Syed Ishmum   May 30, 2023

BrainStain

Data Science

Sydishmum@gmail.com

Business Report: Trip Analysis of Bixi Company (2016-2017)

User and Trip Comparison by year:

During 2016-2017, Bixi substantial grower as a leading bike-sharing company. The company's performance indicators show a positive trajectory, showcasing its potential for expansion and market influence. Bixi had gained more members over the years, but non-members are still increasing. At the end of the day the goal is to have a high convergence rate, and the best way to start that is understand the different growth areas.

Total Trips by Mem vs Non-Mem

Month of E..	Member		Not Member	
	2016	2017	2016	2017
April	161,717	163,412	28,141	32,241
May	454,988	481,456	106,076	105,853
June	510,703	599,483	120,677	142,327
July	537,541	657,922	161,594	202,885
August	520,709	656,029	152,277	183,909
September	508,711	604,371	111,548	127,481
October	343,378	483,476	49,200	76,081
November	136,913	138,533	13,228	11,306

Figure 1.1

This shows how Bixi users were growing significantly during the year 2017, Trips peaking at 860,732 for the month of July. Overall, we saw around 10% -15% growth from 2016 to 2017 both in member and Non-members.

More users mean the number of trips should also increase accordingly. Looking at the number of trips can give the company a good understanding of whether the new users are actively using their product.
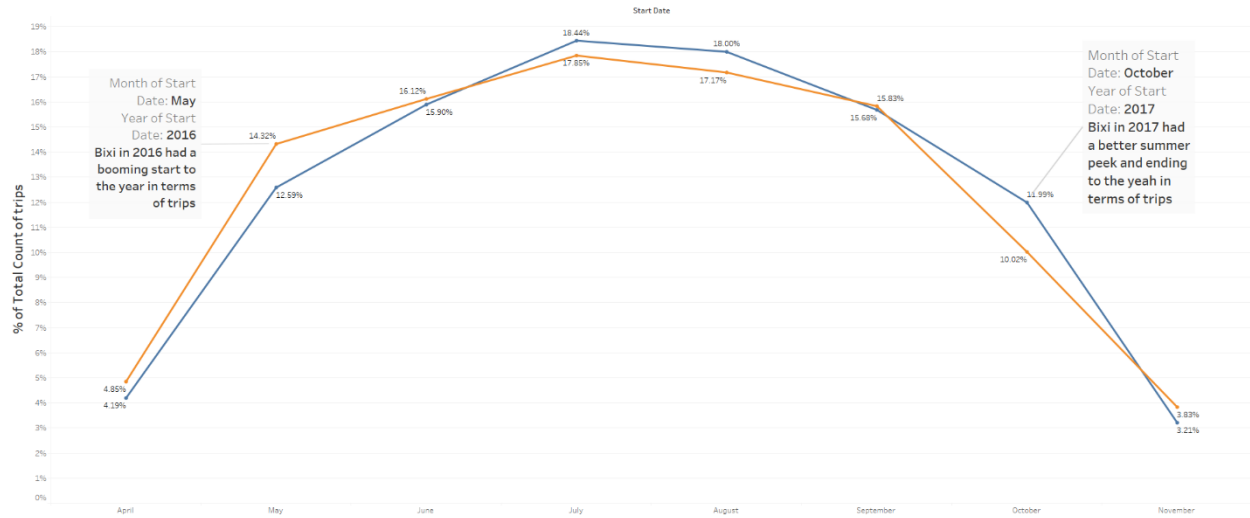
1.2 Trip Percentage by Month

