



Photo David Green via NorwoodNews.org

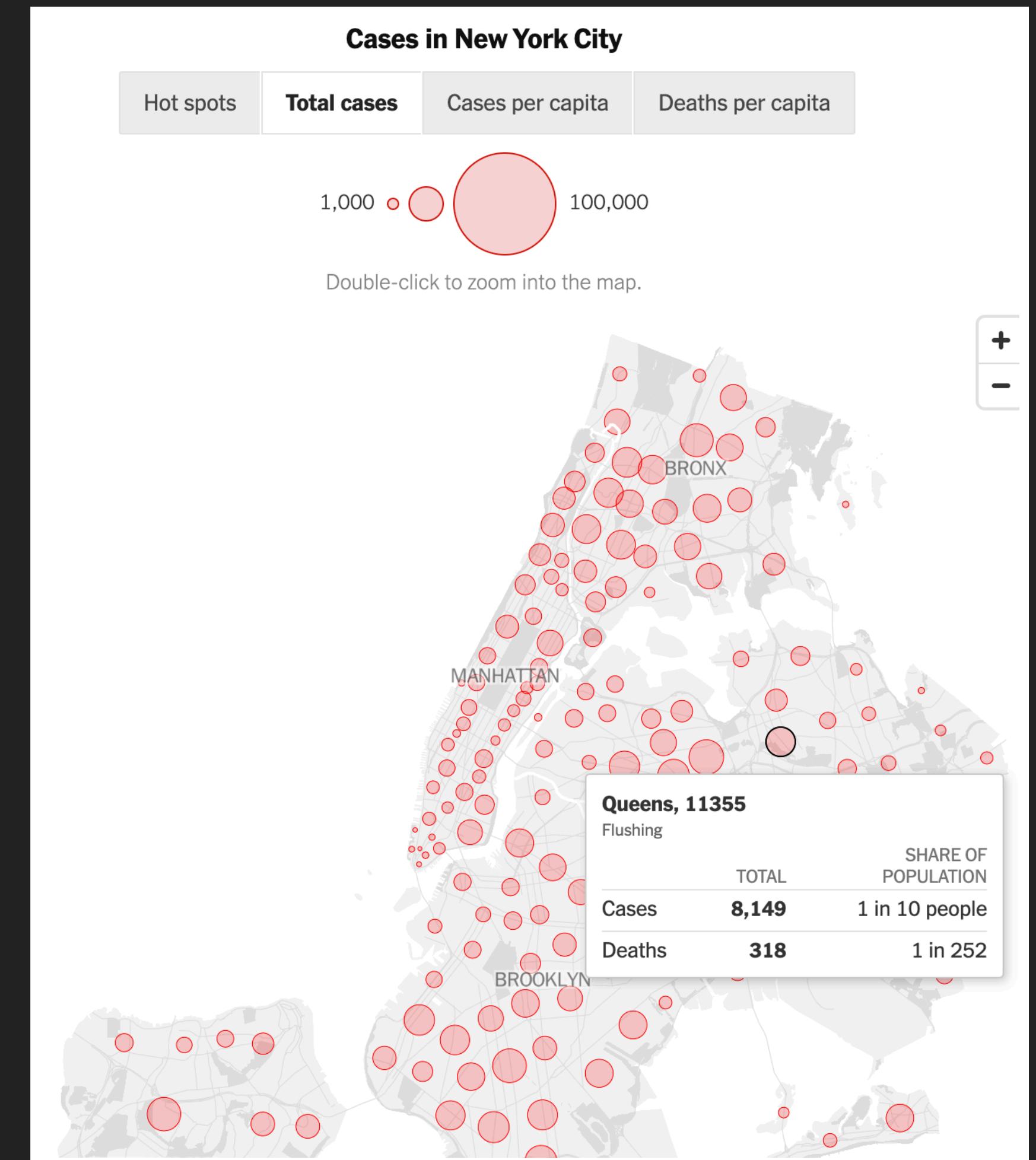
MTA TURNSTILE DATA PROJECT

ADDRESSING HEALTHY EQUITY WITH MOBILE COVID TESTING

Sandra Paredes

INTRODUCTION

- ▶ **Motivation:** In the first year of the COVID pandemic, Queens had a high burden of disease and deaths. Essential works were especially vulnerable because of shift work and unpaid sick leave.
- ▶ **Research Question:** Could the city health department address health equity by deploying mobile COVID testing units to subway stations during late-night hours to reach people who cannot access COVID services during regular hours?
- ▶ **Recommendation:** Assigning mobile COVID testing units to subway stations with high late-night entries could provide testing services for many essential workers.



