

MTA Traffic & Citi Bike Capacity

Exploratory Data Analysis

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Background

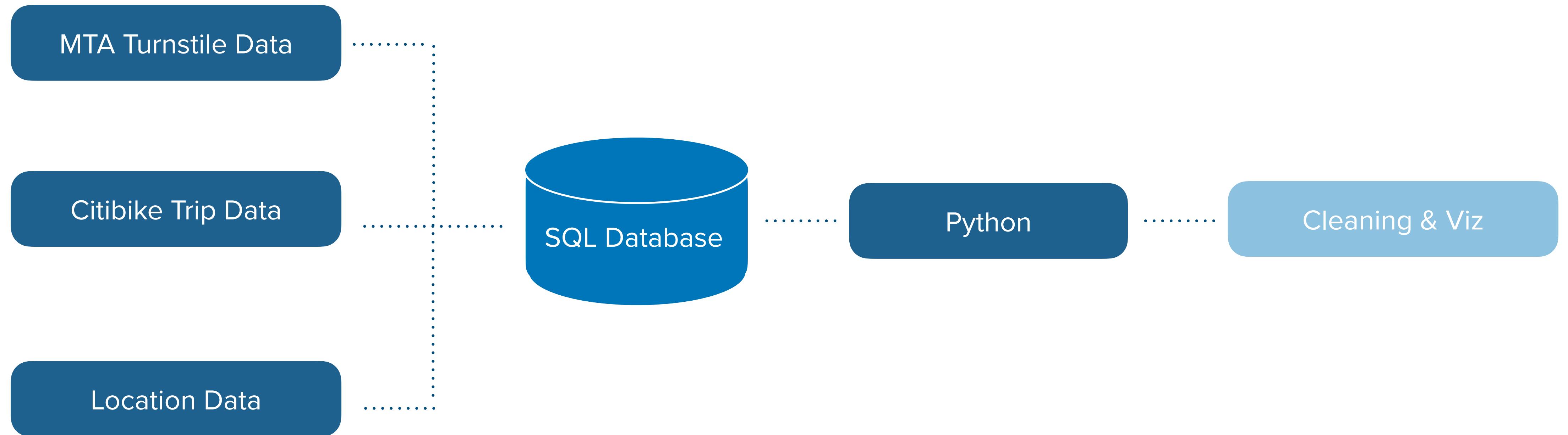
Identify areas of focus to avoid bike demand shortage

Citi Bike is looking to identify areas where there may be a potential shortage of bikes in comparison to demand. The goal of this analysis is to identify underserved traffic hubs with an opportunity to increase the capacity of existing Citi Bike Stations.

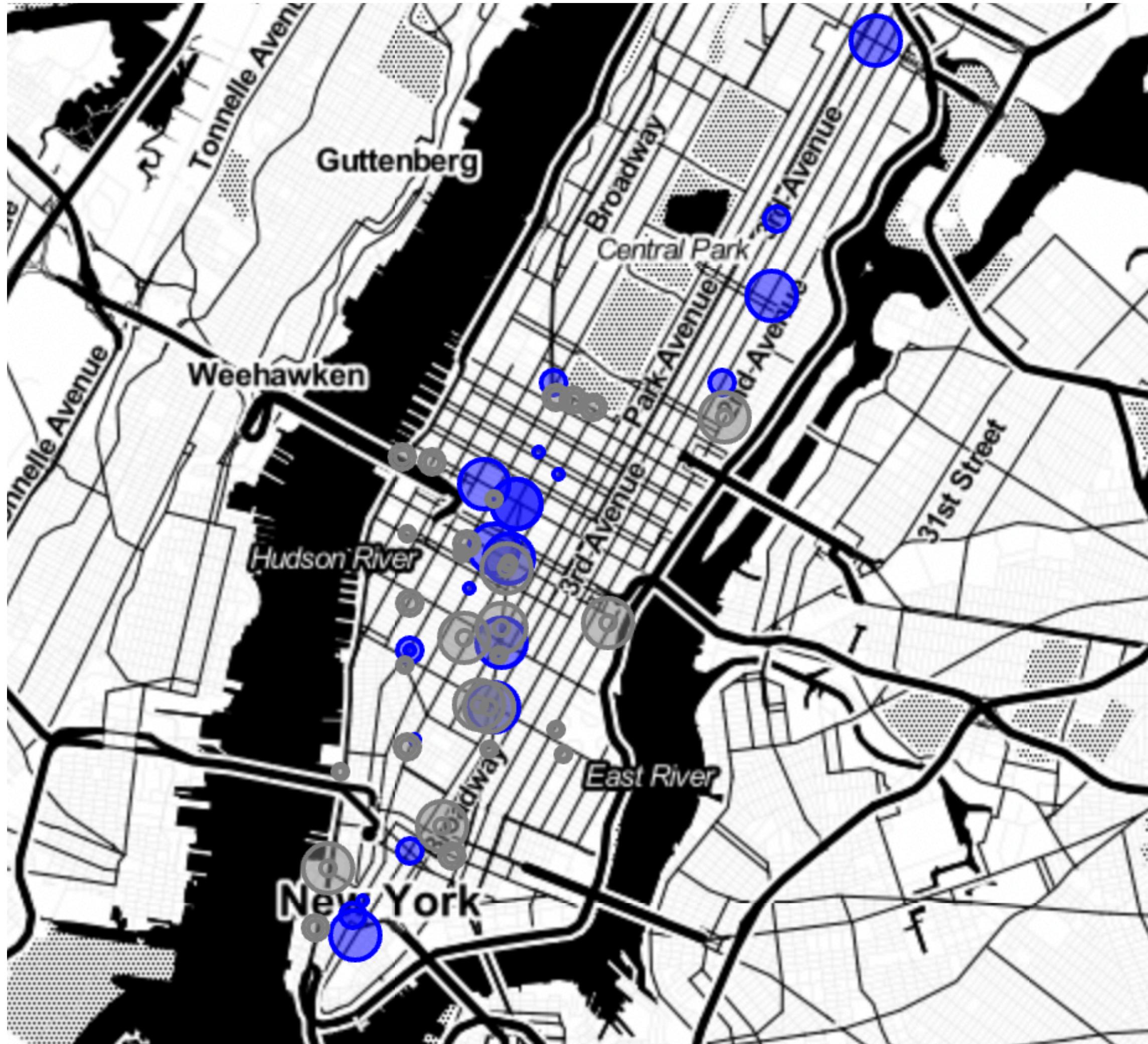
Citi Bike Struggles to Keep Up With New Yorkers' Love of Cycling

New Yorkers are biking much more since the pandemic, making it hard to find bikes and parking docks in some high-use neighborhoods.

