



TIME TO WALK

Presentation at APBP PDS

June 29, 2017

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Project Manager, Pedestrian Projects Group



PEDESTRIAN PROJECTS GROUP



Goals:

- Safety
- Pedestrian accessibility
- Mobility for all users
- Enhanced quality of life

40+ quick, in-house projects a year, small to large

Projects focus on complex intersection design

DETERMINE NEED

Before

- Community requests (~120 in 2016)
- Crashes
- Partner opportunities

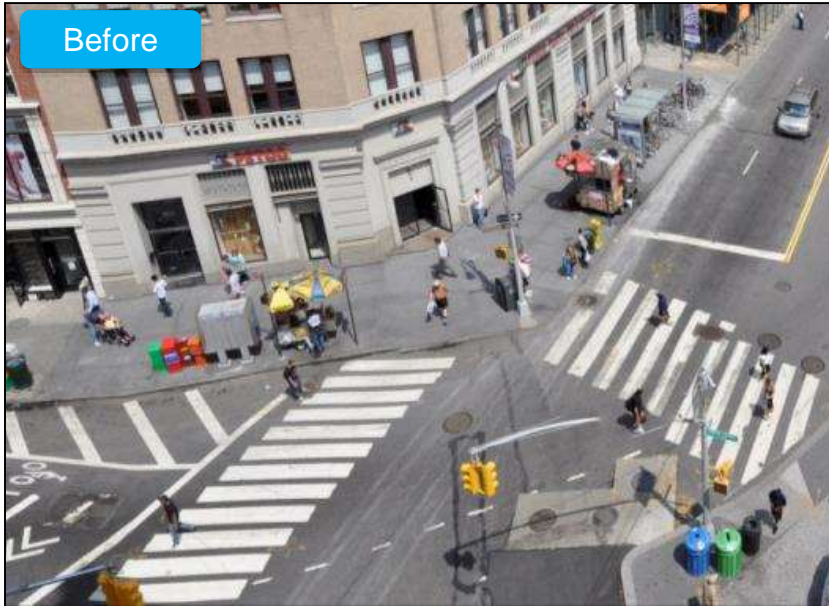
Data Collection

- Volumes
- Observe use
- Speeding
- Congestion
- Signal Plan
- Crash data
- Local concerns

After

DESIGN DEVELOPMENT

Before



Determine if roadway can be reallocated

- Traffic volumes & analysis
- Lane widths

Simplify complicated intersections

- Remove traffic movements
- Follow the pedestrian desire line
- *Signal timing & phasing*

After



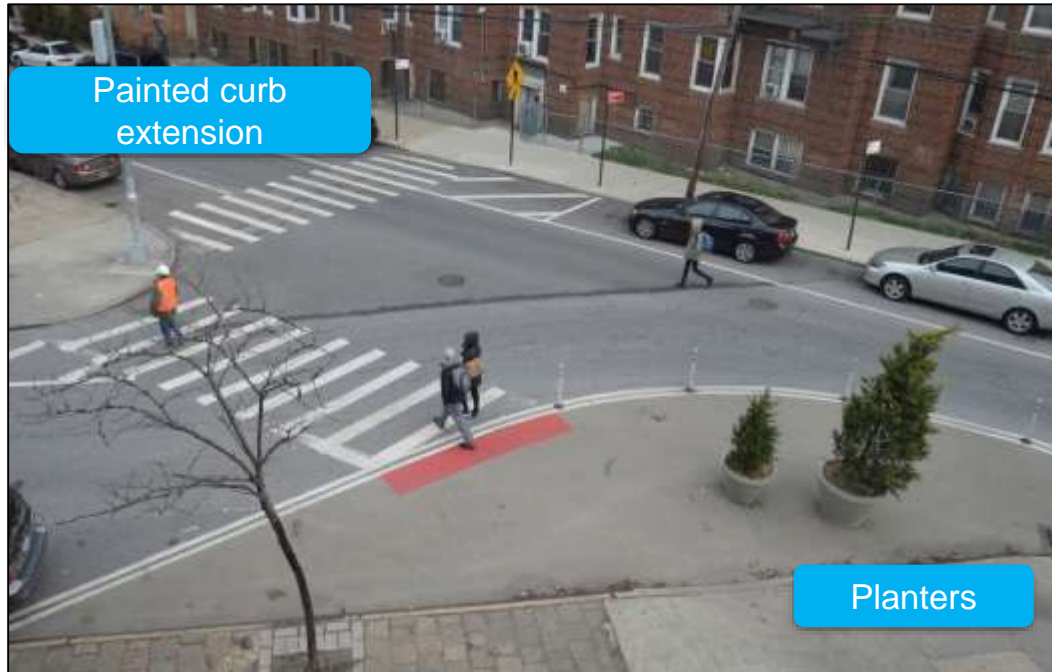
Union Square

TOOL KIT

Geometry

Temporary Materials

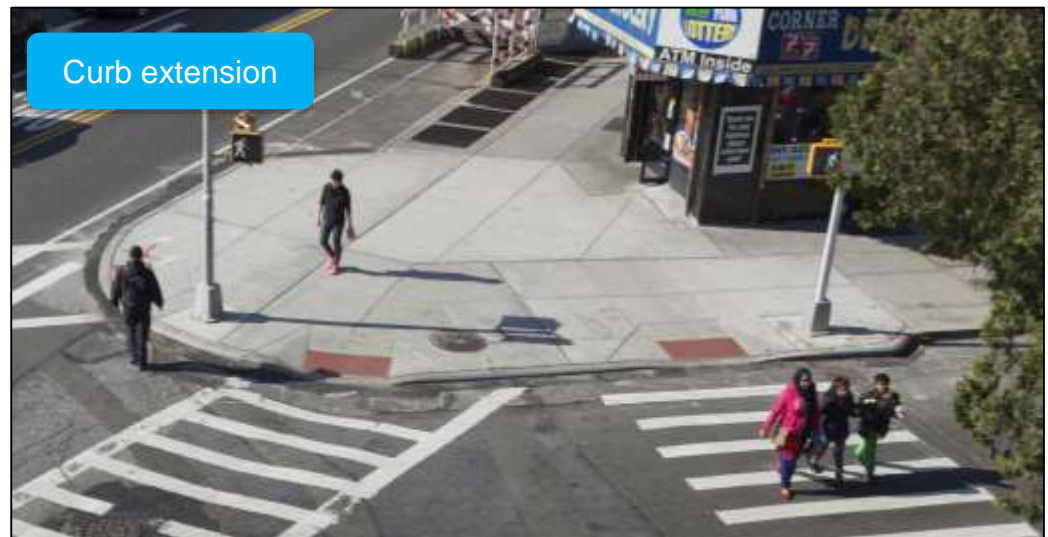
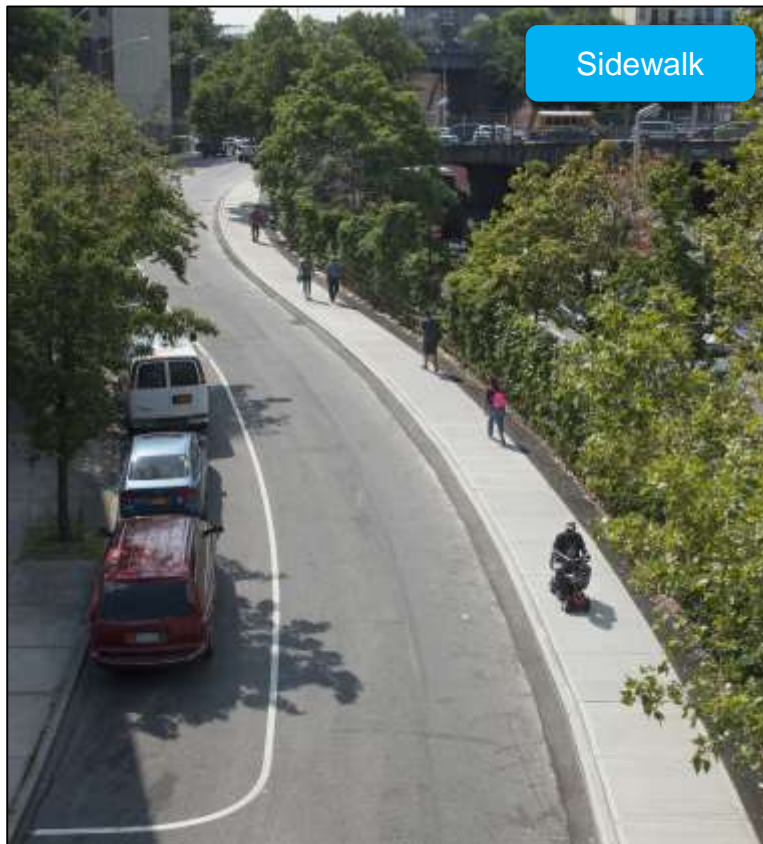
- Epoxied gravel / ruby glass
- Colored thermoplastic (“truffle paint”)
- Planters
- Granite Blocks



