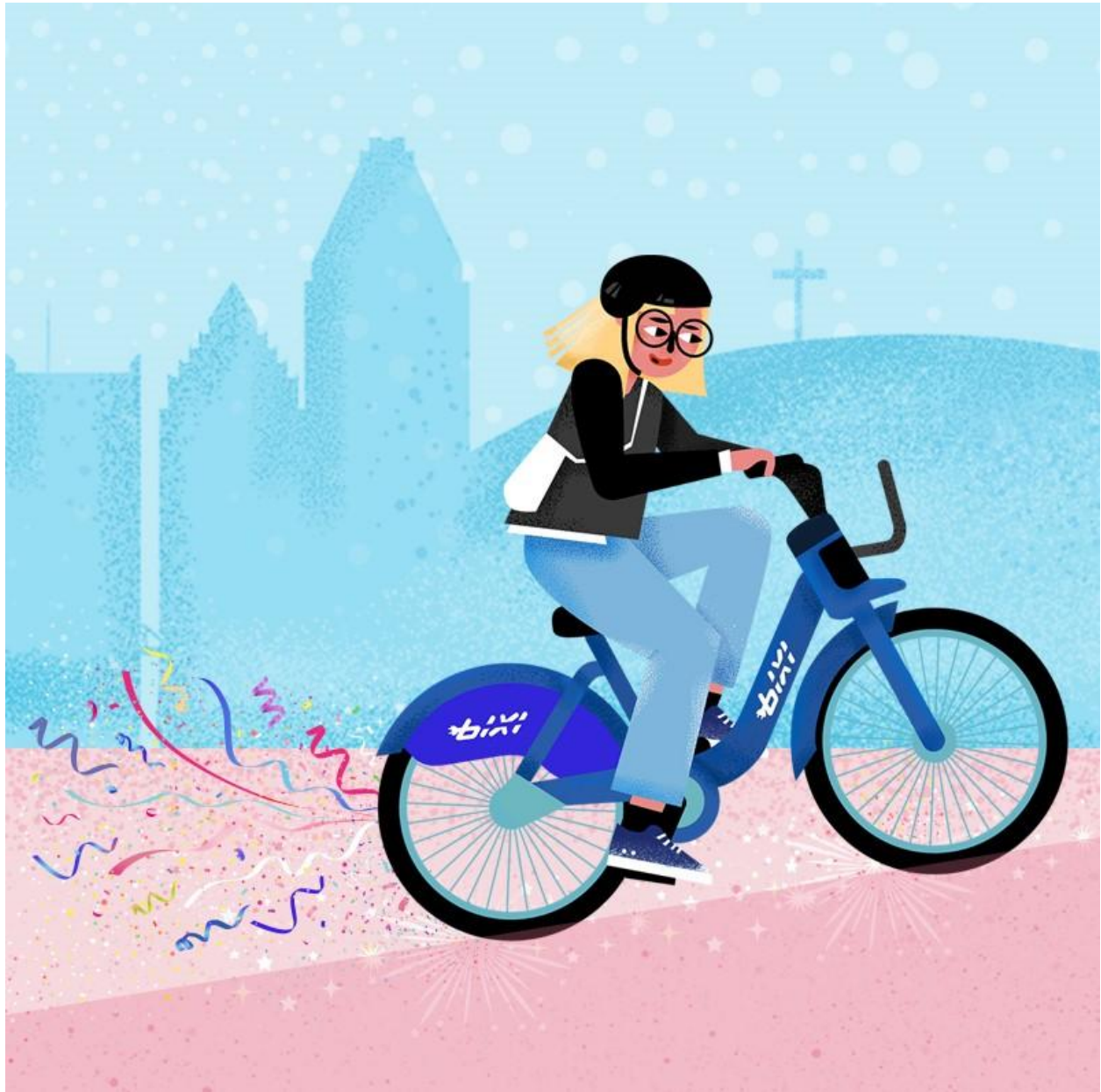


BIXI DELIVERABLE 2

BIXI BIKE SHARE REPORT

- VIRAJ KUNTHE



Introduction

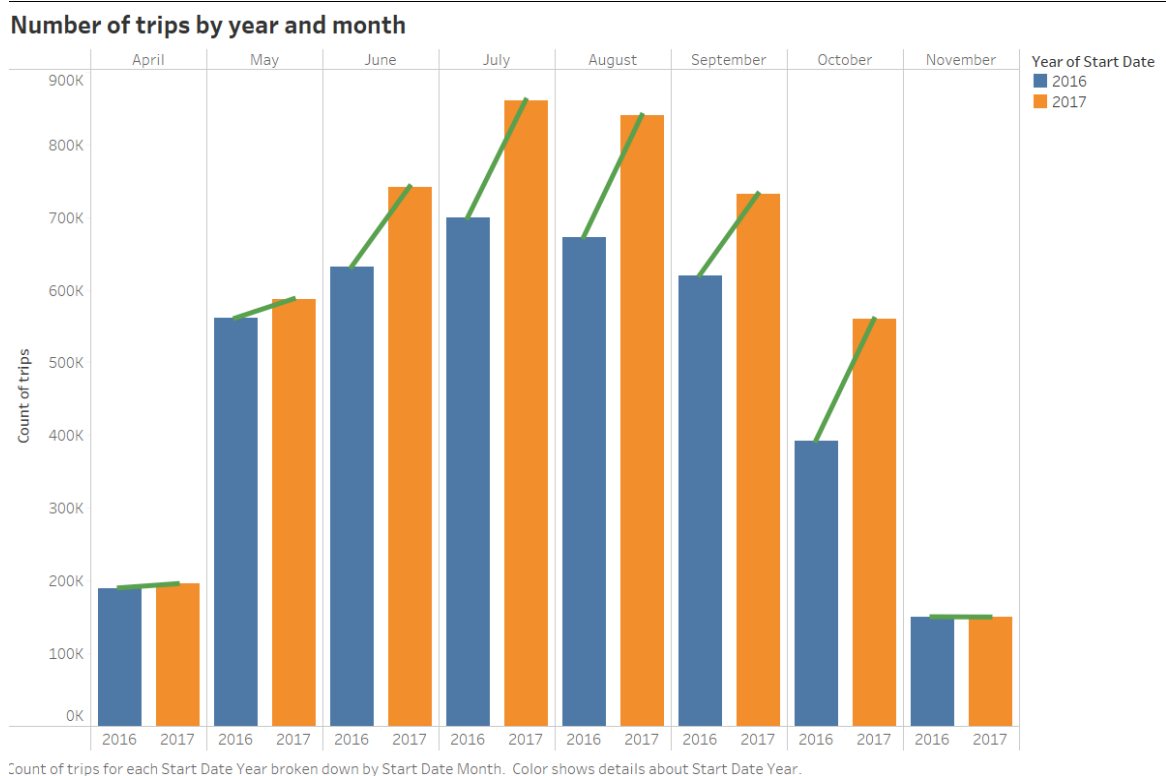
BIXI Montréal is a public bicycle sharing system serving Montréal, Quebec, Canada. Launched in May 2009 by Public Bike System Company, it is North America's first large-scale bike sharing system and the original BIXI brand of systems. This report aims to visualize certain trends and make a few observations as well as suggestions based on the 2016 and 2017 trip data.

Insights

Growth in usage

The usage has grown year on year for 2017 compared to 2016.

The performance of the service can be evaluated based on the year on year growth as shown by the monthly breakdown of trips taken for both the years.