[New York Times: New York City Coronavirus Map and Case Count](#)

MTA TURNSTILE DATA

METHODOLOGY

- ▶ Dataset: [NYC Subway Turnstile](#)
- ▶ April to June 2019
- ▶ Late-night entries: 12:00 am to 4:00 am
- ▶ Matplotlib and Seaborn
- ▶ [COVID cases by zip code \(2020\)](#)
- ▶ [Income level by zip code \(2019\)](#)

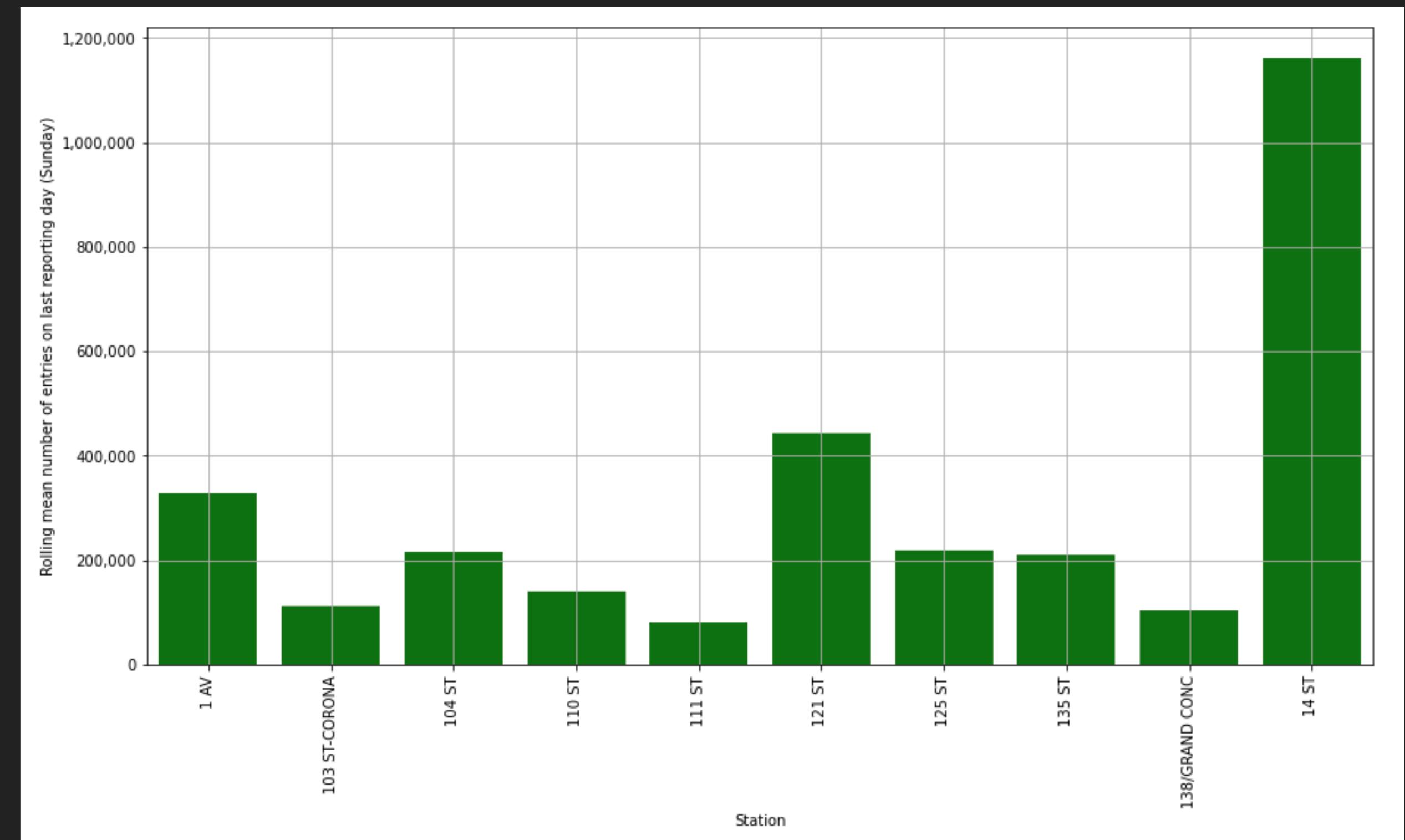


NYC Late Night Service Map

RESULTS

- ▶ Calculated rolling mean by week to compare station entries across New York.
- ▶ The majority of late-night entry traffic is in Manhattan.
- ▶ However, one station in Queens was among the top 10 stations with the highest entries
103rd Street-Corona Plaza.