TOOL KIT

Geometry

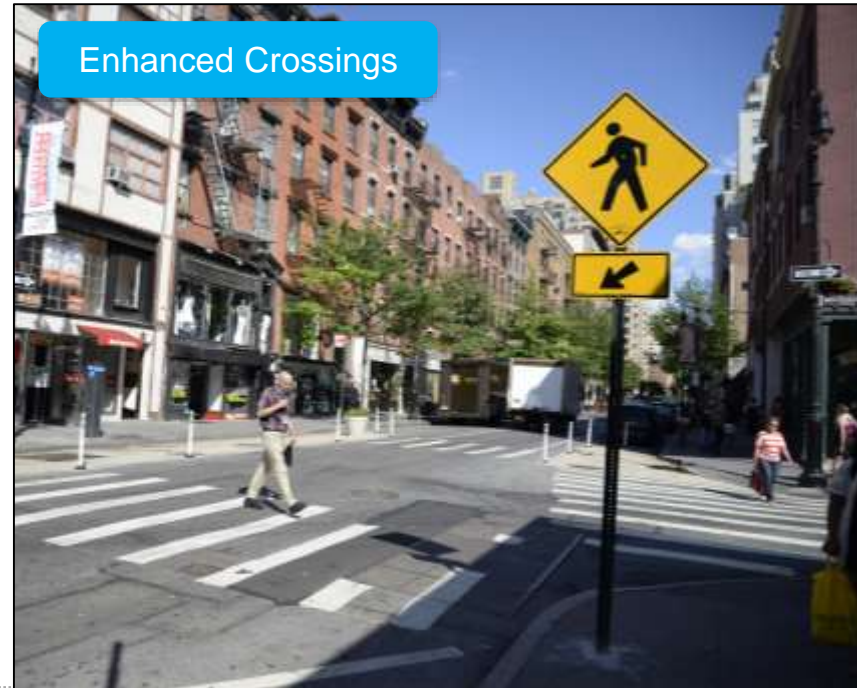
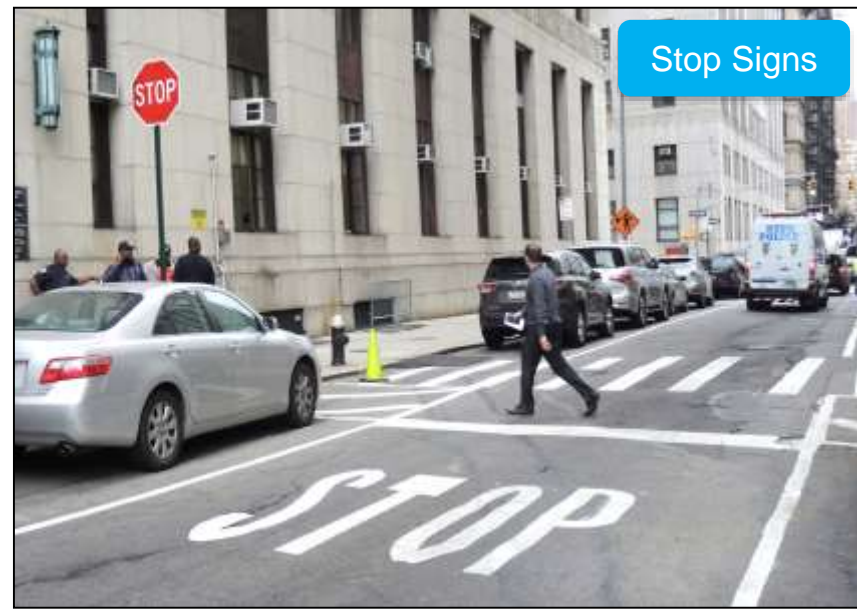
Concrete Construction



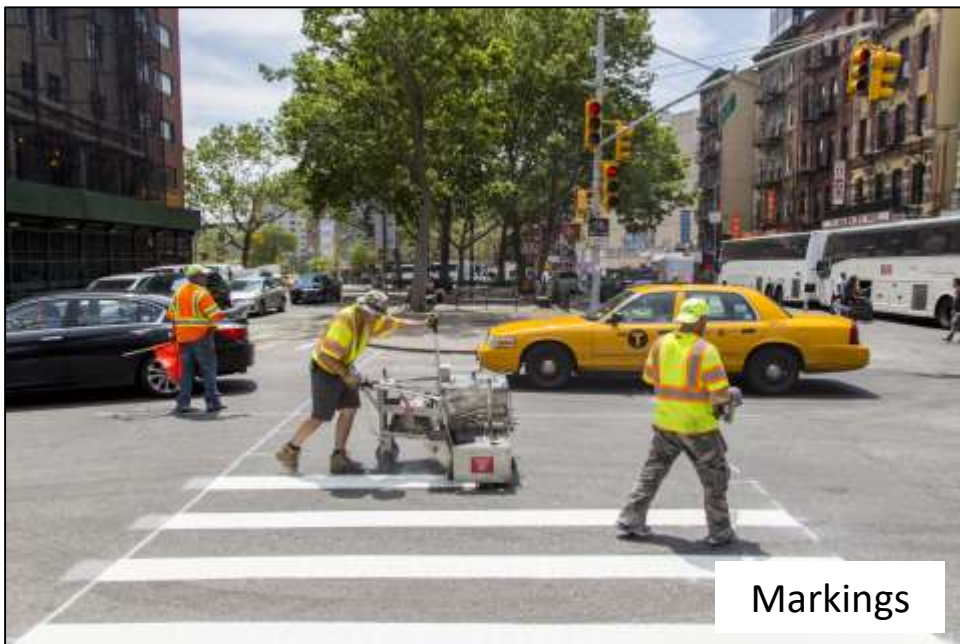
TOOL KIT

Operations

- Markings
- Signage
- Signals



IMPLEMENTATION



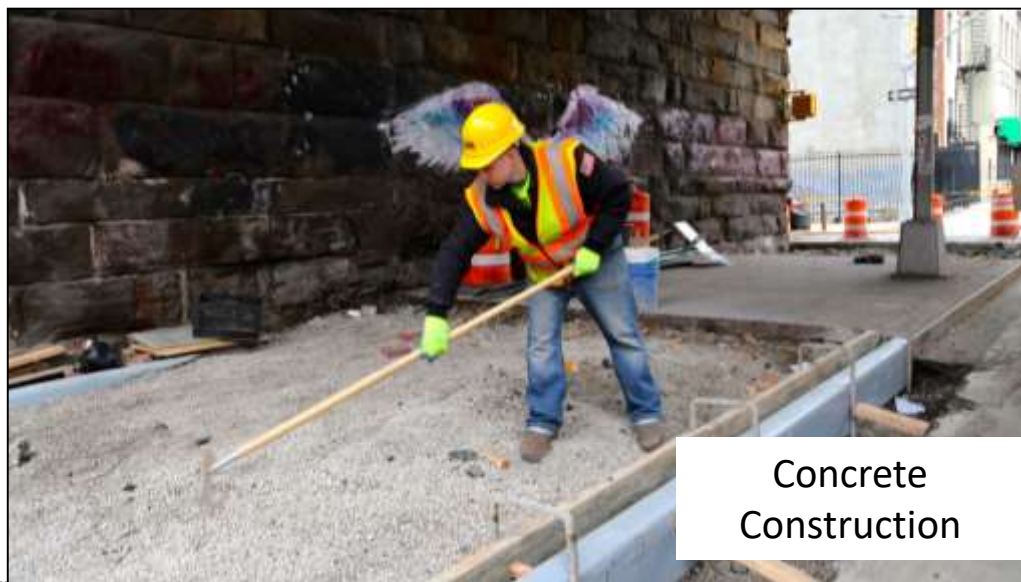
Markings



Concrete Layout



Epoxied Gravel

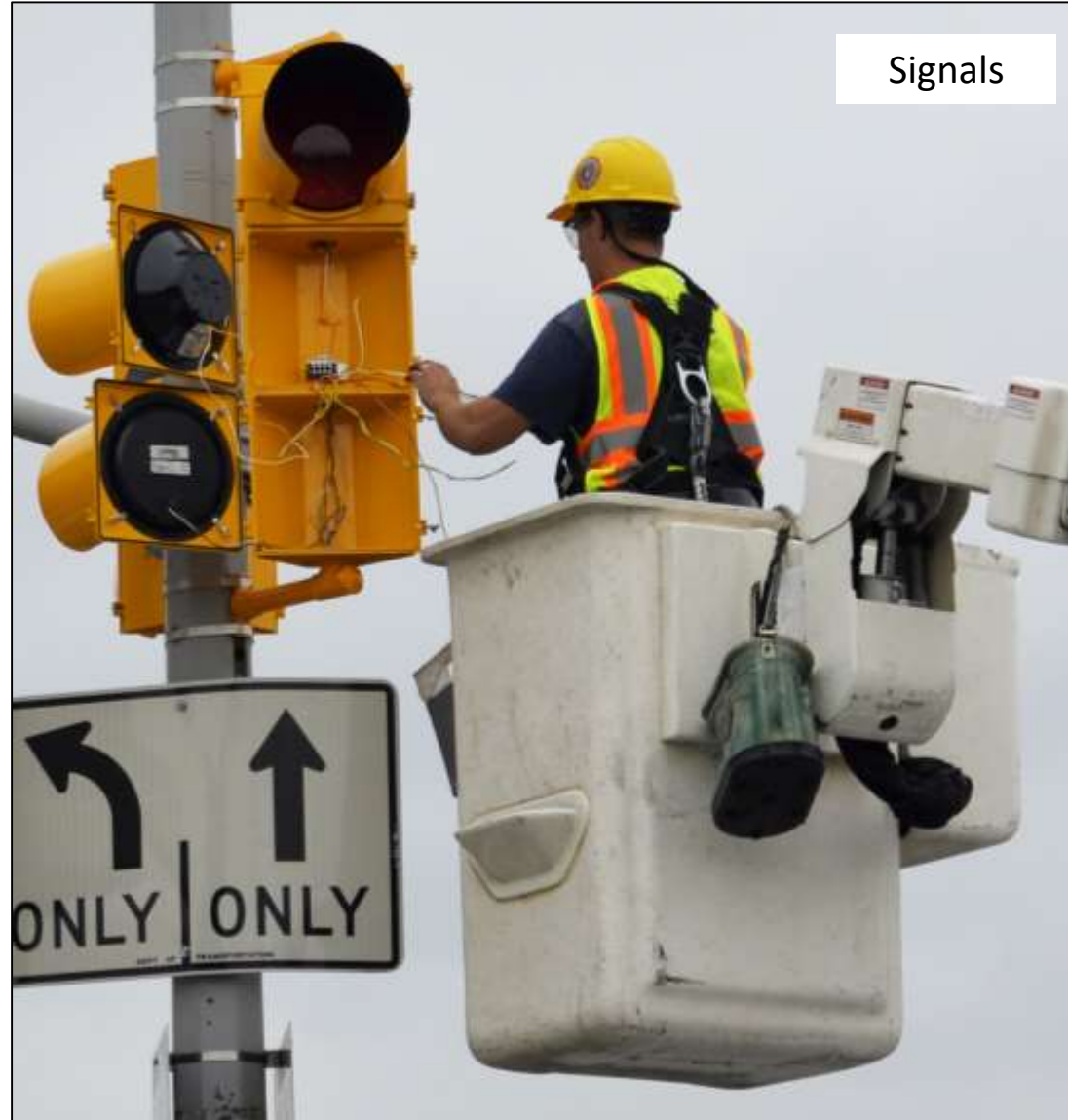


Concrete Construction

IMPLEMENTATION



Signage



Signals

GRAND CONCOURSE, Bronx



Issues:

- Long crossing distances
- Speeding vehicles
- Numerous pedestrian crashes

Solutions:

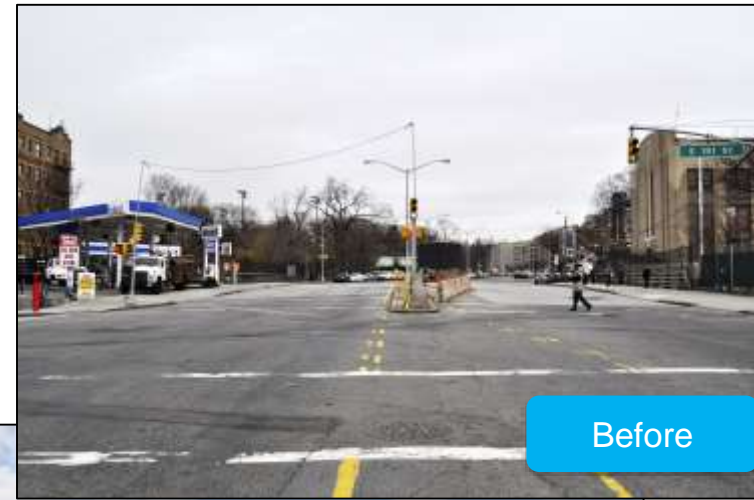
- Install median tip and curb extensions
- Close slip lane at E 153 St

GRAND CONCOURSE, Bronx



CAPITAL DEVELOPMENT

- Identify future capital improvements
- Project Sponsoring



OUTREACH

New York City has 59 Community Board (CB) Districts that DOT seeks support from
Outreach strategies:

- Location walk-throughs
- Workshops (charrettes)
- Partner with elected officials, Business Improvement Districts, and community groups





FREQUENT COMPLAINTS

Community Boards:

“These proposals are all fine, but the real problem is the pedestrians ignoring the light”

“Just give them a different time to cross!”

