Impact of COVID-19 on citi bike in NYC

Team 17

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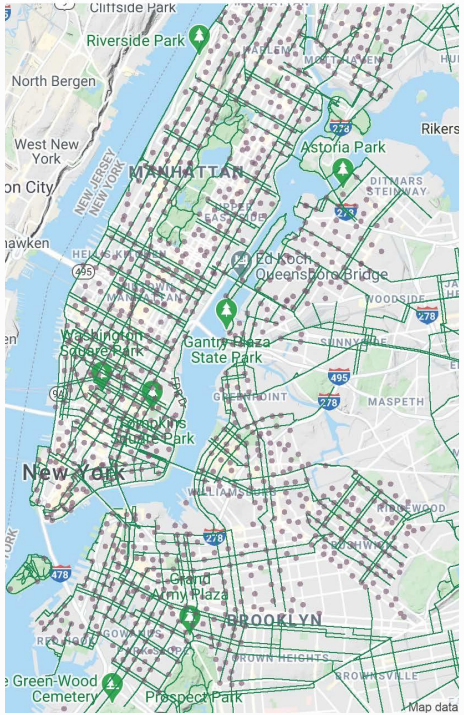
Agenda

- Citi Bike business overview and data
- Comparison of ridership in 2019 and 2020
- COVID-19 impact on Citi Bike usage:
    - forecasting into Q4 2020
    - forecasting into 2021

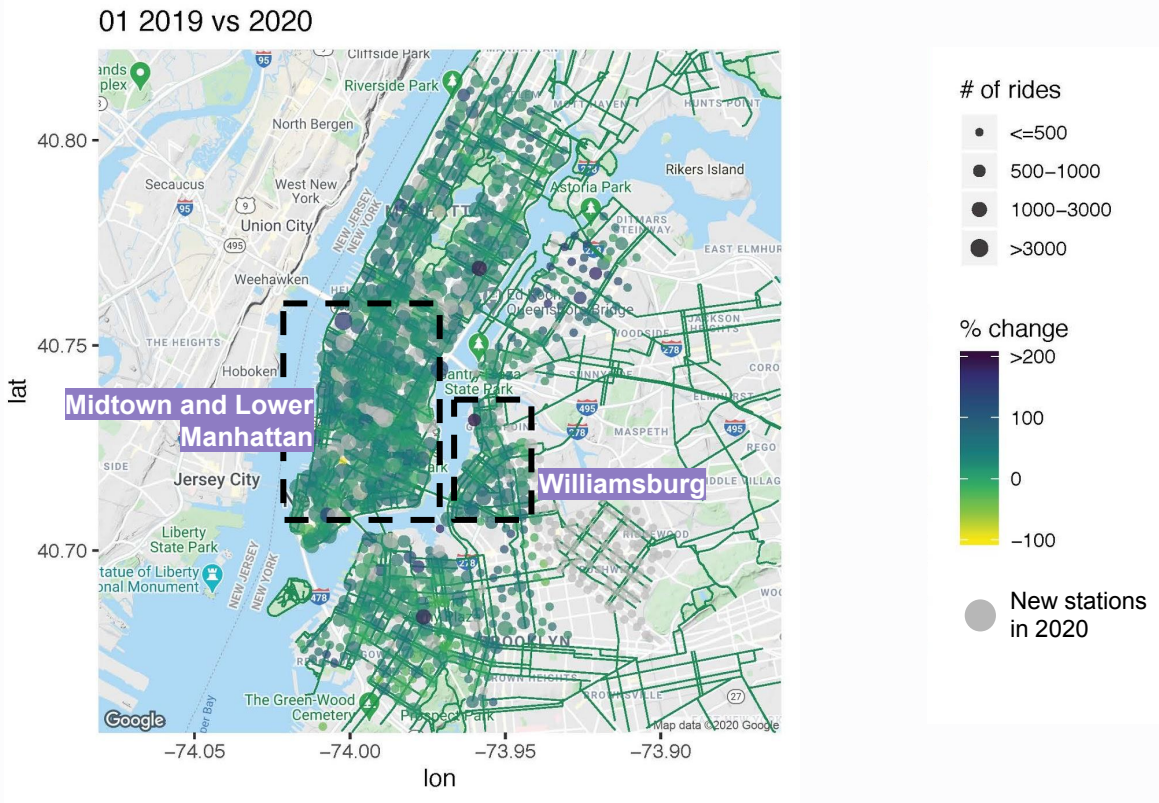
citi bike Key Facts and Data

- **950** bike stations with **14,500** bikes in NYC
- Two types of users:
  - **Subscribers** with annual membership (170$/year = ~2$/day)
  - **Customers** with 24hr passes (13.5$/day)
- 7 years of data:
  - Trip durations and start/end time
  - Start and end stations
  - User type
  - Gender and birth year

