citi bike

2018 Annual Report of Program Performance

This report summarizes the performance of the New York citibike program in 2018 based on analysis of ride information collected from the bikes themselves. Topics covered include the growth in rides taken, annual subscriber versus short-term customers, seasonal usage patterns, rider gender, rider age, and bike utilization.

The dataset goes back to the start of the system in 2013 and includes information on over 70 million citibike rides through the end of November 2018. The analysis in this report covers topics relevant to 2018 as will as trends that include the entire dataset.

program usage:

One key measure of the citbike program is the number of rides taken each year. The usage of the bikes has steadily increased over the life of the program. 2018 continued the growth trend but at a markedly reduced rate.

The chart to the right exaggerates the slow-down in growth as it only contains ride information through November of 2018 so that this report could be prepared for use during the December budgeting cycle.

Similarly the Annual Ride Growth chart in the lower left shows only a 1 percent year on year growth rate due to the lack of December data. If however the ride count is compared based on January through November data for all years, we see that ride count grew at nearly 7 percent as shown in the Adjusted Annual Ride Growth chart in the lower right.

If the adjusted growth rate continues through the end of 2018, I estimate the program will end the year with a new high of 17.5 million rides.
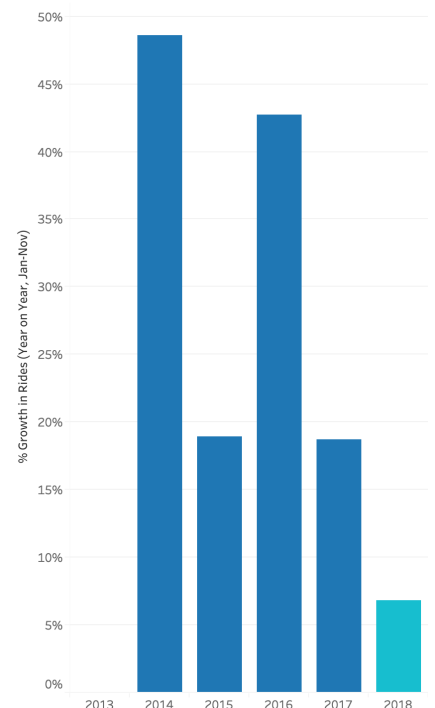
Total Annual Rides (2018: Jan-Nov)
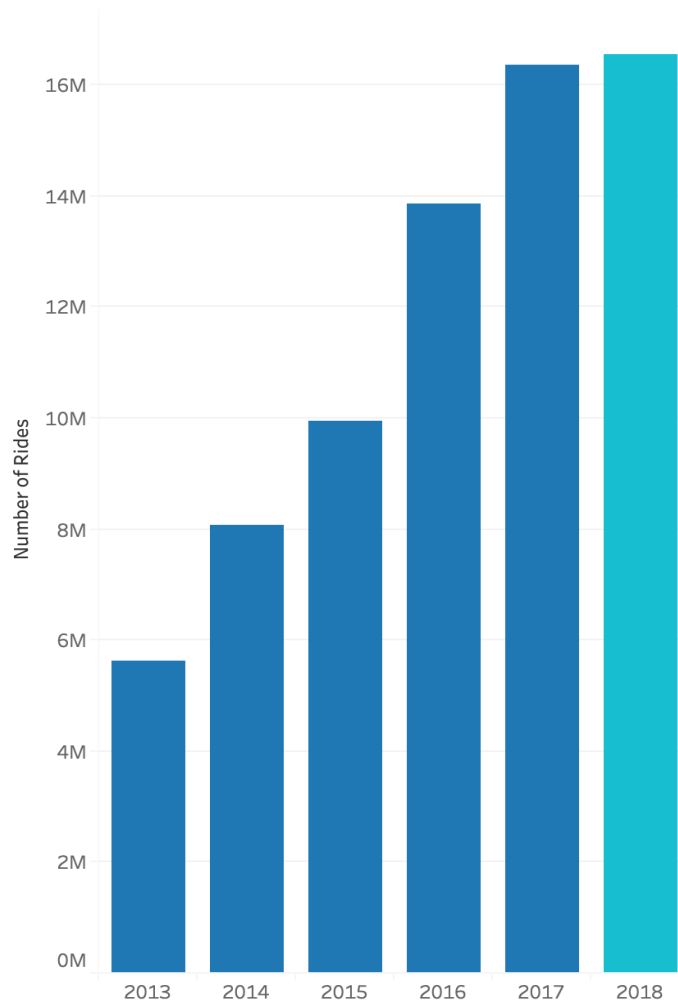
Annual Ride Growth (YoY %)
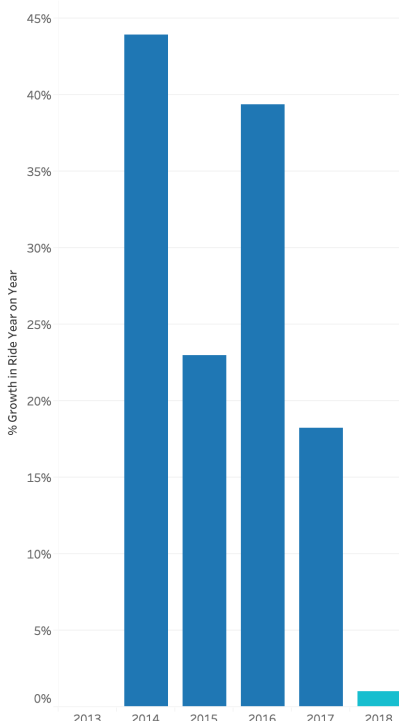
Adjusted Annual Ride Growth
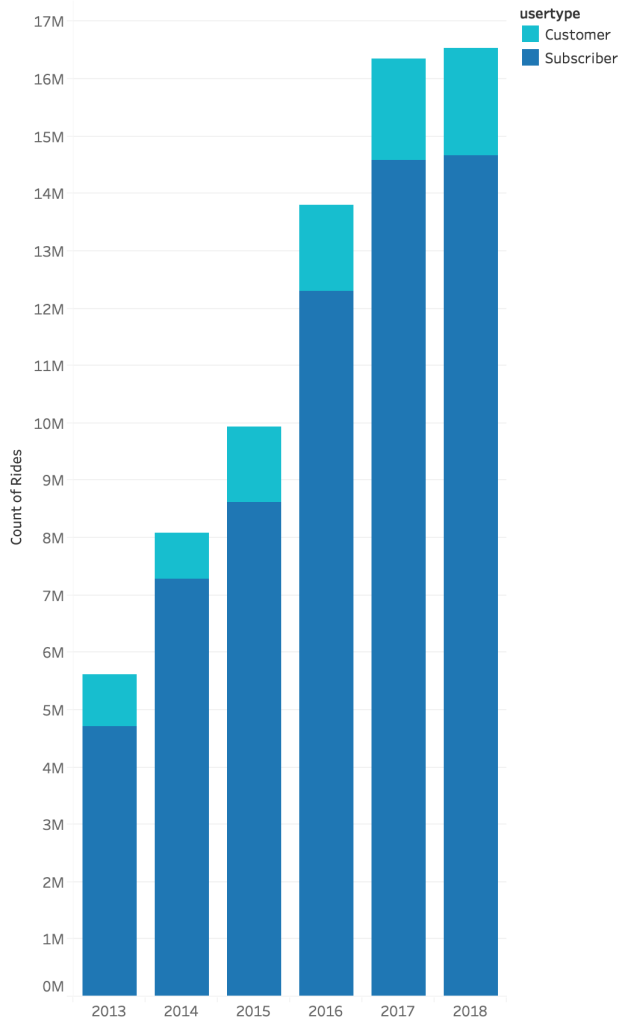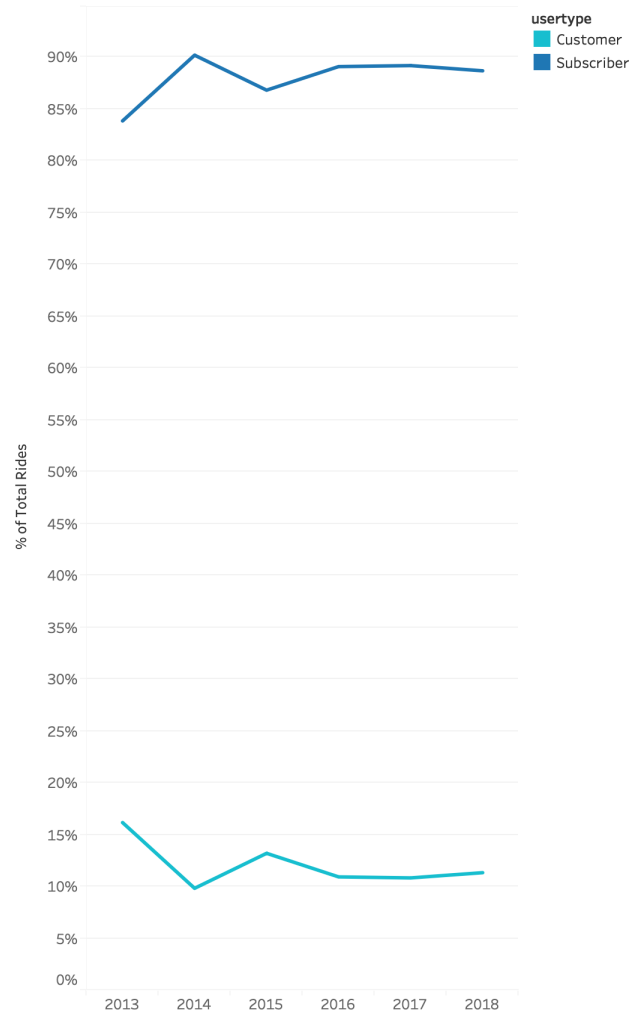(YoY %, all years Jan-Nov)