“What we need is a turn signal”

Advocates and Workshop Participants:

“We need more time to cross the street”

“This intersection needs a separate phase for pedestrians”

Everyone:

“What we really need is a traffic light here – why can’t you just put one in?”



Project managers want to accommodate desire to cross street and improve safety and comfort



Engineers tied to federal standards
13,000 existing signalized intersections
3,000+ signal requests per year

INTERNAL ISSUES

Bureaucracy



Image courtesy of Politics in Theory and Practice

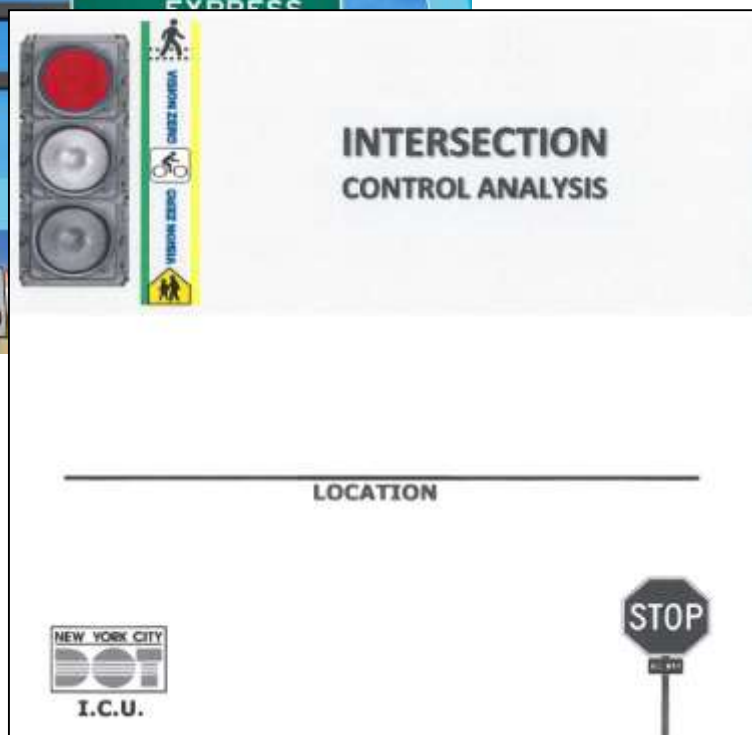
Deputy Commissioner
of Traffic Operations

Director of Signals and
Street Lighting

Chief Engineer

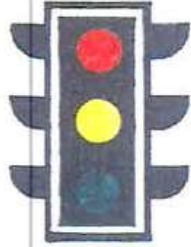
Chief of
Intersection Control Unit (ICU)

Field Staff



Warrants

P WARRANT



Initial Safety Impact of "P" Warrant Traffic Signals in New York City



New York City
Department of Transportation
Bureau of Planning and Research

Ross Sandler
Commissioner
Samuel I. Schwartz, P.E.
Chief Engineer
Gerard Soffian, P.E.
Assistant Commissioner
Richard Retting
Deputy Assistant Commissioner

February 1989

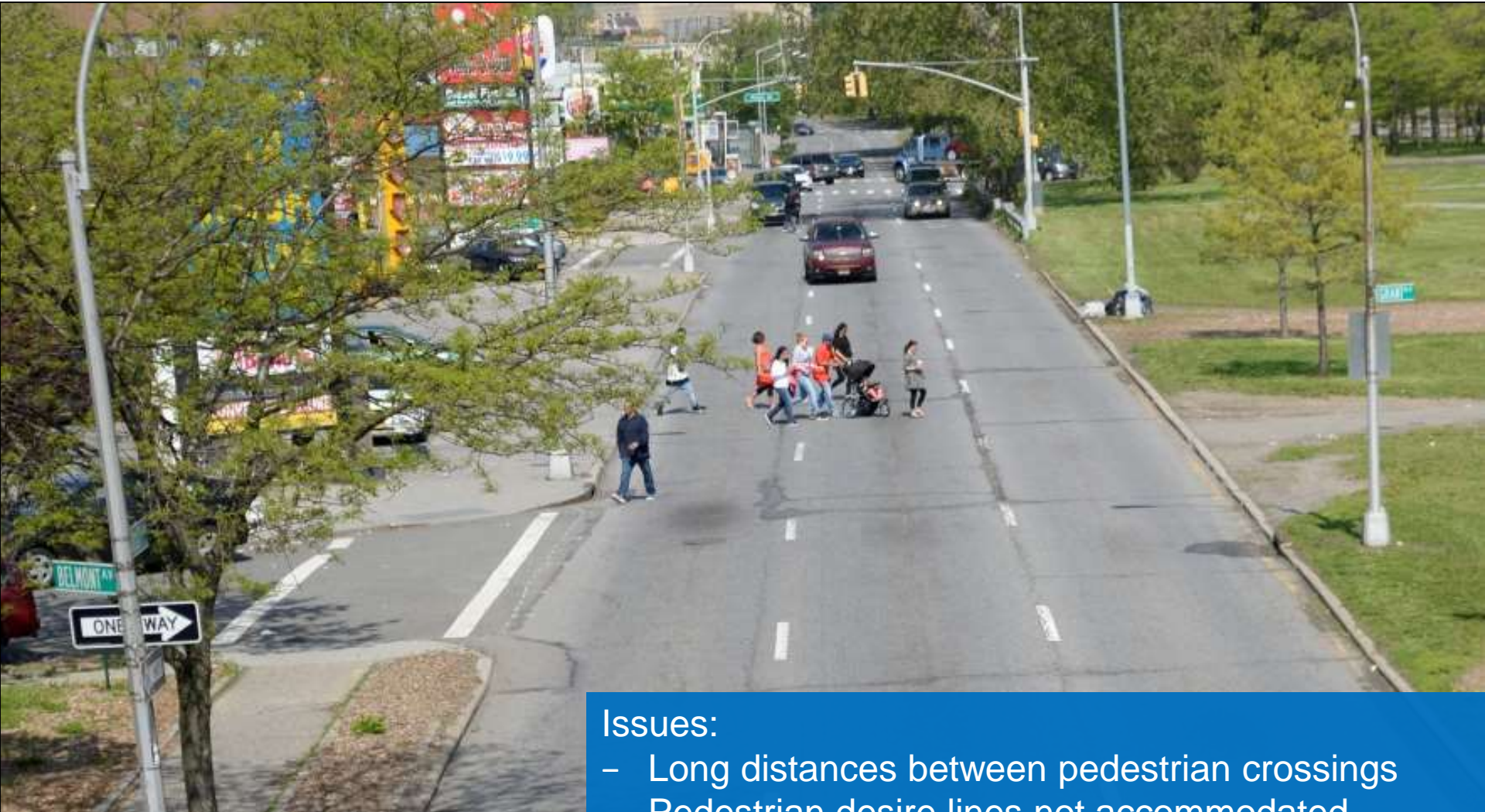
- Reluctance to install traffic signals at locations simply because a politician or community member requests it
- 1989 Study found that unwarranted traffic signals may result in an increase of 65% in crashes
 - Compared to control group of warranted locations where crashes decreased 49%

FINDING COMMONALITIES



- Planners should know how warrants work
- Need to **understand** shortcomings of signal warrants to differentiate from typical community requests
 - Do not succumb to “P Warrants”
- Consider signal engineers’ workload
- Use data supplemented by qualitative data (photography, field visits)

CONDUIT BLVD, Brooklyn



Issues:

- Long distances between pedestrian crossings
- Pedestrian desire lines not accommodated
- Speeding
- Data discrepancies in warrant analysis

CONDUIT BLVD, Brooklyn



- ICU accepted PPG's data for warrant analysis

Solutions:

- Install new traffic signals and crosswalks
- Add sidewalks on median
- Reduce speed limit from 40mph to 30mph



