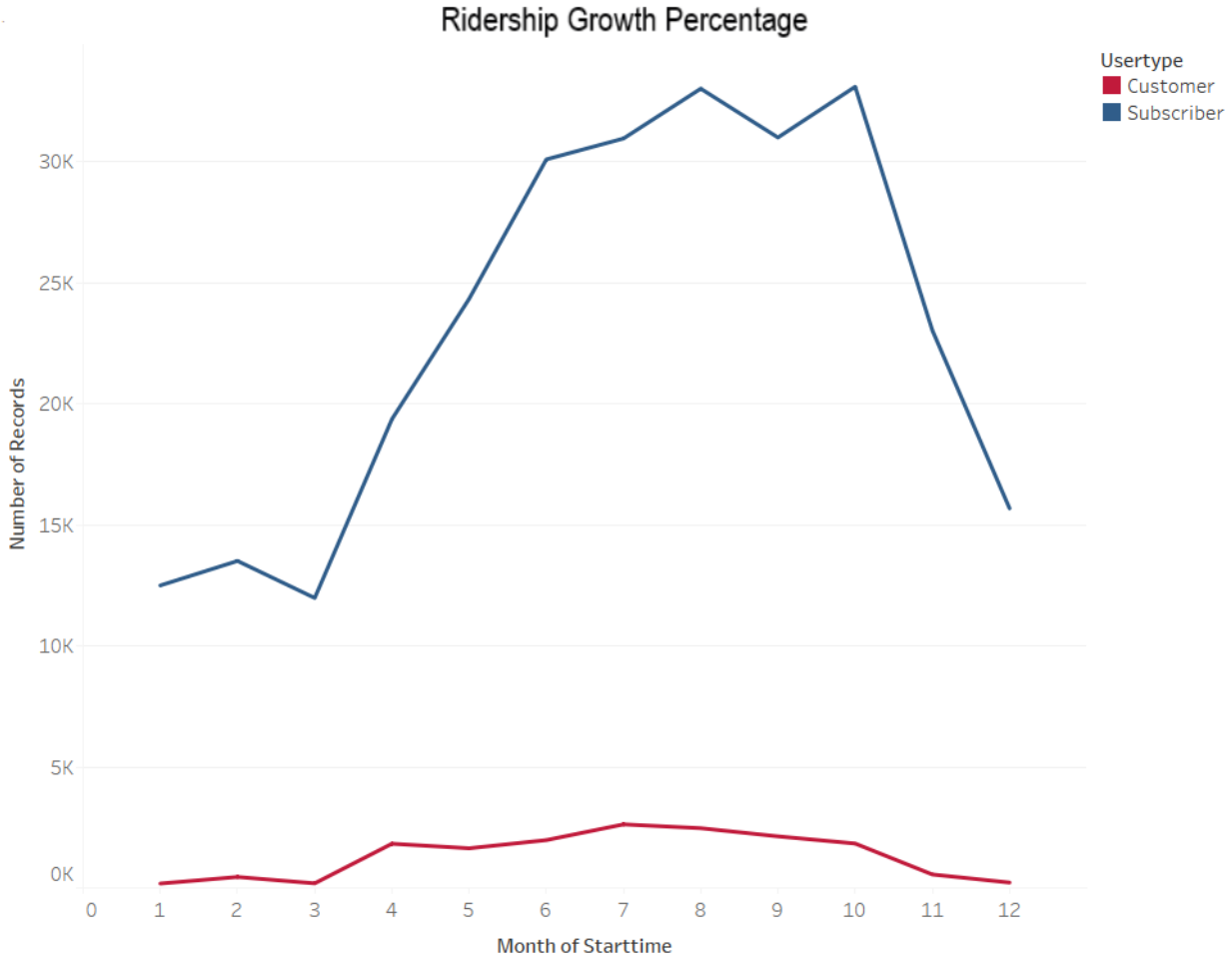
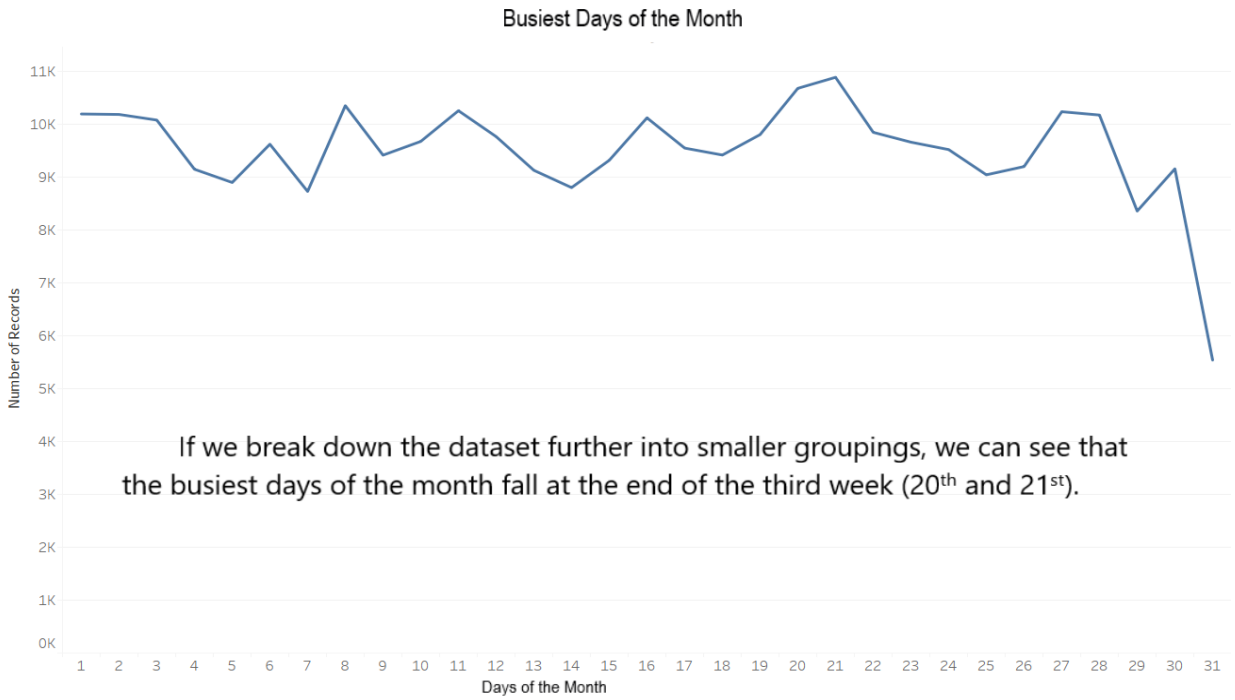
