



MTA Mask Force Placement

Exploratory Data Analysis

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Backstory



Wearing masks help prevent virus transmission and keep riders and frontline employees safe from the virus. Wearing a mask is required on NYC public transit and at subway stations for COVID safety.



Client Solicit:

Big Apple Cares, a volunteer organization in NYC, requested to find efficient ways to place Mask Force volunteers at subway stations.



The Exploratory Data Analysis (EDA) goal:

To specify the time and location and schedule Mask Force volunteers to maximize the distribution of free masks for riders without wearing masks.

Design



Data Collection

- MTA Turnstiles (March 27 to August 13, 2021)
- MTA Geospatial Data
 - MTA Station Location
 - NYC Borough maps



Data Cleaning

- Remove duplicate data and discard unnecessary data
- Drop missing data and Inconsistent turnstile data, i.e., reverse or reset the counter
- Aggregation for ridership counts (i.e., daily entries)



Data Exploration

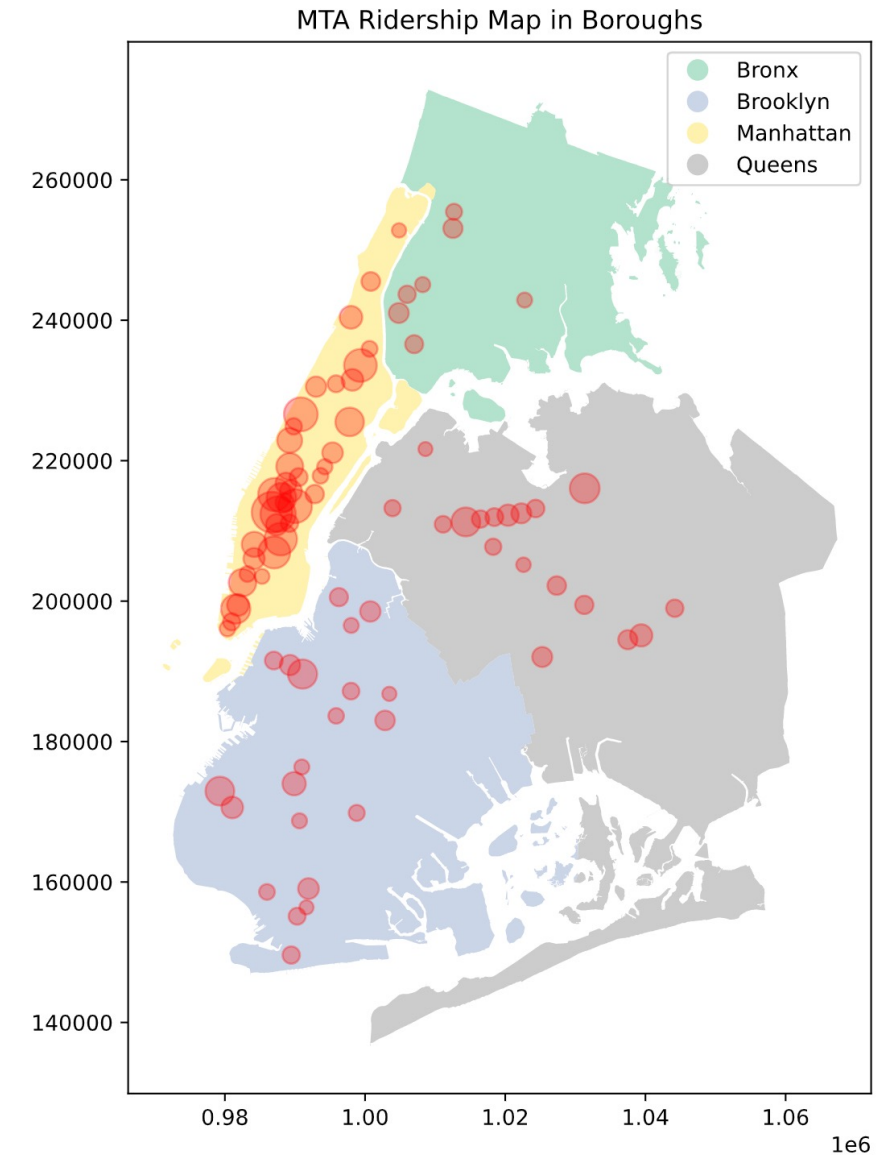
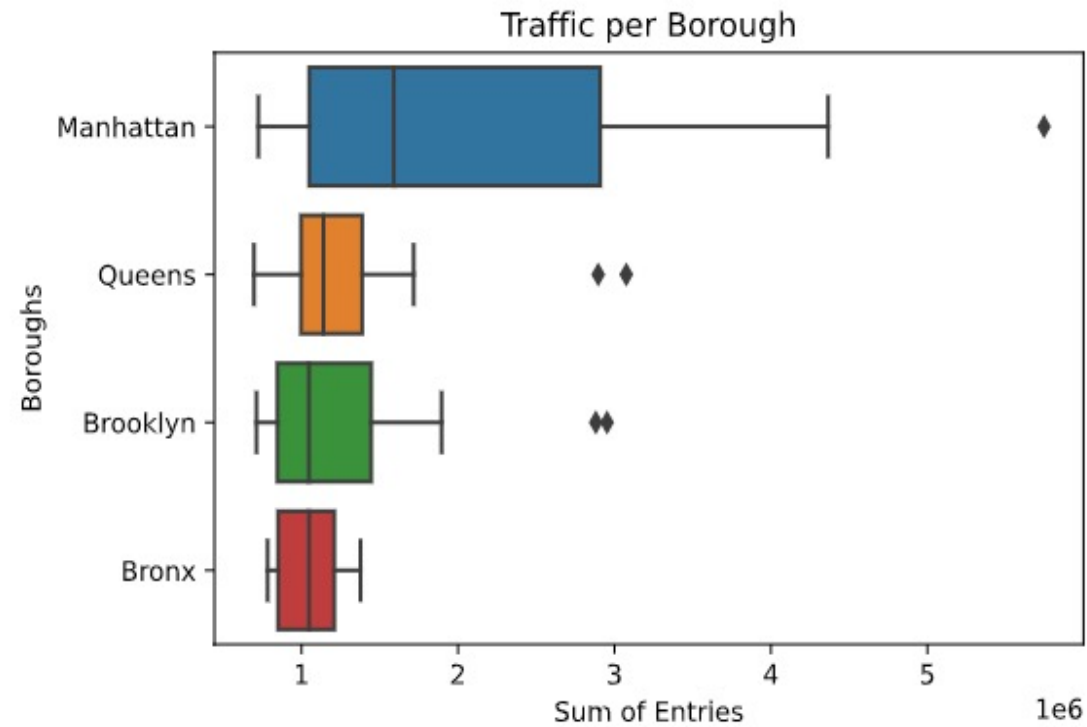
- Which borough are busier than others?
- Which stations need more volunteers?
- What day/time do volunteers need to be at stations?