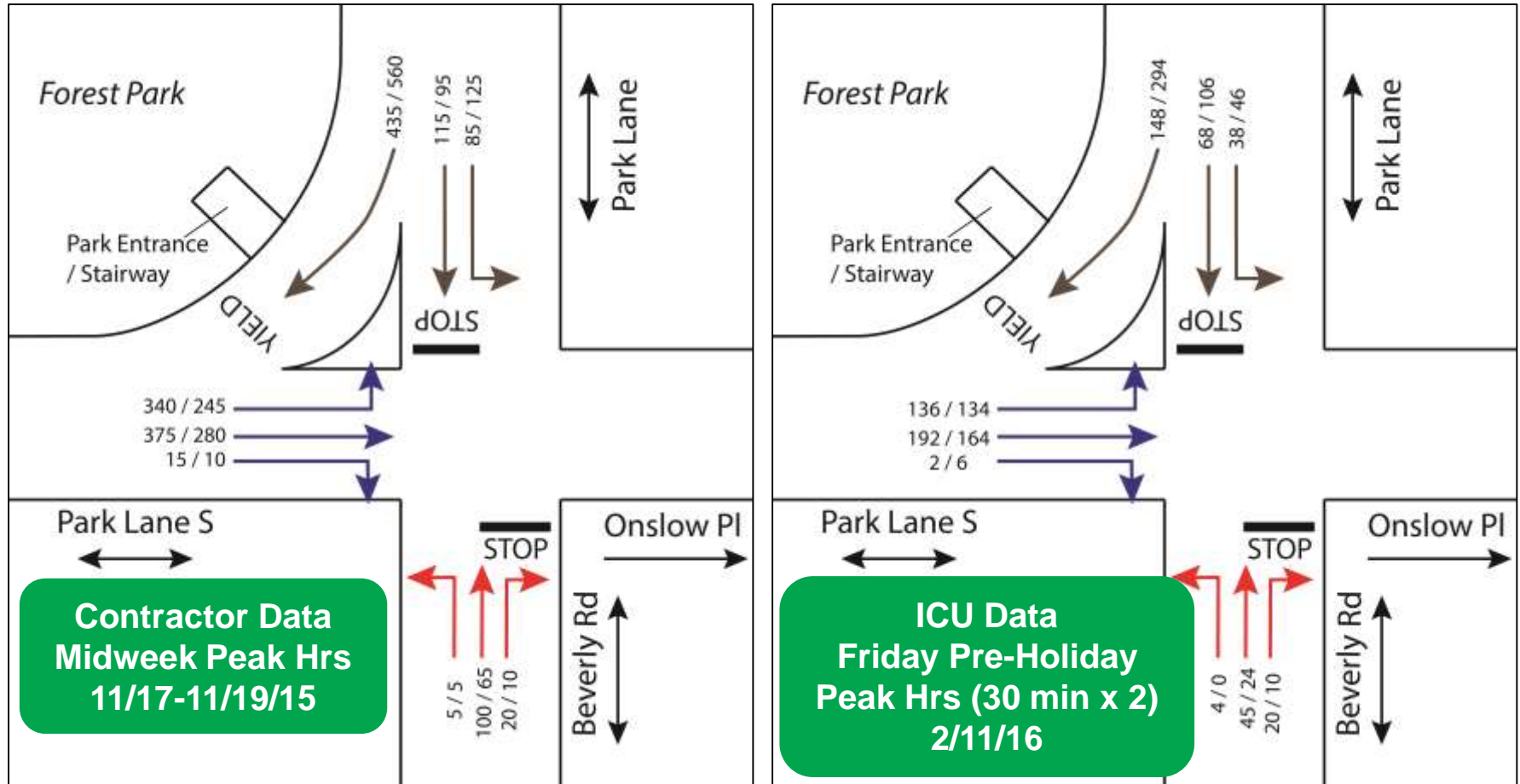
PARK LANE S, Queens



Issues:

- Free flowing elbow traffic movement makes it difficult to find gaps
- Uncontrolled slip lane in front of park entrance stairs
- Desire lines not accommodated
- Poor visibility for pedestrians and drivers

PARK LANE S, Queens



Issues:

- Data discrepancies
- Signal warrants do not address unique nature of geometry and traffic flow

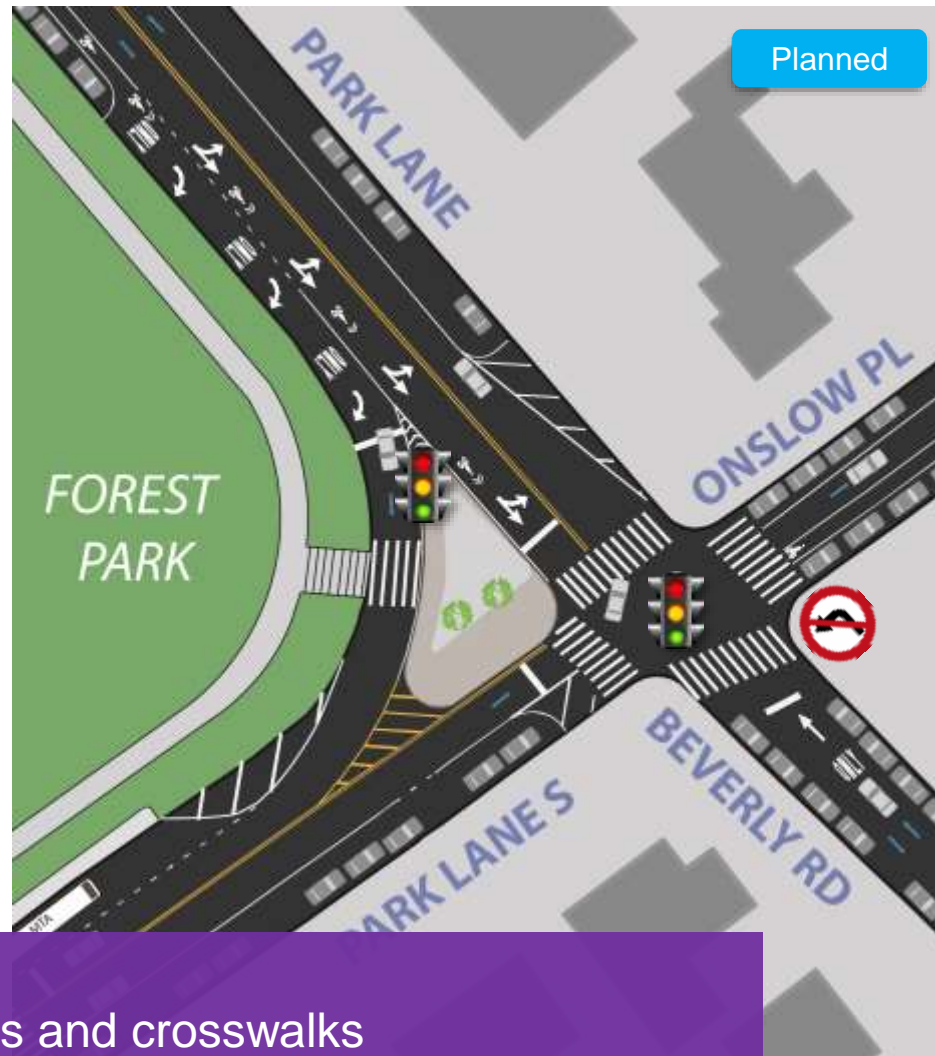
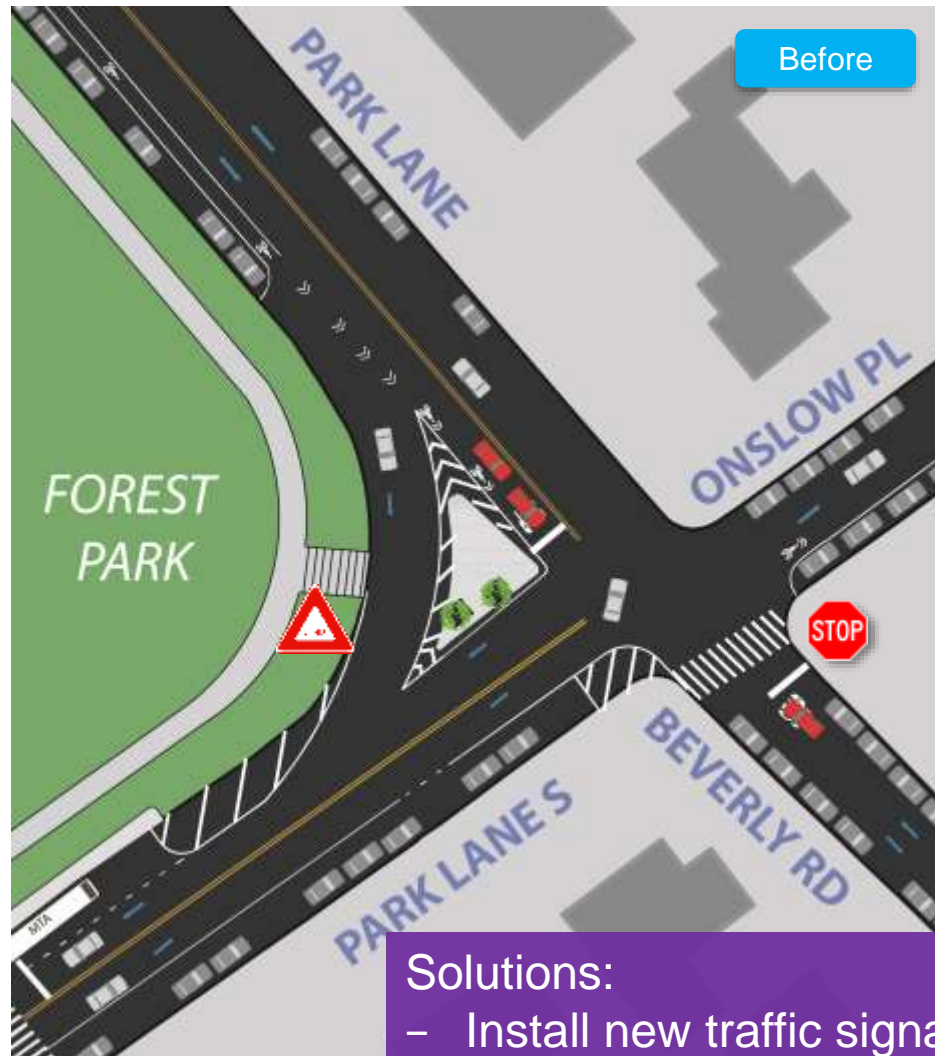
PARK LANE S, Queens



Solutions:

- Presented qualitative and quantitative case to division leadership
- Issue elevated to signals leadership
- On-site meeting scheduled with signals leadership to explain issues

PARK LANE S, Queens



Solutions:

- Install new traffic signals and crosswalks
- Expand pedestrian space
- Removed parking spaces to provide for right turn storage

VAN SINDEREN AV, Brooklyn



Issues:

- Stop-on-minor intersection
- Crosswalks lead to retaining walls and fences
- No marked crossings on major
- Subway entrance and bus stops