Methodology



Busy Citi Bike Stations and busy MTA Stations are next to each other



Legend

MTA Traffic

- Top 20-30
- Top 10-20
- Top 10

Citi Bike Traffic

- Top 20-30
- Top 10-20
- Top 10

Locations of top 30 MTA and Citi Bike stations by traffic

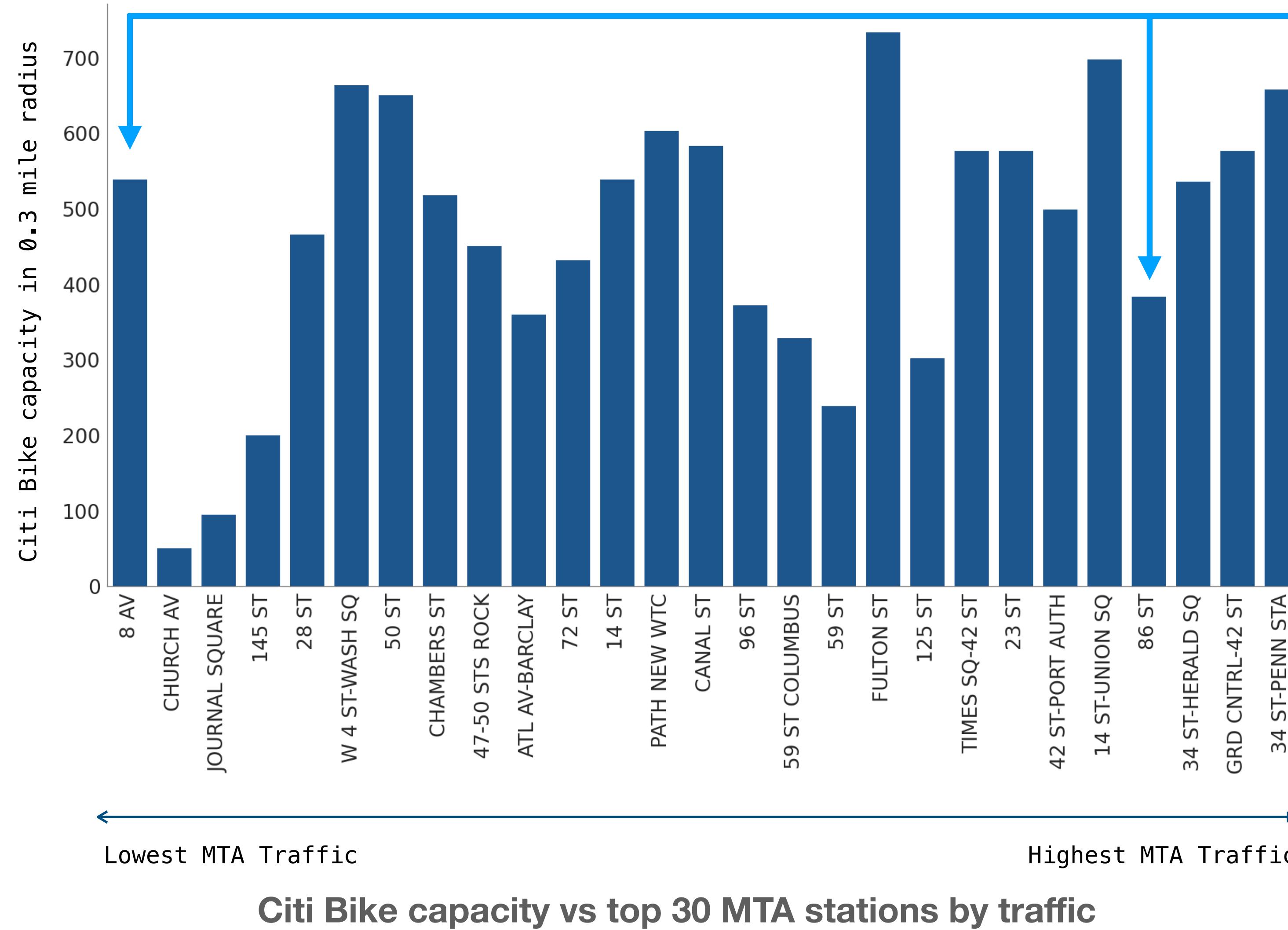
Highest Traffic MTA Stations:

- 34 Penn St
- Grand Central 42nd St
- 34 St - Herald Sq

Highest Traffic Citi Bike Stations:

- W 21 St & 6 Ave
- West & Chambers St
- 1st Ave & 68 St

High MTA Traffic isn't always met with proportional Citi Bike capacity

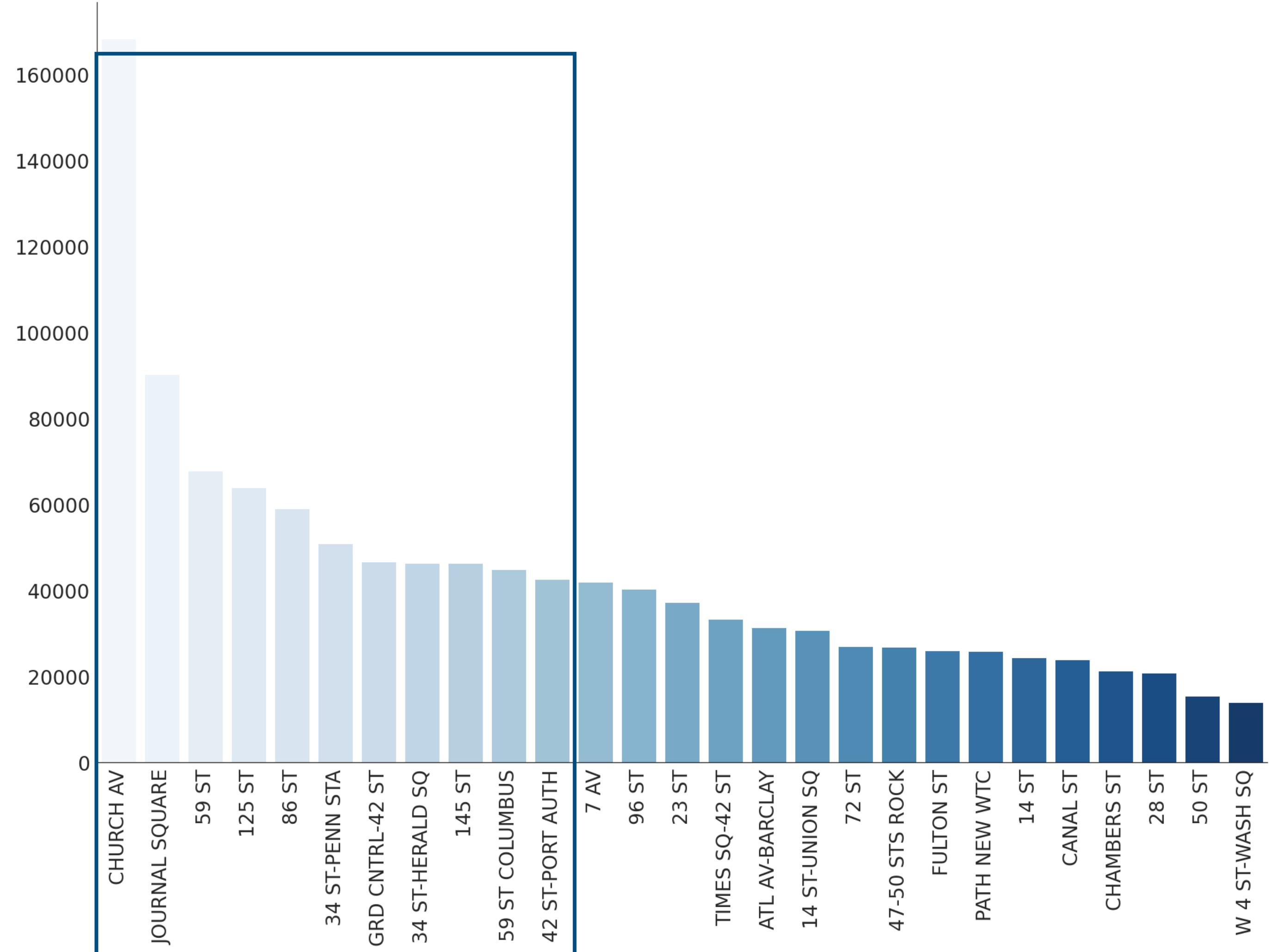


For example, **86 ST Station** is much higher in Traffic than **8 AV** but has a lower number of Citi Bikes available in a close radius.

“MTA Traffic : Citi Bike Capacity” Ratio in a 0.5 km (~ 0.3 miles) radius reveal underserved traffic hubs

How can we find MTA stations whose nearby Citi Bike racks need more capacity?

- Ratio:
$$\frac{\text{MTA Traffic}}{\text{CitiBike Capacity in a 0.3 mile radius}}$$
- This ratio allows us to compare the areas around two MTA stations
- For example, Church Ave has a much higher ratio than W 4ST
 - This means that each bike dock in Church Ave is “supporting” a much higher traffic
 - Therefore, if we have to add a dock around one of those stations, we should pick Church Ave



“MTA Traffic : Citi Bike Capacity” Ratio
for top 30 MTA stations by traffic

Recommendation: Citi Bike should consider adding capacity near these MTA stations

MTA Stations with relatively low Citi Bike capacity nearby	Closest Citi Bike Stations
Church Av	<ul style="list-style-type: none">• Parade Pl & Crooke Ave• Caton Ave & Argyle Rd
59 ST	<ul style="list-style-type: none">• 59 St & 4 Ave• 57 St & 4 Ave
125 ST	<ul style="list-style-type: none">• E 123 St & Lexington Ave• Lexington Ave & E 127 St
86 ST	<ul style="list-style-type: none">• E 85 St & 3 Ave• E 88 St & 1 Ave
34 ST-PENN STATION	<ul style="list-style-type: none">• W 36 St & 7 Ave• Broadway & W 36 St
GRAND CENTRAL - 42 ST	<ul style="list-style-type: none">• Broadway & W 41 St• W 40 St & 7 Ave
34 ST - HERALD SQ	<ul style="list-style-type: none">• 6 Ave & W 34 S• 6 Ave & W 33 St
145 ST	<ul style="list-style-type: none">• W 146 St & Broadway• Riverside Dr & W 145 St
59 ST COLUMBUS	<ul style="list-style-type: none">• Broadway & W 58 St• Broadway & W 61 St
42 ST - PORT AUTHORITY	<ul style="list-style-type: none">• W 42 St & 8 Ave• W 41 St & 8 Ave

Note: Citi Bike Data mostly reflects NY Traffic, so Journal Square in Jersey City is excluded.