Start Date

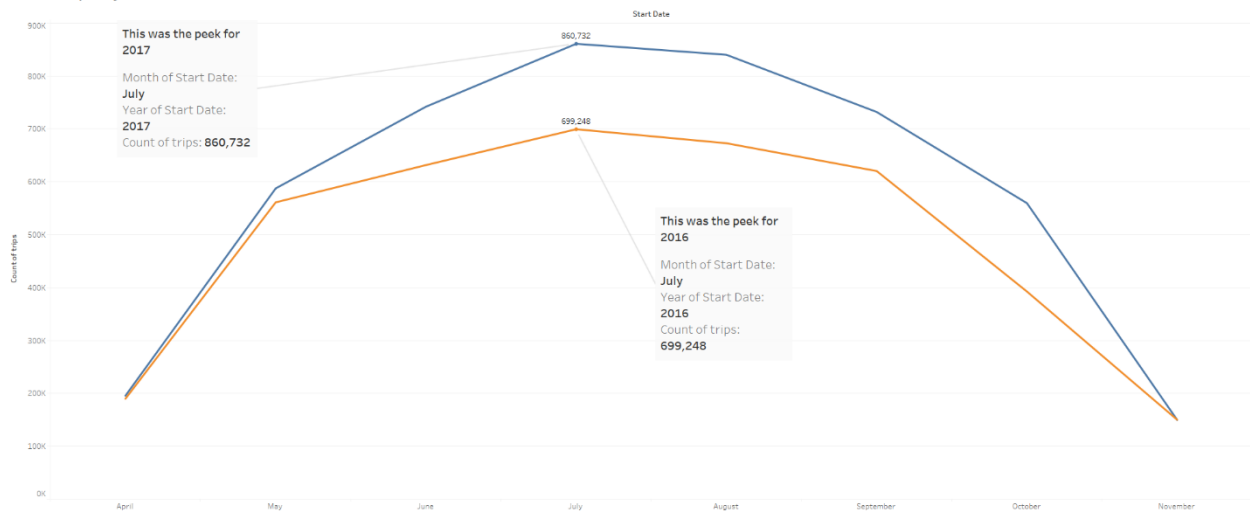**Figure 1.2**

Total Trips by Month

Start Date

Figure 1.3

These figures show that Bixi did see a growth in the total trip count between the years 2016 and 2017 rounding up to a record growth of 21.7%. As you can see, the apogee of the curve line in both graphs indicates that a large number of trips were taken during the summer for both years. But when looking at Figure 1.3, we can see that users took more trips at the start of the year 2016 than they did at the start of the year 2017. This can be due to many reasons; weather conditions can be a leading cause of it.

Round Trips and How They Define User Behavior:

When examining the data for Bixi's round trips, some interesting insights were discovered. Looking at the round trips is a fabulous way to understand many different aspects of business; it can unfold patterns about where the users are traveling frequently, what is the relationship between location and trips and how we can target more non-members with location-based advertising for a higher conversion rate.
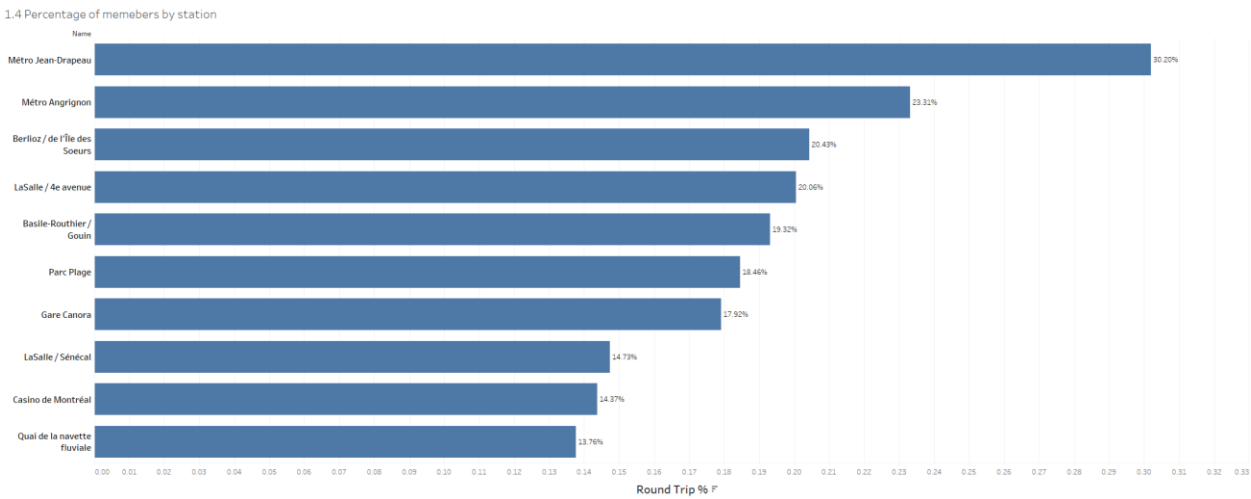

