



# 20<sup>TH</sup> ST, 21<sup>ST</sup> ST PROTECTED BIKE LANES & BIKE BLVD

Presented to Brooklyn Community Board 7 - August 3, 2021





## PRESENTATION OVERVIEW

1. Background
2. Existing Conditions & Route Selection
3. Proposal – 20<sup>th</sup> St One-Way Conversion, Protected Bike Lane, Shared Use Path & Connections
4. Proposal – 21<sup>st</sup> St Bike Blvd
5. Making it Work
6. Summary





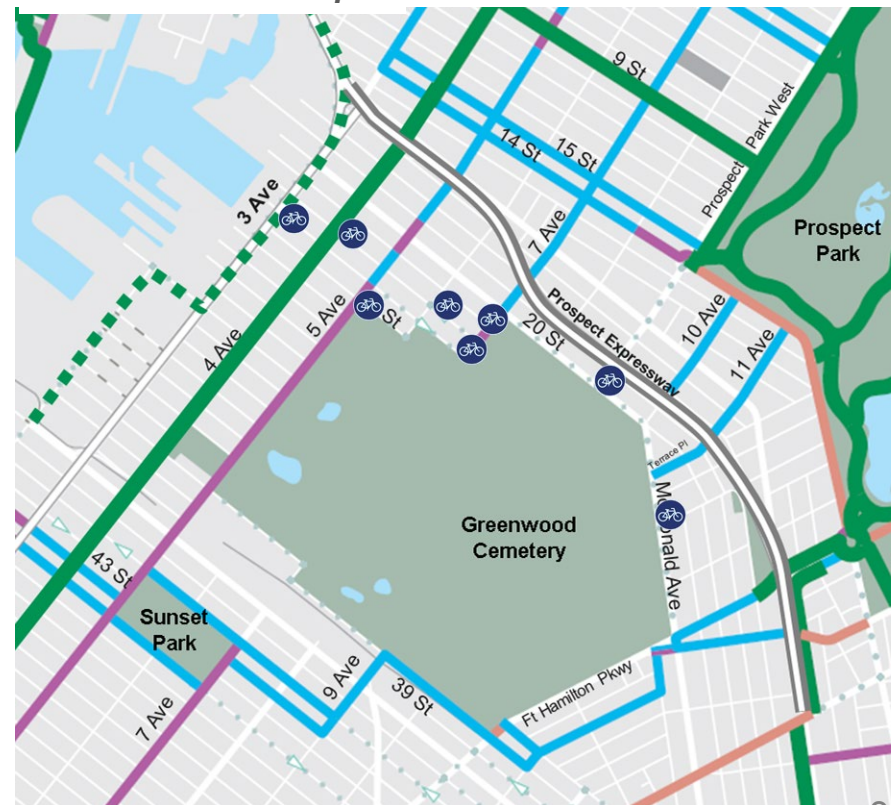
## PROJECT LOCATION & GOALS

- Upgrade substandard 20<sup>th</sup> St geometry, and lessens the effect of truck travel on the immediate neighborhood
- Create new bike network connection, close gap between greenway and parks
- Extend greenway experience to increase cyclist safety and comfort
- Connect neighborhoods to parks, recreation, waterfront greenway

*NYC Truck Route Map*



*NYC Bike Route Map*



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**Background**

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# PLANNING CONTEXT

## Project Motivation

- Community request for corridor study– updated analysis & street design toolkit
- Changing nature of deliveries & e-commerce
- Pedestrian & cycling activity along corridor, including Citi Bike Expansion
- Expanding bicycle network and access to waterfront greenway & parks



# PLANNING CONTEXT

## Delivering New York: A Smart Truck Management Plan for NYC

- Safety: **implement new design standards** to enhance truck safety at intersections and along corridors
- Sustainability: **improve compliance** using signage, targeted enforcement, and technology
- Efficiency: **update the NYC Truck Route Network** and publish a new map

## Green Wave: A Plan for Cycling in NYC

- Citywide protected bike lane network: Build **30 miles of protected bicycle lanes** annually
- Integrate and install new street design treatments, including **bike boulevards** to prioritize cyclists and limit vehicles

## Pandemic Response – Open Streets

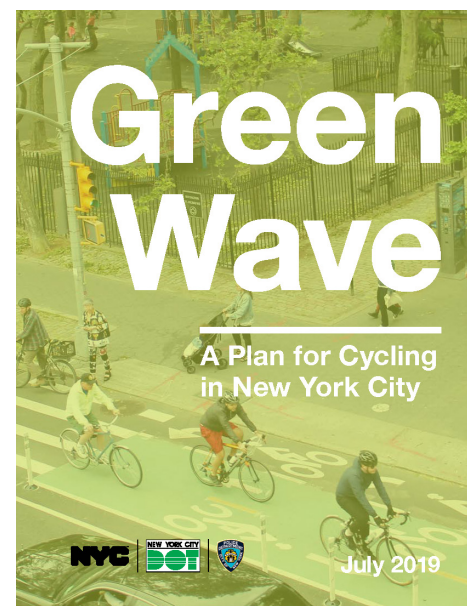
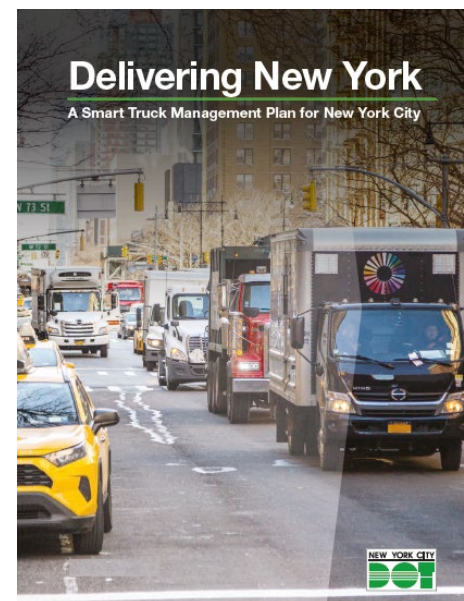
- **Open Streets** Initiative made permanent (2020)
- DOT to convert an Open Street to a **Bike Blvd** in every borough (2021)

## Brooklyn Waterfront Greenway

- Construction beginning on **3<sup>rd</sup> Ave & Hamilton Ave** segment (2021)

## Citi Bike Expansion

- Phase 3 Expansion plan includes **Community District 7** (2021)





## PLANNING FOCUS AREAS

### Truck route

- Address issues of narrow two-way truck route with one-way conversion

### Bike connection

- Create new bike network connections
- Link new waterfront greenway to Prospect Park & bike network
- Accommodate new Citibike riders

### Cut through traffic

- Minimize traffic on neighborhood streets after trucks rerouted
- Increase pedestrian safety through Open Streets / Bike Blvd treatment



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## Existing Conditions & Route Selection

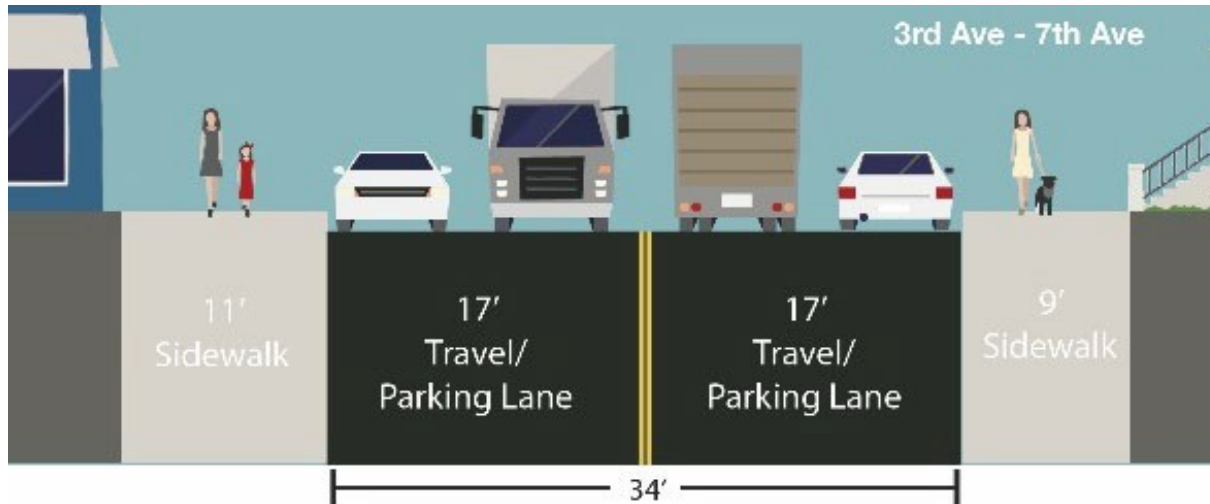
# 2



# EXISTING CONDITIONS & ISSUES – 20<sup>th</sup> STREET (3<sup>rd</sup> AVE - 7<sup>th</sup> AVE)

Commercial, residential, & industrial corridor, actively used by vehicles, pedestrians and cyclists

- Narrow two-way truck route – potential vehicle damage, opposing vehicles can't pass easily
- Cars mount curb to park, and parking is restricted in especially narrow sections
- No dedicated space for cyclists



Narrow lanes



20<sup>th</sup> St (4<sup>th</sup> Ave to 5<sup>th</sup> Ave)

