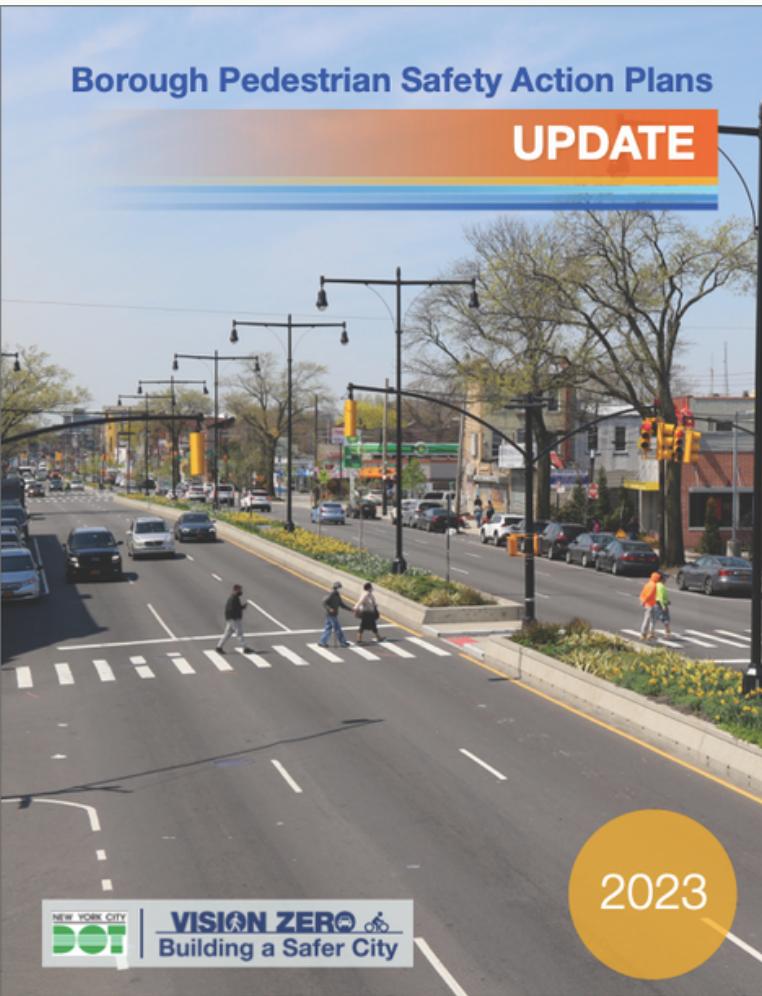




TEAM 11  
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# NYPD MOTOR VEHICLE COLLISIONS SOLUTION



# FEBRUARY 14, 2023

**Vision Zero: DOT  
Releases Update to  
Borough Pedestrian  
Safety Action Plans**

# MEETING THE TEAM



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# OVERVIEW

## Total Number of Collisions By Year and Month



### • Top 5 contributing factors(collision)

- Drivers Inattention/Distraction
- Failure to Yield-Right-Way
- Backing Unsafely
- Following Too Closely
- Fatigued/Drowsy

### • Top 5 vehicle types(collision)

- Carry-All Vehicle
- Sedan
- Bicycle
- Bus
- Other

# ANALYSIS - Time

## Year, Month:

- **October, 2015** has the highest collision case
- **July** has high injured and killed cases
- **October** has high injured and killed rate

## Hour:

- The collision, injured, and killed numbers are high during **daytime**
- The injured rate and killed rate is the highest during **late night and early morning**

	Year Month	Hour
Collision cases	October, 2015	5:00 PM
Injured Cases	July, 2013	5:00 PM
Killed Cases	July, 2022	5:00 PM
Injured Rate	October, 2021	9:00 PM
Killed Rate	October, 2022	4:00 AM

# ANALYSIS - Geographic

Borough:

# NEW YORK

- **Brooklyn** has most collision cases, injured and killed numbers
- **Bronx** has the highest injured rate
- **Staten Island** has the highest death rate

Street:

	Borough	Street
Collision cases	Brooklyn	Brooklyn-Atlantic Avenue; Queens-Northern Blvd Manhattan Broadway; Brooklyn-Flatbush Avenue, Queens-Queens Blvd
Injured Cases	Brooklyn	Brooklyn-Atlantic Avenue; Queens-Northern Blvd Queens-Queens Blvd; Manhattan Broadway Staten Island-Hylan Blvd
Killed Cases	Brooklyn	Staten Island-Hylan Blvd; Queens-Northern Blvd Brooklyn-North Conduit Avenue; Manhattan West Street Queens-Queens Blvd
Injured Rate	Bronx	Queens-31 Avenue; Brooklyn-Ocean Parkway Manhattan-West 125 street; Brooklyn-Coney Island Avenue Manhattan-West 145 Street
Killed Rate	Staten Island	Brooklyn-Avenue P; Brooklyn-East 32 Street Brooklyn-Fort Hamilton Parkway; Brooklyn-Chester Street Brooklyn-Oriental Blvd

# ANALYSIS - Contributing Factor

- **Driver Inattention** is the most frequent contributing factor (~20%)
- **Failure to yield Right-of-way** is the second most frequent contributing factor
- Even though **pedestrian/bicyclist** has a low number of cases, they would lead to a high injured rate and killed rate
- **Drugs(illegal)** is a huge factor with high injured rate and killed rate
- **Alcohol involvement** has highest frequency in factor combination with high killed rate

