Overview

- NYC Clear Curb Initiative
- Phase I review
- Phase II study
NYC Clear Curbs Initiative

• In October 2017, Mayor Bill de Blasio announced his Congestion Action Plan -- a series of initiatives to combat traffic congestion in New York City;

• “Clear Curbs” as one of these initiatives, aiming to increase lane capacity during weekday peak hours by maintaining a curbside travel lane from 7AM to 10AM and from 4PM to 7PM;

• Pilot locations include: Midtown Manhattan, Flatbush Ave in Brooklyn and Roosevelt Ave in Queens. Our research will focus on Midtown Manhattan;
Phase I study

- To investigate the impacts of “clear curbs” implementation on local delivery activities, a Phase I study was conducted relying on field observation, data collected on a specific block – **W 46th Street between 5th Ave and 6th Ave Midtown Manhattan** from **7:00AM to 1:00PM** on six days between January and June in 2018;

- Delivery activities (including arrival and departure time, vehicle type, commodity type, parking regulation where they parked, etc.) on this single block before and after implementation were recorded;

- In addition, we analyzed parking violation data from Department of Finance.
Main findings from Phase I study:

• **A substantial volume of delivery trips continue to occur** during rush hours;

• While economic pressures from increased violation costs may have influenced **some operators to adapt** their operations, some continue, some disappear, we are not sure the reason, some may because of **seasonality**;

• A **generous increase** in parking violations accrued by all vehicle types (especially delivery and refrigerated trucks and vans) following clear curbs implementations.

• Higher violation costs and enforcement result in substantial **increase in the cost** to park on W 46th street;

• **From field observations, this increase is unlikely to be due to higher volumes of vehicles**;
Phase II study

Phase II expands upon the scope of Phase I to investigate:

(1) the entire “clear curbs” study area (zone 1) area spanning from 6th Ave to Madison Ave and from 45th Street to 50th Street;

(2) its immediate surrounding neighborhood (zone 2);

(3) A comparison of Zone 1 and Zone 2 during “before” and “after” April 2018 are analyzed.

This analysis relies on detailed New York City Department of Finance (DOF) parking violation records issued between January 2017 and December 2018 on weekdays.
Methodology & Data

Data Extraction
- Parking Violation Records from DOF

Data Cleaning & Correction
- Vehicle Body Type
  1. Abbreviation correction
  2. Assign the type/color which has the highest frequency for each plate ID
- Vehicle Color

Data Categorization
- Vehicle Body Type
  - 8 types
- Violation Type
  - 7 types
- Plate ID
  - Non-Frequent and Frequent Violator

Spatio-temporal Categorization
- Zones
  - Zone 1 and Zone 2
- Periods
  - Before and After Clear Curb Implementation

Analysis and Visualization
Overall Violation Frequencies and Potential Revenue

- In total, **309,063 tickets** were issued in both zones from **79,514 individual vehicles** (Plate ID);

- **77%** were freight or service-related vehicles (DELV, VAN, REFG, and TRAC), 1% are utility vehicles (UTIL), and 22% are passenger related (SUBN and PASSENGER) or OTHER;

- This substantial growth in cost is due to two factors: **an increase in overall enforcement** and **a shift in violation types** from less costly meter violations to relatively more expensive No Parking/No Standing violations

<table>
<thead>
<tr>
<th>Zone</th>
<th>Average Monthly Violations</th>
<th>Change in Average Monthly Violations</th>
<th>Average Monthly Potential Revenue</th>
<th>Change in Potential Monthly Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before</td>
<td>After</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>3,174</td>
<td>5,501</td>
<td>2,327</td>
<td>73.3</td>
</tr>
<tr>
<td>2</td>
<td>8,254</td>
<td>9,792</td>
<td>1,538</td>
<td>18.6</td>
</tr>
</tbody>
</table>
Yearly violation trend

Zone 1:
- In 2017, the number of tickets hovers around 2,500-3,000 per month, when Clear Curbs were implemented in April 2018, an immediate increase is observable. The typical monthly violation rate approximately doubled, even reaching close to 7,500/month in August 2018.

