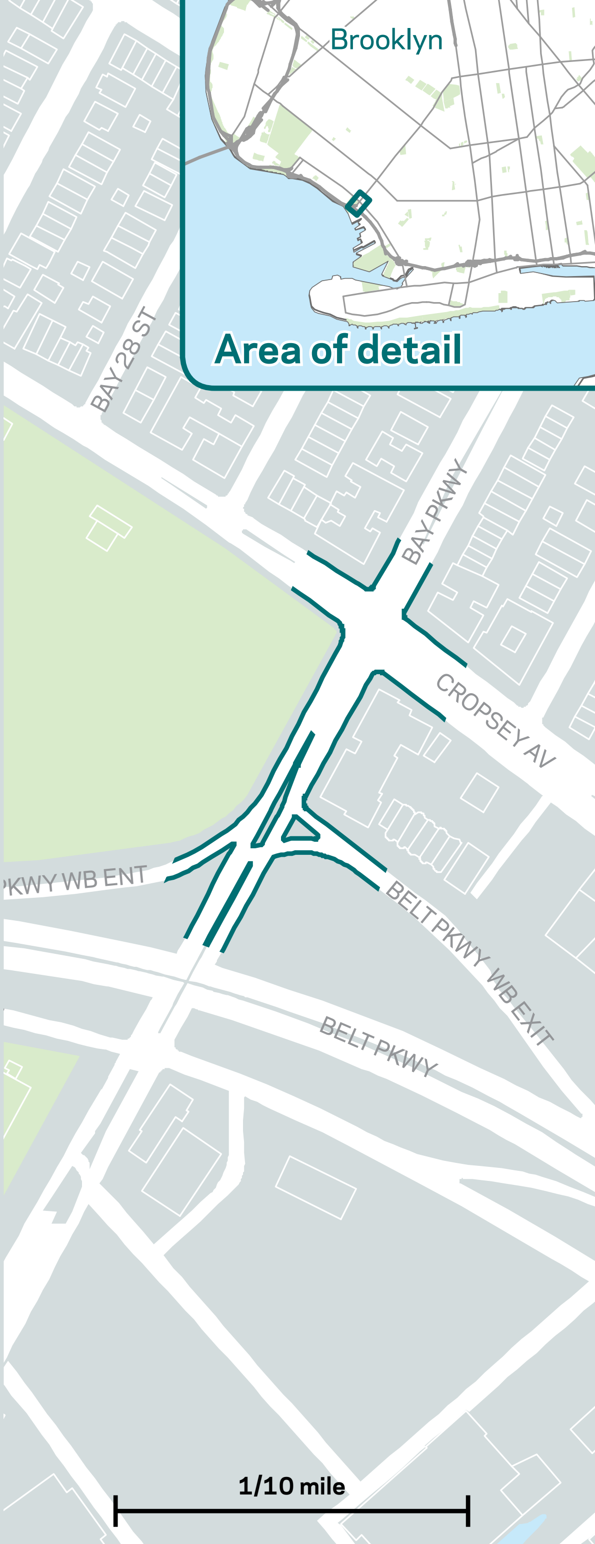
- Project recommendations developed from the Coney Island/ Gravesend Sustainable Development Transportation Study
- DOT presented plans to the Brooklyn Community Board 11 Transportation Committee (CB11) in May 2009 and received feedback
- DOT presented the modified plans to CB11 in June 2009 and received support for the plan

Approach

- Provided additional southbound lane on Bay Parkway designated for westbound Belt Parkway vehicles by removing concrete median along Bay Parkway between Cropsey Avenue and Belt Parkway
- Reconfigured the Belt Parkway westbound exit ramp to increase capacity for vehicles exiting the parkway
- Adjusted signal timing at the intersection of Bay Parkway and Cropsey Avenue and restriped the westbound approach on Cropsey Avenue to provide a second left-turn lane

Results

- Southbound Bay Parkway can accommodate 34% more through traffic and 37% more traffic turning right onto westbound Belt Parkway during the morning peak period due to the additional southbound lane
- Number of crashes involving injuries to pedestrians and motor vehicles lower than the average for the three prior years



The Belt Parkway is an east-west six-lane parkway that provides access to Brooklyn, Staten Island, Queens and Long Island as well as John F. Kennedy International Airport. Bay Parkway is a major north-south arterial in southwest Brooklyn that connects to the Belt Parkway near Caesar's Bay Shopping Center.

Belt Parkway Access/ Egress Improvements

Coney Island is one of New York City's major summer destinations that attracts millions of visitors each year. It is home to the amusement park, Luna Park; the New York Aquarium; the MCU Baseball Park where the Brooklyn Cyclones play; and Nathan's, home of the famous hot dog. Coney Island is the world's most iconic urban amusement park. Once a vital and thriving community, the area now contains large vacant lots, lacks basic retail shops and services such as grocery stores and restaurants, and has a high unemployment rate.

Coney Island and several other communities such as Brighton Beach and Gravesend in southwestern Brooklyn are undergoing revitalization. DOT and other City agencies including New York City Economic Development Corporation, Parks, Housing Preservation and Development, and Department of City Planning are working with the community to bring jobs, housing, retail, services and amenities to the area through commercial, residential and recreational development. DOT has been upgrading and enhancing roadway features in many locations in southwestern Brooklyn as described in the Coney Island/Gravesend Sustainable Development Transportation Study, a multimodal transportation and planning study. The recommendations developed in this study included short-term and long-term improvements at over thirty locations in the area to improve traffic operations and safety.

One area where DOT completed improvements is located along Bay Parkway between Cropsey Avenue and the Belt Parkway. Bay Parkway south of Cropsey Avenue provides access to and egress from the Belt Parkway. Just south of the Belt Parkway, Bay Parkway connects to Caesar's Bay Shopping Center, a major retail destination in the area. Along the west side of Bay Parkway from Cropsey Avenue to the south where Bay Parkway ends, is Bensonhurst Park. A residential area begins just north of the westbound Belt Parkway exit ramp.

The project improvements along Bay Parkway were developed from the Coney Island/Gravesend Sustainable Development Transportation Study. DOT presented the project plans to CB11 in May 2009. DOT incorporated feedback from CB11 into the plans. In June 2009, DOT presented the modified plans to CB11 and received support for the plan. Project implementation began in September 2009 and was completed in October 2009.

The Bay Parkway roadway configuration provided two southbound and three northbound lanes between Cropsey Avenue and the Belt Parkway westbound entrance and exit ramps. The volume of vehicles traveling southbound on Bay Parkway to access westbound Belt Parkway was much larger than the roadway capacity allowed. As a result of the inadequate capacity, queues on southbound Bay Parkway extended beyond Cropsey Avenue. To alleviate the congestion, DOT created an additional lane on southbound Bay Parkway by removing the raised, concrete median on Bay Parkway between Cropsey Avenue and the westbound Belt Parkway ramps. The underutilized crosswalk across Bay Parkway at the westbound Belt Parkway ramps was also removed to make way for the additional lane and to improve traffic operations at the Belt Parkway intersections with Bay Parkway. The additional southbound lane is designated only for motorists needing to access westbound Belt Parkway.

The Belt Parkway westbound exit ramp was reconfigured to increase capacity for vehicles exiting the parkway. The size of the island was reduced to create two right-turn and two left-turn lanes where there previously was one lane for each turning movement. Both the right-turn and left-turn movements are now signalized. Prior to this project, only the left-turn was signalized. New crosswalks were painted at the ramp approach with Bay Parkway.

