

Improving Mobility with Corridor Redesign New York City Case Studies



NACTO
Designing Cities

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Deputy Commissioner



Outline

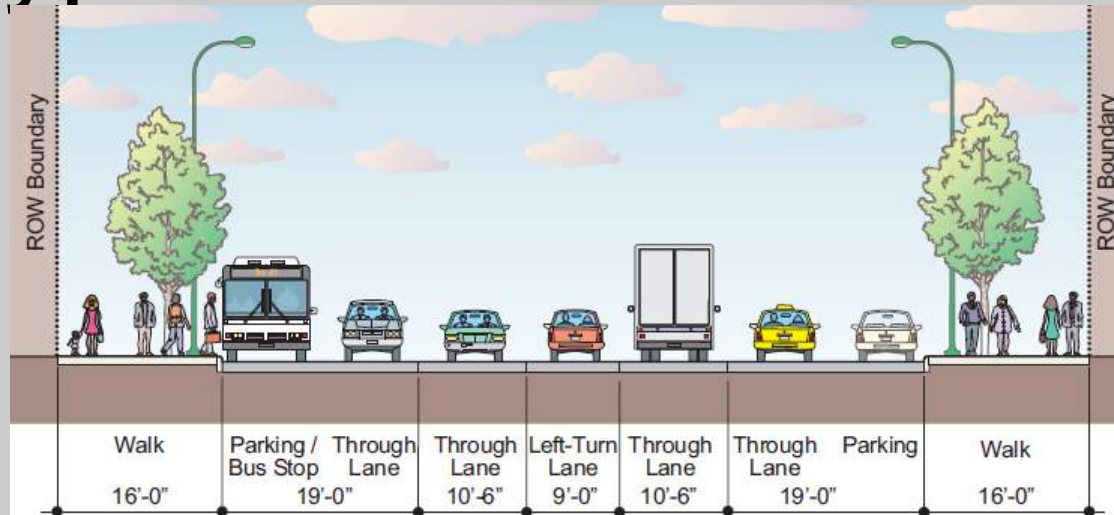
- I. Bus: Webster Avenue, Bronx
- II. Pedestrian: 4th Avenue, Brooklyn
- III. Bike: 1st & 2nd Avenue, Manhattan

Webster Avenue Select Bus Service Corridor Redesign

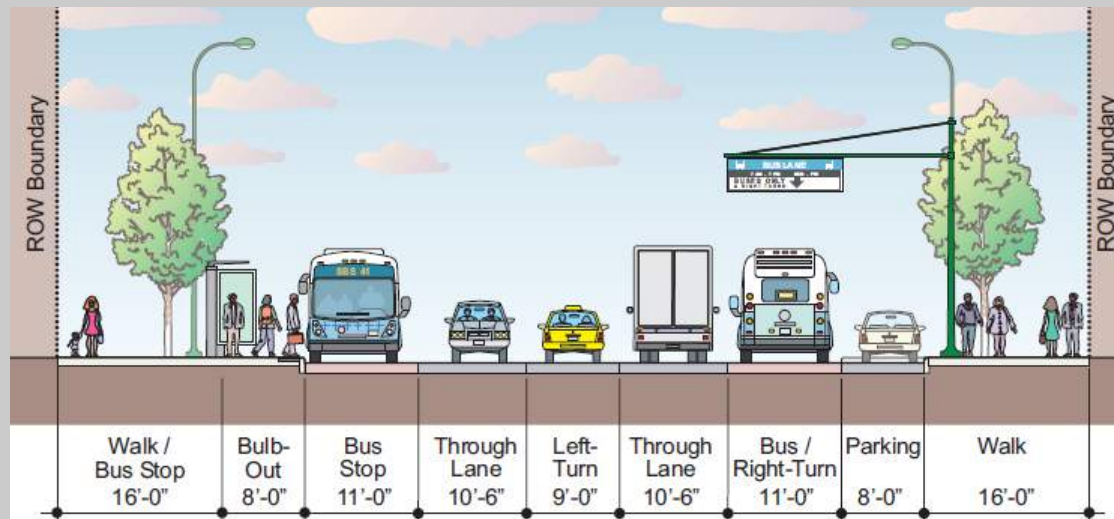


Typical cross section

before



after



Webster Av & 167 St - before



Webster Ave & 167 St - after



Typical aerial view before



after



Webster Av & E Tremont Av - before



Webster Av & E Tremont Av – after



Webster Av & E 195 St - before



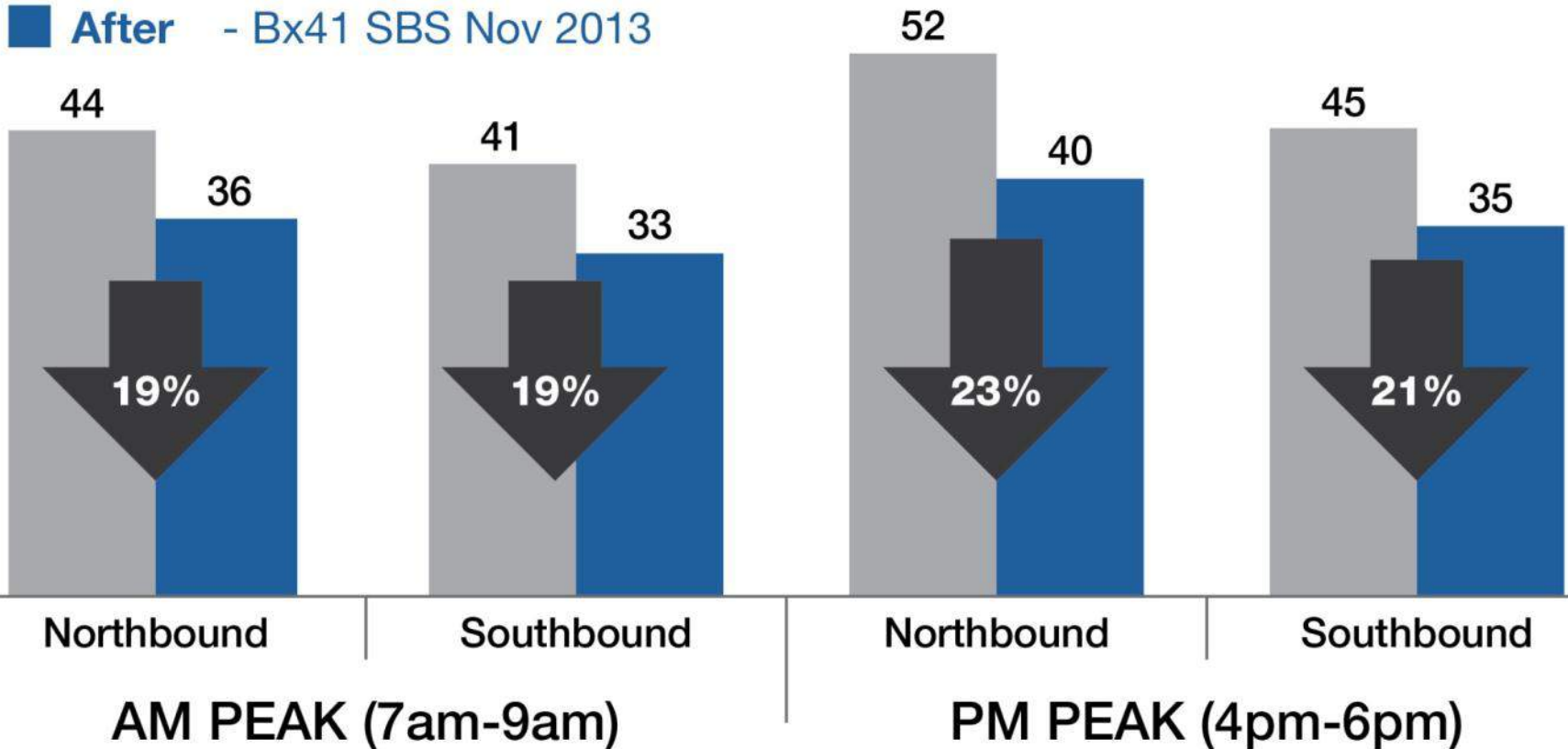
Webster Av & E 195 St - after



Results

Bx41 weekday travel time

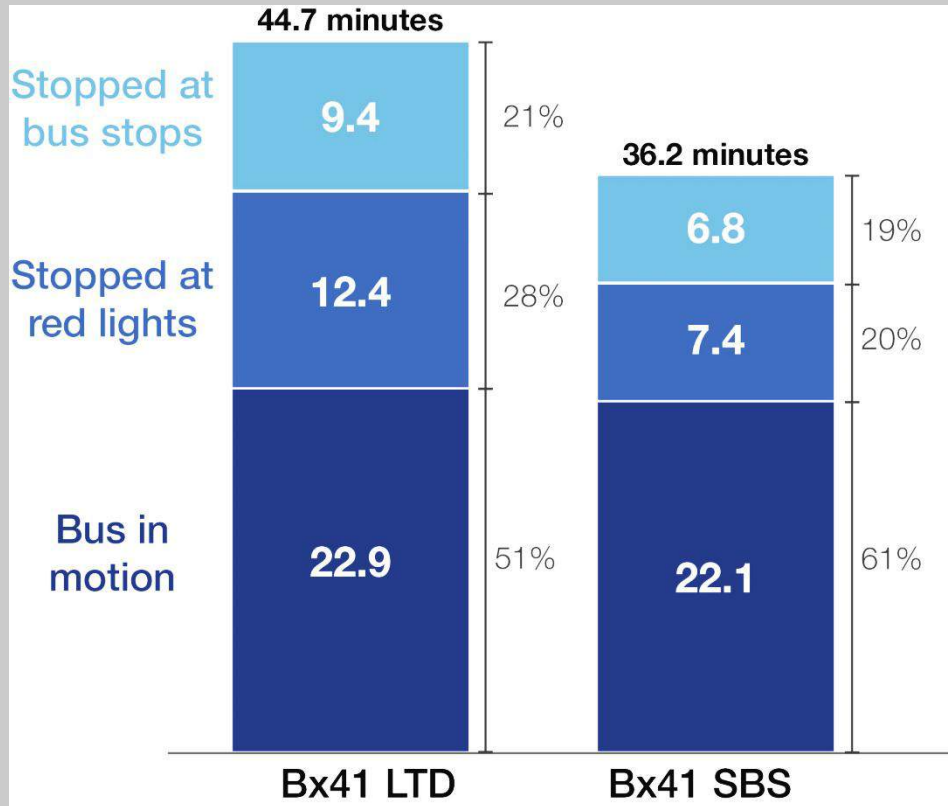
■ **Before** - Bx41 LTD Nov 2012
■ **After** - Bx41 SBS Nov 2013