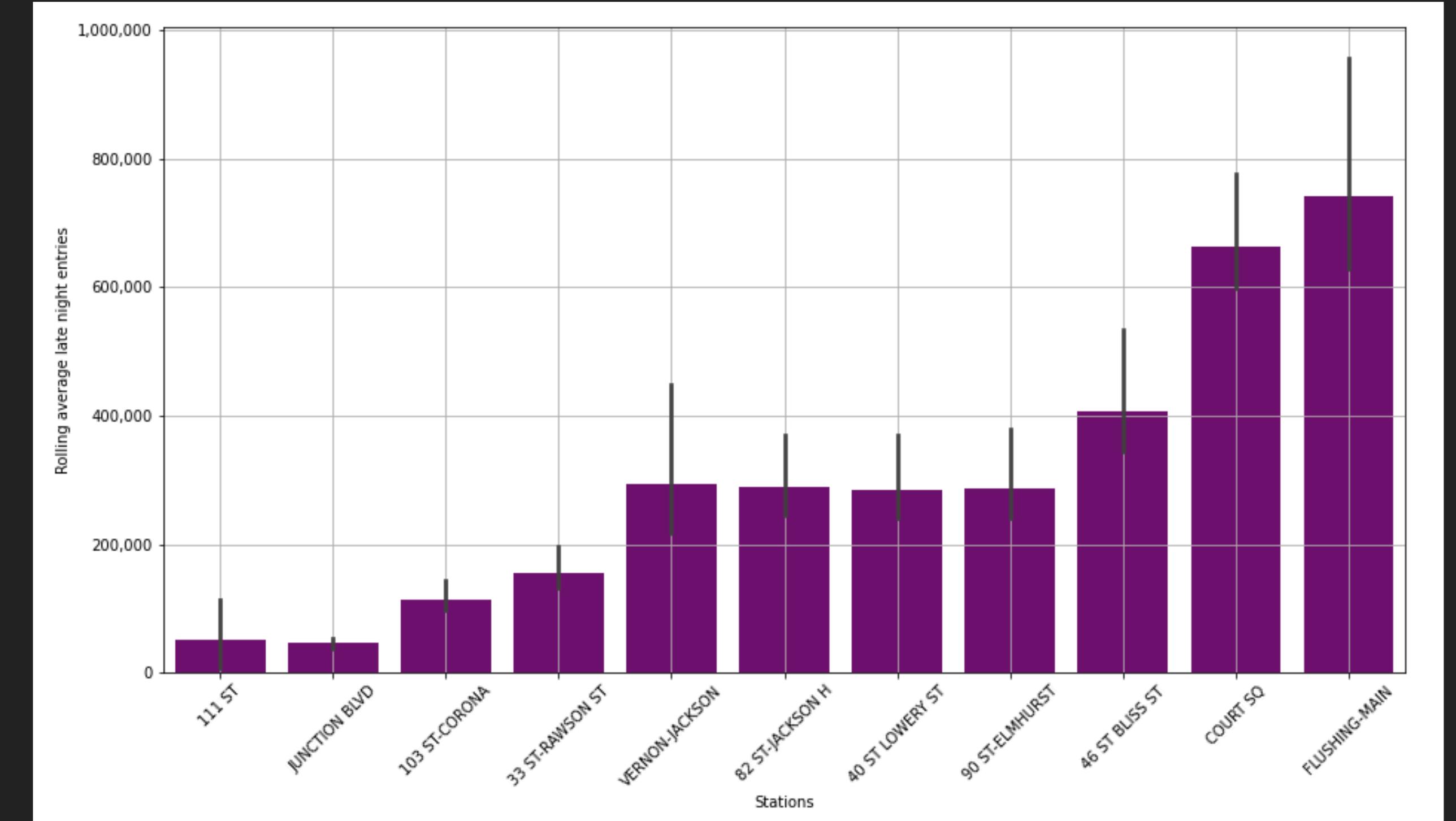
Figure 1.
Top 10: Rolling Mean Late-Night Entries vs. Stations



