

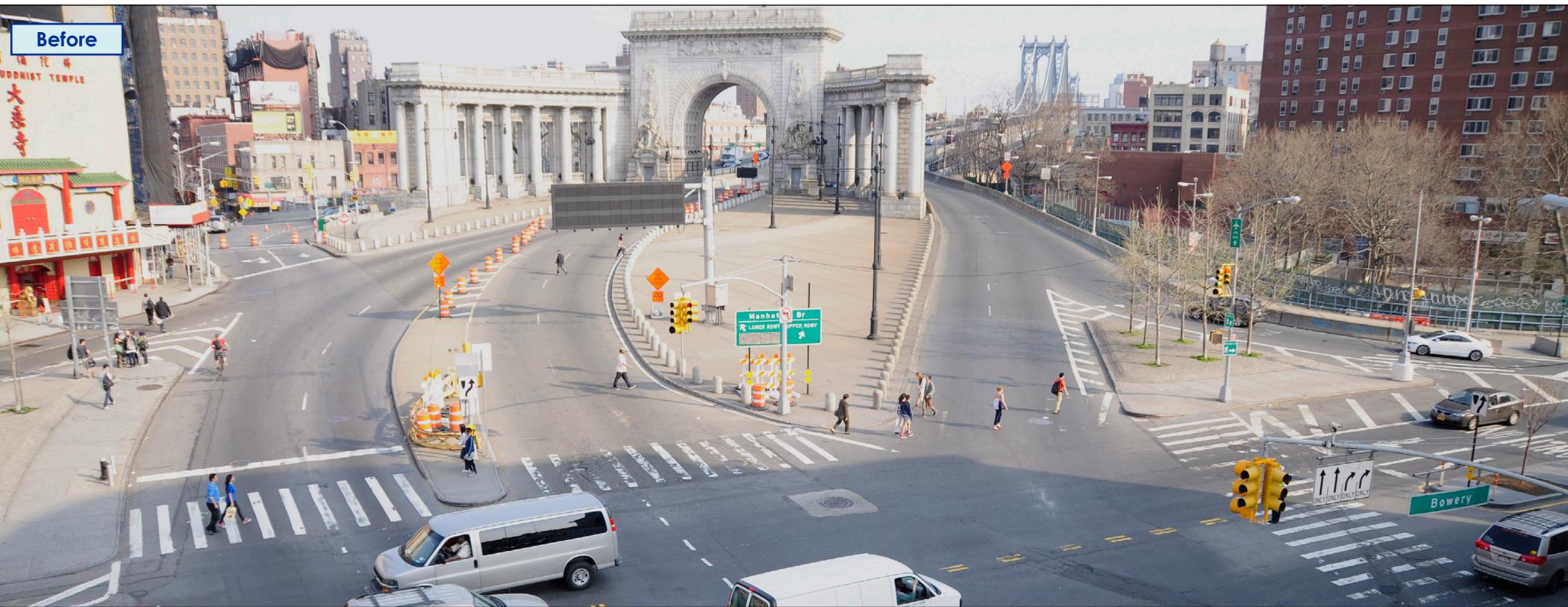
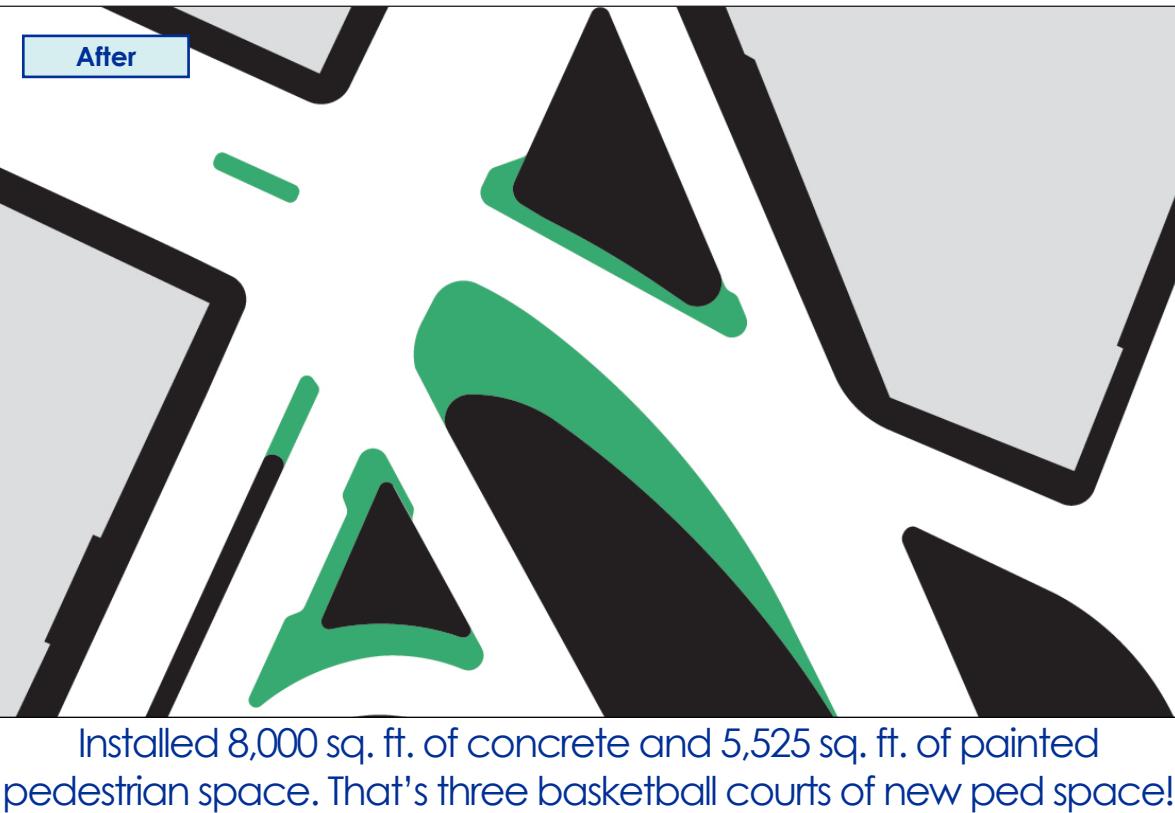