1.4 Percentage of memebers by station

Figure 2.1

2.1 Percentage of Member vs Percentage of Round Trips

The genarel trend line shows that, stations with less mebers tend to have more round trips.
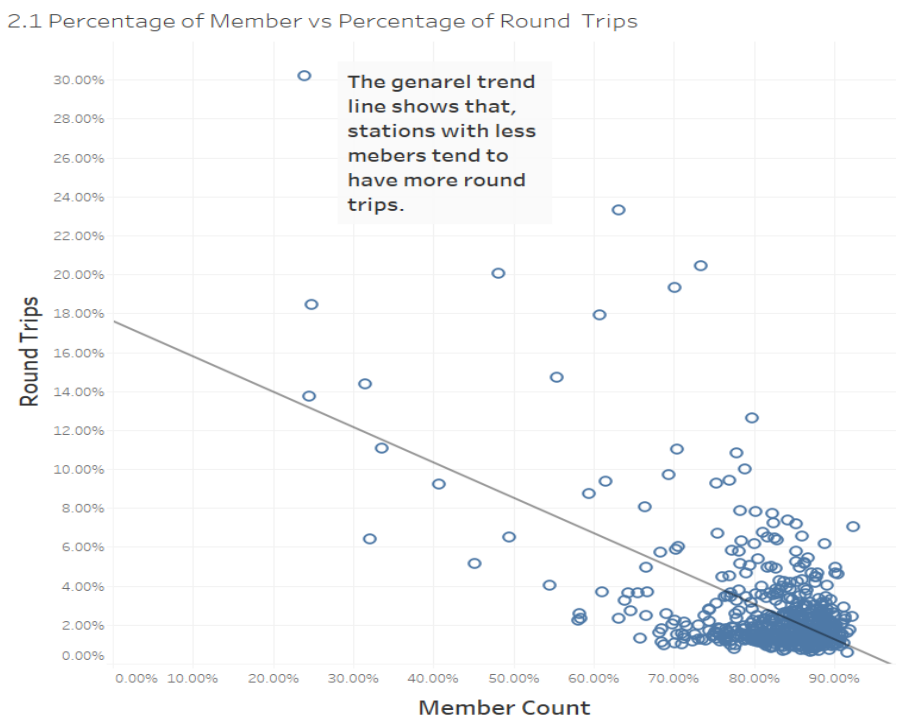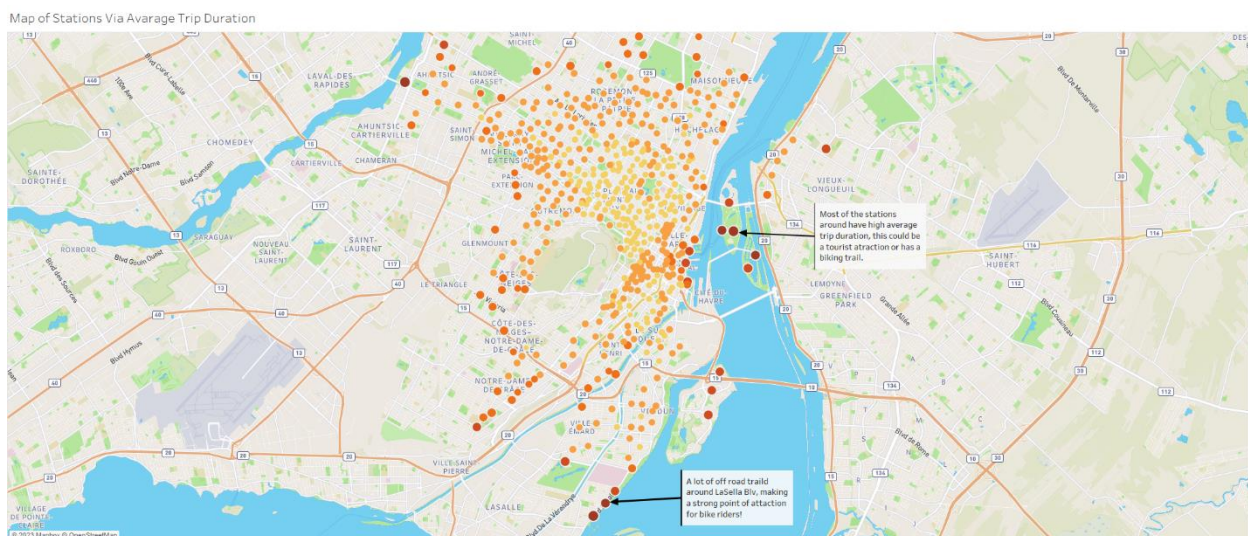
Figure 2.2

On the Figures above, we are looking at data that shows roundtrips distributed by stations. For Figure 2.1 we can see that Métro Jean-Drapeau has the most roundtrips racking up to 30.20% of its total trips as round trips followed by Métro Angrignon for 23.31% and Berlioz / de l'Île des Soeurs 20.43% in their respective order.

