# BIXI BIKES USAGE ANANLYSIS AND REPORT

We have been provided with Bixi stations and trip data for the years 2016 and 2017 and have carried out the analysis in Tableau to get business insights on how the usage trends vary at the station level and among members and non-members.

Section I

We plotted the graph to compare the usage trends for 2016 and 2017 on monthly basis and found that overall, the number of trips recorded for 2017 was more than in 2016, especially for the summer months.

**Comparison of total number of monthly trips for 2016 and 2017.**
The usage of bixi bikes has increased in the year 2017.
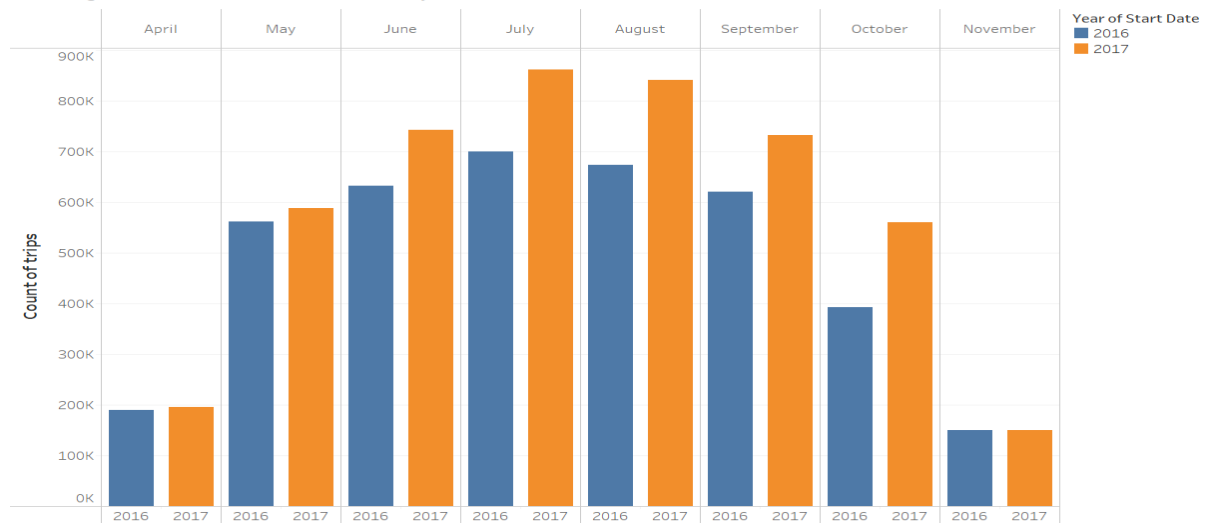
Count of trips for each Start Date Year broken down by Start Date Month. Color shows details about Start Date Year.