Conflict points

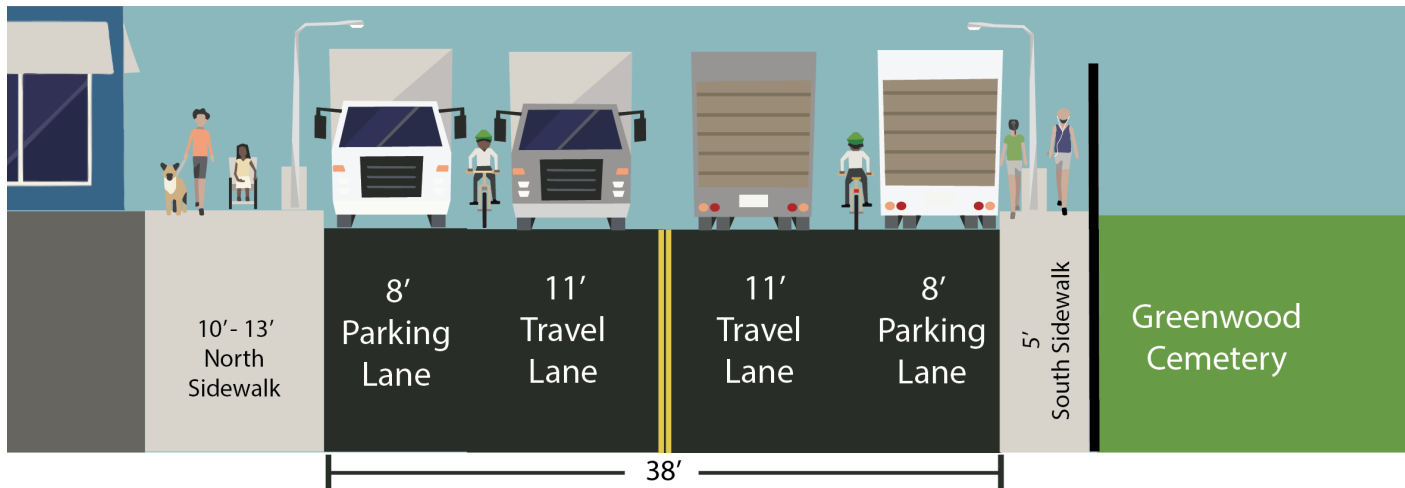


20<sup>th</sup> St (5<sup>th</sup> Ave to 6<sup>th</sup> Ave)

## EXISTING CONDITIONS & ISSUES – 20<sup>th</sup> STREET (7<sup>th</sup> AVE-10<sup>th</sup> AVE)

Commercial, residential, & industrial corridor, actively used by vehicles, pedestrians and cyclists

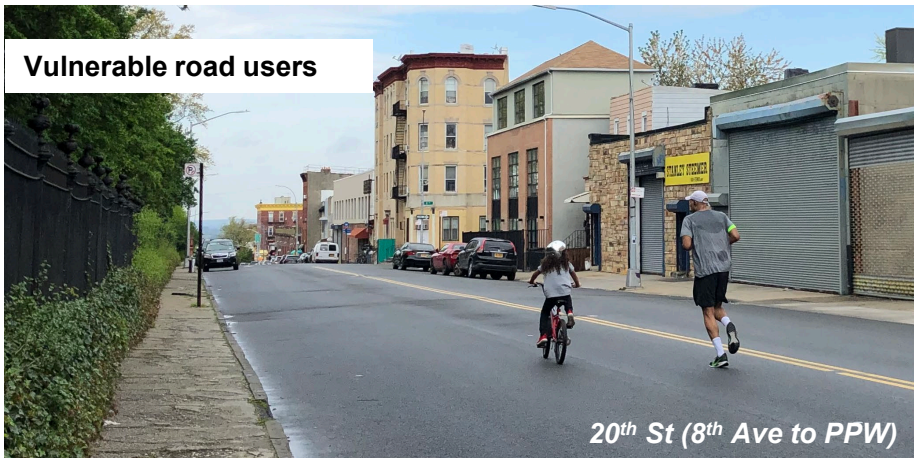
- Narrow two-way truck route – potential vehicle damage, opposing vehicles can't pass easily
- No dedicated space for cyclists - lack of space for vehicles to pass a cyclist or jogger
- Narrow sidewalk in poor condition along cemetery edge – joggers often use roadway



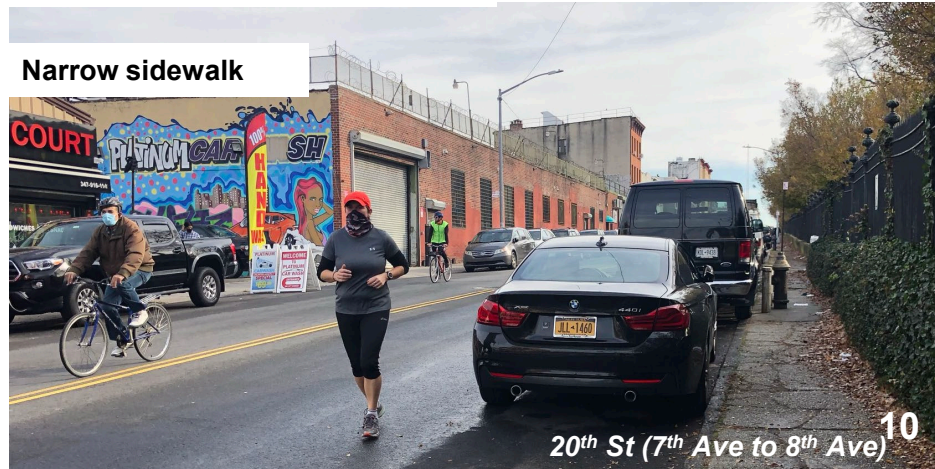
20<sup>th</sup> St (near 8<sup>th</sup> Ave)



Vulnerable road users



Narrow sidewalk

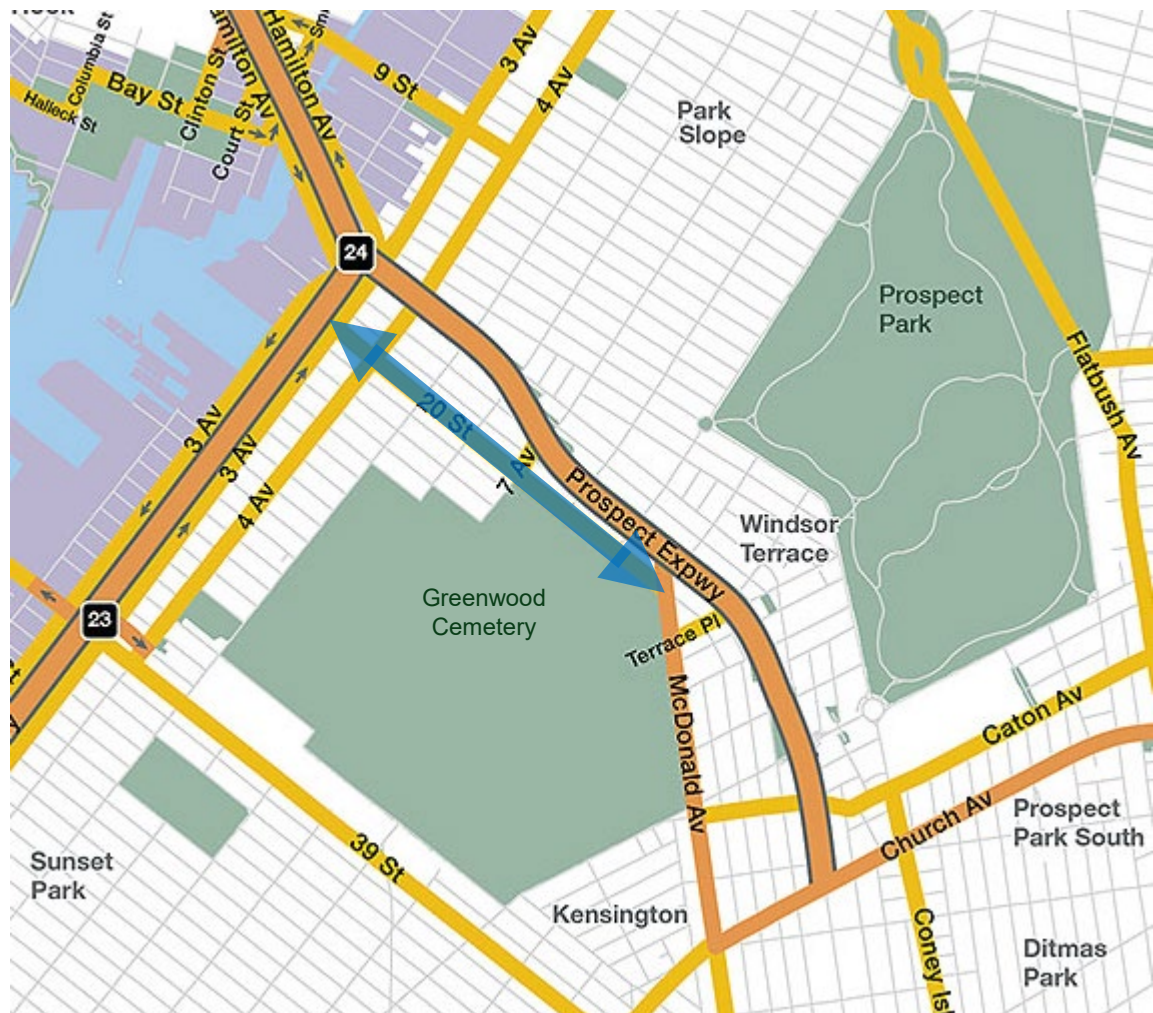




## 20<sup>th</sup> STREET TRAVEL PATTERNS

### Role in the Network

- 20<sup>th</sup> St is a two-way truck route connecting McDonald Av with 3<sup>rd</sup> Av, 4<sup>th</sup> Av, and the southwest Brooklyn waterfront
- Directly paralleled along its entire length by the Prospect Expressway
- 60 – 75% of 20<sup>th</sup> St traffic is westbound, attributable to nearby eastbound on-ramps to the Prospect Expressway
- Traffic volume measured at 7<sup>th</sup> Avenue (AM peak hour):
  - 314 WB vehicles (36 trucks)
  - 121 EB vehicles (26 trucks)