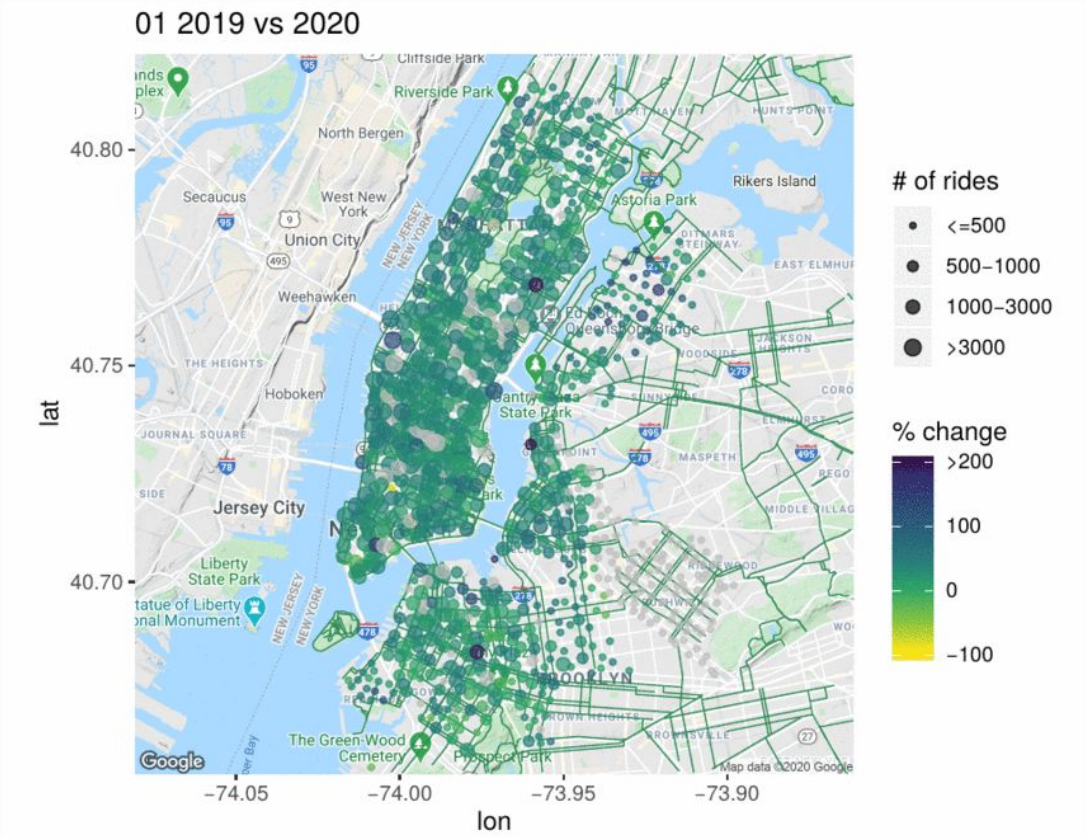


Bike lanes and stations in 2020

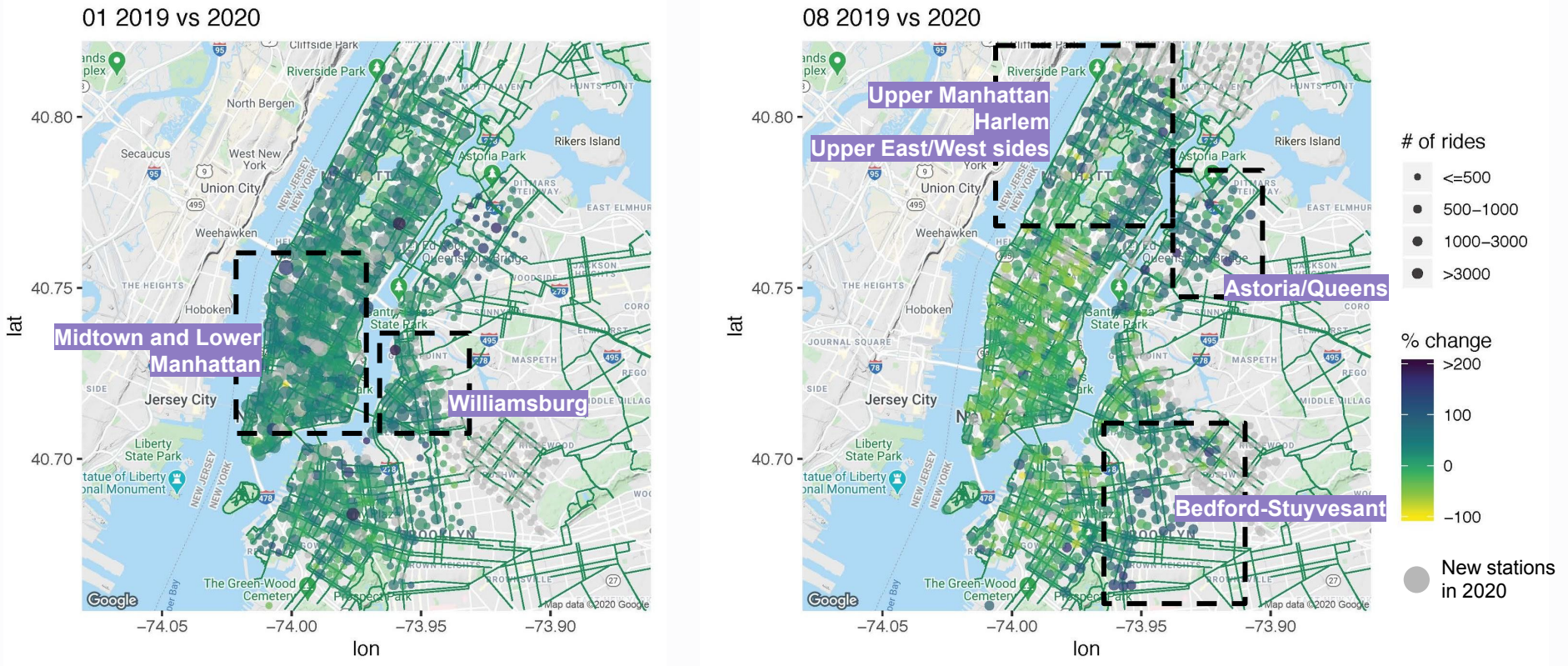
Trends in Popular Neighborhoods before COVID-19



