The City that Never Sweeps

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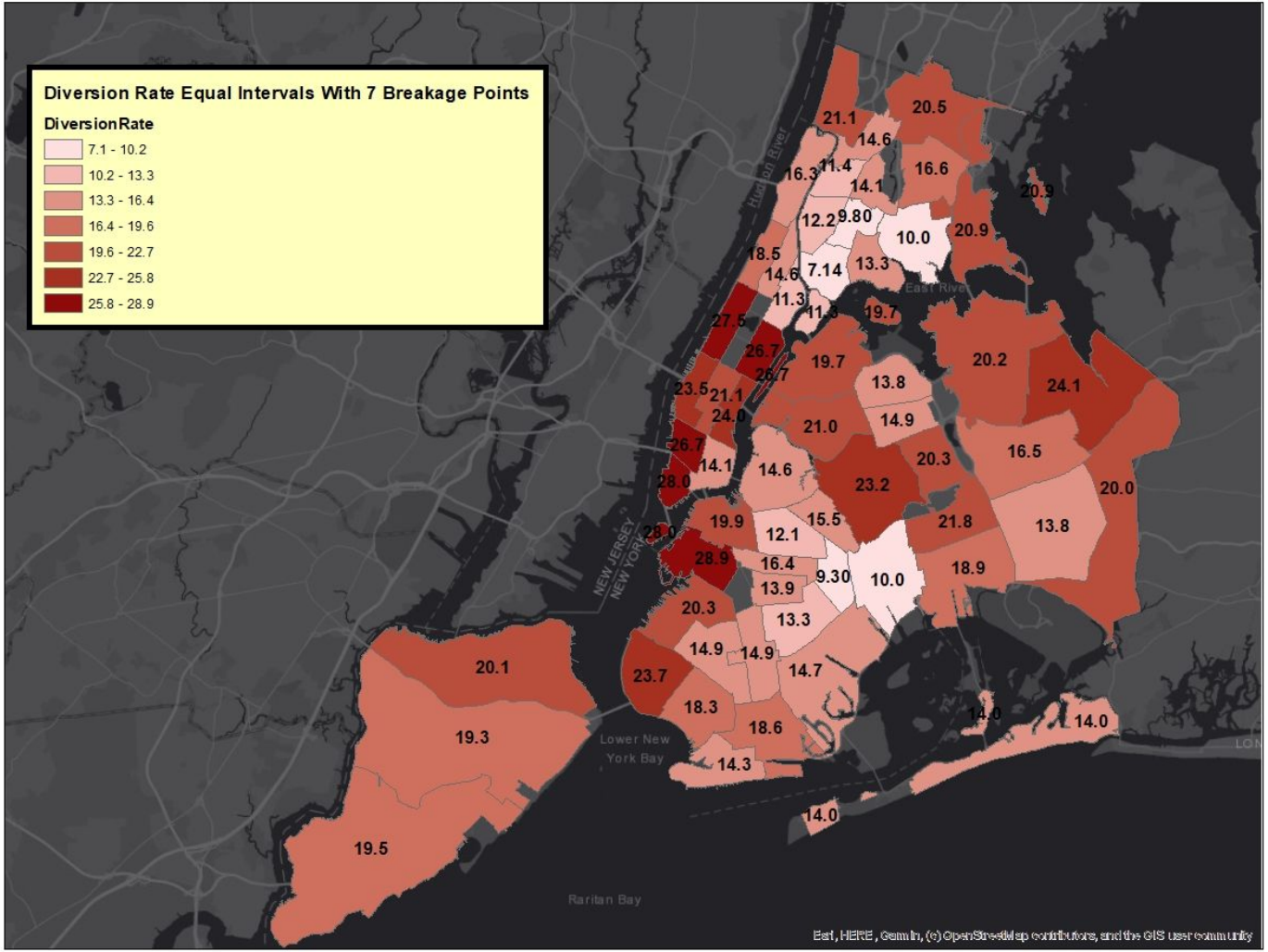
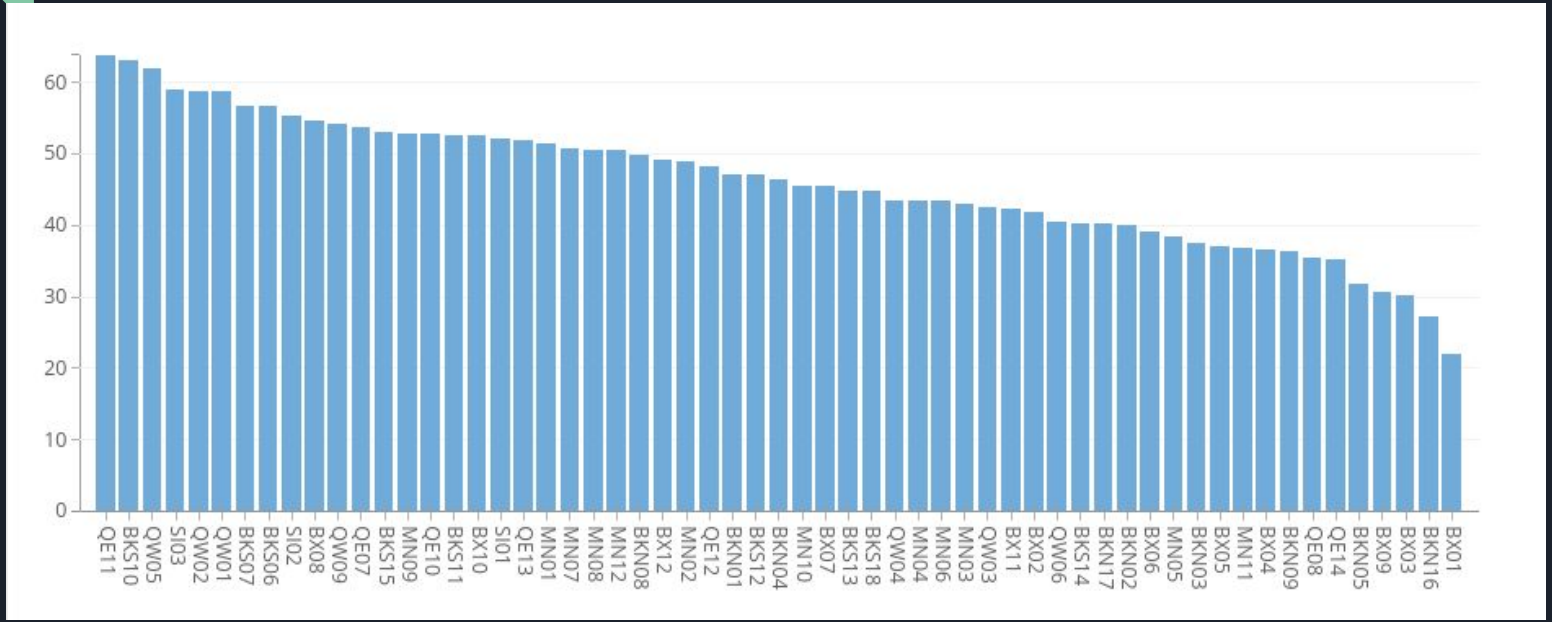
ReNew York