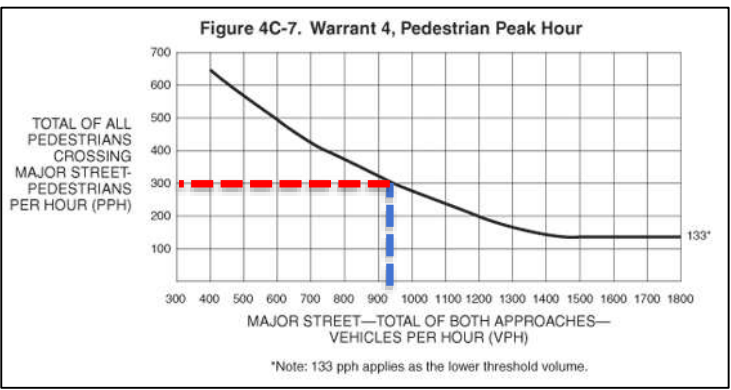
VAN SINDEREN AV, Brooklyn



- Requested that ICU study this intersection
- Denied in December 2016

VAN SINDEREN AV, Brooklyn

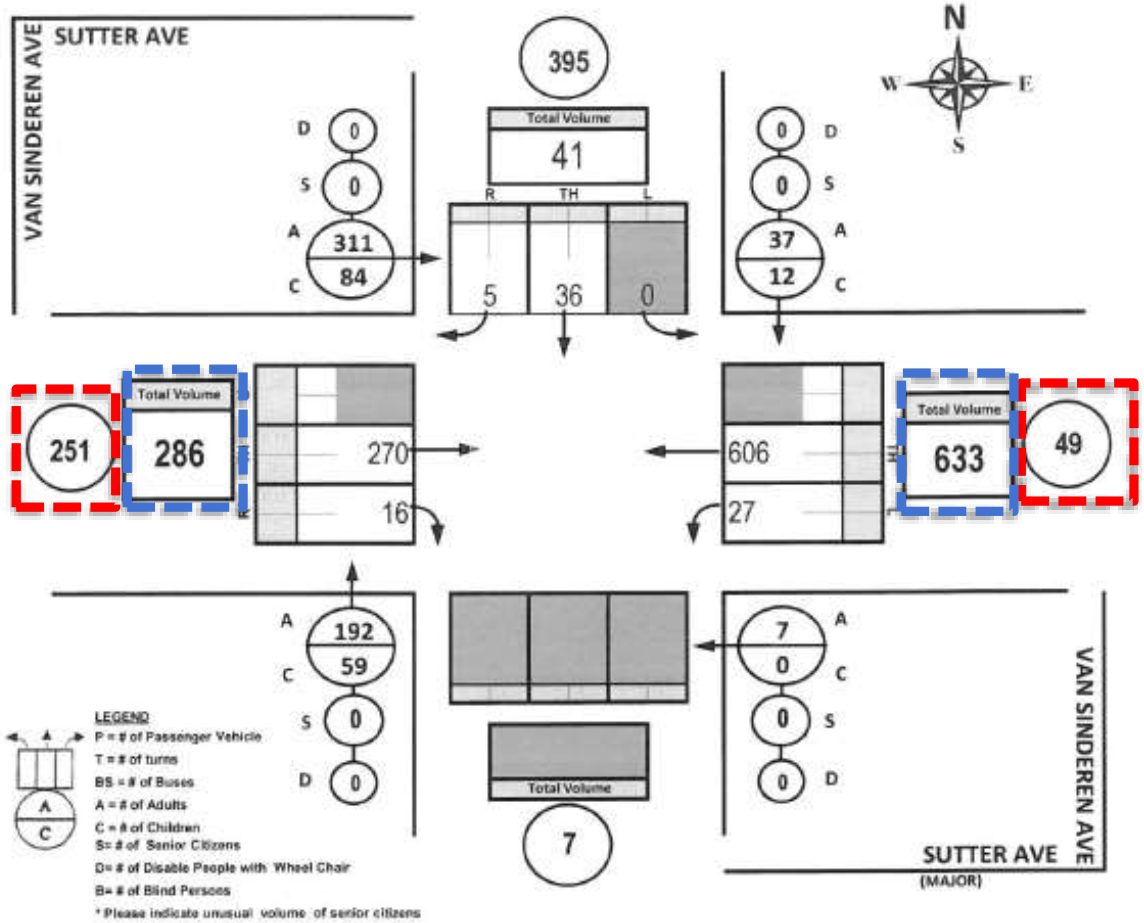
Data Review



**MUTCD –
Pedestrian Peak Hour
Volume Warrant**

VPH on the major street (Total of both approaches)	PPH for the total of all pedestrians crossing the major street
1000	280
900	325

– Requested additional study and special consideration given to unique context



COMMENTS		VEHS VS VEHS	VEHS VS PEDS
RAILS ARE AT S/LEG BUT SOME PEDS STILL GO AROUND	MAJOR	919	
	MINOR	41	
	PEDS	300	

VAN SINDEREN AV, Brooklyn



Solutions:

- Provided photos and description of intersection characteristics
- ICU agreed to re-study
- Signal approved
- Capital project to reconstruct intersection to address accessibility issues
- Interim design TBD

SIGNAL TIMING

Before

What improvements do you see here?



After

SIGNAL TIMING

	1	2	3	4	5	6	7	8		AAT					
	R	R	DW	DW						90 SEC					
	A	A	WK	WK											
	G	G													
L/S #	1	2	5	6											
NEMA	1	3	1P	POL1 (2+3)											
PHASE A	G	R	WK	DW						34					
SPARE	G	R	WK	DW						2					
PED CL	G	R	FLDW	DW						14					
VEH CL	A	R	DW	DW						3					
VEH CL	R	R	DW	DW						2					
										65					
PHASE B (LPI)	R	R	DW	WK					3						
	R	R	DW	WK					4						
									7						
PHASE C	R	G	DW	WK					5						
SPARE	R	G	DW	WK					2						
PED CL	R	G	DW	FLDW					16						
VEH CL	R	A	DW	DW					3						
VEH CL	R	R	DW	DW					2						
									28						
CITY OF NEW YORK															
BUREAU OF TRAFFIC OPERATIONS															
34-02 Queens Blvd. Long Island City, NY 11101															
										OFFSET					
										76					
										SURF AVENUE @ STILLWELL AVENUE					
										Prep. <u>F. Mikhail</u> Date <u>01/14/15</u>					
										Appr. _____ Date _____					
NOTES: NON - ACTUATED PC = 3.5 FT/SEC															
INTERVAL PROGRAM CABINET TYPE: ASTC-6 CABINET ADDRESS: 5C5A															
1/15	FM	INSTALL LPI TO CROSS SURF AVENUE/868													
DATE	BY	REVISIONS													

LEADING PEDESTRIAN INTERVALS

Treatment Description

- Allows pedestrians to get a 7+ second head start in the crosswalk before vehicles begin to move

Applications

- Long pedestrian crossing distances
- High vehicular turning volumes
- Low vehicular thru-movement volumes

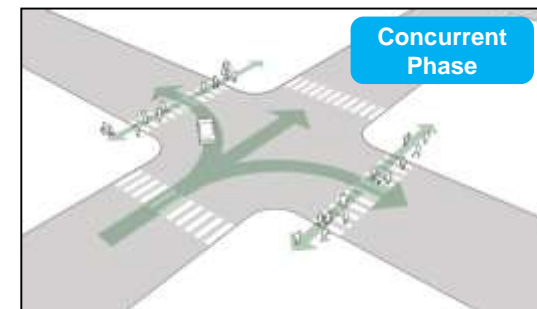
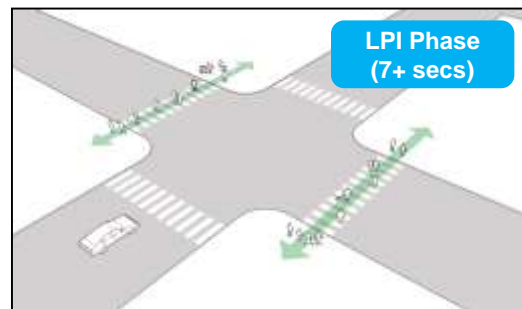
Benefits

- Pedestrians can establish right-of-way
- Increases pedestrian visibility in crosswalk
- Reduces pedestrian-vehicle conflicts

Trade-offs

- Can increase vehicular delays

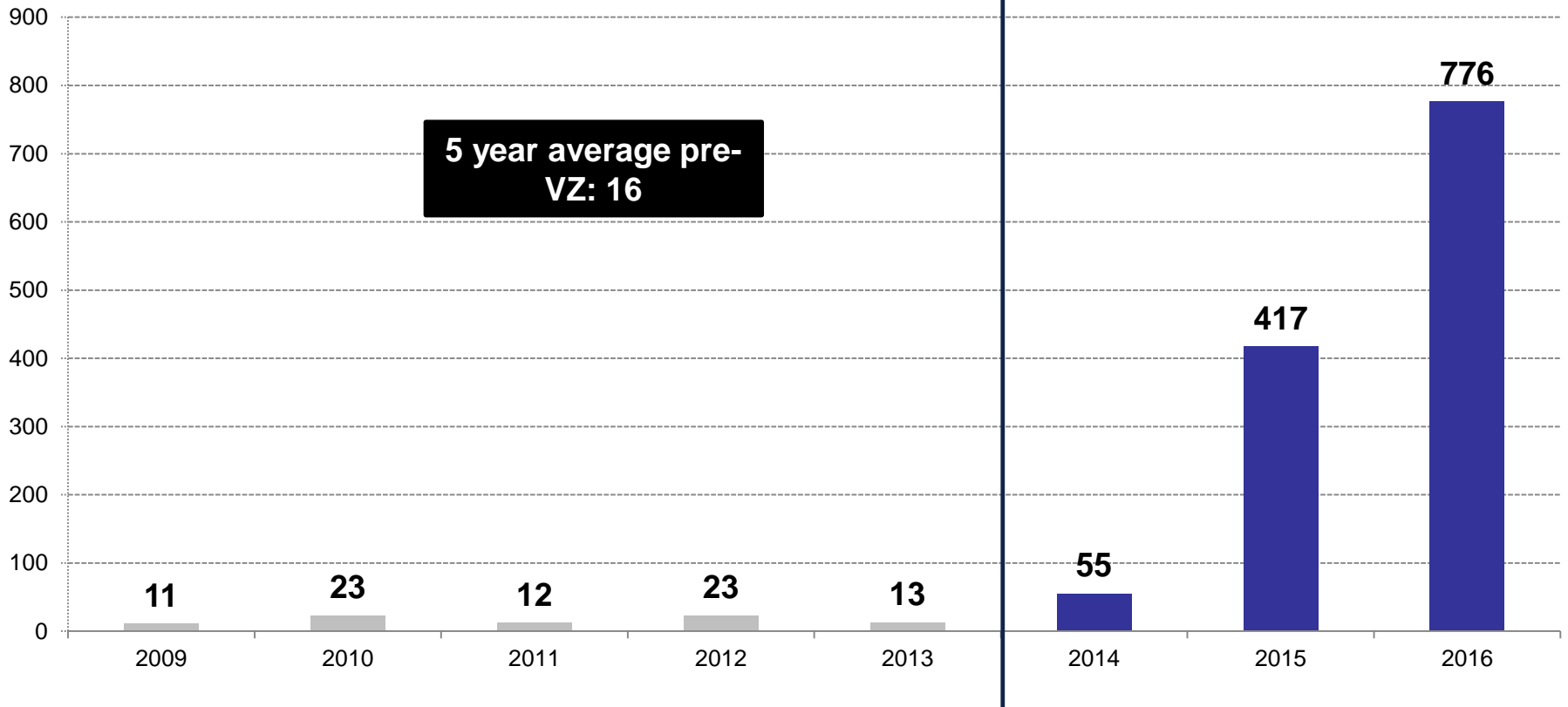
2,081 LPis installed
(as of 5/31/2017)

