WomenTechWomenYes

Maximum Reach for Critical Connections

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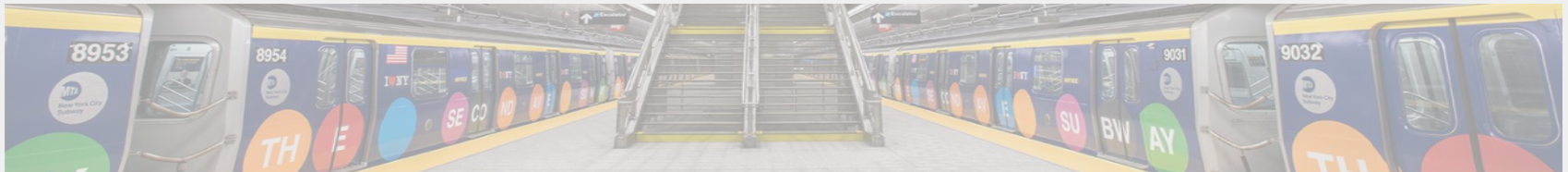
INTRODUCTION | how we help you

- **MOTIVATION**
  - *Critical Connection . . .*

to promote awareness and opportunities for **women in tech**
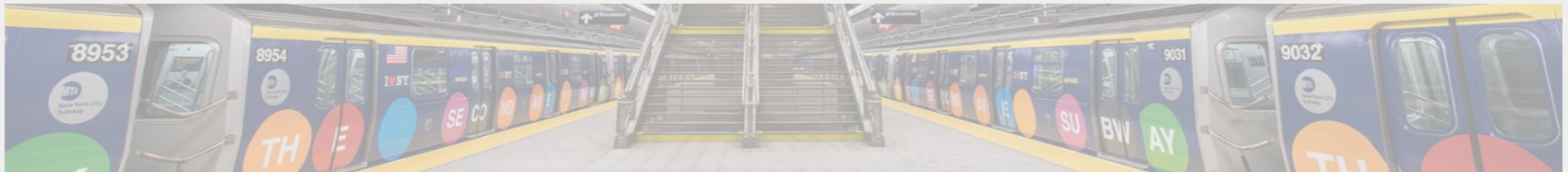
# *INTRODUCTION* | how we help you

- **MOTIVATION**
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- **OBJECTIVE**
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-

to promote awareness and opportunities for **women in tech**

to maximize your resources by **targeting high volume areas**

INTRODUCTION | how we help you

- **MOTIVATION**
  - *Critical Connection . . .*

- **OBJECTIVE**
  - *Maximum Reach . . .*

- **GOALS**
  - *Effective Engagement . . .*

to promote awareness and opportunities for **women in tech**

to maximize your resources by **targeting high volume areas**

to increase your impact on **previously non-connected communities**
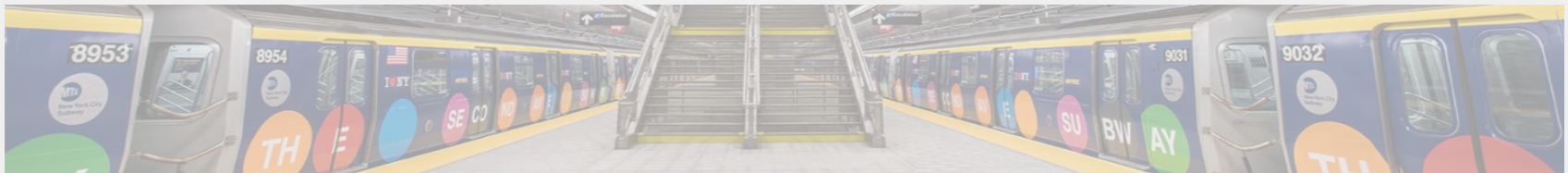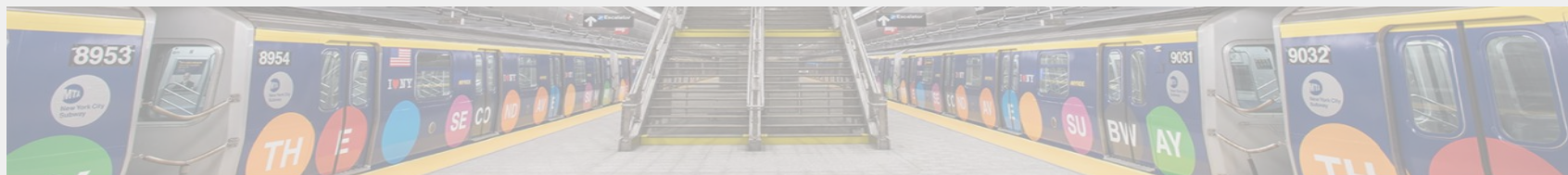
METHODOLOGY | how we did it

Data:

MTA Turnstile data (September 2017, 2018, 2019)
  - Omit Long Island, Westchester, New Jersey, Staten Island
MTA Station geographical data
NYC borough data (GeoPy plugin)

