

Pedestrian Safety Initiatives in New York City

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August 16, 2012



Today's presentation

- ⇒ Introduction and housekeeping
- ⇒ Audio issues? Dial into the phone line instead of using “mic & speakers”
- ⇒ PBIC Trainings
<http://www.walkinginfo.org/training>
- ⇒ Registration and Archives at
<http://www.walkinginfo.org/webinars>
- ⇒ Questions at the end
- ⇒ Follow-up email with certificate of attendance for 1.5 hours of instruction and link to download slides

NYC Pedestrian Safety Action Plan

Process and Progress

2012



Matthew Roe, Senior Planning & Research Manager
New York City Department of Transportation
Pedestrian Safety Initiatives in New York City
August 16, 2012

Pedestrian Safety Study & Action Plan

- Goal/Issue: 50% reduction in fatalities by 2030
- NYU, RPI, and SUNY-Buffalo
- Scope:
 - Pedestrian severe injuries & fatalities, 5 years (7,000 cases)
 - 400 attributes: Person, vehicle, crash, facility, neighborhood
 - PARs, census, geometry, and health/vital stats data
- Descriptive stats/geography → Regression models → Simple but statistically rigorous summary



Pedestrian Safety Through the Decades

Decade	NYC Pedestrian Fatalities Avg per Year	Pedestrian Fatalities per 100,000 Residents per Year	% Pedestrian
1910 - 1919	381	7.3	70%
1920 - 1929	735	11.7	70%
1930 - 1939	693	9.6	70%
1940 - 1949	567	7.4	84%
1950 - 1959	454	5.8	72%
1960 - 1969	434	5.5	60%
1970 - 1979	386	5.2	52%
1980 - 1989	331	4.6	55%
1990 - 1999	261	3.4	51%
2000 - 2009	167	2.0	51%

Pedestrian Fatalities and Severe Injuries

- 28% reduction in pedestrian fatalities since 2001
- 22% reduction in pedestrian severe injuries since 2001
- Goal: 50% reduction in all fatalities from 2007 to 2030

Year	NYC Pedestrian Fatalities	NYC Pedestrian Severe Injuries
2001	193	1,452
2002	186	1,417
2003	177	1,418
2004	155	1,311
2005	157	1,285
2006	168	1,353
2007	139	1,313
2008	151	1,308
2009	156	1,161
2010	152	1,155
2011	139	--

NYC vs. USA

Traffic Fatalities per 100,000 Residents Yearly Average (2008-2010)

	Pedestrian	Non-Pedestrian	Total
NYC	1.82	1.43	3.26
USA (less NYC)	1.38	10.16	11.54

Journey-to-Work Transit + Walking Mode Share (2008-2010)

68.3%
8.2%

Sources: NYCDOT, NHTSA FARS, Census ACS 2010 3-year estimates (excl. worked at home)

- National fatality rates are >3x higher than NYC rates
- NYC has much higher pedestrian activity than rest of USA
- NYC has lower VMT per capita, driven at lower speeds

Study Findings

- Who:
 - Male drivers (80%) striking male pedestrians (60%)
 - Older adults and foreign-born population overrepresented
- When: Afternoon most frequent (20%) but late-night twice as deadly
- Where:
 - Arterial streets: 2/3 of all pedestrian fatalities in 15% of network
 - Intersections – but not particular intersections
- How:
 - Crossing-with-signal struck by turns more frequent (27%), but crossing against the signal 56% deadlier
 - Speeding-related and aggression-related crashes twice as deadly

**Bottom Line: Speed, Failure to Yield,
Crossing Midblock & Against Signal
*Especially on Arterials***

Action Plan

- Public Information
 - Core message: “It’s 30 for a Reason.”
 - Ads, speed display boards, YouTube videos, etc
- Education
 - Age, language, and geographic focuses



Default State:



If you go over 30:



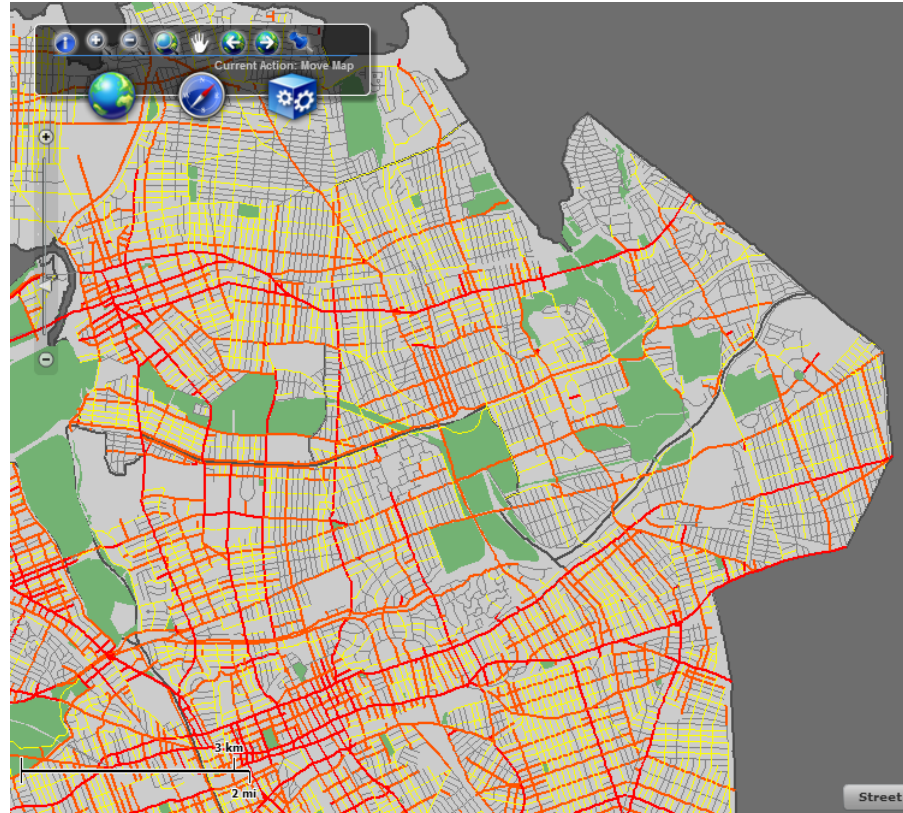
- Enforcement
 - Speed, failure to yield – geographic focus
 - Coordinated with engineering & public info
- Engineering

Engineering Programs/Initiatives

- Action Plan commitments
 - High-Crash Corridors
 - 20 miles redesigned
 - 40 miles upgraded
 - 1500 pedestrian countdown signals
 - Neighborhood Slow Zone
 - 20 Tame the Two-Ways
 - Left Turn Daylighting
- Safe Streets for Seniors
- Bike Network Expansion
- School Safety Engineering
- High Pedestrian Crash Locations

Project Prioritization

- High-Crash Corridors identification
 - KSI (Killed or Severely Injured persons) per mile
 - Top 1/3 of road miles per borough
- Typically arterial streets
- Provides focus for engineering, enforcement, and education efforts
- Updated annually



Implementation

Operations Projects

- Initiation to implementation:
6 – 18 months
- Concrete: In-house crews
 - Secured approval to use Federal grant funding
- Markings, Signals: Citywide contracts
- Signage: In-house
- Resurfacing: In-house



Capital Projects:

- 1-2 year initiation
- Multiyear construction
- NYC DDC project management
- Built by contractor

Action Plan Progress

- 2011:
 - Completed 21 miles of redesigns & 46 miles of upgrades
 - Addressed turn safety at 26 major Manhattan intersections (Tame the Two-Ways program)
 - Implemented left-turn daylighting on Lexington Avenue
 - Implemented pedestrian countdown signals at 1,500 high-priority locations, with 1,700 more in pipeline
 - Implemented a Neighborhood Slow Zone (Claremont)
 - 13 more planned 2012-2013
 - “It’s 30 for a Reason” campaign
 - “You the Man” campaign
 - Speed display boards
 - New educational initiatives
 - Convened monthly meetings with NYPD Traffic Division
 - Increased penalties for vehicular violence, distracted driving
 - Crossover mirror requirement for trucks