The interesting fact that we uncovered with Figure 2.2 is that the stations with high roundtrip percentage have relatively low amounts of members. Meaning, the majority, if not all the users, are non-members. **These locations are a great opportunity to further advertise member benefits, show the cost reduction for members riding frequently, and perks of doing more runs with Bixi. With this data driven strategy, Bixi will be boosting their non-member outreach for a potential increase in conversion rate.**

Trip Duration and Increased Revenue:

When talking about a revenue system that relies on how long users are engaging with Bixi's products; trip duration is a vital data to examine.

Figure 3.1

This map displays the all the stations for Bixi and color coordinates them based on average duration of trips in minutes; lighter colors having lower duration and darker colors having higher duration on average. With the usage of a map setting, we can quickly identify some trends for stations with higher average trip duration. The majority of the stations with the higher average trip duration are located near a body of water or are located in an island. From this we can assume that people are taking longer trips for sightseeing purposes and around locations that provide a lot of off-road lanes.
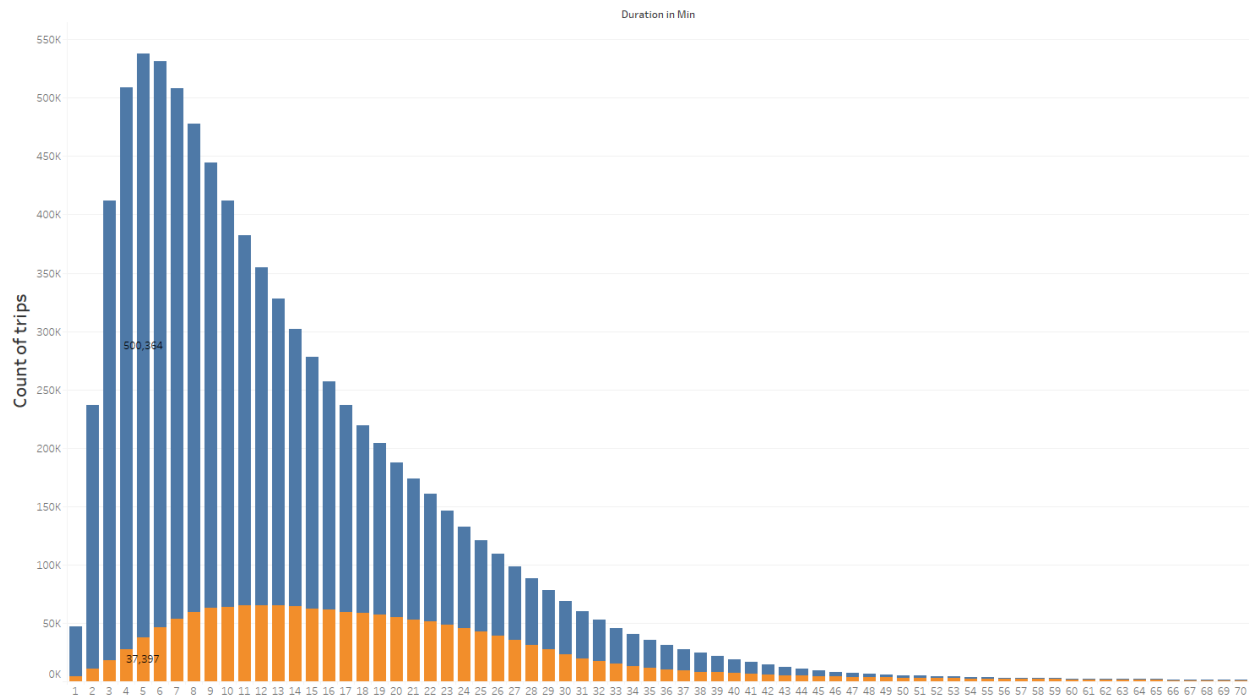
Duration in Min

Figure 3.2

Figure 3.2 indicates that members (Blue) account for the majority of the trip duration. Using this data, Bixi can used this data to target their member audience and maximize their revenue based on what is the most popular trip duration. **Lowering the price point for longer trip duration can increase better customer retention where users don't have to worry about their Bixi bike usage**, being that area has less users, there is nothing to lose.