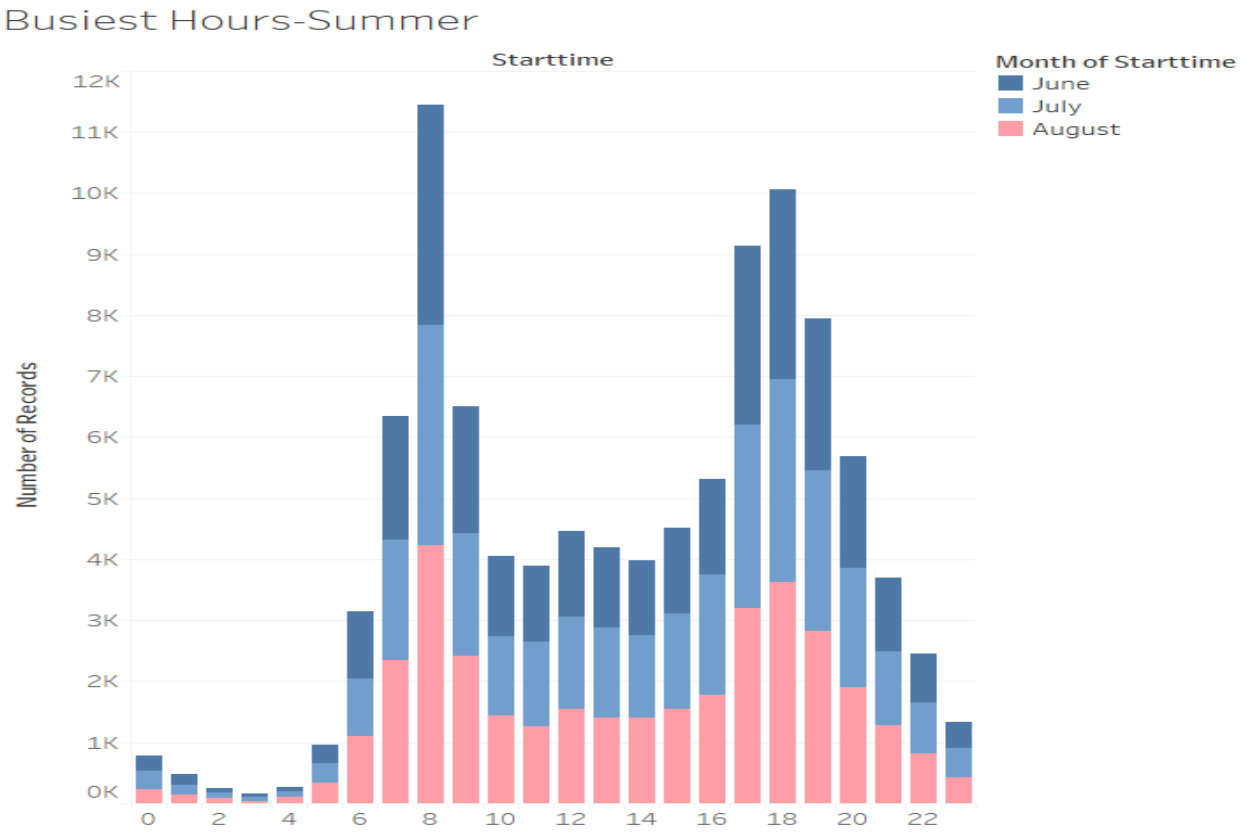
Jersey City Citi Bike Analysis