	Primary Factor	Factor Combination
Collision cases	Driver Inattention/Distraction;Failure to Yield Right-of-Way; Backing Unsafely; Following too closely; Other Vehicular	Driver Inattention/Distraction & Driver Inattention/Distraction; Other Vehicular & Other Vehicular; Failure to Yield Right-of-way & Failure to Yield Right-of-way; Other Vehicular & Driver Inattention/Distraction;
Injured Cases	Driver Inattention/Distraction; Failure to Yield Right-of-Way; Traffic Control Disregarded; Following too closely; Other Vehicular; Unsafe Speed	Driver Inattention/Distraction & Driver Inattention/Distraction; Other Vehicular & Other Vehicular; Failure to Yield Right-of-way & Failure to Yield Right-of-way; Traffic Control Disregarded & Traffic Control Disregarded; Other Vehicular & Driver Inattention/Distraction
Killed Cases	Failure to Yield Right-of-Way; Driver Inattention/Distraction Traffic Control Disregarded; Unsafe Speed Alcohol Involvement; Pedestrian/Bicyclist/Other Confusion	Driver Inattention/Distraction & Driver Inattention/Distraction; Unsafe speed & Failure to Yield Right-of-way; Failure to Yield Right-of-way & Failure to Yield Right-of-way; Driver inexperience & Driver inexperience; Failure to Yield Right-of-way & Driver Inattention/Distraction
Injured Rate	Pedestrian/Bicyclist/Other Confusion; Listening/Using Headphones; Illness; Passenger Distraction; Drugs(illegal)	Other Vehicular & Headlights defective; Obstruction/Debris & Pedestrian/Bicyclist/Other confusion; Drug(illegal) & Unsafe Speed; Drugs(illegal) & Aggressive Driving/Road Rage Unsafe Lane Changing & Other Lighting Defects
Killed Rate	Illness; Drugs(illegal); Tinted windows; Unsafe speed; Pedestrian/Bicyclist/Other Confusion	Drugs(illegal) & Unsafe speed; Alcohol involvement & Other lighting defects; Physical Disability & Alcohol Involvement; Unsafe Speed & Passenger distraction; Unsafe Speed & Pedestrian/Bicyclist/Other confusion

# ANALYSIS - Vehicle Type

- **Carry-all vehicle, sedan and Bicycle** has the most collision cases
- Most injured and killed cases comes from **carry-call vehicles, sedan and passenger vehicles.**
- **Bicycle** has the highest injured rate
- **Motorcycle** has the highest killed rate
- The vehicle type combination with high injured rate and killed rate always involves **bicycle and motorcycle**

	Primary Vehicle	Vehicle Type Combination
Collision cases	Carry-all vehicle, Sedan, Bicycle	Carry-all vehicle & Sedan Carry-all vehicle & Passenger Vehicle Sedan & Sedan Sedan & Sedan
Injured Cases	Sedan, Carry-all vehicle, passenger vehicle	Carry-all vehicle & Carry-all vehicle Carry-all vehicle & Sedan
Killed Cases	Carry-all vehicle, Sedan, passenger vehicle	Passenger vehicle & Passenger vehicle Carry-all vehicle & Carry-all vehicle Sedan & Sedan
Injured Rate	Bicycle, Motorcycle, Carry-all vehicle	Truck & Bicycle Bicycle & Bus Motorcycle & Emergency Motorcycle & Emergency
Killed Rate	Motorcycle, Commercial vehicle, Bicycle	Commercial Vehicle & Bicycle Motorcycle & Bus



# **Top Questions we need to address to achieve Vision Zero:**

## **Addressing driver inattention and distraction**

- Accounted for **68%** of total injured rate

## **Reducing accident related to Carry-all vehicle**

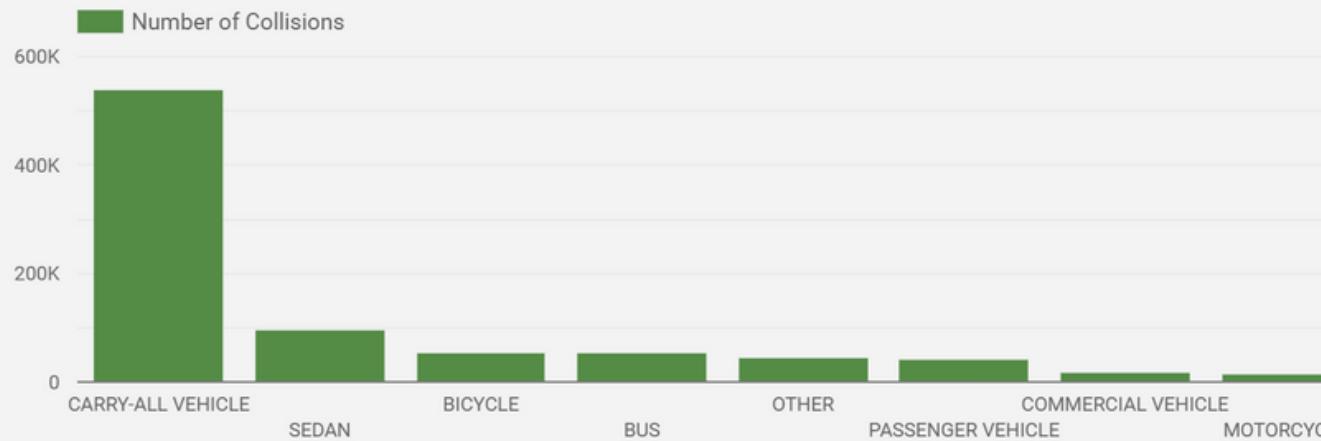
- **31%** of injured number involves carry-all vehicle

## **Paying more attentions at 4 a.m.- 5a.m.**

- With highest death rate of 0.5% among all the time period (**188%** times more than the average)

# RECOMMENDATIONS - Policy & Education

Total Collisions by Vehicle Types



## 1. Increasing traffic enforcement and education campaigns

- For inexperienced drivers (Especially for drivers of carry-all and sedan)
- For drivers who violate the traffic regulations several times

## 2. Installing automated speed enforcement cameras

## 3. Introducing more strict penalties and fines for violation behaviours

- Drunk driving(especially from 4a.m.- 5a.m.), speeding, tired driving, drug using

## 4. Further limiting the speed for some districts from the current 25MPH

(\*Detailed street in Appendix 5)

# RECOMMENDATIONS - Street Design

## Detailed Streets

The Primary factor caused occurrence of collisions is **Driver Inattention/Distraction** in the following districts:

Borough	Street
QUEENS	QUEENS BOULEVARD
MANHATTAN	2 AVENUE
QUEENS	NORTHERN BOULEVARD
MANHATTAN	BROADWAY
BROOKLYN	ATLANTIC AVENUE

### 1. Adding caution signs on the street above

- a. Add signs for slippery road
- b. Roundabouts
- c. Speed humps/bumps

### 2. Increase police presence

- a. For high-risk areas, increasing the number of traffic checkpoints throughout the city.
- b. During late night and early morning hours, to deter dangerous driving behaviours

### 3. Increase street lights during night time

# RECOMMENDATIONS - Street Design

## Vulnerable Group

### **Motorists**

#### Highest injury rate of 21.6%

- Motorcycles were one of the top 10 vehicles type involved in the total collisions

#### Speed limit of motorcycle is 25MPH

#### Entitled to the full use of a lane



### **Pedestrians**

#### Highest kill rate of 0.09%

#### Children death rate increased by 45%

- 16 children were killed in 2022 (which was the highest among all years since 2014)