- Two metrics for each zone and district:
  - **Recycling Diversion Rate**
  - **Capture Rate**
- Ratios measure how much of the targeted materials are actually being recycled (success rate)

- **Goal**: target education for specific zones and types of recycling
- We can also use this dataset to predict recycling behavior

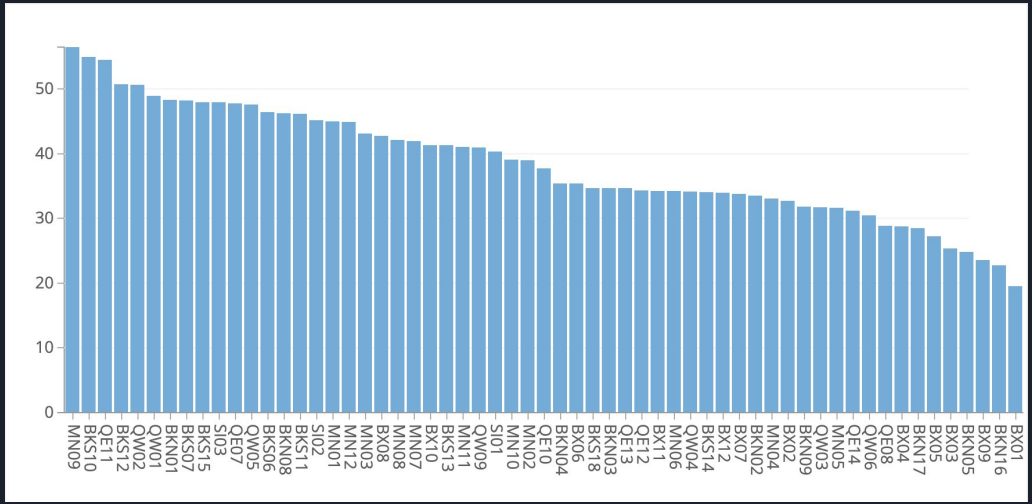

Diversion Rate Equal Intervals With 7 Breakage Points
DiversionRate
7.1 - 10.2
10.2 - 13.3
13.3 - 16.4
16.4 - 19.6
19.6 - 22.7
22.7 - 25.8
25.8 - 28.9
Hudson River
East River
NEW JERSEY
NEW YORK
Lower New York Bay
Raritan Bay
21.1
20.5
14.6
16.3
11.4
16.6
14.1
20.9
12.2
9.80
10.0
20.9
18.5
14.6
7.14
13.3
11.3
19.7
27.5
26.7
26.7
19.7
20.2
24.1
23.5
21.1
13.8
24.0
14.9
21.0
26.7
14.1
14.6
20.3
16.5
28.0
23.2
20.0
19.9
15.5
21.8
13.8
12.1
28.9
16.4
9.30
10.0
18.9
13.9
20.3
13.3
14.9
14.9
14.7
20.1
23.7
18.3
14.0
14.0
19.3
18.6
14.3
14.0
19.5
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

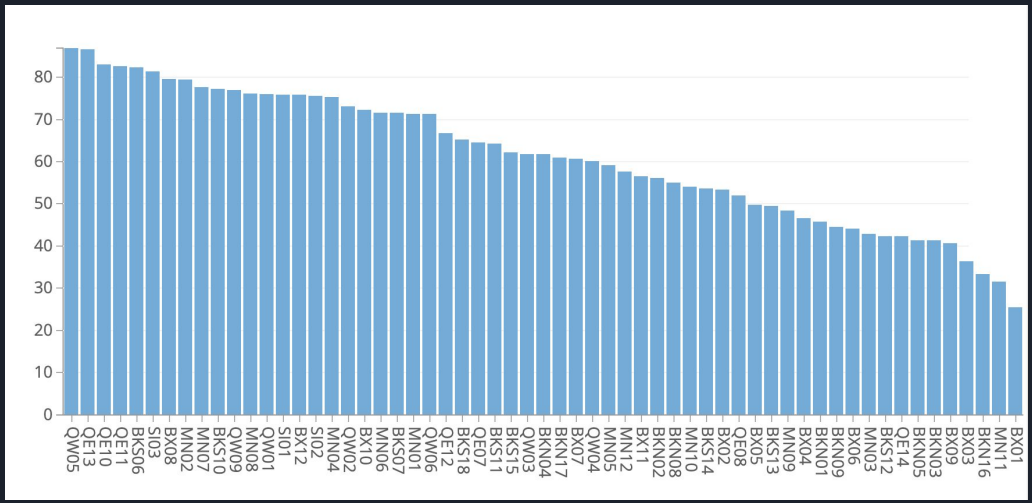
Average Total Capture Rate by District



(Each point is an average over the four fiscal years provided)

Best - QE11 (Queens East), Worst - BX01 (Bronx)