The intersection of Bay Parkway and Cropsey Avenue is congested with heavy vehicular traffic during the peak hours and throughout the day because both roadways are major arterials in the area and because of the proximity to the Belt Parkway. The westbound approach on Cropsey Avenue was restriped to provide a second left-turn lane which was previously a second through

An additional southbound lane designated for westbound Belt Parkway vehicles was added on Bay Parkway to improve traffic operations.

The Belt Parkway westbound exit ramp at Bay Parkway was reconfigured to increase capacity for vehicles exiting the parkway.

Southbound Bay Parkway can accommodate 34% more through traffic and 37% more traffic turning right onto westbound Belt Parkway during the morning peak period due to the additional southbound lane.

lane. Signal timing changes were implemented to reduce conflicts between pedestrians and vehicles making left turns from westbound Cropsey Avenue.

Turning movement counts were collected in the study area before and after project implementation at the intersection of Bay Parkway and the westbound Belt Parkway ramps. The largest changes in traffic flow were due to the additional southbound lane on Bay Parkway. The improvement did not induce more traffic but rather the additional capacity allowed more vehicles to be counted because they were not stuck in queues. Southbound Bay Parkway can accommodate 34% more through traffic and 37% more traffic turning right onto westbound Belt Parkway during the morning peak period due to the additional southbound lane. The operations at the intersection of Bay Parkway and Cropsey Avenue also improved since traffic no longer spills back from the Belt Parkway ramps.

Analysis of NYPD crash data shows there were no statistically significant changes in the number of crashes involving injuries on Bay Parkway in the project area. The number of crashes involving injuries to pedestrians and motor vehicles after implementation was lower than the average for the three prior years.

The improvements focused on providing additional capacity and relieving conflicts while maintaining a safe roadway for vehicles and pedestrians alike.

Crashes with Injuries on Bay Parkway
Cropsey Avenue to Westbound Belt Parkway Exit and Entrance

	Before* (three previous years)			After
Total Crashes with Injuries	24	10	18	17
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	13	2	13	9
Pedestrians	10	7	4	4
Bicyclists	1	1	1	4

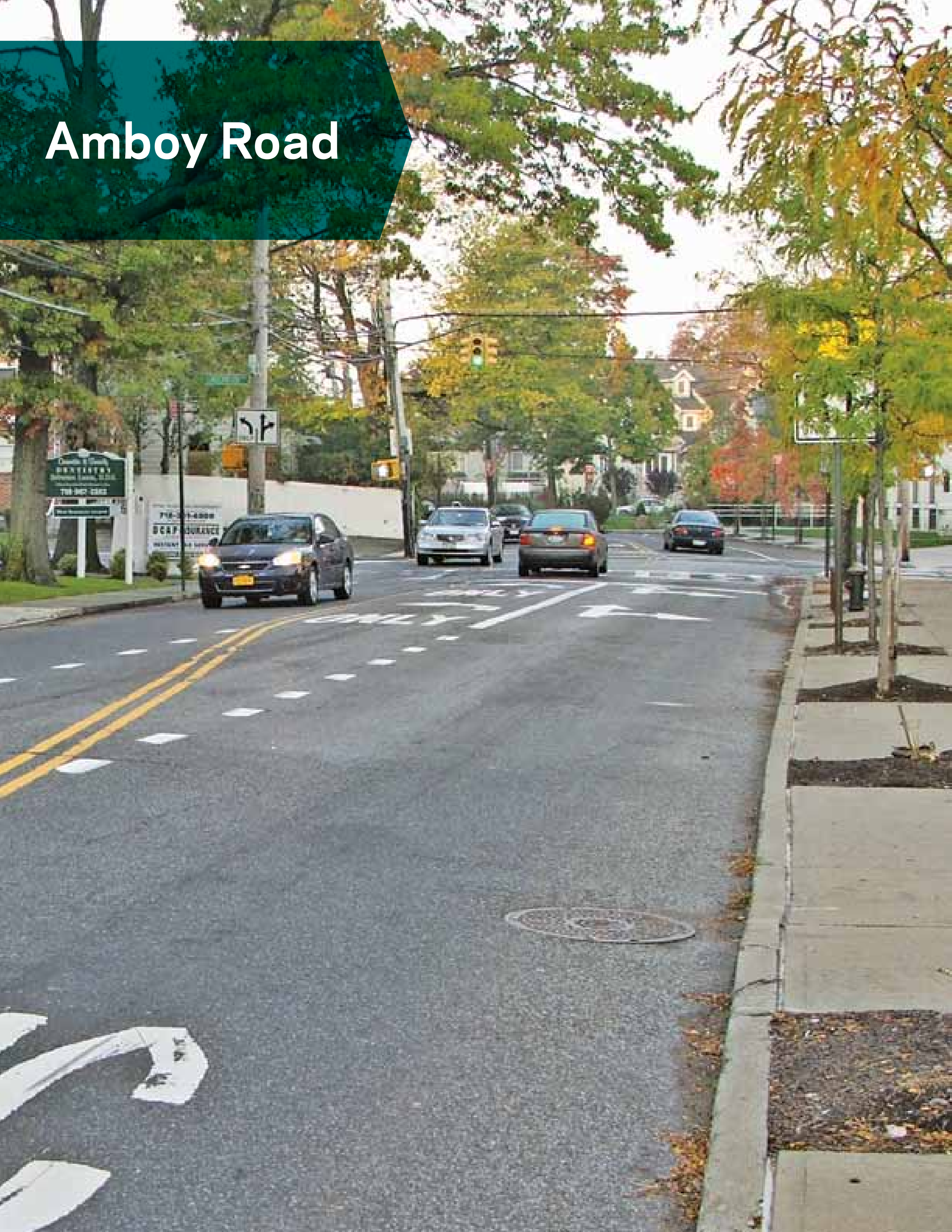
*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through October 2010) at annual rate. See page 72 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.

Westbound Belt Parkway Ramps and Bay Parkway Intersection Traffic Volumes (average vehicles per hour)

Location	Time	Before	After	% Change
Northbound Through Traffic on Bay Parkway	8-9 a.m.	477	536	12%
	1-2 p.m.	633	610	-4%
	5-6 p.m.	852	732	-14%
Southbound Through Traffic on Bay Parkway	8-9 a.m.	647	870	34%
	1-2 p.m.	739	714	-3%
	5-6 p.m.	799	879	10%
Southbound Bay Parkway Traffic Turning Right to Belt Parkway	8-9 a.m.	546	746	37%
	1-2 p.m.	491	404	-18%
	5-6 p.m.	600	638	6%
Westbound Traffic Exiting the Belt Parkway	8-9 a.m.	599	667	11%
	1-2 p.m.	709	650	-8%
	5-6 p.m.	895	646	-28%

Before data collected in August 2008. After data collected in November 2010. All data collected on weekdays.