Project Type: 4-to-3-Lane Conversion

- Before
 - 60', 4 lanes
- After:
 - One lane each direction
 - Left turn bays
 - Bike lanes or wide parking lanes (13')
 - Planted refuge islands



Empire Boulevard, Brooklyn

Project Type: 2-to-3-Lane Conversion

- Before:
 - 50', two lanes
- After:
 - Flush center median
 - Left turn bays
 - Alternate: Bike lanes or wide parking lanes



E 180th Street, Bronx

Project Type: Arterial Street Median Tips

- Before:
 - Narrow medians don't extend into crosswalk
- After:
 - Widened median tips extend into crosswalk as pedestrian islands



Project Type: Separated Bike Path, Plaza

- Before:
 - Multi-lane one-way. Marked bicycle lane
- After:
 - Separated on-street bike path
 - Pedestrian plaza or parking lane
 - Left turn bays or mixing zones
 - Narrowed crossings



Obstacles

- Legislation
 - State law needed for speed cameras
 - Lopsided penalties (e.g. less punishment for hit & run than DUI)
- Public, Media, & Political Acceptance
 - Widespread disinformation about safety & trade-offs
 - Driving-oriented local leadership despite pedestrian population
 - PR is a full-time job
- Culture of Speeding (and Jaywalking)
 - Combine to deadly effect on arterials
 - It's hard to address both at once - messaging, resources
- Speed enforcement on city streets is difficult
- Prosecution of traffic crimes is difficult

Lessons Learned

- Safety stats are key
- Implement in-house/with existing contracts if possible
- Executive and management support needed
- Comprehensive outreach works for big changes
 - Involve people that are already interested in safety
 - Schools, police, seniors, environmental justice groups, etc.
 - Let community members identify problems, and work with them on solutions





Thank You

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www.nyc.gov/html/dot/html/about/pedsafetyreport.shtml

<http://www.nyc.gov/html/dot/html/about/dotlibrary.shtml#research>

Project Types: Plaza

- Lane reduction/reassignment
- Textured epoxy gravel or painted surface
- Planters
- Café tables
- Available materials
- Retail area
- BID partner



Union Square, Manhattan

Neighborhood Slow Zones

A community-driven approach to reducing speeds to 20MPH



What is a Neighborhood Slow Zone?

- Inspired by programs in the UK and Europe
- Speed limit set at 20mph
- Small, self-contained area (~5x5 blocks or ¼ mile diameter)
- Announced with signs and gateway treatments
- Self-enforcing via traffic calming and markings



Safety Impacts from Other Cities

- United Kingdom

- London: 46% reduction in KSI, as compared to untreated areas
- London: No collision migration
- Average speeds reduced 9mph

- The Netherlands

- Average decrease in injuries of ~25% in Zones 30
- As of 2007, 75% of residential streets set at 30 kph (19mph)
- Amsterdam: Entire city center set at 30 kph

- Barcelona

- Began piloting in 2006, crash rates dropped up to 27%
- Building 215 km of “Zone 30” by end of 2009



Overall Benefits

Quality of Life Improvements

- Reduced traffic noise
- Reduced cut-through traffic
- More social streets

Develop Safer Driving Culture

- Slowly build a network of slower speed zones citywide
- Shift driving habits to slower, more context appropriate speeds



Slow Zone Toolbox

- Gateways
- Speed humps
- 20 MPH markings
- Other traffic calming markings

Gateways

- Roadway is narrowed by in-street sign base, signs and markings to bring down vehicle speeds
- Drivers are clearly alerted that they are entering a traffic calmed zone by signage and markings
- Two parking spaces “daylighted” at each gateway



Speed Humps

- Keep vehicle speeds around 20mph; 15 mph near schools & other sensitive locations
- ~20% reduction in speeds
- ~30% reduction in mid-block crashes
- ~40% reduction in pedestrian crashes, without increasing any other type of crash
- Speed humps distributed as evenly throughout the Slow Zone as feasible
- Key element in making the Slow Zone “self-enforcing”
- Follow standard NYCDOT speed hump criteria when choosing streets for installation



20 MPH Markings



Other Traffic Calming Markings

- Optional treatments: where appropriate, markings employed to narrow and calm roadway

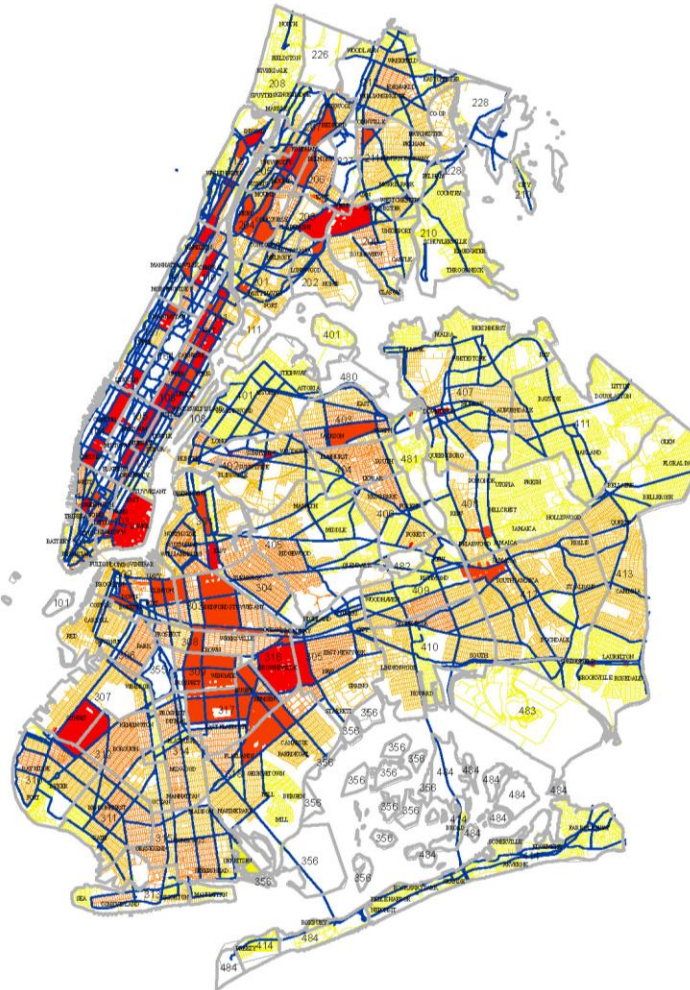
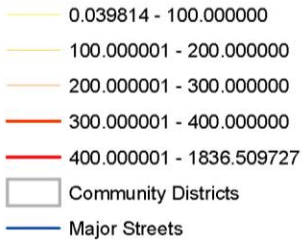


Requires Minimal DOT Operations Resources

- No signals work required
- Minimal data collection required
- Minimal design work: formulaic sign and markings installations
- Two “double” signs & ped island sign at most gateway, average 12 gateways per Zone
- ~13 Speed Humps per Zone (one every three blocks)
 - Excluded from bus routes
 - No truck routes inside the Slow Zones