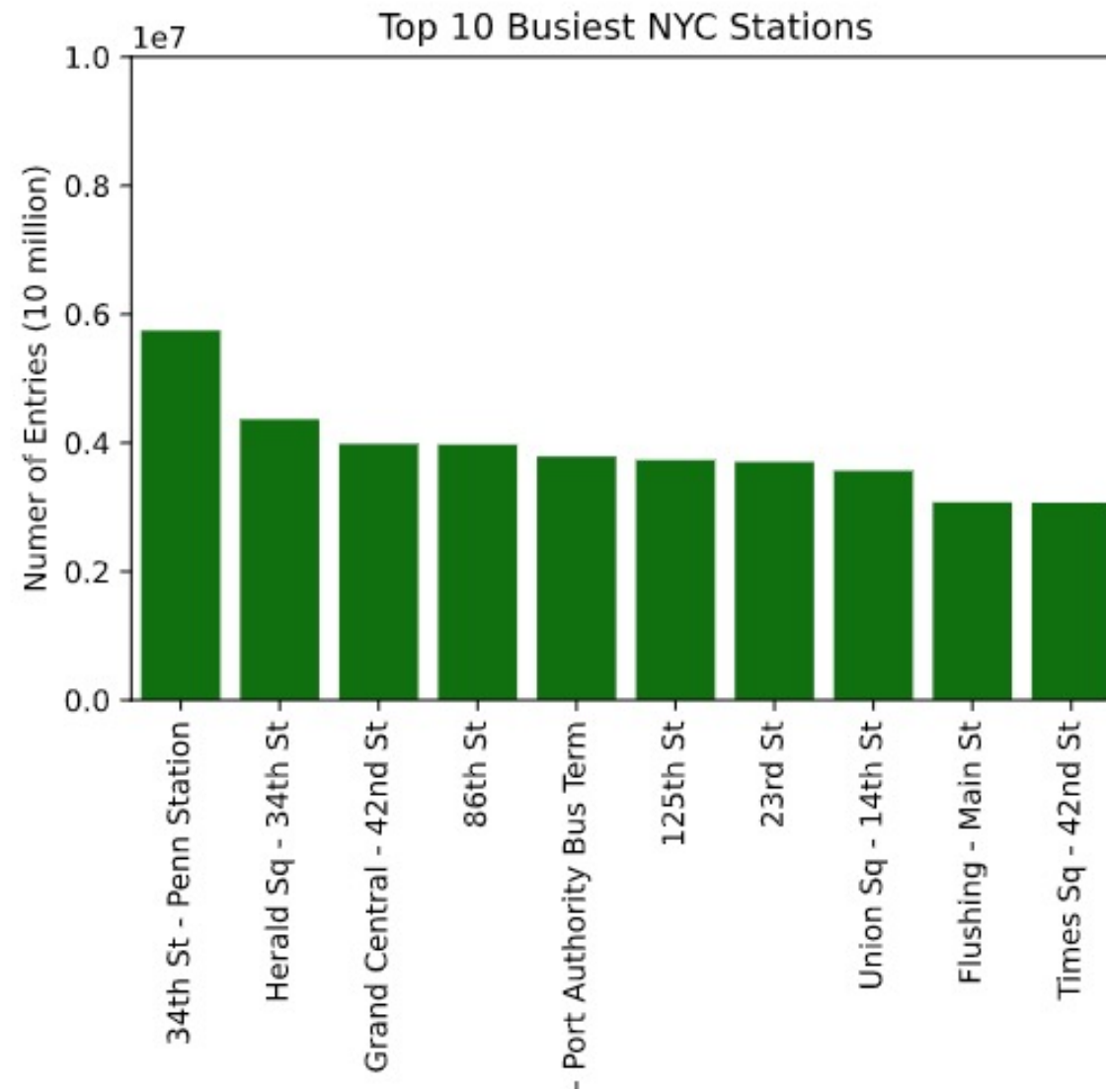
Tools

- Data Manipulation: Pandas, Numpy
- Data Visualization: Matplotlib, Seaborn, Geopandas
- Data Processing: SQLAlchemy