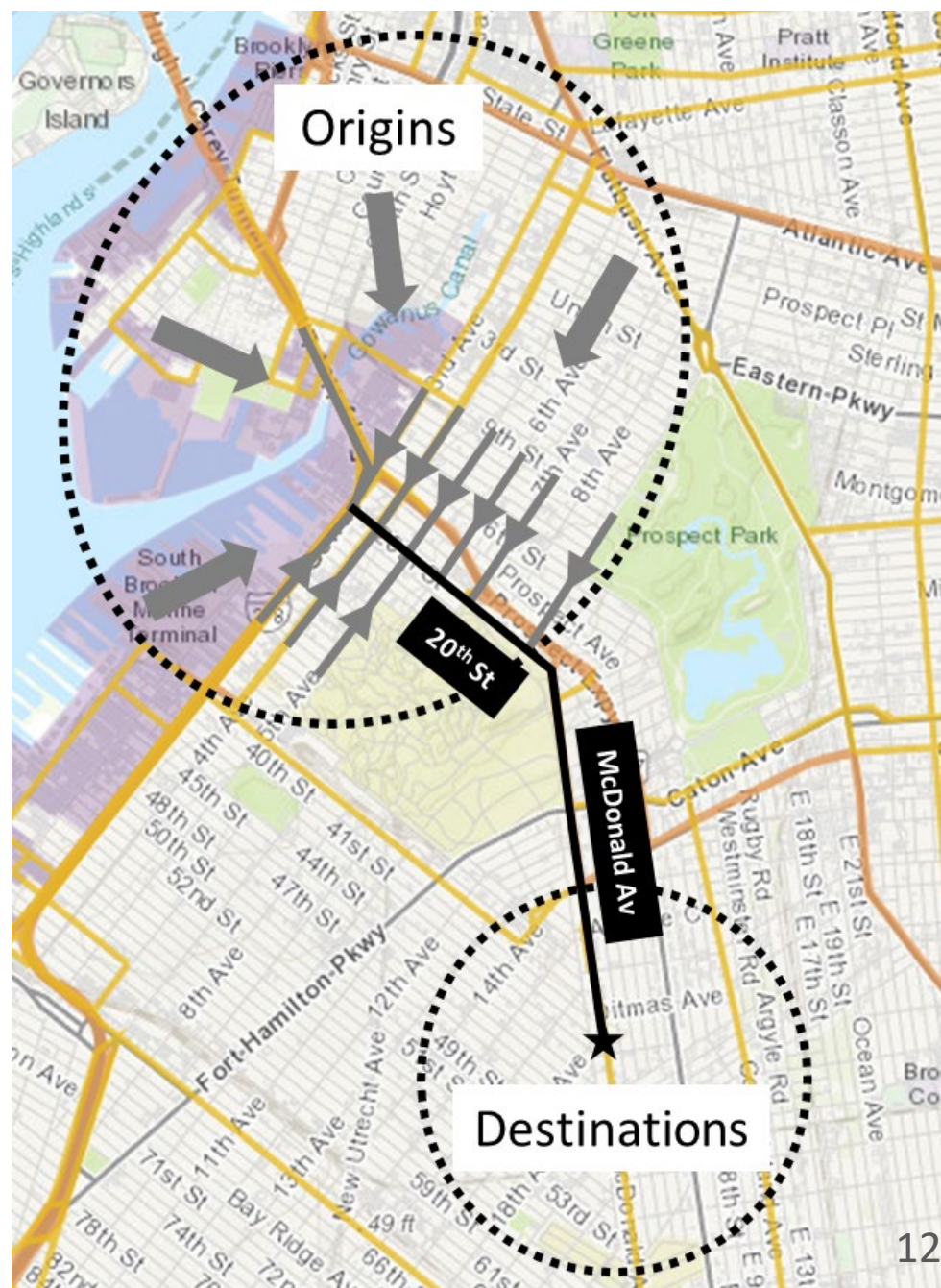


Snapshot of the 2015 Truck Route Map

## 20<sup>th</sup> STREET TRAVEL PATTERNS

### Eastbound Origins & Destinations

- Though the majority of traffic on 20<sup>th</sup> St is westbound, routing apps (Google Maps, Waze) route vehicles to 20<sup>th</sup> St from the avenues to get to McDonald Av
- 3<sup>rd</sup> Av, 4<sup>th</sup> Av, 5<sup>th</sup> Av, 6<sup>th</sup> Av, 7<sup>th</sup> Av, and Prospect Park West are all eastbound feeder routes for 20<sup>th</sup> St, with many of those trips originating in Red Hook, Gowanus, Park Slope, and Boerum Hill
- Though trucks have fewer options, other vehicles can access the Prospect Expressway or Prospect Park Southwest from connecting avenues.





# BIKE ROUTE SELECTION

## Existing Bike Network

- Connections to Prospect Park
- Protected lanes on 4<sup>th</sup> Ave, 9<sup>th</sup> St, Prospect Park West
- Lack of east-west connection in South Slope
- Street network challenging to navigate due to Prospect Expressway, Greenwood Cemetery, 3<sup>rd</sup> Ave & Gowanus Expressway



20<sup>th</sup> St at 7<sup>th</sup> Ave



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**Proposal:** 20<sup>th</sup> St One-Way Conversion, Protected Bike Lane, Shared Use Path, & Connections

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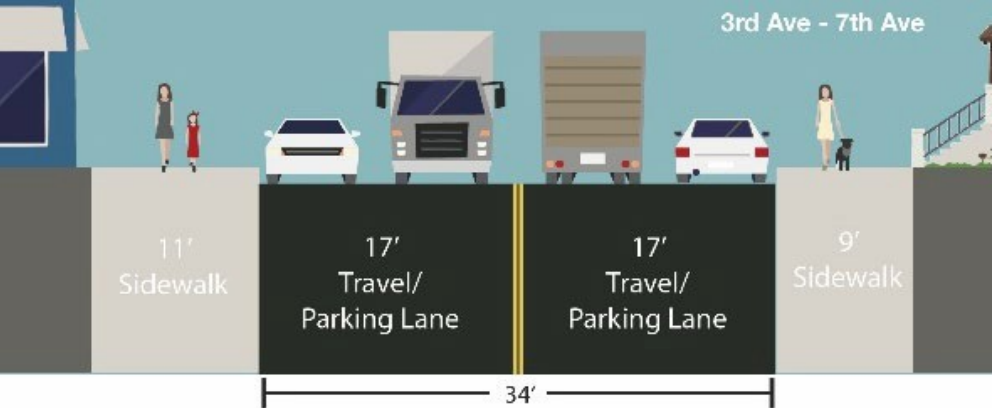


① 20th St: 3<sup>rd</sup> Ave to 7<sup>th</sup> Ave

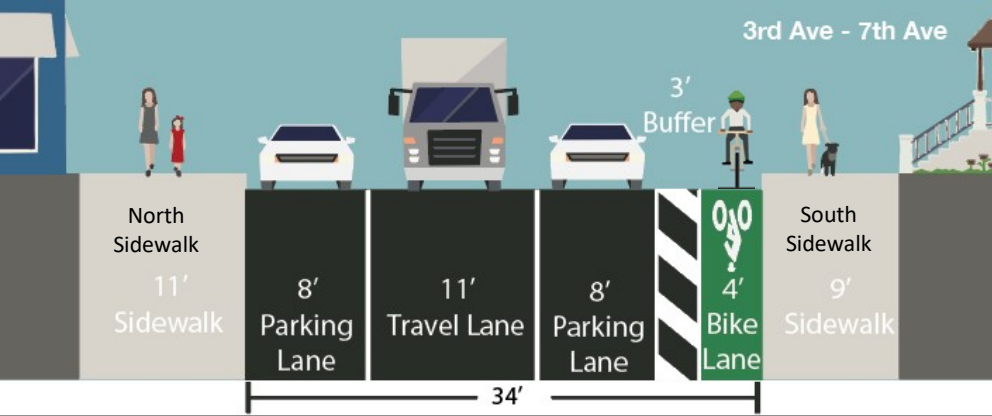
Parking-Protected One-Way Bike Lane

- Standard travel lane width provides improved clearance for trucks
- Cyclists protected by buffer and parked vehicles
- Add back parking on both sides between 3<sup>rd</sup> Av & 4<sup>th</sup> Av

Existing



Proposed



20<sup>th</sup> St (5<sup>th</sup> Ave to 6<sup>th</sup> Ave)