When it comes to the monthly trips per year, the summer months of June, July, August, and September have the highest percentage of monthly trips in 2016 and 2017.
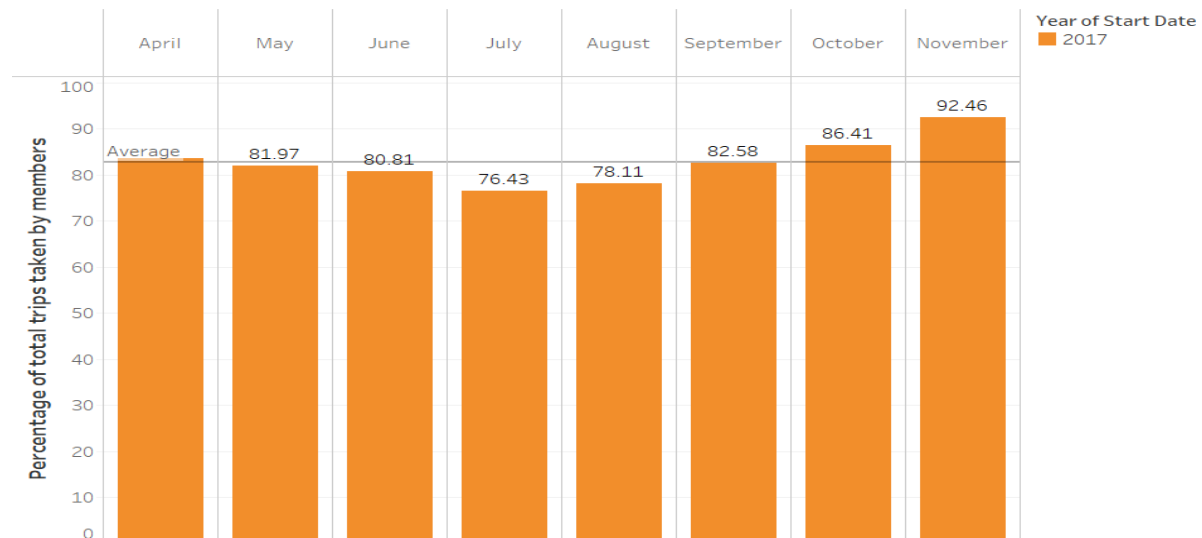
Percentage break up of annual trips per month
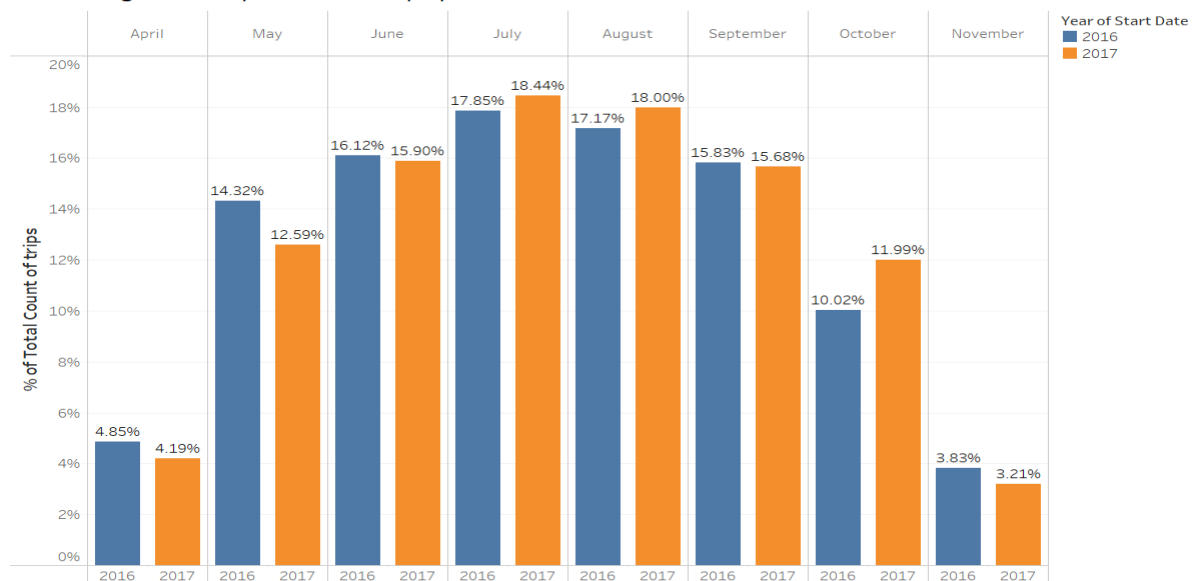
% of Total Count of trips for each Start Date Year broken down by Start Date Month. Color shows details about Start Date Year.

Although members took an average of 82.79 % of the trips throughout 2017, this percentage was comparatively less for the summer months as a greater percentage of non-members were using the bikes. **It shows that the popularity of Bixi bikes among non-members is high in the summer.**

Percentage of total trips per month taken by members in year 2017.


Percentage of total trips taken by members for each Start Date Year broken down by Start Date Month. Color shows details about Start Date Year. The view is filtered on Start Date Year, which keeps 2017.