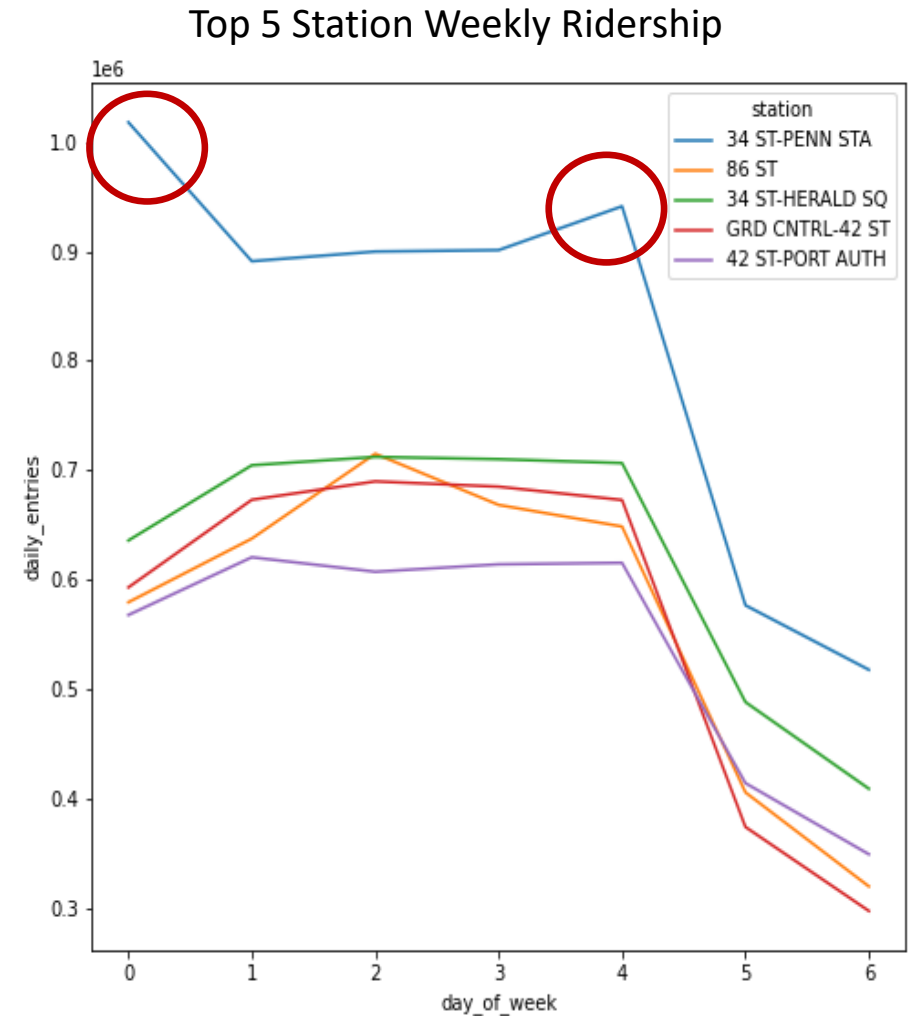
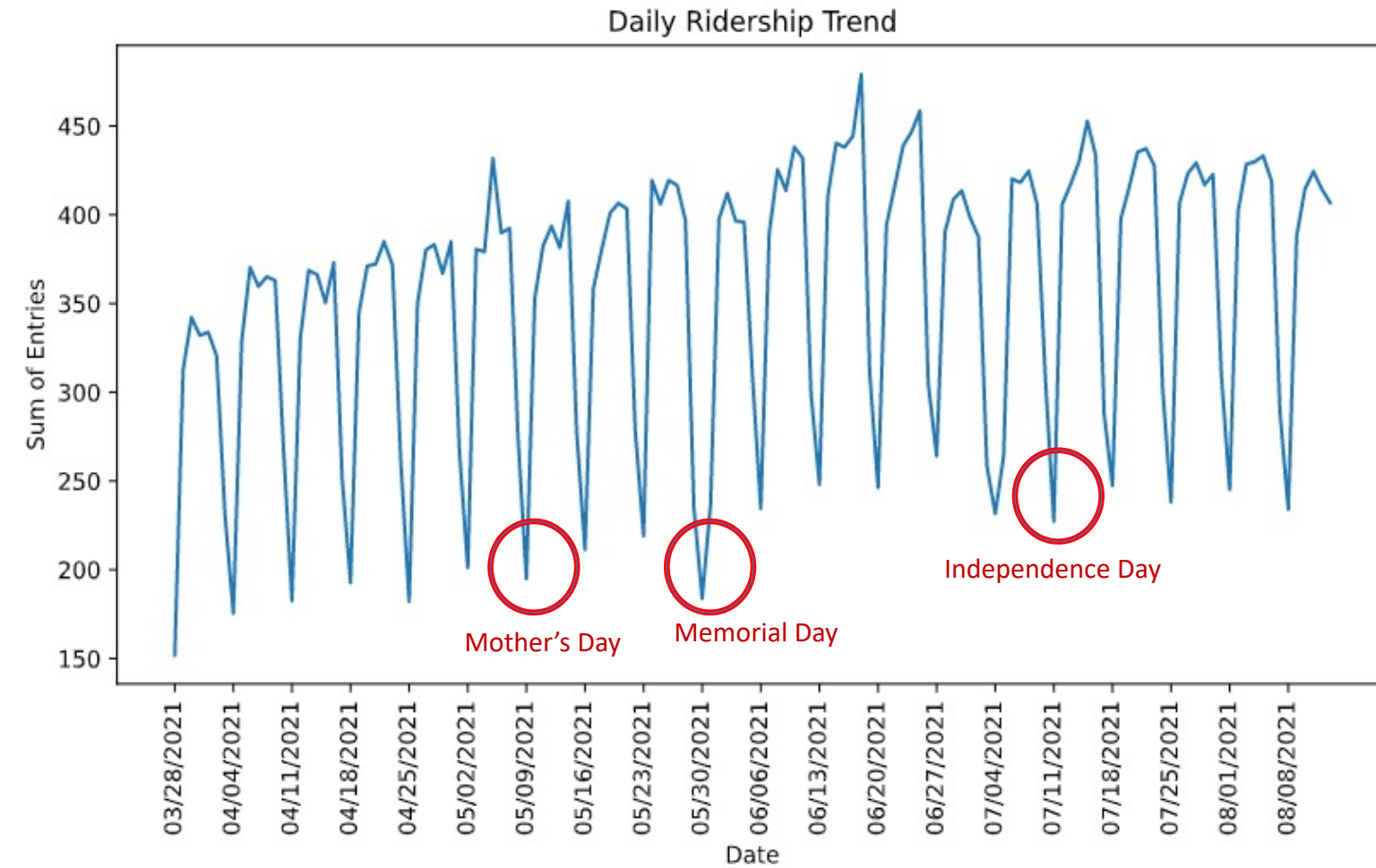
Which borough are busier than others?