Bx41 Local travel times also reduced 11 to 17%

Bus in-motion time

- 2.6 minutes saved at bus stops
- 5 minutes saved at red lights



Average of all Bx41 Trips



Improved fare collection



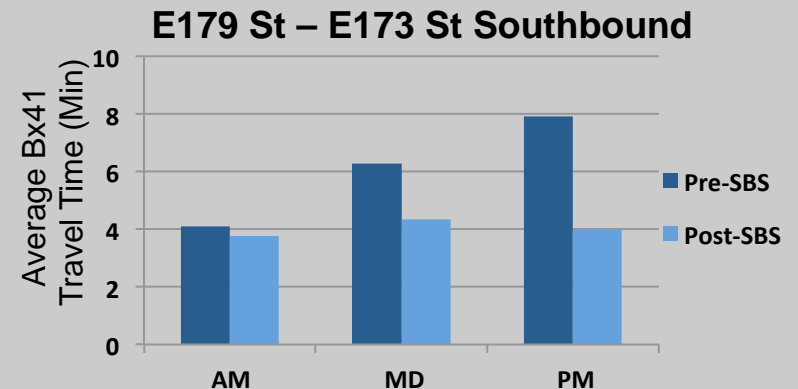
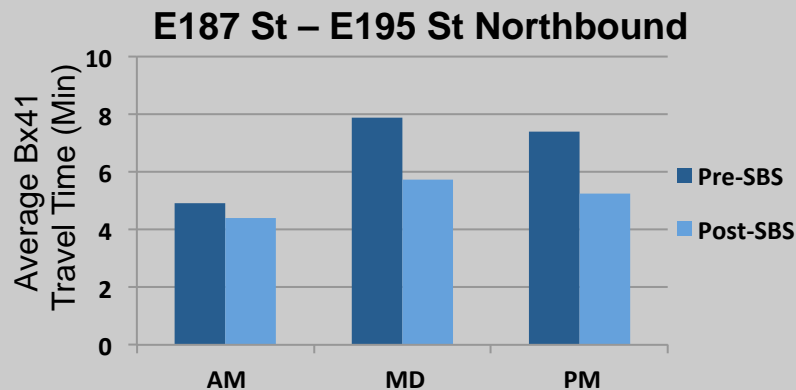
Bus lanes



Transit signal priority (future)

Intersection improvements

- Bus travel time savings at key intersections due to bus priority treatments, signal timing, and street improvements
- Future TSP expected to save more time at intersections

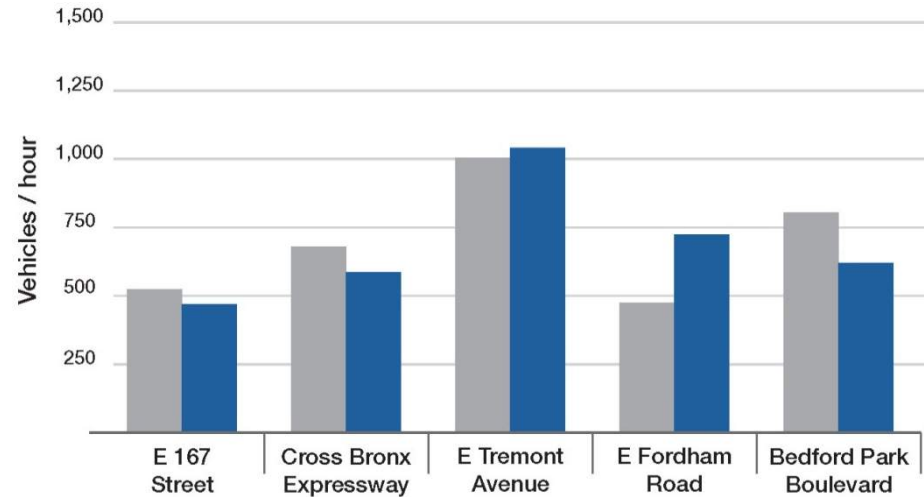


Traffic Volumes

- Traffic volumes after implementation of bus lanes relatively unchanged in PM peak
- Webster Ave carries significantly more traffic southbound at Cross Bronx Expy and northbound at E Fordham Rd

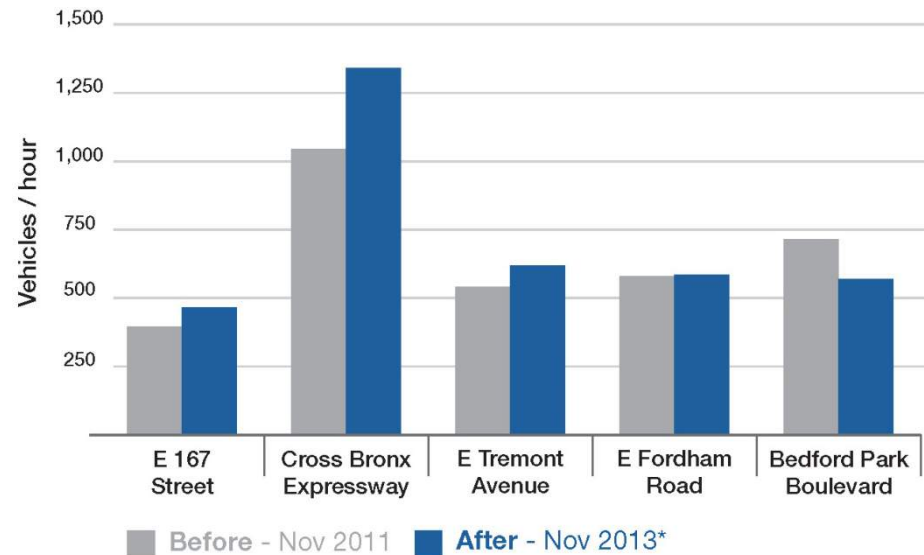
Webster Avenue Northbound Traffic Volumes

Average Weekday Peak PM Hour



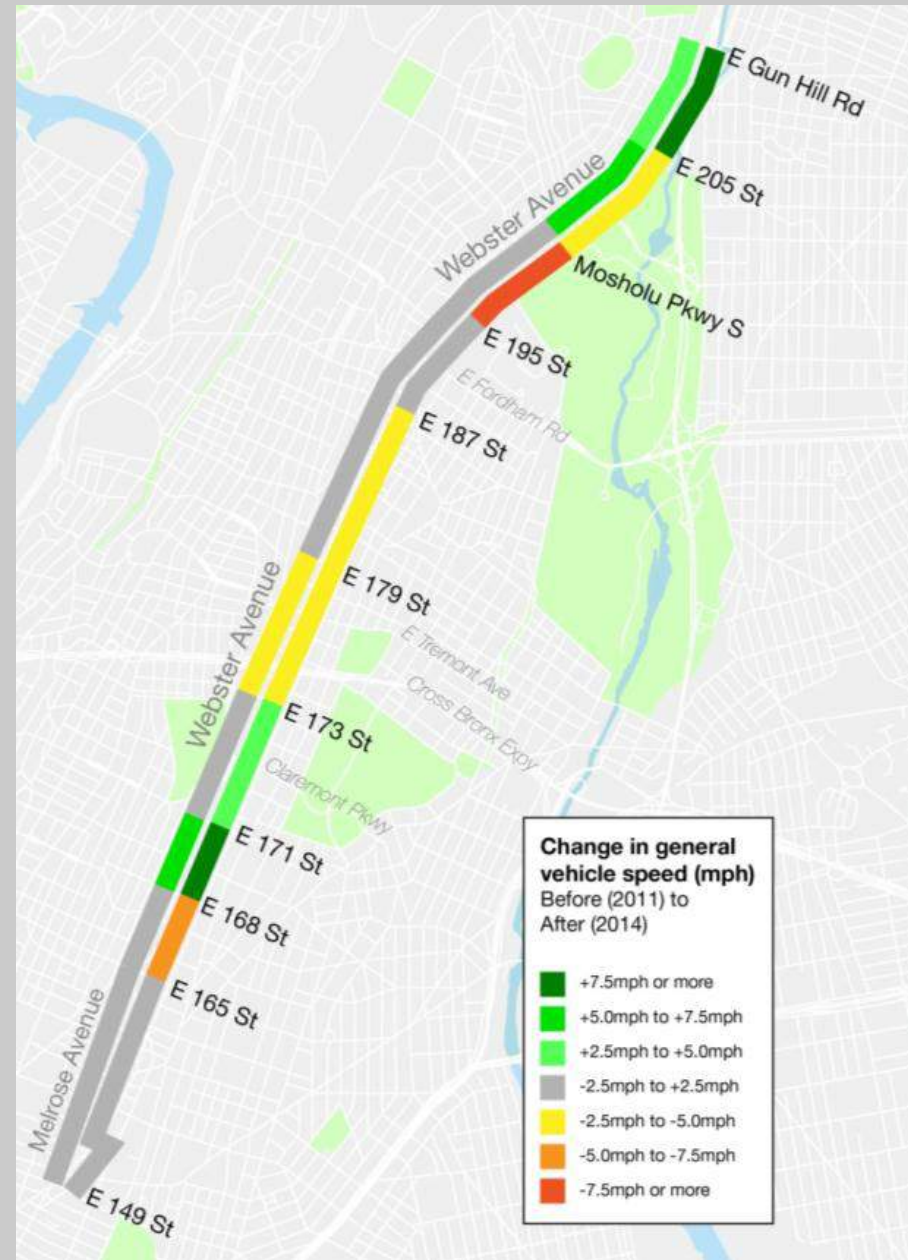
Webster Avenue Southbound Traffic Volumes

