

New York Citi Bike Tableau Analysis

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The New York Citi Bike sharing system launched in 2013 as an effort to provide an affordable and efficient means of transportation around the city. Since then, the platform has become an integral part of the transportation ecosystem in the city. The program has grown significantly over the last five years to include approximately 12,000 bikes with over 143,000 members.¹ While the ridership numbers have increased, NYC Citi Bike 3-day passes has seen a drop off in purchases from 2017 to 2018. This is in contrast to 24-hour passes purchased which has increased over this time. The visuals below give insight into this trend and provide recommendations to improve 3-day ridership totals.

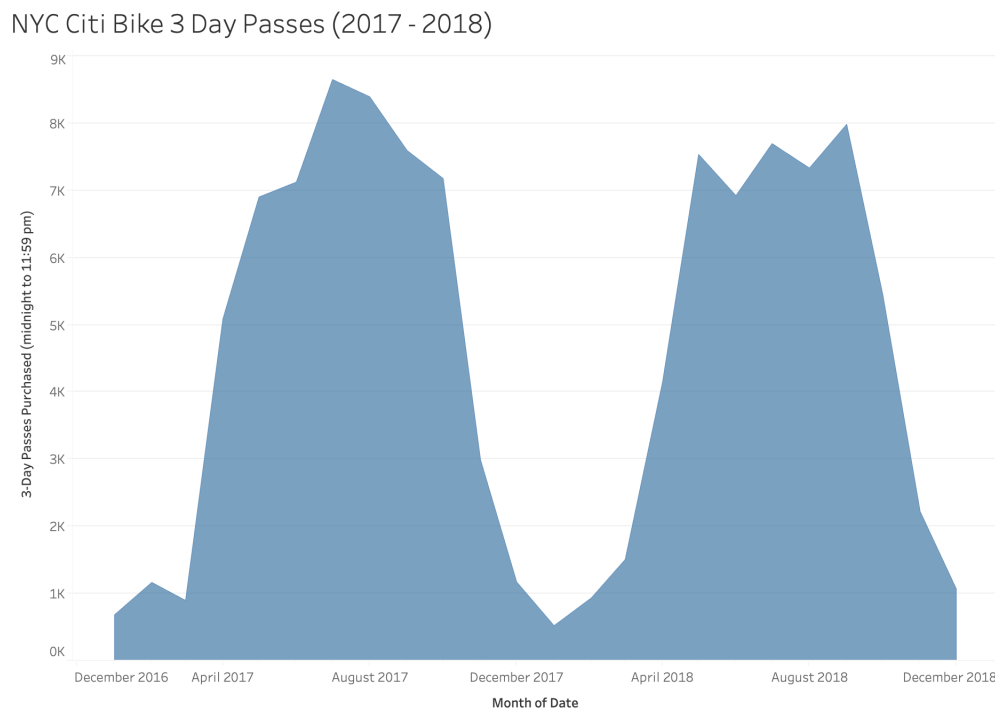


Figure 1. NYC Citi Bike 3-day passes Purchased by year and month (2017-2018)

The Citi Bike program is reliant on weather conditions as illustrated in Figure 1. During winter months, the number of 3-day passes purchased is significantly smaller than the totals during the warmer months. The first part of this analysis was to determine if this significant downswing in passes purchased during the winter months was specific to 3-day passes. For comparative analysis, 3-day passes were compared to 24 hour passes from 2017 to 2018 broken down by yearly quarters (Q1 = Jan – Mar, 'winter', Q2 = Apr – Jun, 'summer', Q3 = Jul – Sep, 'summer', Q4 = Oct – Dec, 'winter').

¹ NYC Citi Bike. *About Citi Bike*. <https://www.citibikenyc.com/about>

As you can see in Figure 2, 24-hour passes purchased also see significant decreases during Q1 and Q4 (winter months) in comparison to Q2 and Q3 (summer months). However, every quarter for 24-hour passes saw growth in going from 2017 to 2018. In fact, even in Q4 (Sep – Dec), there was almost a 70% increase in passes purchased from 2017 to 2018.