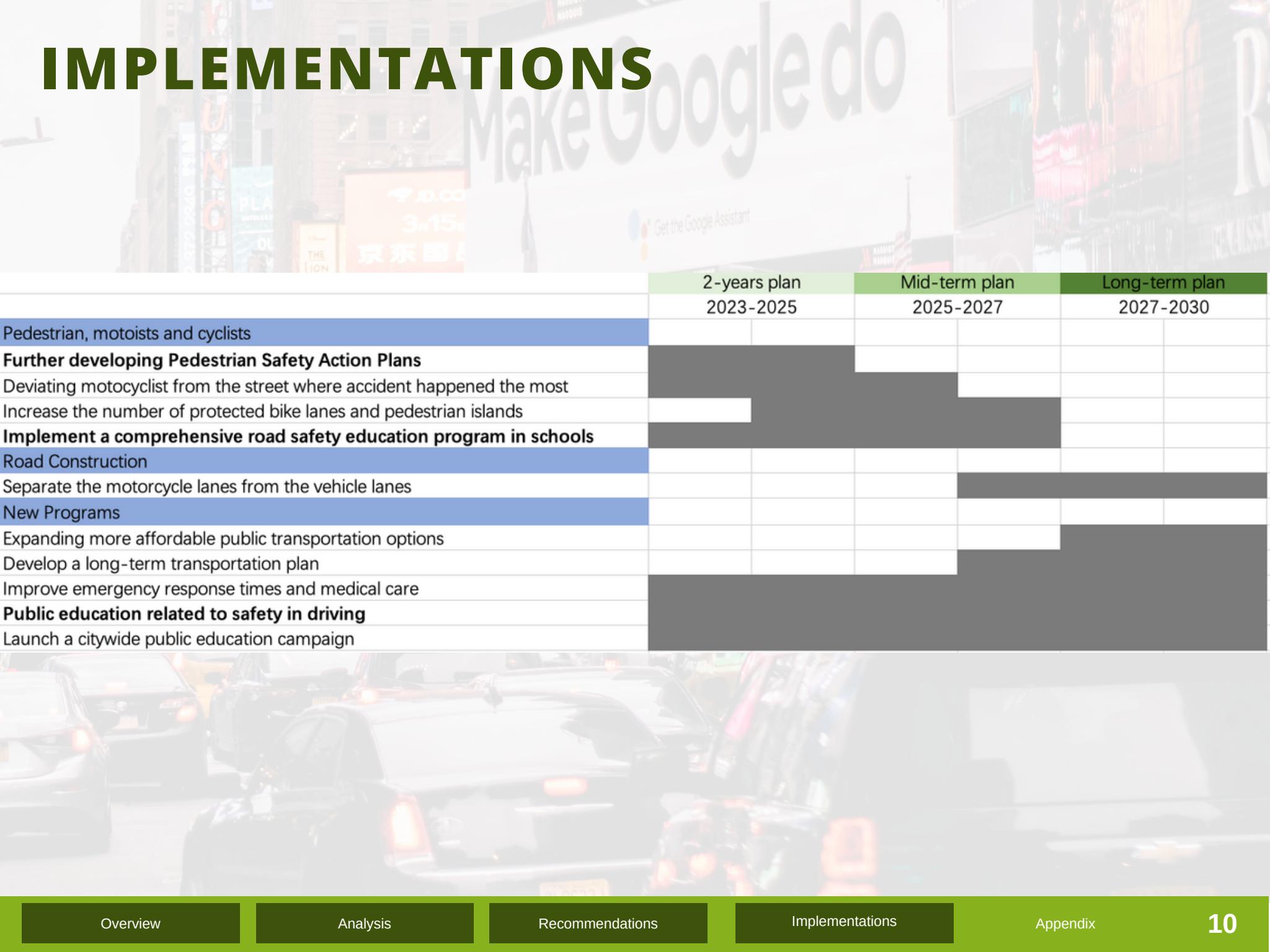
## **1. Putting more signs:**

- a. Setting signs near schools and community districts

## **2. Road:**

- a. Separating motorcycle lanes from vehicle lanes
- b. Wider sidewalk and pedestrians overpasses
- c. Increasing extensions and pedestrians islands

# IMPLEMENTATIONS





# **VISION ZERO**

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## **Building a Safer City**

**THANK YOU!**

**TEAM 11  
SYNTAX ERROR**

# APPENDIX 1: VEHICLE TYPE COMBINATION

**Step 1:** Deleted records with vehicle types with occurrences less than 5 since those are mistyped.

**Step 2:** Categorized the vehicle types with occurrences over 400 into 14 primary groups.

The categorization processes are shown below:

1. PASSENGER VEHICLE: PASSENGER VEHICLE, CONVERTIBLE
2. TAXI: TAXI, LIVERY VEHICLE
3. EMERGENCY: AMBULANCE, FIRE TRUCK, AMBUL
4. CARRY-ALL VEHICLE: CARRY ALL, REFRIGERATED VAN, VAN, STATION WAGON/SPORT UTILITY VEHICLE, SPORT UTILITY / STATION WAGON
5. SEDAN: SEDAN, 4 DR SEDAN, 2 DR SEDAN
6. TRUCK: PICK-UP TRUCK, BOX TRUCK, FLATBED TRUCK, TRACTOR TRUCK DIESEL, DUMP, FLAT BED, GARBAGE OR REFUSE, TRACTOR TRUCK GASOLINE, TOW TRUCK / WRECKER, CHASSIS CAB, TANKER, CONCRETE MIXER
7. BUS: BUS, MINI BUS
8. MOTORCYCLE: MOTORCYCLE, E-SCOOTER, MOPED, MOTORSOOTER, MOTORBIKE
9. BICYCLE: BICYCLE, BIKE, E-BIKE, E-BIK
10. COMMERCIAL VEHICLE: LARGE COM VEH(6 OR MORE TIRES), SMALL COM VEH(4 TIRES), PK
11. UNKNOWN: UNKNOWN
12. OTHER