Let us understand the usage trends at the station level. In the below graph we can see the list of top 10 stations with <u>maximum percentage of round trips</u> and upon checking these stations online we find these stations are primarily falling under the below categories:

1. **Metro stations** i.e., Métro Jean-Drapeau and Métro Angrignon,
2. **Bus station** i.e., Berlioz / de l'Île des Soeurs,
3. **Train station** i.e., (Gare Canora),
4. **Visitor centre** (Basile-Routhier / Gouin), or
5. **Tourist attraction** i.e., Beach (Parc Plage) and Casino (Casino de Montreal).

People prefer these stations as they are associated with means of public transportation where people can reach from different locations pick up bikes and drop off at the same stations to go back to their respective destinations. Tourists prefer to use Bixi bikes to explore the nearby area and return to the same station.

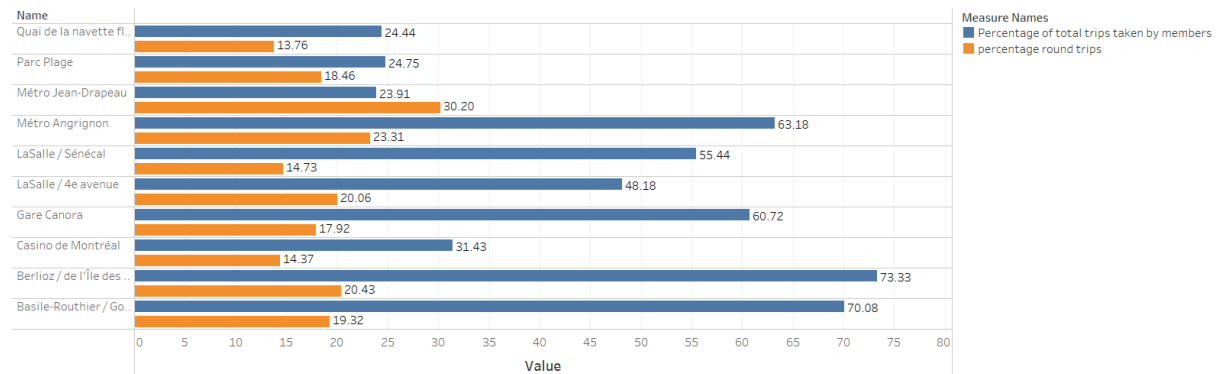## Top 10 stations with highest percentage of round trips
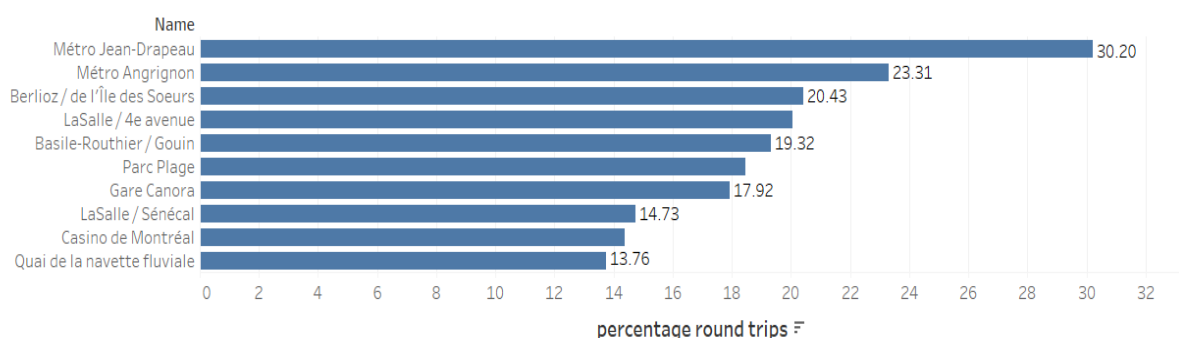
Percentage round trips for each Name. The marks are labeled by percentage round trips. The view is filtered on Name, which has multiple members selected.