RESULTS

- ▶ Used the rolling entry average to explore stations where only the 7 train stops in Queens.
- ▶ The majority of the entries on the 7 were at opposite ends of the train line in Queens.
- ▶ However, one station on the 7 train had the highest late-night entries **Flushing-Main Street.**

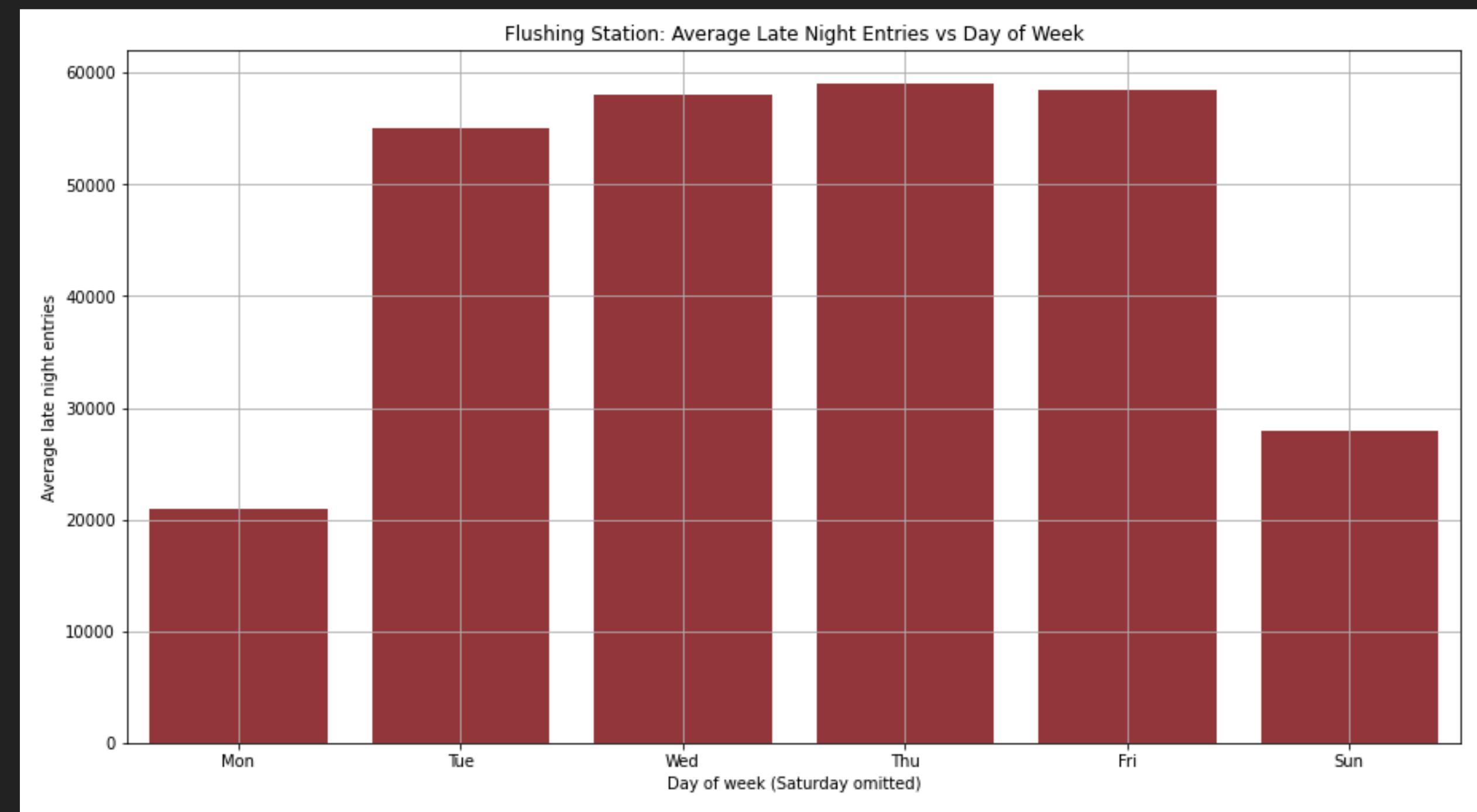
Figure 2.
7 Train: Rolling Mean Late-Night Entries vs. Stations