Average Weekday Peak PM Hour



Vehicle travel time

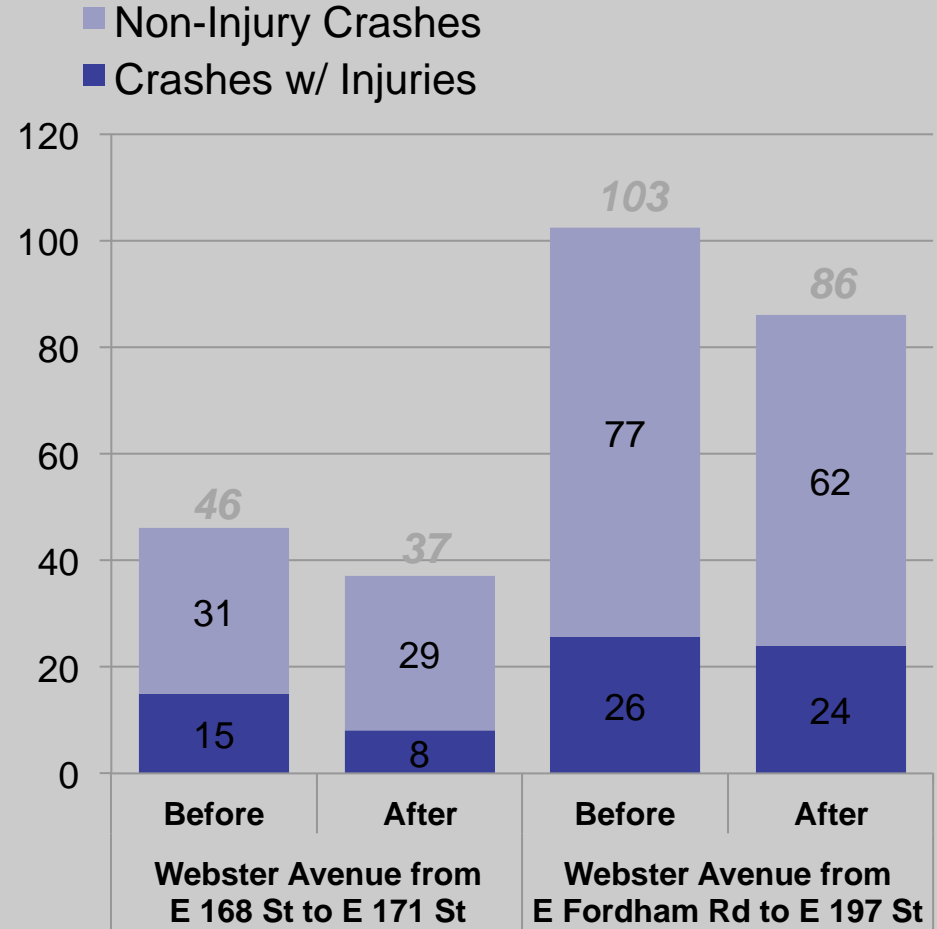
- Before / after data collected using in-vehicle GPS recorders
- Average end-to-end speeds were relatively unchanged
 - Northbound: 12.1 to 12.3 mph (+1%)
 - Southbound: 11.4 to 12.1 mph (+7%)



Safety

Preliminary results for sections of the corridor where pedestrian safety islands were built:

- 6-47% reduction in crashes with injuries
- 16-20% reduction in total crashes



Before : 3-year average 03/2010 - 03/2013

After: 1-year average 09/2013 - 09/2014

4th Avenue, Sunset Park



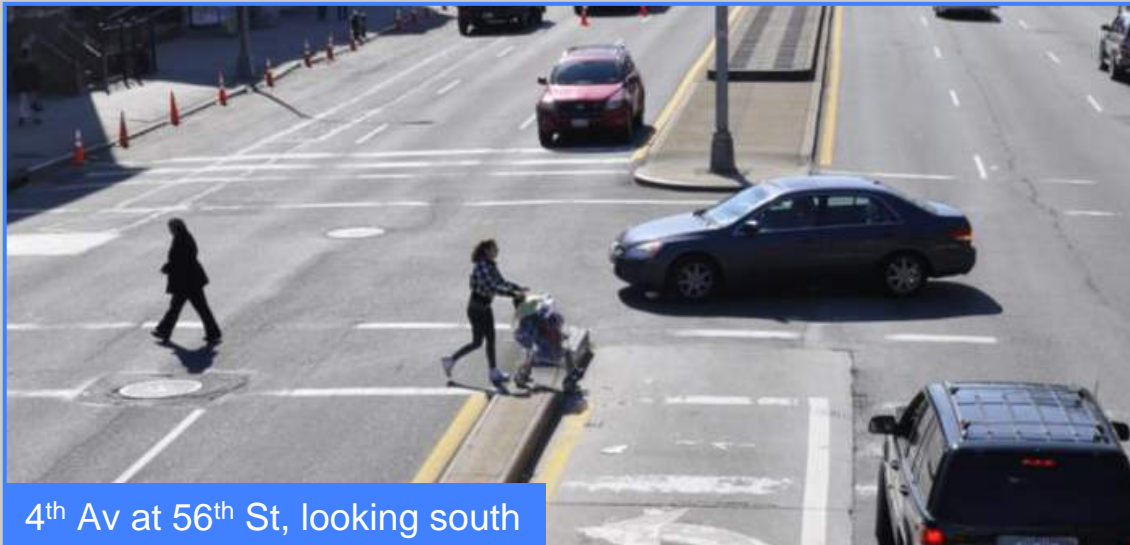
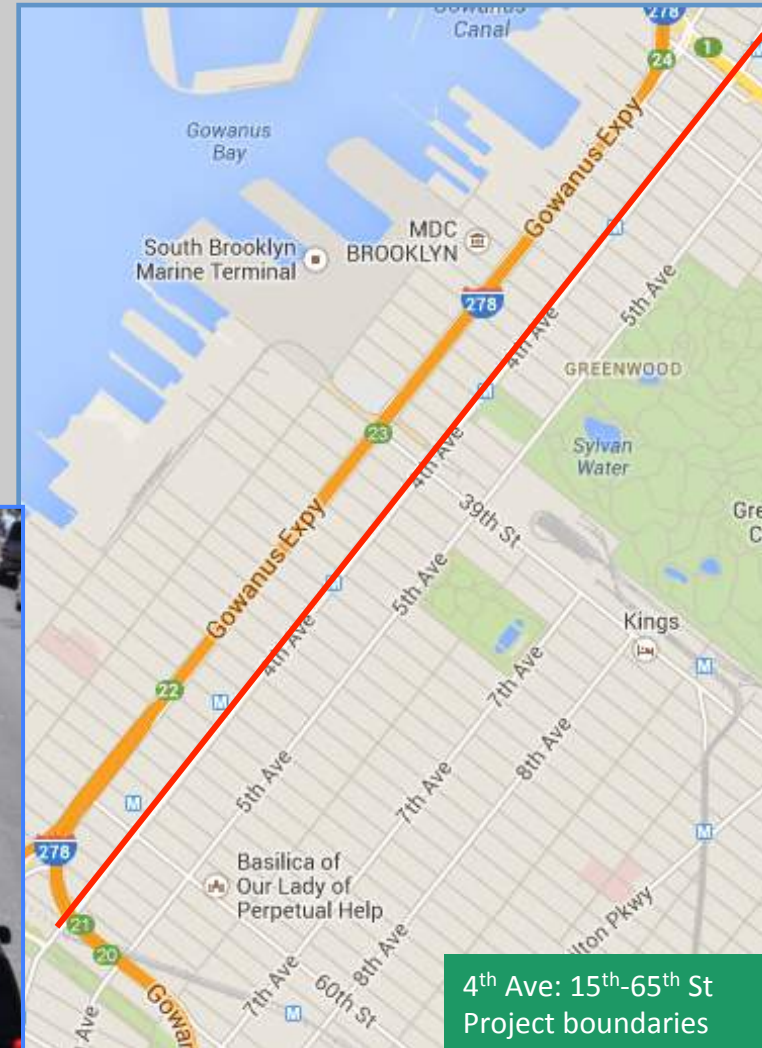
**VISION
ZERO**

NEW YORK CITY



Context: 4th Ave: 15th-65th Sts

- High traffic volume
 - Parallel to Gowanus Expressway
- High pedestrian volume
 - Retail, Subways, Schools
- Very wide street (88' wide, with median)
- Very narrow medians and left turn bays
- Community request to improve safety