user types:

There are two modes by which riders may use the citibike program: annual subscription - those who pay a yearly fee to ride the bikes, snd short-term customers - those who purchase a daily pass to ride the bikes. Since the beginning of the program most riders have chosen to purchse annual passes. The User Type Chart in the lower left of this page illustrates this prefernce.

Although the number of rides taken by short-term customers has grown over the years, so has the total number of rides taken. If we look at the chart in the lower right of this page, we can see that the user type has stabilized with nealy 90% of rides taken by annual subscribers and just over 10% of rides taken by day pass customers.
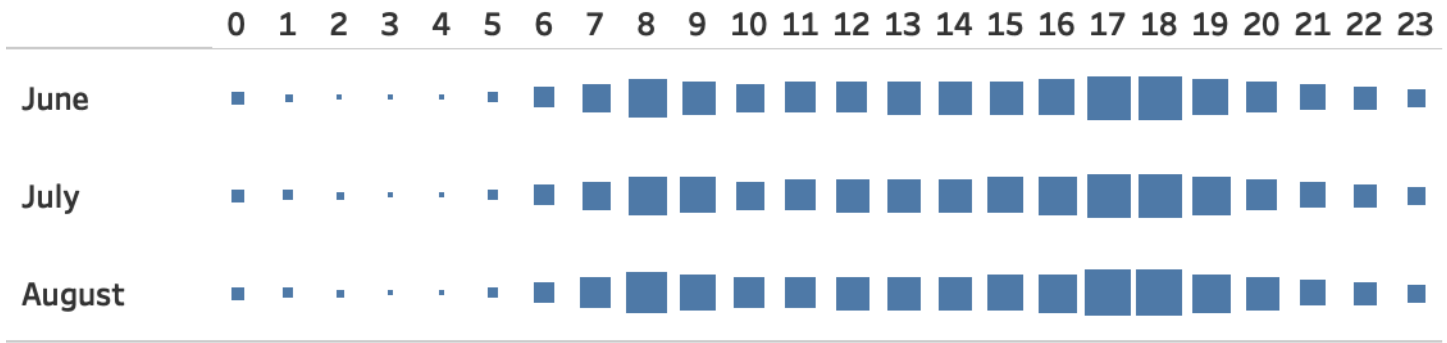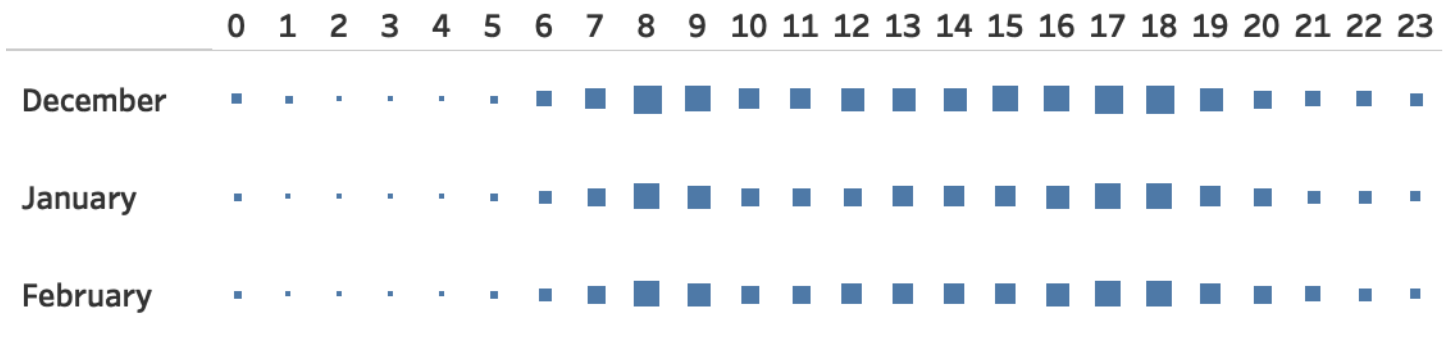
User Type