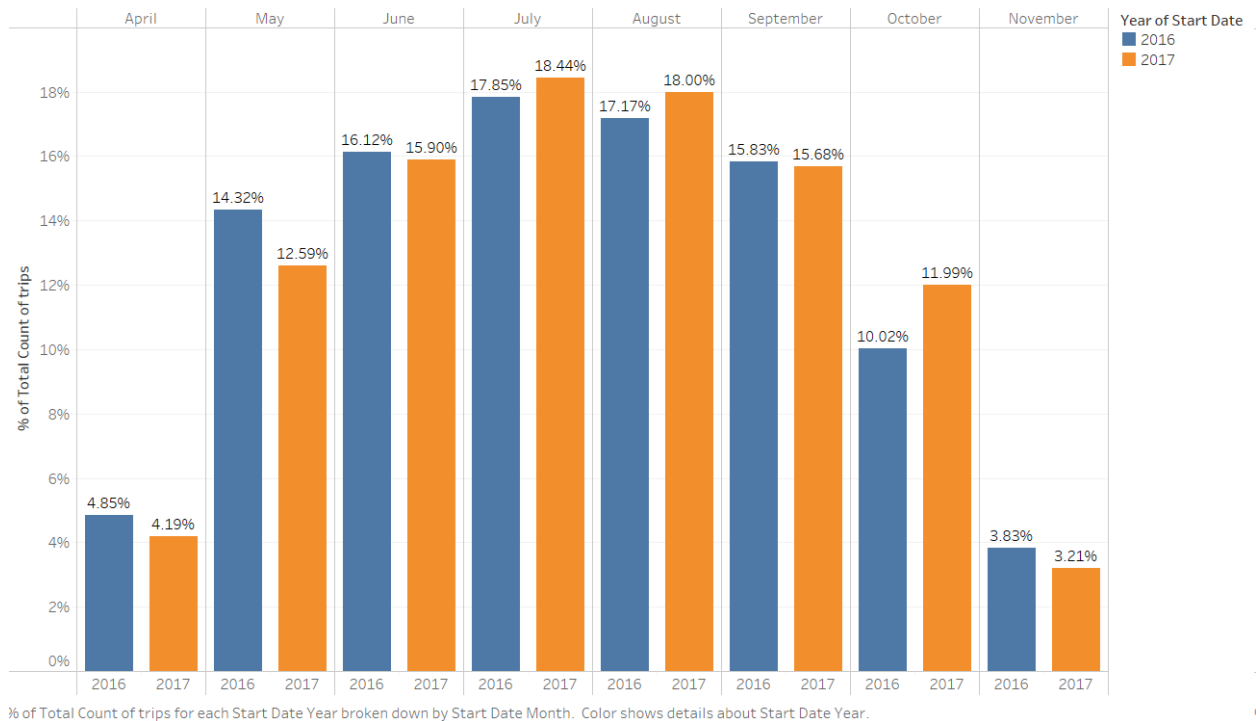


Performance by month

It is clear from the above visualization that the **warmer months of May-September contribute the most to the yearly usage of the service.**

The contribution of each month when the service is operational (mid-April to mid-November) to the yearly performance of the service is highlighted by the following image.