These increases are in stark contrast to the results for 3-day passes. Only Q1 saw a slight increase in passes purchased from 2017 to 2018 while the three other quarters saw decreasing results. In fact, in Q4 for 3-day passes, there was an approximately 23% drop in purchases from 2017 to 2018, more than any other quarter.

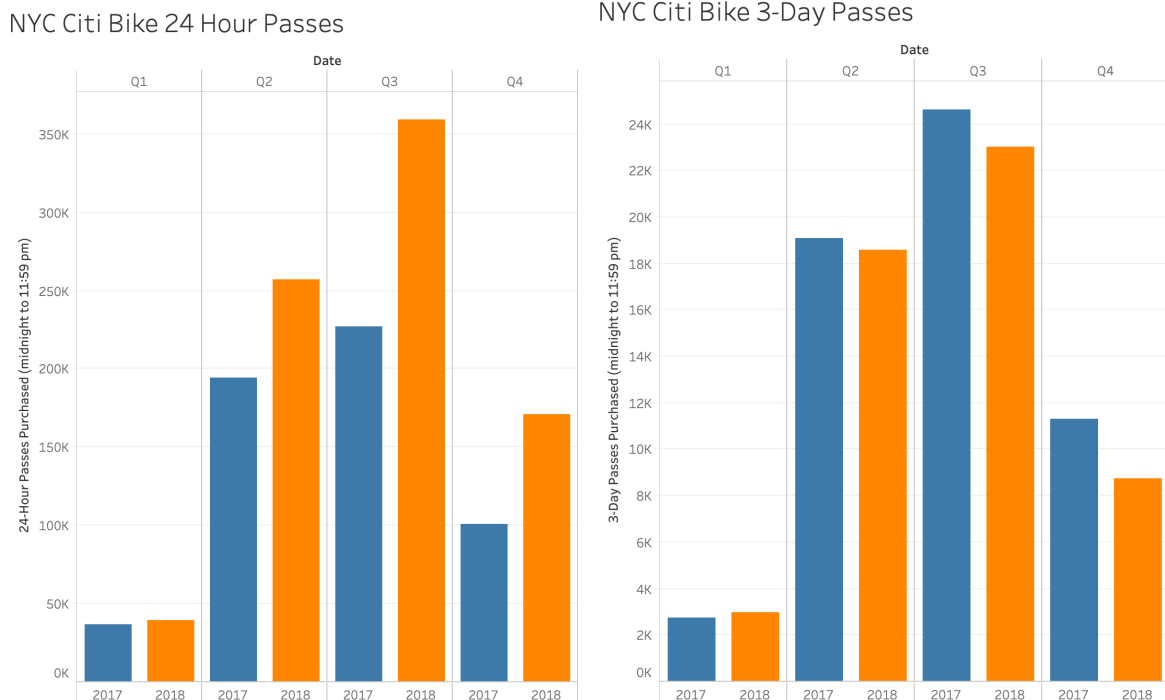


Figure 2. NYC Citi Bike 24 hour and 3-day passes purchased by yearly quarter (2017 – 2018)

In addition to tracking quarterly performance of 3-day bike passes by year, an analysis of weekday performance is also provided below (Figure 3). Not surprisingly there is a decrease in performance for every day of the week for the 2017 to 2018 transition. With an average decrease of approximately 8%, Sunday and Tuesday (14 and 11% respectively) saw the largest percent decrease in 3-day passes purchased. However, there are no significant outliers in days of the week.