Amboy Road



Purpose

- Reduce traffic congestion
- Improve mobility and safety for all users of the street system
- Improve air quality

Outreach

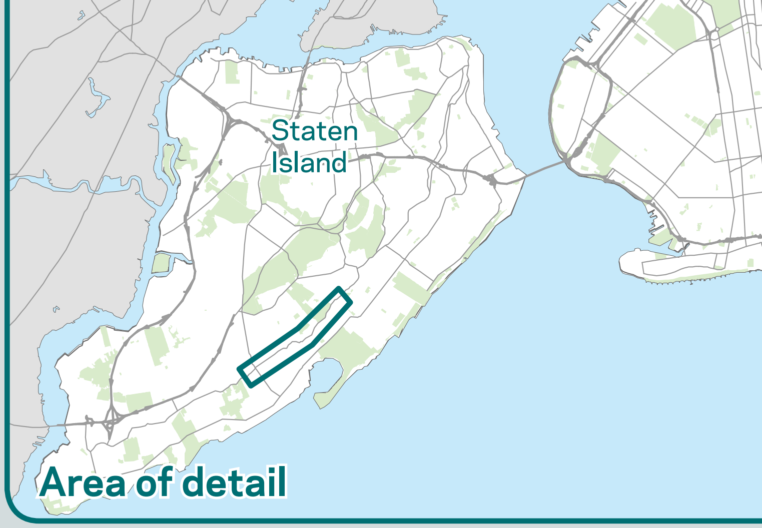
- DOT presented plans to the Staten Island Community Board 3 Transportation Committee (CB3) in February 2008 and received feedback
- DOT conducted community walk-through and drive-through with CB3 in June 2008
- DOT presented revised plans to CB3 in May 2009 and received support for the plan
- DOT installed short-term improvements July 2009
- DOT presented results of short-term improvements and modifications to long-term plans to CB3 in October 2009

Approach

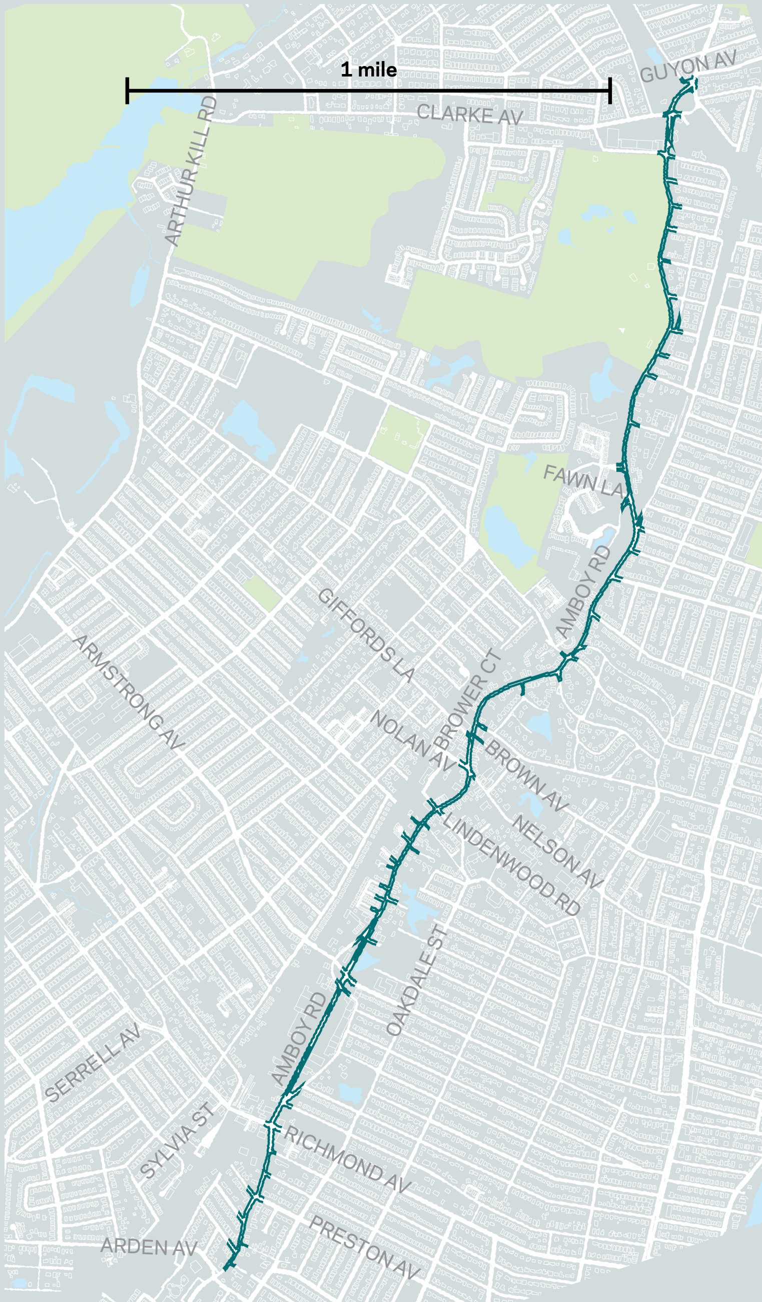
- Adjusted signal timing along corridor
- Installed left-turn bays at key intersections
- Rerouted S54 bus to eliminate left turns from Amboy Road to reduce congestion
- Reconfigured intersection at Richmond Avenue and Amboy Road
- Realigned traffic lanes on Richmond Avenue from Serrell Avenue to Sylia Street to match adjoining segments
- Constructed channelized right-turn lane at Amboy Road and Nelson Avenue
- Added, removed and relocated parking spaces

Results

- Eastbound travel times decreased by more than two minutes during the weekday afternoon, weekday evening and weekend midday peak periods; travel time decreased by 45 seconds during the morning peak period
- Westbound travel times decreased throughout all peak periods by as much as 45 seconds in the morning peak and by as little as 9 seconds in the evening peak
- Weekday traffic volumes were virtually unchanged along the Amboy Road corridor
- Number of crashes involving injuries to motor vehicle occupants and pedestrians lower than the average for the three prior years



Amboy Road traverses Staten Island's southeastern quadrant. Most of Amboy Road has narrow, winding single lanes in each direction. The study area's land use is primarily residential with pockets of commercial businesses and retail establishments. Amboy Road parallels Hylan Boulevard and the Staten Island Railway. The three-mile project corridor runs through the Annadale, Eltingville, Great Kills, and Bay Terrace neighborhoods. The corridor also serves as a local truck route.



Amboy Road

In 2008, DOT began the Congested Corridors Study to reduce traffic congestion and improve air quality across the five boroughs. One of the five pilot locations was Amboy Road in Staten Island, from Guyon Avenue to Arden Avenue. The Congested Corridors Study is a PlaNYC initiative, funded through the federal Congestion Mitigation and Air Quality Improvement (CMAQ) program. The studies are one avenue in which DOT carries out the City policy accommodating the needs of all street users including motorists, pedestrians, bicyclists, and transit users.

Much of the congestion that results on Amboy Road is due to the single-lane operation in each direction. Vehicles frequently queue behind slow moving vehicles, turning vehicles, and buses, thus causing congestion. Congestion is also experienced at intersections where vehicle volumes are much larger than the capacity of the intersection. Parking availability was also a concern in the project area. Parking is permitted along certain sections of the corridor; however, parking maneuvers can impact traffic flow.

In February 2008, DOT met with CB3 to present project plans and received feedback from the board. In June 2008, DOT conducted a walk-through and drive-through with CB3 to see and hear firsthand the issues along the corridor. DOT presented revised plans to CB3 in May 2009 and received support for the project. DOT installed the short-term improvements in July 2009. In October 2009, DOT presented the monitoring results of the short-term improvements and presented the modified long-term improvements to CB3.