NYC DOT - Pedestrian Projects Group

- reduce pedestrian injuries and fatalities
- improve accessibility
- increase safety for all users
- create sustainable streets
- ensure transportation equity



Typical Implementation Process: Manhattan Bridge



PROJECT ORIGINS

- Community/Elected Official Request
- Vision Zero/Safety Data Priority
- Proximity to Past Projects
- Request from other DOT Unit

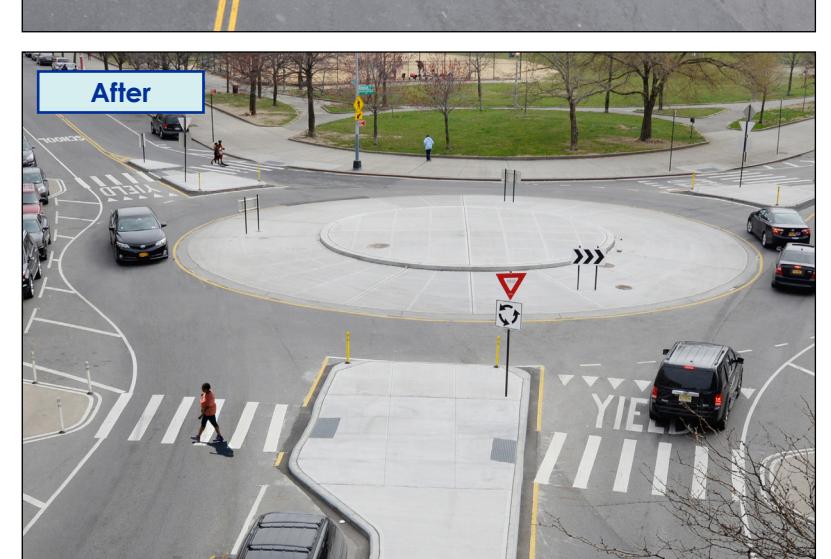


OTHER TASKS

- Management of Enhanced Crosswalk Program
- Sponsorship and Review of Capital Projects
- Management of Pedestrian Count Program
- Development of Pedestrian Policy
- Assist with Split LPI's and LPI's