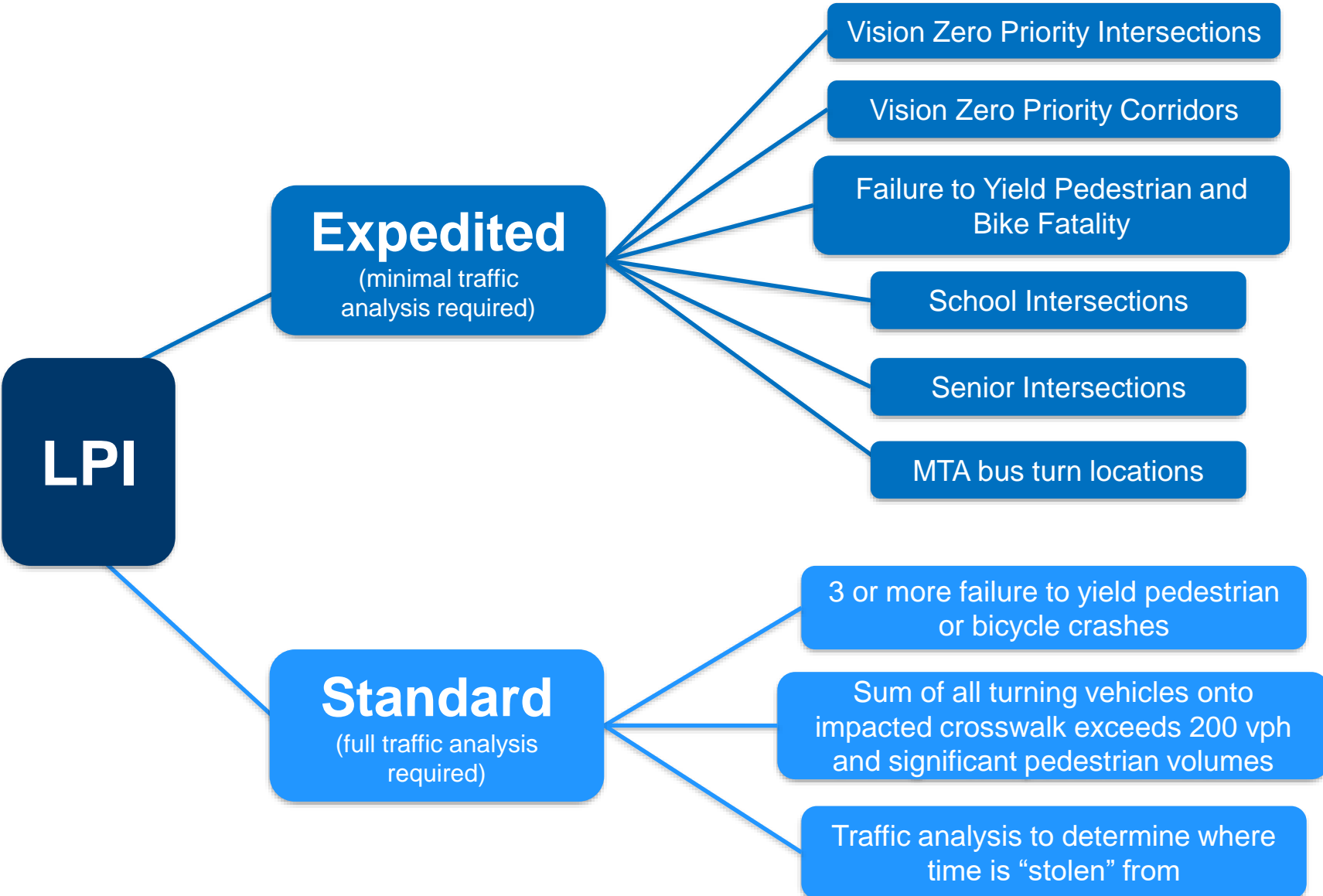


Images courtesy of NACTO

LEADING PEDESTRIAN INTERVALS

- Over **1,700** new LPIs since the start of Vision Zero vs 254 citywide prior to Vision Zero (LPIs began in late 1970s)
- **776** new LPIs in 2016 vs. pre-VZ annual average of 16
- **498** new LPIs installed in 2017 (as of 5/31/17)





How do you take away time from traffic in a congested environment?



©NYC DOT

SPLIT PHASE LEADING PEDESTRIAN INTERVALS (SPLIT-LPIS OR DELAYED TURNS)

Treatment Description

- Allows pedestrians (and bicyclists on bike routes) to get a 7+ second head start before turning vehicles begin to move
- Only turns are held during LPI phase. Thru vehicles permitted to move
- Requires turn bay/lane

Applications

- Long pedestrian crossing distances
- High vehicular thru volumes
- Low vehicular turning movement volumes and/or short storage lengths

Benefits

- Same benefits for pedestrians as LPI
- No impact to thru vehicle delay, provided sufficient queuing space for turns

Trade-offs

- Increases delay for turning vehicles
- Potential loss of parking thru lane

66 Split-LPIs installed
(as of 6/12/2017)



Leading Pedestrian Interval Phase (7+ secs)



Flashing Yellow Turn Phase

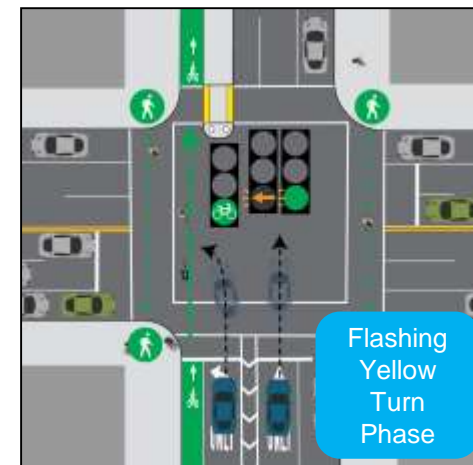
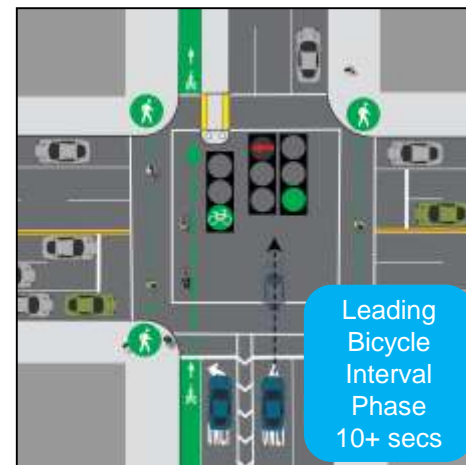


SPLIT PHASE LEADING BICYCLE INTERVALS (SPLIT-LBIS)

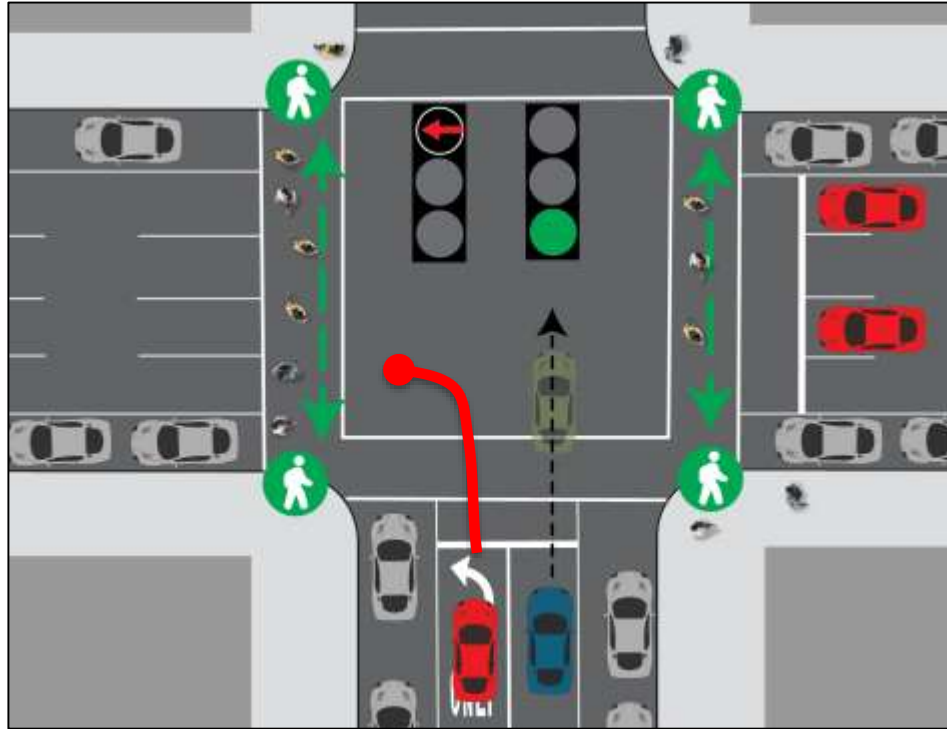


22 Split-LBIs installed

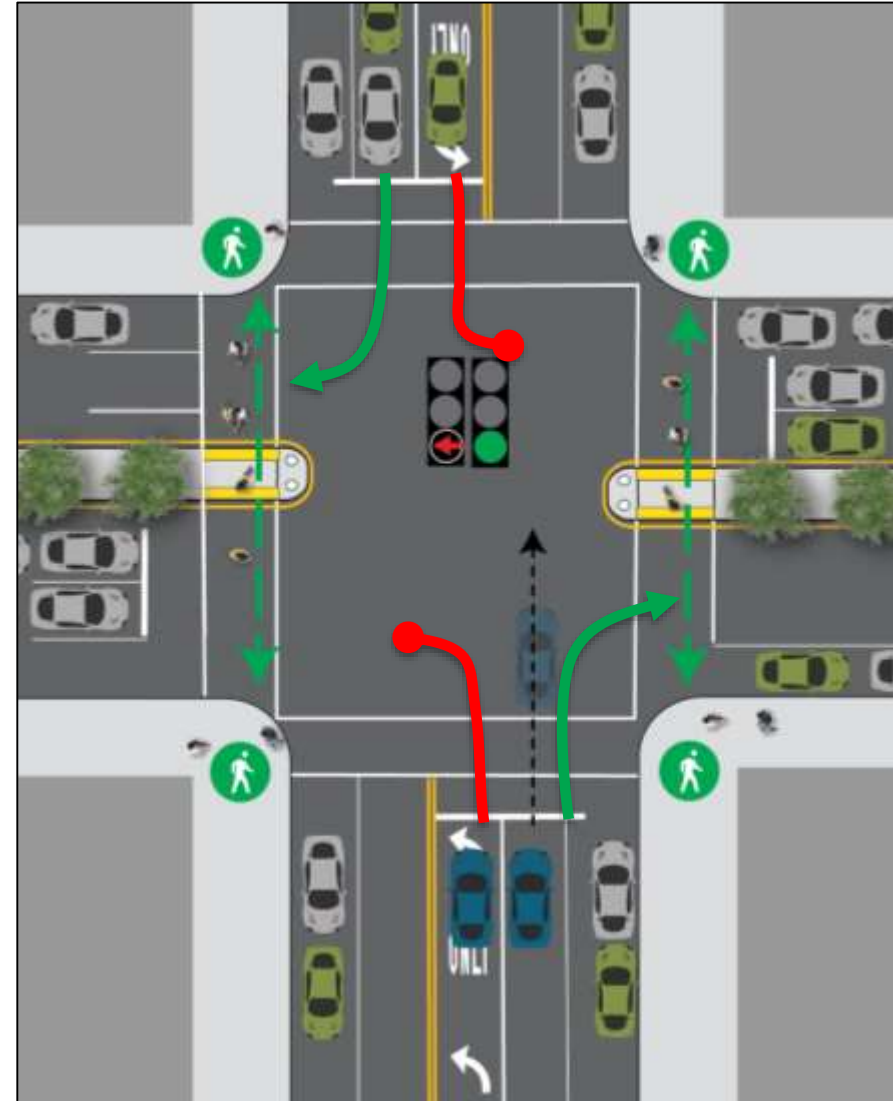
(as of 6/12/2017)