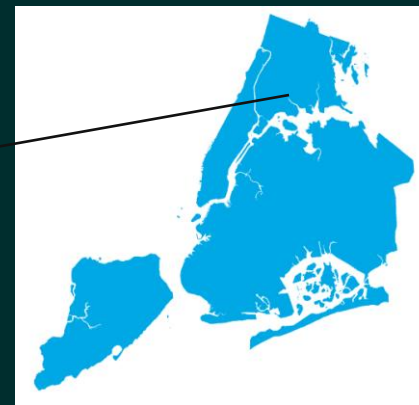
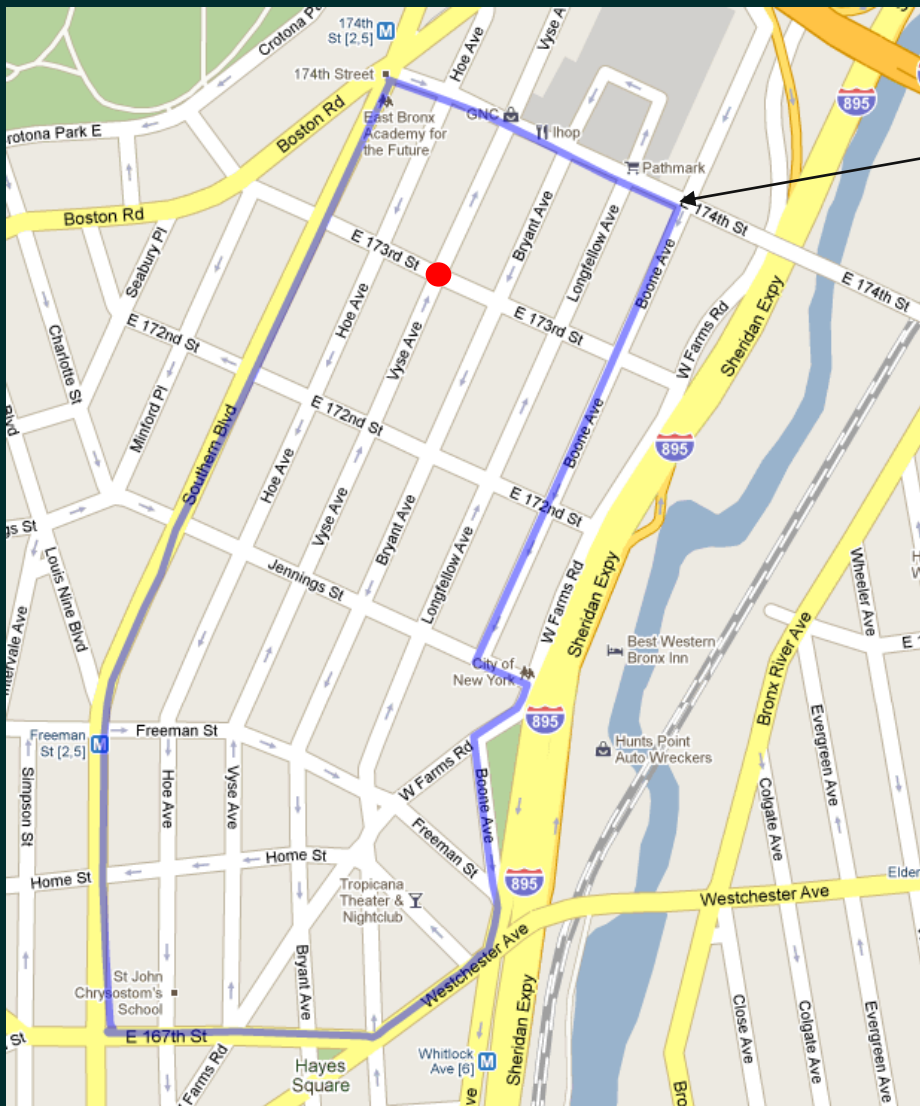
Pilot Neighborhood Selection Process

Local Streets: Severity-Weighted Crashes/Mile



- Select preliminary list of possible locations using crash rates and street characteristics
- Solicited Borough Commissioner (NYCDOT community Liaison) input on potential community interest

2011 Slow Zone Pilot Area



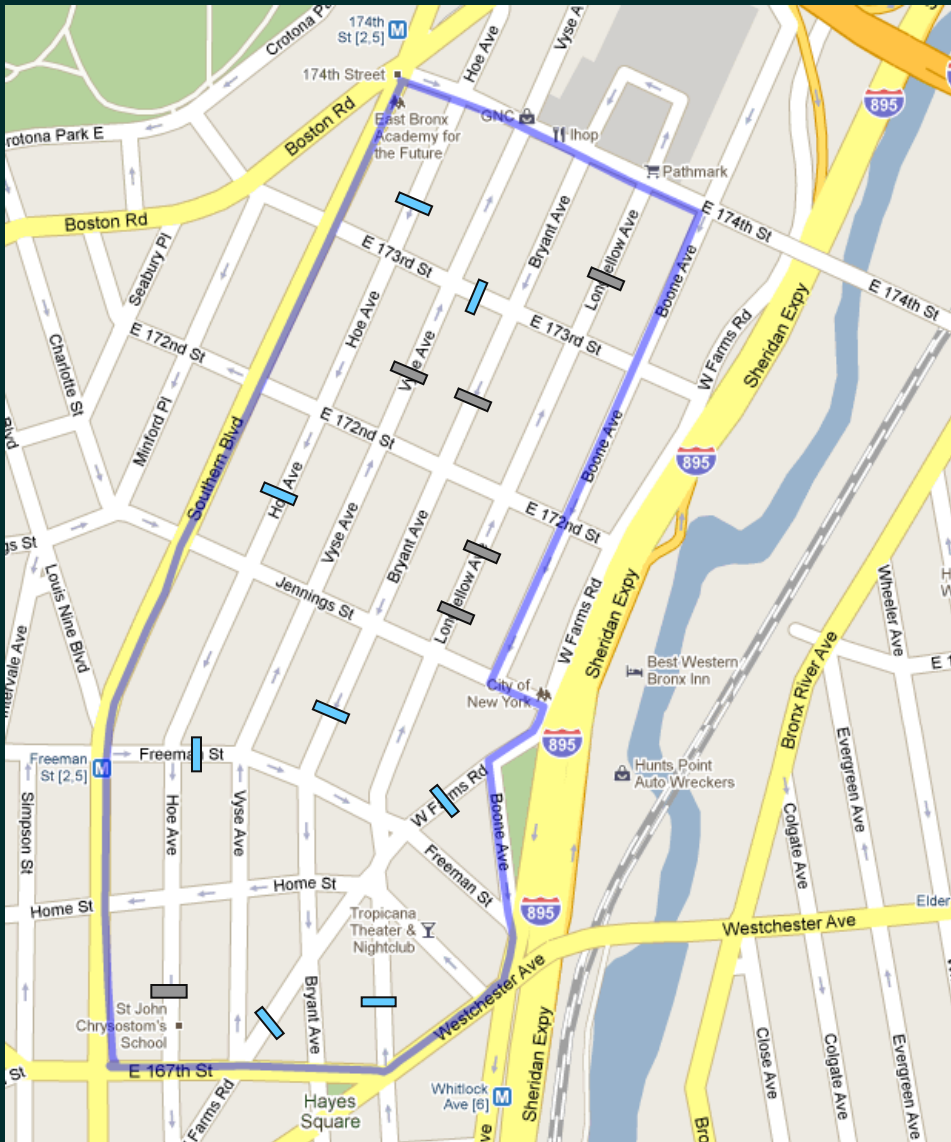
Claremont, South Bronx

- 1 fatality (2005-2009)
- 74th percentile for injuries per mile
- Community Board open to the project
- Strong boundaries: surrounded by elevated train, highway, industrial zone, commercial streets
- .22 square miles
- 6 schools within Zone
- Close to 3 subway stations
- Strong neighborhood quality, highly residential

