

## Executive Summary

This report provides an exploratory analysis of the New York City Citi Bike trip data of June, July and August in 2017. The primary aim of the project is to learn about the usage of Citi Bike across different groups of riders and provide useful information for improving the Citi bike sharing system in the city. Where do they ride? How far do they go? When do they ride? We have got answers to these questions with the analysis below.

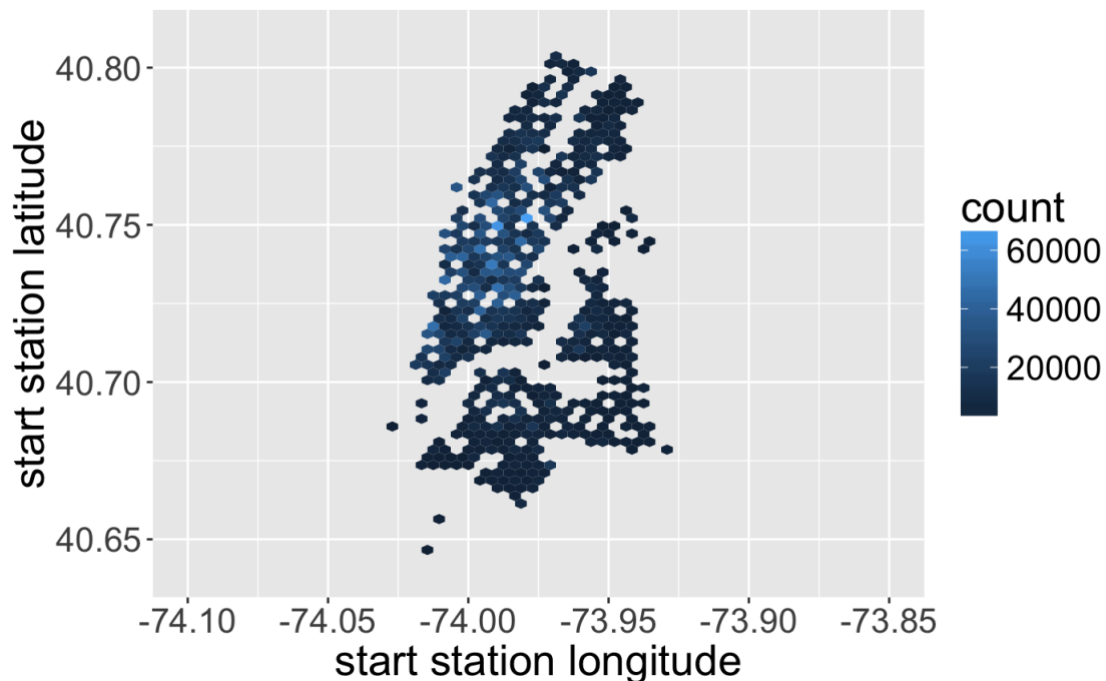


Fig. 1 Hex heat map of starting locations of NYC Citi Bike Rides

The Hex heap map above visualize the start station of bike trips in Manhattan and part of Brooklyn. We can see that bright hexagons are concentrated in the time square and midtown areas and Brooklyn and upper Manhattan have darker hexagons. It is where most companies, shops and activities located, while more residential neighborhoods have darker hexagons, such as in Brooklyn and upper Manhattan. It tells us that people tend to use Citi bike for short trips to work and for other conveniences in the heart of the city.

We also want to know how far people ride in general. It is pretty obvious from the right graph in Fig. 2 that most users are subscribers; only a tiny portion of users are customers who pay on the go. Most of the subscribers ride for roughly 250-500 seconds, which is equivalent to about 4 to 9 minutes. On the other hand, the customers ride longer time than subscribers on average. More than half of customers would ride more than 1000 seconds to 2000+ seconds, which is 15 to 40 minutes, according to the density curve graph. It can be inferred that people who ride with day pass use it as bike tour more often.