Zone 2:
- 2018 monthly ticket rates are fairly consistent with 2017 trends, except for a substantially higher rate of violations issued in May 2018. While some monthly variation is observed, there does not appear to be any systematic response in overall violation rates following enforcement (e.g. a decline in violation rates following increased enforcement).
Block Violation density

Equation was used to estimate average monthly violation densities on each individual block:

\[ d_{j,p} = \sum_j v_{j,p} / l_j * 100 \]

Where

- \( d_{j,p} \) = monthly violation density occurring on block \( j \) in period \( p \), per 100 feet;
- \( v_{j,p} \) = number of violations occurring on block \( j \) in period \( p \);
- \( l_j \) = length of block \( j \), feet.
Undesignated Parking by Violation Type (Zone 1)

Before Implementation

- NP/NS: 25.8%
- Meter: 5.13%
- Other: 5.02%
- DP: 63.2%
- Bus: 3.02%
- Obstruction: 4.8%

After Implementation

- NP/NS: 16%
- Meter: 4.8%
- Other: 3.02%
- DP: 75.6%
- Bus: 3.02%
- Obstruction: 4.8%

- About **90%** of violation type comes from NP/NS and Meter both before and after the implementation;
- The share of violations issued as NP/NS tickets increased by **13%** (from **63%** to **76%**), while Metered tickets decreased from **26%** to **16%** and Double Parking dropped from **5%** to **3%**;
- From field observations, double parking has dropped off.
Time of day distributions in Zone 1

Clear Curbs start from April 2018
Frequent Violators

Three groups of frequent violators – those receiving 50+ tickets, 100+ tickets, and 200+ tickets in Zones 1 and 2 over the two-year study period (January 2017 - December 2018) were summarized;

The highest number of tickets observed for a single plate ID was 919 tickets issued in 24 months, about 2 tickets per weekday

Among the vehicles receiving more than 50 violations, 98% are freight and service-related vehicle body types (DELV, VAN, REFG, or TRAC); this is a substantially higher share than the 77% observed for all violations

<table>
<thead>
<tr>
<th>Violation Frequency per Vehicle</th>
<th>No. Unique Vehicles</th>
<th>% of Total Vehicles (76514)</th>
<th>No. Violations</th>
<th>% of Total Violations Issued (309063)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50+</td>
<td>776</td>
<td>0.98%</td>
<td>98,505</td>
<td>32%</td>
</tr>
<tr>
<td>100+</td>
<td>305</td>
<td>0.38%</td>
<td>65,395</td>
<td>21%</td>
</tr>
<tr>
<td>200+</td>
<td>108</td>
<td>0.14%</td>
<td>38,557</td>
<td>12%</td>
</tr>
</tbody>
</table>
Vehicle Zone Pair

**Before Implementation**

- Zone 1
  - Stay in Zone 1
  - Shift to Zone 2
  - Not Observed

**After Implementation**

- Stay in Zone 1
- Shift to Zone 2
- Not Observed

<table>
<thead>
<tr>
<th>Zone Before Clear Curbs Implementation</th>
<th>Zone Before Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone</td>
<td>1</td>
</tr>
<tr>
<td>Total Observed Vehicles</td>
<td>142</td>
</tr>
<tr>
<td>Percent by Response After Implementation</td>
<td></td>
</tr>
<tr>
<td>Stay in Zone</td>
<td>59.2%</td>
</tr>
<tr>
<td>Observed in Other Zone</td>
<td>26.8%</td>
</tr>
<tr>
<td>Not Observed</td>
<td>14.1%</td>
</tr>
</tbody>
</table>
Case study 1 (Zone Pair 1-1)

Plate ID: 30649MA
Color: White
Vehicle Type: Van
Total tickets: 372

Zone 1:
- Before: 18 tickets / month
- After: 7 tickets / month

Zone 2:
- Before: 0.6 tickets / month
- After: 2.1 tickets / month

<table>
<thead>
<tr>
<th>Street Name</th>
<th>Before (15months)</th>
<th>After (9 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>West 45</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>West 46</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td><strong>West 47</strong></td>
<td><strong>272</strong></td>
<td><strong>45</strong></td>
</tr>
<tr>
<td>West 48</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>West 49</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>West 50</td>
<td>NA</td>
<td>1</td>
</tr>
</tbody>
</table>