Claremont Slow Zone Pilot Area

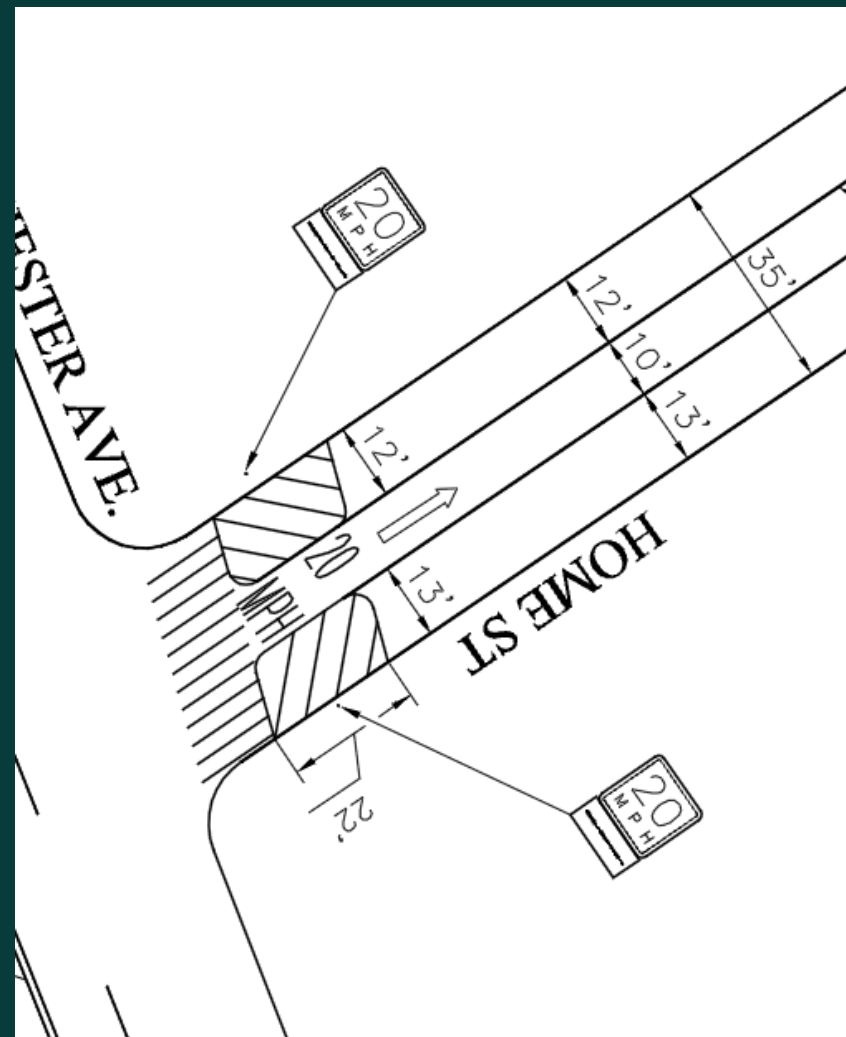
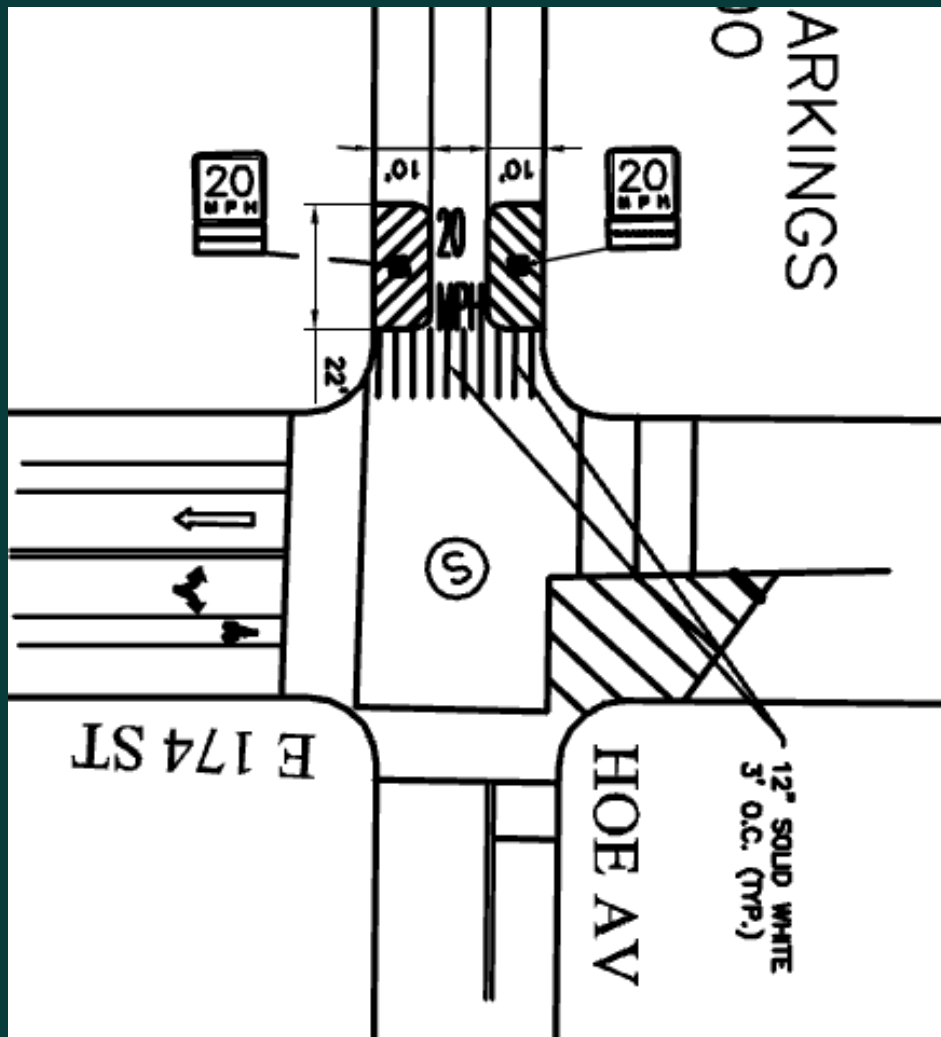