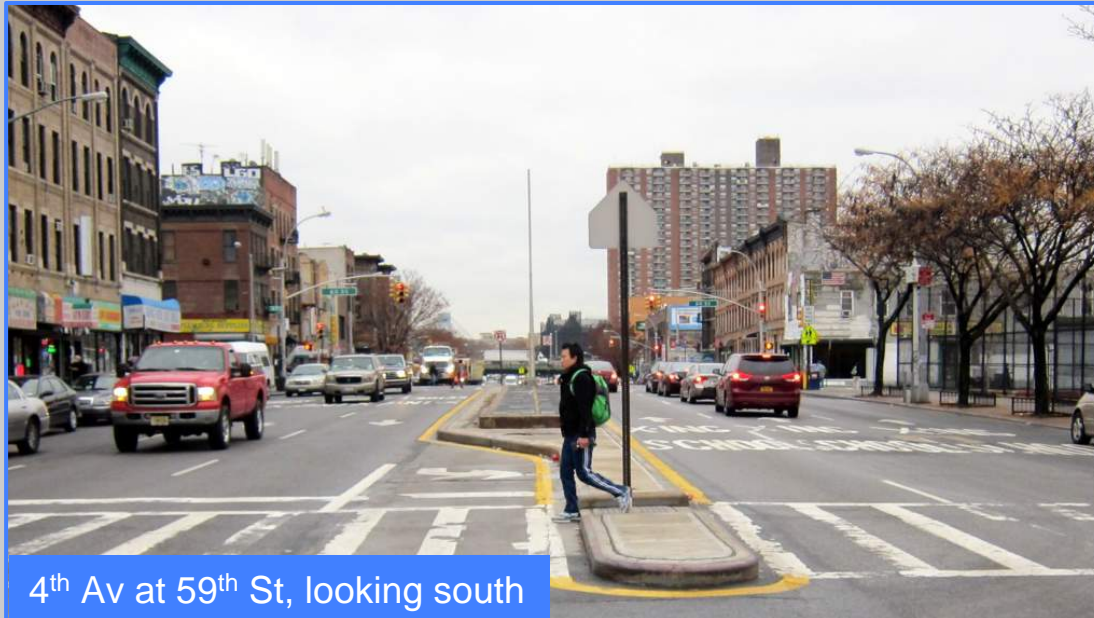


4th Av at 56th St, looking south

4th Ave: 15th-65th St
Project boundaries

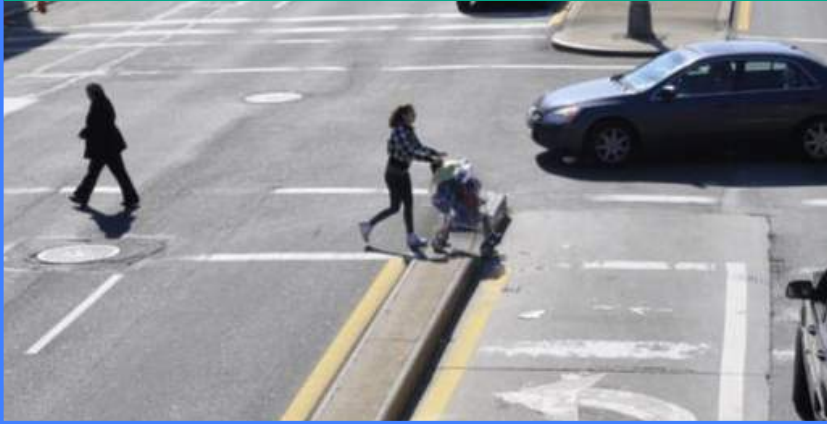
Before: Why 4th Avenue?

- 7 pedestrian fatalities, 1 motor-vehicle fatality: 2006-2011
- High-crash corridor
 - Ranks in top 10% of corridors in Brooklyn
- High incidence of speeding
 - Up to 80% of vehicles speeding on 4th Avenue



Before: Why 4th Avenue?

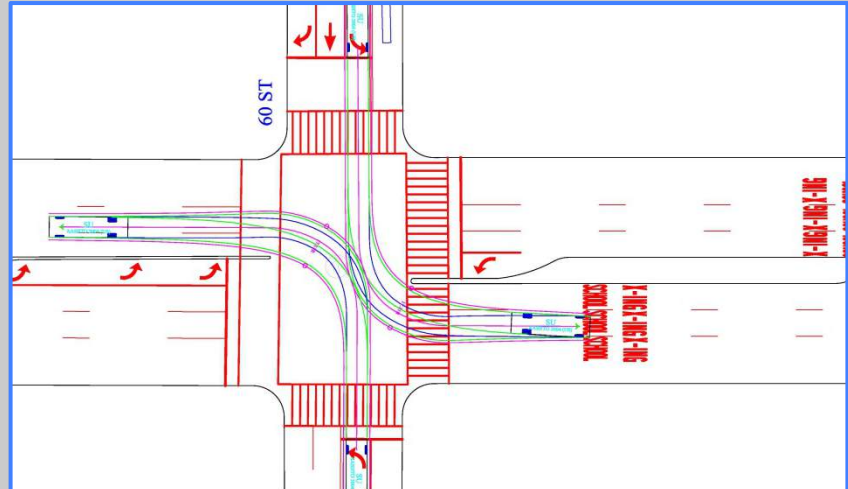
2' wide pedestrian refuges



Separated uptown/downtown subway platforms



Double parking blocked right lane, causing swerving



Opposing left in narrow intersections

Community Engagement

2009

- NYPD and CB7 safety requests to DOT

2010

- BP's *Vision Plan for the Fourth Avenue Corridor*
- DOT attends CB7 and PSCC walk-throughs

2011

- 4th Avenue Task Force created
- DOT begins 4th Ave safety project

2012

- Public workshop, open house, CB7 Outreach
- 15th-65th Sts built in temporary materials

2013

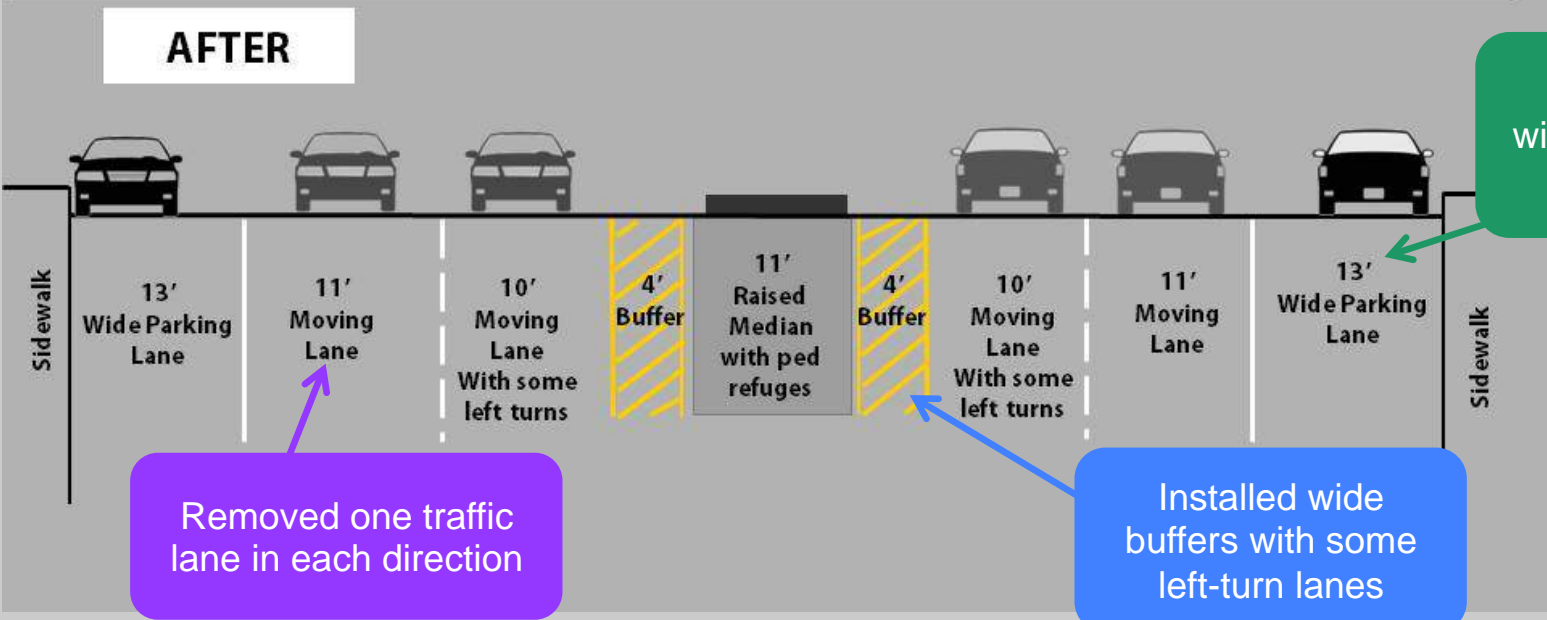
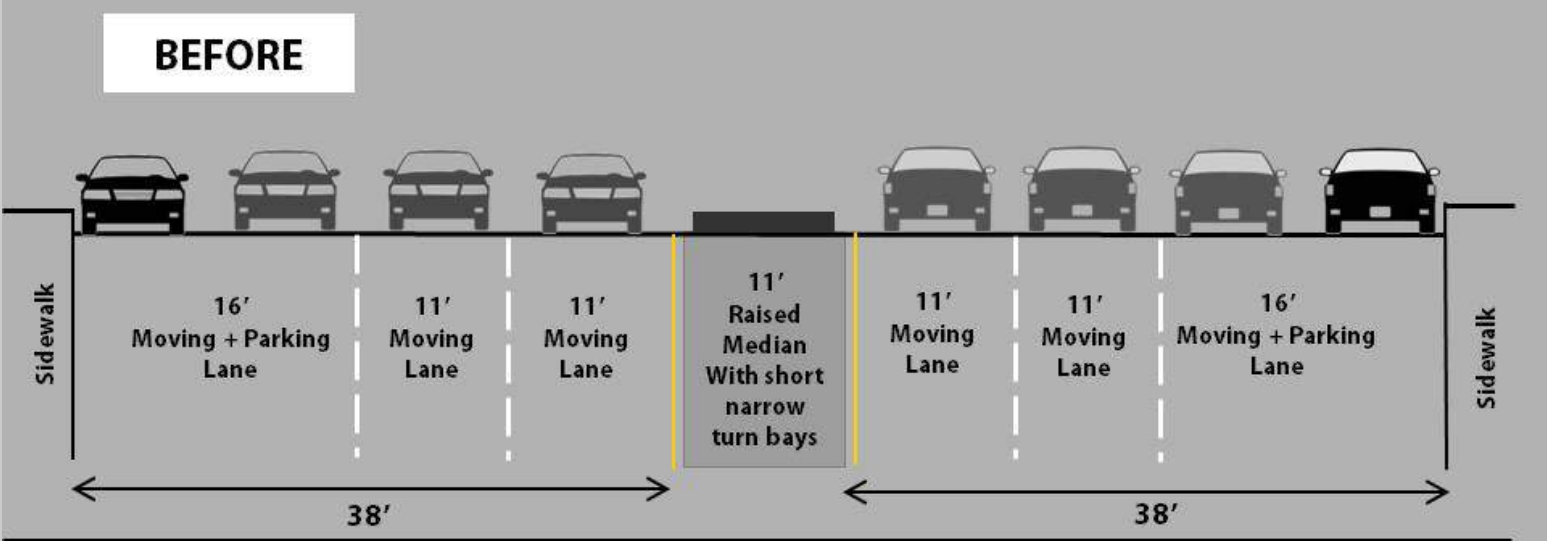
- Atlantic Ave-15th St: Outreach and build
- 15th-65th Sts: Collected after data

