Rhythms of the City

An Analysis of NYC MTA Traffic by Matt Edrich

Introduction

- NYC's community parks represent a wide spectrum of ecological systems
- Roughly half of children in NYC are living in or near poverty[1] (2018)
- Is there broad community support to fund ecologically-focused nature education programs for underserved youth?
- Can such programs be funded with small MTA fare increases?

NYCgov In or Near Poverty Rates, by Borough
Children Under 18, 2005 - 2018
(Numbers are Percent of the Population)

Borough	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Bronx	63.5	63.3	62.2	66.8	64.3	66.6	65.5	70.1	69.3	71.2	68.0	65.6	68.2	66.7
Brooklyn	57.6	58.4	58.3	56.5	58.3	61.8	60.6	59.4	58.3	57.2	56.8	54.0	54.6	53.0
Manhattan	42.3	39.9	41.0	35.3	35.7	39.5	36.7	41.5	38.6	36.8	40.2	39.5	38.3	32.2
Queens	47.6	46.5	49.2	47.1	48.0	54.7	53.6	52.9	53.0	52.6	52.5	51.2	51.7	48.6
Staten Island	32.5	35.8	33.3	32.7	38.1	38.6	41.2	39.0	47.3	44.3	41.4	42.7	46.3	40.0
All Children	52.6	52.3	52.8	51.7	52.5	56.6	55.4	56.3	55.9	55.4	54.8	53.0	53.9	51.1

N.A. indicates that variability of estimate exceeds NYC Opportunity threshold for reporting.
Poverty Rates are based on NYC Opportunity methodology. See NYCgov Poverty Measure, 2005 - 2018 for further information.

[1] https://www1.nyc.gov/site/opportunity/poverty-in-nyc/data-tool.page

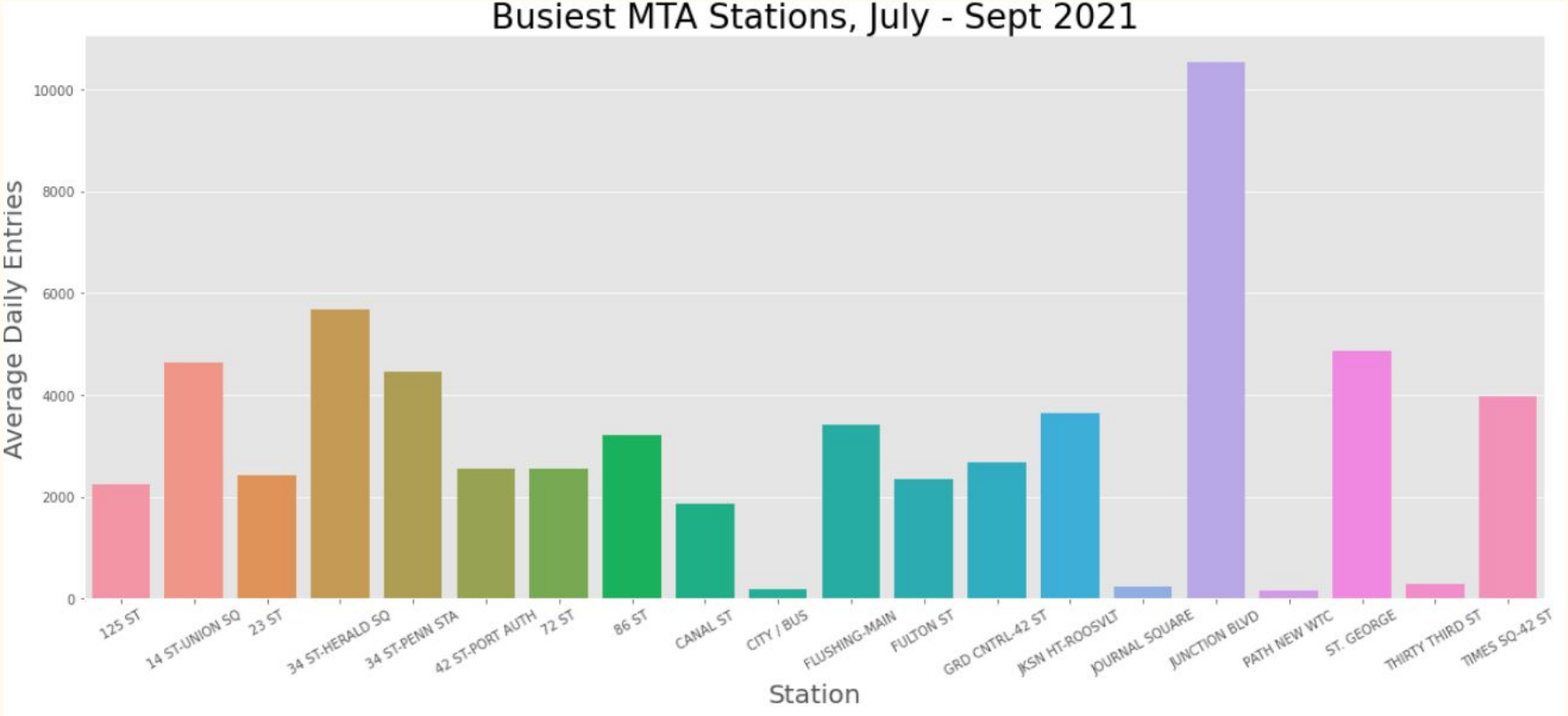
Methodology: Determining Support

- MTA's Turnstile Data contains data collected from each turnstile at 379 transit stations across the city
- Let's clean up this data with Python (Pandas + other libraries) so that we can see how busy each station is at various timestamps, and with varying levels of granularity
- Can we find the names of the twenty busiest stations?
- If so, can we see where these stations are geographically?
- Can we determine the best times to poll the public at these twenty stations?