SPLIT-LPIS – ONE-WAY VS TWO-WAY STREETS

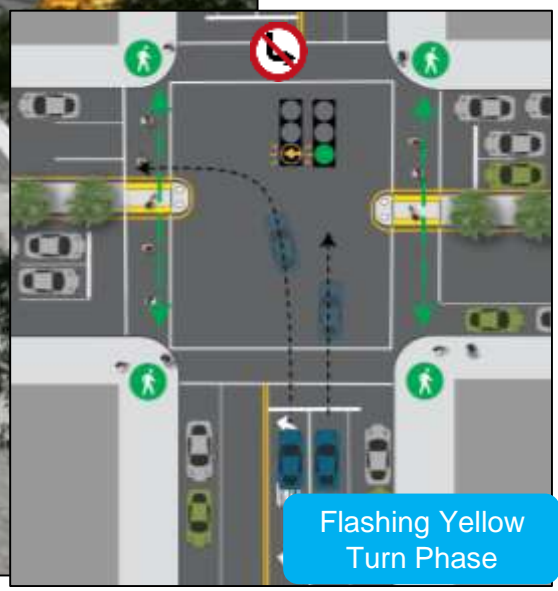
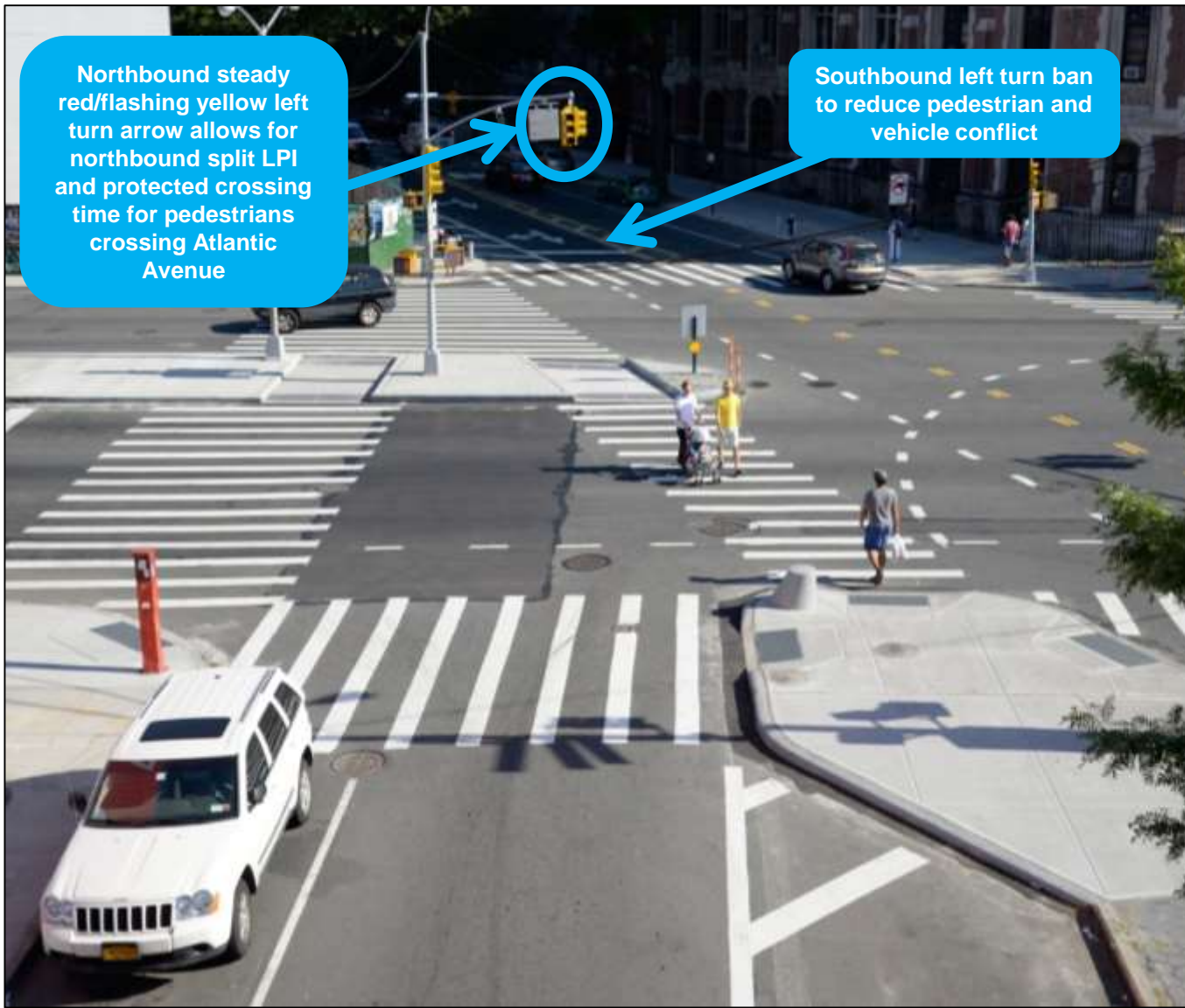


- Fewer trade-off with one-way cross streets
- Two-way cross streets require determination of most critical movements or additional turn lanes and signals



SPLIT-LPIS – TWO-WAY STREETS

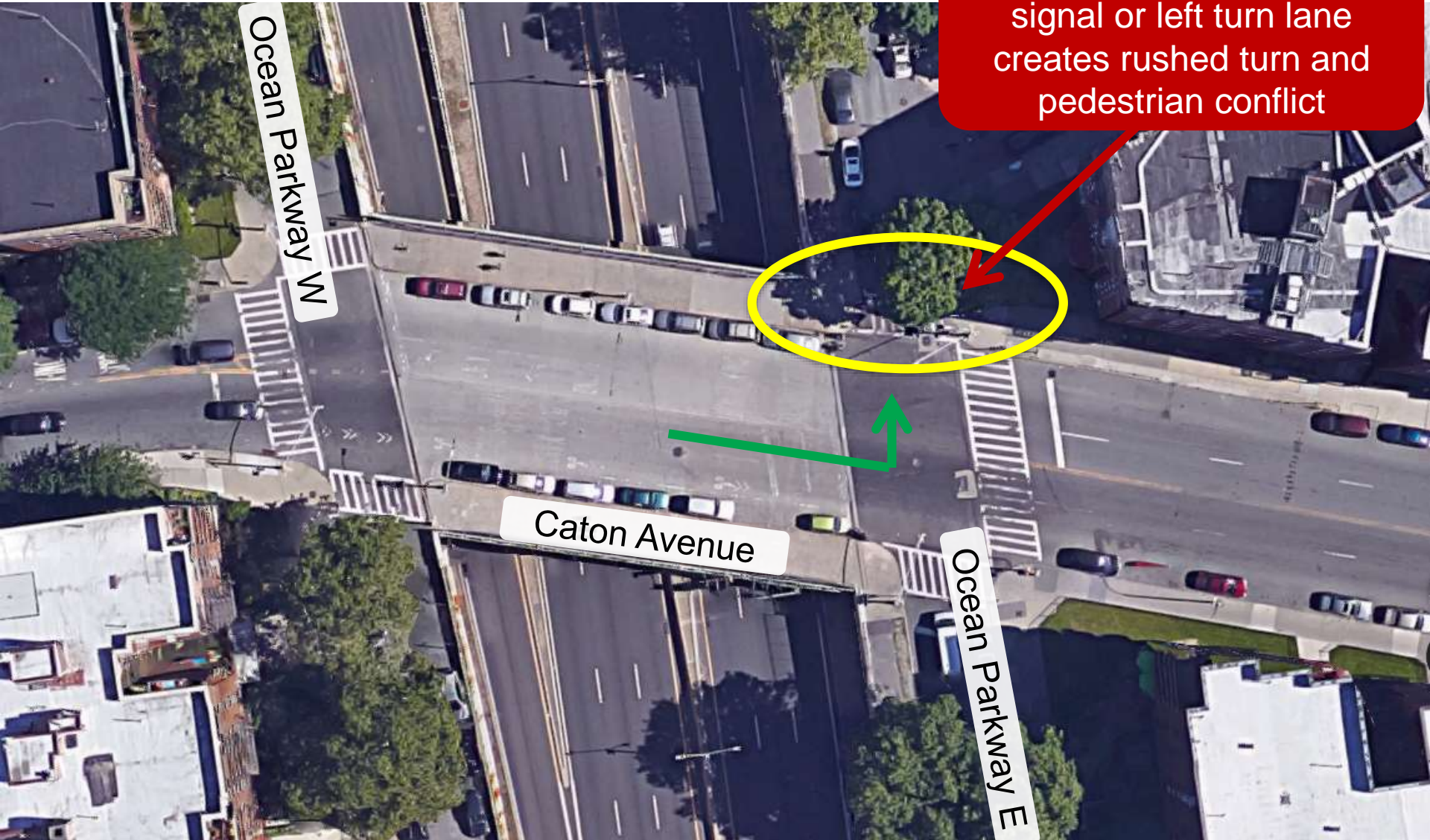
ATLANTIC AV & WASHINGTON AV, BROOKLYN



SPLIT-LPIS – TWO-WAY STREETS

CATON AV, BROOKLYN

No eastbound left turn signal or left turn lane creates rushed turn and pedestrian conflict