2014

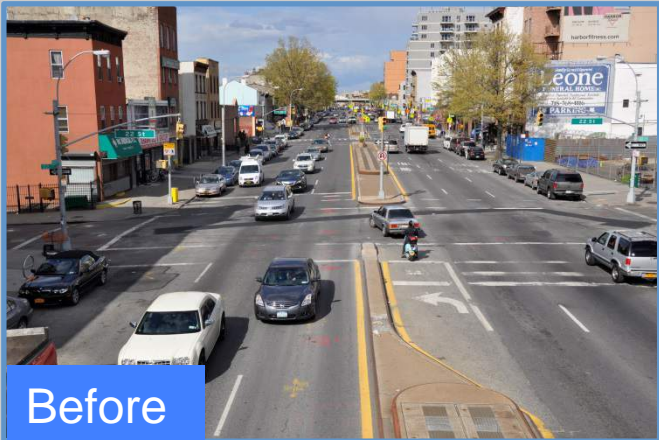
- Sunset Park: 1 Year After data presentation
- Plan for multiphase capital build out



Project Summary



Before/After



Before



Reduced moving lanes from 3 to 2 in both directions, added 4' buffer to medians

Added 13'-wide parking lanes

After

4th Av at 22nd St, looking north

Before/After



Before



Added 4' buffer next to center medians

Banned left turns at select low-volume locations and widened pedestrian refuge

4th Av at 20th St, looking north, in front of the Al-Noor

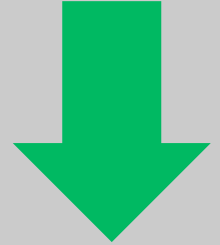
After

Safety – Results



4th Av at 25th St, looking south

Pedestrian
injuries
decreased
29%



Total
crashes
decreased
13%



Crashes
w/injuries
decreased
8%

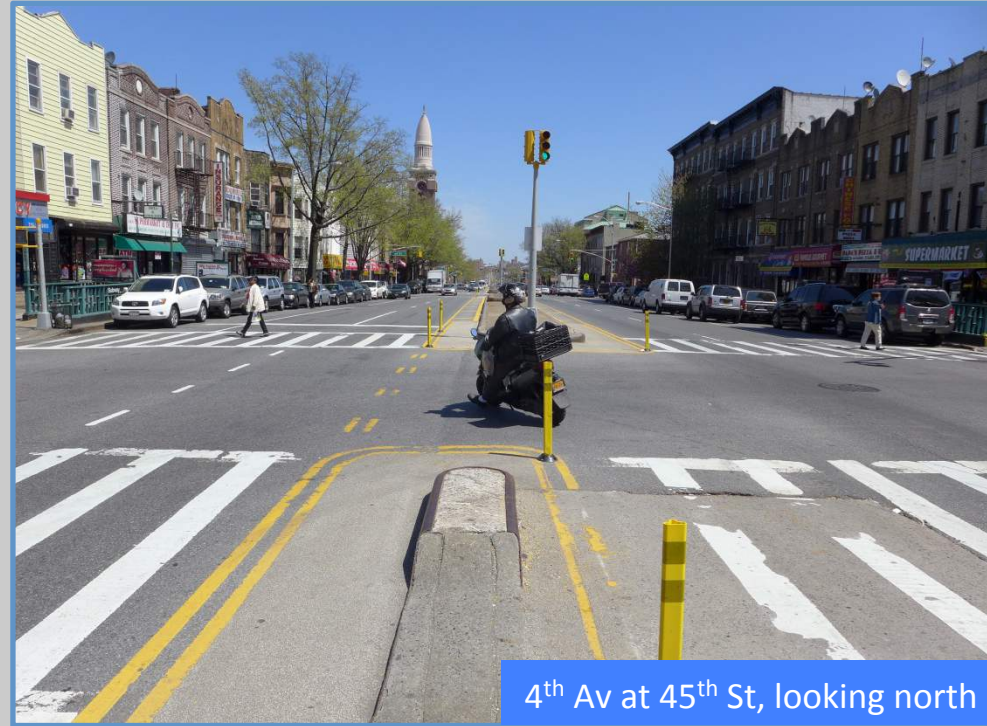
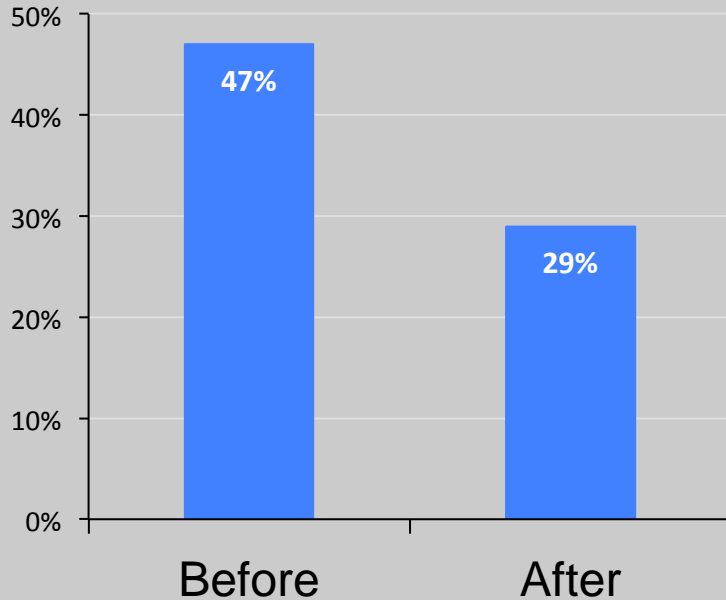


Safety – Results

- Percentage of drivers speeding reduced by 38%

**Percentage of Drivers
Traveling above Speed Limit**

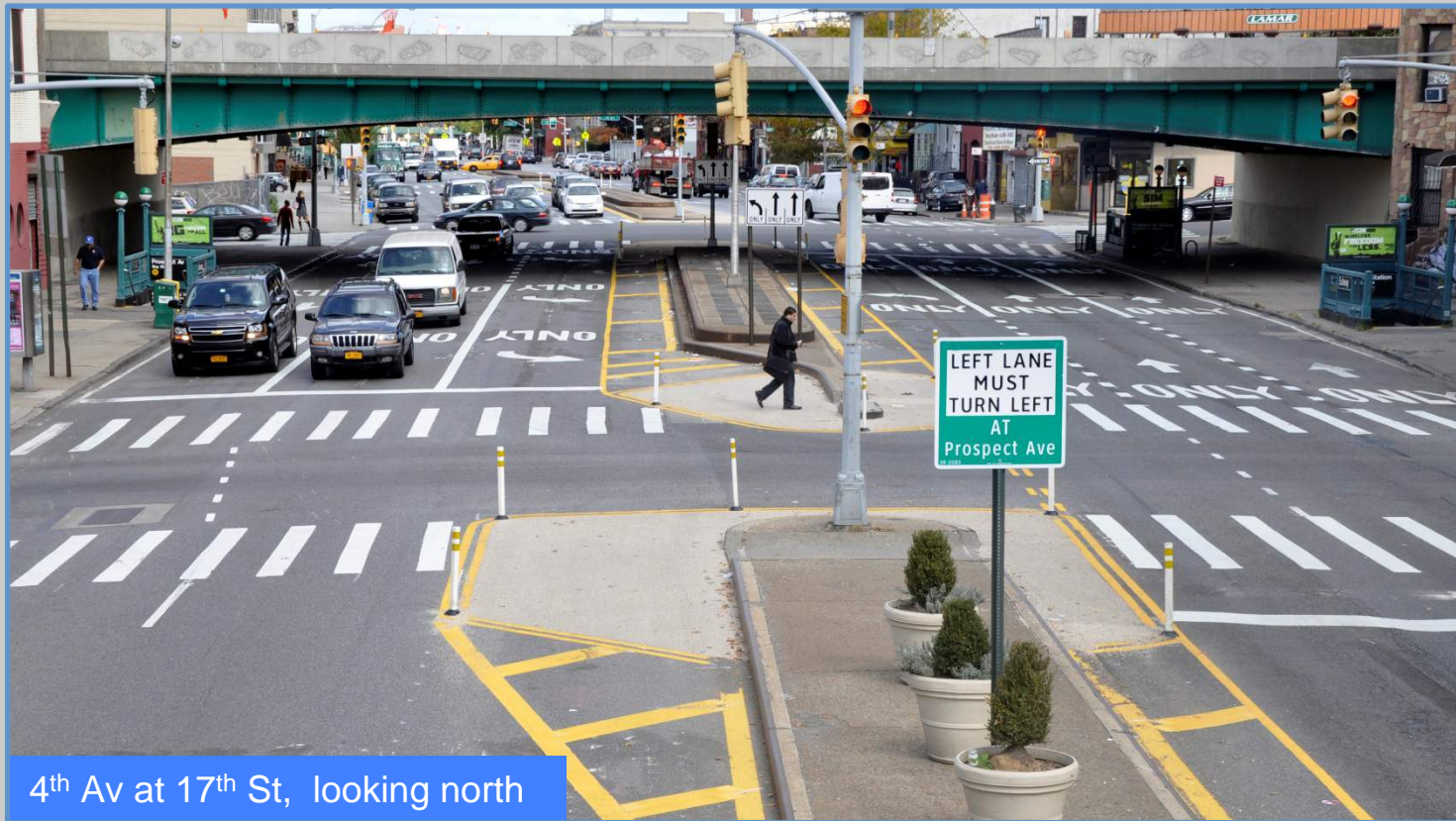
4th Avenue, 15 St to 65 St



Radar speeds taken on 4th Avenue in both directions between 22 St and 23 St, 40 St and 41 St, 61 St and 62 St.
Before: 11am-1pm January 19, 2011, After: 11am-1pm January 15, 2014