For our dataset, I chose to work primarily with the most recent available data over the period of a year ago. The most recent data we have thus far is from January so we went back to February of last year for a full twelve months to analyze.

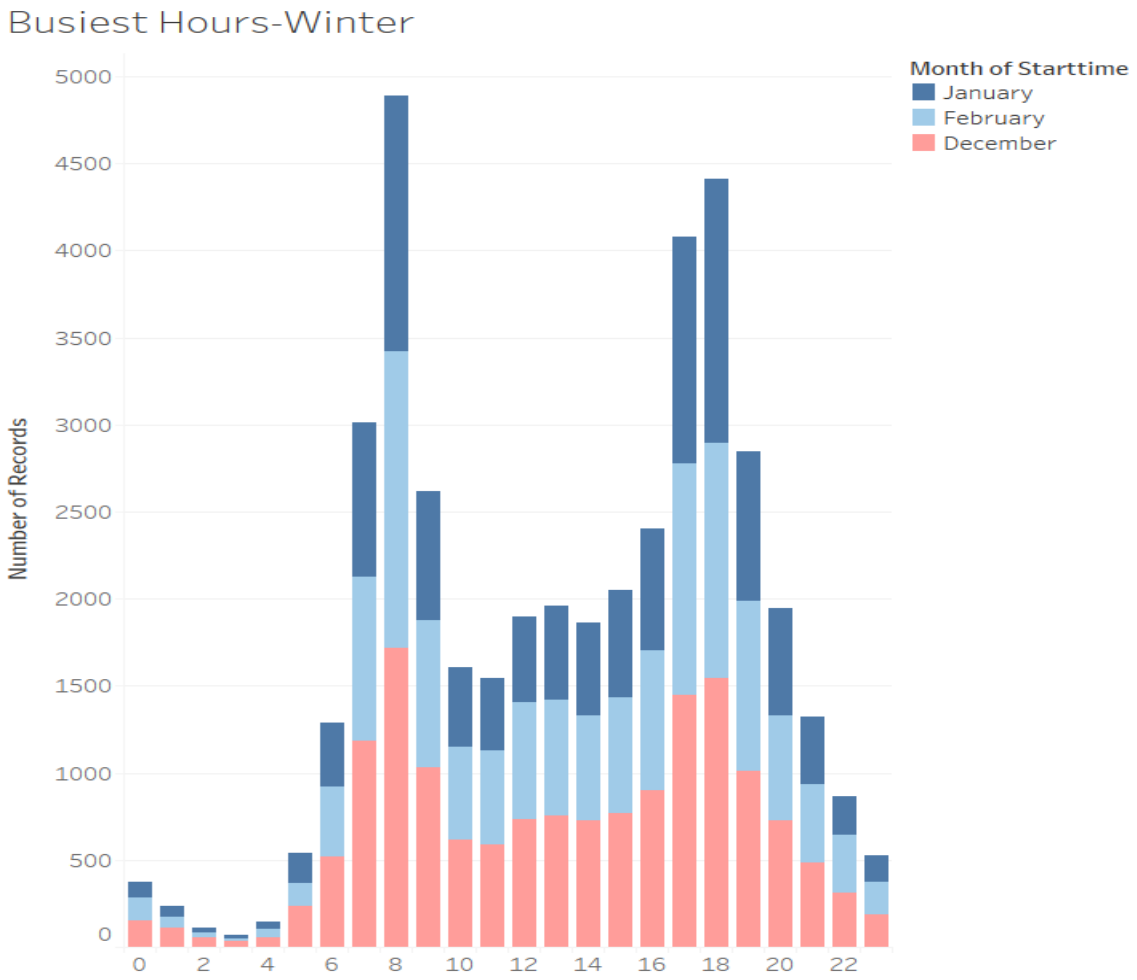


The total amount of rides during this period was 294,679. Based off of a report from the last full year of records (2016), the average ridership for Jersey City increased in 2017 by around 16% up from 247, 584 trips to 294, 928 trips. Out of those total trips, the amount of customer trips has remained fairly small, starting at around 200 trips in the winter to 2,500 trips over the busy summer months. On the other hand, there was a large number of subscriber trips from around 13,000 trips on average during the colder months and increasing to about 31,000 trips in the summer. At their peaks, the customer trips represent around 8% of the total trips in Jersey City.