Short-term improvements included signal timing adjustments throughout the corridor to improve traffic flow. Left-turn bays were installed along Amboy Road at the intersections of Waimer Place/Preston Avenue, Lindenwood Road, and Nolan Avenue. DOT constructed a channelized right-turn lane for eastbound Amboy Road traffic at Nelson Avenue. Channelization was installed to help calm traffic and make the movement more noticeable to pedestrians and other motorists, and therefore safer.

The intersection of Amboy Road and Richmond Avenue was reconfigured to reduce congestion and improve safety. DOT prohibited northbound left turns from Richmond Avenue onto Amboy Road and converted the lane into a through-only lane. Signal time that was originally used for northbound left turns was reallocated to a new phase for left-turning vehicles from eastbound and westbound Amboy Road. Vehicles which are now unable to make the northbound left turn onto Amboy Road from Richmond Avenue can access westbound Amboy Road via Oakdale Street and Arden Avenue. Left-turn bays were added at the intersection of Oakdale Street and Richmond Avenue to accommodate the rerouted vehicles. Parking spaces had to be removed along Richmond Avenue to accommodate the turn bays, but DOT is considering replacing the lost spaces along Oakdale Street.

DOT made several other changes in the area of the Richmond Avenue and Amboy Road intersection. The two northbound bus stops along Richmond Avenue just north of Amboy Road were combined and relocated closer to the nearby Staten Island Railway entrance. Metered parking spaces were removed on northbound Richmond Avenue to provide space for the relocated bus stop and to decrease friction with the travel lanes. Metered parking spaces were added on side streets throughout the area creating a net increase of 19 parking spaces. Just north of the intersection, the lanes on Richmond Avenue between Sylvia Street and Serrell Avenue were realigned from two southbound and one northbound lane to one southbound and two northbound lanes to match the lane arrangement on the rest of Richmond Avenue.

DOT worked with the MTA to reroute the S54 bus in order to reduce congestion caused by left-turning buses at the Amboy Road intersections at Giffords Lane for northbound buses and Nelson Avenue for southbound buses. The S54 travels between Giffords Lane and Nelson Avenue on Brower Court instead of Amboy Road. One bus stop was removed and three new bus stops were added to accommodate the route change.

Travel time runs were completed before and after project implementation. Travel times have decreased along the corridor in both directions. In the eastbound direction during the morning peak period, travel times dropped by approximately 45 seconds and decreased even further to a savings of more than two minutes during the midday,

A channelized right-turn lane was constructed at Nelson Avenue for eastbound Amboy Road traffic to help calm traffic.

Northbound left turns are prohibited from Richmond Avenue onto Amboy Road to reduce congestion and improve safety.

Travel times improved by up to 2 minutes on Amboy Road, after implementation of signal timing adjustments, lane reconfigurations, left-turn bays and other improvements.

evening and weekend peak periods. Westbound travel times were reduced throughout all periods as well, though less significantly in the evening peak period.

Weekday traffic volumes were virtually unchanged for eastbound and westbound traffic along Amboy Road. Volumes on Richmond Avenue just north and south of Amboy Road were also relatively unchanged after project implementation. There was a small decrease of 7% in the northbound vehicle volumes which may be due to seasonal variation or the rerouting of northbound left-turning traffic at Amboy Road.

Analysis of the NYPD crash data shows that there were no significant changes in the number of crashes involving injuries along Amboy Road in the project section. The number of crashes involving injuries to motor vehicle occupants and pedestrians after implementation was lower than the average for the three prior years.

Further improvements will be made as the long-term changes are implemented. Pedestrian improvements will be completed at the Amboy Road/Fawn Lane intersection. The Amboy Road intersections at Arden Avenue, Clarke Avenue and Guyon Avenue will be reconstructed to improve traffic flow and safety.

Eastbound Amboy Road Travel Times
Arden Avenue to Clarke Avenue

	Before	After	Change	% Change
Weekday 7-10 a.m.	10:27	09:43	-00:44	7%
Weekday 12-2 p.m.	11:24	09:17	-02:08	19%
Weekday 4-7 p.m.	11:51	09:32	-02:19	20%
Weekend 11 a.m.-2 p.m.	12:32	09:39	-02:53	23%

Before data collected in April 2007. After data collected in October 2009.
Times shown in minutes, seconds.

Westbound Amboy Road Travel Times
Clarke Avenue to Arden Avenue

	Before	After	Change	% Change
Weekday 7-10 a.m.	10:18	09:32	-00:46	7%
Weekday 12-2 p.m.	10:47	09:45	-01:02	10%
Weekday 4-7 p.m.	09:45	09:36	-00:09	2%
Weekend 11 a.m.-2 p.m.	10:34	10:11	-00:22	4%

Before data collected in April 2007. After data collected in October 2009.
Times shown in minutes, seconds.

Crashes with Injuries along Amboy Road

	Before* (three previous years)			After
Total Crashes with Injuries	4	9	16	8.8
Number of Crashes with Injuries to:				
Motor Vehicle Occupants	4	7	10	6.4
Pedestrians	0	2	5	1.6
Bicyclists	0	0	1	0.8