Safety – Results

- Zero fatalities in the project area since completion



Looking South

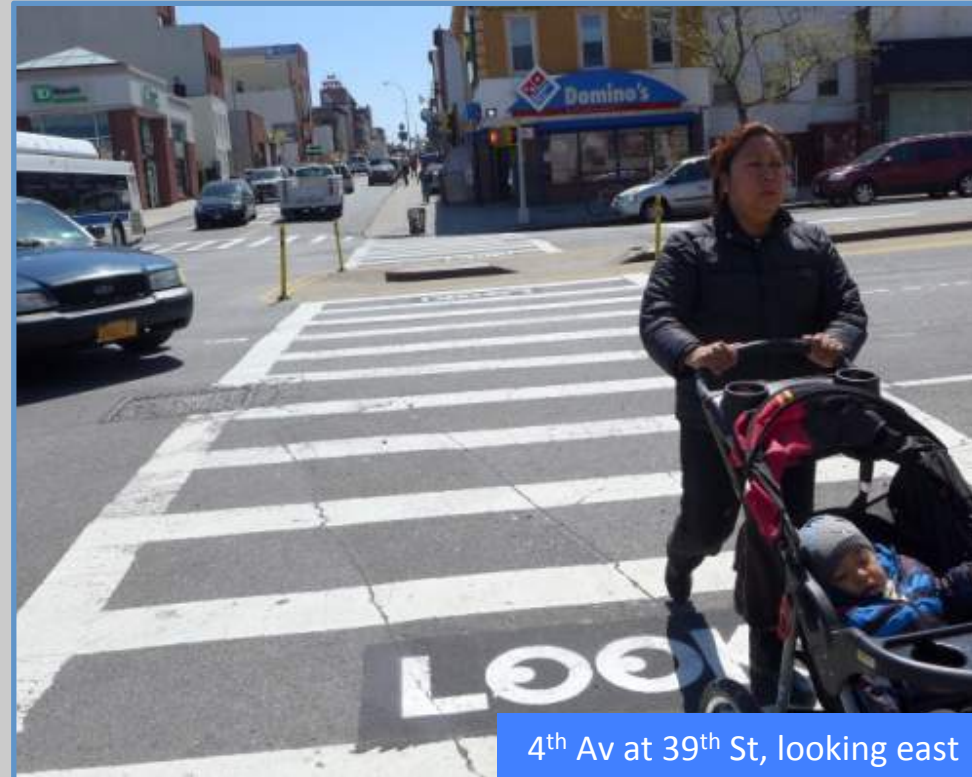
4th Av at 17th St, looking north

2006-11: 7 fatalities occurred in the project area. One fatality occurred during the project implementation period of August 1 to November 30, 2012. Fatality data as of May 1, 2014

Mobility – Traffic Volumes

- Northbound (AM) and southbound (PM) traffic volumes increased slightly at most locations
- Pedestrian volumes generally increased at intersections throughout the corridor

4th Av at 38th St, looking south



4th Av at 39th St, looking east

Traffic volumes:

Before: Average midweek peak hour volume week of June 14 and June 21, 2010; After: Average midweek peak hour volume week of October 21, 2013

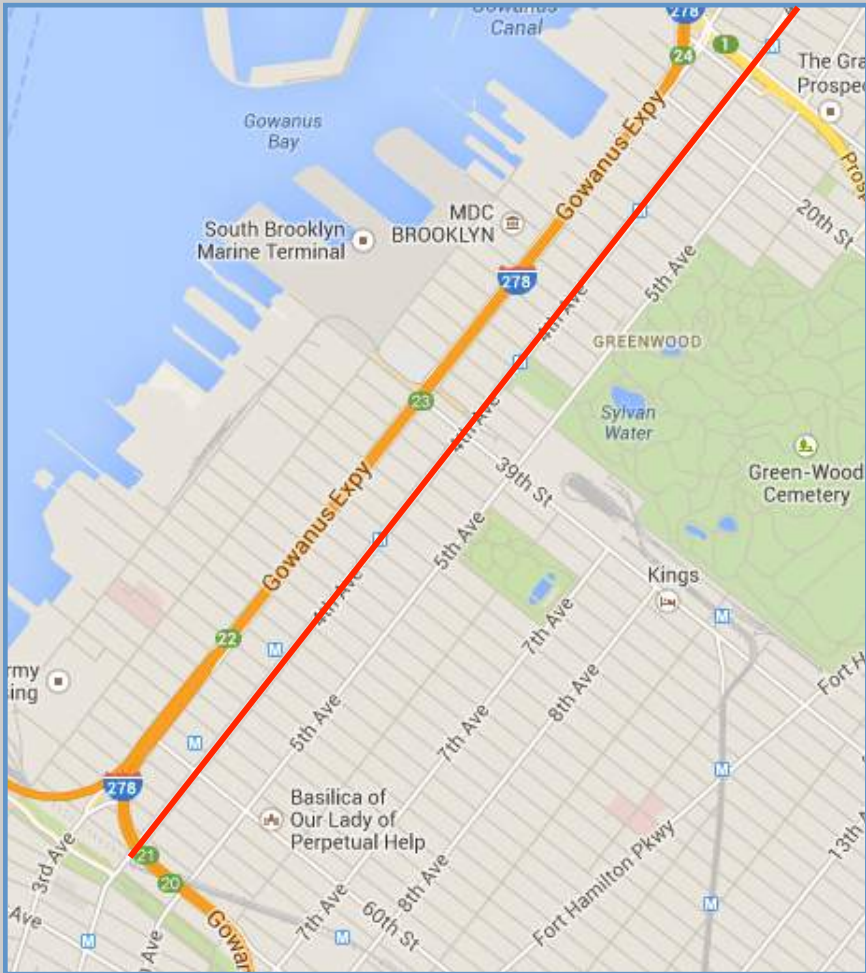
Pedestrian volumes:

Before: 8-9 am and 5-6pm, September 20, 2010

After: 8-9 am and 5-6pm, October 24, 2013

Mobility – Travel Times

Travel times were maintained in the northbound direction and increased by less than 90 seconds in the southbound direction (approx. 2.5 miles)



Before travel time runs done 11/15/2011 from 8-9 am and 5-6pm. At least 4 runs were completed for each route.

After travel time runs done 2/6/2014 and 11/09/13. At least 18 runs were completed for each route.

ROUTE	BEFORE	AFTER	+/-
	Minutes : Seconds		
NB 4 th AV (AM)	10:57	10:42	-0:15
SB 4 th AV (PM)	7:43	9:11	+1:28

Future: 4th Ave Capital Project

- New: Planned 4th Ave capital median project
- Phase 1: 33rd-47th Sts
 - Partially funded
 - Funding applications in progress
- Future Phases: all blocks from Atlantic Avenue to 65th Street



Rendering shown is schematic. Final design, including plantings, not yet determined.

Design – 2nd Avenue (14th Street to 23rd Street)



Reduction of vehicle volumes as users apparently shifted to other modes allowed for the 2013 upgrade:

- AM vehicle volumes (-11.8%)
- PM vehicle volumes (-15.3%)
- M15 Bus Ridership (+9%)
- Bicycle Volumes (+60%)

First Avenue: E 61 St to E 72 St

Parking Protected Bicycle Path Extension



Project Summary

Before



Completed June 2012:

- Installed 0.6 miles of separated bicycle path with mixing zones
- Installed dedicated bicycle signal at E 72nd St
- Constructed 14 landscaped pedestrian safety islands
- Removed afternoon peak period parking restrictions

After

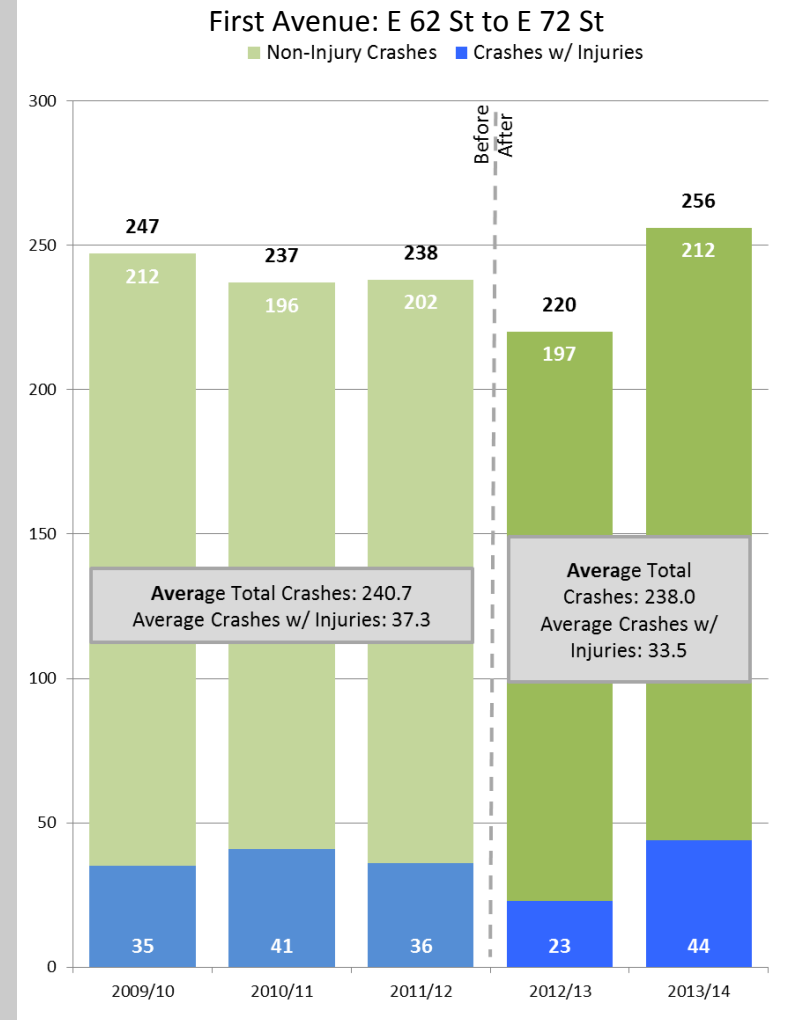


Safety – Crashes and Injuries

- Crashes with injuries decreased 10%



Crashes, Two-Year After Analysis



Each before year period is the 12-month period beginning March 1 and ending February 28. The 2-yr after period is July 1, 2012 to June 30, 2014. The implementation period of March 1, 2012 to June 30, 2012 is excluded.