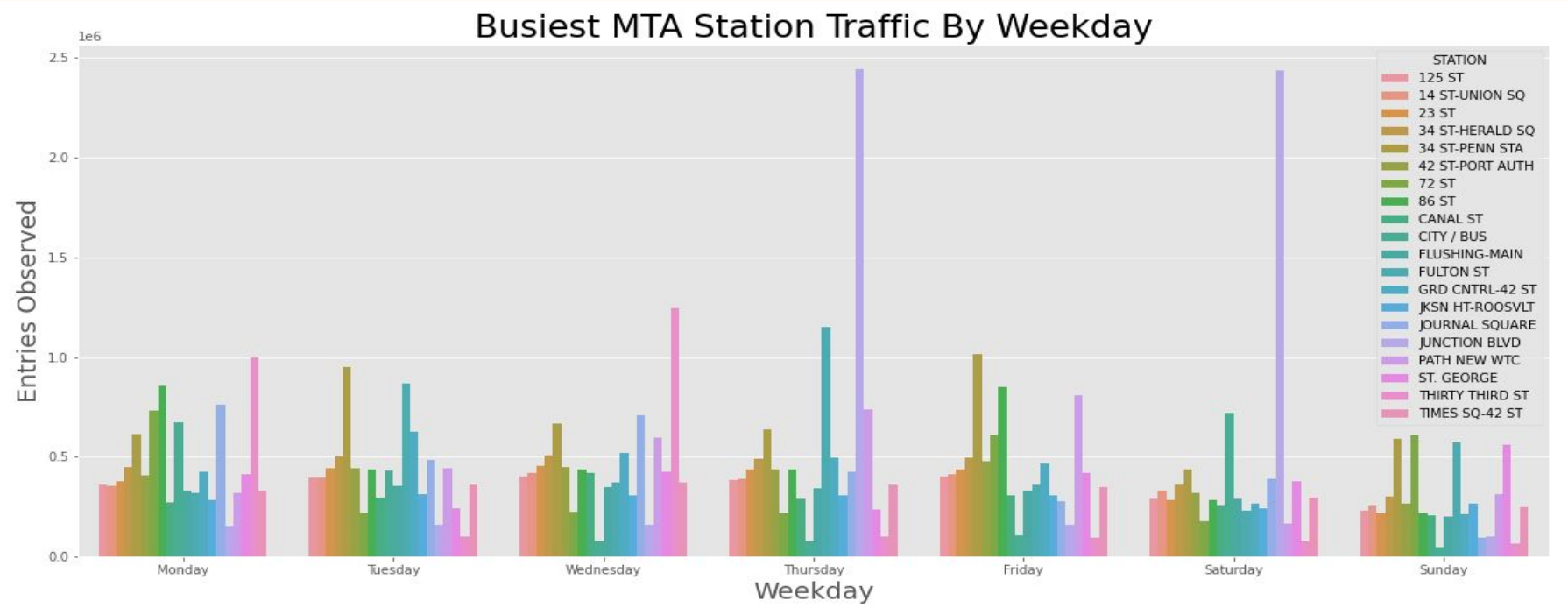
Locations Of Busy Stations

- A general idea of where to find the busiest stations (summer 2021)
- Busy stations occur in the boroughs with the highest *and* lowest rates of children living in/near poverty
- Approximately even spatial distribution
- *No spatial data for Staten Island
- **My spatial dataset didn't "play very nicely" with turnstile data

The Twenty Busiest Stations (Daily Averages)



Cumulative Entries By Weekday



Many stations appear to have two days of the week that are significantly busier than others!

Conclusions

- Nearly 300,000 people use the MTA on an average day!
- Increasing MTA fares **by a quarter** could generate **$293,000** annually
- Increasing MTA fares **by 10%** could generate **$322,000** annually
- Polling the public at the selected 20 stations will give a decent snapshot of the opinion across **4 of 5 boroughs**
- The selected stations generally have **two** busy days per week, with most stations being busiest during the work week
- Recommendation: capitalize on expected high-traffic times (rush hour) during the work week to poll MTA riders on a given station's busiest two days; select weekend times/locations intentionally

Future Work

- Develop station timeseries with greater granularity
- Greater representation of stations in the spatial context
- What would a system of rate increases based on “traffic windows” look like?
- What kinds of parks and ecosystems can be easily accessed by the subway?