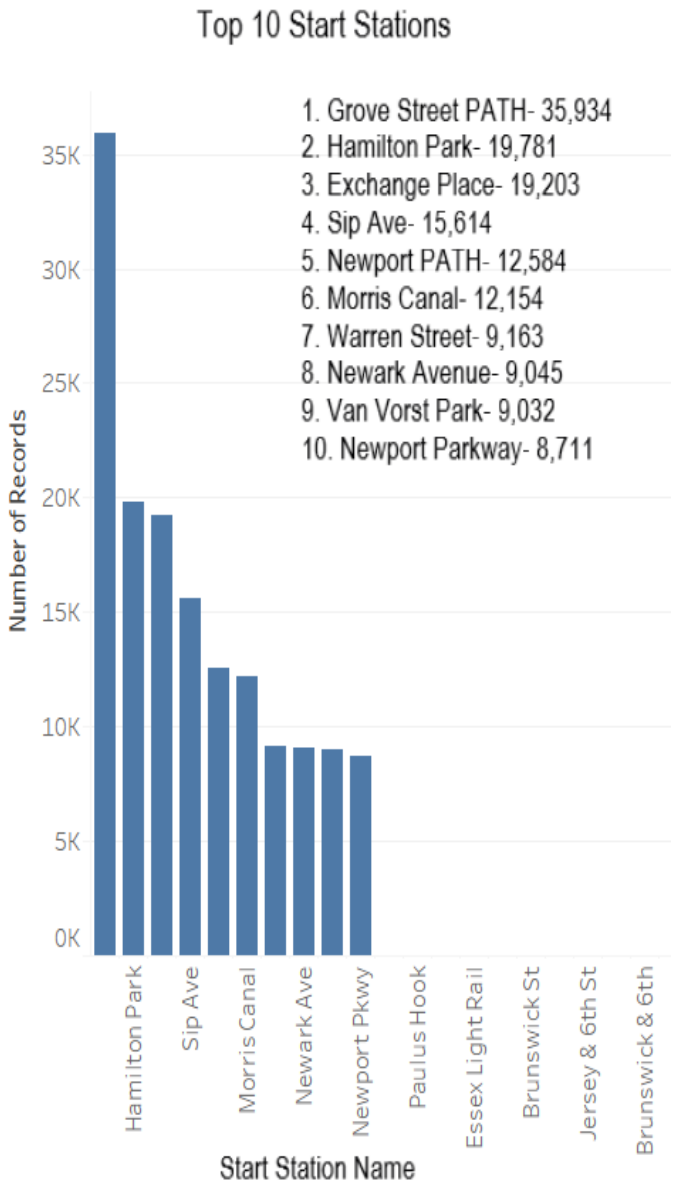


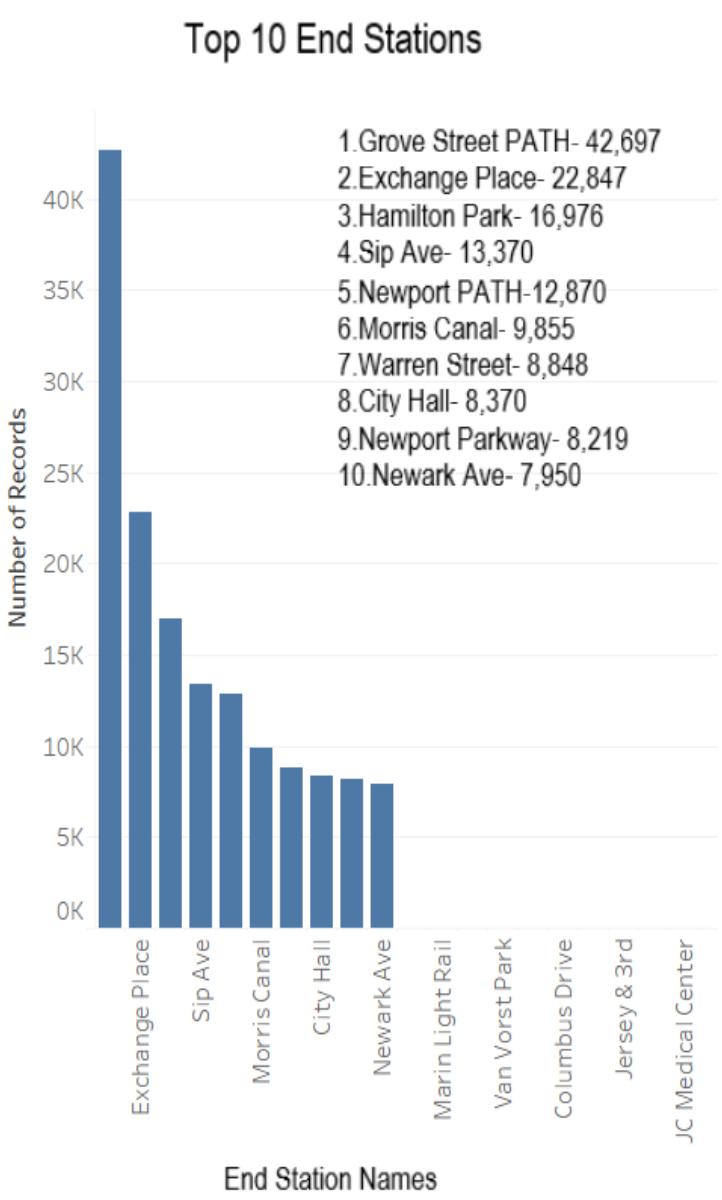
We can also see that the busiest hours, on average, are 8 am and 5-6 pm during the summer & winter months (see below). The number of riders begins to rise around 5 am and peaks at 8 am. Then, in the afternoon, the number of riders rises around 3 pm and peaks at 6 pm. These hours correspond to typical commute times in metropolitan areas.



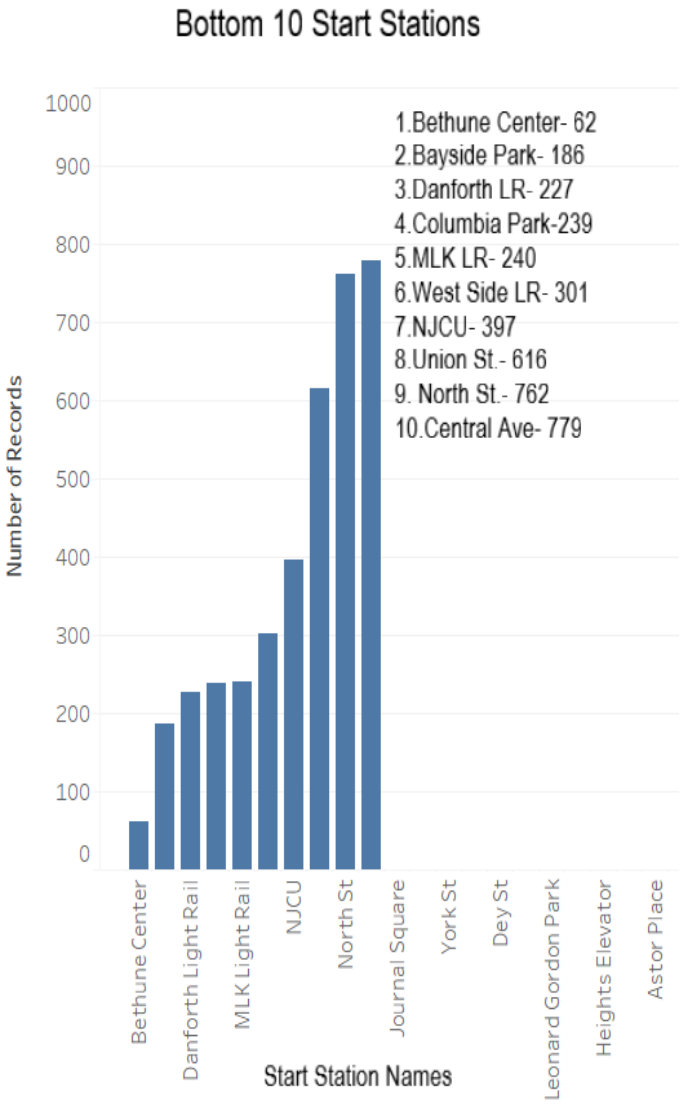
In a similar vein, if we wanted to see which bike stations are the most busy in Jersey City, we can break it down by the top ten stations and the bottom ten. First, we'll look at the start stations where folks begin their biking adventures (see below).