Number of trips per month as a percentage of yearly trips

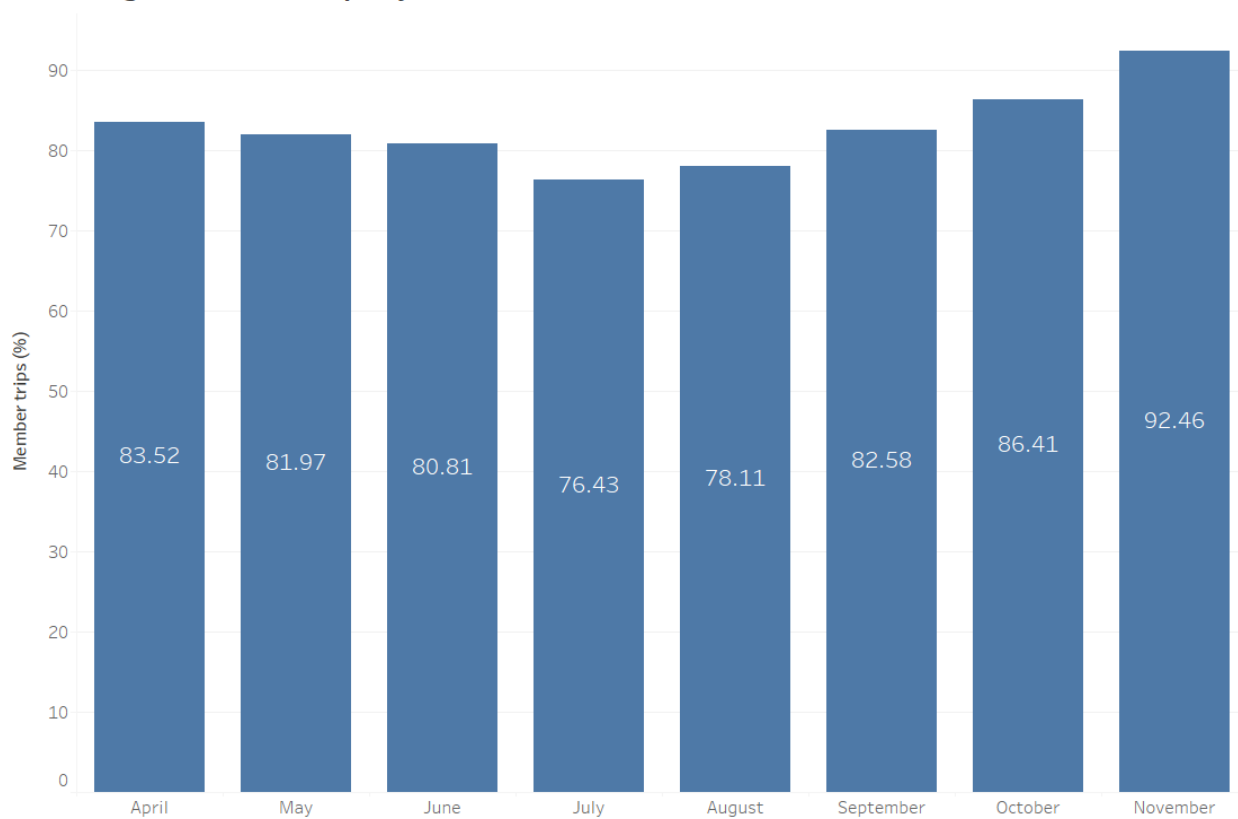


Membership impact

It is observed that **members are more likely to keep utilizing the service even during the colder months of April, October and November** when typically the number of total trips drops drastically.

The following visualization provides details about how many trips per month were completed by members.

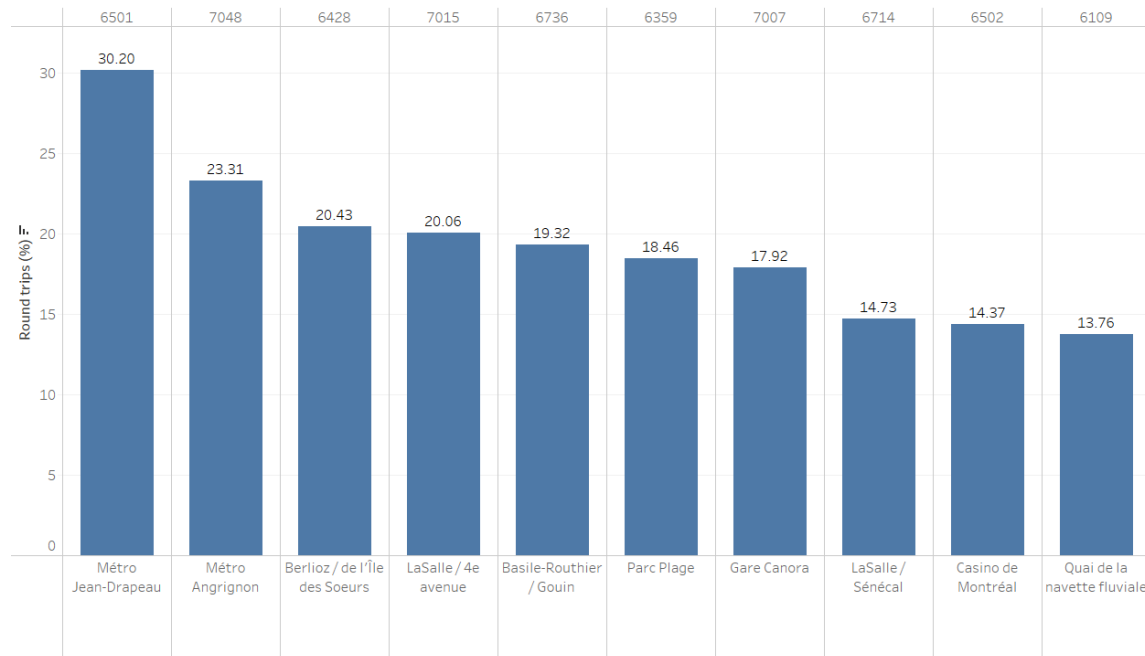
Percentage of member trips by month



%ct_member_trips for each Start Date Month. The data is filtered on Start Date Year, which keeps 2017.