Source: NYPD AIS/TAMS Crash Database

Safety – Crashes and Injuries

- Pedestrian crashes fell by 13%

Crashes and Injuries
Two-Year After Analysis, First Avenue (E 62 St to E 72 St)

	Before				After			Change	
	'09/ '10	'10/ '11	'11/ '12	Average	'12/ '13	'13/ '14	Average	Actual	Percent
Total Crashes	247	237	238	240.7	220	256	238.0	-2.7	-1%
Crashes w/ Injuries	35	41	36	37.3	23	44	33.5	-3.8	-10%
Motor Vehicle Occupant	18	21	17	18.7	15	21	18.0	-0.7	-4%
Pedestrian	18	16	16	16.7	12	17	14.5	-2.2	-13%
Cyclist	7	9	4	6.7	0	10	5.0	-1.7	-25%
Total Injuries	43	46	37	42.0	27	48	37.5	-4.5	-11%

Note: The block between E 61 St and E 62 St was left out of the analysis due to an adjacent construction project that was affecting traffic operations during and after implementation.

Each before year period is the 12-month period beginning March 1 and ending February 28.

The 2-yr after period is July 1, 2012 to June 30, 2014. The implementation period of March 1, 2012 to June 30, 2012 is excluded.

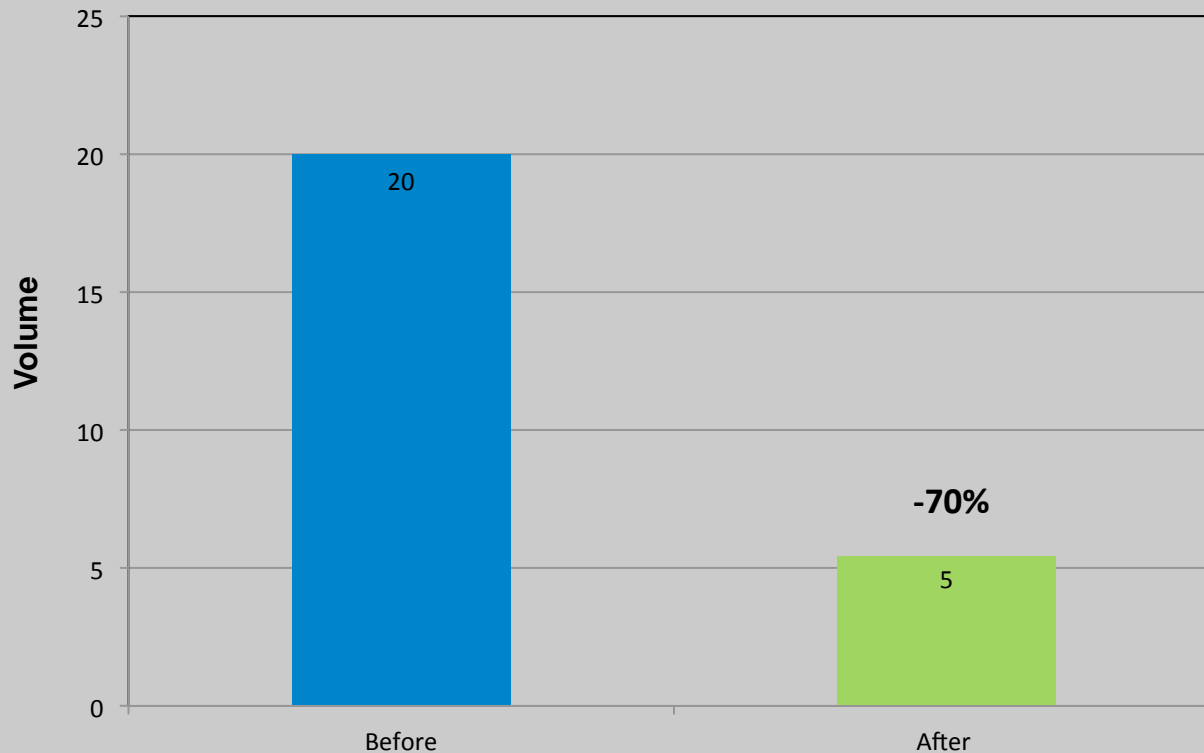
Source: NYPD AIS/TAMS Crash Database

Safety – Sidewalk Riding

- 70% decrease in cyclists riding on the sidewalk on First Ave

12-Hour Weekday Sidewalk Riding Volumes

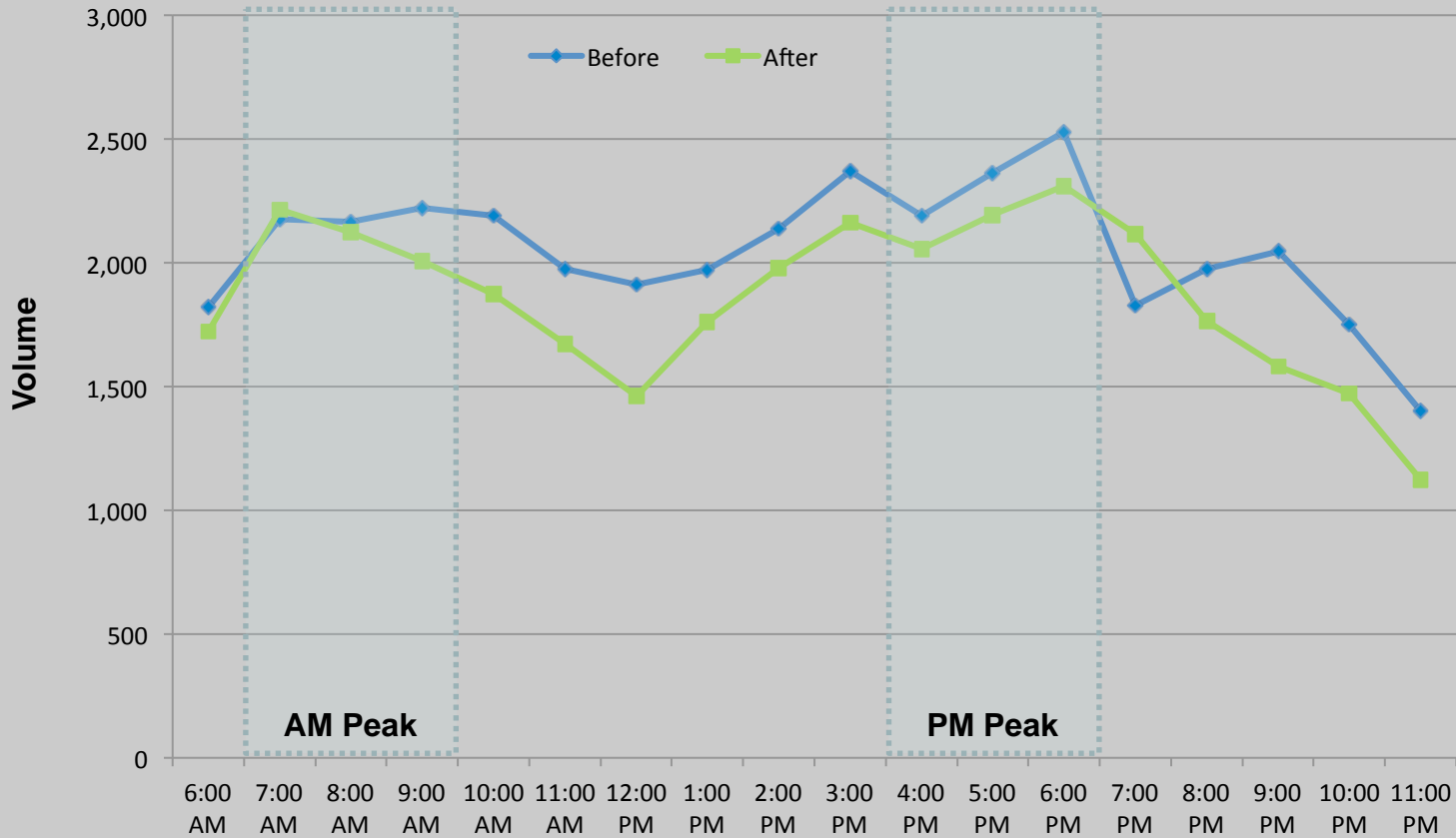
(First Ave between E 67 St and E 68 St, 7:00a – 7:00p)



Note: Before data; average of single weekday counts between 7a & 7p on 3/20/12, 3/21/12 and 3/22/12; After data is the average of single weekday counts on 4/24/13, 6/25/13, 7/17/13, 9/17/13, 10/19/13

