



Bike It Out

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Background

- What is Citi Bike?
 - NYC's bike share system
 - A shared transport service in which bicycles are made available for shared use to individuals on a short-term basis
 - Launched in 2013
 - 1,300 stations
 - 20,000 bicycles



Rebalancing Operations

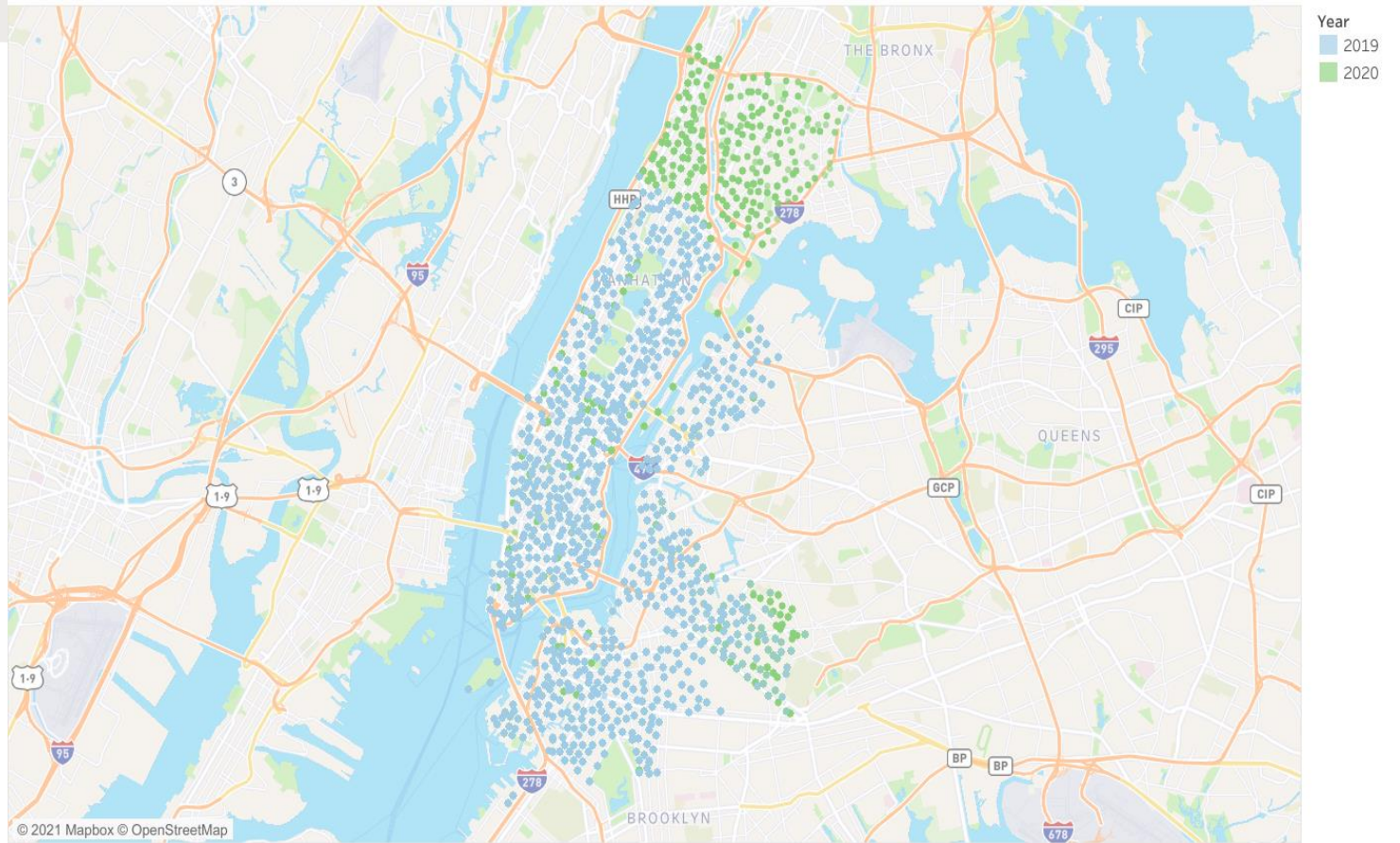
- What is rebalancing?
 - Restoring the number of bikes in each station to its target value
- Strategies:
 - Valets
 - Bike train operators
 - Motorized vehicles
 - Bike Angels



2020 Expansions

- Expanded into upper Manhattan with 36 new stations
- Added 4,500 e-bikes to its fleet
 - E-bikes are motorized bicycles

New Stations in 2020



Objectives

- Impact hypothesis:
 - By better understanding the changing trends in the past year due to Covid-19 and the continuous expansions within the company, Citi Bike can adjust their rebalancing operations, which can avoid potential discontent and improve user experience.