# APPENDIX 1: VEHICLE TYPE COMBINATION

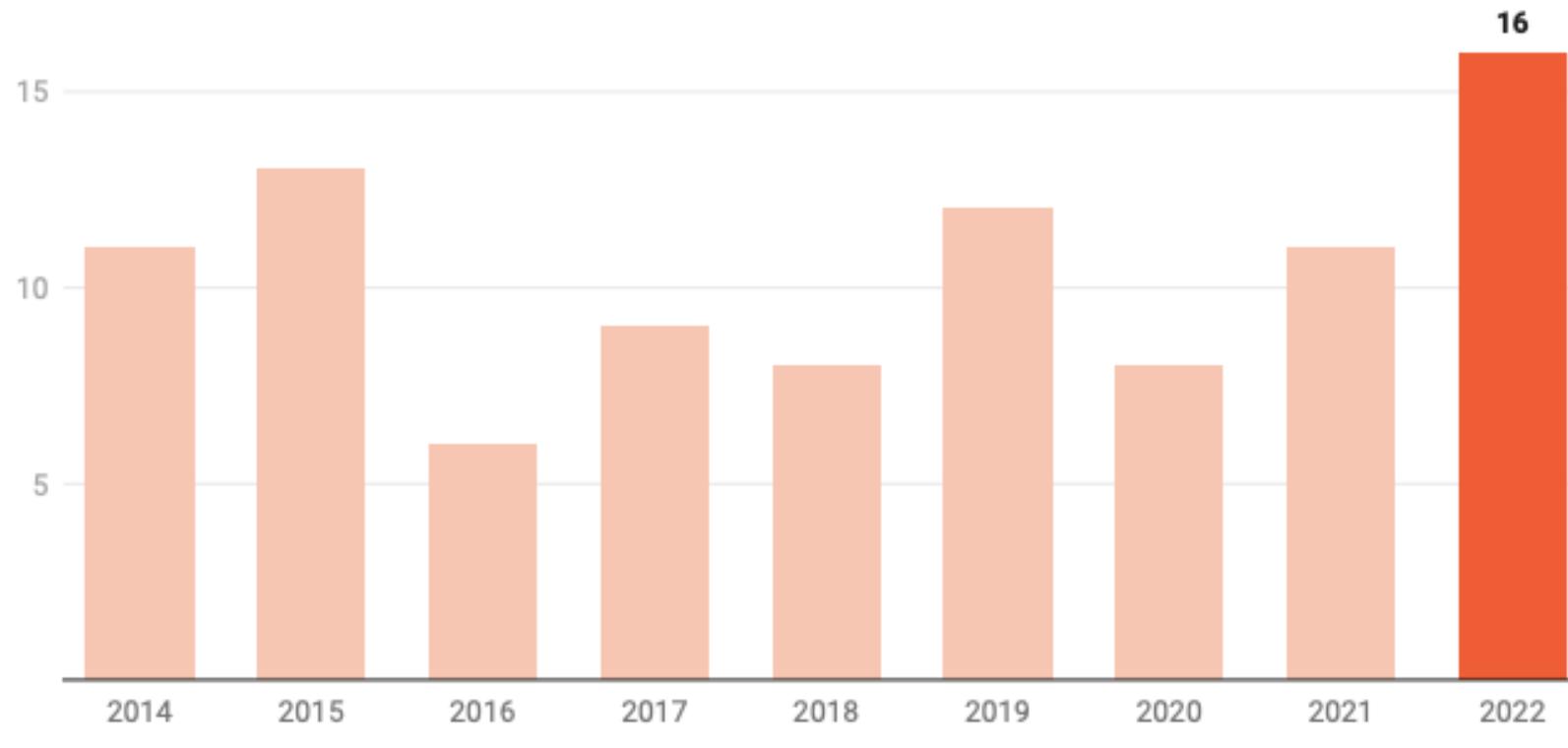
**Step 3:** further categorized it into four mother\_groups, the categorization processes are shown below:

1. PASSENGER: PASSENGER VEHICLE, CONVERTIBLE, TAXI, LIVERY VEHICLE, CARRY ALL, REFRIGERATED VAN, VAN, STATION WAGON/SPORT UTILITY VEHICLE, SPORT UTILITY / STATION WAGON, SEDAN, 4 DR SEDAN, 2 DR SEDAN, BUS, MINI BUS, LARGE COM VEH(6 OR MORE TIRES), SMALL COM VEH(4 TIRES), PK
2. TRUCK: PICK-UP TRUCK, BOX TRUCK, FLATBED TRUCK, TRACTOR TRUCK DIESEL, DUMP, FLAT BED, GARBAGE OR REFUS E, TRACTOR TRUCK GASOLINE, TOW TRUCK / WRECKER, CHASSIS CAB,TANKER, CONCRETE MIXER
3. TWO-WHEELS: MOTORCYCLE, E-SCOOTER, MOPED, MOTORSCOOTER, MOTORBIKE, BICYCLE, BIKE, E-BIKE,E- BIK
4. EMERGENCY: AMBULANCE, FIRE TRUCK, AMBUL
5. OTHER

# APPENDIX 2

## Children Killed Under Vision Zero

Fatalities of New Yorkers aged 0-17 in traffic violence, 2014-2022



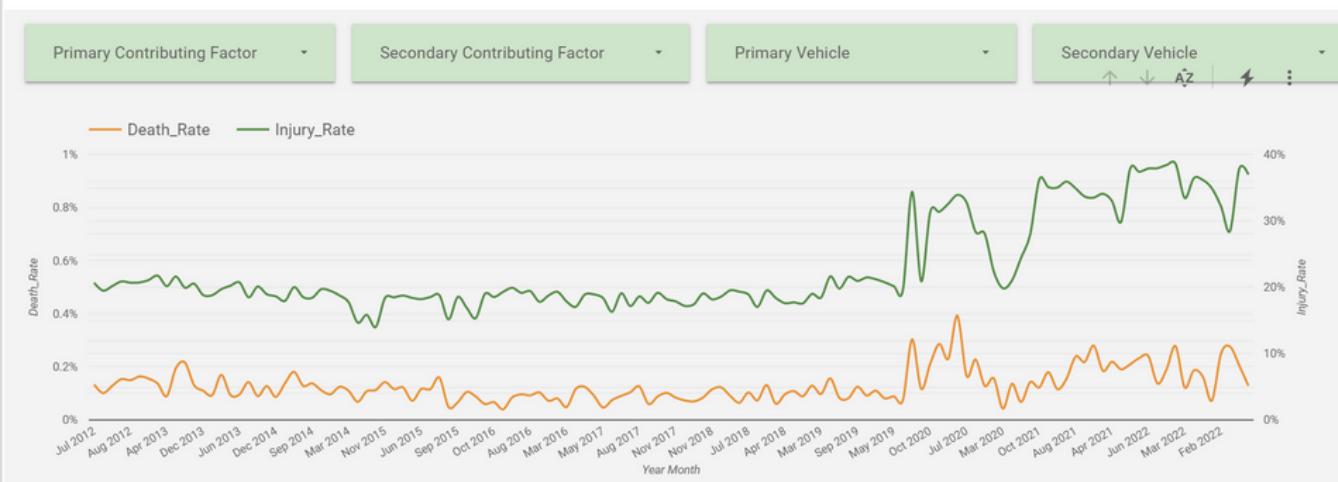
<https://nyc.streetsblog.org/2023/01/23/vision-zero-2022-more-dead-kids-more-crashes-in-known-danger-zones/>