Example: W 29<sup>th</sup> St, MN

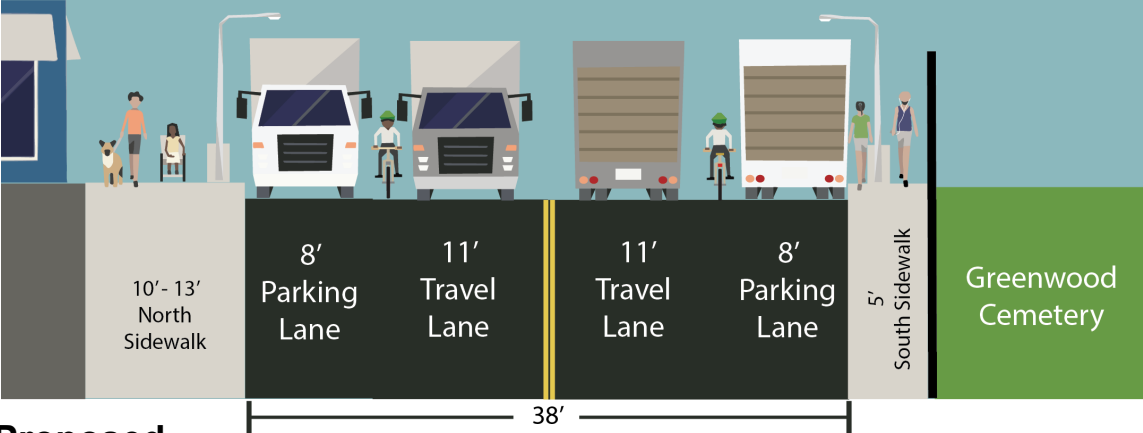
Proposal

② 20<sup>th</sup> St: 7<sup>th</sup> Ave to 10<sup>th</sup> Ave / McDonald Ave

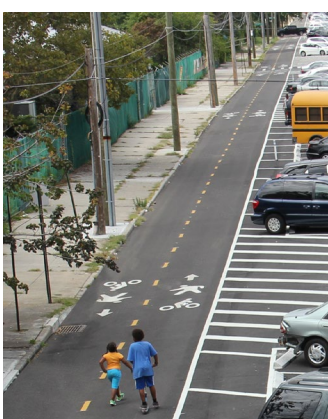
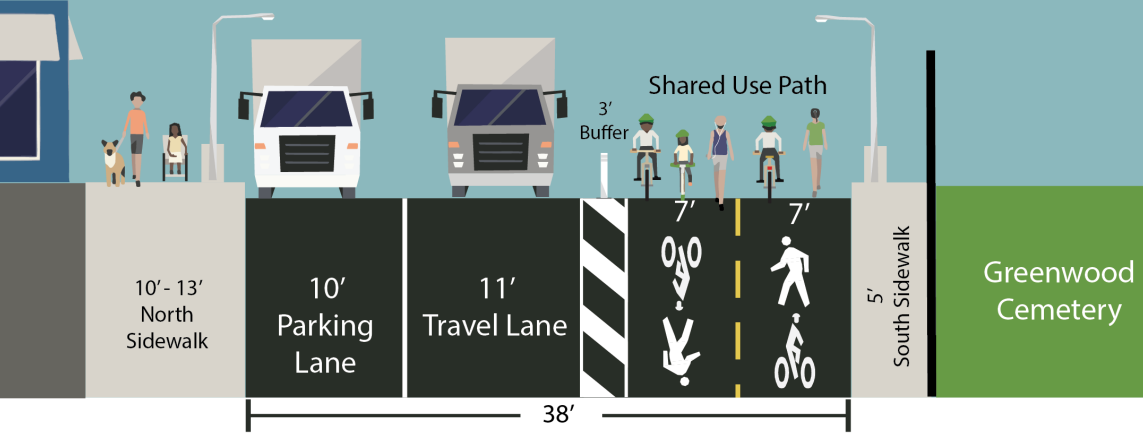
Protected two-way Shared Use Path

- Improve vehicle clearance for trucks – wider travel lane
- Separate cyclists from pedestrians and vehicles
- Pedestrians, joggers, cyclists separated by buffer and bollards
- Repurpose one parking lane

Existing



Proposed

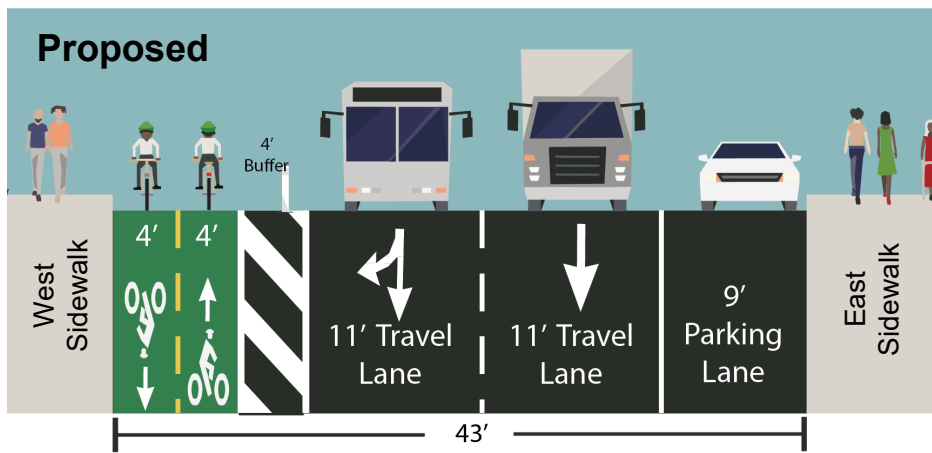
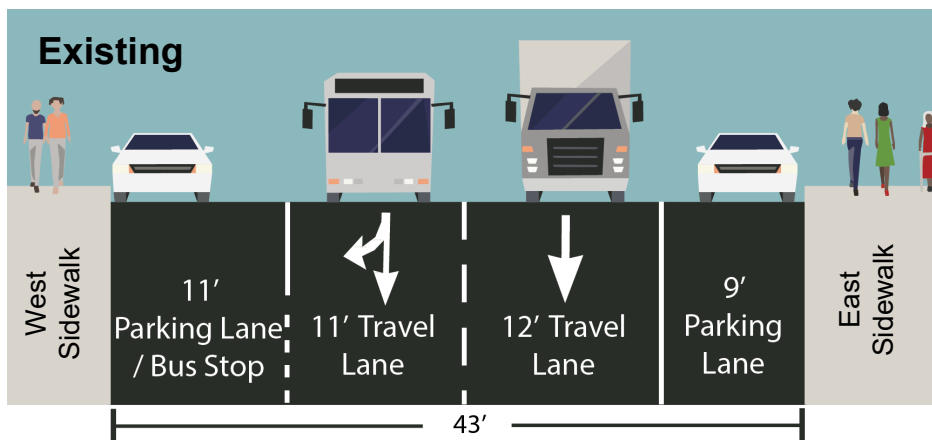




## ③ 10<sup>th</sup> Ave: 19<sup>th</sup> St to 20<sup>th</sup> St

### Protected Two-Way Bike Lane

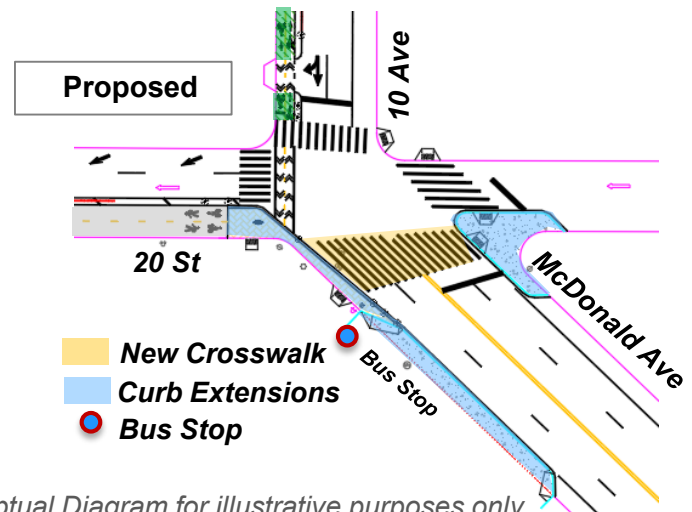
- Separate cyclists from pedestrians and vehicles
- Cyclists protected by buffer and vertical bollards
- Repurpose one parking lane on west curb
- Relocate SB B67/69 bus stop to McDonald Ave



### Pedestrian Improvements:

#### 10<sup>th</sup> Ave at 20<sup>th</sup> St / McDonald Ave

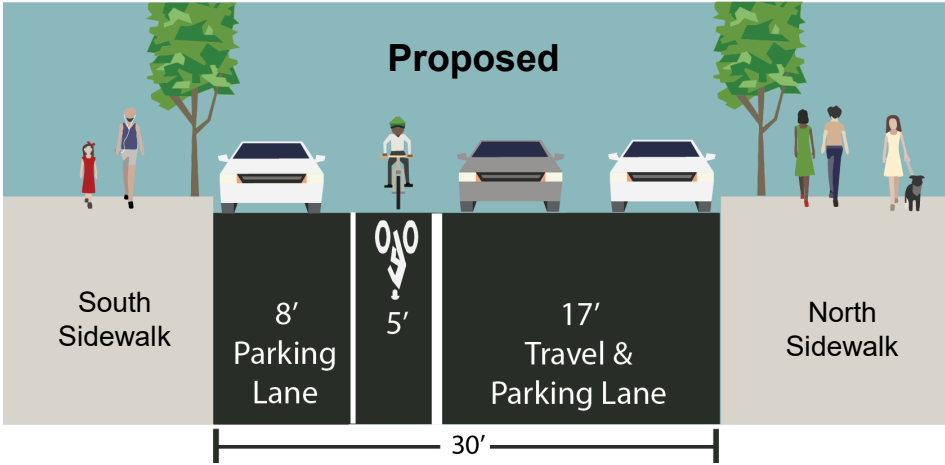
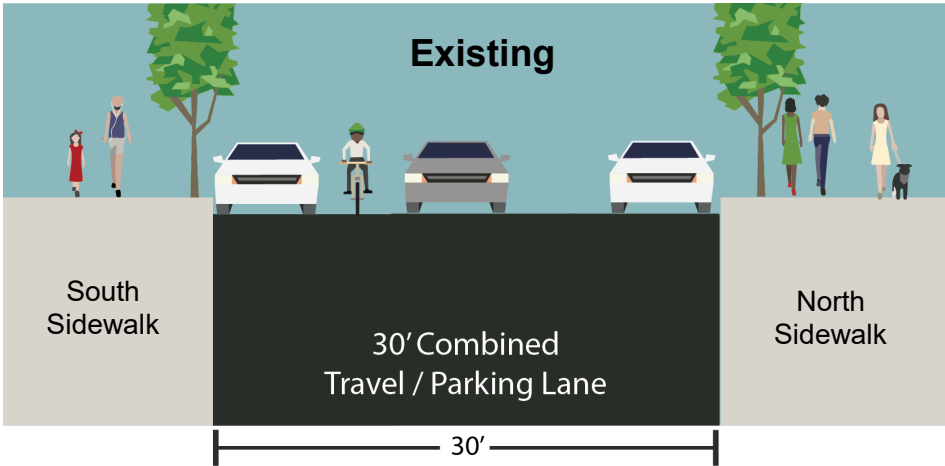
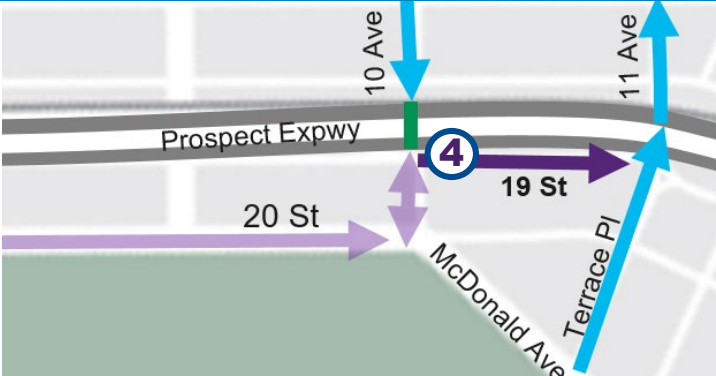
- Install new crosswalk on south side of intersection
- Expand curb extension on SE corner
- Construct curb extension & bus bulb on SW corner to accommodate relocated bus stop & crosswalk