usertype
- Customer
- Subscriber

User Type - Percent of Total

usertype
- Customer
- Subscriber

peak use hours:

Usage by Hour Started in Summer (Jun-Aug)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
June																								
July																								
August																								

Usage by Hour Started - Winter(Dec-Feb)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
December																								
January																								
February																								

New York citibikes are used throughout the day and through out the year. However usage is not uniform and the use patterns are fairly predictable.

The peak hours of citibike usage mimic familiar city traffic levels: heaviest during work commute times, steady during midday and ebb in the early hours of the morning. From this one can assume that most riders are people commuting to work.

The winter usage levels follow a similar pattern to those in the summer, however winter usage is, not surpsingly, lower than summer usage with summer peaks being nearly 900,000 rides per hour and winter peaks just over 300,000.

rider gender:

citibike users are asked to provide their gender when signing up for an annual subscription or buying a day pass. As you can see from the Rides by Gender chart on the lower left of this page, most riders do provide their gender and most riders are male. SInce the gender of people working in NewYork is more balanced than citibike's rider gender, it stands to reason that increasing the number of women riders represents and opportunity to grow program usage. Indeed, the program has been running an advertising campaign to increase female rider counts.

The number of female riders has increased as can be seen from the Rides by Gender chart. However overall ridership has increased. By looking at the Rider Gender % chart on the lower right of this page we can see that there has been a rise in the percentage of rides taken by female riders. Looking closer, we see that the percent of rides taken by males has not declined. The only corresponding change in the gender percentage chart is a decline in the percent of riders with unspecified gender. The resonable conclusion is that some women who previously declined to provide their gender are now providing that informaiton.