# APPENDIX 3 - Time Related Observation 1

Number of Collisions by Year and Month

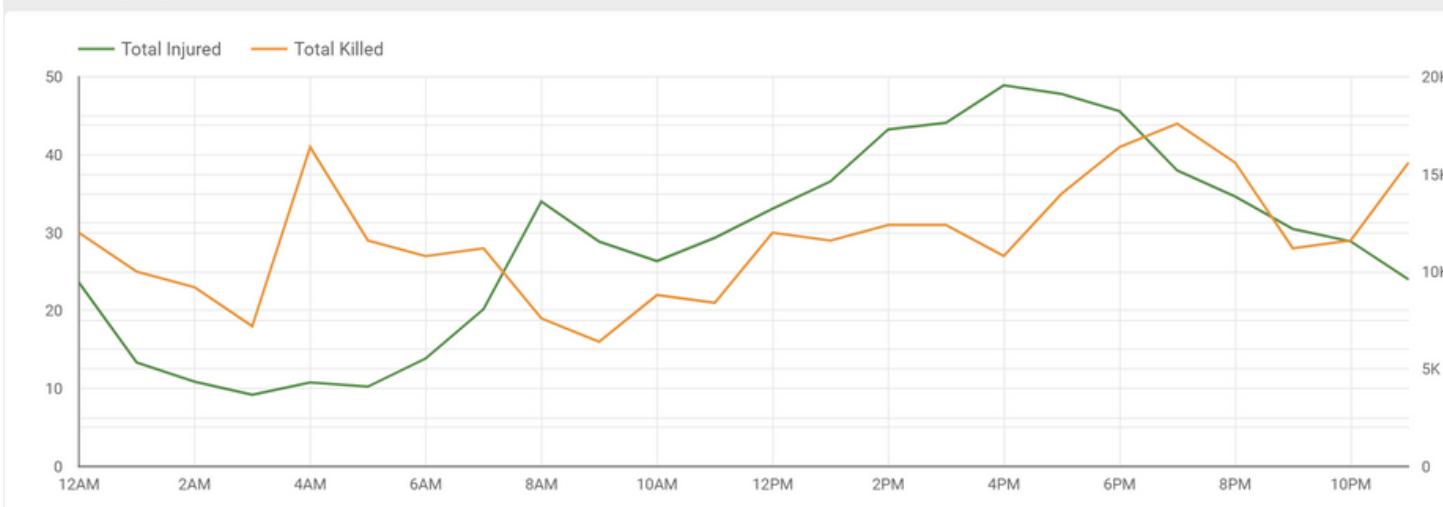


Injury and Death Rate by Year and Month



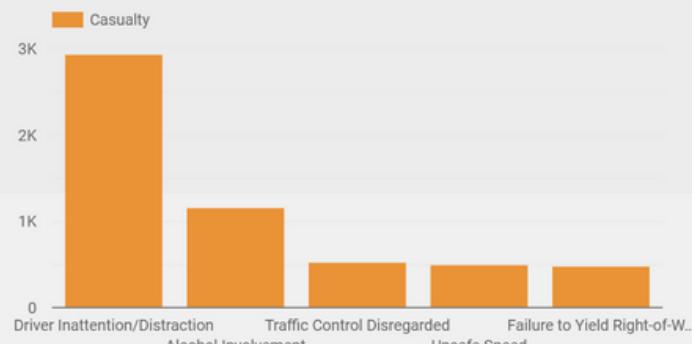
# APPENDIX 4 - Time related Observation 2

## Casualty by Time in a Day



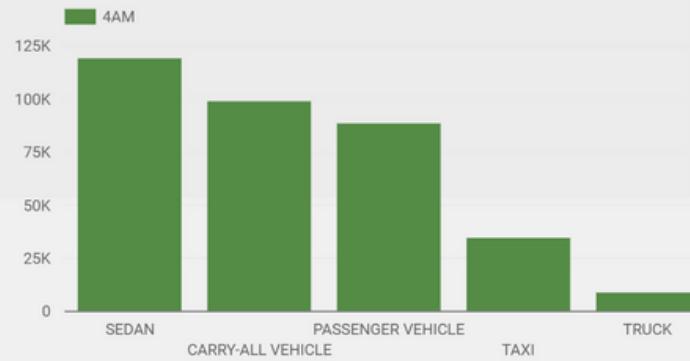
### 4AM Deep Insight by Contributing Factor

(Compare with all-day data,, only "Driver Inattention" and "Failure to Yield" are same)  
A-Z | ⚡ | ⚖



### 4AM Deep Insight by Vehicle Type

(Compare with all-day data, "Passenger Vehicle", "Taxi" and "Truck" are on the top)