Intervale Avenue



E Tremont Ave



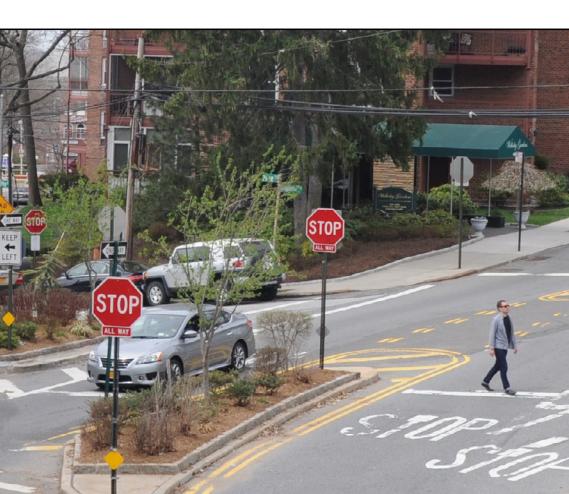
Lincoln Center



Bushwick Ave



Douglaston



TOOLBOX



Safety Island

- Pedestrian Cut-Through with detectable warning
- Trees
- Concrete Refuge Area



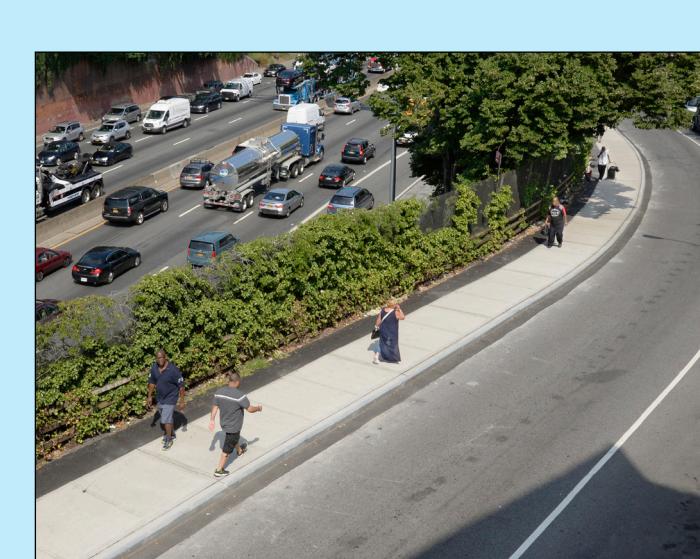
Triangles

- Pedestrian Ramps
- Large Planting Beds
- Seating Area



Road Diet

- Flush Malls
- Safety Islands
- Left-Turn Bays



Expanded Sidewalks

- Pedestrian Desire Lines
- Substandard Sidewalks



Large Pedestrian Spaces

- Planters
- Granite blocks
- Neighborhood Partnership



Curb Extensions

- Extended Sidewalk
- Increased Sightlines
- Slower Vehicular Turns

DON'T CUT CORNERS: LEFT TURN PEDESTRIAN AND BICYCLIST CRASH STUDY

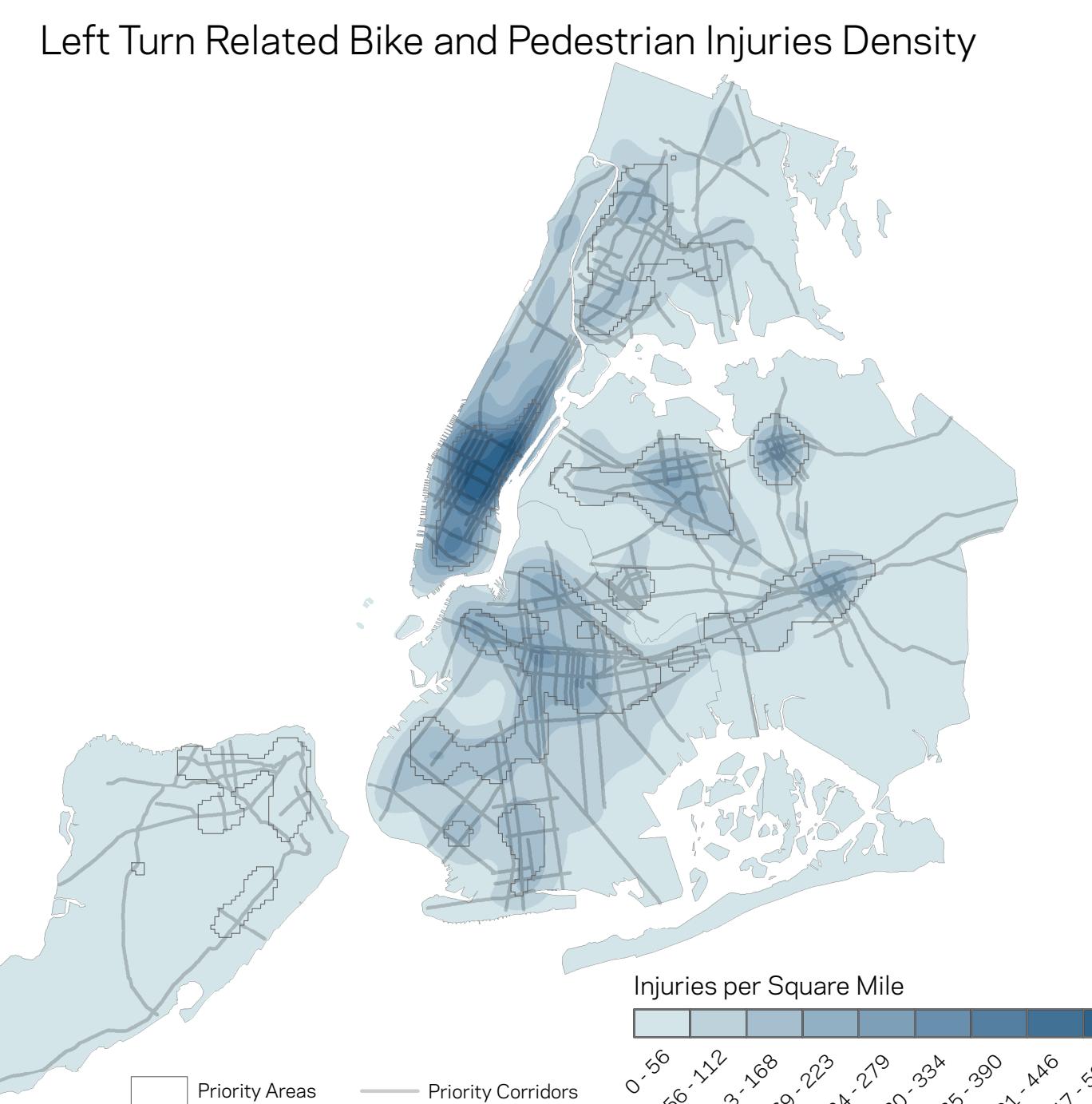
PROJECT BACKGROUND

New York City Department of Transportation (DOT) developed Don't Cut Corners: Left Turn Pedestrian and Bicyclist Crash Study to advance New York City's Vision Zero initiative to eliminate traffic deaths and serious injuries. Between 2010 and 2014, 108 pedestrians and bicyclists were killed by left turning vehicles (out of 859 pedestrian and bicyclist fatalities).

In 2016, Mayor de Blasio prioritized the reduction of these failure to yield crashes, noting that left turns account for more than twice as many pedestrian and bicyclist fatalities as right turns and over three times as many serious injuries and fatalities.

DOT took an exhaustive look at the problem of left turn pedestrian and bicyclist injuries (including fatalities) in New York City, querying five years of citywide crash data, manually reviewing 1,105 crash reports drawn from the most problematic locations citywide, and analyzing 478 intersections where treatments were installed.

The study relies on these findings to provide recommendations for additional engineering, planning, and education efforts to prevent and mitigate left turn failure to yield pedestrian and bicyclist injuries.