Section II

Is there a relationship between the percentage of round trips and the percentage of member trips at stations? Let us understand by finding out stations with highest and lowest percentages of round trips and see what the percentage of member trips is.

Below is the list of the top ten stations with the highest percentage of round trips and we can see the percentage of member trips in the blue sidebar.
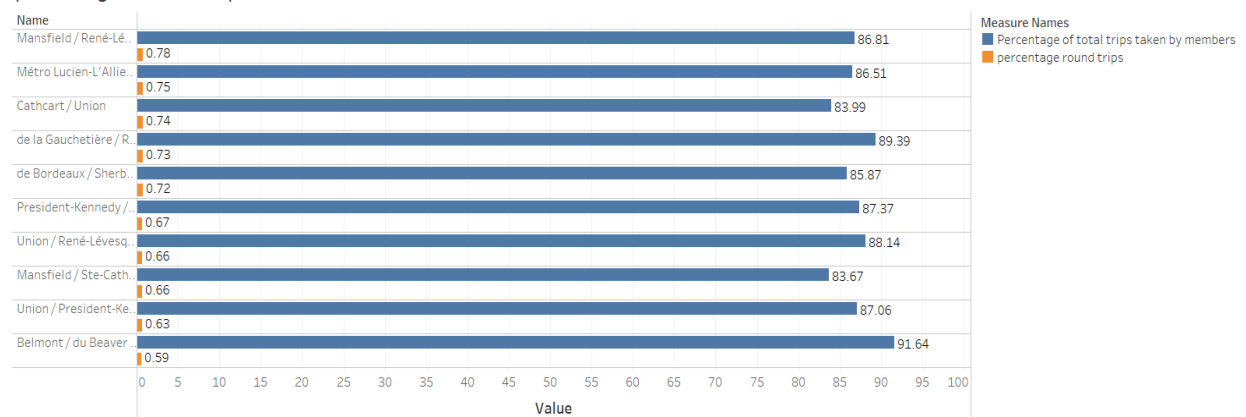
Percentage of round trips vs percentage of member trips at each station for top ten stations with highest percentage of round trips.

Percentage of total trips taken by members and percentage round trips for each Name. Color shows details about Percentage of total trips taken by members and percentage round trips. The view is filtered on Name, which has multiple members selected.

When we see the station with the lowest percentage of round trips, we get the below data which shows that these stations have a high percentage of member trips.

Percentage of round trips vs percentage of member trips at each station for ten stations with lowest percentage of round trips.

Percentage of total trips taken by members and percentage round trips for each Name. Color shows details about Percentage of total trips taken by members and percentage round trips. The view is filtered on Name, which has multiple members selected.

We can see that **stations with the highest percentage of round trips have the lowest percentage of member trips and vice versa.** It implies that non-members are taking maximum round trips.

So far, we learned about the Bixi's yearly and monthly usage, and how members and non-members are using the bikes at the station level. Let us understand if members and non-members are taking long or short trips and how long these trips are.

We can see from the below histogram that trip length can vary from a minute to more than an hour. Members take many short trips of length 2-7 minutes while many non-members take slightly longer trips of length 9-14 minutes.