Citi Bike Ride Monthly Comparison



Changes in Trends due to COVID-19

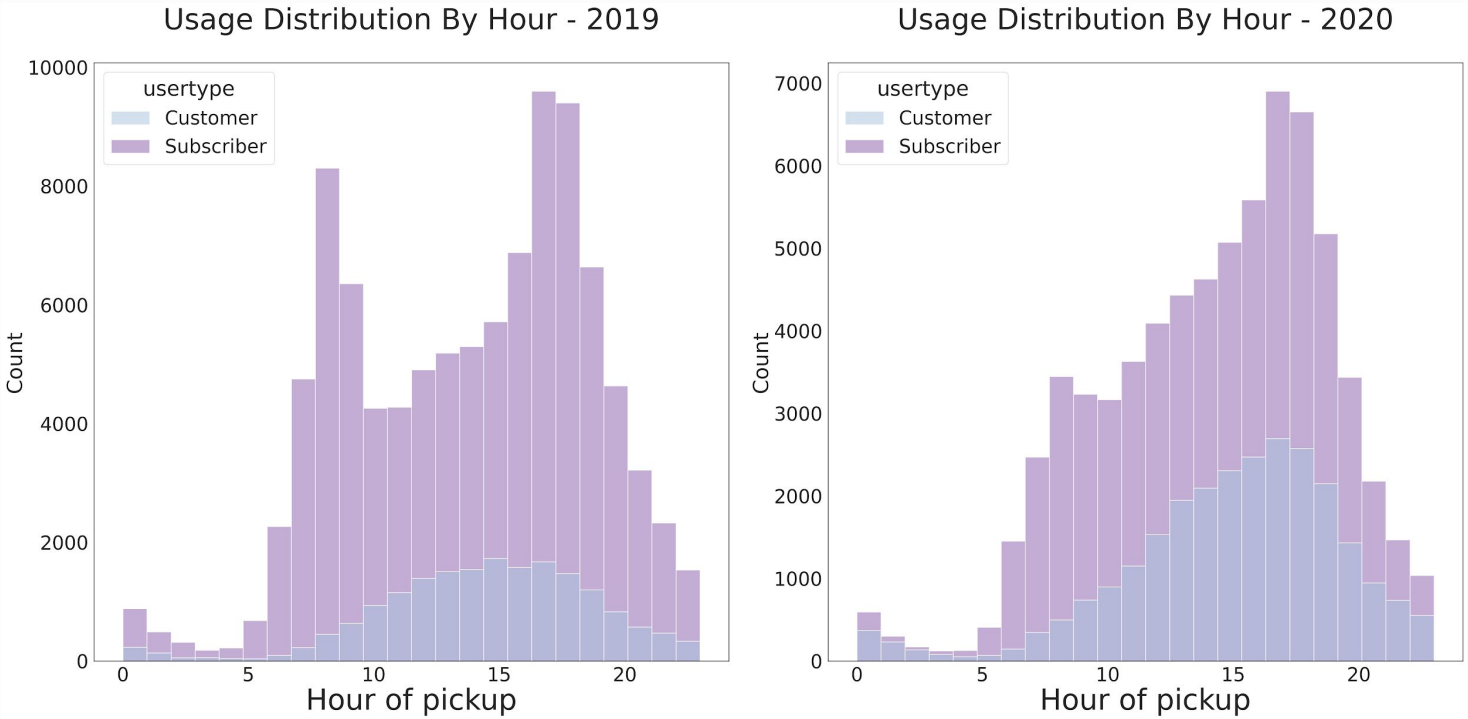


Suggestions

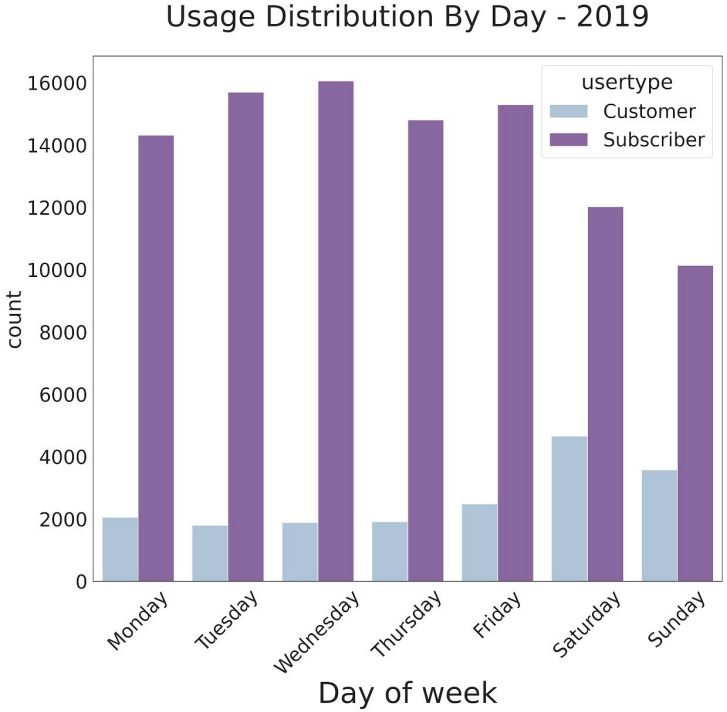
- Add new bike docks towards central Queens and Brooklyn
- Increase bike supplies at new trending stations
- Add new bike lanes in central Queens and Brooklyn