Future Work

1. Layer in Citi Bike Rider Type Data (Member vs Casual Rider) to narrow down recommended stations by focusing on paying subscribers

- For example, we could recommend adding docks in stations where membership rates are increasing at a high rate

2. Use availability data on Citi Bike racks to confirm this analysis

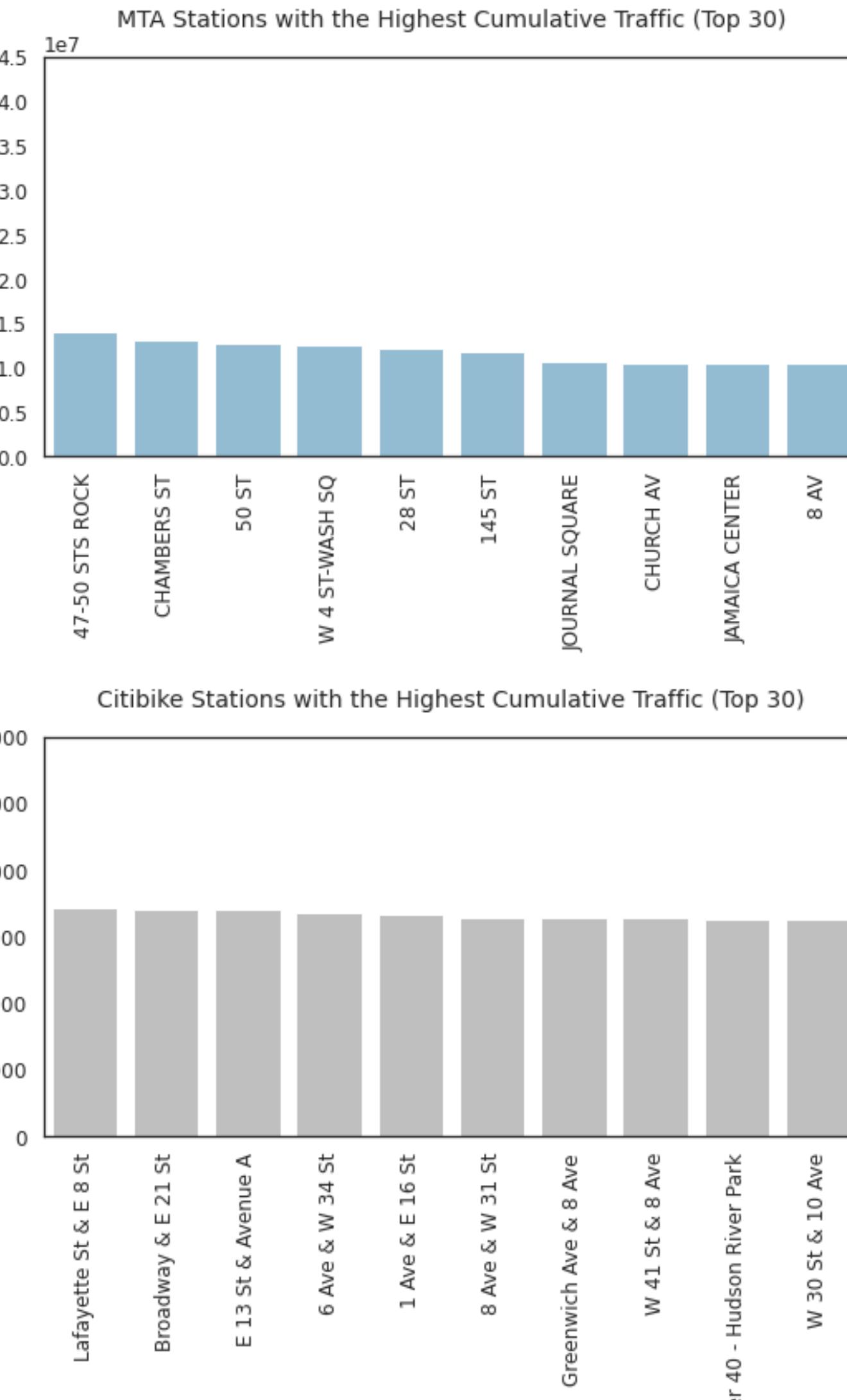
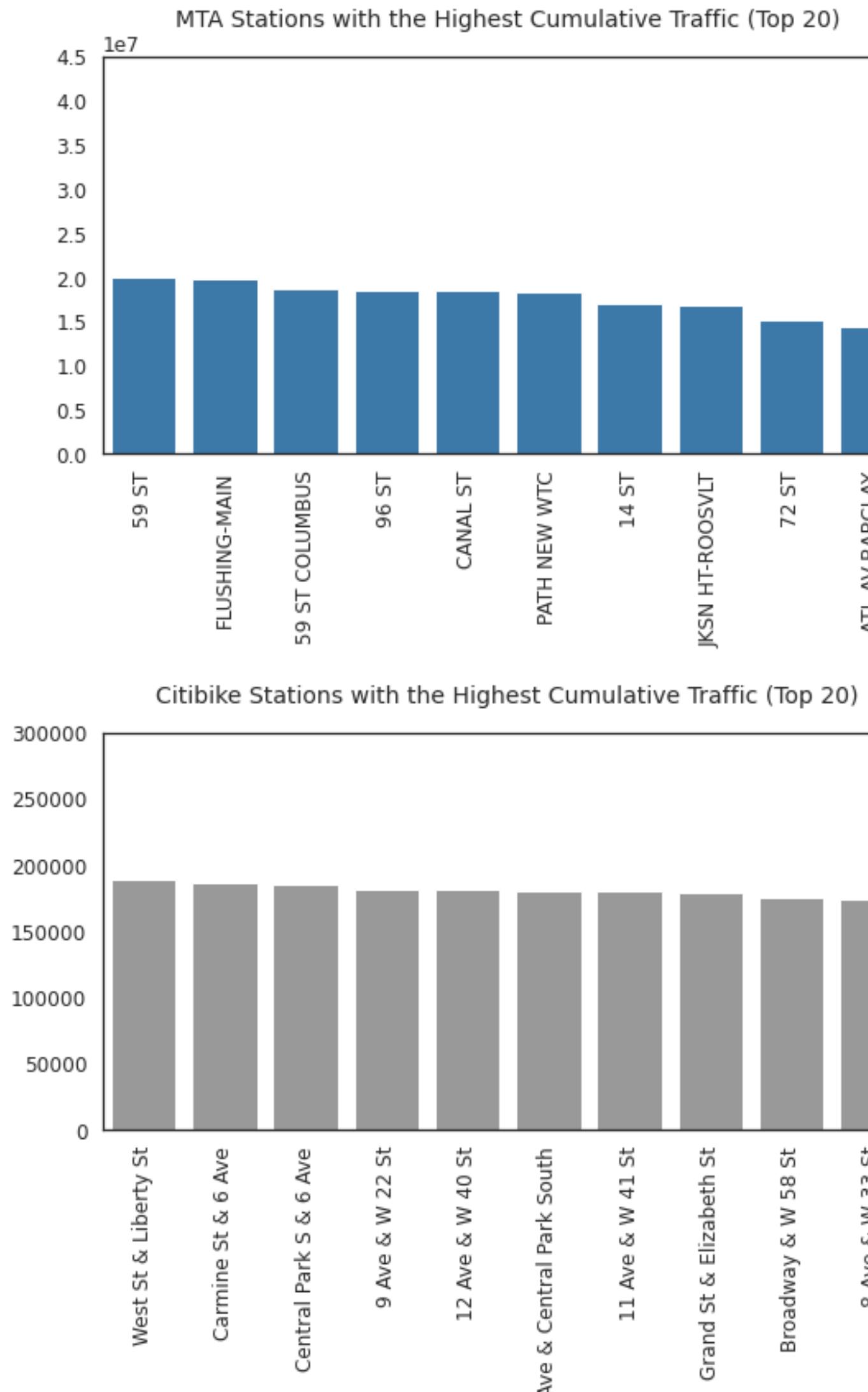
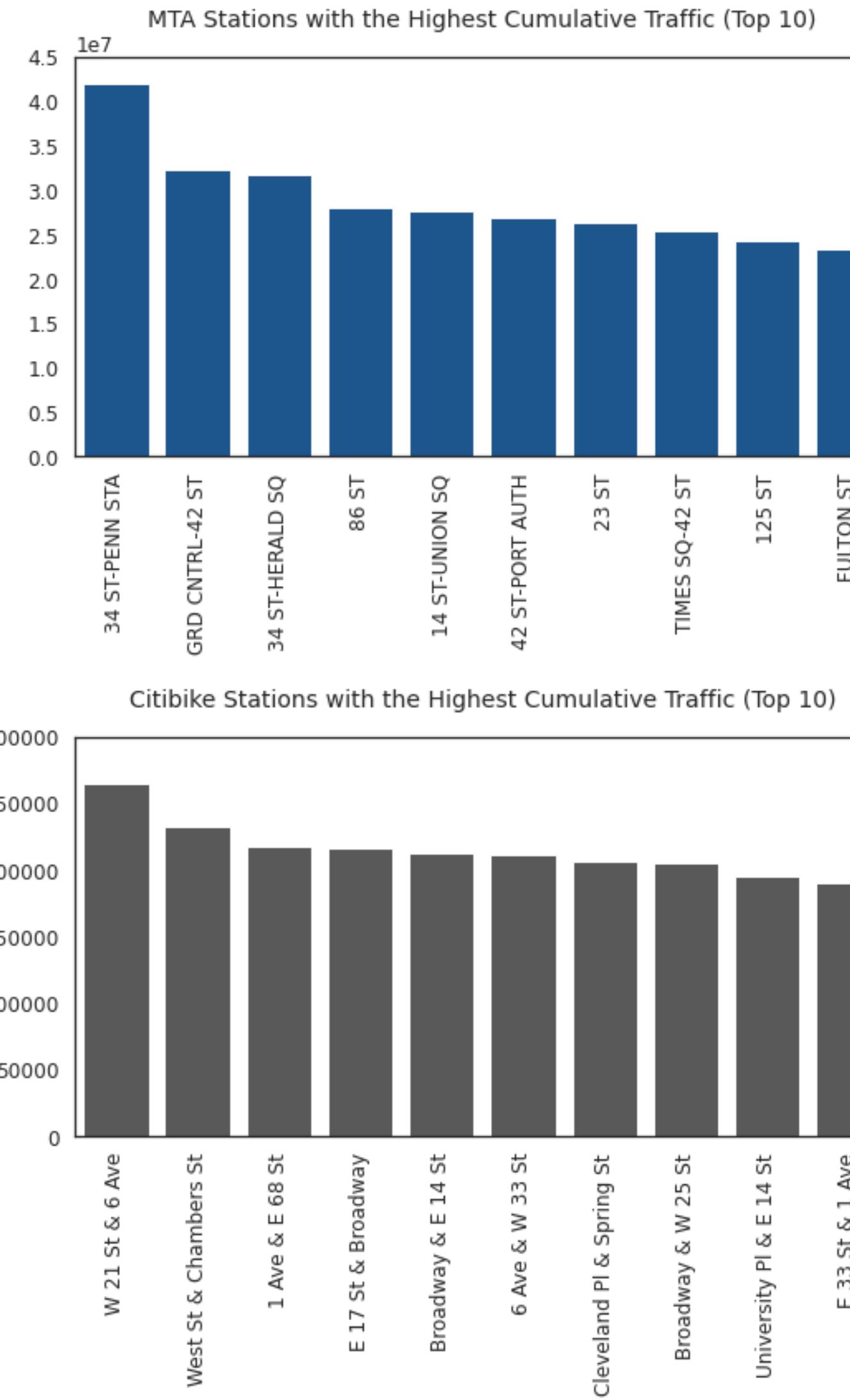
- If an area is underserved from a capacity perspective, we should find low availability of bikes during peak usage times