Distribution of all trips by duration in minutes for members and non-members.
Trips of lenght of 2-7 minutes are common members while trips of lenght 9-14 are common among non members.
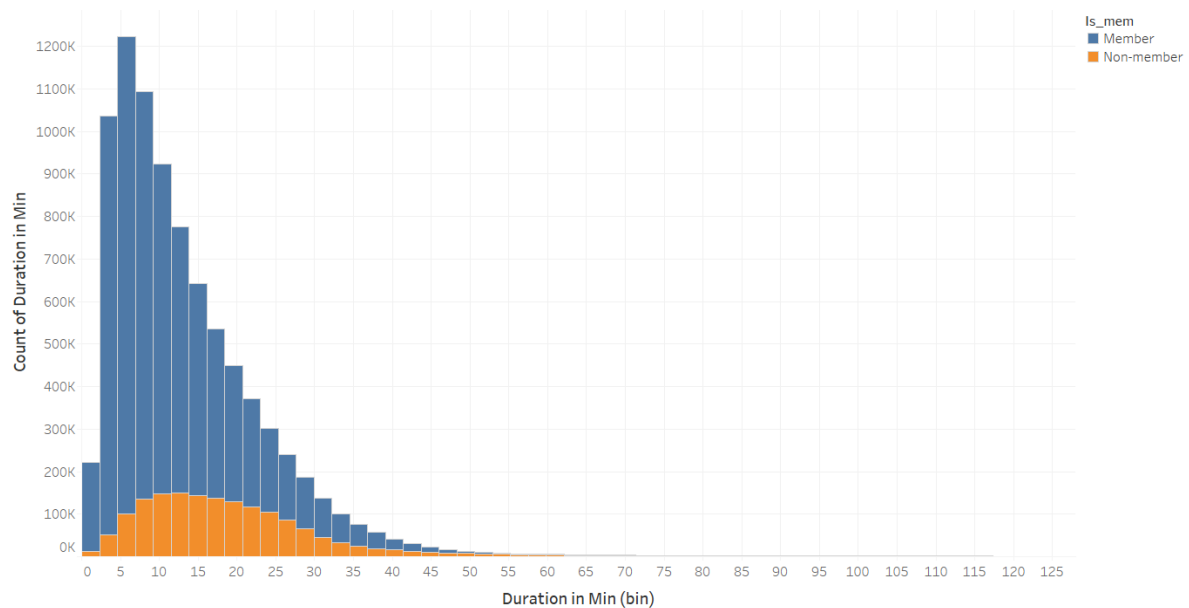

The trend of count of Duration in Min for Duration in Min (bin). Color shows details about Is_mem.

The average duration of trips at each station varies from 8 minutes to 31.65 minutes.

From the map, we can see that stations clustered in Montreal city are the ones where the average trip duration is less. **While the stations far from downtown in locations like Montreal west, near hospitals, colleges (Douglas Mental Health University Institute), island Île Notre-Dame and metro stations have the average trip duration within 20-32 minutes.**

Riders at these stations may be using Bixi to reach downtown.