On the other hand, increasing the cost for shorter duration as a flat rate will introduce a higher revenue because of the number of users that fall within the 1 – 24 min category. People who are riding more around the city and busy areas would still use the Bixi products for its sheer accessibility.

Targeting Non-members and Their Conversion Rate:

At the end of the day, of the main goals for Bixi is to have a high conversion rate and maintain that with the growth of users over the year. A good way to target the non-member audience is to look at their peak usage or revenue and advertise based on those factors to maximize any form of return.
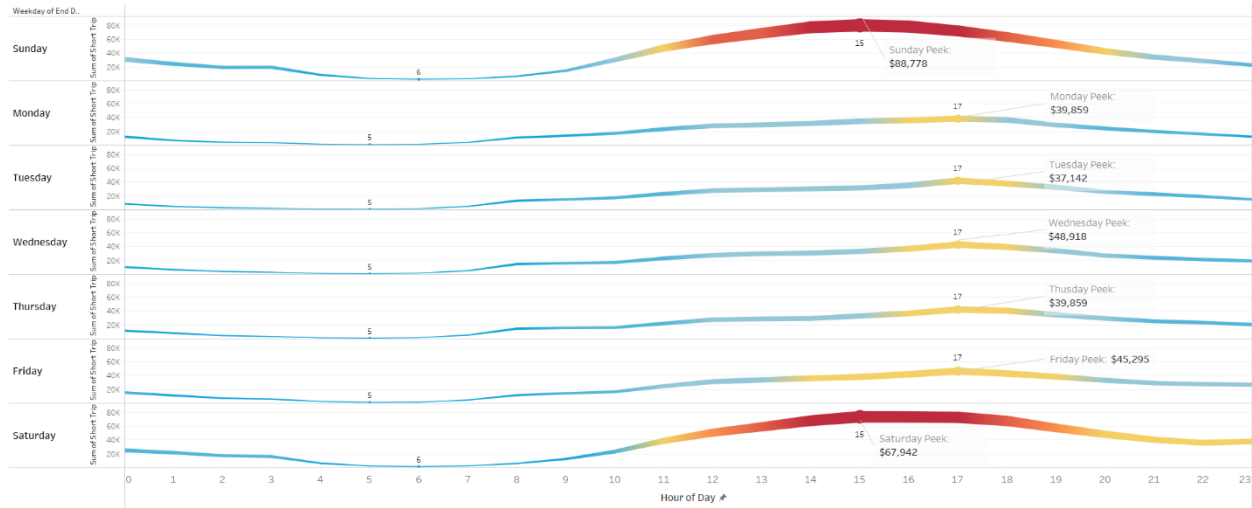
Figure 4.1

This is a breakdown of when Bixi saw the highest revenue from their non-members based on the weekday and the hour of day. This set of data can be used to specifically target the non-member audience at rush hour to make sure advertisement outreach is the biggest. Looking at engagement time is crucial for better understanding user behavior and product usage.

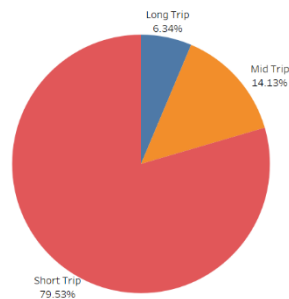Total Revenue Divided Into Trip Size for Non-Memebers
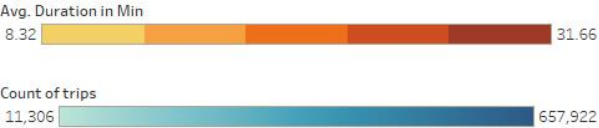