4 19<sup>th</sup> St: 10<sup>th</sup> Ave to 11<sup>th</sup> Ave

Conventional Bicycle Lane

- Organize roadway, calm traffic
- Provide dedicated space for cyclists to connect to 11<sup>th</sup> Ave & continue north to Prospect Park
- Maintain existing travel and parking lanes





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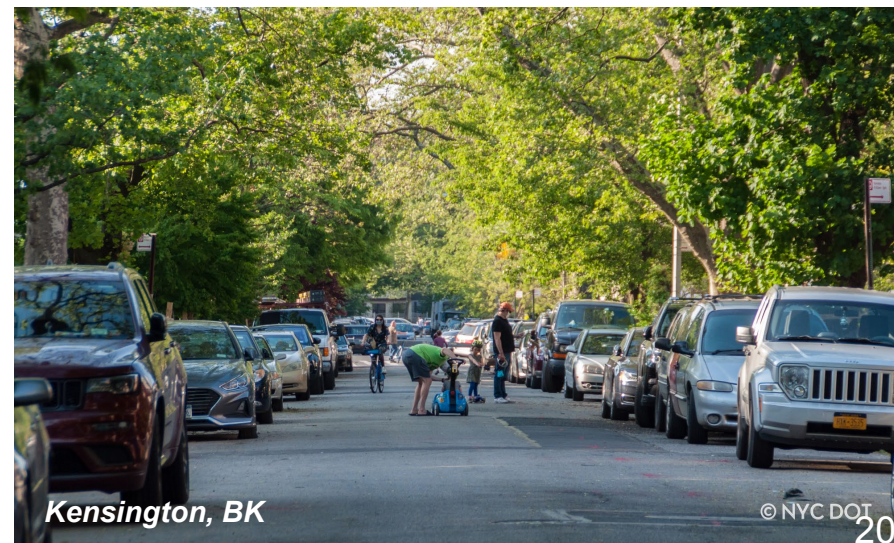
**Proposal: 21<sup>st</sup> St Bike Blvd**

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## OPEN STREETS – 21<sup>st</sup> STREET

### Streets Opened for Social Distancing - 2020

- **Pedestrians and cyclists** to use the roadbed of the street while maintaining social distancing when Open Streets in effect. Available daily, 8 am to 8 pm\* hours may vary by location due to staffing
- **No through traffic permitted while Open Streets are in effect.** Vehicle traffic limited to local deliveries, pick-ups/drop-offs, necessary city service vehicles, utility vehicles, and emergency vehicles only.
- **September 2020** Mayor's office announced Open Streets initiative to be made permanent
- **Winter 2021** DOT developing proposals to update an Open Street in each borough to a Bike Blvd





## BIKE BOULEVARD

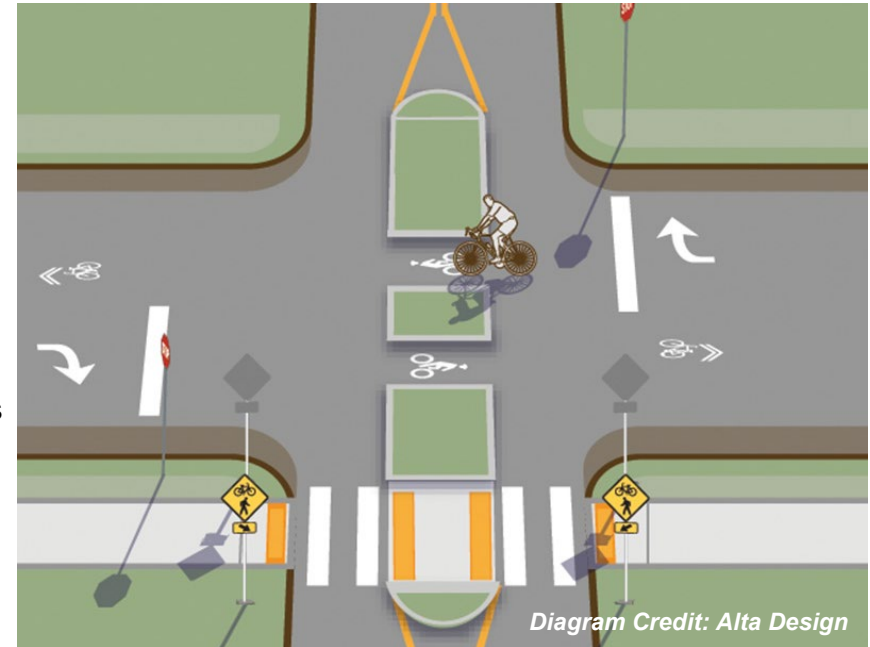
### What is a Bike Blvd?

Corridor designated and designed for bicycle travel

- **Enhance** conventional, shared and signed bicycle routes
- **Calms traffic** with design interventions

Design elements include:

- **Route planning:** direct access to destinations
- **Speed and traffic volume management:** slow vehicle speeds and reduce vehicle volumes
- **Signs, wayfinding, pavement markings** easy to find /follow
- **Street crossings:** minimal cyclist delay at minor street crossings. Safe and convenient crossings at major streets



Bike Blvd in Berkeley, CA



Bike Blvd in San Luis Obispo, CA

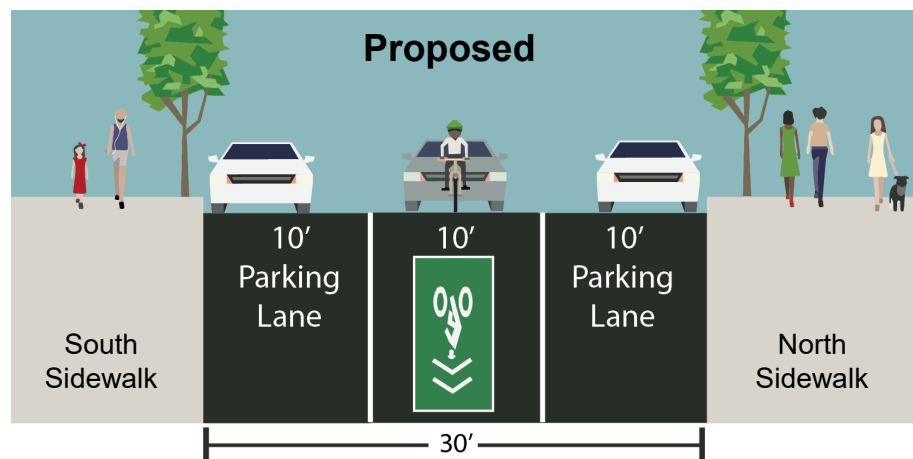
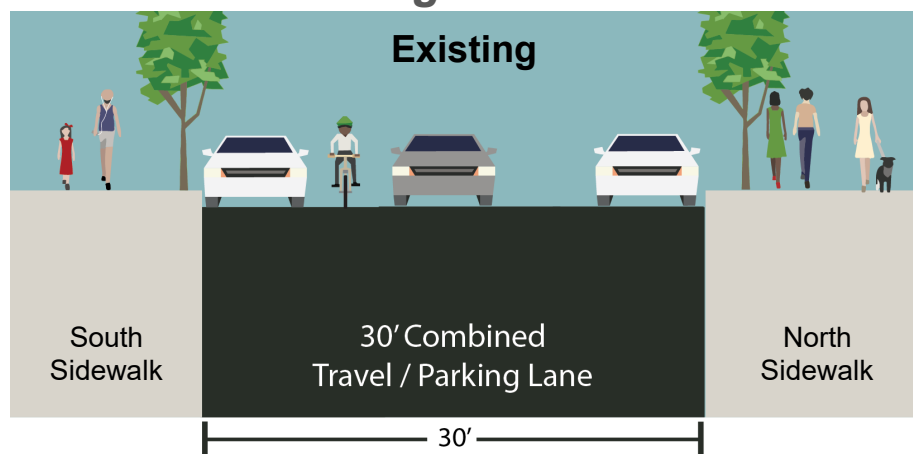
## ⑤ 21<sup>st</sup> St: 3<sup>rd</sup> Ave to 7<sup>th</sup> Ave

### Bike Boulevard – Mid-block Markings

- Cyclists prioritized with Bike Blvd signage, markings
- Maintain existing travel and parking lanes



### Mid-block markings





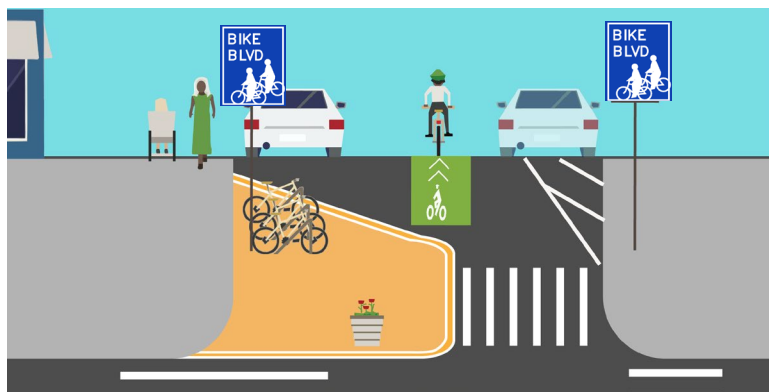
**5 21<sup>st</sup> St: 3<sup>rd</sup> Ave to 7<sup>th</sup> Ave**