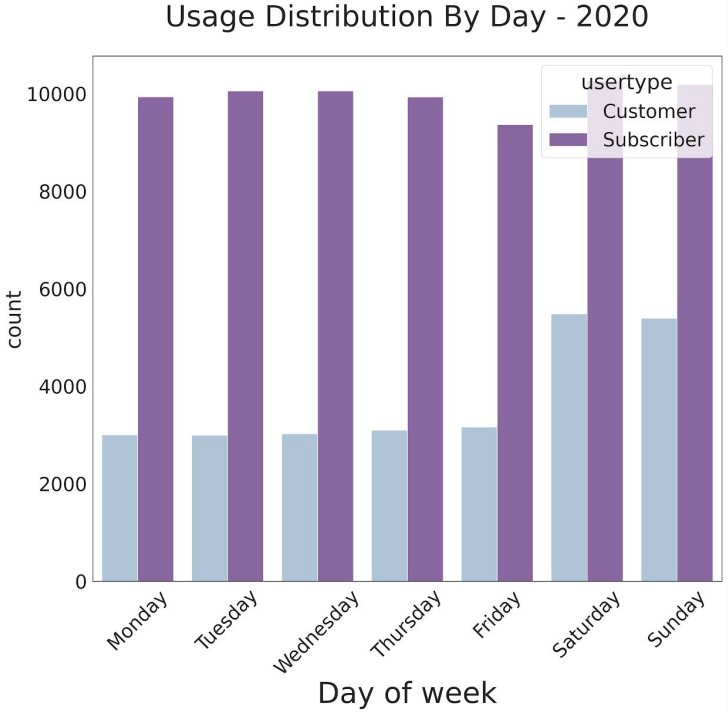
User behavior - 2019 vs 2020 (March-August)

Riding hours shifted due to COVID-19

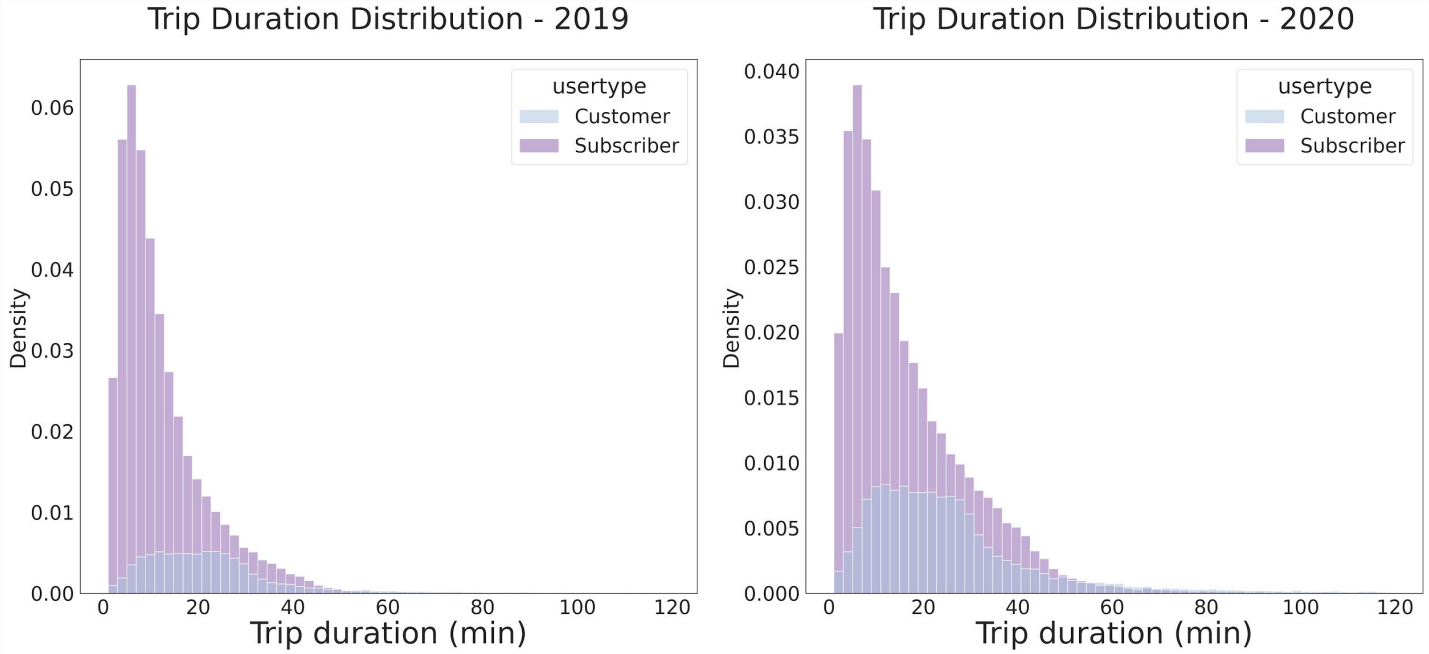


Weekend usage increased in 2020





Average trip duration increased amid pandemic



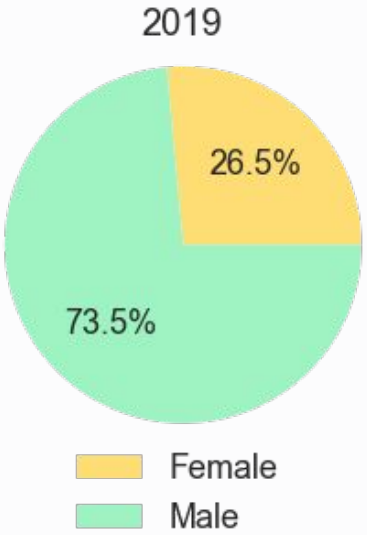
*The trip duration distribution differences between 2019 and 2020 were statistically significant**