Rides by Gender

RiderGender%
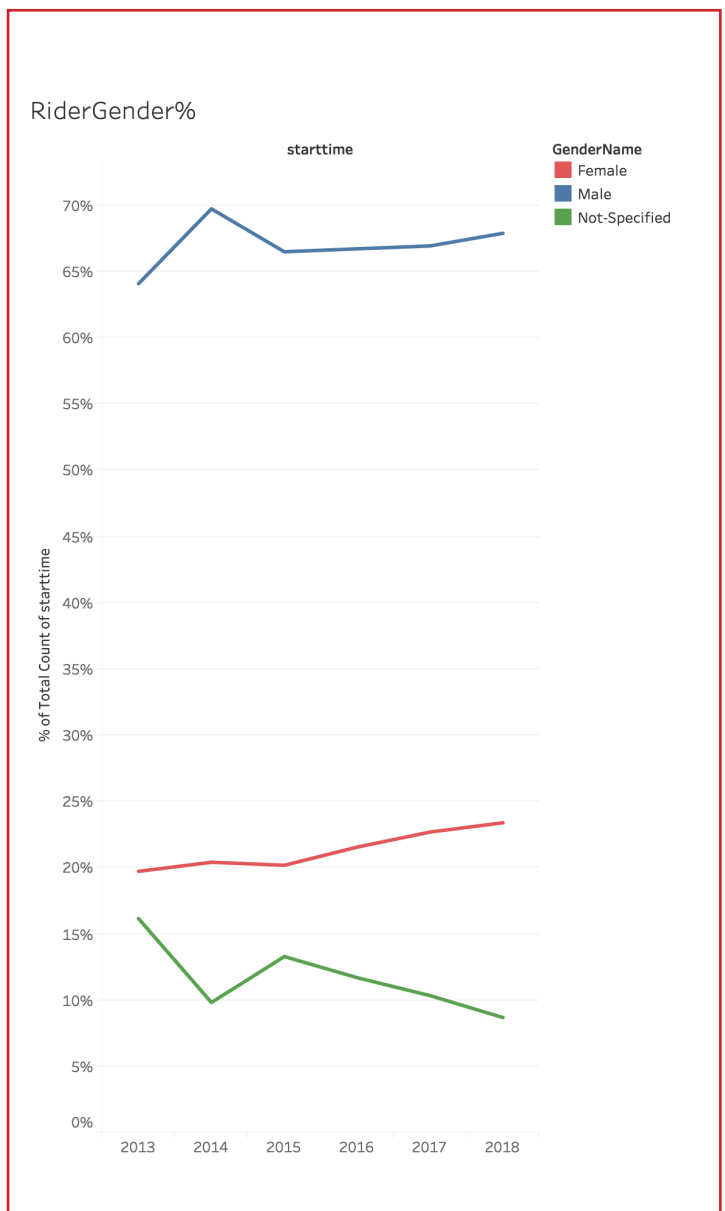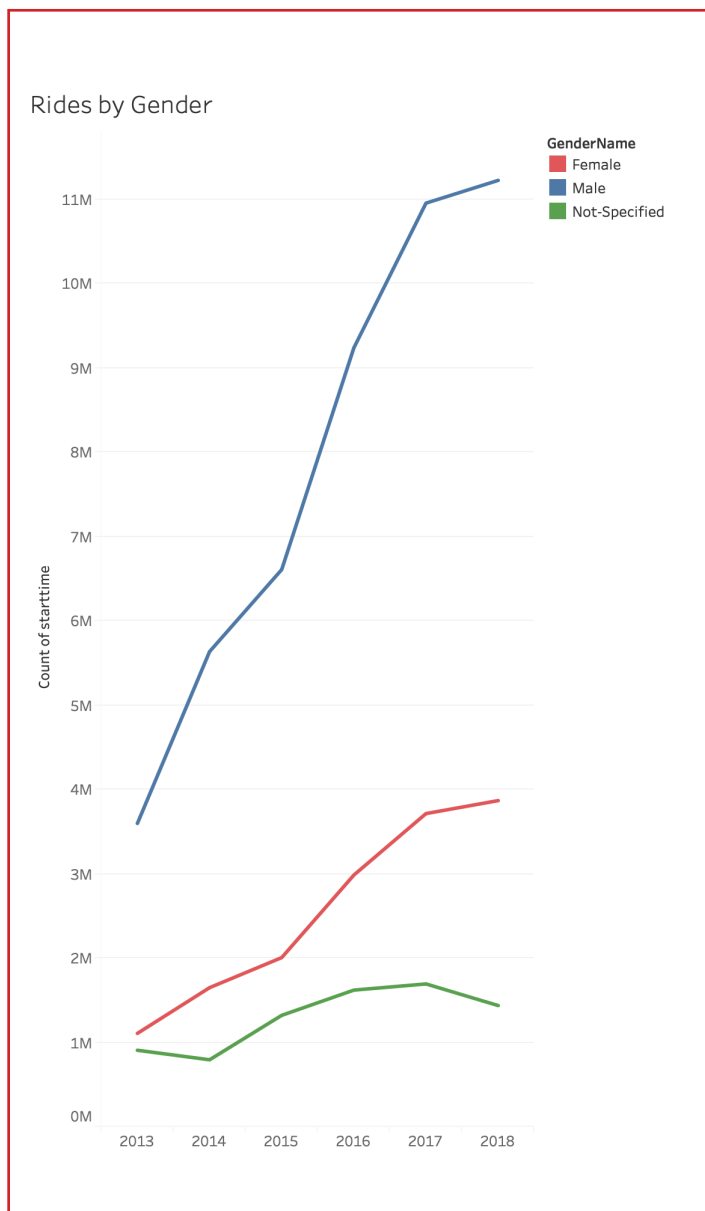
age and ride duration:

citibike riders also provide their age. the chart below compares rider age with the duration of rides taken. The trend is much as one would expect. The longest rides are taken by riders in what is typically considered thje years of "prime physical condition" and drops of as riders get older. Perhaps the most intersting par of this data is that the progream is used by people into their 70's.