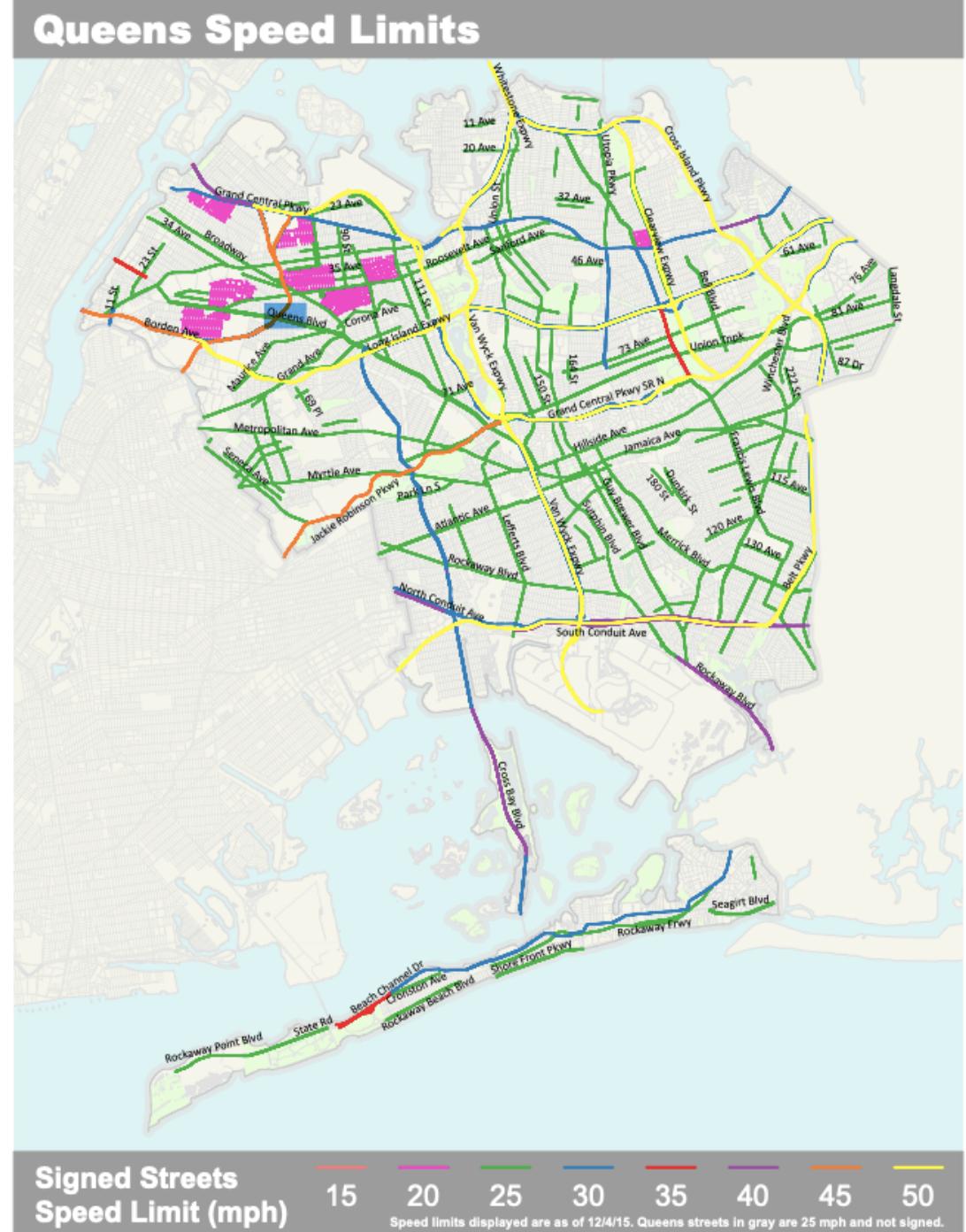
# APPENDIX 5

## -SPEED LIMIT

Row	borough	street	primary_factor
1	BROOKLYN	ATLANTIC AVENUE	Unsafe Speed
2	BROOKLYN	FLATBUSH AVENUE	Unsafe Speed
3	BROOKLYN	LINDEN BOULEVARD	Unsafe Speed
4	STATEN ISLAND	HYLAN BOULEVARD	Unsafe Speed
5	QUEENS	NORTHERN BOULEVARD	Unsafe Speed
6	BROOKLYN	OCEAN PARKWAY	Unsafe Speed
7	BROOKLYN	UTICA AVENUE	Unsafe Speed
8	QUEENS	NORTH CONDUIT AVENUE	Unsafe Speed
9	BRONX	JEROME AVENUE	Unsafe Speed
10	QUEENS	LIBERTY AVENUE	Unsafe Speed