Speed Humps



- 8 New Speed Humps Proposed
- 6 Speed Humps Existing

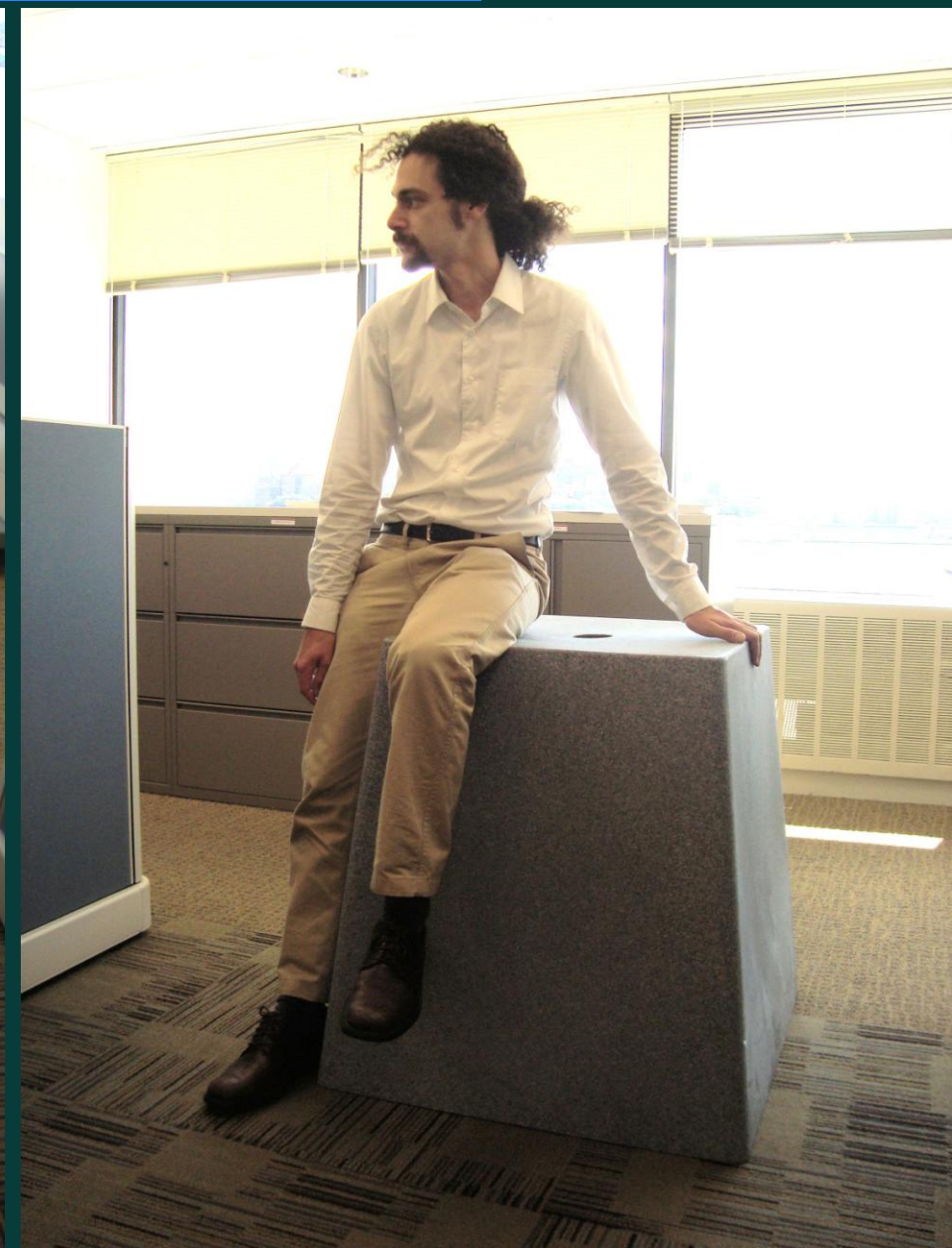
Gateway Design



Custom Sign



Custom Sign Base







SPEED
LIMIT
20

NEIGHBORHOOD
SLOW
DOWN

NYC DOT

659-4

NEW YORK CITY
DOT
Traffic Engineering

NO PARKING
ANY TIME

NYC DOT



SPEED LIMIT
20
PEDESTRIAN

SPEED LIMIT
20
PEDESTRIAN

FRAG
LAUNDRY
FOLD-DROP OFF SERVICE

MAY
20



SPEED LIMIT
20
SLOW ZONE

SPEED LIMIT
20
SLOW ZONE



MNG Auto Body Work AUTOMOTIVE

BOONEWAY
E 173 ST
ONE WAY

SPEED LIMIT 20
SLOW ZONE

SPEED LIMIT 20
SLOW ZONE

MNG
OFFICIAL
NEW YORK
MISSIONS
SECTION STATION

STOP
20 MPH





BUMP

BUMP
15

BUMP
15

Application Launched

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About DOT Neighborhood Slow Zones

Neighborhood Slow Zones are a community-based program that reduces the speed limit from 30 mph to 20 mph and adds safety measures within a select area in order to change driver behavior. The ultimate goal of the Neighborhood Slow Zone program is to lower the incidence and severity of crashes. Slow Zones also seek to enhance quality of life by reducing cut-through traffic and traffic noise in residential neighborhoods.

Neighborhood Slow Zones are established in small, self-contained areas that consist primarily of local streets. Signs and gateways announce the presence of a Slow Zone. The Zone itself is a self-enforcing, reduced-speed area with speed bumps, markings and other traffic calming treatments. Implementing Neighborhood Slow Zone safety treatments can result in the loss of some on-street parking.



DOT creates slow zones in response to applications from communities. After each round of applications, DOT selects appropriate location(s) and works with the community to devise a plan to install the Slow Zone. Slow Zones must be approved by the local Community Board.

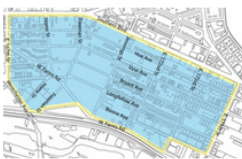
Applying

Applications may be submitted by local Community Boards, civic associations, business improvement districts (BIDs) or elected officials. The deadline for submitting applications is Friday, February 3, 2012. Applications must be submitted via email to slowzones@dot.nyc.gov.

[Download the Application](#)

Applicants should:

- pick a location that is approximately a quarter square mile (around 5 by 5 blocks) in area
- pick a location that is primarily residential
- avoid wide, major streets, industrial and major commercial areas within the zone
- choose strong boundaries, e.g. highways, large parks, elevated trains, dead ends, major streets



Map of the Cleveant Neighborhood Slow Zone in the Bronx.

Applicants must provide an inventory of relevant institutions and transportation facilities within the boundaries of the zone, including schools, senior centers, daycare centers, subway stations, bus routes (in the zone and on the boundary), truck routes (in the zone and on the boundary), fire stations, and hospitals.

[Find schools, hospitals and other institutions on NYCityMap](#)
[Browse transit maps from the MTA](#)

Applications must demonstrate local support for the Slow Zone. Applications that include letters of support from key community stakeholders will be prioritized. Examples of key stakeholders include the local Community Board, police precinct, civic councils, community groups, BIDs and local elected officials.

All applications will be reviewed to ensure they are complete, and applicants will be sent confirmation of receipt of their applications as soon as they have been processed. Applicants may be asked to provide additional information or make changes to the application, if the original application has been submitted.

New York City Department of Transportation

2011

NYC Neighborhood Slow Zone



Application for Communities & Neighborhoods

Please read through the Neighborhood Slow Zone Guidelines before completing the application

Community Information

Name of Interested Community/Group: _____ Borough: _____

Community Board(s): _____ Contact Person and Title: _____

Contact's Address: _____

City: _____ State: _____ Zip Code: _____

Contact's Phone #: _____ Contact's Email: _____

Proposed Boundaries of Slow Zone

Describe the proposed location and boundaries of the Neighborhood Slow Zone. Please indicate any "strong" boundaries, e.g. highways, parks, elevated trains, dead ends, major streets. (Please attach a map):

2011-2012 Applications

- Slow Zone application period was open for 10 weeks
 - 11-17-2011 through 02-03-2012
- ~100 applications received
- ~25 applications promising enough to score
- Other applications were disqualified due to:
 - Contained major, high traffic streets
 - Only specified a single street
 - Collection of disconnected streets
 - Too small or too large (.25 square mile ideal)
 - Information unclear

2011-2012 Applications

- Queens & Staten Island accounted for ~80% of demand
 - Staten Island (43)
 - Queens (34)
 - Brooklyn (13)
 - Bronx (5)
 - Manhattan (2)

2011-2012 Applications

- Applications were scored using positive and negative criteria, with **crashes** and **community support** weighted highest. Criteria included:

Positive Criteria	Negative Criteria
Crashes	Gateways required
Letters of Support	Fire Stations
Schools	Hospitals
Senior Centers	
Daycare	
Strong Boundaries	
Subway Stations	
Bus Routes (on boundary)	Bus Routes (in zone)
Truck Routes (on boundary)	Truck routes (in zone)

2012-2013 Slow Zones

- NYCDOT will install 13 Slow Zones citywide
 - **Bronx**
 - Baychester
 - Eastchester
 - Mt Eden
 - Riverdale
 - **Brooklyn**
 - Boerum Hill
 - **Manhattan**
 - Inwood
 - **Queens**
 - Auburndale
 - Corona
 - E Elmhurst/Jackson Heights
 - Elmhurst
 - **Staten Island**
 - Dongan Hills
 - New Brighton/St George
 - Rosebank

Preliminary Evaluation

- Too early for crash reduction data (NYCDOT waits minimum 18 months)
- Speeds were reduced at 6 out of 7 locations where speed bump was installed
- Of those 6, average reduction of 85th percentile speed was - 10%
- Speeds were unchanged at the non-hump locations
- In-street signs have been problematic, 7 out of the 16 installed have been damaged as of January 2012
- Anecdotal observations from the police are positive, reporting that driving in the Zone was slower and less aggressive
- Public response in the neighborhood has been favorable, no issues or complaints

Questions?