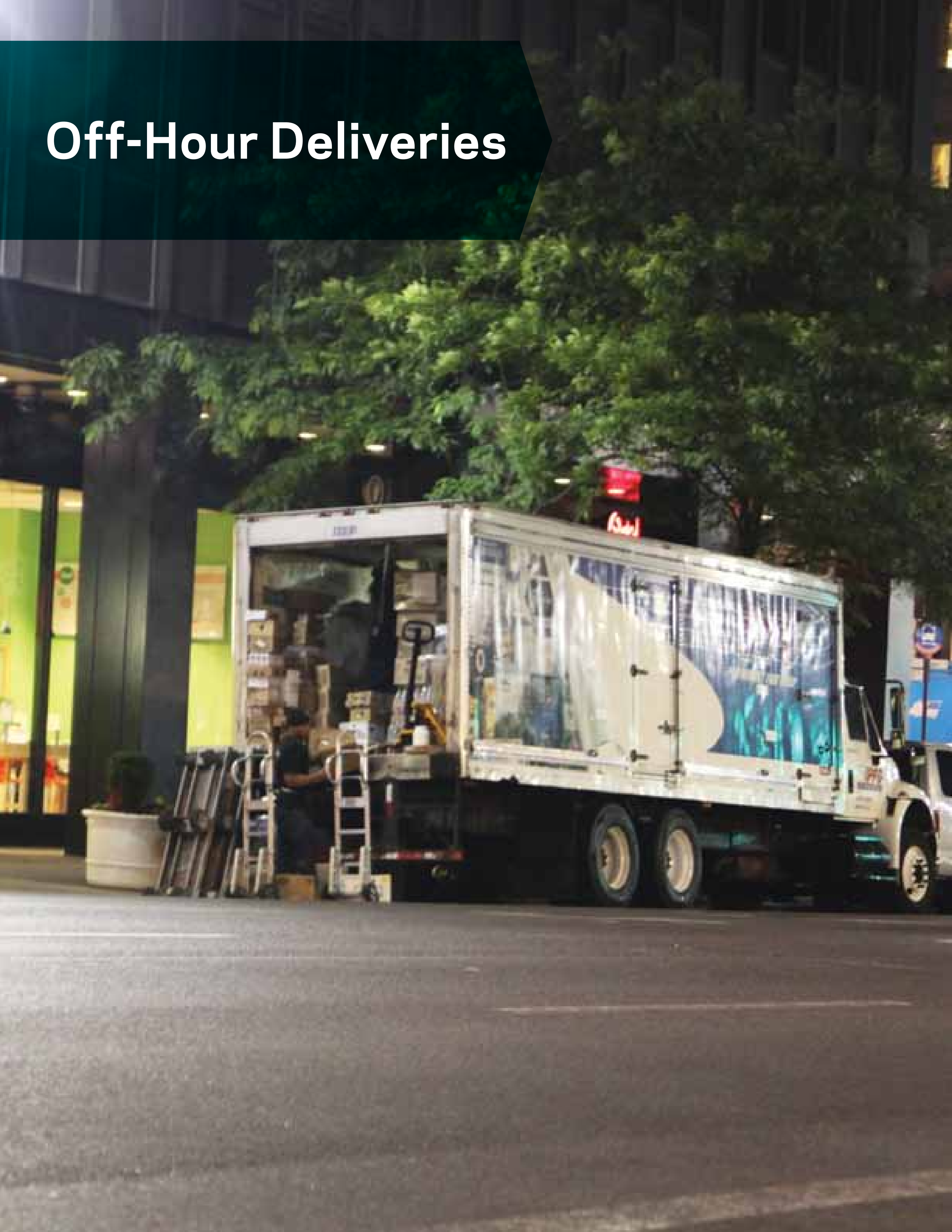
*Before columns show the crash history for each of the three years immediately prior to project implementation. After column shows number of crashes since implementation (through October 2010) at annual rate. See page 72 for further information on crash data source and analysis methodology. The sum of the three specific categories may not equal "Total Crashes with Injuries" because some crashes involved injuries in multiple categories.
Note: Crash data was analyzed for the six intersections where improvements were implemented: Preston Avenue/Waimer Place, Richmond Avenue, Lindenwood Road, Nolan Avenue, Nelson Avenue, and Giffords Lane.

Daily Weekday Traffic Volumes (average vehicles per hour)

Roadway Segment	Before	After	% Change
Amboy Road from Arden Avenue to Clarke Avenue	1,460	1,423	-3%
Amboy Road from Clarke Avenue to Arden Avenue	1,823	1,717	-6%
Richmond Avenue from Lyndale Lane to Amboy Road	441	409	-7%
Richmond Avenue from Mosely Avenue to Amboy Road	325	307	-6%

Before data collected in May 2007. After data collected in November 2010.

Off-Hour Deliveries



Purpose

- Demonstrate feasibility and benefits of off-hour deliveries (OHD) under New York City conditions
- Reduce truck traffic from city streets during congested daytime hours
- Improve business operations of participating vendors and receiving businesses
- Improve air quality

Outreach

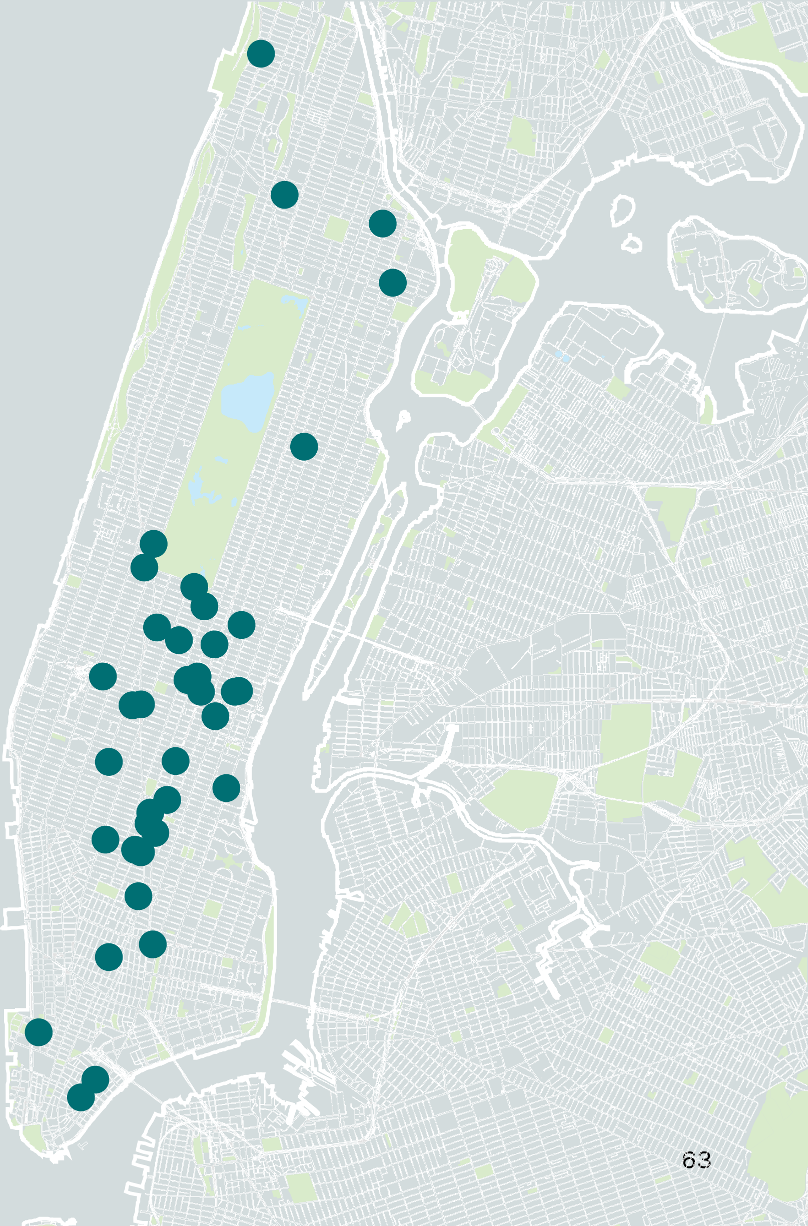
- DOT participated in outreach meetings with trucking industry representatives, New York State Department of Transportation (NYSDOT), the Port Authority of New York and New Jersey (PANYNJ), the New York Metropolitan Transportation Council (NYMTC) and the research team in June and December 2009
- DOT served as the lead coordinating agency for the pilot and worked with the trucking industry to provide education on the OHD pilot program
- DOT met with industry advisory groups to better understand carriers' and receivers' concerns related to shifting to OHD
- DOT met with public agencies to help facilitate the development of the pilot program

Approach

- Identified and approached industry leaders who could help recruit companies to participate in pilot
- Selected industry partners for the pilot representing retail, food stores, restaurants and carriers
- Stimulated OHD interest through financial incentives for carriers and receivers
- Facilitated unassisted delivery systems to minimize off-hour staffing needs of receiving businesses
- Monitored progress of OHD with GPS-enabled cell phones
- Recognized pilot participants and launched an outreach campaign to expand OHD
- Interviewed receivers and carriers after the pilot to document their experience and gauge their willingness to continue operating in the off-hours

Results

- Median speeds for deliveries from customer to customer in Manhattan were 50% higher during off-hours than the morning period (8-10 a.m.) and 130% higher than the midday period (10 a.m. – 4 p.m.) and evening period (4-10 p.m.)
- Median service times in the off-hours were as low as 25 minutes for one delivery whereas median service times from 7 a.m.- 4 p.m. all exceed one hour for one delivery
- No parking fines reported during pilot, reduced from frequent costs of about $1,000 per month per truck
- Drivers overwhelmingly supported OHD, citing ease of delivery, reduced congestion, and lower stress levels
- Restaurant receivers preferred having products waiting for them in the morning rather than anticipating the arrival during the day and found that OHD improved staff productivity since food preparation was not delayed by late daytime deliveries



Trucks and commercial vehicles are critical to the economic vitality of New York City, as they account for the vast majority of freight movement into and within the city. Due to congestion on the city's streets and highways, combined with the volume of freight movement, trucks and commercial vehicles both significantly contribute to traffic congestion and experience higher costs as a result of wasted time, missed deliveries and parking tickets. These costs are passed on to receivers and ultimately raise the cost of doing business and cost of living in the city.