SPLIT-LPIS – TWO-WAY STREETS

CATON AV, BROOKLYN



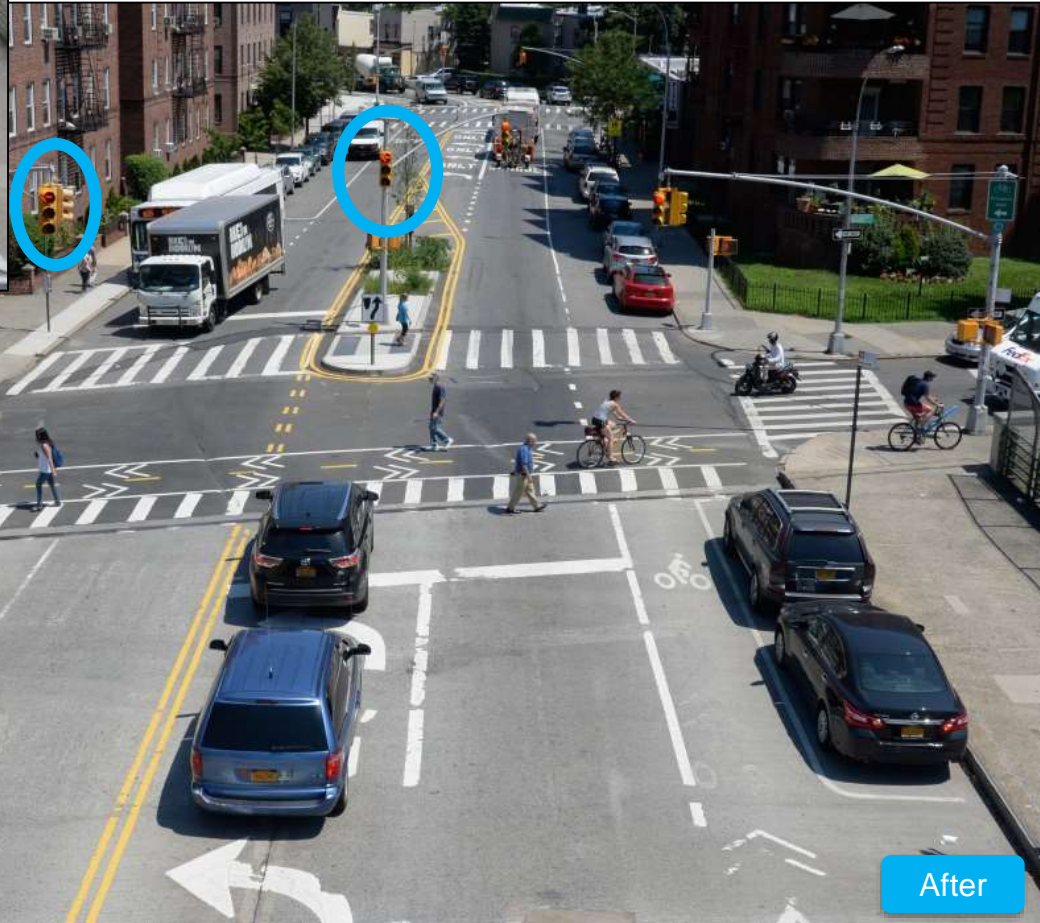
No eastbound left turn signal
or left turn lane created
rushed turn and pedestrian
conflict

Caton Ave at Ocean Pkwy E looking north

SPLIT-LPIS – TWO-WAY STREETS

CATON AV, BROOKLYN

Before



12 second Split-LPI
installed for
eastbound left turn

After

SPLIT LPI OR SPLIT PHASE?

CATON AV, BROOKLYN

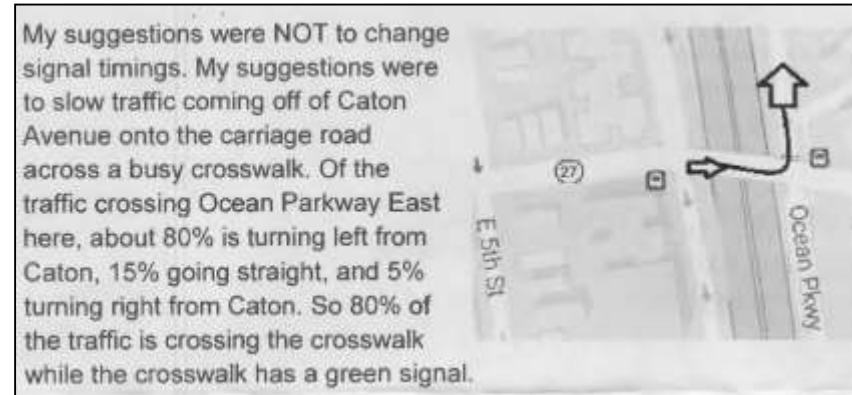
Community Concerns

- Community members and local elected officials were not initially supportive of the Split-LPI once it was implemented
- Claims that flashing yellow was not calming turns
- In particular, parents were concerned about the interaction between aggressive turns and school children
- Asked for full split phase signal

NYC DOT Concerns with Split Phase

- Pedestrian non-compliance given the short crossing distance (~27')
- Reduced pedestrian crossing time
- Storage space for turning queue
- Asked for an evaluation and adjustment period

After receiving additional complaints, NYC DOT will be changing phasing to a full split



FULL SPLIT PHASE

Treatment Description

- Fully splits crossing pedestrians from turning vehicles
- Permits non-conflicting thru movements during pedestrian phases
- Turns only allowed during green arrow phase
- Requires turn bay/lane

Applications

- High pedestrian volumes
- High turning volumes
- High speed roadways
- Multiple turn lanes

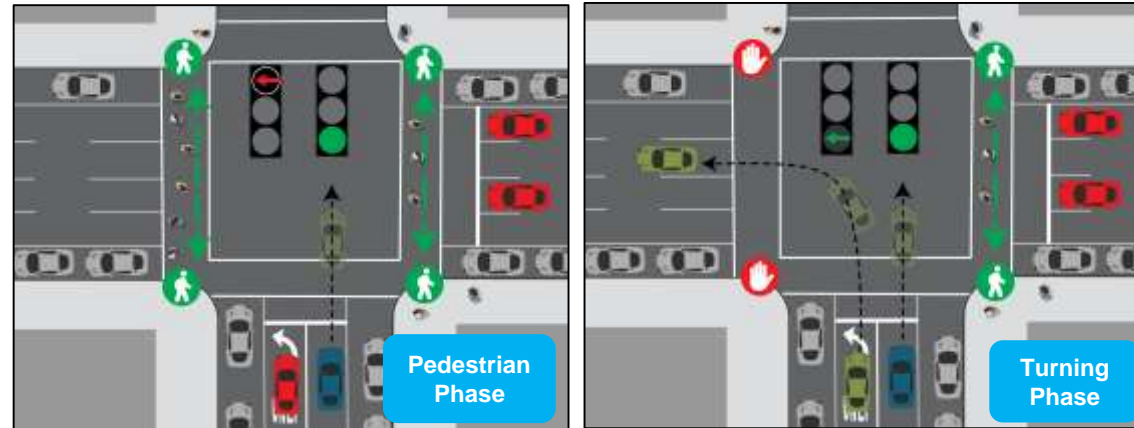
Benefits

- Removes all turning vehicle-pedestrian conflicts
- Allows turning vehicles to proceed without having to find gaps
- No impact to thru vehicle delay

Trade-offs

- Reduces pedestrian crossing time
- Pedestrian non-compliance
- Requires storage space for turn lane

111 Split Phases installed
(as of 6/12/2017)



ALL-PEDESTRIAN PHASE (BARNES DANCE)

Treatment Description

- Signal phase where only pedestrians cross
- Pedestrians may cross in all directions, however the signal is not necessarily timed specifically for the diagonal crossing

Applications

- High pedestrian volumes
- Low traffic volumes
- High pedestrian signal compliance
- Intersections with complex geometry
- Turns are predominant traffic movement
- High demand for diagonal crossing

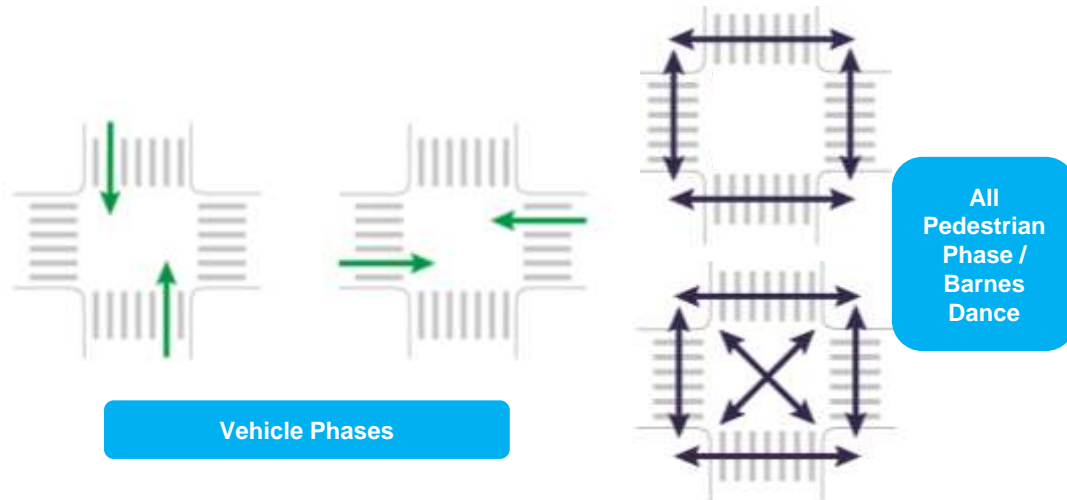
Benefits

- Removes all pedestrian-vehicle conflicts (during all-pedestrian phase)

Trade-offs

- Can reduce pedestrian crossing time
- Pedestrian non-compliance
- Increases vehicular delays

473 All Pedestrian Phases
(includes 92 “Barnes Dances”)
(as of 6/5/17)



ALL-PEDESTRIAN PHASE



- Skewed geometry
- Shortest distance to cross is diagonal
- Desire to cross diagonally to and from subway

Diagonal crosswalk to be added in Summer 2017*

Northern Blvd and Broadway, Queens

ALL-PEDESTRIAN PHASE

- Skewed geometry
- Low traffic volumes
- Desire to cross diagonally to and from LIRR station

Pedestrian signals and diagonal crosswalk to be added in Summer 2017*

Lefferts Blvd and Grenfell St, Queens

ALL-PEDESTRIAN PHASE

- Skewed geometry
- No thru movements – all vehicles turning
- Both legs of Beaver St go “away” from intersection
- Low traffic volumes



Broad St and Beaver St, Manhattan

THANK YOU!

Questions?

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NYC DOT



NYC DOT



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