**Thank
You**

Left Turns and Pedestrian Safety

2012



Why Focus on Left Turns?

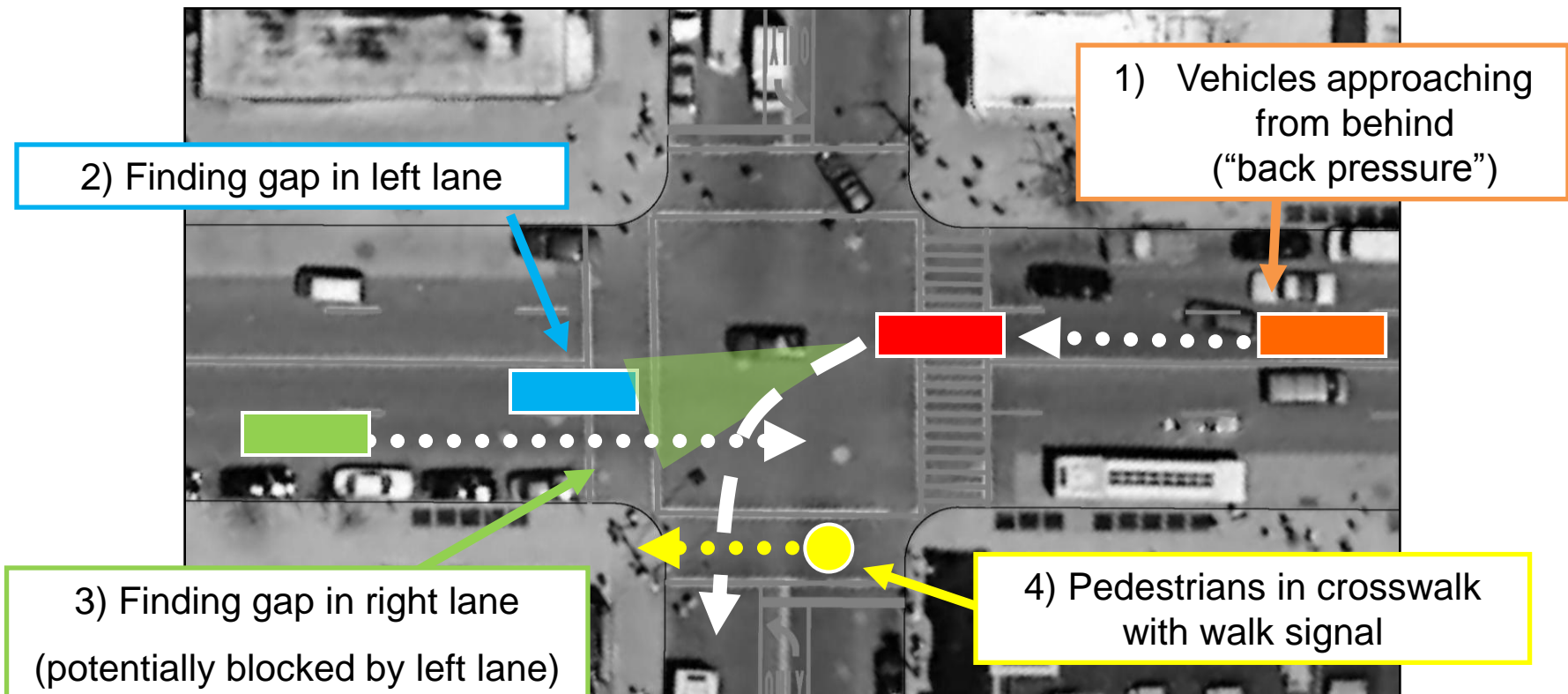
- Among pedestrian fatality and severe injury crashes:
 - LT crashes outnumber RT crashes 3 to 1
 - Driver failure to yield while turning is a leading factor:
 - Among pedestrians struck while crossing at a signalized location, 57% were crossing with the signal



8th Avenue & 125 Street, Manhattan

Two-Way Streets: The Left Turn Problem

- Difficulty of driver task: four concerns at intersection (red car)
- Result: acceleration across oncoming lanes and into crosswalk
- Waiting for gap removes most left-lane capacity



Two-Way Toolbox: One-Way Streets

- Mid-century conversions laid groundwork for massive safety improvements
- Advantages:
 - Eliminates two-way left-turn condition
 - Signal coordination for directional travel
- Challenges:
 - Speeding in low-volume areas
 - Cross-street mobility/network issues
 - Bus transit
 - Bicycle mobility
 - Effects on retail business



Seventh Avenue, Manhattan

Two-Way Toolbox: Left Turn Restrictions

- Advantages
 - Eliminates left turn hazard among compliant vehicles
- Challenges
 - Network/mobility
 - Additional right turns
 - Local public acceptance



Flatbush Avenue Left Turn Restrictions

- Major thoroughfare:
1500-1800 vph
(peak direction)
- Left turns banned
- Right-turn jughandles
naturally present due to
position in grid



Flatbush Avenue at Carlton Avenue, Brooklyn

Two-Way Toolbox: Dedicated Turn Phases

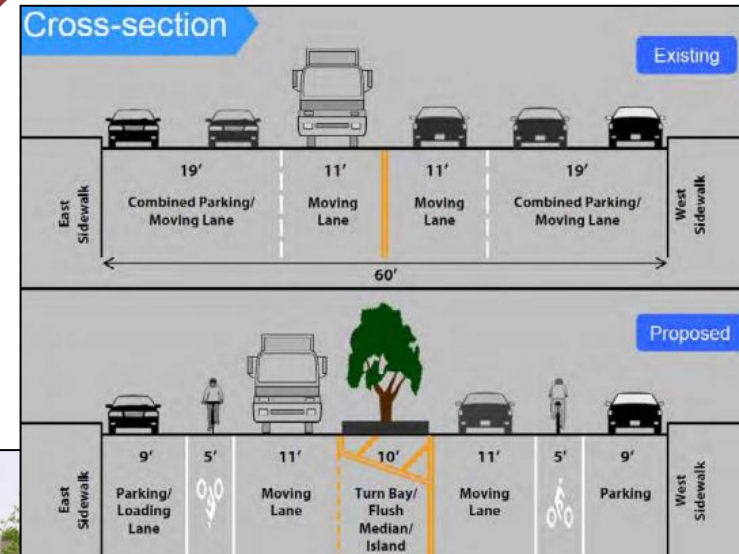
- Advantages
 - Theoretical elimination of vehicle-pedestrian and vehicle-vehicle conflicts
 - Higher left-turn throughput
- Challenges
 - Low pedestrian compliance
 - Time required in signal cycle



14th Street at 1st Avenue, Manhattan

Two-Way Toolbox: Road Diets w/ Turn Bays

- Conversion from 4 lanes to 2 plus left turn bays, or addition of turn bays on wide 2-lane streets
- Advantages
 - Eliminates “Back Pressure”
 - Reduces needed gap to one lane
 - Provides room for bike lanes, pedestrian refuge islands, and other improvements
- Challenges
 - May not be feasible on higher-volume streets



Vanderbilt Avenue, Brooklyn

Road Diet – Allerton Avenue



Before: Allerton Avenue, Bronx

- 2-way, 4-lane street converted to one lane each direction plus left turn bays, refuge islands, and bike lanes