Average trip duration per station across the city.
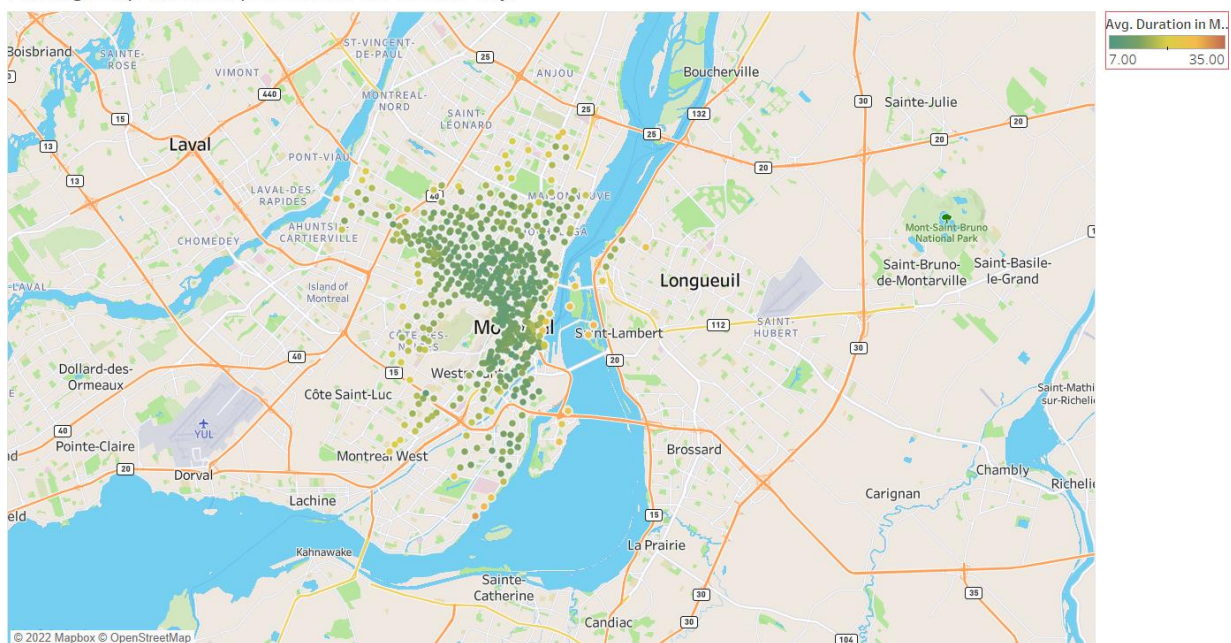
Map based on Longitude and Latitude. Color shows average of Duration in Min. Details are shown for Name. The view is filtered on average of Duration in Min, which ranges from 8.31 to 31.65.
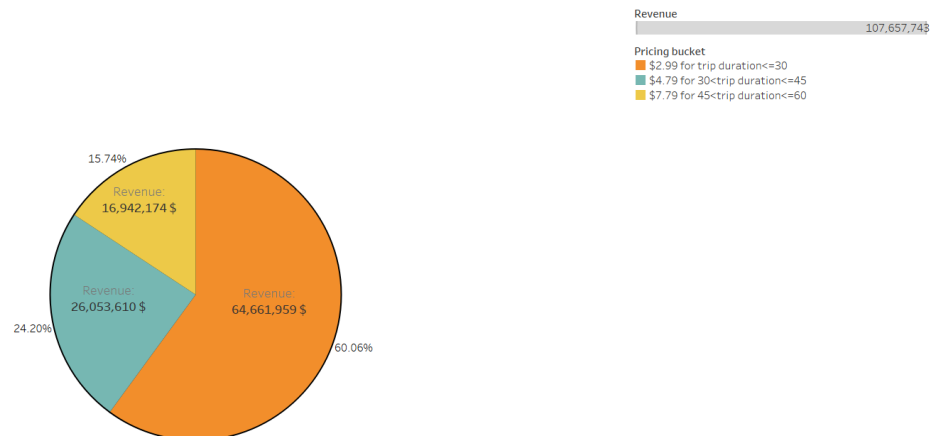
Section III

Let us gain insights into revenue generated by non-members who make single, shorter trips an hour long or less. We are assuming that non-members make single trips and are subject to the below pricing model:

- $2.99 flat rate for each trip that is 30 minutes or less
- $4.79 ($2.99 + $1.80) for trips greater than 30 minutes, up to 45 minutes in length
- $7.79 ($2.99 + $1.80 + $3) for trips greater than 45 minutes, up to 60 minutes

Total Revenue Generated =107,657,743 $
Percentage of revenue from single trips up to an hour in length for each of the three different pricing buckets.

Revenue
107,657,743

Pricing bucket
■ $2.99 for trip duration<=30
■ $4.79 for 30<trip duration<=45
■ $7.79 for 45<trip duration<=60

15.74%
Revenue:
16,942,174 $

Revenue:
26,053,610 $

24.20%

Revenue:
64,661,959 $

60.06%

Pricing bucket (color) and sum of Revenue (size). The view is filtered on % of Total Revenue and Pricing bucket. The % of Total Revenue filter keeps non-Null values only. The Pricing bucket filter excludes Null.