Thank you

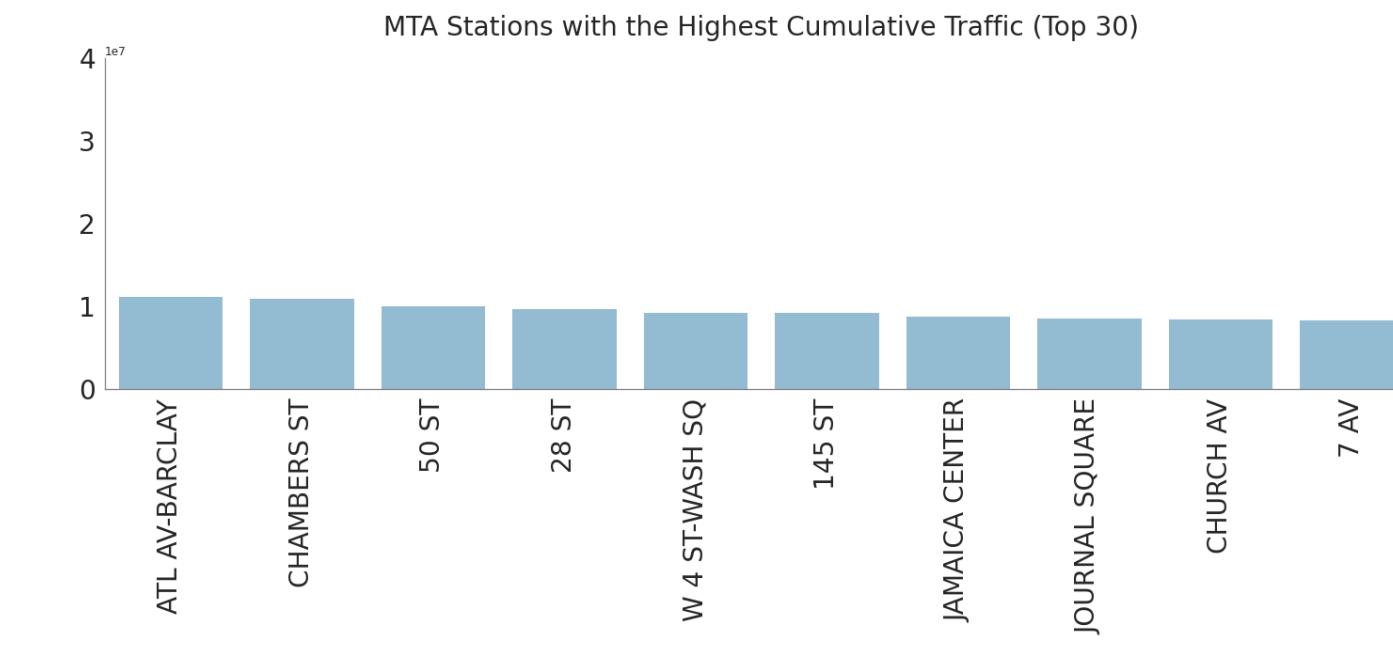
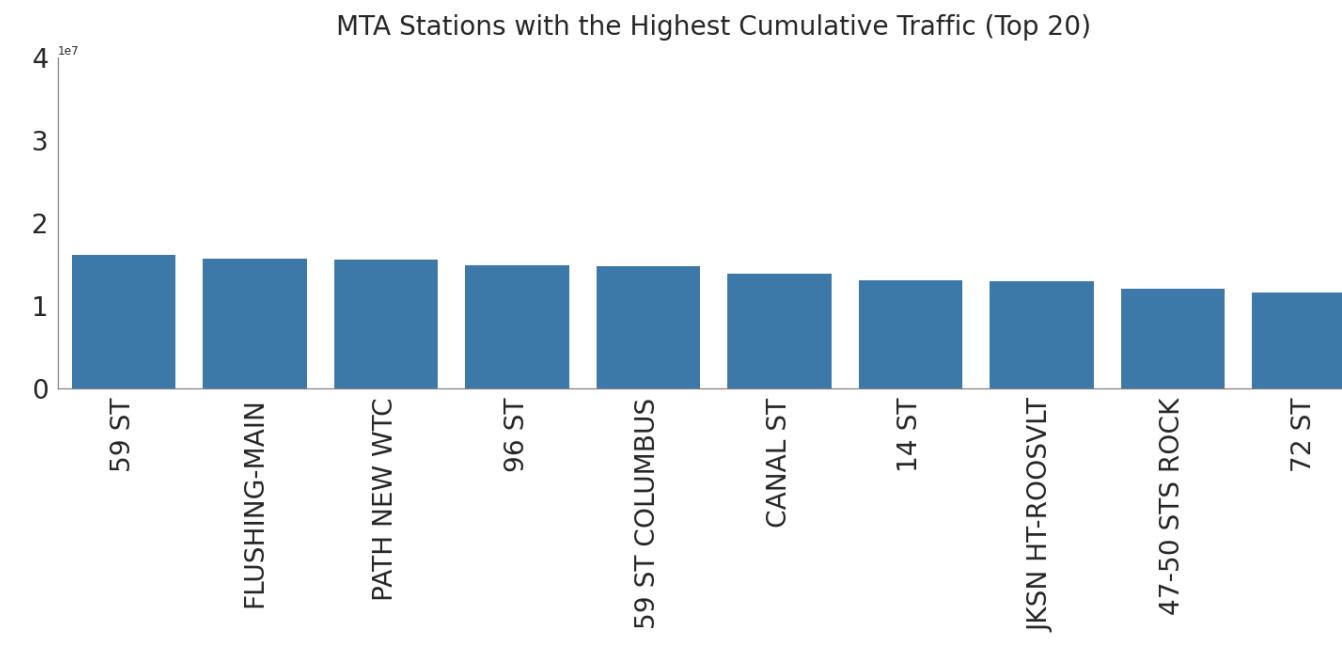
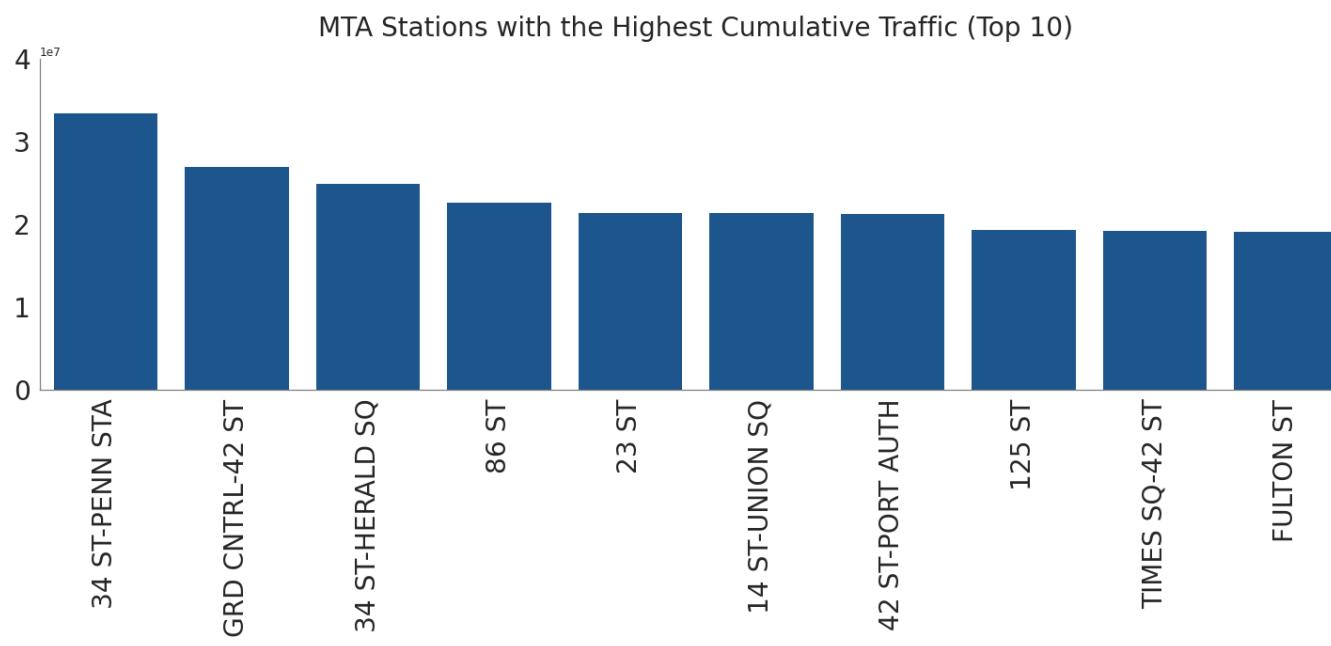