METHODOLOGY | how we did it

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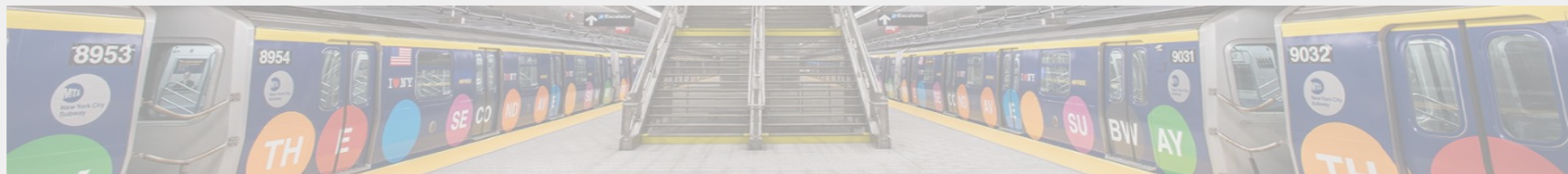
Metrics: MTA Turnstile entries   vs   MTA Turnstile exits
                   MTA Turnstile turns   vs   Geographic distribution

METHODOLOGY | how we did it

Data: MTA Turnstile data (September 2017, 2018, 2019)
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Metrics: MTA Turnstile time of day
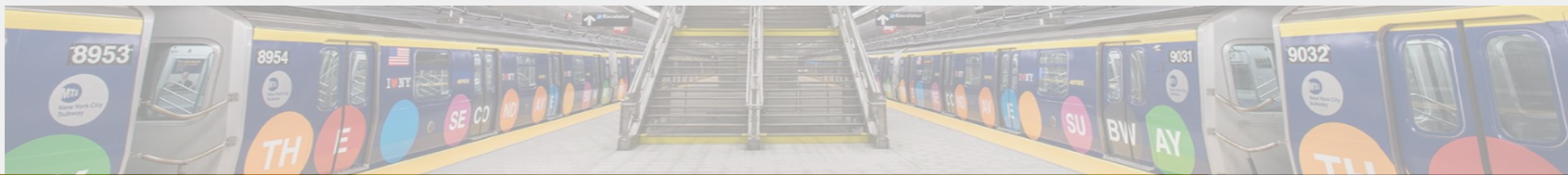   MTA Turnstile turns   vs   Geographic distribution

Tools: Python (pandas, numpy) - *data manipulation*
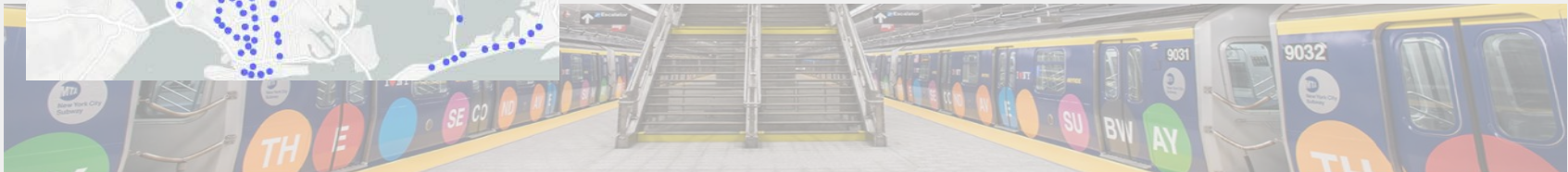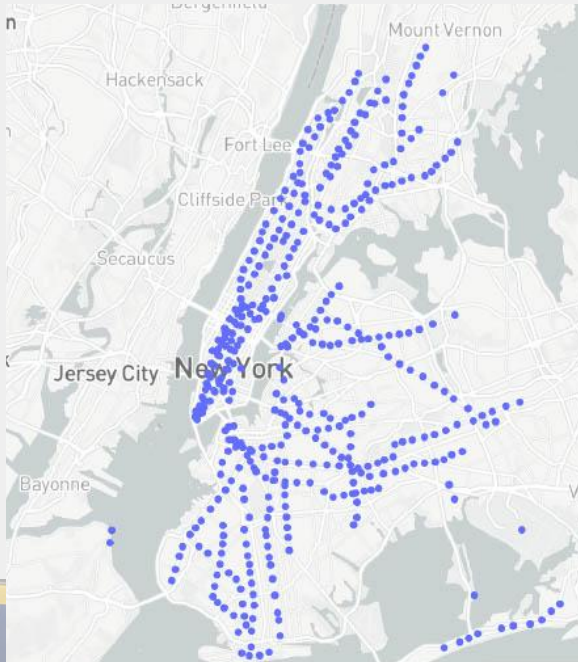   Plotly, matplotlib - *visuals*
                GeoPy - *address / borough data*
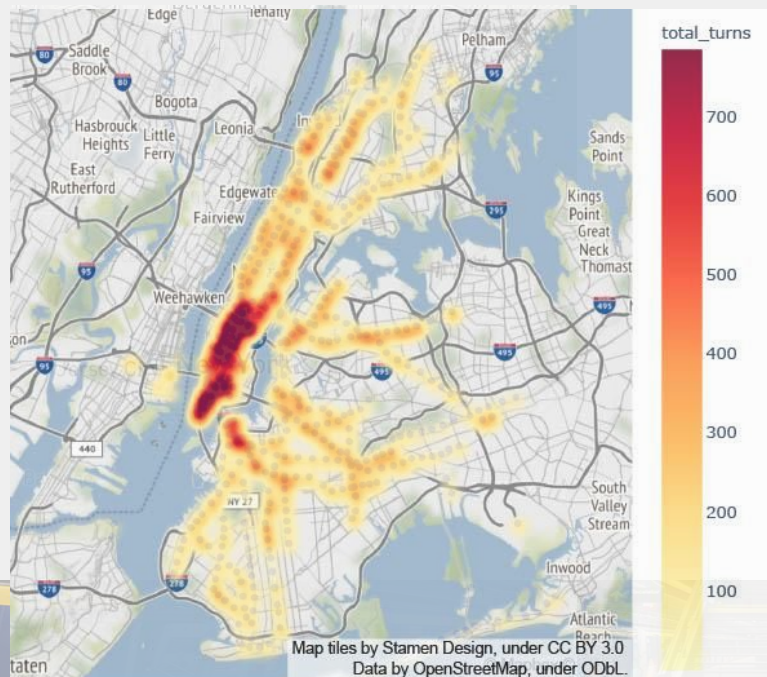
RESULTS | Subway System Reach