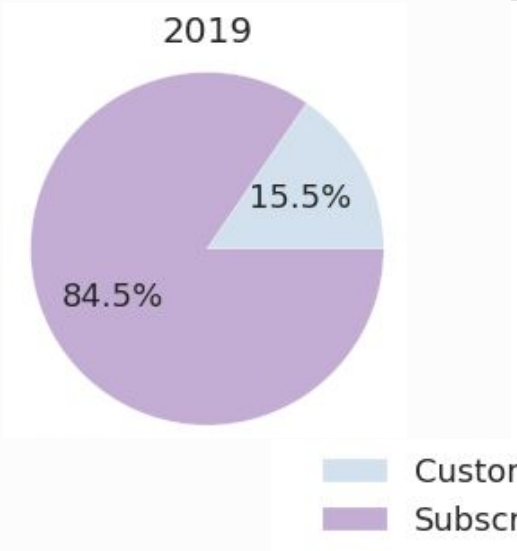
Business insights & recommendations

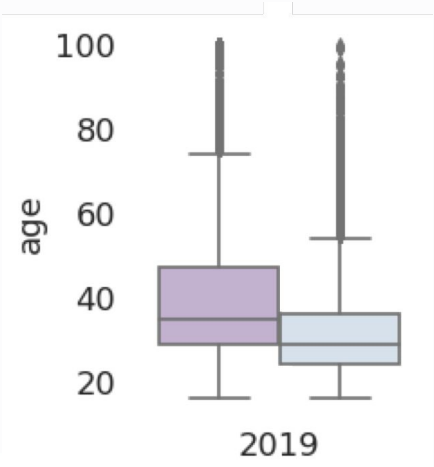
- There were less morning usage and more weekend usage in 2020 than 2019, which indicates a shift in user segmentation from commuters to leisure customers.
- To achieve the pre-COVID usage and to optimize the business opportunity, the company could promote usage using the following strategies:
  - Offer discounts to morning users
  - Provide special offer to those essential workers
  - Design and offer some attractive riding routes or discount packages

User demographics (2019 vs 2020)

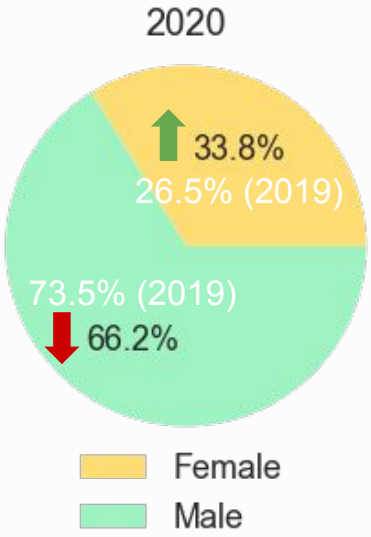
Citi Bike users are dominated by male, middle aged subscribers

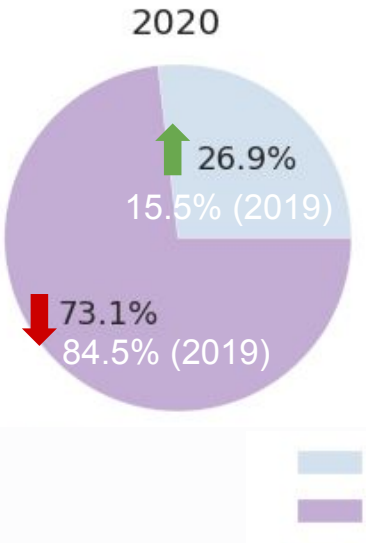


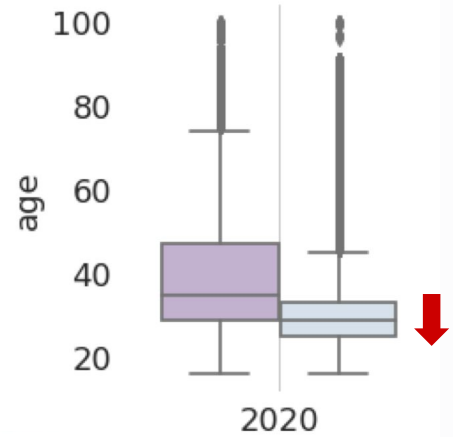




Trips by users are increasingly taken by younger, female customers







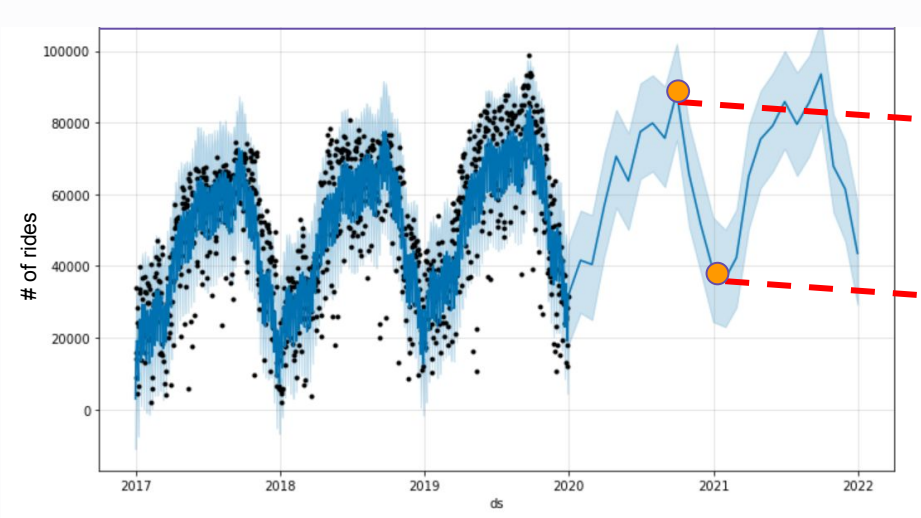
Suggestions

Citi Bike should target the growing population of customers:

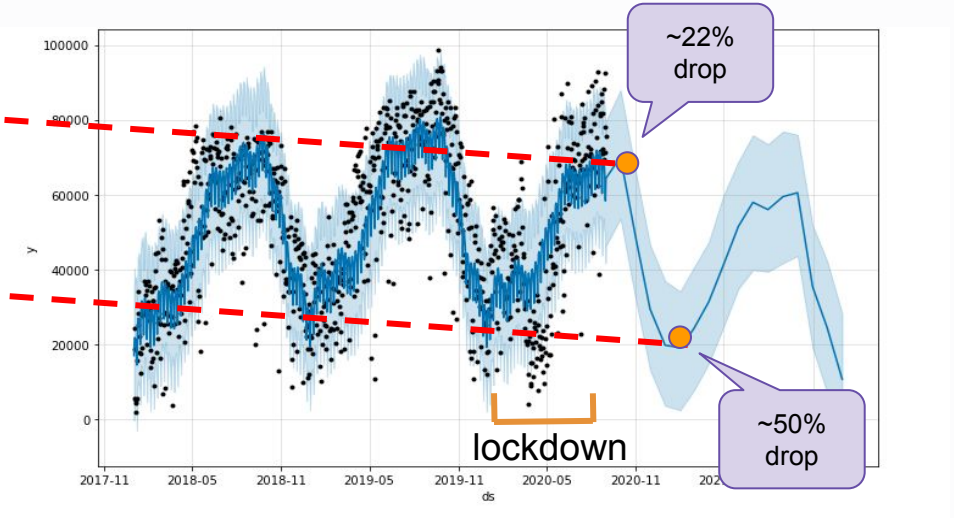
- Increase marketing efforts for a **gender neutral audience**
- Find ways to make an **annual subscription** more accessible