# **APPENDIX 6**

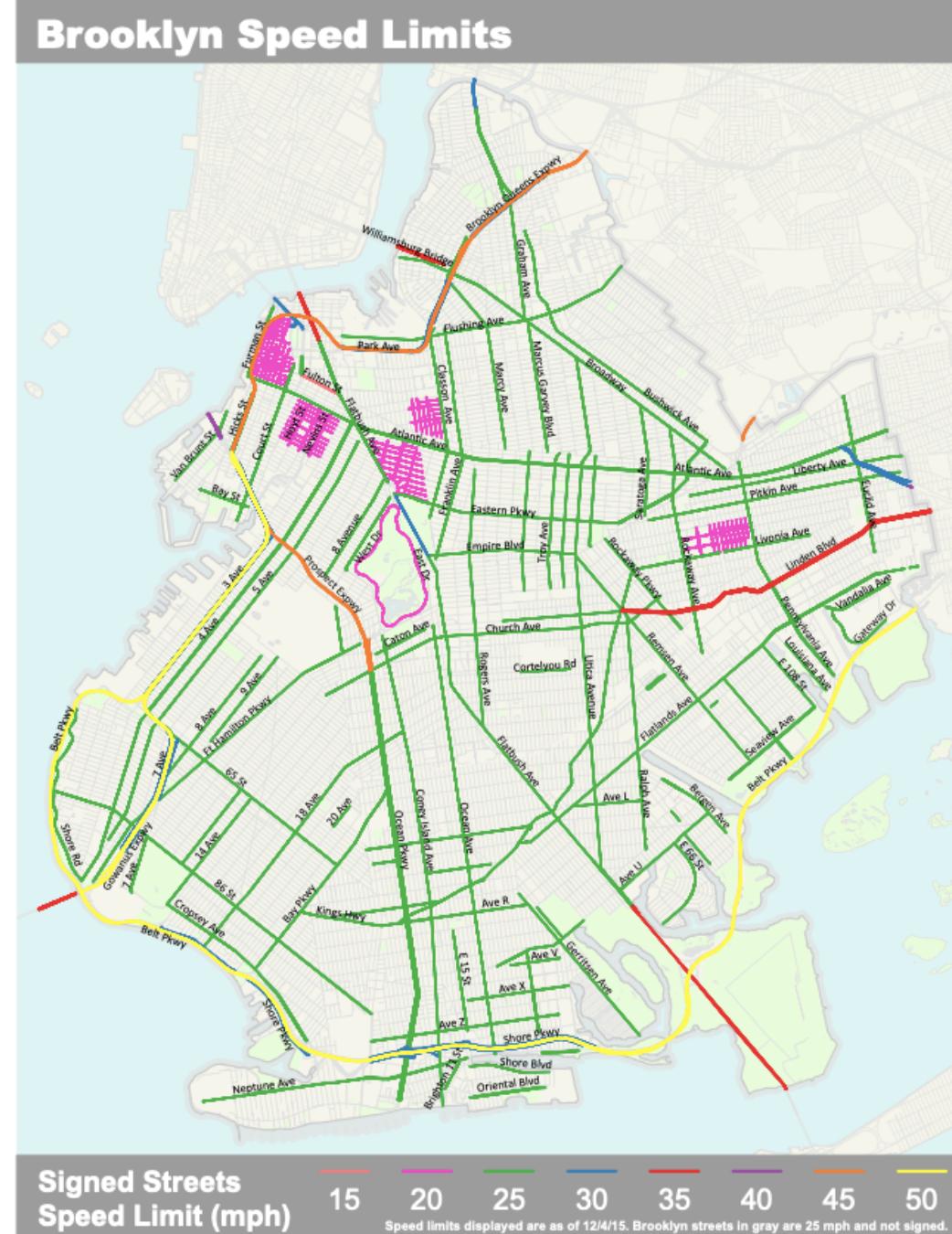
## **-MAP**



<https://www.nyc.gov/html/dot/downloads/pdf/trucks-nycarea-map.pdf>

# **APPENDIX 6**

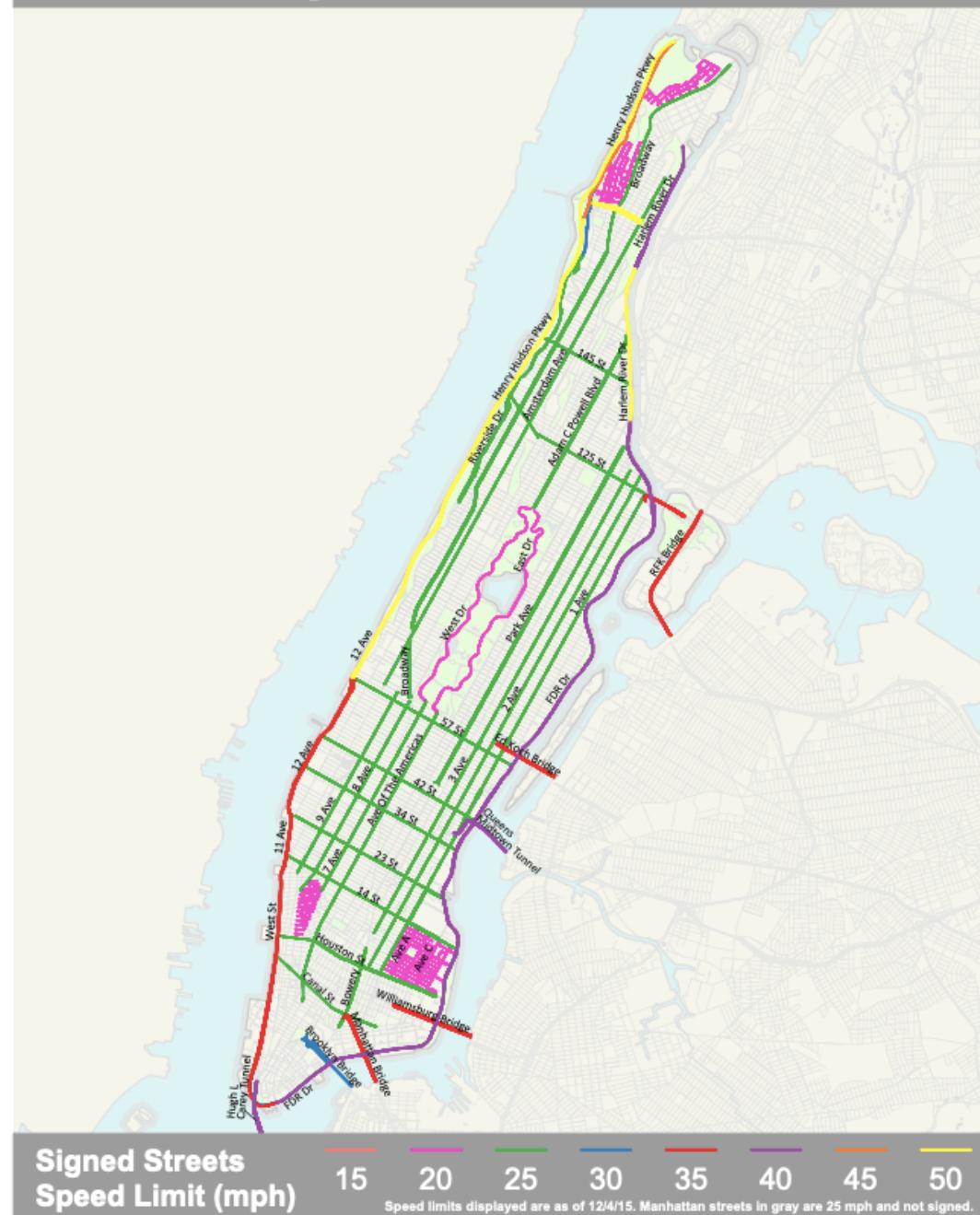
## **-MAP**



<https://www.nyc.gov/html/dot/downloads/pdf/trucks-nycarea-map.pdf>

# APPENDIX 6 -MAP

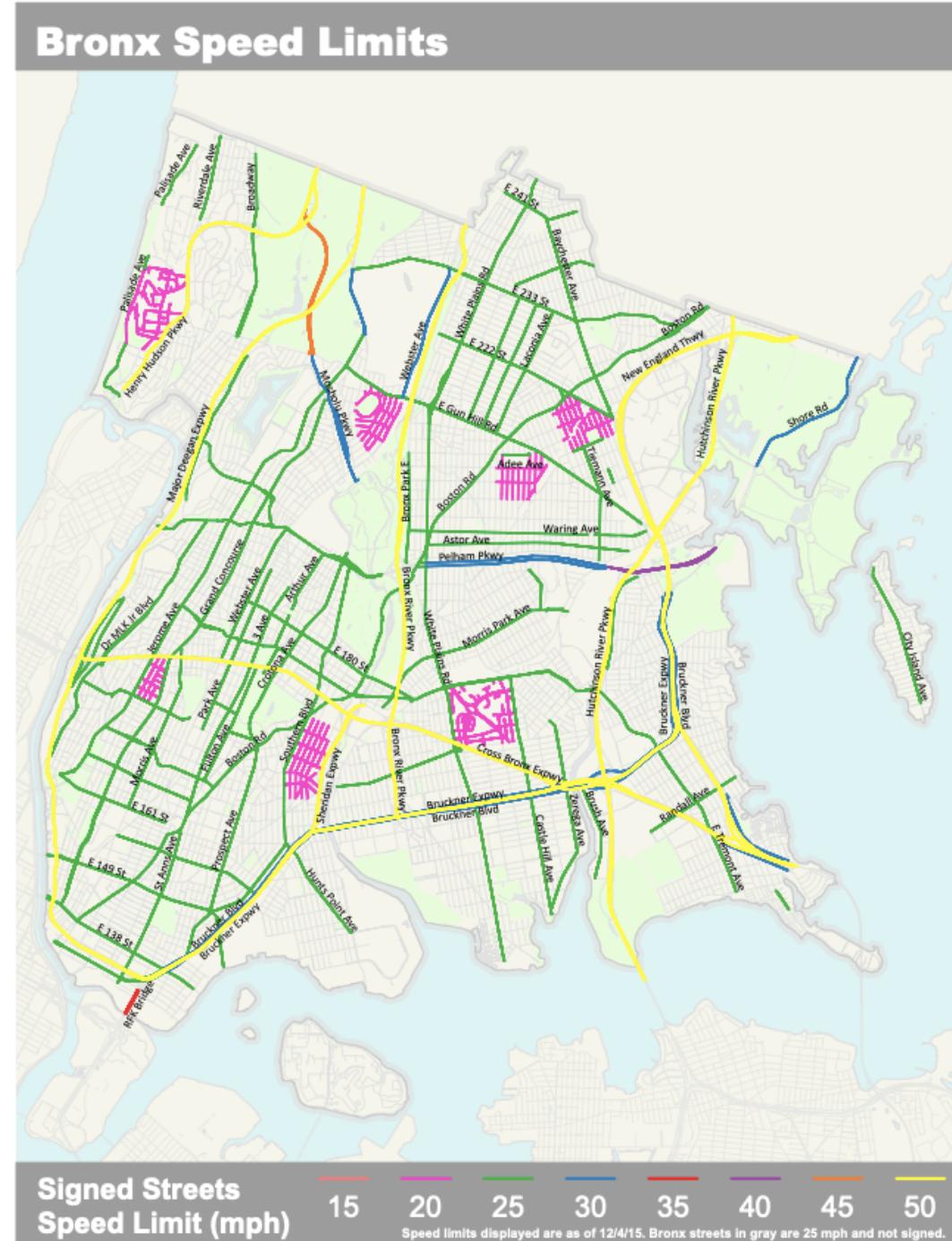
## Manhattan Speed Limits



<https://www.nyc.gov/html/dot/downloads/pdf/trucks-nycarea-map.pdf>

# **APPENDIX 6**

## **-MAP**



<https://www.nyc.gov/html/dot/downloads/pdf/trucks-nycarea-map.pdf>

# APPENDIX 6 -MAP



# APPENDIX 7

## -TRUCKS PROHIBITING AREA

### No Trucks are Permitted on these New York Parkways

#### NEW YORK CITY Manhattan, The Bronx, Brooklyn, Queens & Staten Island

<b>BP</b>	Belt Parkway Queens & Brooklyn
<b>BRP</b>	Bronx River Parkway The Bronx & Westchester County
<b>CIP</b>	Cross Island Parkway Queens
<b>FDR</b>	Franklin D. Roosevelt Drive Manhattan
<b>GCP</b>	Grand Central Parkway • Queens
<b>HHP</b>	Henry Hudson Parkway Manhattan & The Bronx

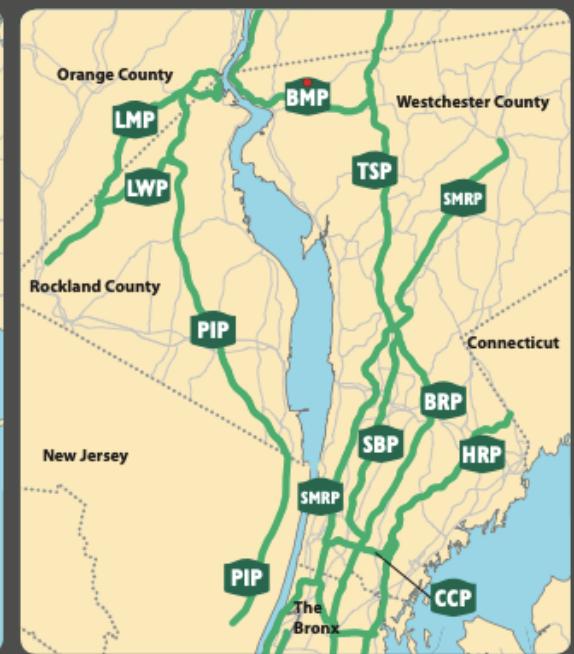
<b>HRD</b>	Harlem River Drive Manhattan
<b>HRP</b>	Hutchinson River Parkway The Bronx & Westchester County
<b>JRP</b>	Jackie Robinson Parkway Queens & Brooklyn
<b>KWVP</b>	Korean War Veterans Parkway Staten Island
<b>MP</b>	Mosholo Parkway The Bronx