- **Blue Dot == Stations**
    - MTA stations designated by *unique turnstiles*
    - Represents boundaries of reach within MTA subway system

- **468 unique locations** in data set
    - ≈ 460 represented here

RESULTS | Heat Map

total_turns

700
600
500
400
300
200
100

Map tiles by Stamen Design, under CC BY 3.0
Data by OpenStreetMap, under ODbL.

- **Highest Concentration** == Manhattan
  - Contingent on midtown transportation hubs
    - 42nd St, 34th St-Penn Station, 14th St

- **Borough Concentrations** == Everywhere
  - Transportation hubs for each borough, in addition to NJ PATH stations
    - Other *hot* areas:
    - Brooklyn - Downtown Brooklyn , Dumbo, Williamsburg
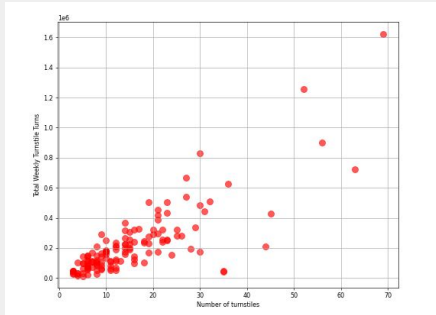   - Queens - Flushing
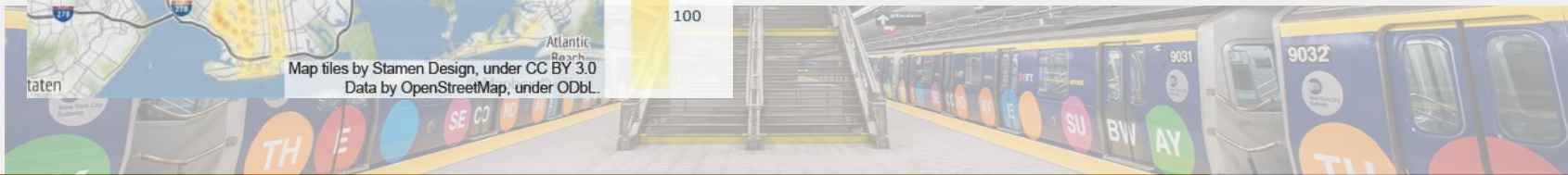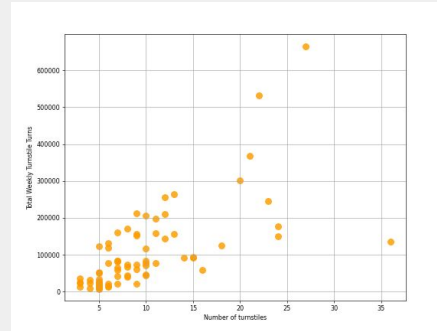
RESULTS | Total Turnstile Turns Per Station

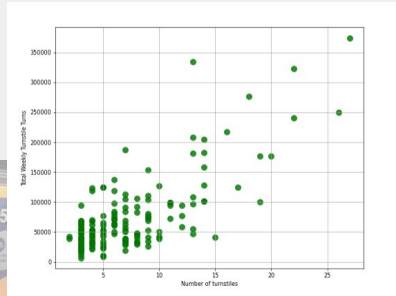### *Manhattan* :

Y-axis range = (0, 1,600,000)

Queens :