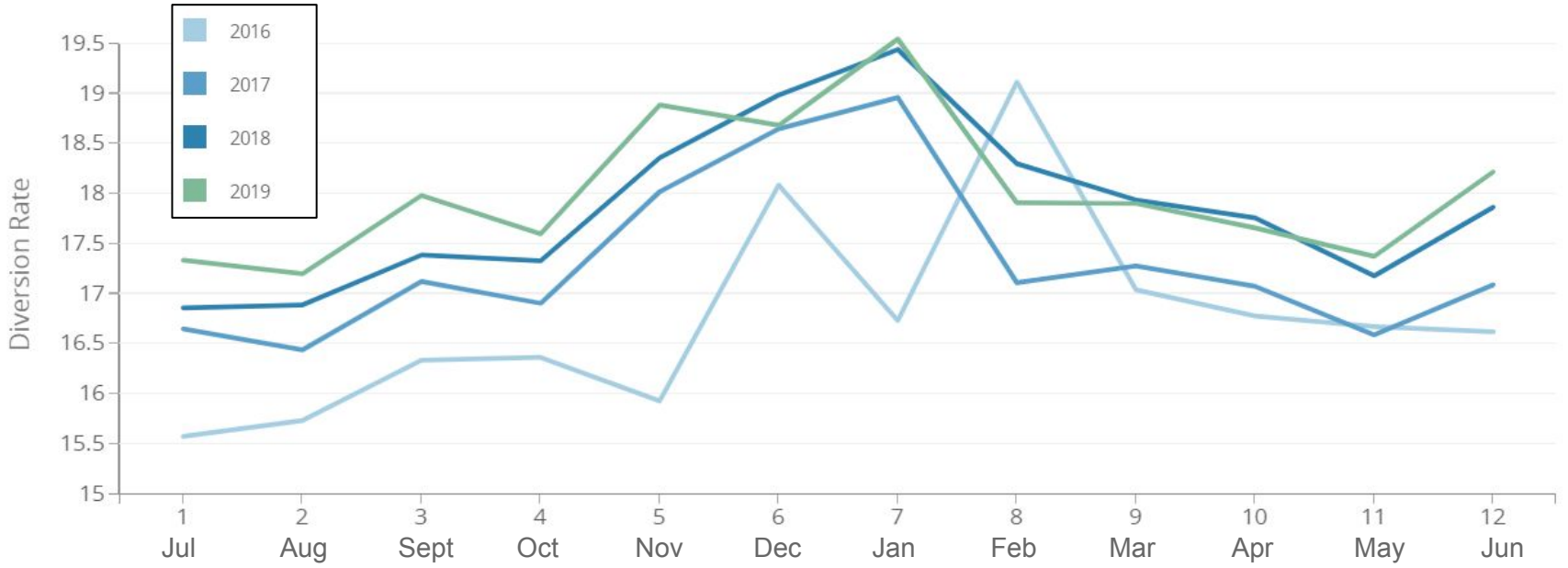




Average Capture Rate by Type by District

- Paper Capture Rate
  - Best - MN09 (Manhattan), Worst - BX01 (Bronx)
- MGP Capture Rate (Metal, Glass, Plastic)
  - Best - QW05 (Queens West), Worst - BX01 (Bronx)

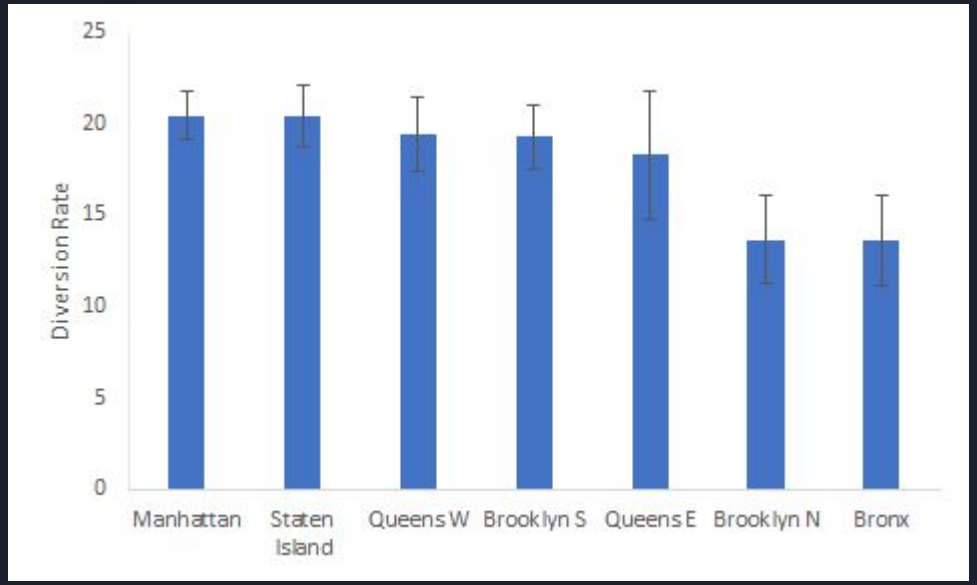
When do they recycle more? (Diversion Rate vs. Fiscal Month)



Why the dip in January 2016?