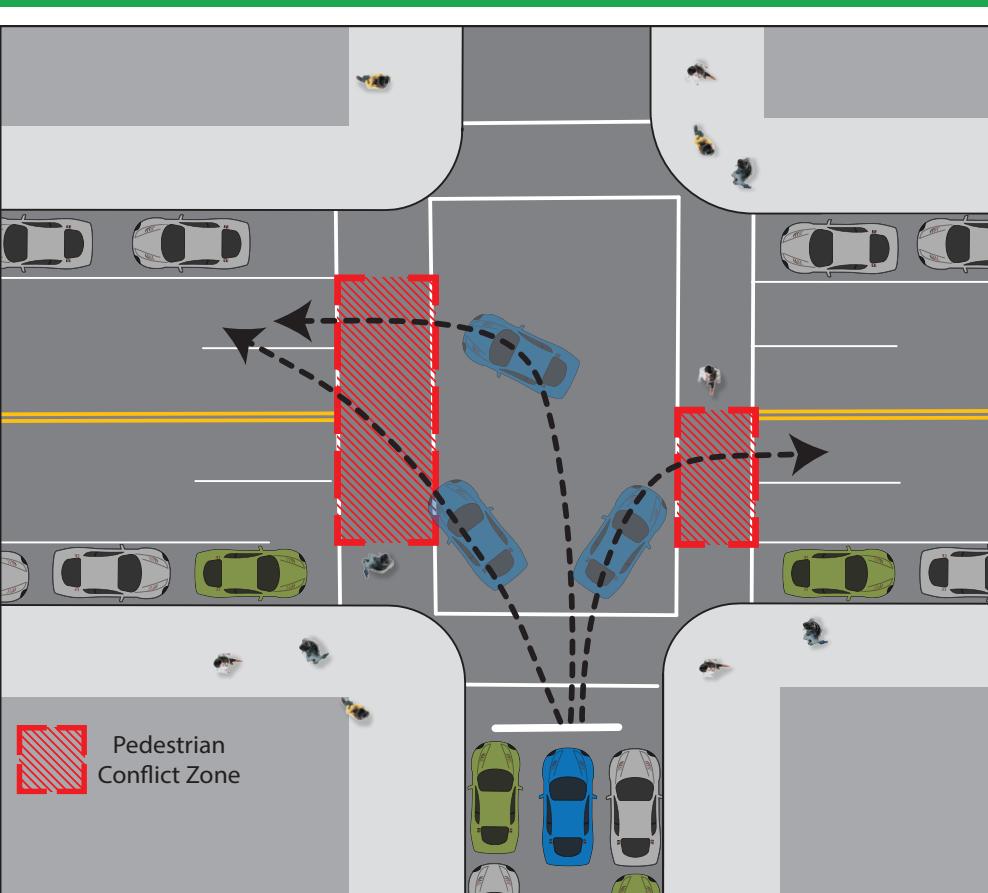
THE LEFT TURN PROBLEM

HIGHER SPEEDS & GREATER EXPOSURE

The larger possible **turning radii** and **longer distance** before the turn encourages drivers to take left turns at higher speeds than right turns.