Appendix

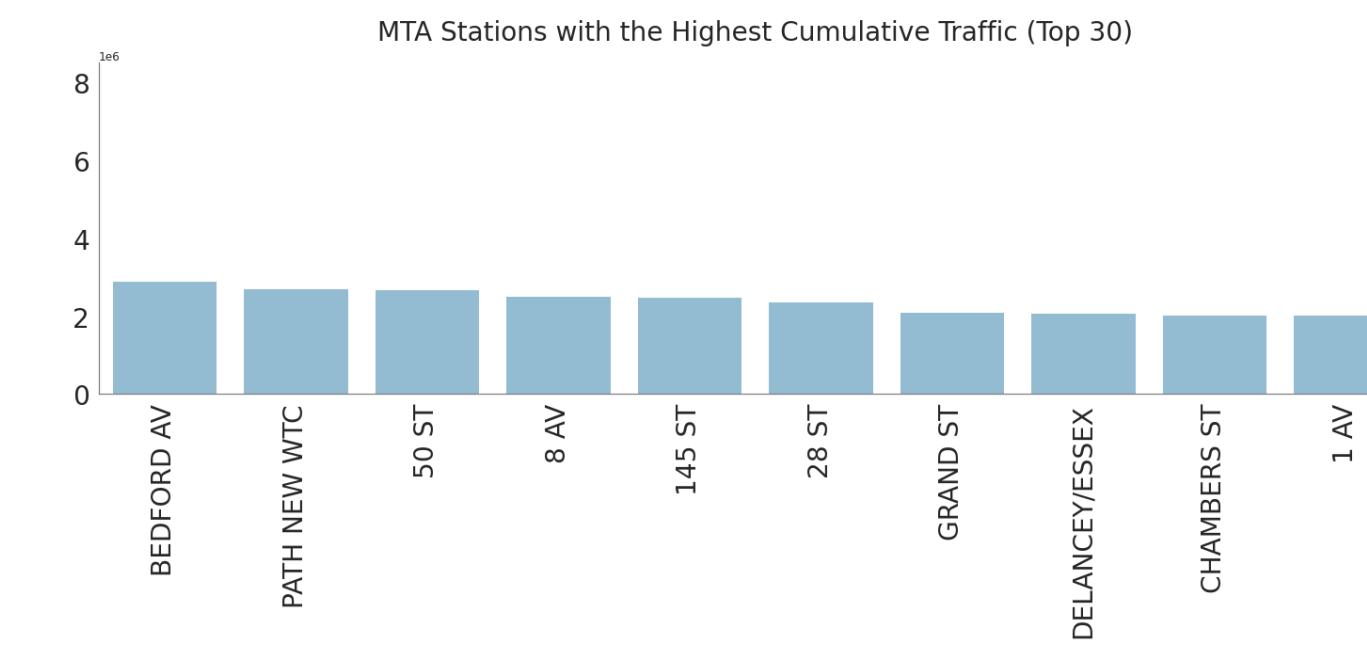
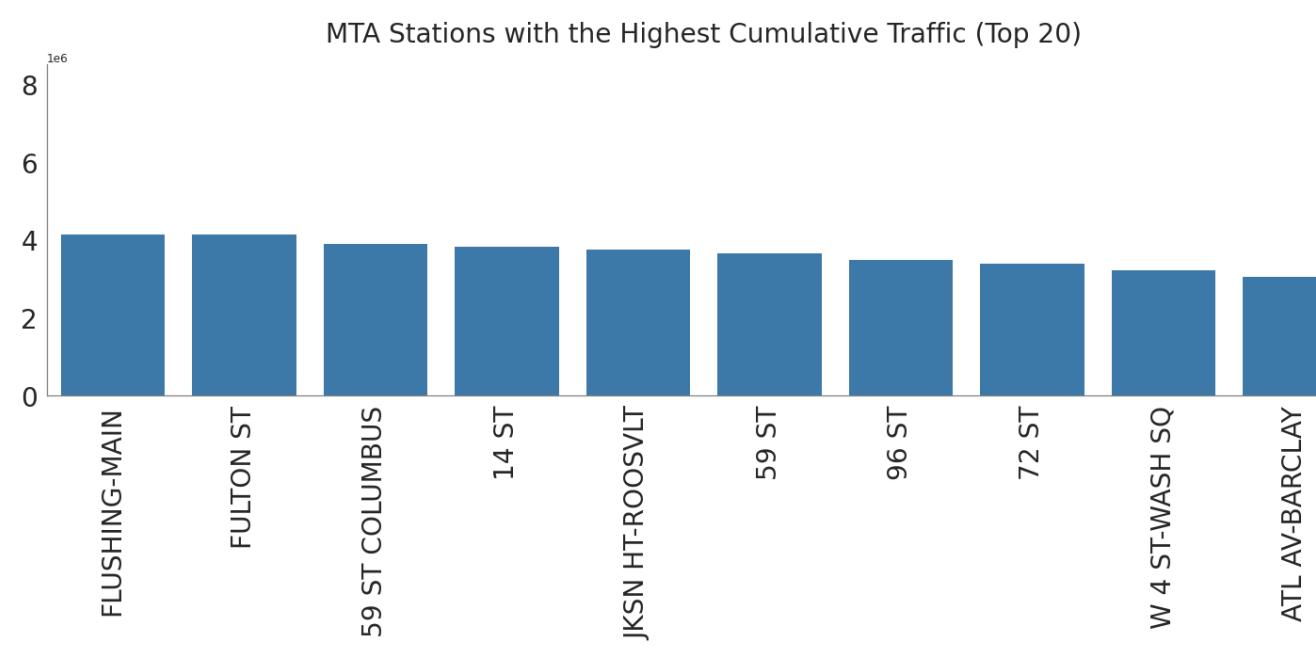
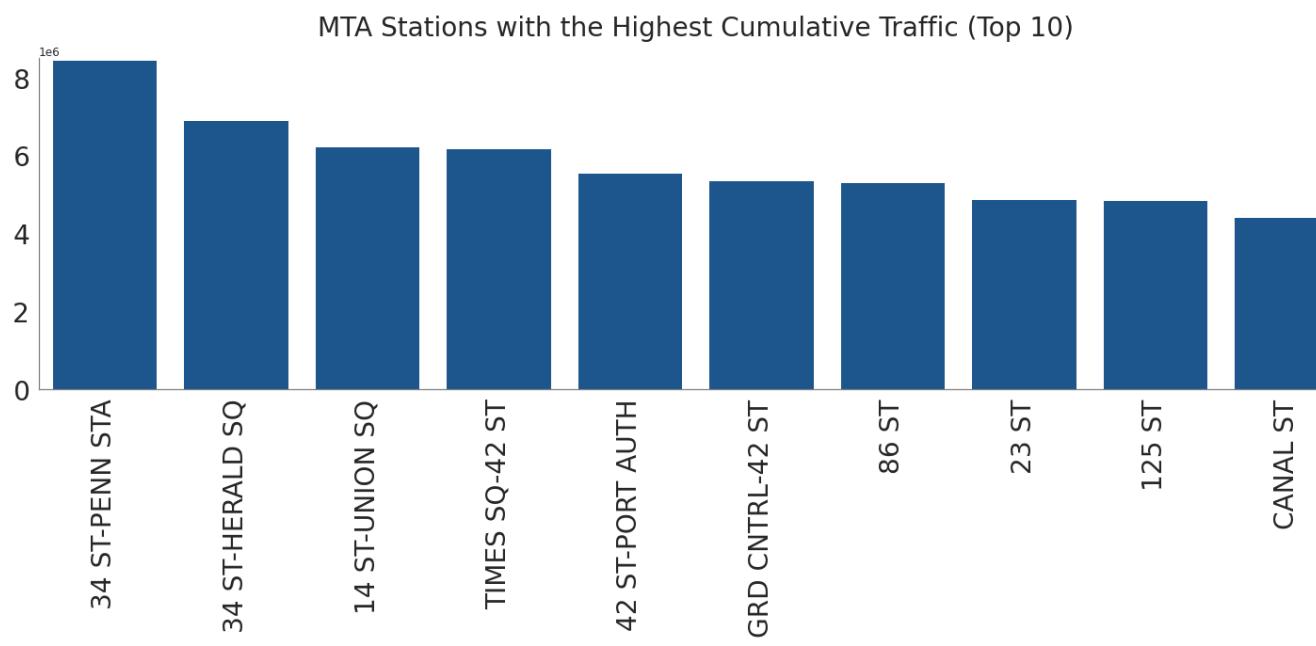
MTA & Citibike Stations Highest Cumulative Traffic (2021-2022)



MTA Stations with the Highest Cumulative Traffic during Weekdays (2021-2022)



MTA Stations with the Highest Cumulative Traffic during Weekends (2021-2022)



“MTA Traffic : Citi Bike Capacity” Ratio during Weekends