Solution Paths

1. Identify the potential stations that have changed in demand
2. Create a model forecasting demand at different stations
3. Create an alert notification that would show stations that are 10 bikes away from reaching maximum capacity or only 10 bikes left at a certain station before it is depleted completely

Scoping

- Measures of Success:
 - Technical – How off are the numbers the model is forecasting
 - Non-Technical – Whether there is an oversupply or undersupply of bicycles at the stations
- Risks:
 - Inaccurate forecast of demand
- Assumptions
 - The behavior at the station level is predictable
 - Citi Bike is able to implement the changes



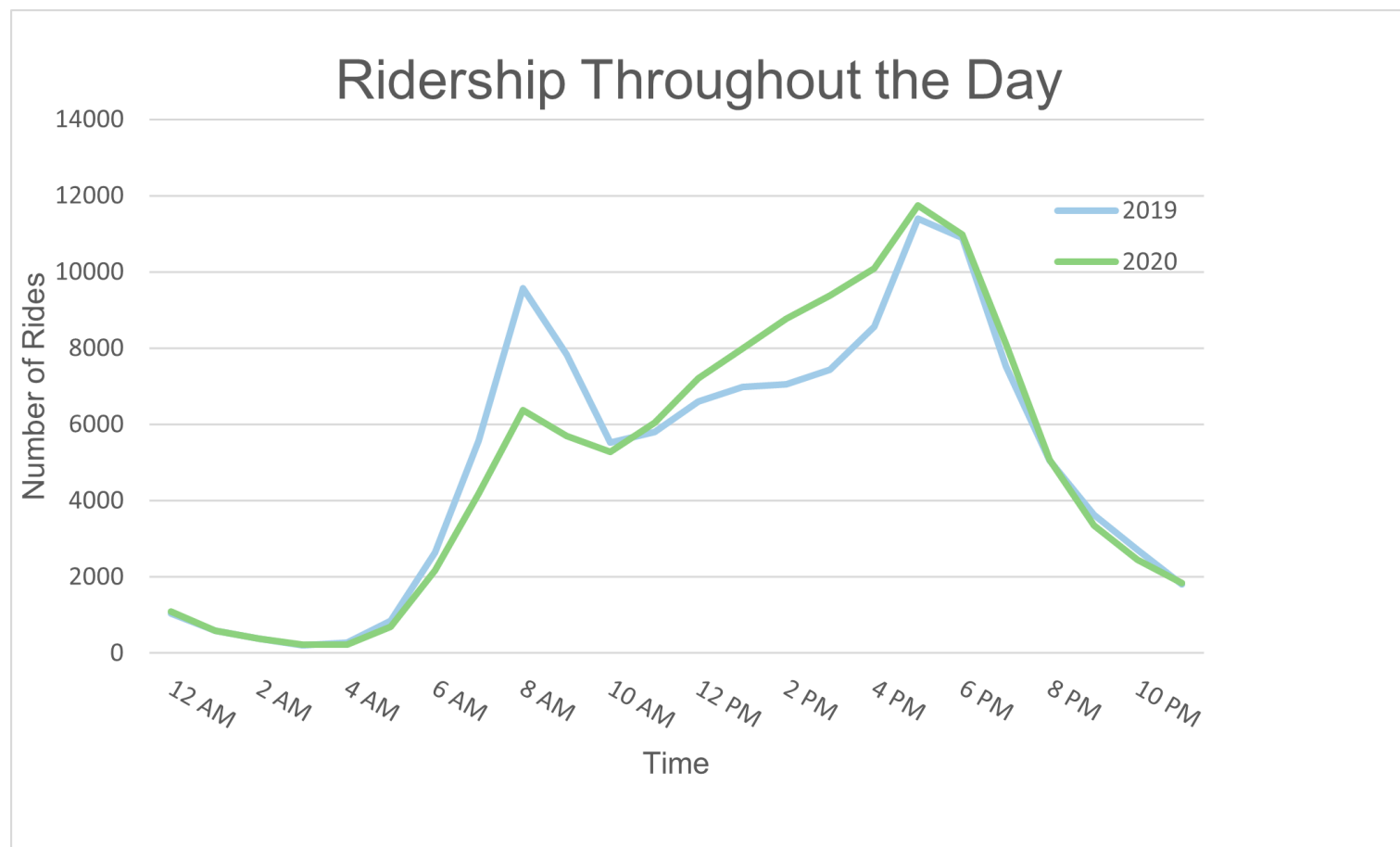
Methodology

- Data:
 - Citi Bike Trip Data
 - 200,000 rides from 2019-2020
- Tools:



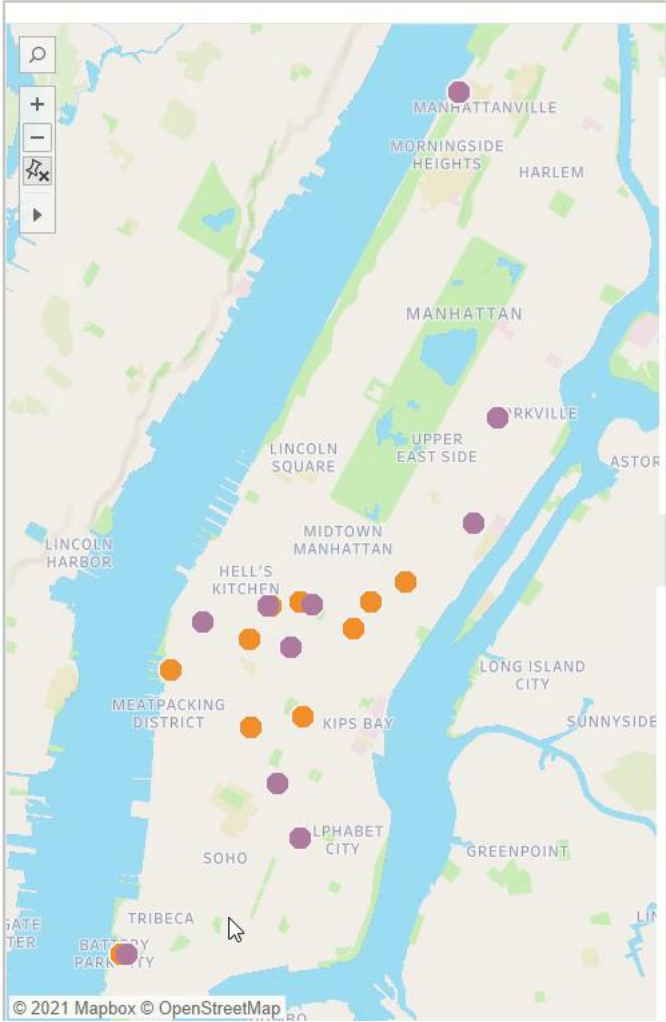
Findings

- Increased demand in the afternoons in 2020



Station Level

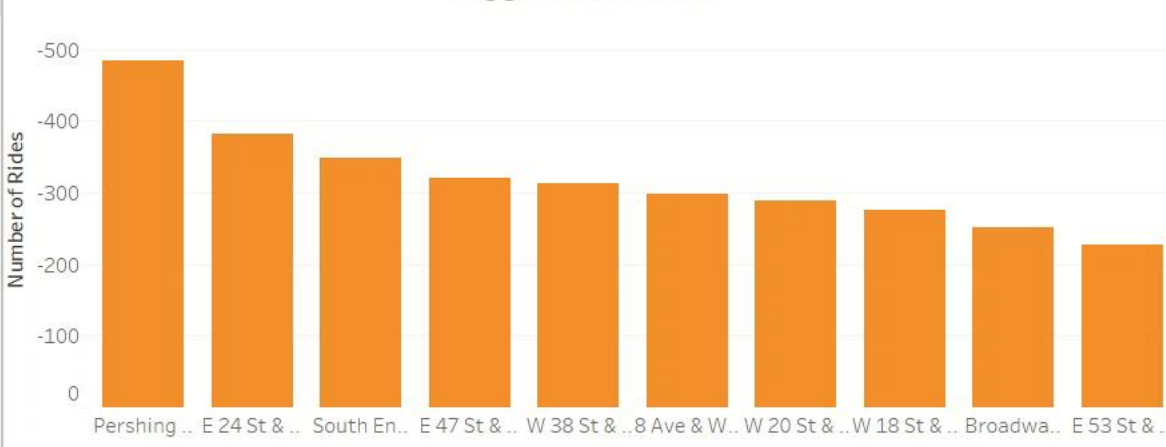
Stations with Biggest Change in Demand



Biggest Increase



Biggest Decrease



Conclusions

- Stations located in Mid-town had more of a decrease in riders
- Stations located in residential neighborhoods have increased in demand