Left turns occur at an average of 9.3 mph vs. right turns at 5.6 mph.¹

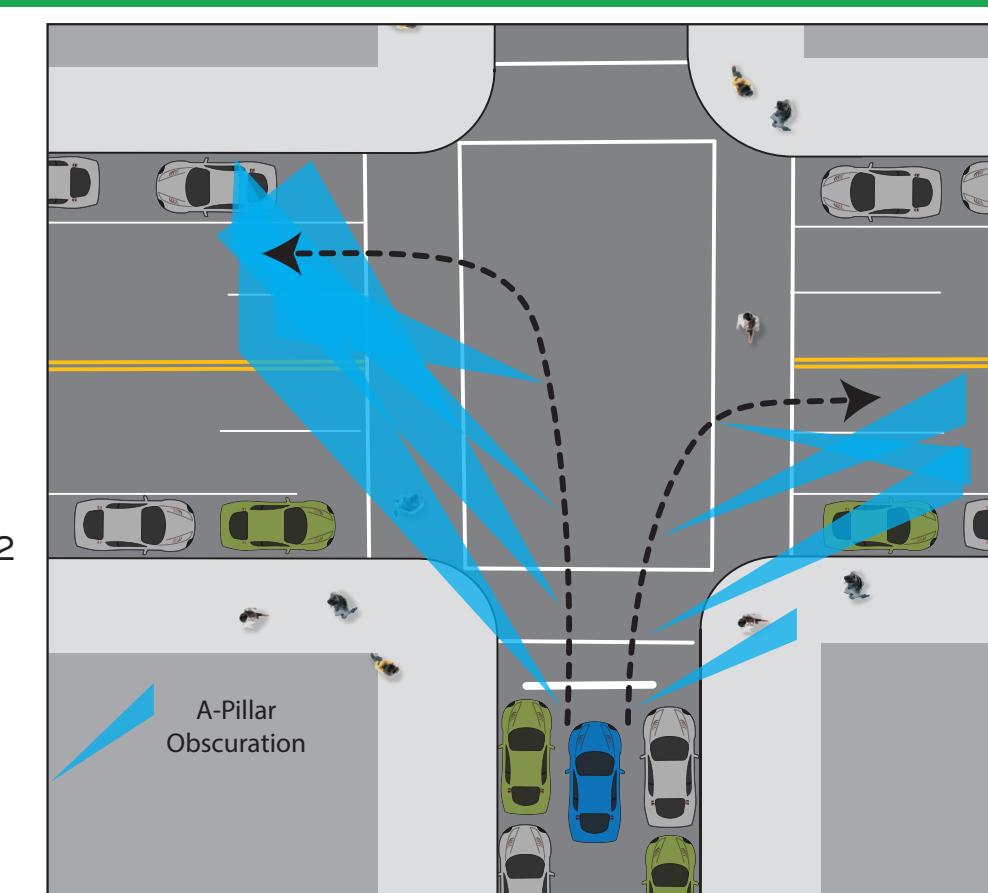
There is a **larger area of exposure** for pedestrians in the crosswalk during left turns. Seen in figure as "Pedestrian Conflict Zone".



DRIVER'S OBSCURED VISIBILITY

The vehicle's **A-pillar** obscures seven linear feet of the driver's view of pedestrians in the crosswalk. This blindspot can track with crossing pedestrians, dramatically obscuring the driver's view as compared to right turns.²

This makes it difficult for vehicles to stop in time, compounded by higher speeds of left turning vehicles.³



DRIVER WORKLOAD

Driver workload is the split-second decision-making based on a complex series of mental and physical tasks a driver must execute to perform a traffic maneuver.

"Back Pressure"

- Back pressure occurs when the left turning vehicle must yield to oncoming traffic while vehicles behind the left turning vehicle must wait

"Find the Gaps"

- The motorist must find the gaps in oncoming traffic in multiple streams (one or more lanes and the crosswalk) with those streams all having different moving speeds
- The high numbers of pedestrians on the roadways makes this especially challenging in NYC