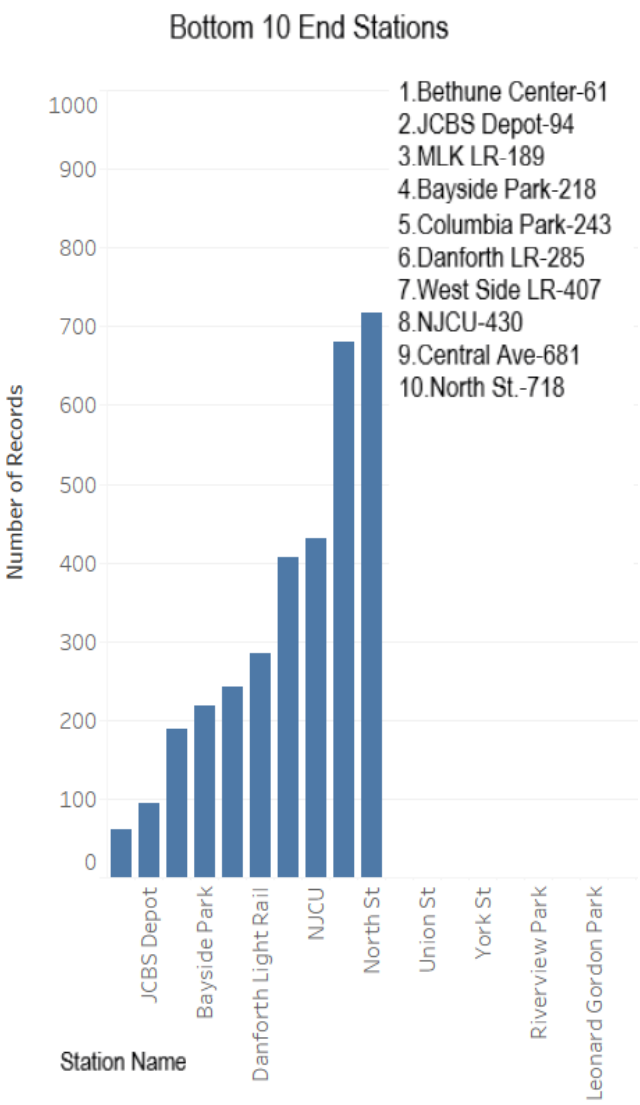
As you look at the charts, you will notice that the top station list printed to the right are actually quite similar. Most of these stations are located along major commute routes, including the PATH (Port Authority Hudson) stations. For example, Grove St. PATH, Exchange Place, Newport PATH, Newark Ave, and Morris Canal are all located along transit routes into NYC. The other top stations are nearby, presumably commuters go to the station nearest where they live and ride to one nearby a transit route.





Conversely, the bottom stations are all farther away from the city center of Jersey City mostly to the south. These are not located nearby popular transit options into NYC. That being said, Danforth, MLK, and West Side are right next to Light Rail stations, but again these are farther away from city center.





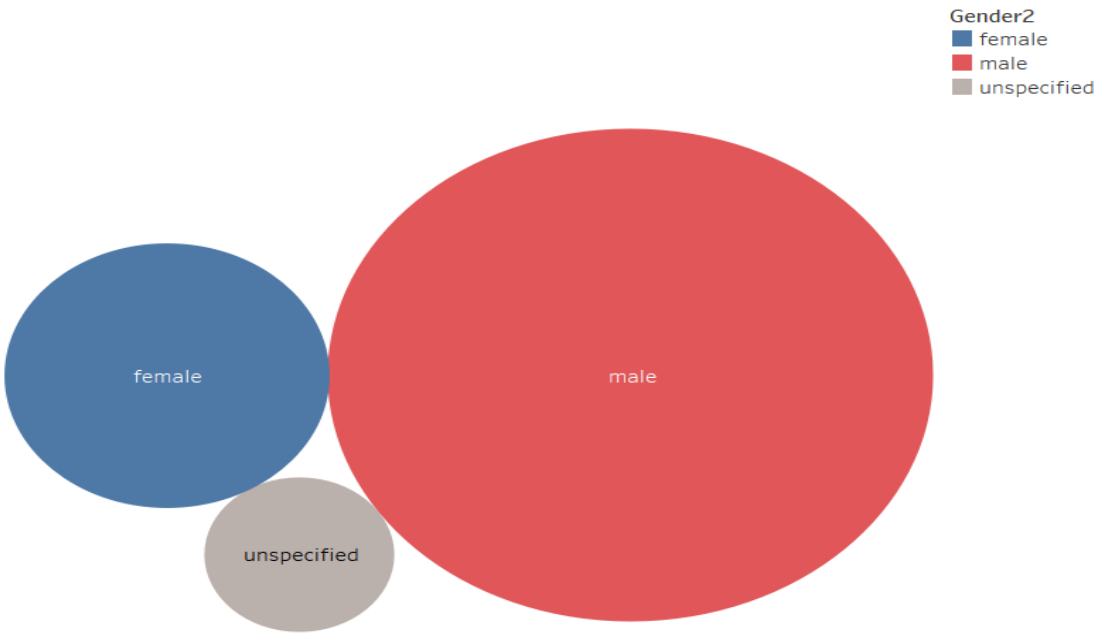
Now, if you we look at the gender breakdown of active participants over the last year, you'll see that male riders make up the majority (72%), female are the minority (21%), and a small number of participants (mostly temporary customers) chose not to disclose their gender (7%).