The concept of OHD, in which goods are delivered in the evening or early morning hours rather than during the business day, presents an opportunity to address the issues of costs, congestion and air quality. Implementing an OHD program, however, presents many difficulties, including rescheduling work shifts, providing a means for businesses to receive deliveries when they may not have employees on duty, and overall coordination between carriers and receivers.

The OHD pilot originated in a request from the New York City Chapter of Supply Chain Management Professionals to the NYSDOT in 2002. NYSDOT issued a Request for Proposals and selected, Rensselaer Polytechnic Institute (RPI) to research the potential for OHD in New York City. RPI's research led to a focus on food and retail deliveries in Manhattan. A consortium of RPI, Rutgers University, the Rudin Center at New York University, and ALK Technologies Incorporated received funding from the U.S. Department of Transportation in March 2007 via their Commercial Remote Sensing and Spatial Information Technology Applications Program. DOT served as the lead coordinating agency for the pilot and worked with the trucking industry to provide education on the OHD program and to reduce participation barriers in the pilot.

This project team brought together advisory groups of industry and public agencies to facilitate development of an OHD pilot. An Industrial Advisory Group helped the project team better understand carriers' and receivers' concerns related to shifting to OHD, while a Technical Advisory Group of public agencies advised on policy obstacles and opportunities related to the proposed pilot. DOT participated in outreach meetings with trucking industry representatives, NYSDOT, PANYNJ, NYMTC and the research team in June and December 2009 where the policy implications of the pilot and its possible effects on current truck traffic were explored further.

The pilot program was a pioneering opportunity to test OHD in a real-life, complex urban setting. Recognizing the setup costs of the pilot, as well as the changes required to their daily business operations, DOT recruited businesses to voluntarily receive OHD through the use of financial incentives. This is a departure from previous studies which charged carriers more to deliver during regular hours, and highlights the critical role that receivers play in making OHD possible. DOT also identified and enlisted industry leaders to help encourage businesses to participate.

Off-hour deliveries in the pilot occurred between 7 p.m. and 6 a.m. OHD was facilitated for some companies by the use of unassisted delivery systems – thus minimizing evening staff needed by the receiving businesses. In unassisted deliveries, drivers are provided a key to the storage (or walk-in refrigerator) area of a business. Double doors, delivery lockers, or container/storage pods can also be deployed in unassisted systems. Some retail receivers did not use the unassisted delivery option because they were concerned about theft of their merchandise. These receivers had staff stay late to accept the deliveries.

In the end, 25 receiver businesses and eight carriers participated in the pilot study. Each participated for a minimum of one month between October 2009 and January 2010 with some making a policy change to shift to OHD. Gotham Bistro, located in the Times Square area, has continued to receive their deliveries between 4 a.m. and 5 a.m. even though the pilot has ended. The managers at Just Salad, preferred the reliability of OHD and have made it a policy for their largest carriers to deliver to their six locations in the off-hours.

Making a day-time delivery on 3rd Avenue at 39th Street in Manhattan.

Making an off-hour delivery at the same location on 3rd Avenue and 39th Street.

Delivery companies' vehicles saw travel times improve 130% from a pilot of off-hour deliveries, based on a comparison of evening and midday travel speeds.

Participating carriers were supplied with GPS enabled smartphones and navigation software, which were configured to only require a single button push from the drivers. The smartphones were then able to log GPS position, speed, date and time every three seconds, safely and distraction-free to the driver. In select cases where companies already had GPS equipment and systems in place, they opted to share this existing data with the project team, which supplemented data from the smartphones for some companies and replaced it for others.

Travel speeds from customer to customer and service times (time spent doing a delivery) of participating carriers improved during the pilot's off-hours period when compared with previous pre-pilot measurements. The median speed for deliveries from customer to customer in Manhattan was 50% higher during off-hours than the morning period (8-10 a.m.) and 130% higher than the midday period (10 a.m. – 4 p.m.) and the evening period (4-10 p.m.). The pilot also demonstrated that service times were significantly reduced during the off-hours. Median service times in the morning and afternoon exceeded an hour for one delivery, reaching median service times of one hour and 48 minutes between 10 a.m. and noon. Median service times in the off-hours were as low as 25 minutes for one delivery. Trucks typically make six deliveries on a tour. If a delivery truck saves 30 minutes at each of the six deliveries that represents a savings of three hours.

Feedback from participants was largely positive. Several participants have considered maintaining or expanding their OHD programs, even without a financial incentive. Carriers noted that among benefits of OHD, they were able to reduce costs by decreasing the amount of parking tickets, as well as maintain a smaller fleet due to more balanced day/night operations. Truck drivers viewed the pilot favorably, reporting faster travel speeds, less congestion, more available parking and lower stress levels. Receiving businesses cited that fewer deliveries during normal hours allowed them to spend time focusing on their clients rather than waiting for and processing deliveries.

In light of the small scale pilot's success, DOT is currently working with RPI to develop an expanded pilot scope, as well as a refinement of the economic benefits model for OHD. Meanwhile, DOT is continuing to support existing participants and assist new participants. The project team has also highlighted an opportunity in reaching out to large traffic generators, such as Grand Central Terminal and Madison Square Garden, for participation in the pilot. DOT is also considering a formal recognition program to acknowledge companies which have voluntarily tested OHD and thus taken steps towards promoting sustainability.

Large deliveries such as this one for a grocery store, may require a lot of sidewalk space.

Customer to Customer Median Speeds (in m.p.h.) in Manhattan by Time Of Day

Time of Day	Speed	% Change in Speed Compared to Off-Hours
All Day (24 hours)	3.3	109%
AM Period (8 a.m. - 10 a.m.)	4.6	50%
MidDay Period (10 a.m. - 4 p.m.)	3.0	130%
PM Period (4 p.m. - 10 p.m.)	3.0	130%
Off-Hours (10 p.m. - 8 a.m.)*	6.9	-

Data collected from November 2009 - January 2010.
*Note: Peak traffic periods occur later and last longer in Manhattan compared to the rest of the city. Off-hours for Manhattan were found to occur from 10 p.m. - 8 a.m.