RESULTS

- ▶ Calculated the average entries by weekday for the Flushing-Main Street station (7 train terminus).
- ▶ Omitted Saturday data with the assumption that it may capture weekend nightlife activity.
- ▶ Weekdays had the highest average entry traffic, especially **Tuesday through Friday.**

Figure 3.
Flushing Station: Mean Late-Night Entries vs. Day



CONCLUSIONS

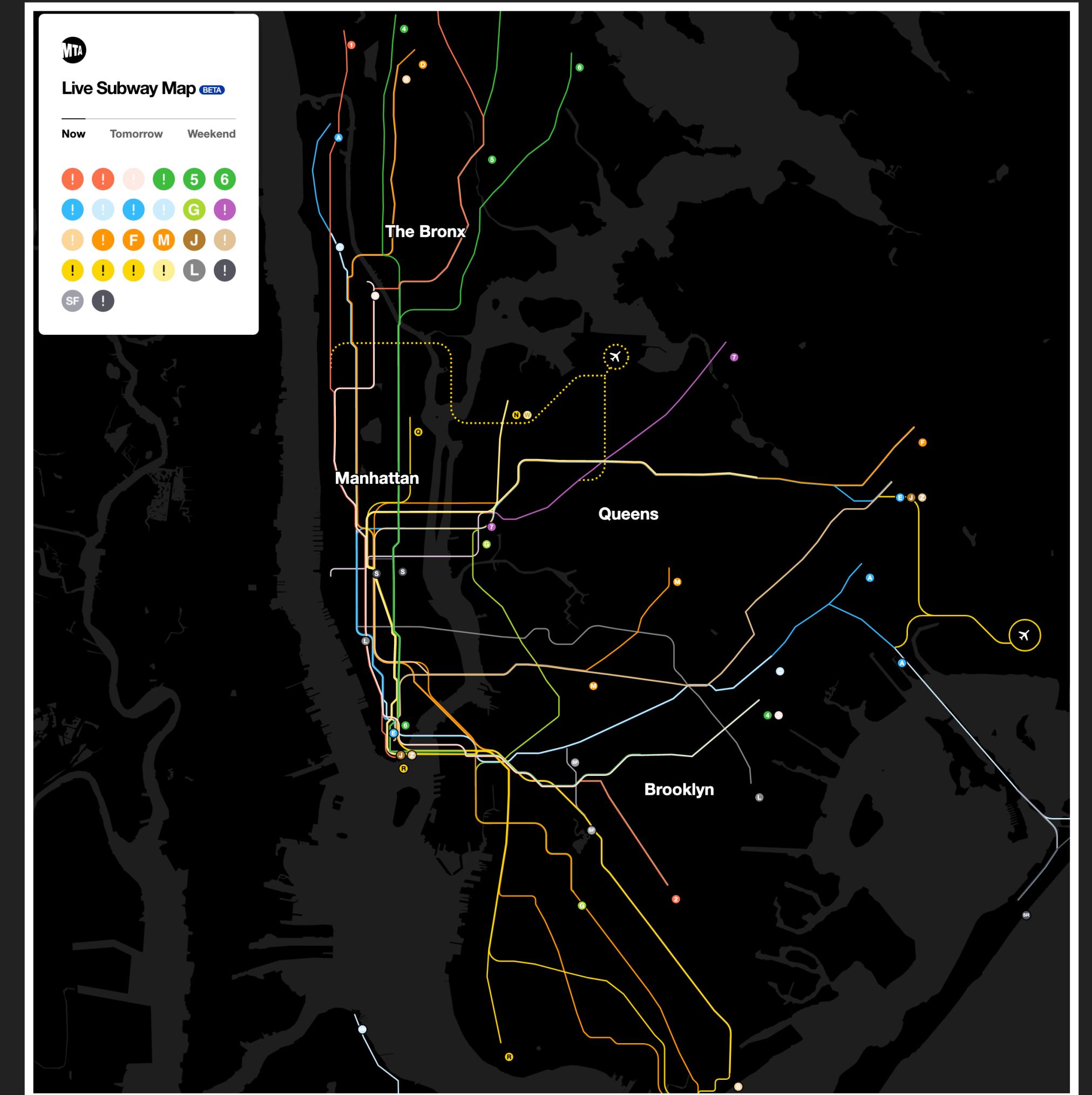
- ▶ Select subway entrances have high foot traffic late at night.
- ▶ Based on the exploration of stations on the 7 train in Queens, the terminus, Flushing-Main Street, and stations close to Manhattan would be strategic places for mobile testing units.
- ▶ Recommend assigning mobile COVID testing units to subway stations with high late-night entries to provide testing services for essential workers.