NYC Citi Bike 3 Day Passes

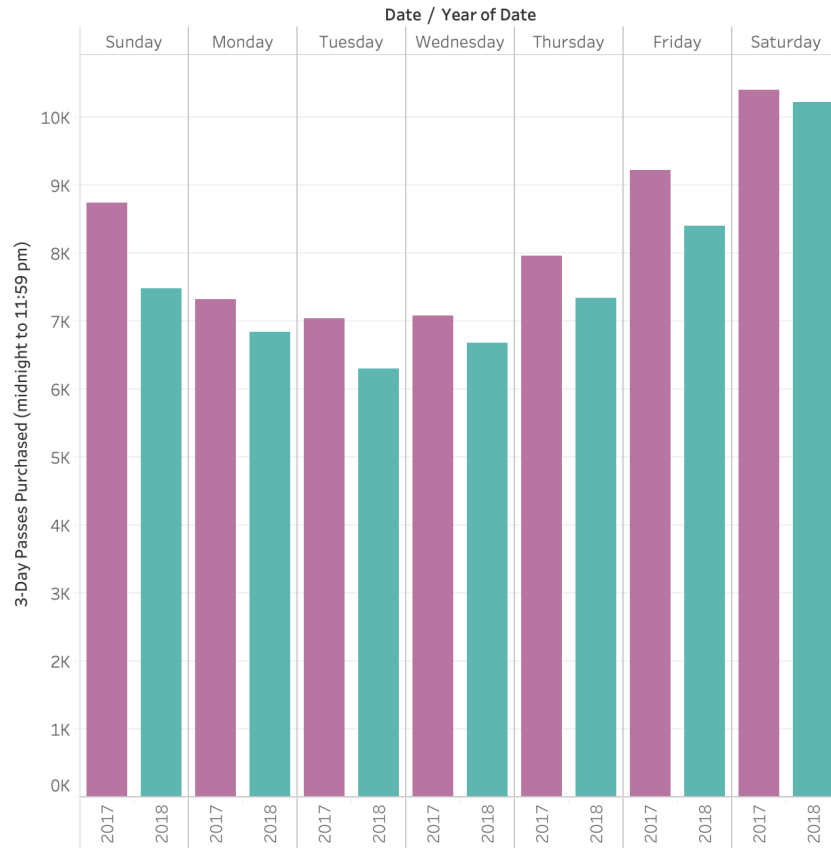
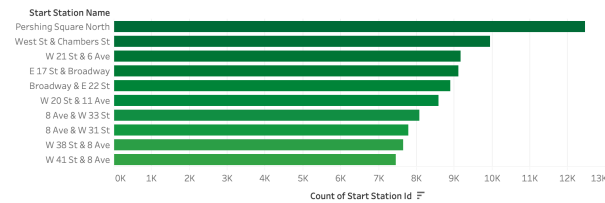


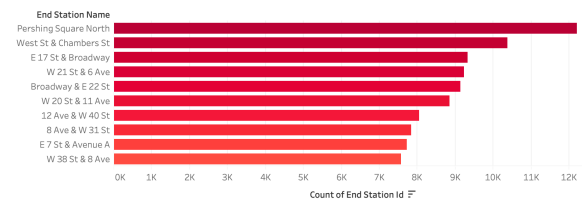
Figure 3. NYC Citi Bike 3-day passes purchased by weekday (2017 – 2018)

Finally, an analysis was conducted on the top 10 Citi Bike stations for starting and ending a journey from a month of data in Q3 and Q4. This was an effort to see if there were significant changes in station usage during winter and summer operation. Figure 4 shows the top 10 bike stations for August 2017 and December 2018. Both a horizontal bar graph and map are used to illustrate the starting and ending rideshare station data. Top start and end station locations can be found in both the winter and summer months of bike sharing data. It is interesting to note that during the summer month, there are some coastal stations that are in the top 10 which are not present in the winter month.