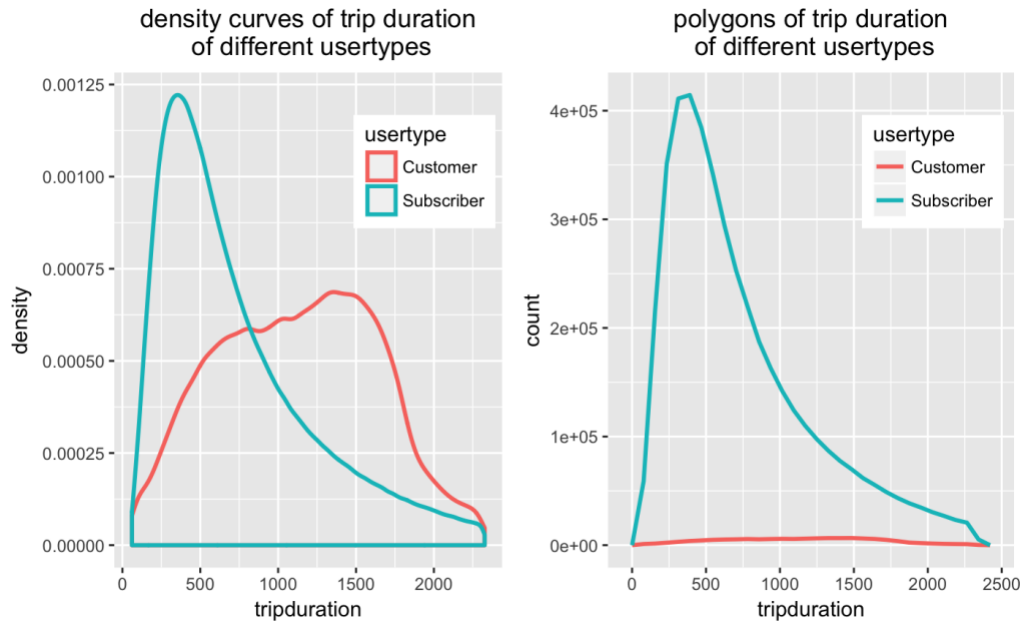


Fig. 2 Density curves and polygons of trip duration of different usertypes

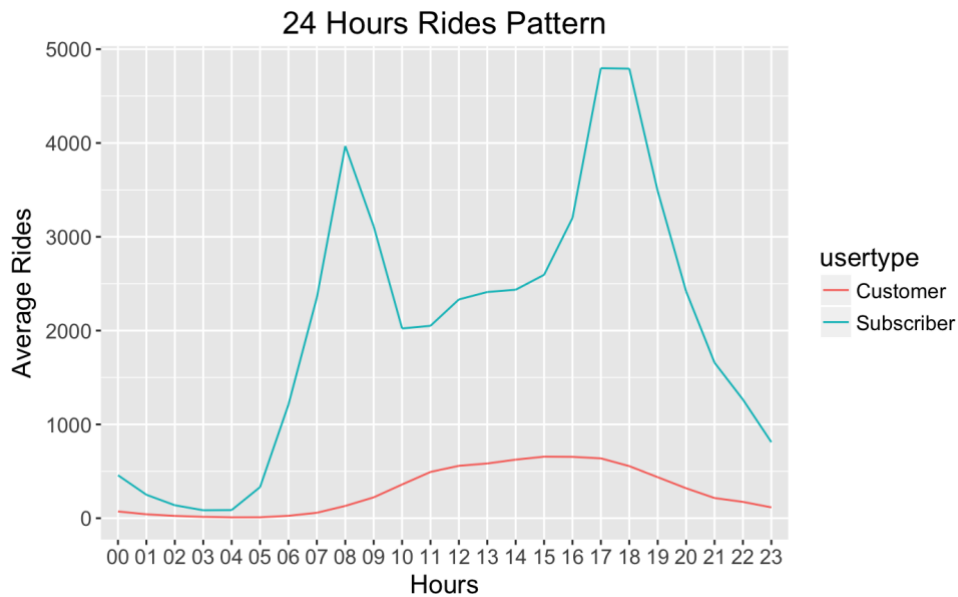


Fig 3. Polygons of average number of rides in 24 hours

Additionally, when do they ride on a daily basis? Obviously, most people ride during day time, and the above hourly ride pattern graph appears to confirm the different bike usage between subscribers and customers. Two peaks appear during rush hours for subscribers since they use Citi bike to commute to work, whereas customers ride more during afternoon for touring purposes. In order to maximize bike usage, we can distribute more bikes near major office buildings, subway stations, and also near residential buildings that are not within minutes' walkable distance to offices or subways to attract more subscribers and provide them with greater conveniences.