85%
Case study 2 (Zone Pair 1-1)

Plate ID: 28568MH
Color: Brown
Vehicle Type: Van
Total Ticket: 481
Zone 1:
• Before: 10 tickets / month
• After: 35 tickets / month
Zone 2:
• Before: 0.5 tickets / month
• After: 1.2 tickets / month

<table>
<thead>
<tr>
<th>Street Name</th>
<th>Before (15 months)</th>
<th>After (9 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>East 45th</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>East 47th</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>West 45th</td>
<td>143</td>
<td>310</td>
</tr>
<tr>
<td>West 46th</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>West 47th</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>West 48th</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

94%
Case Study 3 (Zone Pair None-1)

Plate ID: 29078ML
Vehicle Type: Van
Color: Brown
Total tickets: 170

Zone 1:
- Before: 0 tickets / month
- After: 19 tickets / month

<table>
<thead>
<tr>
<th>Street Name</th>
<th>Before (15 months)</th>
<th>After (9 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>West 46th</td>
<td>0</td>
<td>170</td>
</tr>
</tbody>
</table>

100% Clear Curbs

19:00pm
16:00pm
10:00am
7:00am
Case Study 4 (Zone Pair 1-None)

Plate ID: 83404MG
Vehicle Type: Van
Color: White
Total tickets: 61

Zone 1:
• Before: 3.5 tickets / month
• After: 0 tickets / month

Zone 2:
• Before: 0.3 tickets / month
• After: 0.6 tickets / month

<table>
<thead>
<tr>
<th>Street Name</th>
<th>Before (15 months)</th>
<th>After (9 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>East 45th</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>East 47th</td>
<td>34</td>
<td>0</td>
</tr>
<tr>
<td>East 49th</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Madison Ave</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>West 47th</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>West 48th</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>West 49th</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

Street Name | Before | After |
-------------|--------|-------|
East 45th    | 4      | 0     |
East 47th    | 34     | 0     |
East 49th    | 2      | 0     |
Madison Ave  | 3      | 0     |
West 47th    | 2      | 0     |
West 48th    | 1      | 0     |
West 49th    | 6      | 0     |
Case Study 5 (Zone Pair 1-2)

Plate ID: 53856ME
Vehicle Type: Van
Color: White
Total ticket: 92

Zone 1:
- Before: 2 tickets / month
- After: 0 tickets / month

Zone 2:
- Before: 1 tickets / month
- After: 5 tickets / month

<table>
<thead>
<tr>
<th>Street Name</th>
<th>Before (15 months)</th>
<th>After (9 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadway</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>East 43rd</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>East 46th</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>East 49th</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>East 52nd</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Lexington Ave</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Madison Ave</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>West 43rd</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>West 44th</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>West 46th</td>
<td>26</td>
<td>0</td>
</tr>
<tr>
<td>West 47th</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>West 48th</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>West 49th</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>West 50th</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>West 51st</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>West 52nd</td>
<td>8</td>
<td>1</td>
</tr>
</tbody>
</table>
Conclusions

• As expected, aggregate results reveal a substantial increase in tickets issued to vehicles in zone 1 following implementation;

• Zone 1 used to generate potential revenue of $325,007 per month (stipulated fine system). Following implementation this number increased by 80.4% (reaching $586,377 per month);

• In both zones, throughout the 24 months, 309,063 tickets were issued to 76,514 vehicles. Less than 1% of vehicles received 32% of all parking tickets. About 0.1% of vehicles (108 out of 76514) received 12% of tickets;

• Vehicles with high delivery violations shows low sensitivity to regulation change;

• In future, given the very small number of operators that account for a very large proportion of violations, follow-up efforts should focus on better understanding this group’s customer demands, their operations and costs, their geographic and temporal constraints, and any other factors that influence their parking choices;
Thank you!
Question and Comments?