Y-axis range = (0, 700,000)
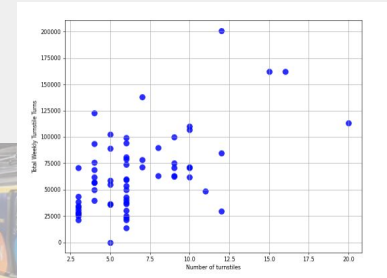

Brooklyn :
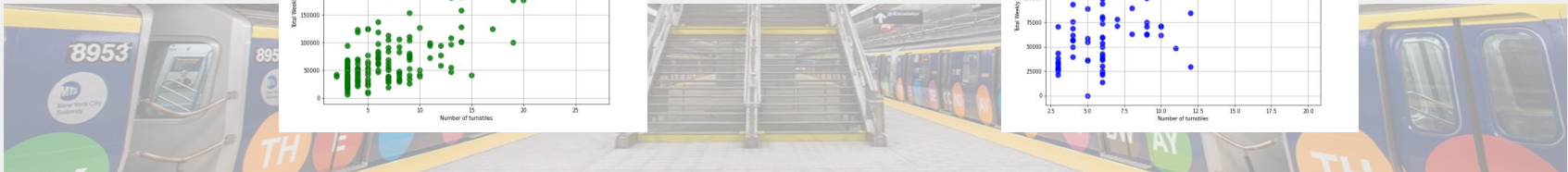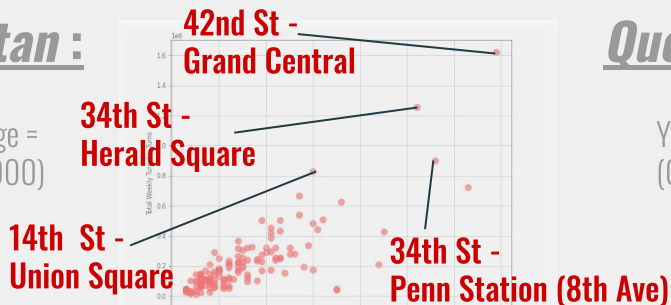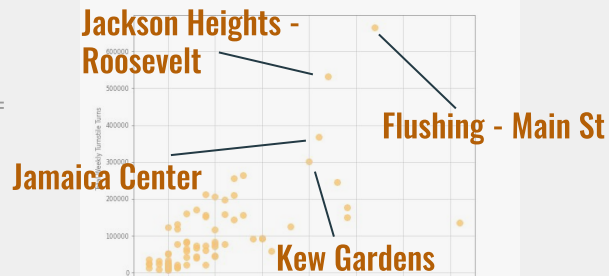
Y-axis range = (0, 400,000)

Bronx :

Y-axis range = (0, 200,000)

X-Axis = # of turnstiles

Y-Axis = turnstile turns

Point = station

RESULTS | Total Turnstile Turns Per Station

Manhattan :

Y-axis range = (0, 1,600,000)

- 42nd St - Grand Central
- 34th St - Herald Square
- 14th St - Union Square
- 34th St - Penn Station (8th Ave)

Queens :

Y-axis range = (0, 700,000)

- Jackson Heights - Roosevelt
- Flushing - Main St
- Jamaica Center
- Kew Gardens

Brooklyn :

Y-axis range = (0, 400,000)

- Jay St - Metrotech
- Bedford Ave
- Borough Hall
- Atlantic Ave - Barclay Center

Bronx :

Y-axis range = (0, 200,000)

- 149th St - Grand Concourse
- Parkchester
- 3rd Ave - 149th St
- 161st St - Yankee Stadium

RESULTS | Busiest Stations by Borough

Manhattan

42nd St-Grand Central Station
34th St-Herald Square
34th St-Penn Station (8th Avenue Line)
42nd St-Port Authority
14th St-Union Square
42nd St-Times Square
Fulton St
59 St-Columbus Circle
34 St-Penn Station (7th Avenue Line)
47th-50th St-Rockefeller Center
Canal St

Brooklyn

Atlantic Av-Barclays Center
Jay St-Metrotech
Bedford Ave
Borough Hall
Crown Heights-Utica Ave
Kings Highway
Myrtle-Wyckoff
Church Ave
Nostrand Ave
Dekalb Ave