Ride Duration by Rider Age
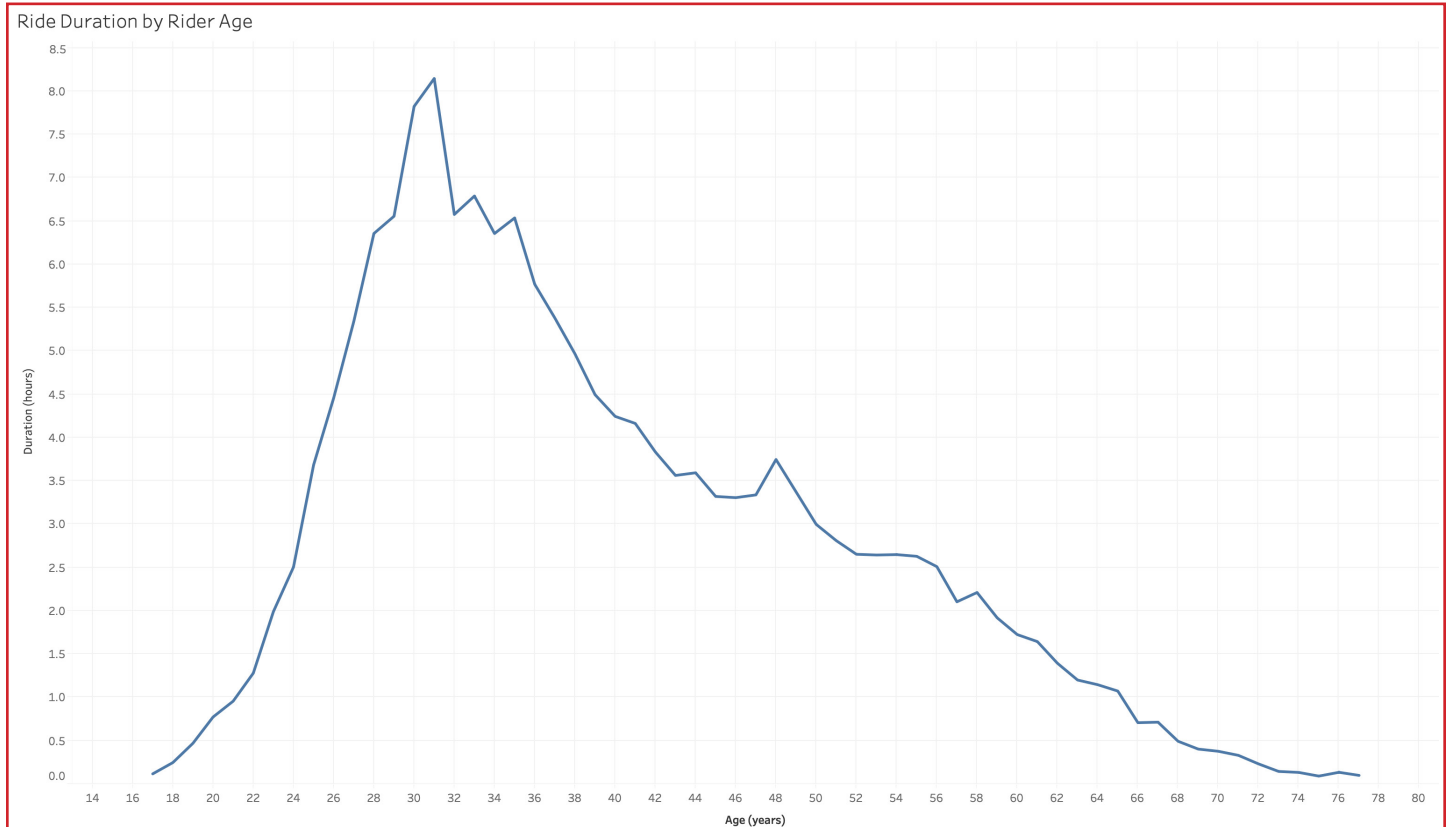
citibike utilization:

The number of rides logged on citibikes varies greatly by by bike. The plot below shows that the number of rides per bike varies fron just a fwe rides to nearly 9000. Of course bike that have been in usage longer have logged more rides than newer bikes. However, there is great variation in the number of rides take on bikes of similar age. Presumably this is due to some bikes being used in locations with more demand. The program should consider rotating bikes from lower demand areas to higher demand areas and vice versa.