The company is making a total revenue of 107,657,743 $ dollars from the non-member trips out of which 60.06% of revenue is generated from shorter trips (lengths less than 30 minutes) while 15.74% of revenue is generated from longer trips (up to 60 minutes in length).
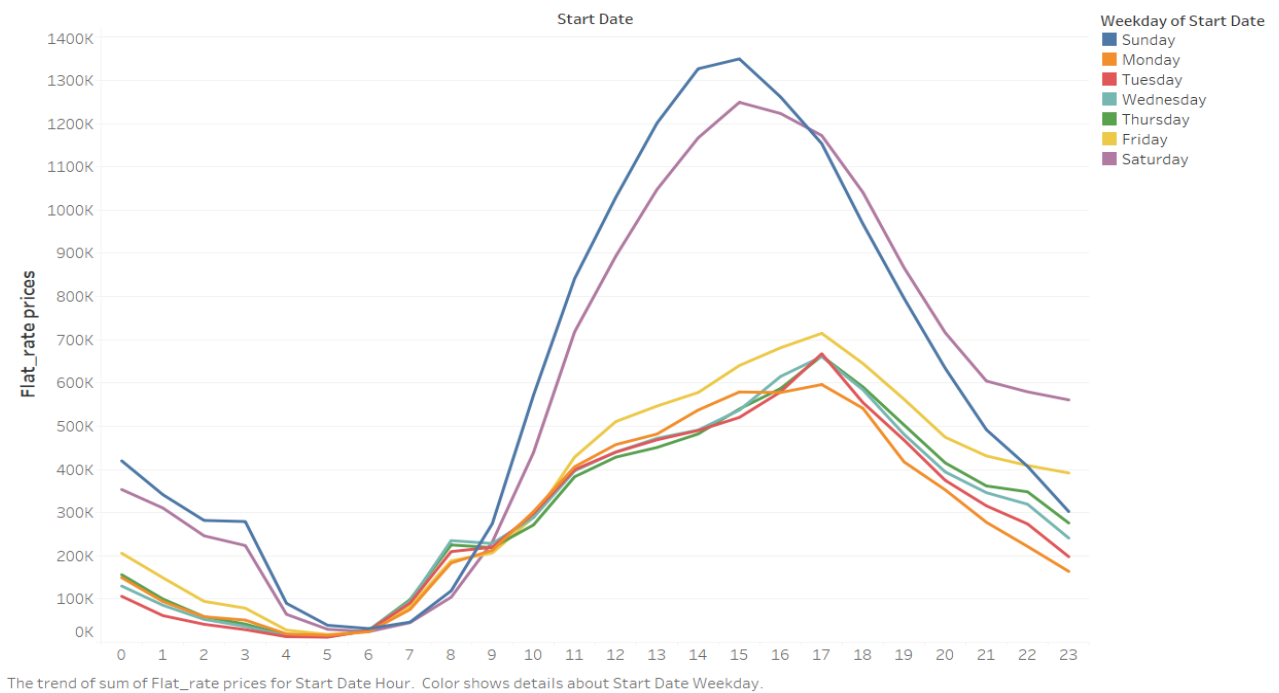
We found that the maximum revenue comes from shorter trips of length 30 minutes at flat rate prices.

If we just see the trend of shorter trips on an hourly basis across all days of the week. We see that the maximum revenue is generated over weekends. In general, the revenue peaks between 14 hr (i.e., 2 PM) to 21 hrs (i.e., 9 PM).

It may be because tourists get free in the evening and night and mostly go out exploring the city, shopping, and dining.

Revenue generated from flat_rate charge for each hour and each day of week.
X- axis represents hours in day from 0-23 hrs (here 0 is 12PM)

Start Date

The trend of sum of Flat_rate prices for Start Date Hour. Color shows details about Start Date Weekday.

Through our analysis, we found that Bixi is performing well and has good prospects for growth in 2018. It is earning good revenues from non-members and can try to attract more riders during off seasons or in less popular locations.

It can provide membership discounts to convert non-members to members and can increase the weekly usage by providing discounts. We learned that shorter trips are very popular among non-members and Bixi can do further research on attracting people to take longer trips.