<b>PP</b>	Pelham Parkway • The Bronx

#### LONG ISLAND Nassau County & Suffolk County

<b>B</b>	Bethpage State Parkway Nassau County
<b>H</b>	Heckscher Parkway • Suffolk County
<b>L</b>	Loop Parkway • Nassau County
<b>M</b>	Meadowbrook State Parkway • Nassau County
<b>N</b>	Northern State Parkway Nassau & Suffolk Counties
<b>O</b>	Ocean Parkway • Nassau & Suffolk Counties
<b>R</b>	Robert Moses Causeway • Suffolk County
<b>S</b>	Sagtikos Parkway Suffolk County
<b>SM</b>	Sunken Meadow Parkway Suffolk County
<b>SO</b>	Southern State Parkway Nassau & Suffolk Counties
<b>W</b>	Wantagh Parkway • Nassau County

#### HUDSON VALLEY Orange County, Rockland County, Westchester County

<b>BMP</b>	Bear Mountain Parkway • Westchester County
<b>LWP</b>	Lake Welch Parkway Rockland County
<b>BRP</b>	Bronx River Parkway The Bronx & Westchester County
<b>PIP</b>	Palisades Interstate Parkway Bergen (New Jersey) and Rockland Counties
<b>CCP</b>	Cross County Parkway Westchester County
<b>SBP</b>	Sprain Brook Parkway Westchester County
<b>HRP</b>	Hutchinson River Parkway The Bronx & Westchester County
<b>SMRP</b>	Saw Mill River Parkway Westchester County
<b>LMP</b>	Long Mountain Parkway Orange County
<b>TSP</b>	Taconic State Parkway Westchester, Putnam, Dutchess, Columbia Counties



# REFERENCE

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