Recommendations:

- Further analysis would be beneficial to make rebalancing operations more efficient



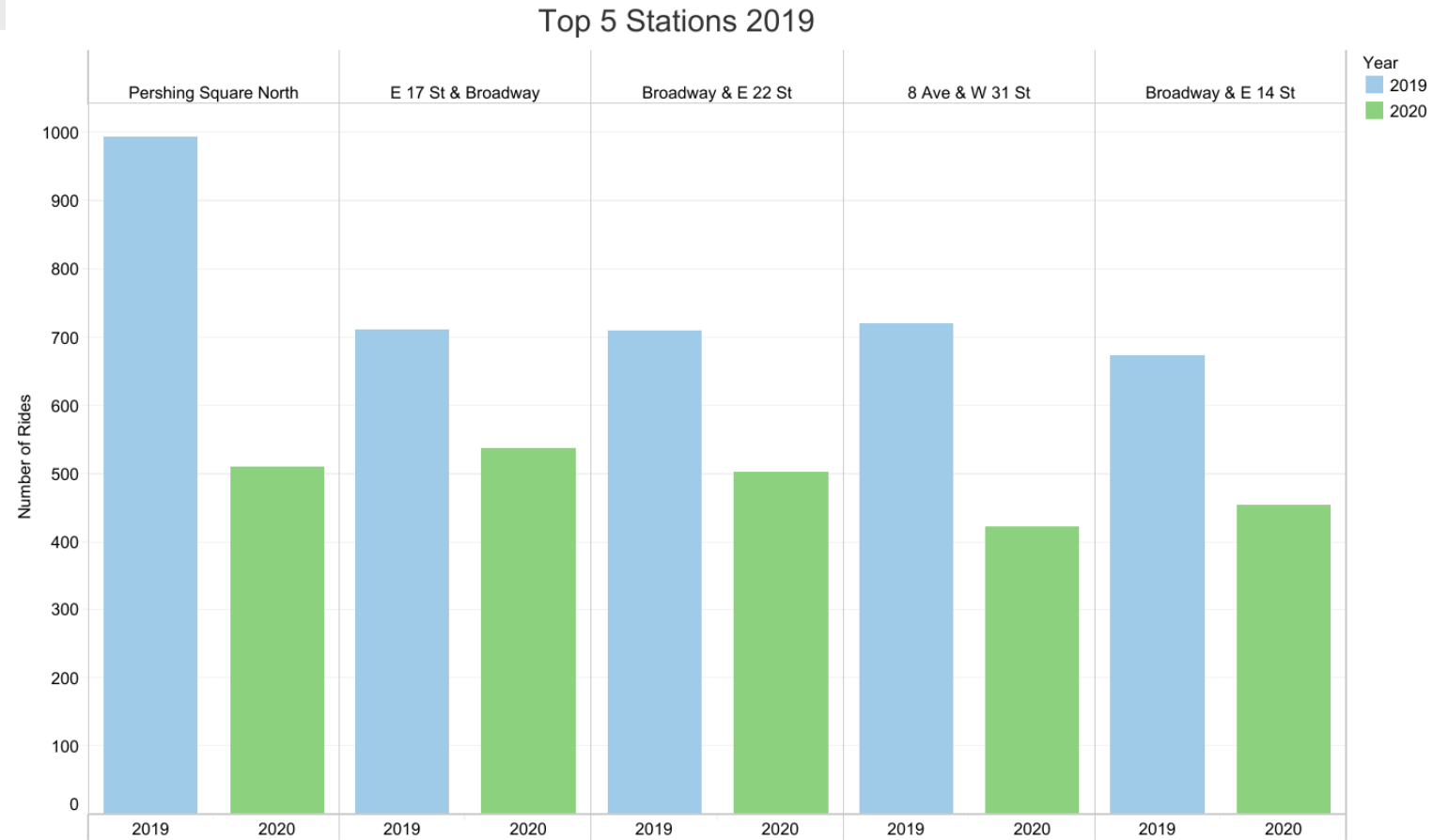
Future Work

- Use the entire dataset to look for more trends
- Use the data to create a model predicting demand
- Ultimately create an app within the next year for rebalancing teams to see the number of bicycles at each station in real time compared to the same time last week