Which stations need more volunteers?

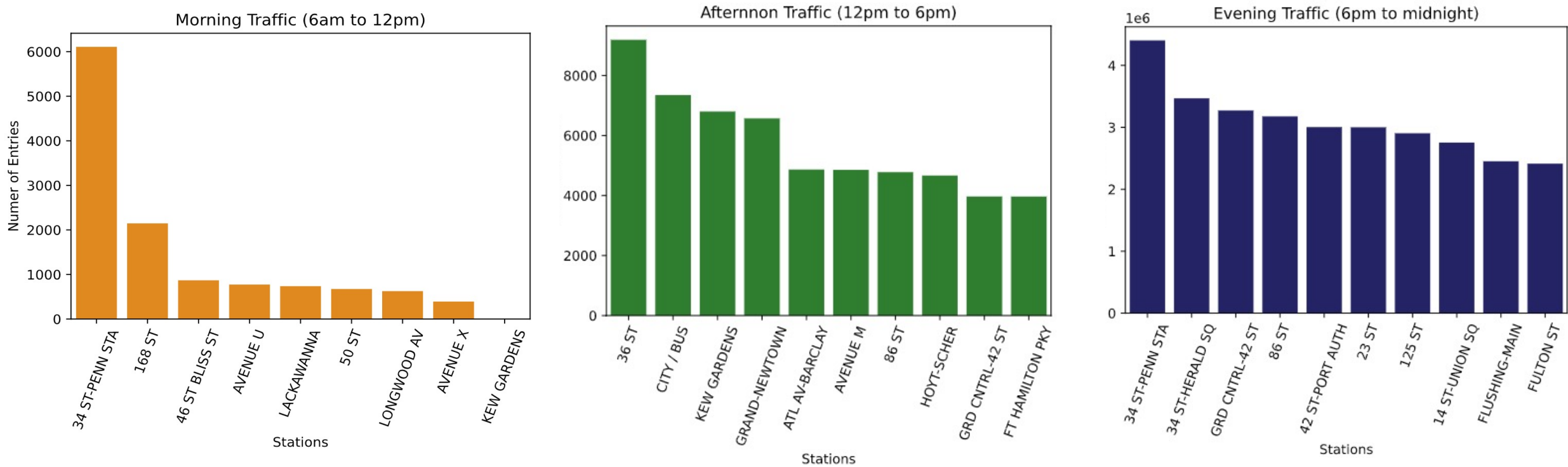


What day do volunteers need to be at stations?



What time do volunteers need to be at stations?

NYC Average Daily Entry (Daytime versus Evening)



Takeaways

Assumptions

- More traffic and crowded stations may have more chance to spread the virus with more crowds
- More riders enter the station, volunteers may encounter those without masks

Conclusions

- Mask Force volunteers should be placed more on weekdays in Manhattan compared to holidays and weekends
- During rush hours, Penn station shows the highest traffic; in the afternoon, the 36th station is the busiest.
- Special note that Penn station is also busy on Mondays/Fridays, unlikely other stations.

Future Study

- Mask behaviors
 - Studies about population groups who are unlikely to wear masks
- Future post-covid traffic trends (e.g., with high vaccination rates and more commuters post-covid)