Queens

Flushing-Main St
Jackson Heights-Roosevelt Ave
Jamaica Center
Kew Gardens
Sutphin-Archer
Junction Blvd
Forest Hills
103 St-Corona
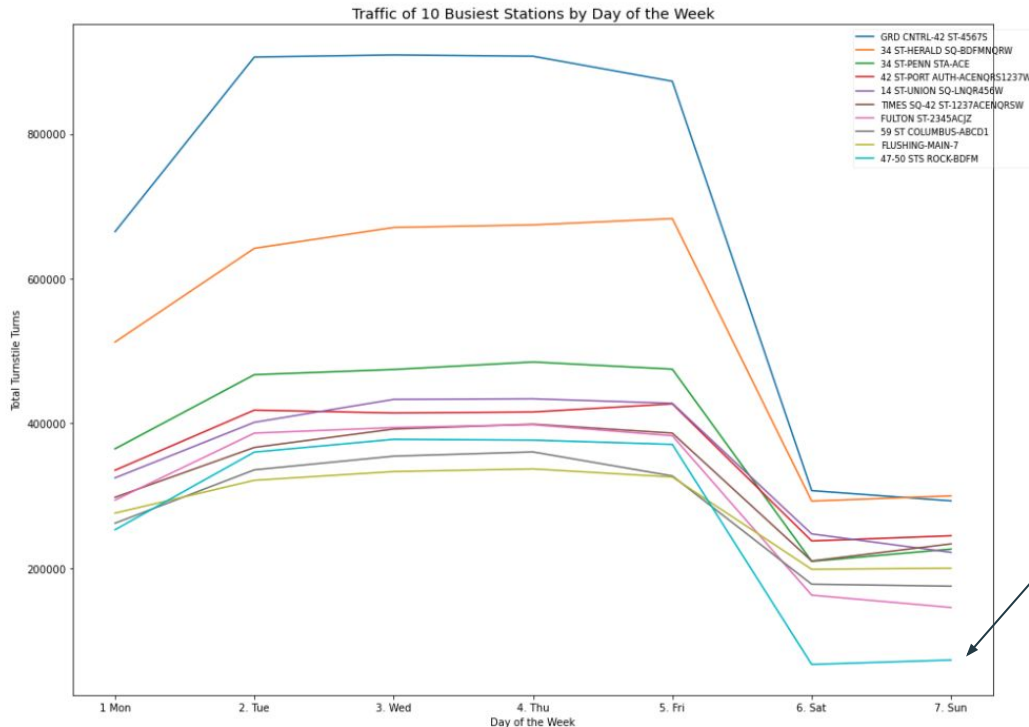**61 St-Woodside**
82 St-Jackson Hts

The Bronx

161 St-Yankee Stadium
Parkchester
3rd Ave-149 St
149th St-Grand Concourse
167th St
Hunts Point Ave
Fordham Road
Burnside Ave
Tremont Ave
Gun Hill Rd

Busiest Stations (Total Turnstile Traffic)

RESULTS | Weekday vs Weekends (NYC)

Traffic of 10 Busiest Stations by Day of the Week

Legend:
- GRD CNTRL-42 ST-4567S
- 34 ST-HERALD SQ-BDFMNQRW
- 34 ST-PENN STA-ACE
- 42 ST-PORT AUTH-ACENQRS1237W
- 14 ST-UNION SQ-LNQR456W
- TIMES SQ-42 ST-1237ACENQRSW
- FULTON ST-2345ACJZ
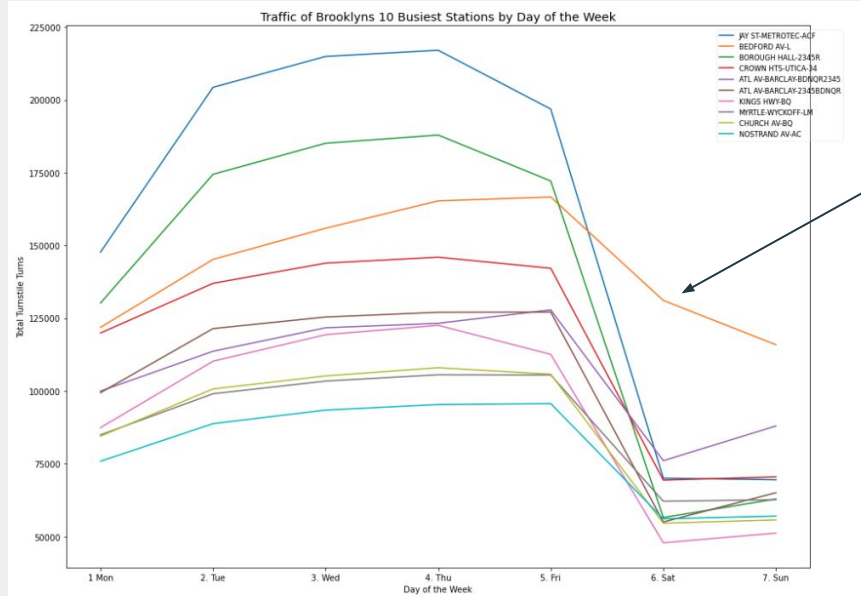- 59 ST COLUMBUS-ABCD1
- FLUSHING-MAIN-7
- 47-50 STS ROCK-BDFM

- **Less ridership on weekends**, particularly in the busiest stations, which are **commuter hubs** (Penn Station, Grand Central Station, etc.)