We can breakdown the gender gap in riders further by looking at the past three months (see next chart). Now, the last three months of recorded data fall in November, December, and January when overall ridership is down due to the colder weather.

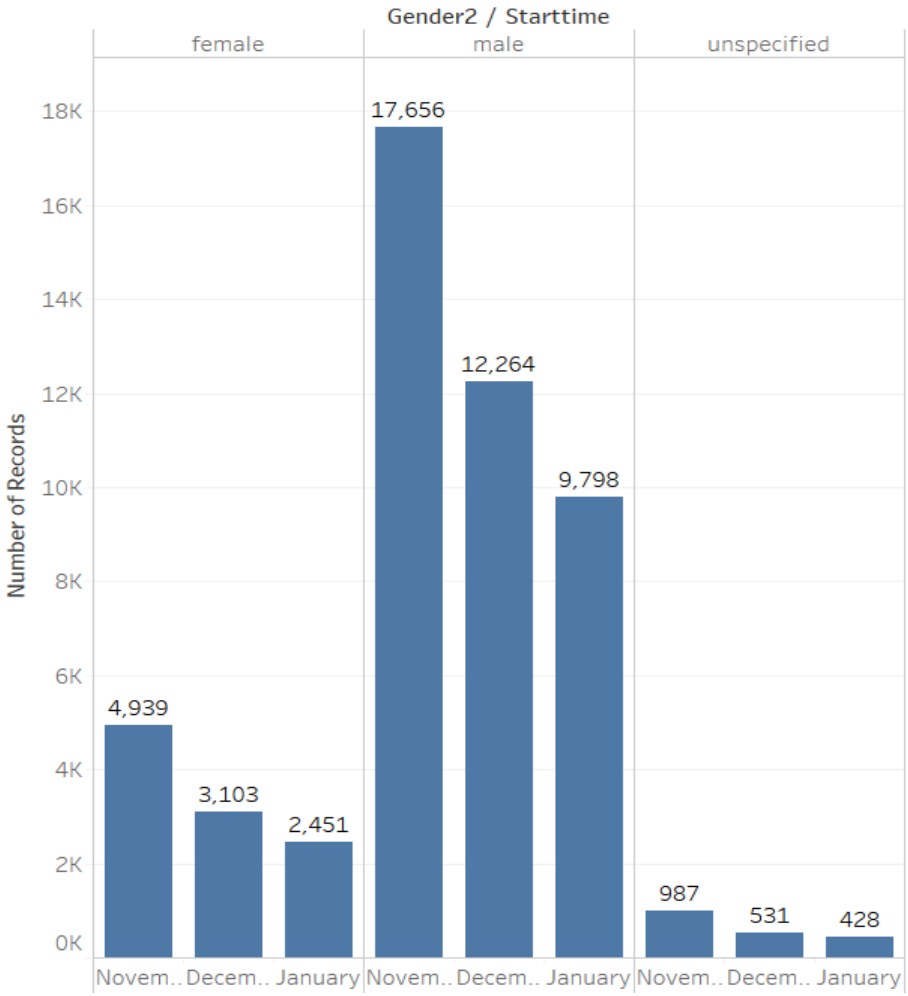
But what are the percentages of female riders over the last three months? In November, the percentage of female riders was around 21%. In December, the percentage went down to 19.5%. Finally, in January the female ridership diminished to 19.3%.