After: Allerton Avenue, Bronx

- 26% reduction in injury crashes
- 48% reduction in pedestrian injuries

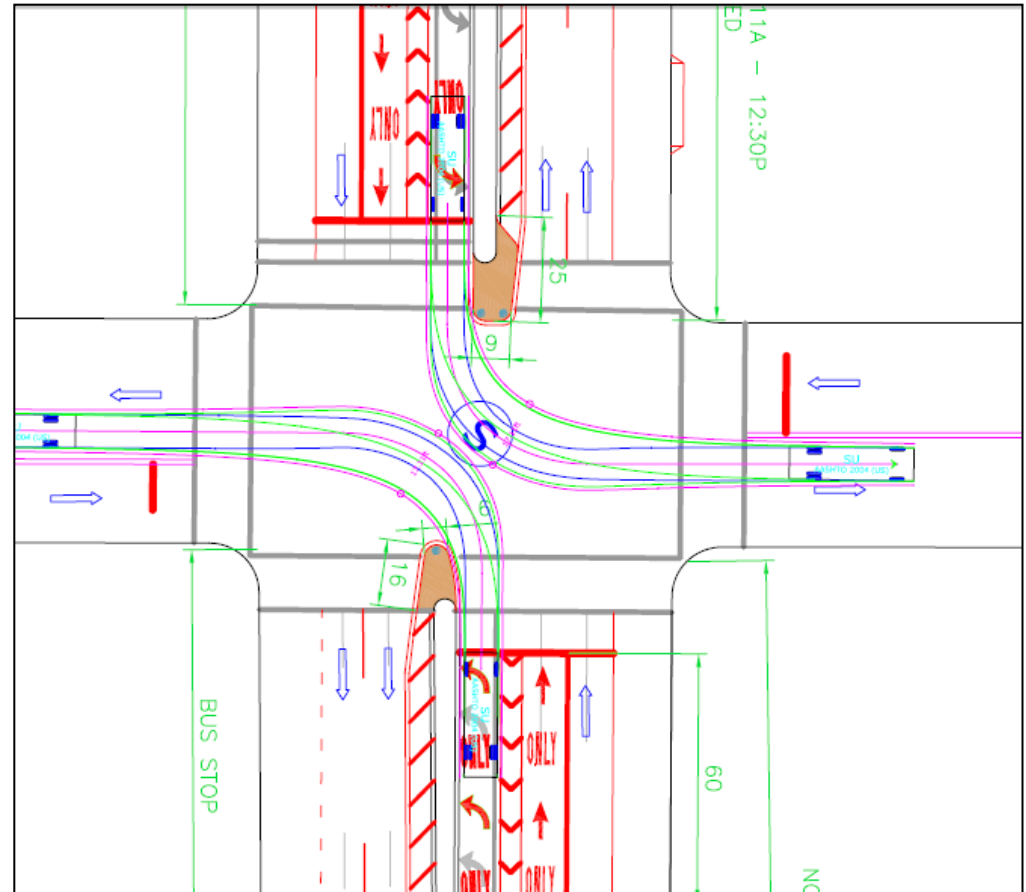
Two-Way Don't: Move Lefts to the Right

- Moving left turns further right may create room for refuge islands, but:
 - Worsens line of sight for turning vehicles of through vehicles
 - Introduces turn-vs.-turn conflict as left turns cross
 - Moves turns further from receiving crosswalks



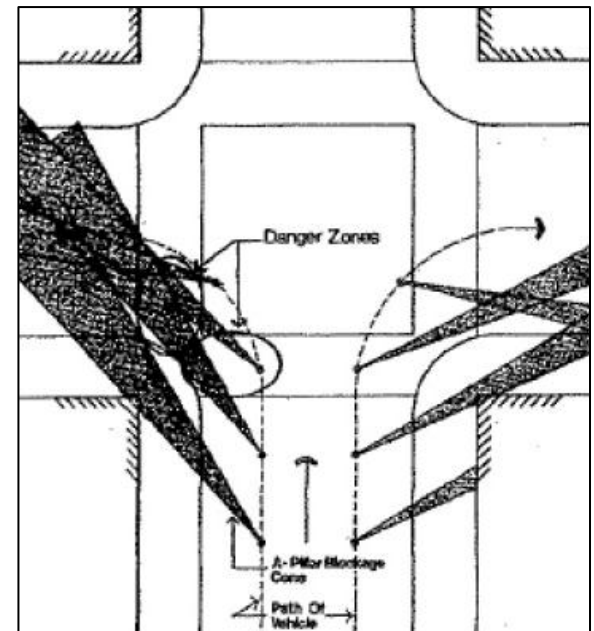
Two-Way Don't: Alternative

- If space permits:
- Left turn bays can be kept in same location
- Adjacent pedestrian space can be added on other side of roadway
- Channelize between left and through lanes to align



One-Way Streets: The Left Turn Problem

- “A-pillar” between windshield and driver window creates blind spot on left side
- Parking blocks view of pedestrians at approach
- Blind spot tracks pedestrians crossing in the same direction as moving vehicles



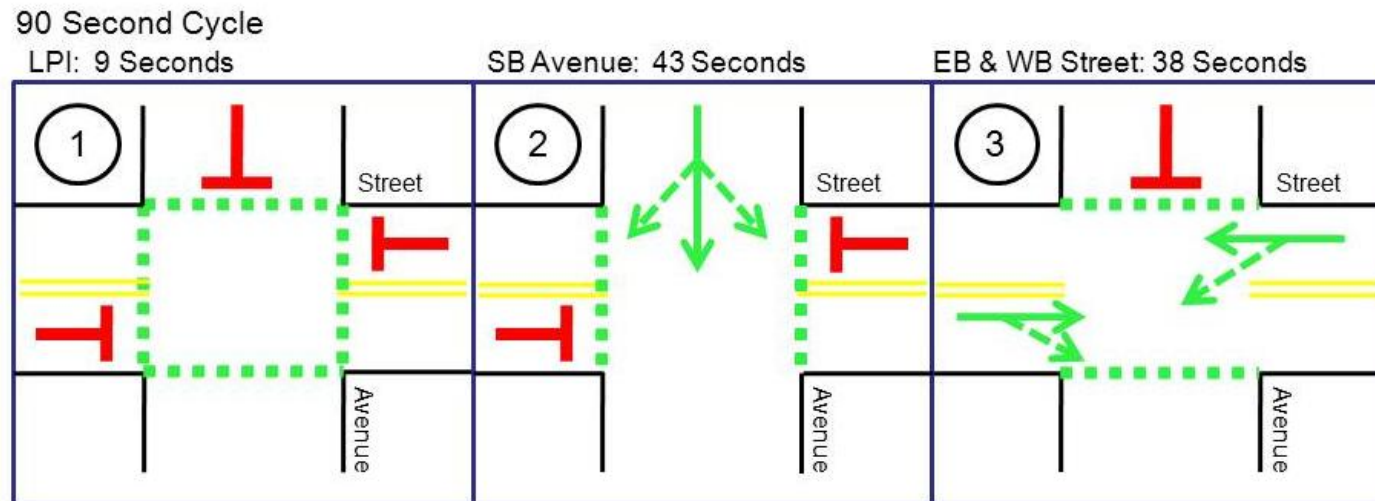
One-Way Toolbox: Yield to Pedestrian Sign

- New MUTCD standard sign (R10-15)
- Advantages
 - Instructs drivers on requirement to yield to pedestrians
- Challenges
 - Effectiveness may be limited