- **Rockefeller Center,** a corporate hotspot, stands out as a location that your street team should **only** visit on weekdays, especially if they want to reach **young professionals** as opposed to **tourists**

Traffic of Brooklyns 10 Busiest Stations by Day of the Week

- Atlantic Ave and Jay St-Metrotech are popular stations in Downtown Brooklyn, with Atlantic Ave being a good choice for event nights (Barclays Center) and Jay St-Metrotech if you wish to reach NYU's Engineering campus
- **Bedford Avenue** stands out as a great choice for **weekends,** with a far less drastic ridership drop off than comparable stations in **Brooklyn**
- Located in the heart of **Williamsburg,** it is also one of the **densest** stations - with only two entrances, you can reach all of Bedford's massive ridership with a relatively smaller team (even if the overcrowded L train means grumpy riders)
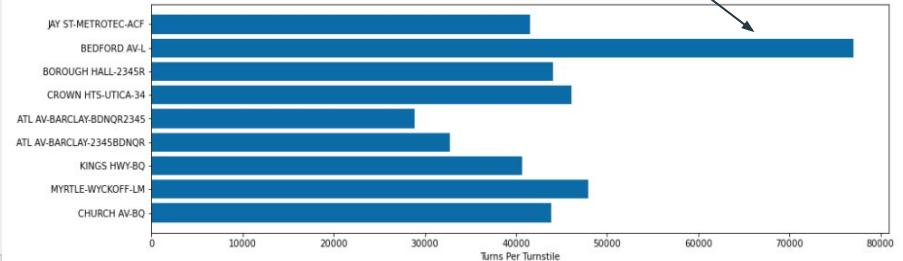
RESULTS

- For **Manhattan** stations, the commuter hubs have a large share of their ridership concentrated during afternoon rush hour.
- **Canal Street** and **Union Square** are both popular stations in bustling areas (Soho and Flatiron district respectively), but without connections to commuter rail systems, they are comparatively **quiet in the mornings**

Top 10 Busiest Stations
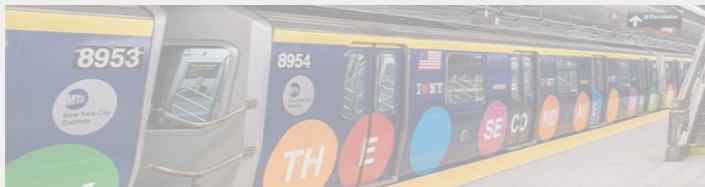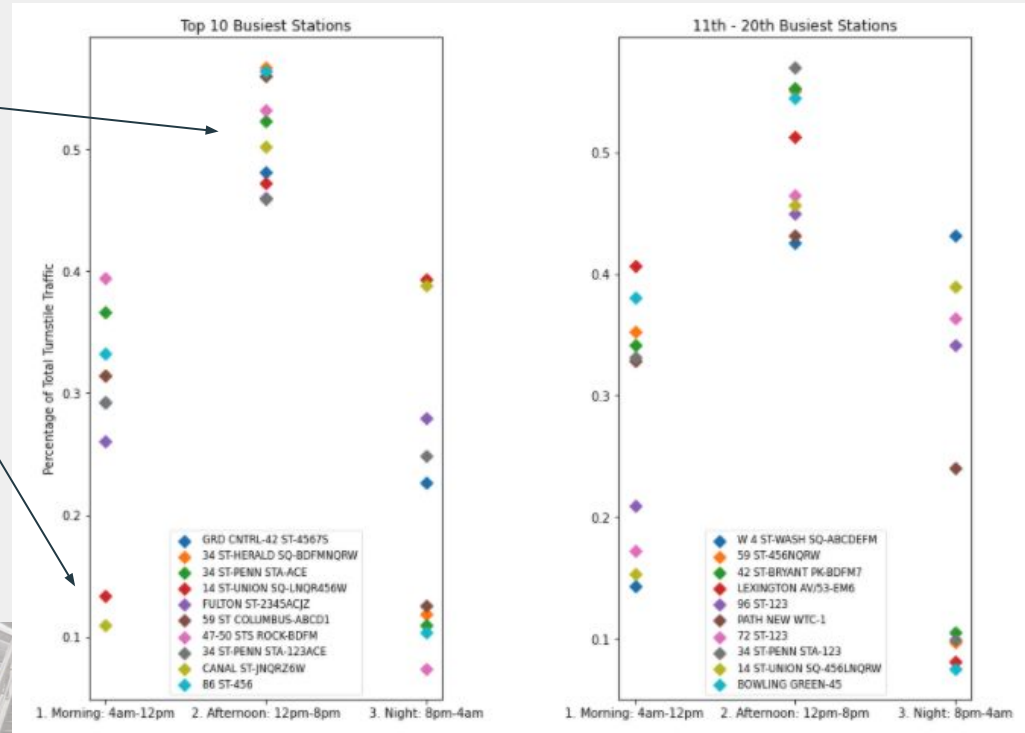
11th - 20th Busiest Stations
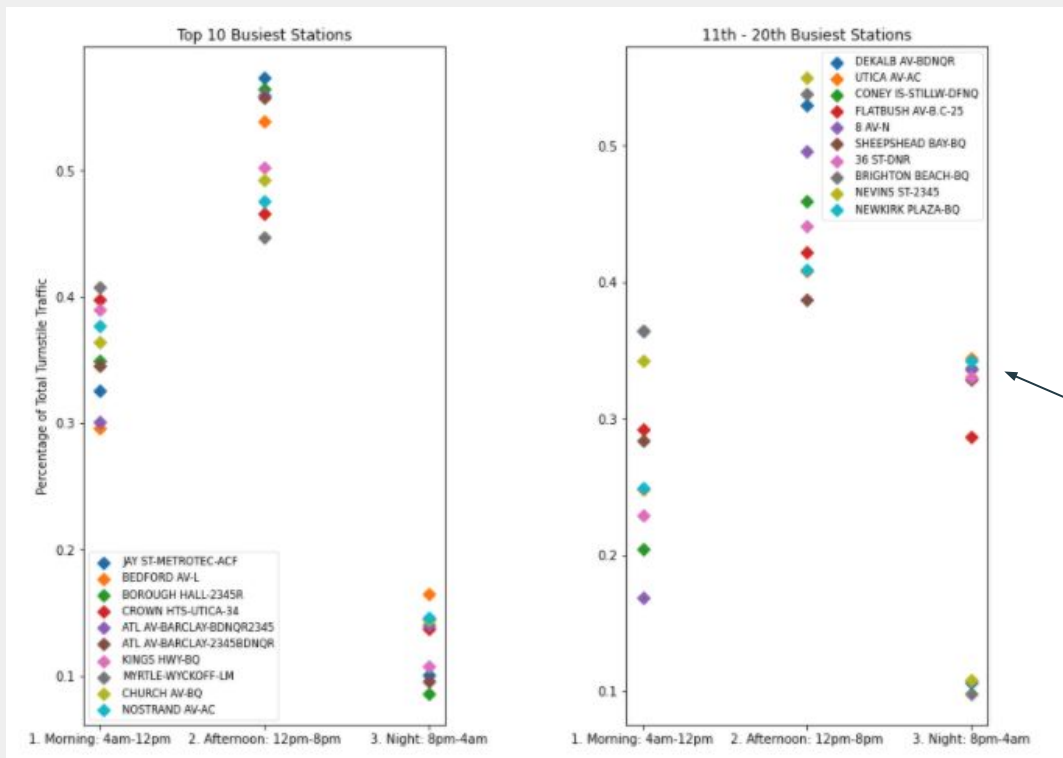
- In Brooklyn, busiest stations all follow very similar patterns, with very low ridership from 8pm - 4am. If the street team is looking for active nighttime stations, they are best served looking for stations in the 11-20 range such as Utica Ave, Dekalb Ave, and Flatbush Ave