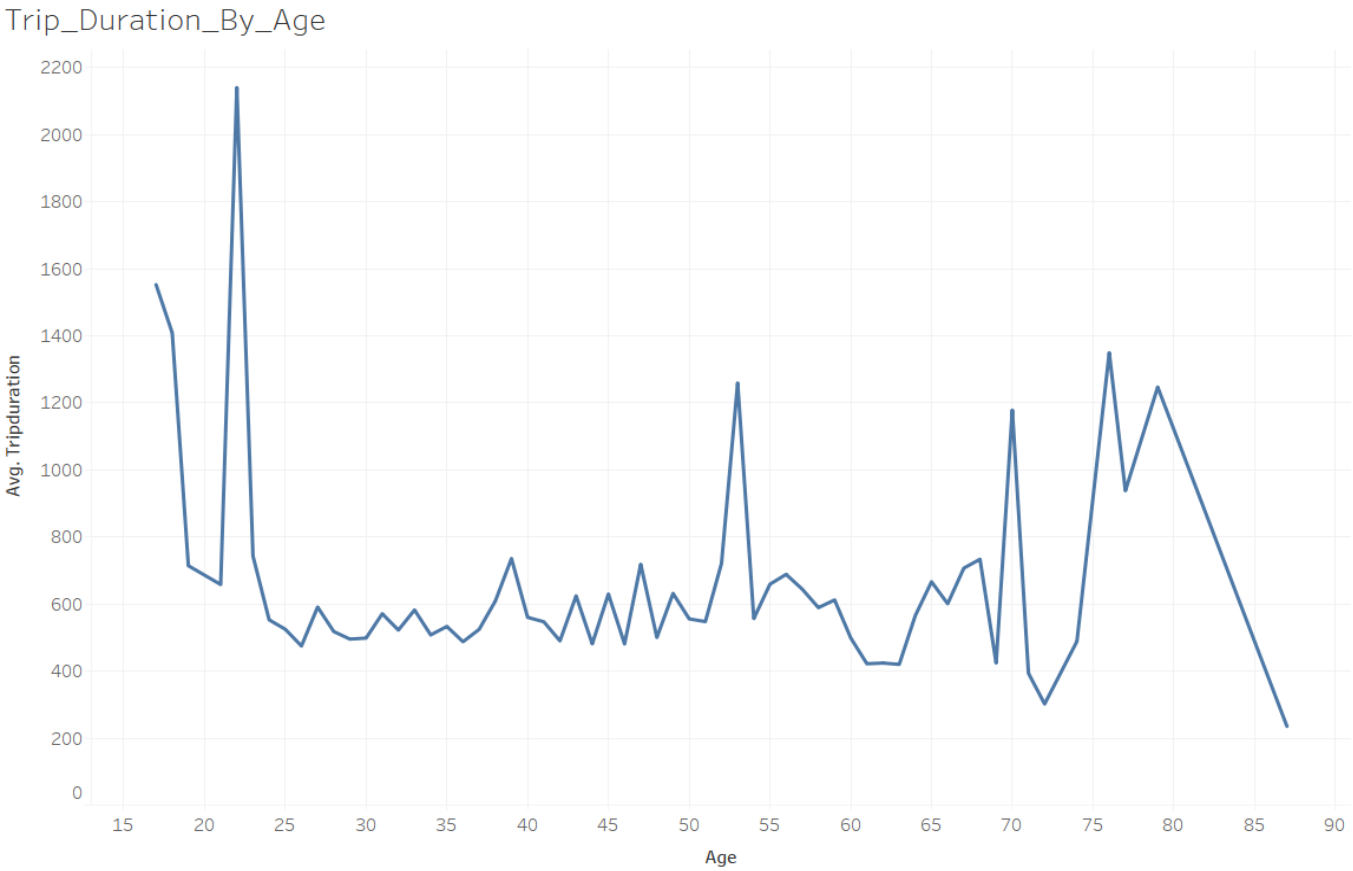
Therefore, based off the past three months, we see that targeted outreach to female riders has not been effective in boosting the amount of female riders.