PARK Smart-Park Slope Pilot

Purpose

- Increase turnover and availability of on-street parking spaces
- Reduce congestion, emissions and double-parking from motorists looking for available parking
- Implement associated curbside management strategies including installation of Muni-Meters, additional meters and delivery windows

Outreach

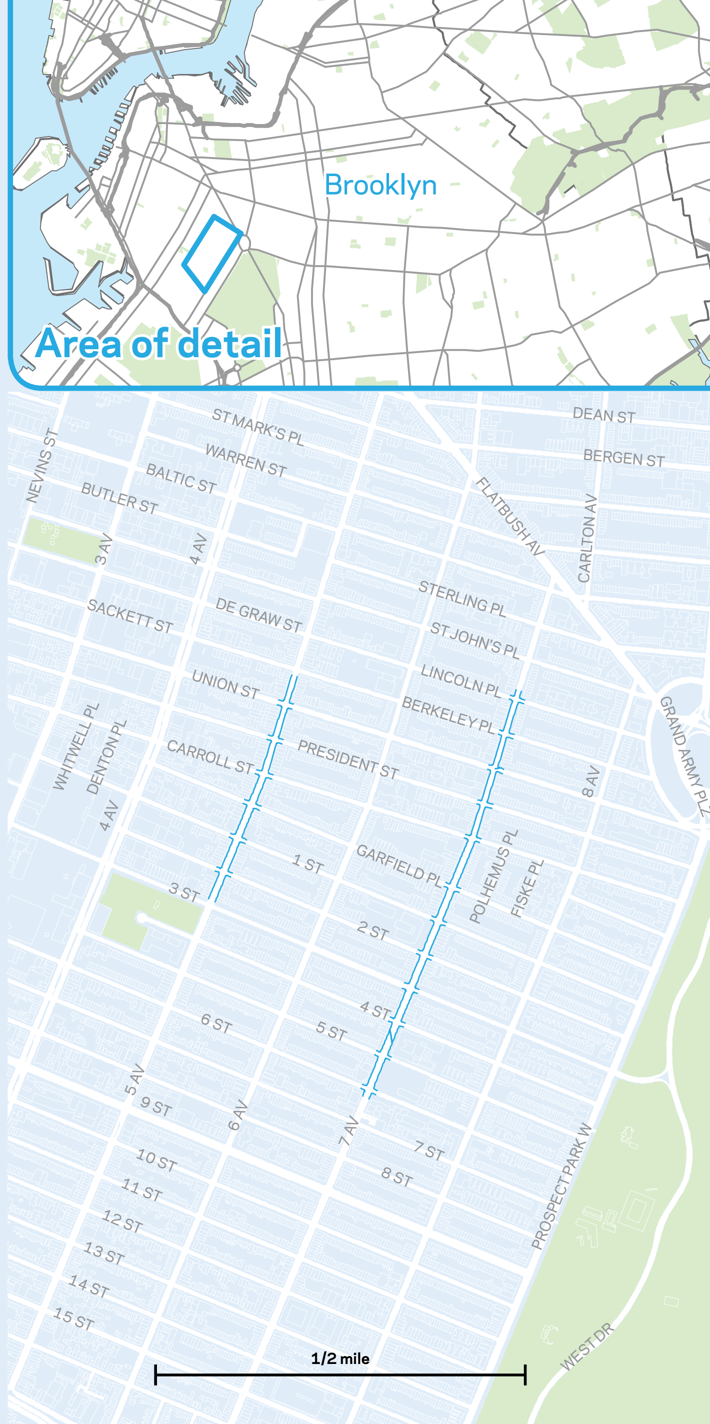
- Engaged the Brooklyn Community Board 6 Transportation Committee (CB6) and stakeholder groups in meetings during planning stages of the pilot
- Presented to merchant and civic groups in March-April 2009
- Discussed delivery needs with local merchants in May 2009
- Presented 1-month "snapshot" review of results with stakeholders in July 2009
- Presented 6-month evaluation in March 2010 and year-over-year results in June 2010 to CB6 and stakeholder groups
- In October 2010, CB6 voted to support making the program permanent including an expansion of PARK Smart area that doubles the size of original pilot area and expansion in the hours the peak rate applies

Approach

- Increased parking rate during peak period (12 p.m. – 4 p.m.) to $1.50/hour (was previously $0.50/hour)
- Collected before and after data on parking duration, turnover, availability, as well as double-parking and illegal parking to assess pilot's impact
- Collected feedback and parking use data from surveys of merchants, parkers and passersby
- Conducted public outreach with community stakeholders before, during and after the pilot
- Peak rate extended to 7 p.m. based on analysis indicating high parking demand into early evening and community support

Results

- 20% reduction in average parking duration during peak hours
- 18% increase in number of unique vehicles, reflecting the higher turnover
- Occupancy of metered spaces showed little change due to already saturated levels of demand and few off-street parking options



Park Slope is a neighborhood in Brooklyn known for its historic brownstones and top-rated restaurants, bars and shops. The two main commercial corridors are located on Fifth Avenue and Seventh Avenue while the side streets are mostly residential. Park Slope has excellent public transportation with access to six bus routes and 11 different subway lines. Park Slope is adjacent to Prospect Park. The Brooklyn Museum, the Botanic Garden and Zoo are all within walking distance.

PARK Smart - Park Slope Pilot

Curbside lanes in retail and commercial districts have myriad uses, including parking, commercial deliveries, bus lanes, bus stops, and bike lanes, as well as sometimes being used for traffic flow. In many retail districts, the potential uses of curb space far exceed the actual amount of space available. It is thus important to carefully manage the use of curb space so as to maximize its value to the community. Inefficient use of curb space can lead to unnecessary traffic and congestion as drivers search for an available space; double-parking by drivers and commercial vehicles; and potentially economic losses to local businesses as customers choose to patronize businesses in more accessible areas.

DOT has developed a toolbox of strategies for making the best use of curbside space. Key among these strategies is peak rate parking pricing. Peak rate pricing has proven to be an effective strategy in areas with an intense demand for on-street parking that exceeds the physical number of spaces. A peak rate encourages drivers to park no longer than necessary, and thus frees up space for other drivers. Increasing the overall availability of spaces can produce less double-parking and cruising for spots, improving the safety and overall flow of traffic on the street.

DOT began its PARK Smart peak rate parking pilot program in 2008 with Greenwich Village, Manhattan, as the first pilot area. (Results were reported in the 2009 Sustainable Streets Index report.) DOT began planning for the second pilot, in the Park Slope neighborhood of Brooklyn in January 2009. DOT worked closely with community residents and businesses to plan, implement and evaluate the Park Slope PARK Smart pilot. Key stakeholders in this process were CB6, the Park Slope Civic Council, the Fifth Avenue BID, Park Slope Merchants Association and Park Slope Neighbors (a group of residents).

PARK Smart enables more drivers to find metered spaces by raising parking meter rates during the peak period.

The Park Slope pilot focused on Fifth Avenue and Seventh Avenue, the two main commercial corridors in the neighborhood. Community outreach and education has been a priority in DOT's approach, given that parking pricing tends to be controversial and is often met with public skepticism. DOT also undertook a comprehensive evaluation program that included parking and traffic data collection and surveyed drivers, merchants, and shoppers to fully document program impacts. (The monitoring program is funded by a grant from the Federal Highway Administration's Value Pricing Pilot Program.)