## Bike Boulevard – Intersection Treatments

- Cyclists prioritized with **signage**, markings & alignment shifts
- **Blockbuster** and **curb extensions** deter cut-through traffic & allow local access
- **Gateway treatment**: wide curb extensions on both sides calm traffic entering block
- **Bicycle parking** corrals to be installed in select curb extensions

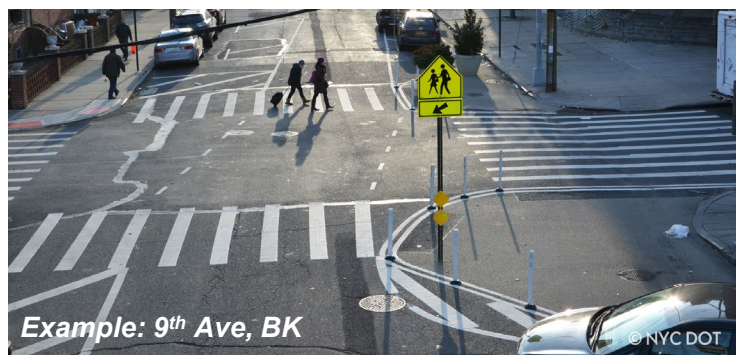


## Blockbuster & Curb Extension

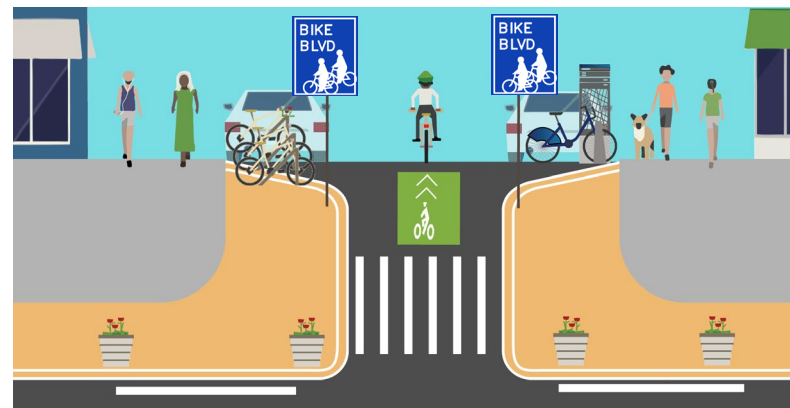


**21<sup>st</sup> St at 3<sup>rd</sup> Ave & 5<sup>th</sup> Ave**

- Alignment shift & painted curb extensions at entry
- Slows turning vehicles, accommodates signage
- Potential for bike parking, planters



## Gateway Treatment



**21st St at 4<sup>th</sup> Ave & 7th Ave**

- Painted curb extensions on both sides
- Potential for bike parking, planters



Diagrams for illustrative purposes only

## 5 6<sup>th</sup> Ave: 23<sup>rd</sup> St to 21<sup>st</sup> St

### Bike Boulevard – Intersection Treatments Mini Roundabouts & Diverters

- Mini roundabout design provides traffic calming along 6<sup>th</sup> Ave to and from the 21<sup>st</sup> St Bike Blvd
- Diverter at 21<sup>st</sup> St and 6<sup>th</sup> Ave allows bikes to continue straight, vehicular traffic to turn right
- New pedestrian crossings at unsignalized intersections

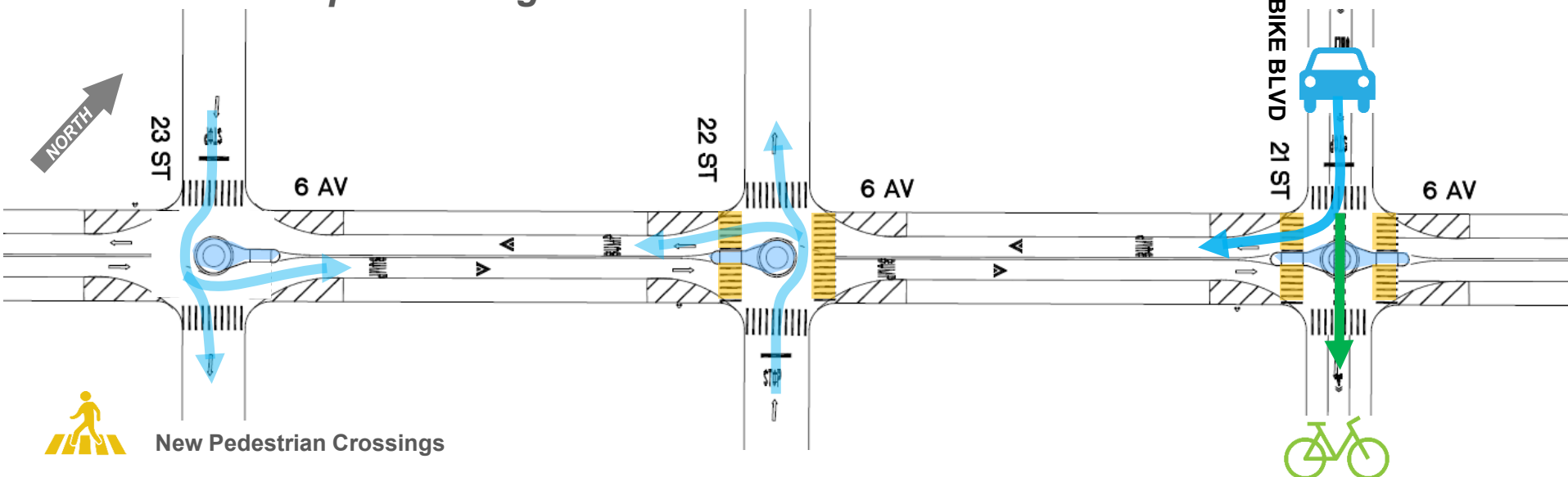


*Diverter in San Luis Obispo, CA*



*Example: Mini Roundabout  
Greeley Ave, SI*

### 6<sup>th</sup> Ave – Conceptual Design



*Conceptual Diagram for illustrative purposes only*



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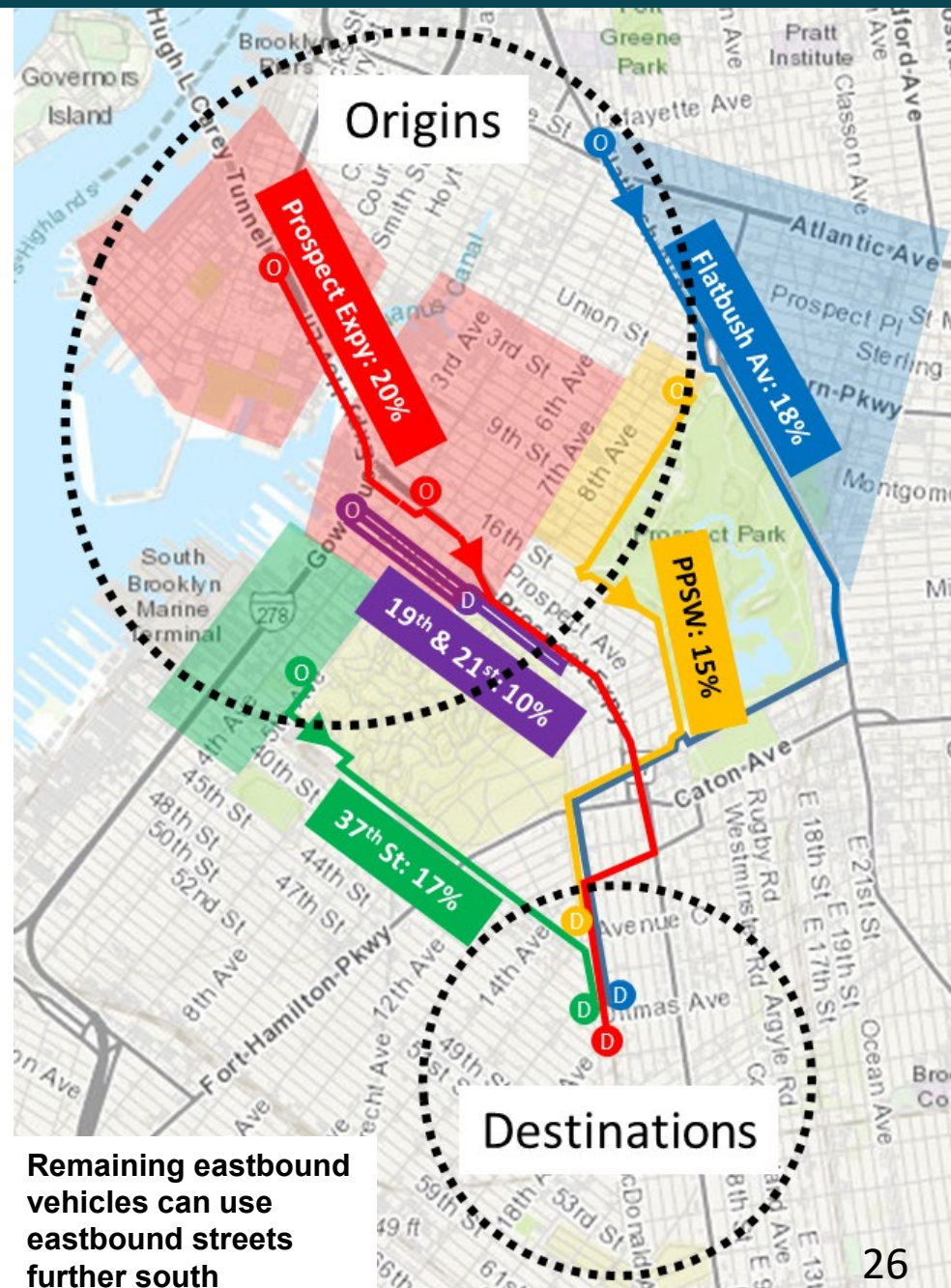
**Making It Work**

