Data Analytics

Using Tableau: Citi Bike 2020 Data Feb-Aug

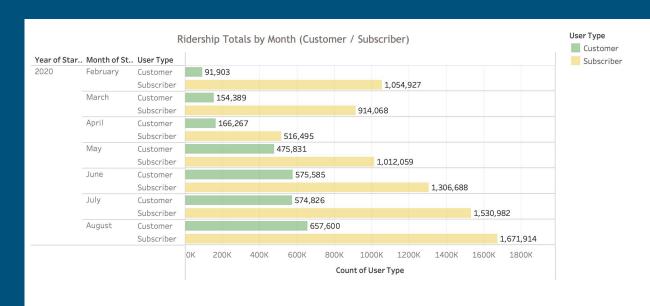
Basic Numbers: Feb-Aug 2020

20,936 Total number of bikes
10,703,531 Total number of bike trips
1,069 Number of start stations used
1,101 Number of stop stations used
23.91 Average trip duration in minutes

Citi Bike Analytics Feb-Aug 2020

https://public.tableau.com/authoring/CitiBikeAnalyticsFebToAug2020/CitiBikeAnalyticsFebAug2020#1

Total Ridership by Month (Customer/Subscriber)



Customer Base Analysis:

Compared to the number of 'subscribers' in February, during March and April there are fewer subscribers. One would expect larger increases in March/April due to the weather conditions being more favourable.

However, this data makes sense, because there was a pandemic that started in March of 2020. People were asked to isolate during March and April. Thus, there is a higher increase in customers and subscribers from May to August. Generally, people going back to work or partaking in a form of exercise may have considered biking a more viable option compared to public transportation or public gyms.

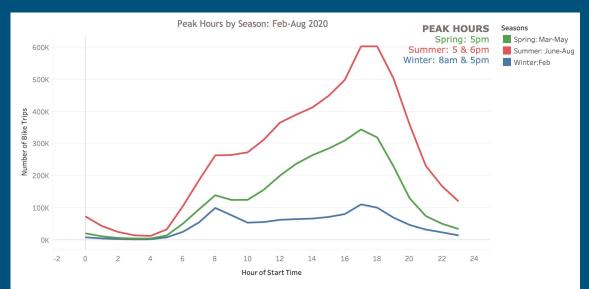
Percent Ridership Monthly Growth (Feb-Aug 2020)



Analysis of % Ridership Growth:

- During March there is an increase in the 'customer' base. At this time, the pandemic began mid-March, and early riders and those with essential
 jobs may have chosen to bike to work rather than using public transportation. The 'subscriber' base went down, as it was unknown how long the
 pandemic would last.
- 2. April showed a further decline in 'subscribers' (one might usually see an increase). One assumption, is that generally, people tended to be in lockdown or have a fear of the spread of a contagious disease.
- 3. May of 2020 one can see a large increase in 'customers' and 'subscribers'. Various reasons can cause an increase of business, but mental health was being promoted along with the mix of better seasonal weather at this time. These reasons made biking a good choice to get around without gathering near others or taking public transit or using public gyms.
- 4. Generally there is an increase in 'customers' and 'subscribers' continued, but at a slower rate, for the remaining months, June-August. Again, this makes sense as more people were finding ways to get out during the pandemic. There is just a slight decrease in 'customer' business in July.

Peak Hours by Season



Analysis of Peak Hours:

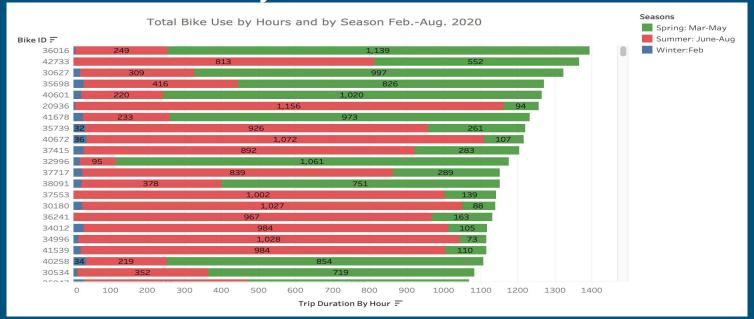
All seasons have a peak hour around 5pm and addtionally, 6pm in the summer.

Generally people are finished work around 5pm and may be commuting by bike. Additionally, others may be getting some outdoor exercise before it turns dark or doing some errand by bike after work. Thus, these peak times make sense.

It looks like fewer bike trips were made in Spring of 2020 compared to the summer. One would think that there would be a similar amount of riders compared to the summer. Again, this perhaps could be due to the pandemic lockdown and fear of spread.

During the winter (Feb 2020), fewer people are biking, normally due to weather, but one can see that those who enjoy a winter bike ride, may be commuting to work. The numbers reveal similar peaks at 8am and 5pm in the winter which corresponds to a working day.

Most Used Bikes by Hour and Season of Use

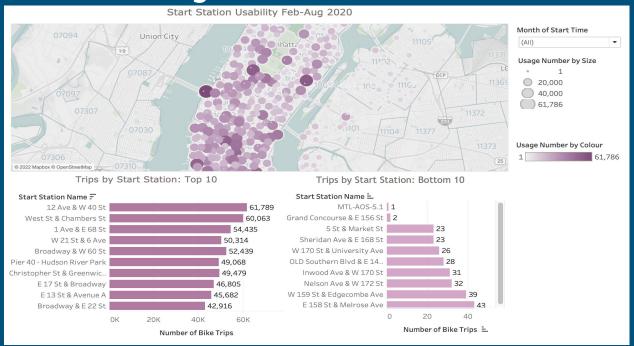


Various types of bike maintenance can be done on a monthly, biyearly and yearly level.