Photo by Jakayla Toney on Unsplash

FUTURE WORK

- ▶ Explore train lines in the outer borough
- ▶ Explore reporting intervals before 12 am and after 4 am
- ▶ Explore exit data in clusters to minimize travel time of mobile testing units



[Live NYC Subway Map](#)

APPENDIX

- ▶ Blog post, code, and slides are available at github.com/slp22/eda-project

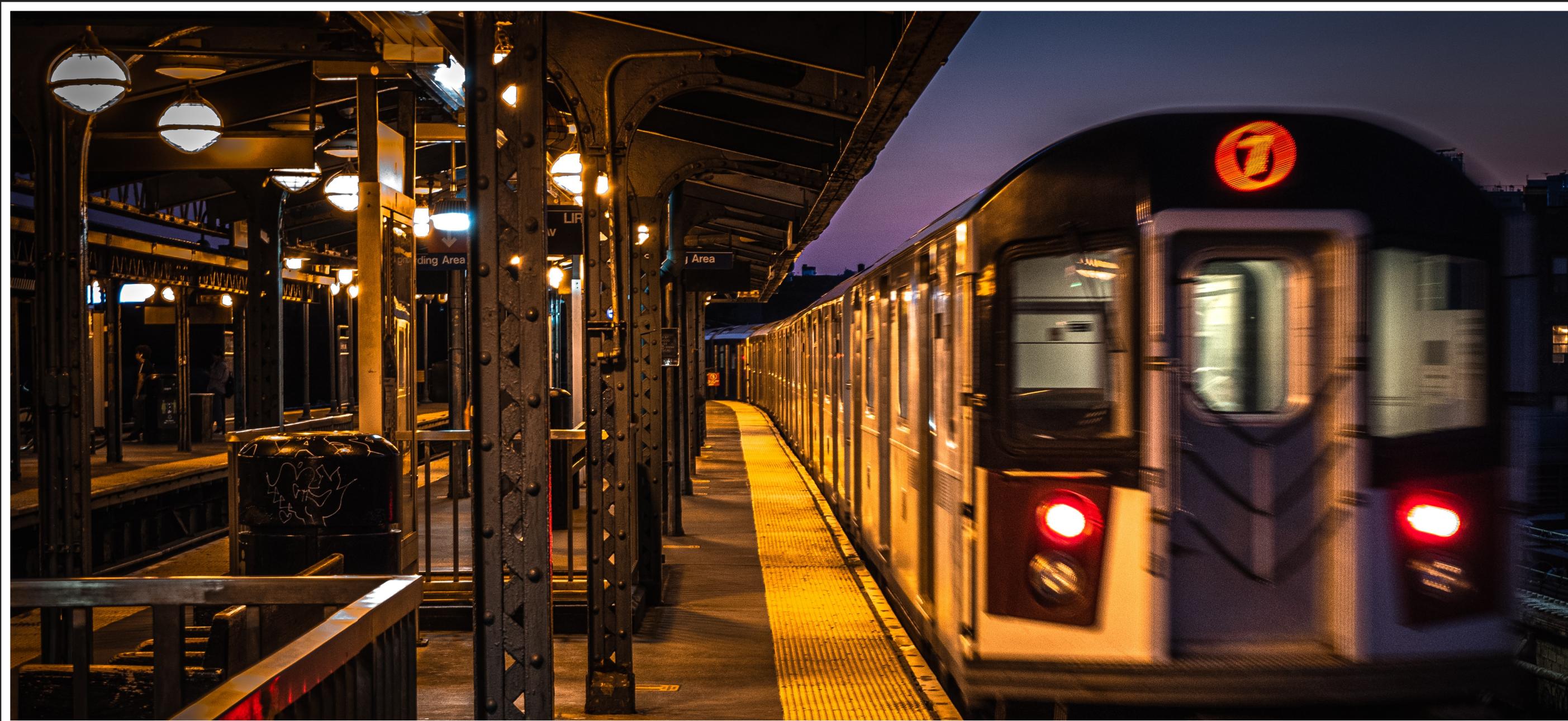


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