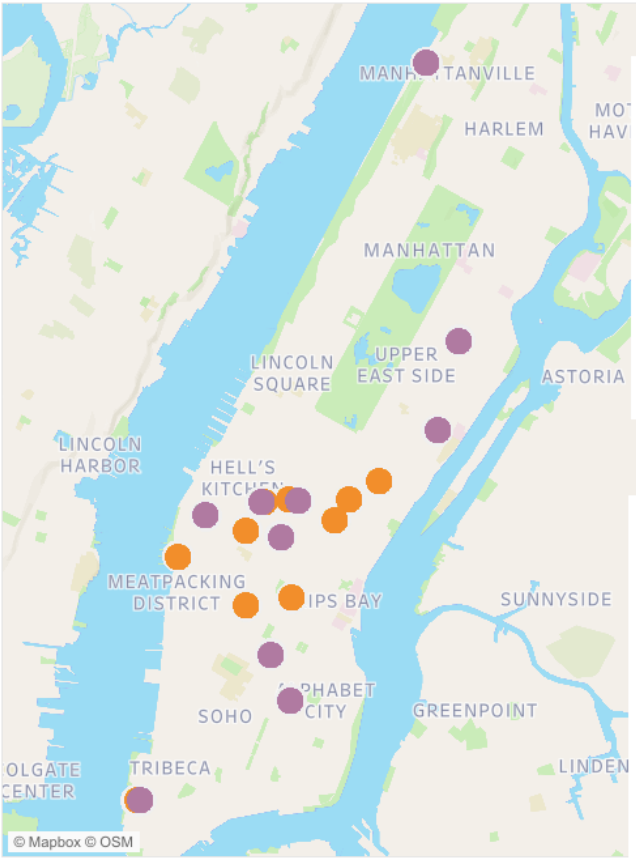
Questions?

Appendix

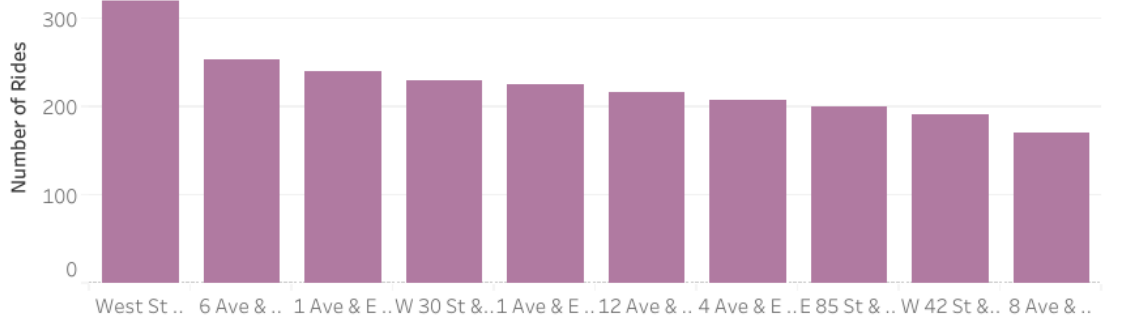


Appendix

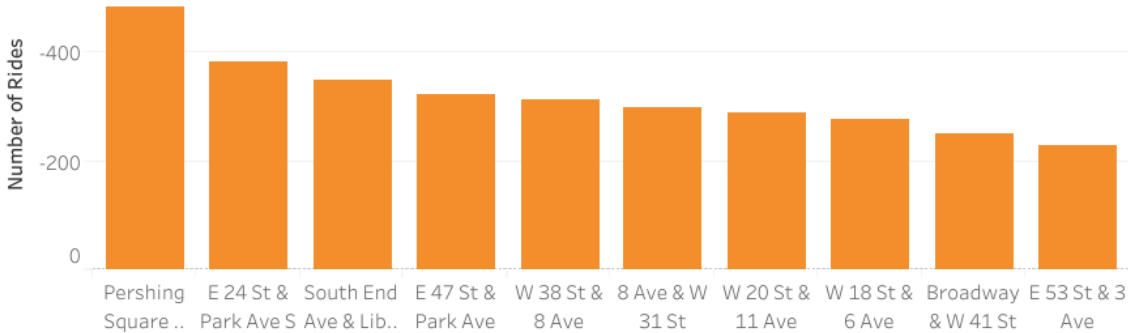
Stations with Biggest Change in Demand



Biggest Increase



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Appendix

- Citi Bike Rebalancing Strategies
 - Valets: Citi Bike team member staffs high-volume stations during peak periods to expand bike and dock availability
 - Bike train operators: Use “train” carriages that can carry 12–16 bicycles to move them between stations
 - Motorized vehicles:
 - Long distance rebalancing
 - Positioning large quantities of bikes at key locations
 - Bike Angels: rewards program that offers points to riders for relocating bikes to stations where riders most need them