Forecasting and Predicting

Ridership Forecast for Q4 2020

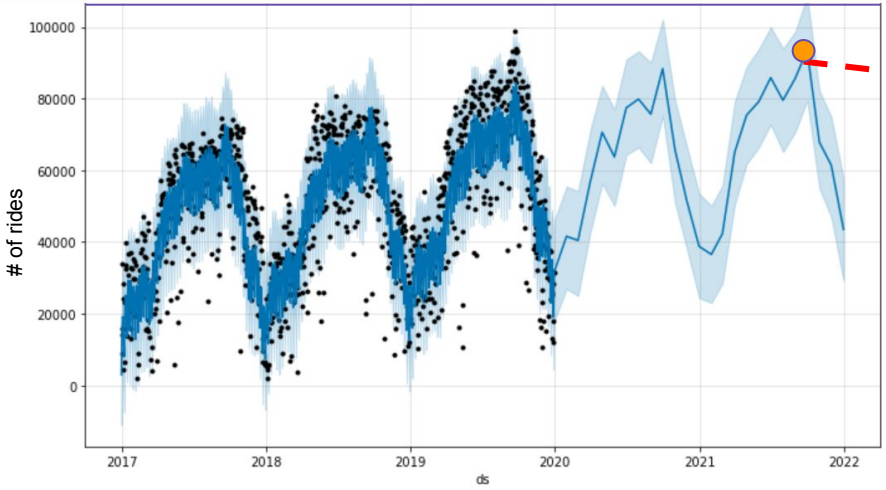


Forecasted values of Q4 2020 based on historical years 2017-19

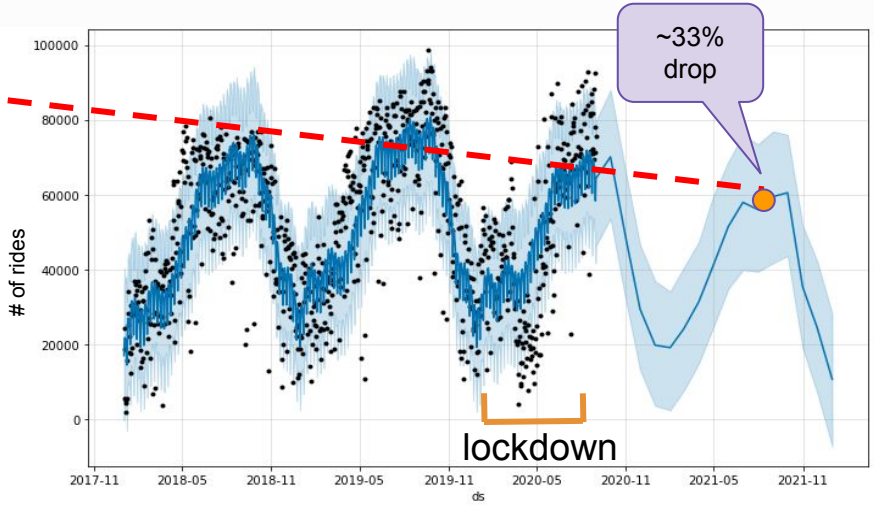


Forecasted values of Q4 2020 based on historical years 2018 - 20

Ridership Forecast for 2021

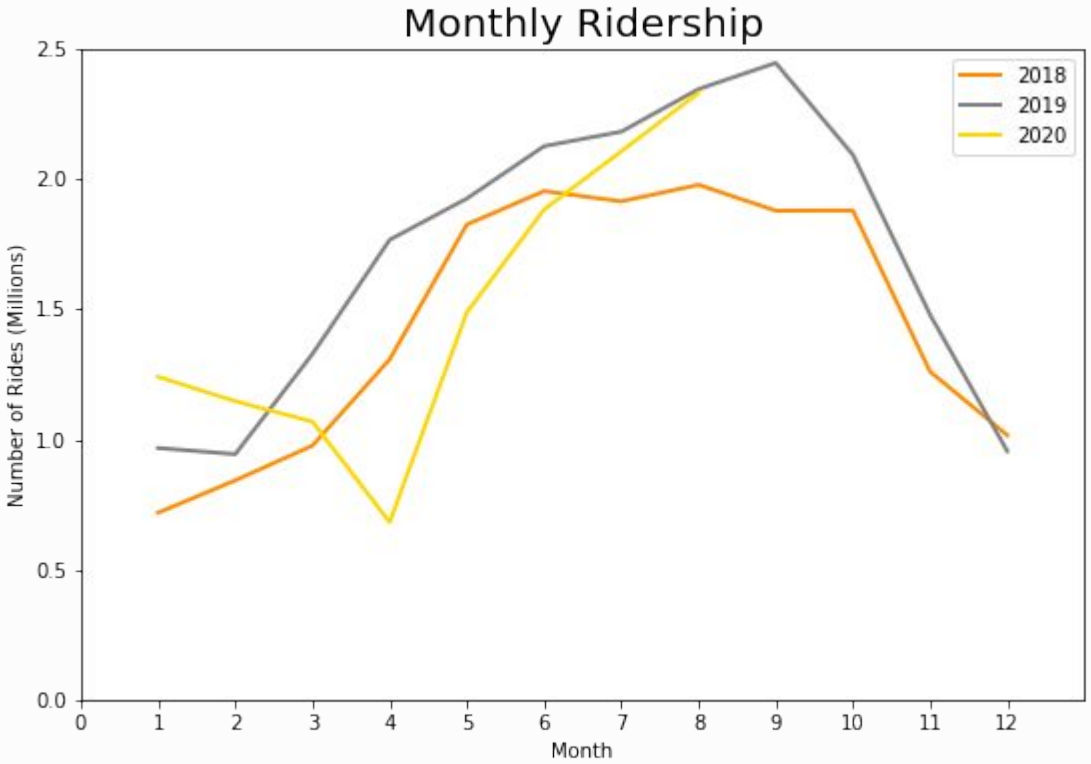


Forecasted values of 2021 based on historical years 2017-19

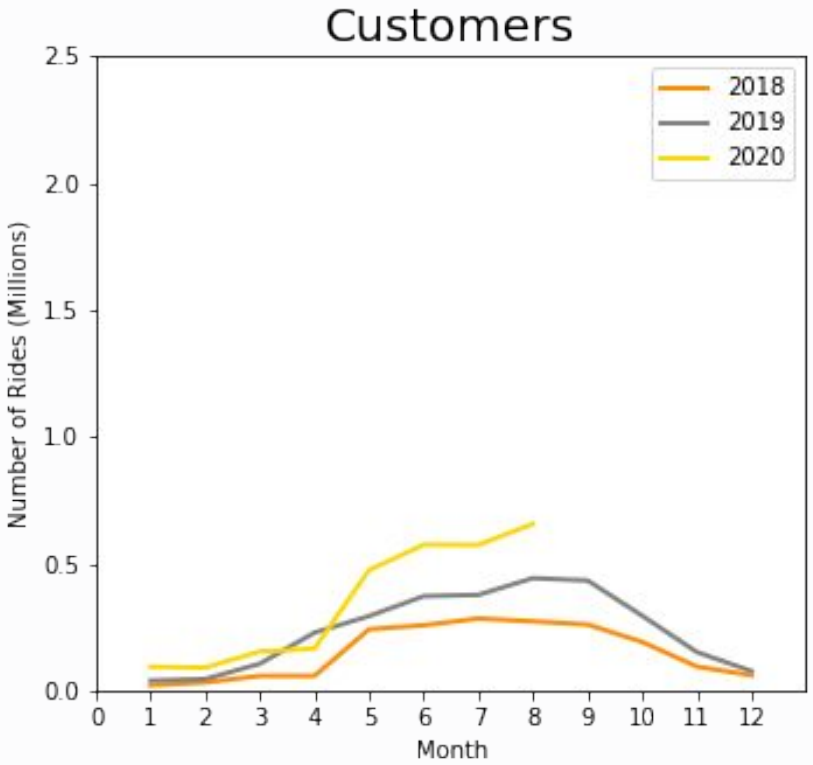


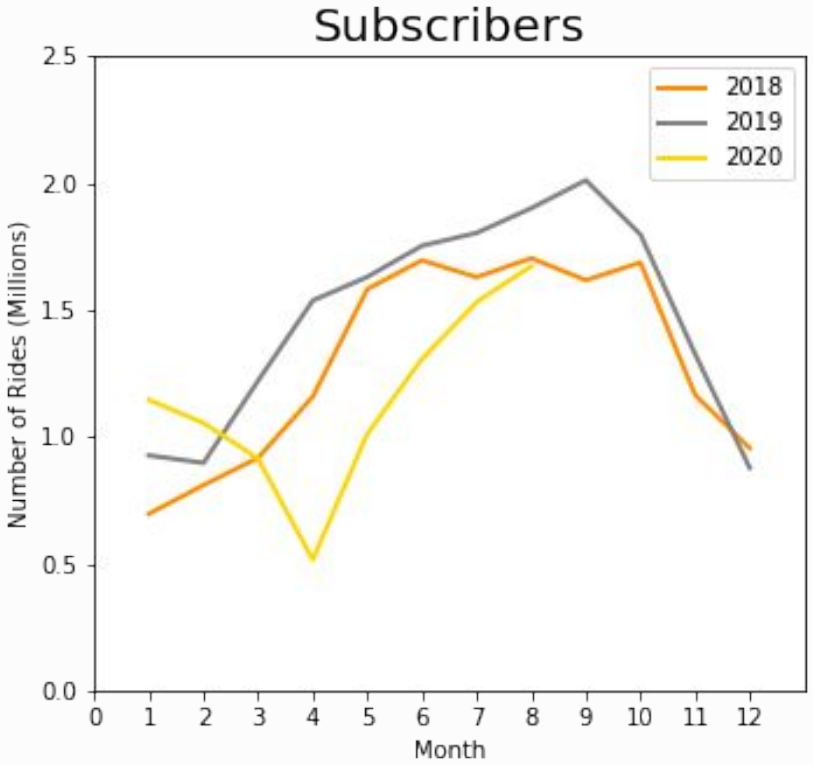
Forecasted values of 2021 based on historical years 2018 - 20