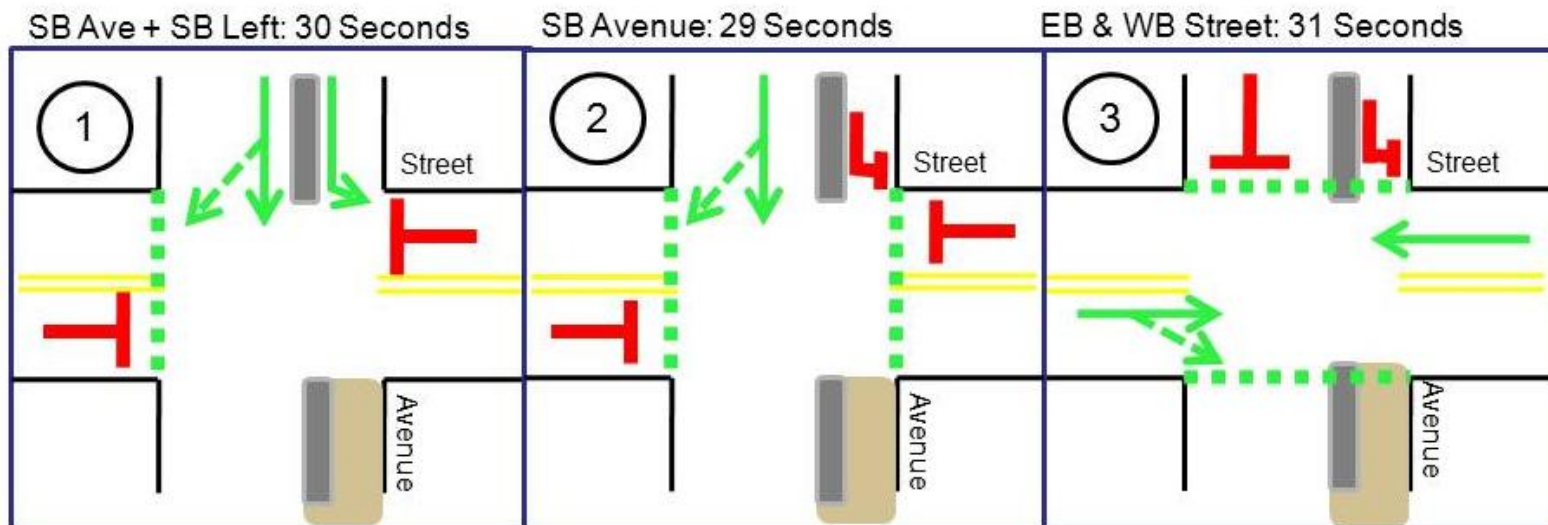
One-Way Toolbox: Leading Pedestrian Intervals

- Hold parallel/turning traffic for several seconds at beginning of pedestrian “Walk” phase
- Advantages
 - Gives pedestrians head start to “take” crosswalk before adjacent through/left turn movement phase
 - Reduces turning vehicle conflicts by increasing pedestrian visibility
- Challenges
 - Requires time in signal cycle – holds all vehicles, not just turns

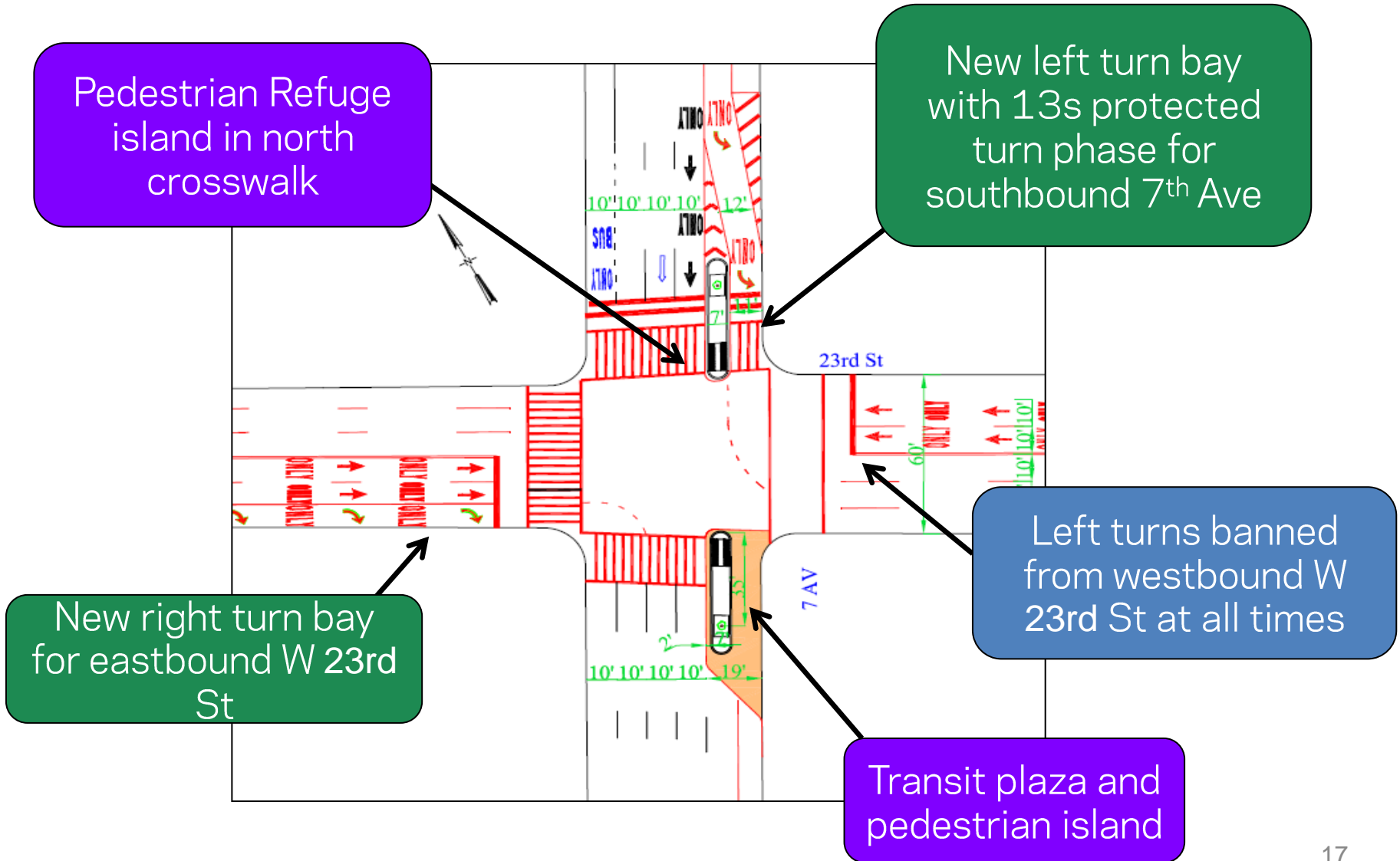


One-Way Toolbox: Split Phase

- Provides separate phases for left turns and pedestrian crossings
- Advantages
 - Provides dedicated pedestrian phase in one crosswalk
 - Increases turning throughput
- Challenges
 - Takes signal time from through-moving vehicles/cross-traffic



7th Avenue at 23rd Street Split Phase



Pedestrian Refuge island in north crosswalk

New left turn bay with 13s protected turn phase for southbound 7th Ave

New right turn bay for eastbound W 23rd St

Left turns banned from westbound W 23rd St at all times

Transit plaza and pedestrian island

7th Avenue at 23rd Street Split Phase



One-Way Toolbox: Daylighting

- Provide clear curb lane at approaches where one-way traffic turns left
- Advantages
 - Improves mutual visibility of pedestrians and left-turning drivers
 - Can provide room for curb extensions or neighborhood amenities
- Challenges
 - Removes parking



Lexington Avenue, Manhattan

One-Way Toolbox: Bike Path Mixing Zone

- Left-turn lane directly adjacent to bike path at approach to intersection
- Advantages
 - Compatible with left-side bike lanes and paths
 - Like daylighting, improves sightlines among drivers, pedestrians, and bicyclists
- Challenges
 - Removes parking



Grand Street, Manhattan

Needs & Challenges

- Public acceptance
 - Parking and curbside use
- Effect on mobility
 - Turn restrictions
 - Signal timing
- Compliance
 - Drivers and pedestrians
- Research & Data
 - Crash data quality
 - Project evaluation in complex urban settings



Chrystie Street at Broome Street, Manhattan

Questions?

**Thank
You**

Thank you!

⇒ Archive at

- walkinginfo.org/training/pbic/pedfocus_webinars.cfm
- **Downloadable and streaming recording and presentation slides**

⇒ Questions?

- **Matthew Roe: mroe@dot.nyc.gov**
- **Rob Viola: rviola@dot.nyc.gov**
- **Other: webinars@hsrc.unc.edu**