Generally, the bikes with the most hours of use will need tune-ups, and maintenance, more often, or given a higher priority to maintain. This assumes that the trip duration has no long 'user stops' inbetween.

As well, the chart shows that generally winter (Feb 2020) is a better time to do the yearly maintenance because most bikes have fewer hours of use at this time.

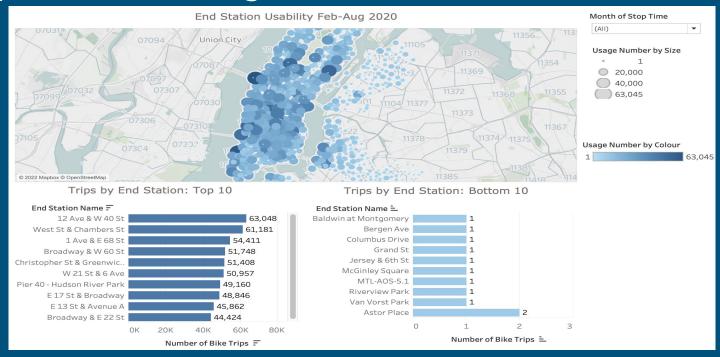
Start Station Usage



Start Station Analysis:

Most bike stations are in the Manhattan area. The highly used start stations are around the outside of Manhatten, by the water, or accesses across the water, and close to area parks. People who regularly commute may be using these stations. As well, people were encouraged not to be around others during the pandemic. Thus, biking the out skirts of Manhattan area or biking in parks may have been a more popular and scenic choice. From Feb-Aug 2020, the 12 Ave & W 40 St station, has the most usage of 61,789. This station is close to the Lincoln Tunnel and Hudson River Park with various Piers. West St & Chambers St.(60,063 starts), is on the out skirts of town by Rockefeller Park and Washington Market Park. Very unpopular start stations may have fewer points of interest, or they are outside of the Manhattan area.

Stop Station Usage



Stop Station Analysis:

Most bike stations are in the Manhattan area. The highly used stop stations are around the outside of Manhatten, by the water, or accesses across the water, and close to area parks. People who regularly commute may be using these stations. As well, people were encouraged not to be around others during the pandemic. Thus, biking the out skirts of Manhattan area or biking in parks may have been a more popular and scenic choice. From Feb-Aug 2020, the 12 Ave & W 40 St as a stop station, has the most usage of 63,048. This station is close to the Lincoln Tunnel and Hudson River Park with various Piers. West St & Chambers St.(61,181 stops), is on the out skirts of town by Rockefeller Park and Washington Market Park. Very unpopular start stations may have fewer points of interest, or they are outside of the Manhattan area.

INTRODUCTION

New York City's Citi Bike is the largest bike-sharing system in the US. It originally opened in 2013 with 6,000 bikes and 332 stations. Today, in this investigation, I explore the bike-sharing data for Feb-Aug 2020.

DATA PREPARATION

Citi Bike provides extensive data on trips, listing start and end times, trip duration, stations, age, gender and user type. I used Jupyter Notebooks to parse, review data, and rename columns for each Monthly csv file.

GENERAL CONCLUSIONS

Basic Counts:

The total number of bikes, now used between Feb-Aug. 2020, are 20,936 with a total of 10,703,531 bike trips. There are at least 1101 stations being used with an average bike trip duration of 23.91 minutes (removing a few long trip outliers).

Customer Base Growth/Decline Feb-Aug 2020:

There were 1,054,927 'subscriber' types in February, and in March this declined to 914,068 and in April a decline to 516,495. One would expect an increase in ridership from winter to spring weather. The pandmic may have had an impact on ridership at this time which started in March of 2020. The percent ridership growth shows the highest increase of customers (+95.9%) and subscribers (+186.2%) in May and an increase mostly continued during the summer months. Generally, people might of started using the bike program as a good alternative to public transportation and/or public gyms.

Bike Hourly Usage/Maintenance:

Peak hours of usage for each season is around 5pm and addtionally, 6pm in the summer.

Generally people are finished work around 5pm and may be commuting by bike. Additionally, others may be getting some outdoor exercise before it turns dark or doing some errand by bike after work. It looks like fewer bike trips were made in Spring of 2020. One would think that there would be more. This could be due to the pandemic lockdown or fear of spread.

During the winter (Feb 2020), fewer people are biking due to cooler weather, but one can see that ridership use may be by commuters. The numbers reveal peaks at 8am and 5pm during the winter which is similar to a working day.

A chart with the hourly usage per bike and by season shows that the winter time (Feb 2020) is the best time to do yearly maintenance to the bikes

A chart with the hourly usage per bike and by season shows that the winter time (Feb 2020) is the best time to do yearly maintenance to the bikes because most bikes have fewer trip hours. As well, one can see that the bikes with the highest trip duration would indicate a higher priority of additional maintenance that can implemented. Note: Not all bikes are used in every season.

Bike Station Usage:

The highest amount of bike stations are in Manhattan. The highly popular stations are around the out skirts of Manhattan by the water or accesses across the water and/or by parks. The top 3 START stations used are the same as the top 3 STOP stations used between Feb-Aug 2020. These stations are all by parks including 12 Ave and W 40 St being near the Lincoln St. Tunnel and a Ferry.

People who regularly commute from outside of the Manhattan area to get to work may be using these stations. As well, people were encouraged not to be around others during the pandemic. Thus, biking the out skirts of Manhattan or in a park may have been a more popular, scenic and open choice.