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# EASTBOUND ROUTING

## Alternative Routes for General Traffic

- Many alternative eastbound routes with equivalent travel times. These alternate routes keep area traffic off 20<sup>th</sup> St.
- Trips originating in Red Hook, Gowanus and western Park Slope can access points east using the Prospect Expressway.
- Trips coming from Prospect Park West can continue south along Prospect Park Southwest.
- Trips north of Flatbush Av can use Flatbush Av, and trips south of Greenwood Cemetery can use 37<sup>th</sup> St

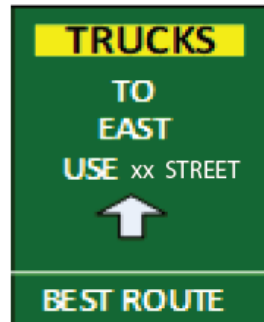




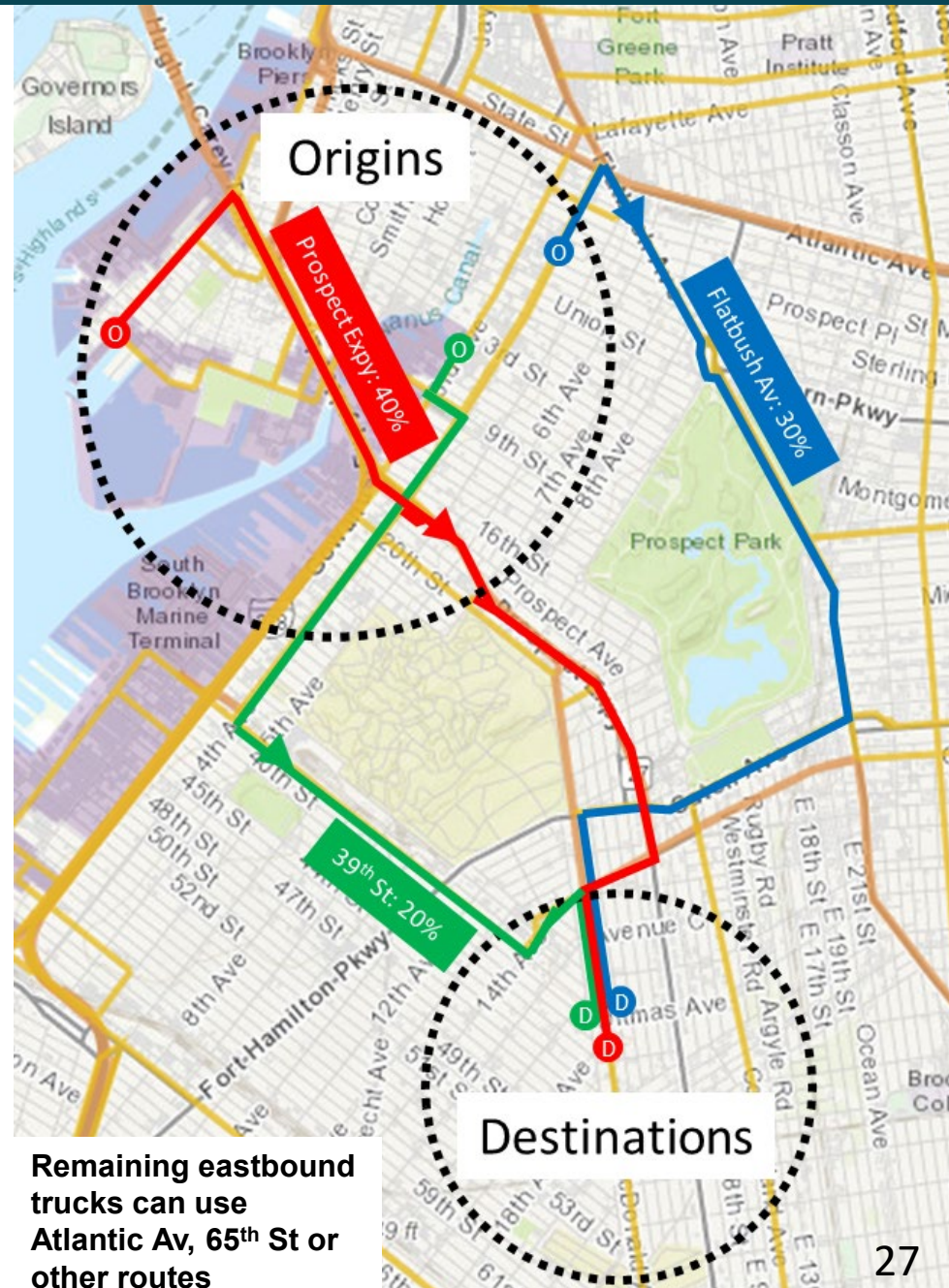
# EASTBOUND ROUTING

## Alternative Routes for Trucks

- Trucks have fewer alternative routes because they must use the existing truck route network
- Trucks originating in Red Hook can get on the Gowanus Expy at Columbia St, and continue onto the Prospect Expressway
- Trucks from Sunset Park can go to 39<sup>th</sup> St before heading east or north to Flatbush Av.
- Trucks delivering in Park Slope can head down 7<sup>th</sup> Av to access the Prospect Expressway on-ramp
- Install wayfinding signs to assist drivers to best eastbound truck route



Example truck wayfinding sign



# PARKING CHANGES

## Curb Management

- Parking-protected blocks maintain most parking on both sides, and adds back parking on both sides between 3<sup>rd</sup> Av & 4<sup>th</sup> Av
- No Standing Anytime zones allow for vehicle clearance at corners and turns
- Potential to update regulations further to ensure residential & business loading needs are accommodated



20<sup>th</sup> St at Prospect Park West





# LOADING AND CURB ACCESS

## Driveways

- Driveway access is maintained and indicated with markings

## Curb Access

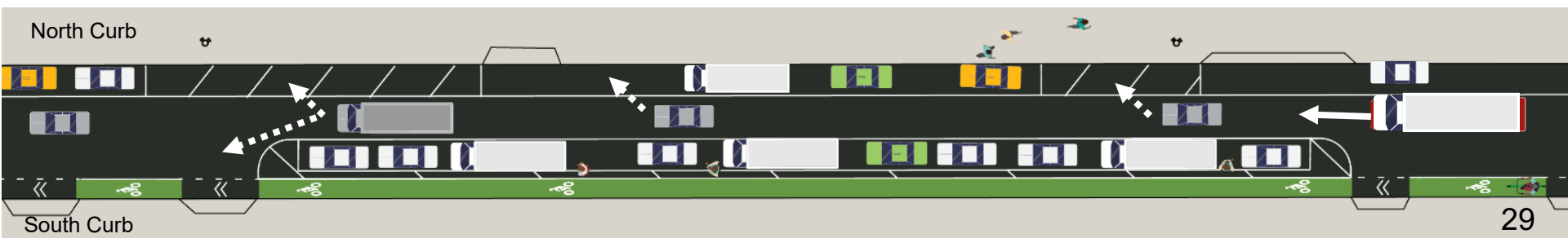
- Parking-protected design maintains loading and access along both sides of the street

## Curb Management Tools

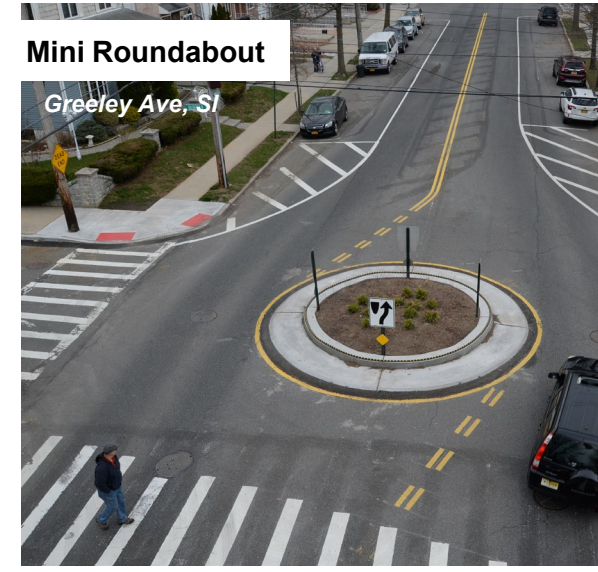
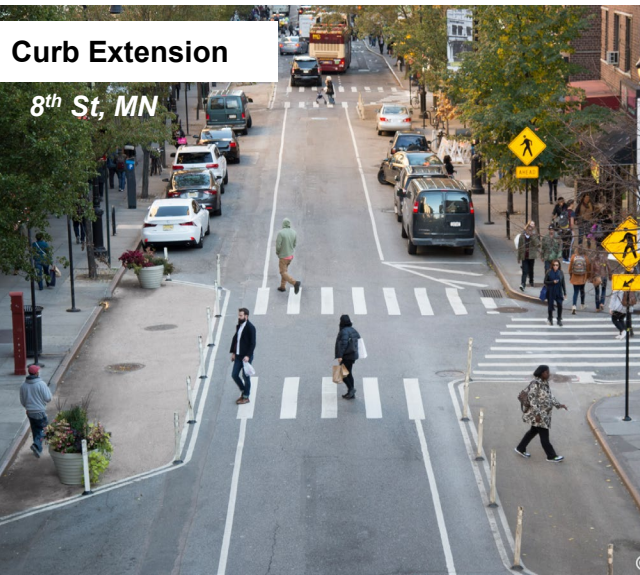
- Potential for neighborhood loading zones, parking regulation changes for pickup/drop-off