CONCLUSIONS | where we go now

Popular Locations:
(based on turnstiles)

Downtown **Brooklyn / Williamsburg**
Stations : Atlantic Av-Barclays Center, Jay St-Metrotech, Bedford Ave

Midtown **Manhattan**
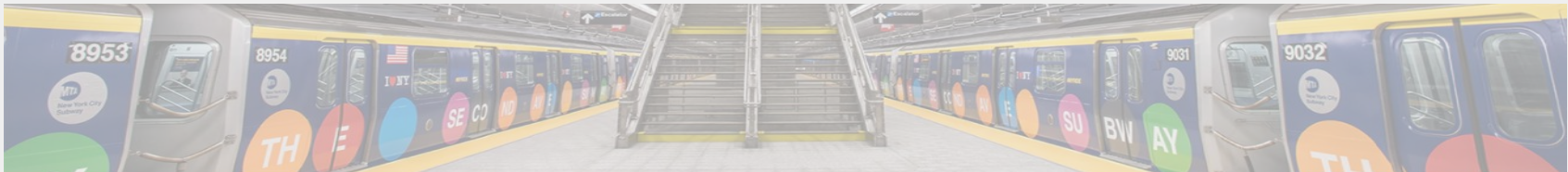*Stations* : 42nd St-Grand Central Station, 34th St-Herald Square

Flushing **Queens**
Stations : Flushing-Main St, Jackson Heights

Suggestion:

Borough-based schedules / teams

Maximum reach outside population density to **consistently busy stations**

CONCLUSIONS | where we go now

Time of day:
1. *Afternoon* (2pm - 8pm)   End-Of-Day rush hour, evening plan travels
2. *Morning* (4am - 12pm)   Beginning-Of-Day Rush Hour
3. *Evening* (8pm -4am)   Late night travelers (lowest engagement)

Day of week:
Monday - Friday: Focus on transportation hubs / corporate areas
Saturday - Sunday: Focus on residential and weekend hotspots