Figure 4.2

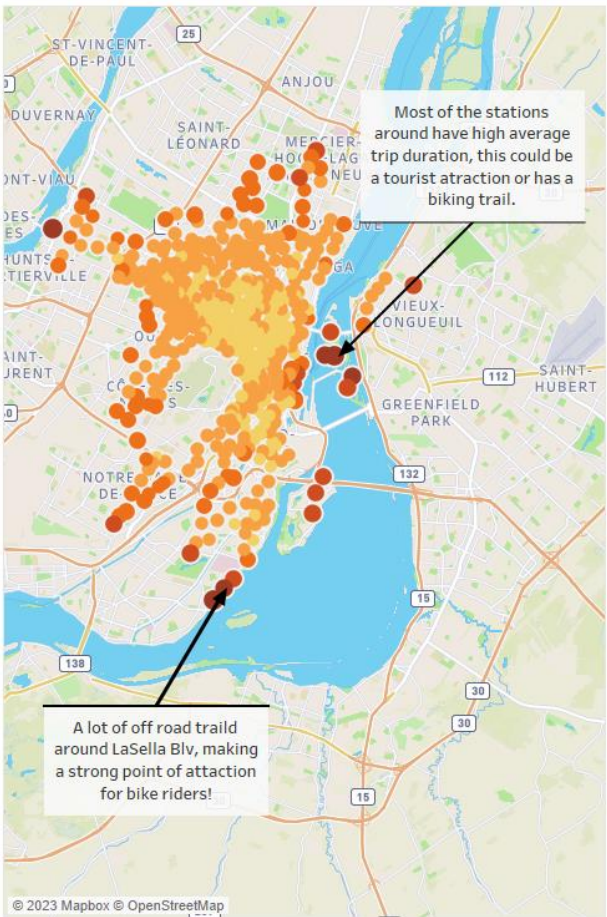To pair it with Figure 4.1, this pie chart breaks down the how much of the non-member total revenue is earned by what kind of trip duration. Here are divide the total revenue for non-member into to three separate parts, short trips (30 minutes or less), medium trips (30 – 45 minutes) and long trips (45 -60 minutes). The total revenue is distributed as the following:

- Short Trips: 79.53%
- Medium Trips: 14.13%
- Long Trips: 6.34%

This data alongside with peak revenue time and date, Bixi can emphasize advertising to non-members on stations locations with low average trip duration time on weekends evening for maximum outreach. Of course, they should reach out to non-members on stations with medium to high average trip duration times on weekdays, but **focusing on low average trip duration time on weekends evening will ensure a bigger audience size and potential raise in conversion rate.**
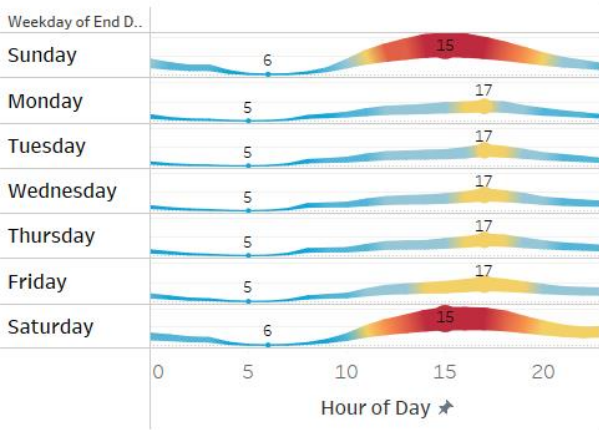
Map of Stations Via Avarage Trip Duration

Most of the stations around have high average trip duration, this could be a tourist atraction or has a biking trail.

A lot of off road traild around LaSella Blv, making a strong point of attaction for bike riders!

© 2023 Mapbox © OpenStreetMap

Avg. Duration in Min

8.32 — 31.66

Count of trips

11,306 — 657,922

Total Trips by Mem vs Non-Mem

| | Member Status / End Date | | | |
| | Member | | Not Member | |
Month of E..	2016	2017	2016	2017
April	161,717	163,412	28,141	32,241
May	454,988	481,456	106,076	105,853
June	510,703	599,483	120,677	142,327
July	537,541	657,922	161,594	202,885
August	520,709	656,029	152,277	183,909
September	508,711	604,371	111,548	127,481
October	343,378	483,476	49,200	76,081
November	136,913	138,533	13,228	11,306

Revenue Peek by Hours of Day by Non-Members

Weekday of End D..

Sunday	6	15
Monday	5	17
Tuesday	5	17
Wednesday	5	17
Thursday	5	17
Friday	5	17
Saturday	6	15

0   5   10   15   20

Hour of Day ✈

In conclusion, this report provides an analysis of Bixi Company's performance for the years 2016 and 2017, based on the provided questions. The findings highlight the volume of bike usage, the behavior of members and non-members, peak demand periods, station popularity, and usage patterns. These datasets can provide strategic decision-making, such as optimizing promotions, expanding station networks, and improving user experiences to further enhance Bixi's performance and customer satisfaction.