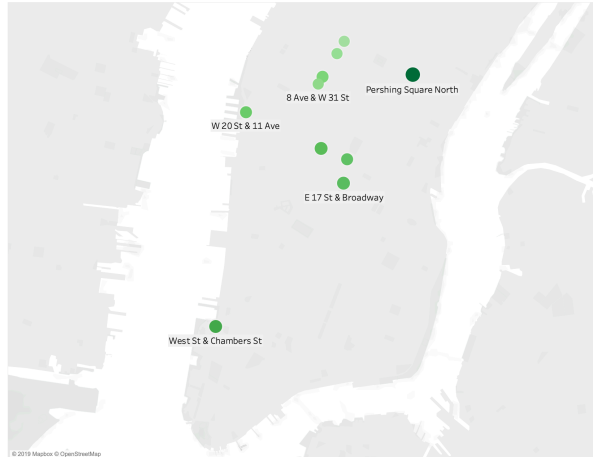
Top 10 Stations for Starting a Journey (Aug 2017)



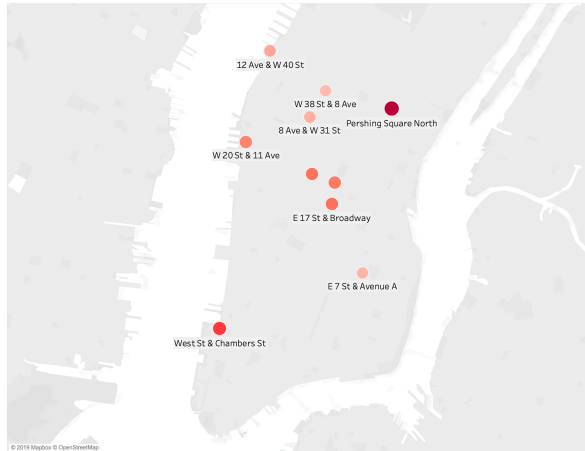
Top 10 Stations for Ending a Journey (Aug 2017)



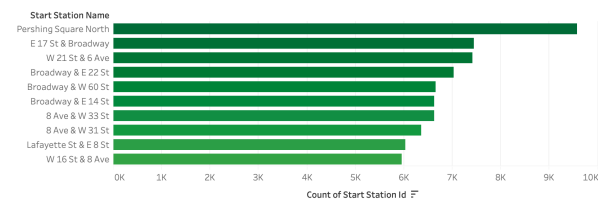
Top 10 Stations for Starting a Journey (Aug 2017)



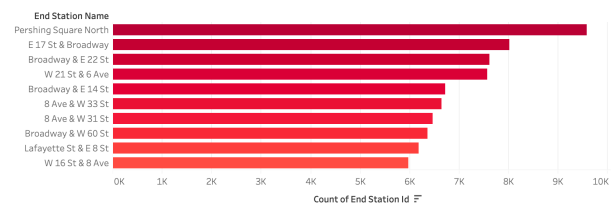
Top 10 Stations for Ending a Journey (Aug 2017)



Top 10 Stations for Starting a Journey (Dec 2018)



Top 10 Stations for Ending a Journey (Dec 2018)



Top 10 Stations for Starting a Journey (Dec 2018)



Top 10 Stations for Ending a Journey (Dec 2018)



Figure 4. Top 10 NYC Citi Bike stations to start and end a journey (Aug 2017 and Dec 2018)

The New York City bike sharing program has seen significant decrease in the number of 3-day passes purchased from 2017-2018. The largest decrease came in Q4 which consists of September thru December. This is in contrast to 24-hour passes purchased which have increased over this time. To improve figures in the sale of 3-day passes the NYC Citi Bike program should:

- Facilitate special discounts during winter months for 3-day passes to increase ridership.
- Apply these discounts throughout the week, as there are no days of the week where significant decreases in passes purchased is observed.

Summary of Analysis

For this analysis, data was acquired from Citi Bike's open data site (<https://www.citibikenyc.com/system-data>). Python via Jupyter Notebook and the Pandas library was utilized for cleaning of the data. Data pertaining to August 2017 and December 2018 are for records of those with a birth year greater than 1960. Rows that contained missing information were also omitted from the analysis. This resulted in over 1 million rows of data for each of the two months.