Mobility – Vehicle Volumes

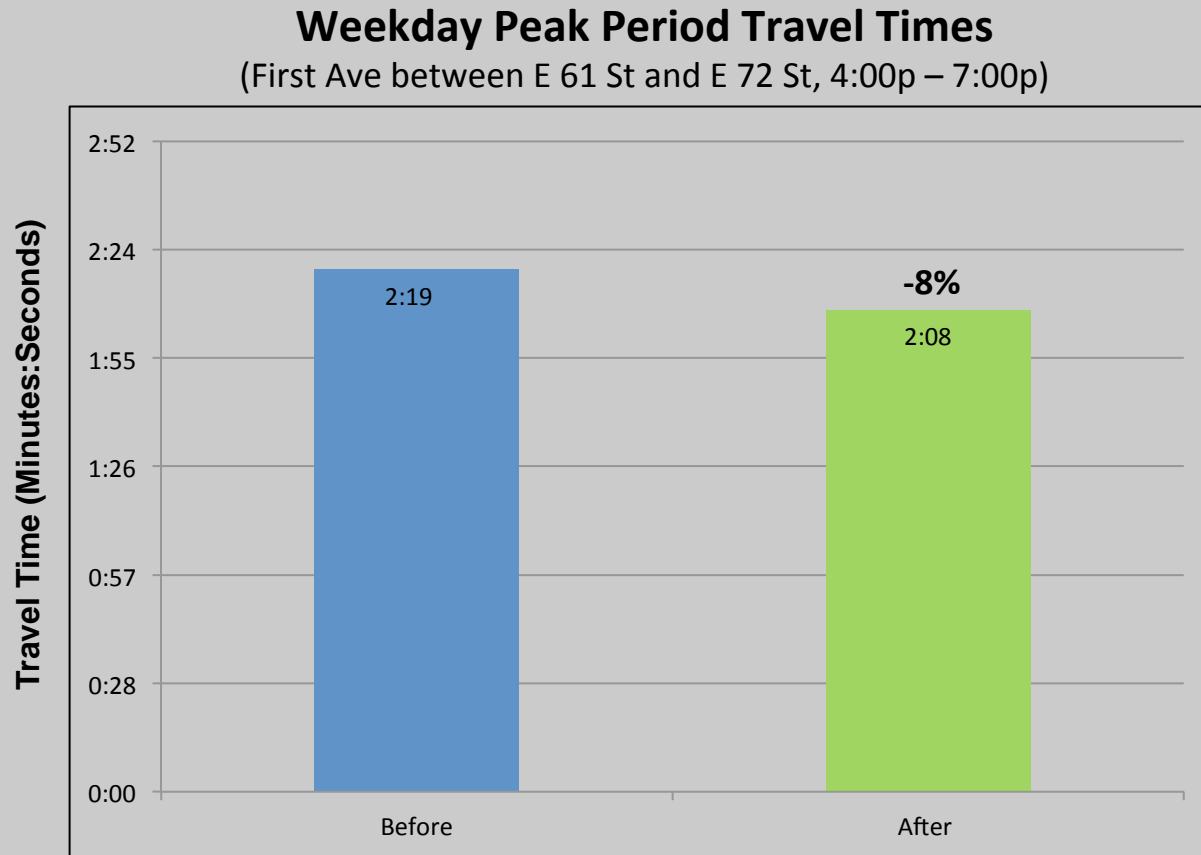
- Vehicle volumes along the avenue have declined modestly



Note: Before data is an average of April 5-7, 2011. After data is an average of January 8-10, 2014.

Mobility – Travel Times

- First Ave travel times improved by 8% during the afternoon peak period (4-7pm)

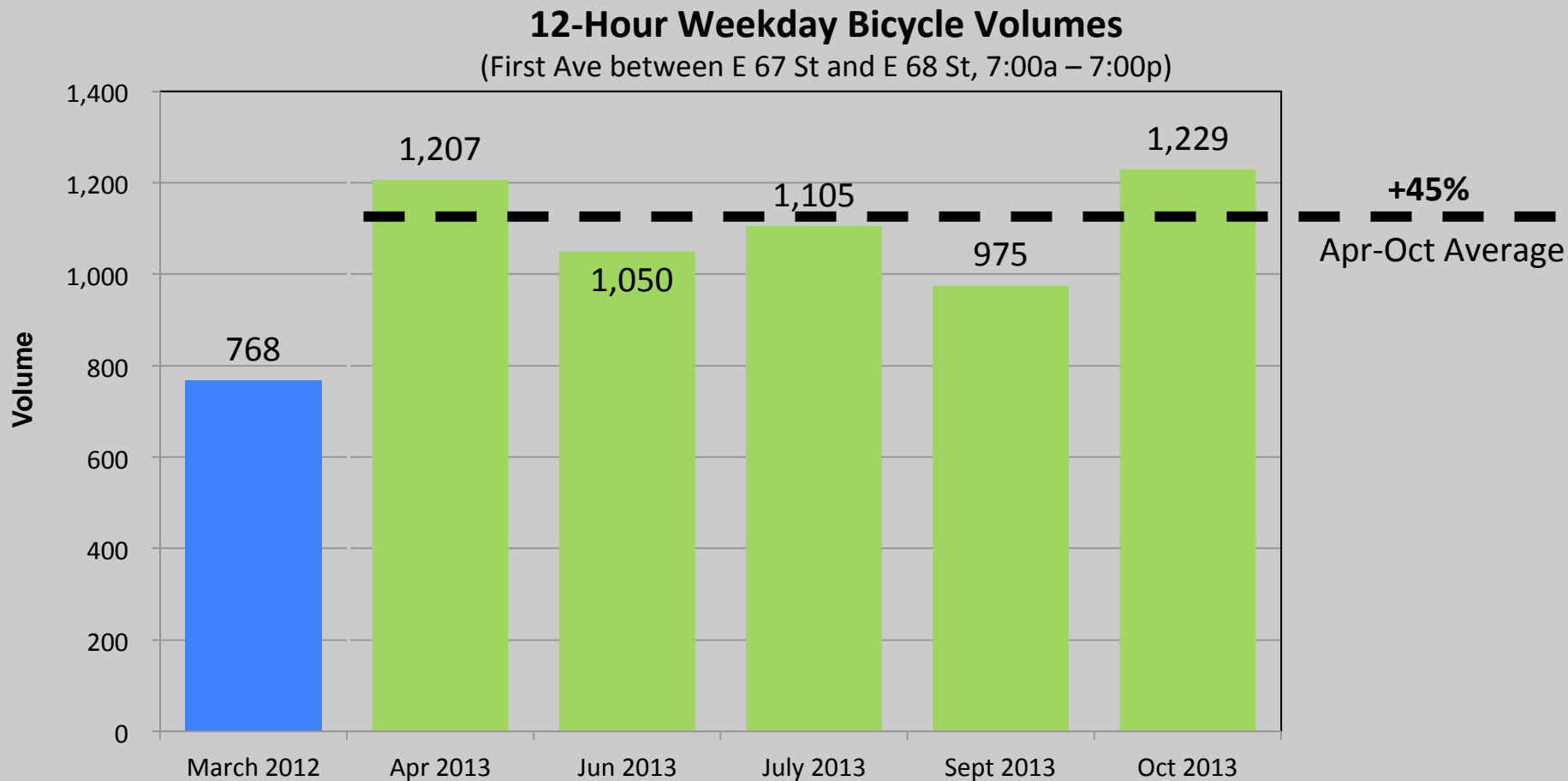


Before: weekday average travel time derived from (2) runs every hour over 3 days conducted May 11-13, 2010

After: weekday average travel time derived from (4) runs every hour over 2 days conducted November 20-21, 2013

Mobility – Bicycle Volumes

- Bicycle volumes on First Ave increased by 45% on weekdays



Note: Before data; average of single weekday counts between 7a & 7p on 3/20/12, 3/21/12 and 3/22/12. After data; single weekday counts between 7a-7p on 4/24/13, 6/25/13, 7/17/13, 9/17/13, 10/19/13

Warm weather months (April-October) are averaged to provide a seasonal factor in comparison to other months

Mobility – Level of Service

- An acceptable Vehicle Level of Service was maintained after implementation

Level of Service of First Ave at E. 72nd Street
(PM Peak 6p-7p)

Approach	Before						After					
	Vehicles (v/hr)	Lane Group			Approach		Vehicles (v/hr)	Lane Group			Approach	
		V/C Ratio	Delay (s)	LOS	Approach Delay (s)	Approach LOS		V/C Ratio	Delay (s)	LOS	Approach Delay (s)	Approach LOS
NB 1st Ave	L = 145	0.38	17.1	B	19.0	B	L = 158	0.67	48.4	D	20.2	C
	T = 2253	0.73	19.4	B			T = 1996	0.67	18.2	B		
	R = 130	0.29	15.2	B			R = 155	0.35	16.2	B		
WB E. 72nd St	L = 0	0.20	18.8	B	18.8	B	L = 0	0.27	19.5	B	19.5	B
	T = 162						T = 215					
	R = 54						R = 54					
EB E. 72nd St	L = 118	0.44	22.1	C	22.1	C	L = 124	0.50	23.1	C	23.1	C
	T = 247						T = 290					
	R = 0						R = 0					
Overall Intersection	Delay: 19.4(s) LOS: C						Delay: 20.5(s) LOS: C					

sat flow rate = 2050 vphpl

First Avenue: E 61 St to E 72 St, 2012

Quality of Life – Emergency Response

- The project has had no adverse effects on FDNY and NYPD operations



- NYPD confirmation date November 14, 2013
- FDNY confirmation date November 14, 2013

First Avenue: E 61 St to E 72 St, 2012

Economic Vitality/Quality of Life

- Created 70 parking spaces during afternoon peak period
- 14 trees planted within concrete safety islands





Thank You