Gender_Breakdown



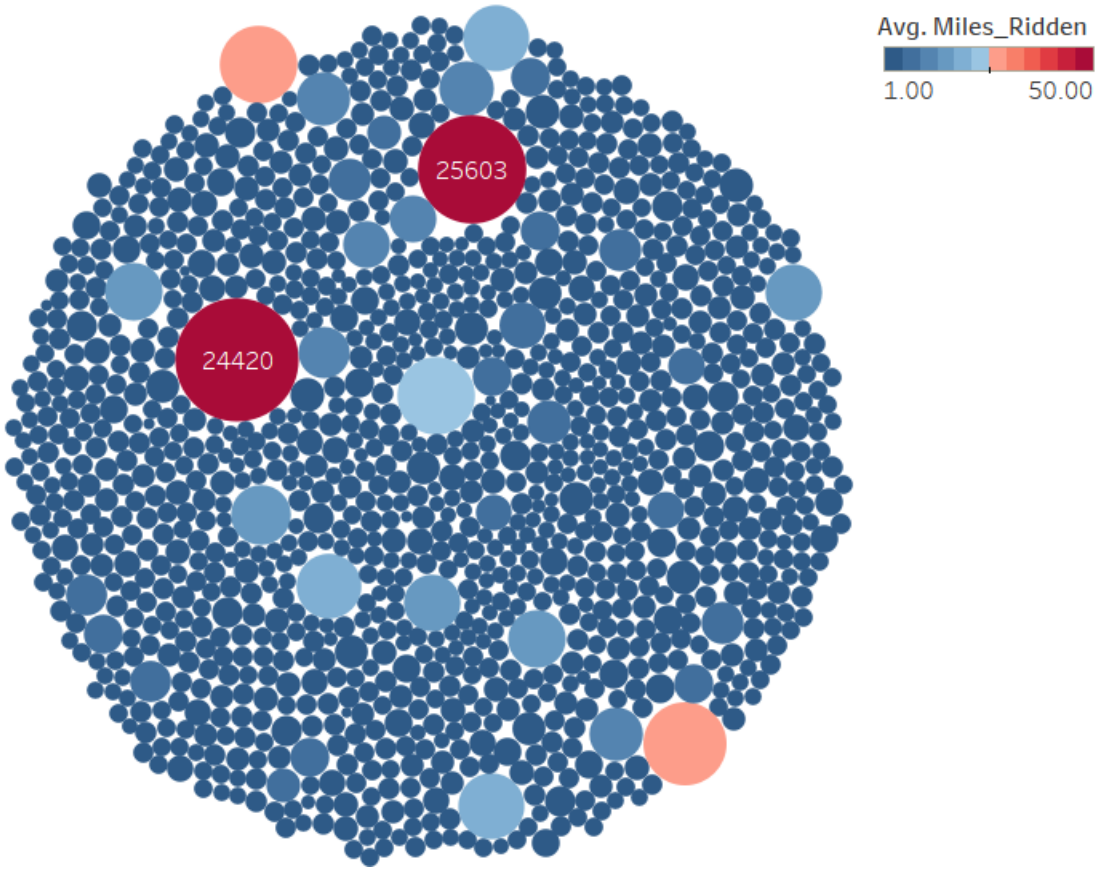
Gender Over Last Three Months





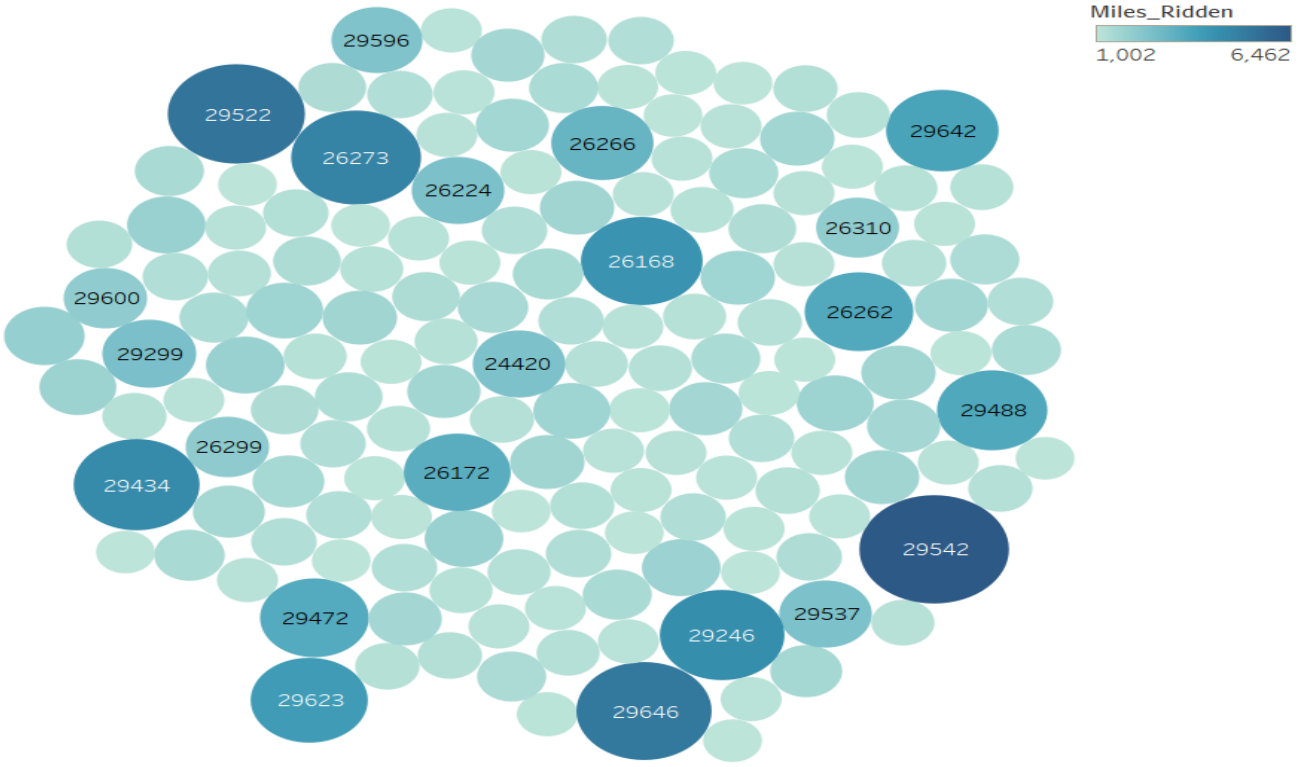
If we look at ridership in terms of their ages, we see that the highest numbers for trip duration occur at either the bottom or the end of the spectrum. We see that in general, the working class population of Jersey City (age 25-60) tend to have relatively short trips (below 10 minutes in length). This may be due to the fact that bikes are used by this group for commuting purposes and for short trips during the workday on average.

Bikes In Miles



If we take a look at the bikes themselves, we see that the majority of trips are shorter, i.e. less than five miles on average. The bikes that would likely be in need of repair are pictured below (ridden >1000 miles).

Bikes by Total Miles Ridden



As we looked at the datapoints, we found that there are some bikes that have been ridden less than one mile in a year, while there are some that have been ridden thousands of miles, with the maximum being just over 7,000 miles. That's quite a large variance, but we are not taking into account that there are likely new bikes being added in over time which have not been put to much use yet.

Finally, here are some bonus charts:

Static_Top_Stations_Map

This chart shows the locations of the most popular start/end stations in Jersey City. Notice how most of them are close by to transit and are located in center city.

Dynamic_Station_Popularity

The above chart ought to be looked at in Tableau, because you can move from February 2017 to January 2018 to see how each station's popularity changes over time. What persists across all the months are that the popular stations tend to be the same. In fact, the only real changes we see over time are that in the warmer months the popular stations see even more usage. This makes sense since people tend to want to ride bikes in comfortable weather conditions.

Unexpected phenomena:

Really Old? There are some riders who have not answered truthfully about their age or may have entered their date of birth incorrectly. For example, there are a couple of records where their calculated age would be 118 & 131. These outlier ages have not been taken into account in assessing ridership ages above.

Really Long Trips? Trips are supposed to last 30 minutes or you pay a fee of $4 per every fifteen minutes. Surprisingly, there were some rather long trips in the dataset (over multiple days). Two of these trips are longer than 24 days and would cost around $10,000 in fees!

Null Usertypes? There are also less than 100 records where the usertype is not registered as customer or subscriber. My instinct is to assume that they are customers, but I am still left asking why wouldn't they be registered in the system as customer or subscriber?