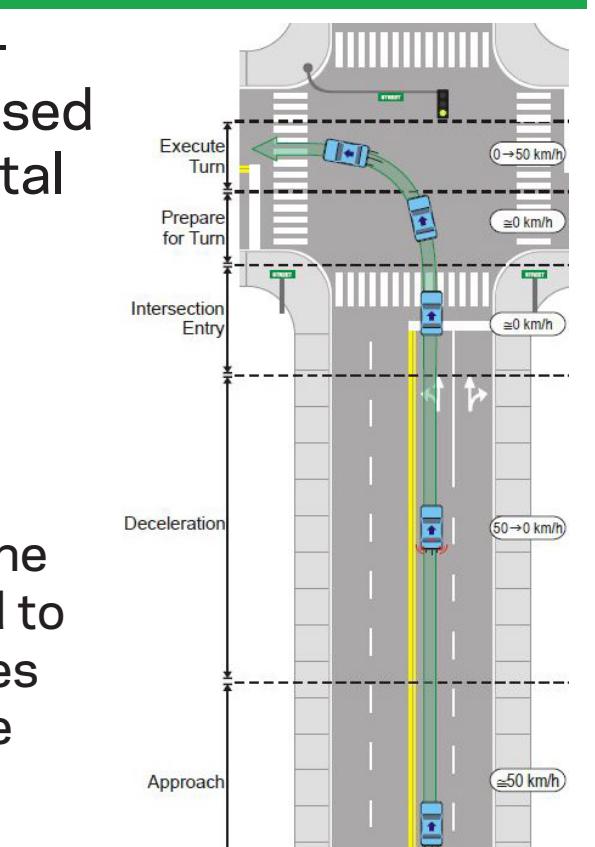
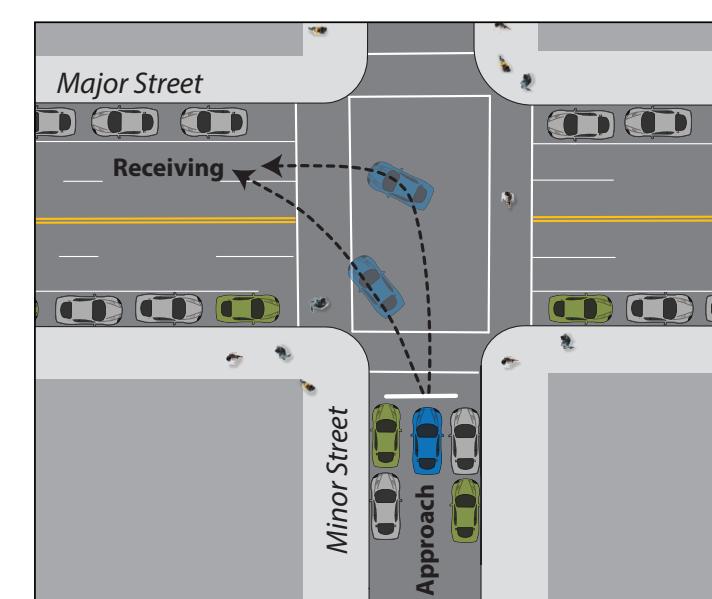


Image taken from: U.S. Department of Transportation Federal Highway Administration, "Task Analysis of Intersection Driving Scenarios: Information Processing Bottlenecks," 2006.

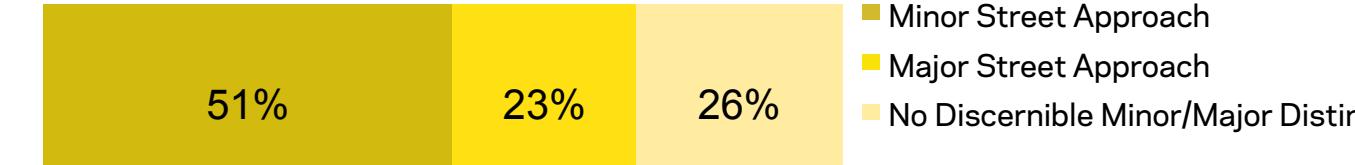
DETAILED ANALYSIS

Select findings from NYC DOT's three analyses on pedestrian and bicyclist left turn crashes

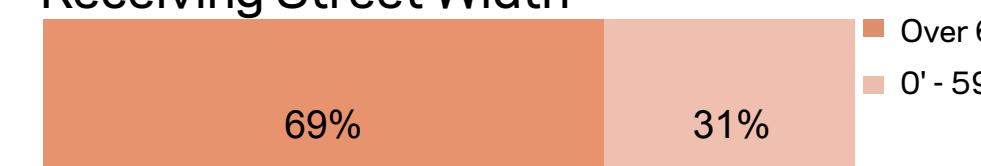
APPROACH & RECEIVING STREET CHARACTERISTICS



Minor and Major Street Approach



Receiving Street Width



Minor and Major Street Approach

- Left turn pedestrian and bicyclist injury crashes occurred when a vehicle was turning from a minor street onto a major street at over double the rate than when a vehicle was turning left from the major street to the minor street

Receiving Street Width

- DOT found that the width of the receiving street is a significant factor: 69% of left turn pedestrian and bicyclist injury crashes occurred on receiving streets that were 60' or wider
- Greater street width encourages vehicles to make left turns with wider radii, producing higher speeds

INTERSECTION CHARACTERISTICS

- In the study group, intersection directionality was a significant factor with 30% of left turn pedestrian and bicyclist injury crashes occurring at intersections that consist of a one-way to one-way configuration
- In contrast, only 13% of intersections citywide are one-way to one-way
- Receiving direction was also shown to be a significant factor with the majority (61%) of left turn pedestrian and bicyclist injury crashes in the study group occurring where the vehicle was turning onto a two-way street
- All of the study group intersections were signalized