“Snowfall totals in Central Park were upped from 26.8 inches to 27.5 inches, making the Jan. 22-23 storm the biggest blizzard to hit the city since record keeping began in 1869” (NBC New York).

Recycling Rate Prediction



Predicted annual average diversion rates

Zone	Lower Limit	Upper Limit
Manhattan	19.13	21.82
Staten Island	18.77	22.08
Queens W	17.45	21.50
Brooklyn S	17.56	21.04
Queens E	14.80	21.80
Brooklyn N	11.22	16.13
Bronx	11.15	16.10

Prediction Interval

A $100(1-\alpha)\%$ prediction interval (PI) on a single future observation from a normal distribution is given by

$$\bar{x} - t_{\alpha/2,n-1}s\sqrt{1+\frac{1}{n}} \le X_{n+1} \le \bar{x} + t_{\alpha/2,n-1}s\sqrt{1+\frac{1}{n}} \qquad (8.28)$$

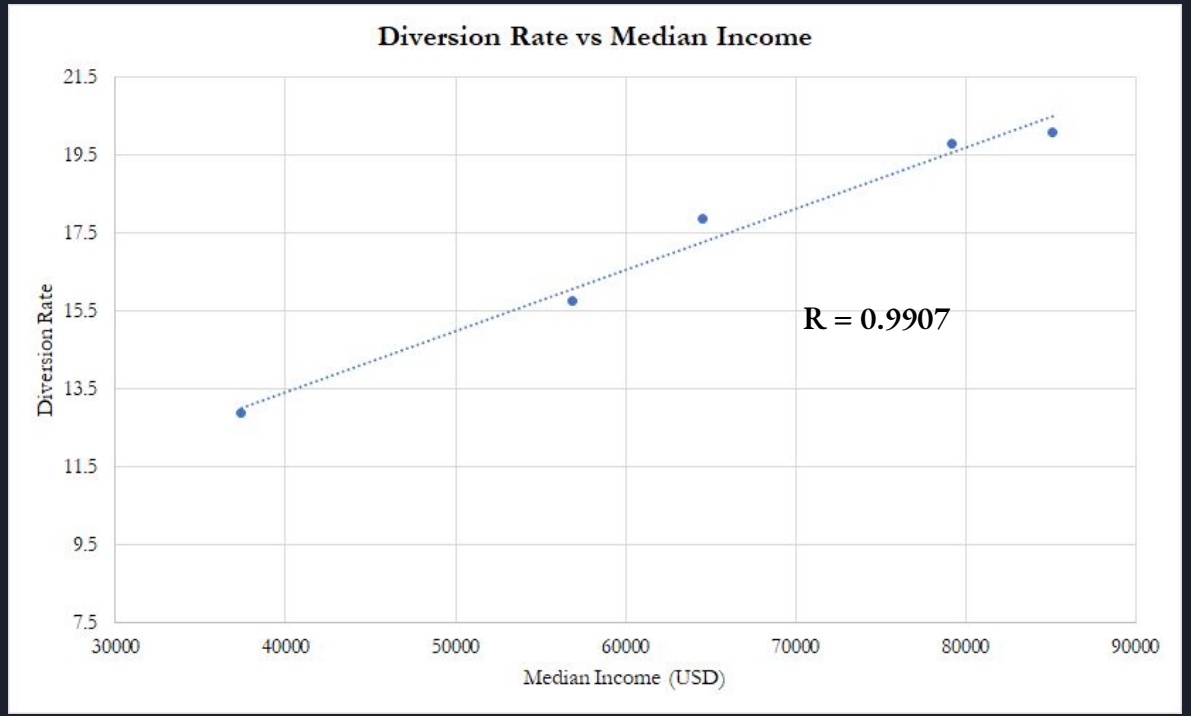
Where to target Recycling Education?

Zones of Concern:

Manhattan

Brooklyn North

Bronx



References

Harris, P. (2011, September 17). Worlds apart – the neighbourhoods that sum up a divided America. *The Guardian*, 1.

https://www.osc.state.ny.us/osdc/rpt7-2019.pdf

Price, D. (2016, April 28). 2016 Blizzard Was NYC's Biggest Snowstorm on Record, NOAA Report Finds. *NBC New York*, 1.