Variation in Number of Rides by Bike ID
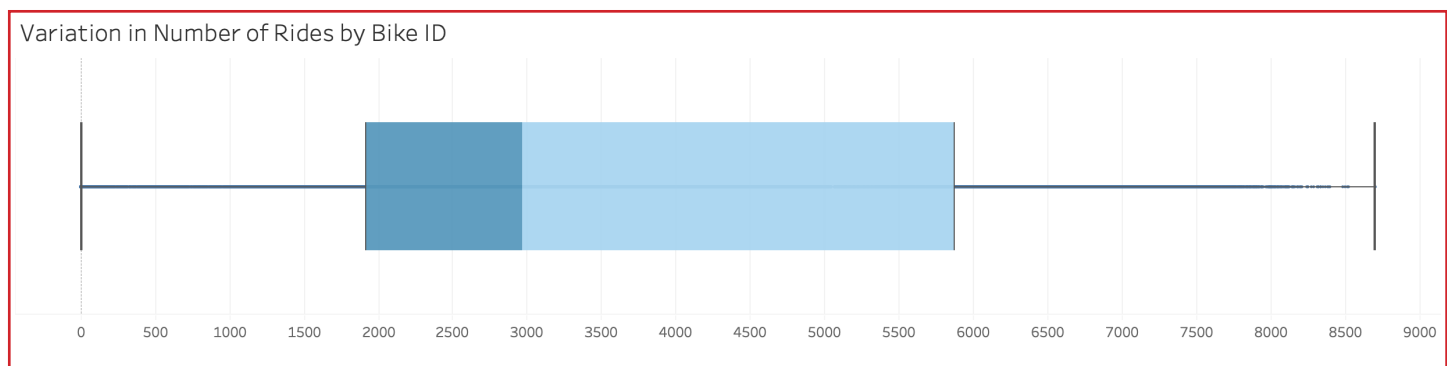
most popular stations:

The charts below show the most popular locations for citibike rides to be started (left) and ended (right). As can be seen in the charts and corresponding tables the most popular origin and destination stations are nearly the same with slightly different rankings.

Top 10 Start Stations

Top 10 Start Stations in 2018

start station name	2018
Pershing Square North	142,040
E 17 St & Broadway	102,226
W 21 St & 6 Ave	100,440
Broadway & E 22 St	99,905
West St & Chambers St	91,123
Broadway & E 14 St	87,581
W 41 St & 8 Ave	82,912
8 Ave & W 33 St	80,378
Broadway & W 60 St	79,899
12 Ave & W 40 St	79,598

Top 10 End Stations

Top 10 End Stations in 2018

end station name	2018
Pershing Square North	141,684
E 17 St & Broadway	106,506
Broadway & E 22 St	102,222
W 21 St & 6 Ave	101,915
West St & Chambers St	95,908
Broadway & E 14 St	87,655
W 41 St & 8 Ave	83,091
12 Ave & W 40 St	82,385
8 Ave & W 33 St	80,440
Lafayette St & E 8 St	78,995

The reason for the popularity of these stations is likely related to the observations made from the usage hours: most rides are taken in commute hours. The most popular stations are located in areas of most dense business concentration in the city. There may be another thing in common among these stations: they were all built in the first year of the citibike program. Whether their popularity is due to the amount of commuter traffic in this area or whether rider volume naturally increases over the age of the station would need to be investigated further.

least popular stations:

The charts below show the least popular locations for citibike rides to be started (left) and ended (right). The citibike data includes stations with lower ride counts but many of those stations are citibike depots and other non-standard stations. To eliminate these outliers, the minimum station ride count was set at 100 rides.

While the least popular stations for starting a ride are not the same as for ending a ride, they are located in similar locations.

Bottom 10 Start Stations

Bottom 10 Start Stations in 2018

start station name	2018
11 St & 43 Ave	1,013
Driggs Ave & N 9 St	986
27 Ave & 4 St	981
Columbia St & Lorraine St	791
E 80 St & 2 Ave	716
Division Av & Hooper St	311
E 98 St & Lexington Ave	268
47 Ave & Skillman Ave	172
Bressler	166
Henry St & W 9 St [old]	163