E 52 St, MN



# OVERVIEW OF PEDESTRIAN IMPROVEMENTS



Images for illustrative purposes, designs may vary





# Safety – Complete Street Redesign

Street designs that include protected bike lanes increase safety for all users

**-15%** drop in all crashes with injuries

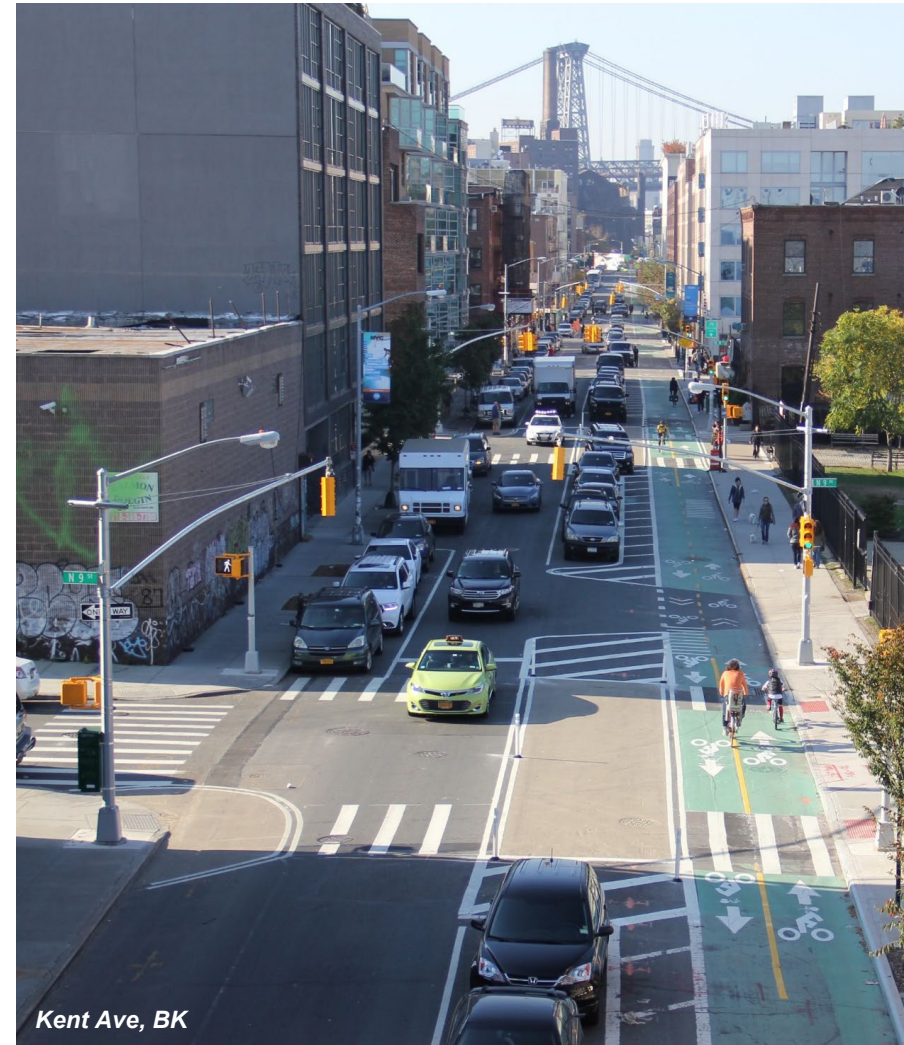
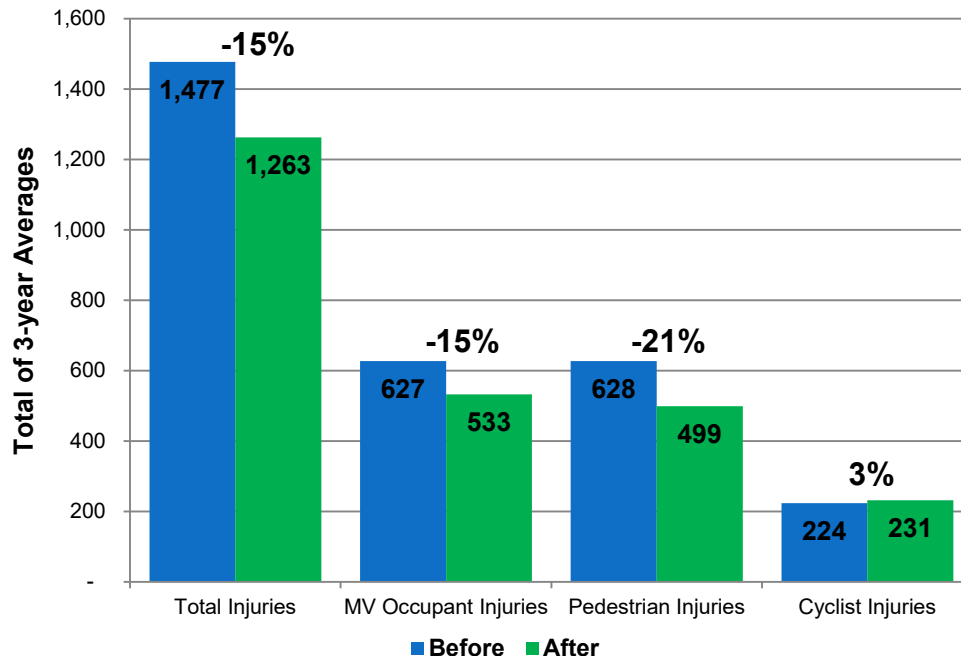
**-21%** drop in pedestrian injuries

*on streets where protected bike lanes were installed 2007-2017*

*Injuries to cyclists increase only 3%,  
despite a 61% bike volume increase*

## Protected Bike Lanes

*Before and After Crash Data, 2007 - 2017*



Kent Ave, BK

Data from 25 separate protected bicycle lane projects installed from 2007-2014 with 3 years of after data. Includes portions of 1 Ave, 2 Ave, 8 Ave, 9 Ave, Broadway, Columbus Ave, Hudson St, Lafayette St / 4 Ave, Sands St, Allen/Pike St, Kent Ave, Prospect Park West, Flushing Ave, Bruckner Blvd & Longfellow Ave, Imlay St / Conover St, Paerdegat Ave. Only sections of projects that included protected bike lanes were analyzed. Source: NYPD AIS/TAMS Crash Database

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## Summary

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# Design

## 20<sup>th</sup> Street

- One-way westbound conversion on 20<sup>th</sup> St btwn 3<sup>rd</sup> Ave to 10<sup>th</sup> Ave
- Allows upgrade to standard lane width for trucks, and addresses property damage and sideswipe issues without creating negative traffic effects for the community
- Protected bike path and shareduse path on 20<sup>th</sup> St
- Improved pedestrian safety with LPIs and extend neck downs to shorten crosswalks where possible

## 21<sup>st</sup> Street

- Convert corridor from a OpenStreet treatment to a Bike Boulevard
- Connecting bicycle facilities on 4<sup>th</sup> Ave, 5<sup>th</sup> Ave, 7<sup>th</sup> Ave, and future Gowanus Connector greenway on 3<sup>rd</sup> Ave
- Add pedestrian improvements & bike parking along corridor



Questions?  
**THANK YOU!**



NYC DOT



NYC DOT



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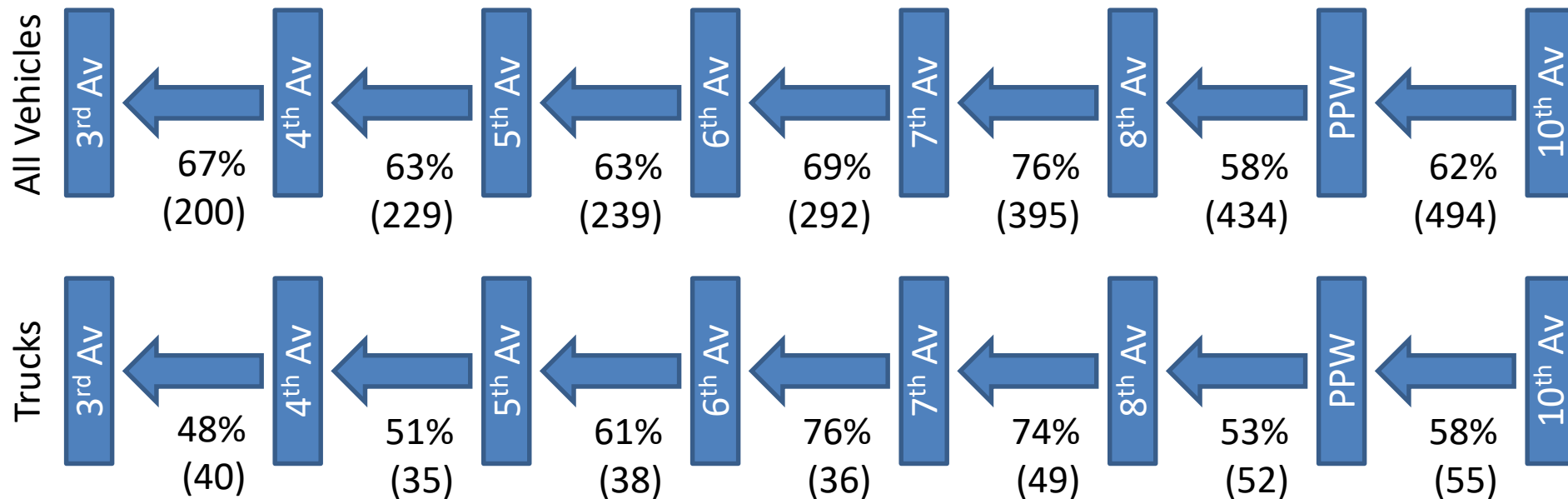
NYC DOT



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# Appendix

## 20<sup>th</sup> STREET TRAVEL PATTERNS



### Existing Westbound Prevalence

- 58-76% of all peak hour traffic was heading westbound, and 48-76% of trucks, showing a clear prevailing westbound pattern
- Vehicles are more likely to travel the entire corridor going WB; EB trips typically begin when a vehicle turns from a numbered avenue
- Predominant westbound pattern attributable to nearby eastbound on-ramps to the Prospect Expressway to accommodate local deliveries:
  - 17<sup>th</sup> St & 4<sup>th</sup> Av
  - 19<sup>th</sup> St & 7<sup>th</sup> Av



# OVERVIEW OF STREET DESIGN

## Parking-Protected Bike Lane



## Bike Boulevard



## Bollard-Protected Path & Shared Use Path Markings