The pilot area included all metered parking spaces on Fifth Avenue from Sackett Street to 3rd Street, and on Seventh Avenue from Lincoln Place to 6th Street. Within the pilot area, the parking rate was increased to $1.50/hour during the peak time period (noon to 4 p.m.), while remaining at $0.75/hour (the standard rate for outerborough areas) at all other times that meters were in effect. (Note that rates at non-Manhattan meters were increased from $0.50 to $0.75/hour as part of a city-wide parking adjustment at the same time that the pilot began.) The pilot ran for six months from May 2009 through November 2009.

Based on discussions with community stakeholders, several additional strategies were deployed as part of the pilot. DOT also installed multi-space meters, which accept credit and debit cards as well as coins, throughout the pilot area to replace coin-operated meters. DOT also converted several blocks from residential to metered parking along Fifth Avenue and installed additional curb space and time for vehicles making deliveries to local businesses at two locations.

Results showed that turnover increased, resulting in a 20% reduction in parking duration between April 2009 and April 2010. Consistent with the higher turnover, 18% more vehicles were able to find legal metered spaces in April 2010 as compared to the pre-implementation level a year earlier. While some community members were concerned that the higher rates would lead to fewer people patronizing local establishments, in fact, more potential customers were able to park on the affected blocks.

Occupancy rates for metered parking were very high prior to implementation of peak rates: 91% on Seventh Avenue and 82% on Fifth Avenue during the noon to 4 p.m. peak, with occupancies near 100% at many specific times. Occupancy rates measured six months and 12 months after implementation found essentially the same occupancy levels as pre-implementation. This result appears to be due to the saturated level of demand for parking and limited off-street parking options.

Parking duration fell by 20% in Park Slope due to the PARK Smart peak rate pricing pilot, enabling more drivers to find metered spaces and reducing overall traffic volumes on the neighborhood's main commercial avenues.

Of local merchants surveyed, 66% reported that the PARK Smart program had either a neutral, positive, or no effect on their business. Concerns among other merchants included customers hurrying through the store, and customers asking merchants to make change for the meters (the survey was conducted prior to installation of Muni-Meters, which accept credit and debit cards).

Traffic volumes declined by 7% post-implementation compared with pre-implementation traffic levels. This decline may be at least partly due to drivers finding a parking space somewhat more quickly after vehicle turnover increased.

In October 2010, CB6 voted to support PARK Smart as a permanent program. CB6 also voted to support expanding PARK Smart rates to the rest of Fifth and Seventh Avenues, and to 9th Street, thus more than doubling the geographic area of the program, and to extend the hours of the peak rate to include the late afternoon and early evening hours, which also show high levels of parking demand. The peak rate will thus cover noon to 7 p.m. These changes will be implemented in spring 2011.

Overall, the Park Slope pilot showed substantial progress toward PARK Smart program goals in the increased turnover at metered spaces, larger number of drivers able to find an available space and reduction in traffic volumes. At the same time, the pilot showed the difficulty of achieving measurable improvements in parking space availability in conditions of high demand for on-street parking combined with high sensitivity among key stakeholders with increased rates.

A third PARK Smart pilot is in progress on the Upper East Side of Manhattan, and other possible areas throughout the city are under consideration for future pilots.

PARK Smart Park Slope Pilot Program - Results

	April '09	June '09	November '09	April '10	% Change
Occupancy (Vehicles parked in legal spaces / total capacity legal spaces)					
5th Avenue	82%	82%	86%	82%	0%
7th Avenue	91%	89%	90%	92%	1%
Overall	87%	86%	88%	87%	0%
Duration (Peak Period noon to 4 p.m., Weekend and Weekday)					
5th Avenue	1:10	0:58	0:59	0:58	-17%
7th Avenue	1:11	0:58	1:06	0:55	-23%
Overall	1:11	0:58	1:03	0:57	-20%
Daily Unique vehicles (Average, Weekend and Weekday)					
5th Avenue	501	523	543	585	17%
7th Avenue	1,127	1,254	1,254	1,332	18%
Overall	1,628	1,777	1,797	1,917	18%

Base data collected in April 2009. Two-month snapshot collected in June 2009. Seven-month snapshot collected in November 2009. One-year snapshot collected in April 2010.

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	4,186	5,187
1997	7,773	3,440	4,286	5,424
1998	7,858	3,527	4,401	5,893
1999	7,948	3,619	4,503	6,335
2000	8,018	3,718	4,528	6,737
2001	8,071	3,689	4,423	6,921
2002	8,094	3,581	4,495	6,979
2003	8,144	3,531	4,559	6,801
2004	8,184	3,549	4,581	6,919
2005	8,214	3,602	4,534	7,069
2006	8,251	3,666	4,516	7,205
2007	8,275	3,745	4,497	7,401
2008	8,364	3,790	4,405	7,638
2009	8,392	3,687	4,419	7,446

* 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	776	2,237	5.6
1997	84	808	2,249	5.2
1998	85	835	2,294	5.1
1999	103	843	2,431	4.7
2000	85	824	2,517	4.8
2001		689	2,390	4.9
2002	129	785	2,441	6.0
2003	119	810	2,392	6.9
2004	102	814	2,454	7.4
2005	100	798	2,472	7.7
2006	97	794	2,566	8.4
2007	101	783	2,683	9.3
2008	105	754	2,743	12.3
2009	105	762	2,586	15.5

* 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	100	375	119	182
1997	101	377	131	199
1998	102	389	138	206
1999	112	393	135	203
2000	105	387	131	201
2001	60	369	127	133
2002	97	377	133	178
2003	103	383	139	185
2004	102	384	133	195
2005	101	377	133	187
2006	103	364	141	186
2007	102	353	136	192
2008	101	341	132	180
2009	95	346	138	183

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

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

* 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

* 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

* 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

Appendix: Methodology for Crash Data

Crash (accident) data reported in the Project Indicators section is derived from accident reports filed with 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 October 2010. "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
CB	Community Board
CBD	Central Business District
CMAQ	Congestion Mitigation and Air Quality Improvement
DDC	New York City Department of Design and Construction
DOT	New York City Department of Transportation
GPS	Global Positioning System
HOV	High-Occupant Vehicle
MTA	Metropolitan Transportation Authority
NYCT	New York City Transit
NYMTC	New York Metropolitan Transportation Council
NYPD	New York City Police Department
NYSDOT	New York State Department of Transportation
OHD	Off-Hour Deliveries
PANYNJ	Port Authority of New York and New Jersey
Parks	New York City Department of Parks and Recreation
RFID	Radio-Frequency Identification
RPI	Rensselaer Polytechnic Institute
SBS	Select Bus Service
SSFS	Safe Streets for Seniors
TLC	New York City Taxi and Limousine Commission

New York City Department of Transportation

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up to **93%**
of people in eight shopping and entertainment districts arrived by bus, subway, walking or biking.
Source: NYCDOT

3-6%
increase in bus ridership on the M34 after implementation of bus countdown clocks and related improvements in bus service.
Source: NYCDOT

48%
reduction in total crashes involving injuries along Gerritsen Avenue from Nostrand Avenue to Whitney Avenue.
Source: NYCDOT

130% reduction of travel times for delivery companies participating in off-hours delivery pilot.

Source: NYCDOT

70% reduction in delay for vehicles exiting the Pulaski Bridge in Queens after lane reconfigurations and signal timing changes.

Source: NYCDOT

20% reduction in parking duration as result of peak-rate pricing pilot in Park Slope, Brooklyn

Source: NYCDOT

NEW YORK CITY DOT