Bottom Top 10 End Stations

Bottom 10 End Stations in 2018

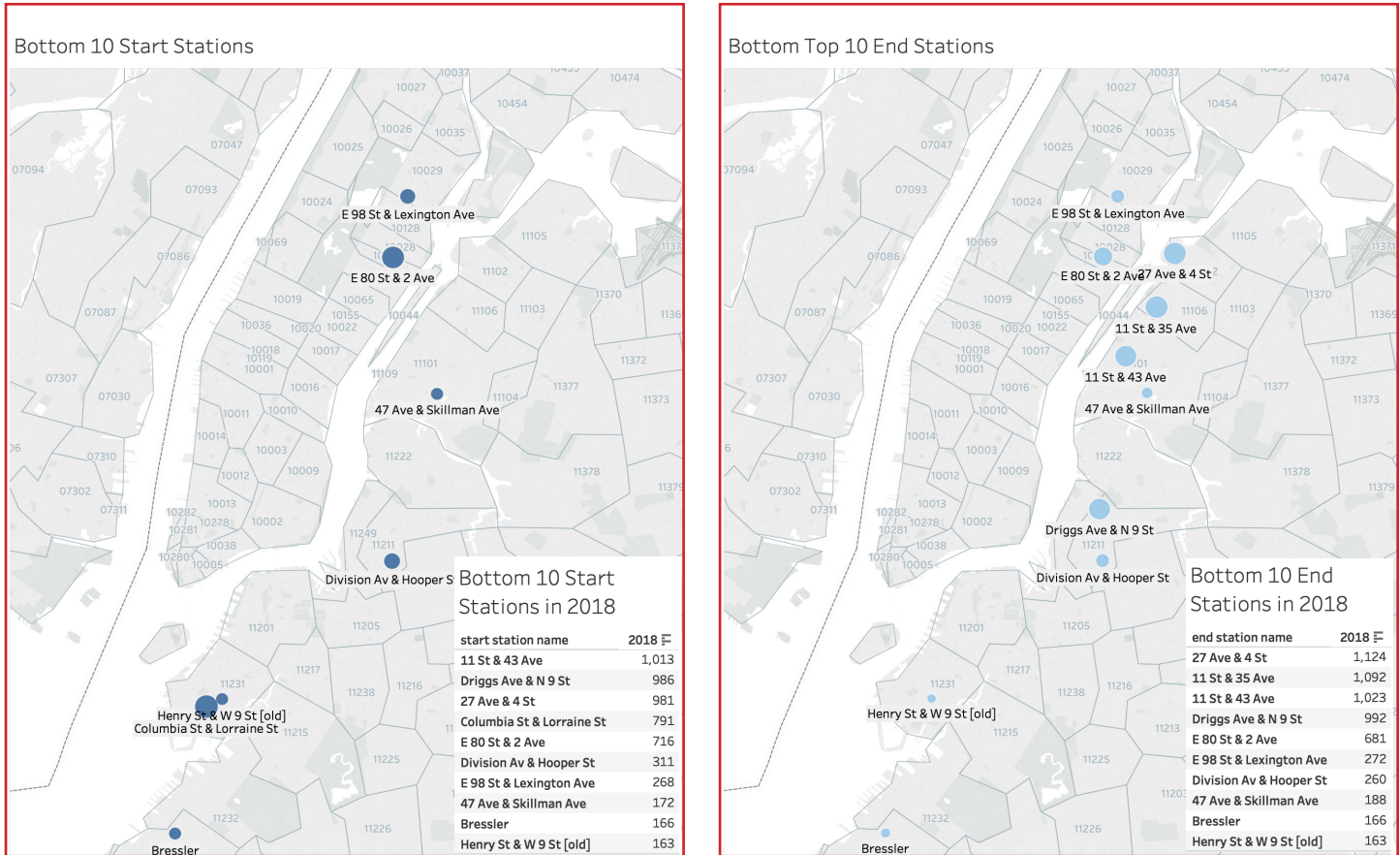| end station name	2018
27 Ave & 4 St	1,124
11 St & 35 Ave	1,092
11 St & 43 Ave	1,023
Driggs Ave & N 9 St	992
E 80 St & 2 Ave	681
E 98 St & Lexington Ave	272
Division Av & Hooper St	260
47 Ave & Skillman Ave	188
Bressler	166
Henry St & W 9 St [old]	163

The reason for the unpopularity of these stations is likely related to the observations made from the usage hours: most rides are taken in commute hours. The least popular stations are located in areas outside the most dense business concentrations in the city. There is another thing in common among these stations: they were all built in the last 12 months. Whether their unpopularity is due to the lack of commuter traffic in this area or whether rider volume is naturally low in new stations would need to be investigated further.