Suggestion:
Morning shift priority (weekdays) **/ Afternoon shift** (weekdays / weekends)
*Effective engagement* of corporate and residential populations
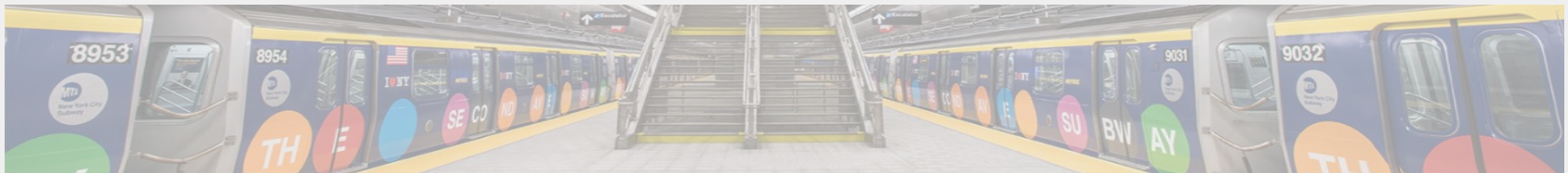
FUTURE WORK | what next?

<u>Multi-year Analysis</u>:   **Growth of tech sector** in NYC from 2015 - present

<u>Demographics</u>:   U.S. Census - Balance high-income w/ unexposed audience
Targeting neighborhoods :   based on **high average income**
based on **low STEM engagement**
near **colleges with STEM** programs

<u>Residential Areas</u>:   Engaging with residential **New Yorkers** in their neighborhoods,
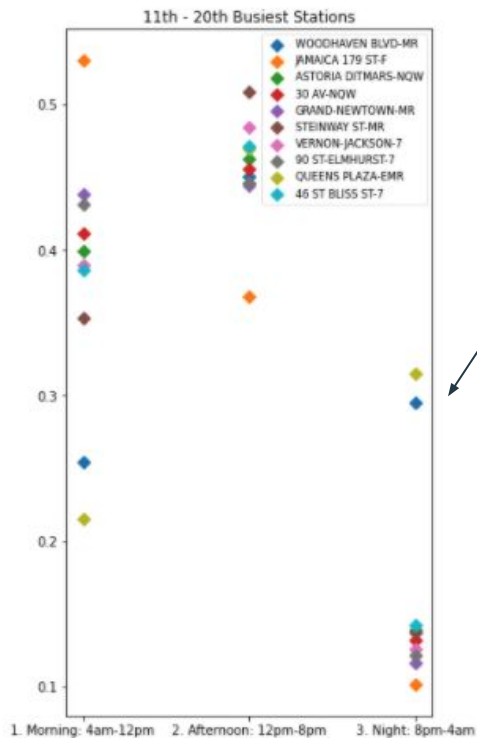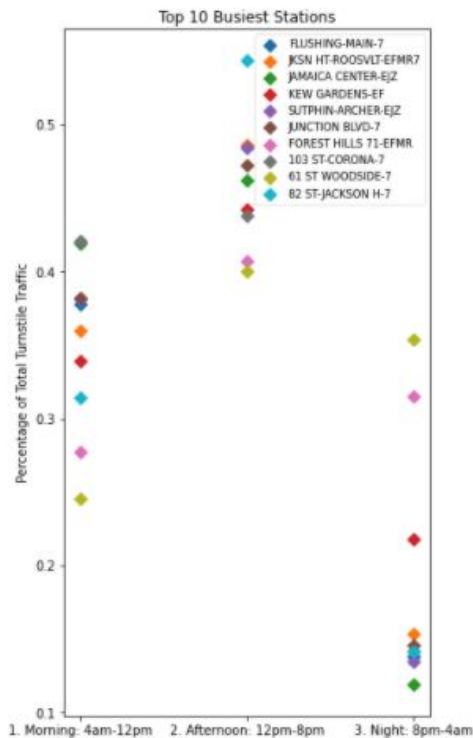promoting **long-term relationships** + **annual fund** contributions
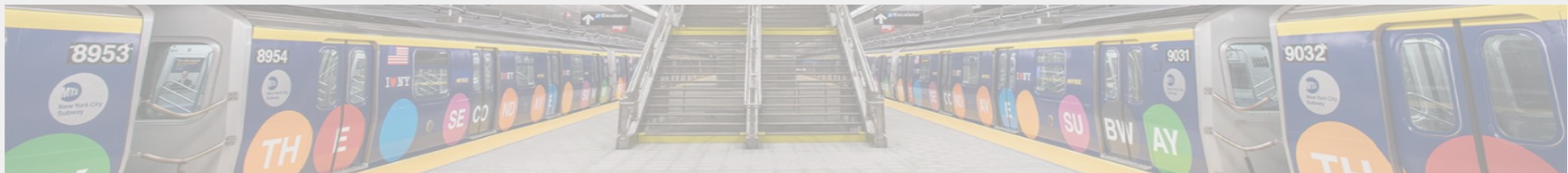
Thank you!

- **In Queens**, while Flushing-Main St and Jackson Heights stand out as by far the busiest stations, Forest Hills and Woodside also work for a night shift given that >30% of their traffic comes in the 8pm - 4am window