Ridership Trends- 2018, 2019, 2020

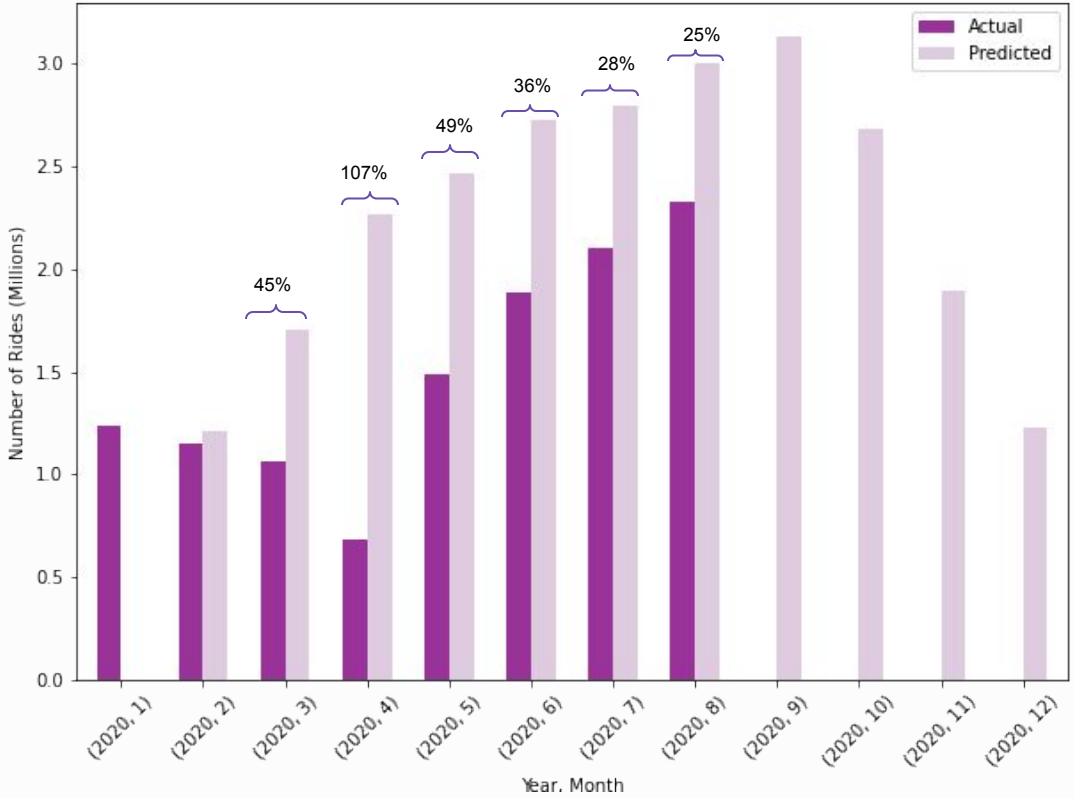


Customer vs Subscriber Trend- 2018, 2019, 2020





Predicted vs Reality- 2020



Recommendations

- Expand stations towards central parts of Queens and Brooklyn
- Adjustment of rebalancing: stations and timing (morning)
- Attractive riding routes and events → more leasure-type customers
- Expand bike lanes including protected bike lanes → improve safety and space
- Discounted morning rates → attract previous morning commuters
- Discounted subscriptions to essential workers → more riders
- Discounted annual subscription → more riders
- Payment in installments → convert young customers to subscribers
- Gender-neutral marketing campaigns → attract females

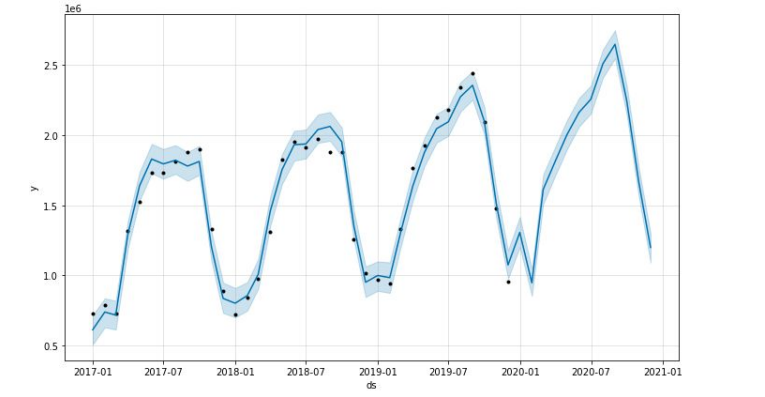
Appendix

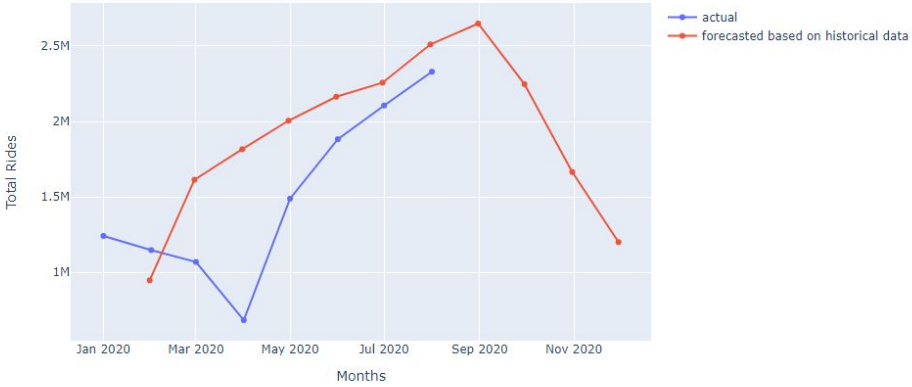
Mann-Whitney U Test

	U-statistics	p-value
2019 customer vs subscriber	440481938.5	<0.001
2020 customer vs subscriber	587710971.5	<0.001
Customer 2019 vs 2020	216363366.0	<0.001
Subscriber 2019 vs 2020	2772629871.0	<0.001

Ridership Forecast for 2020

Forecasted values of 2020 based on historical years 2017-19



# of rides

Actual vs forecasted