Study Group Intersection Directionality



Citywide Intersection Directionality



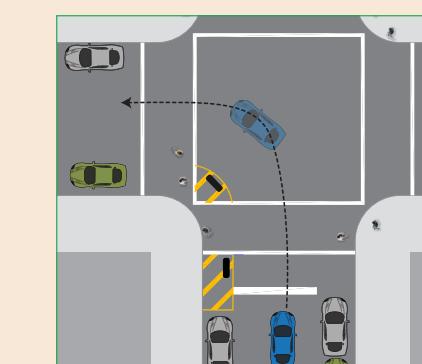
Study Group Receiving Street Directionality



ACTION PLAN: Left Turn Traffic Calming Pilot

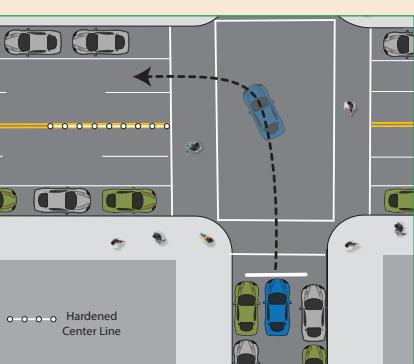
Enhanced Daylighting/ Slow Turn Wedge

- One-way to one-way treatment
- Utilizes markings and plastic delineators
- Clears parking 10' from the crosswalk



Hardened Centerline

- One-way to two-way treatment
- Utilizes rubber curb with delineators on receiving centerline

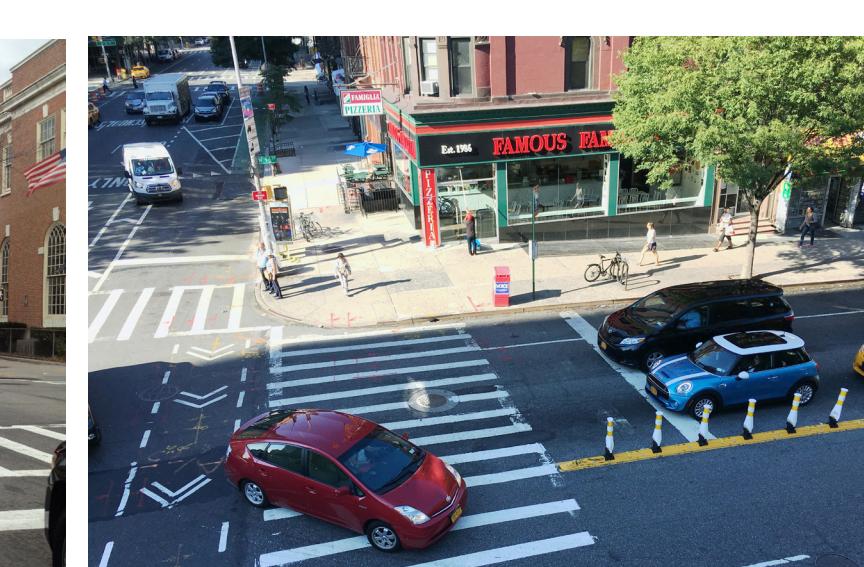


Treatment Benefits

- Hardened centerline and guiding radius tightens and calms left turns
- Increases visibility of pedestrians in the crosswalk, providing more stopping time
- Modifies turning angle to create safer, slower left turns with no change in traffic capacity
- Enhanced daylighting mitigates visibility issues caused by vehicle's A-pillar



Slow Turn Wedge at 89th Ave & 164th St, Queens



Hardened Centerline at Amsterdam Ave & W 96th St, Manhattan

Pilot Evaluation

NYC DOT implementation the pilot treatments at 100 locations in 2016:

1. Speed Reduction: Median speeds **decreased 24.4%** (from 11.5 to 8.7 mph)
2. Safer Turns: Vehicles crossing double yellow line **fell 97.6%** (exceptions for hardened centerline that stopped at stop bar)
3. Resiliency: About **60%** of treatments are in working condition (others have flattened or missing posts)