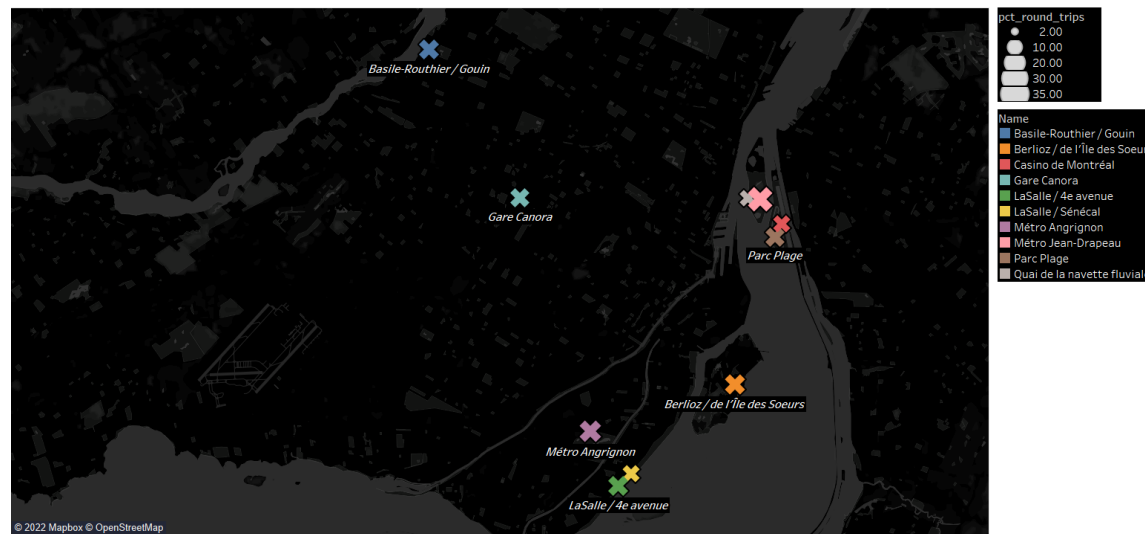
Round trips

Top 10 stations by percentage of round trips



pct_round_trips for each Name broken down by Start Station Code. The marks are labeled by pct_round_trips. The view is filtered on Start Station Code, which has multiple members selected.

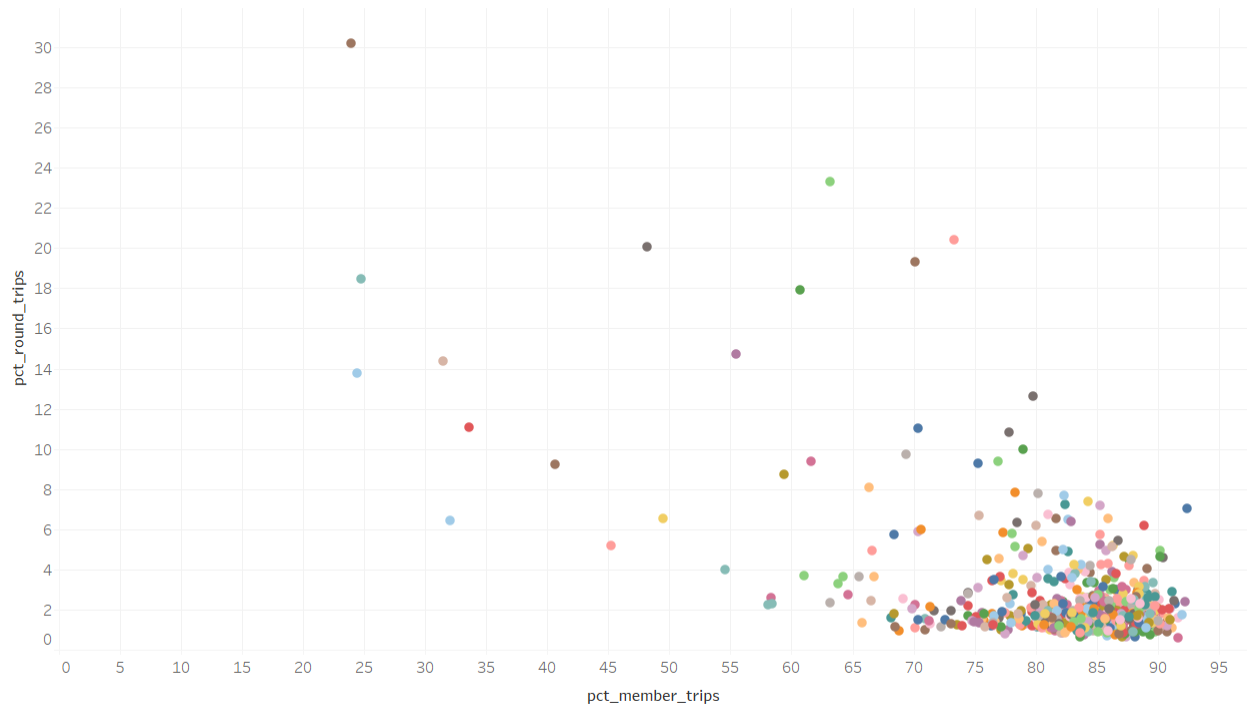
Top 10 stations by percentage of round trips



It is observed that the percentage of round trips is high at metro stations, and also on the islands where people visit only for a limited amount of time and return their bike at the same location they picked it up from.

Do members take round trips?

Member trips vs Round trips



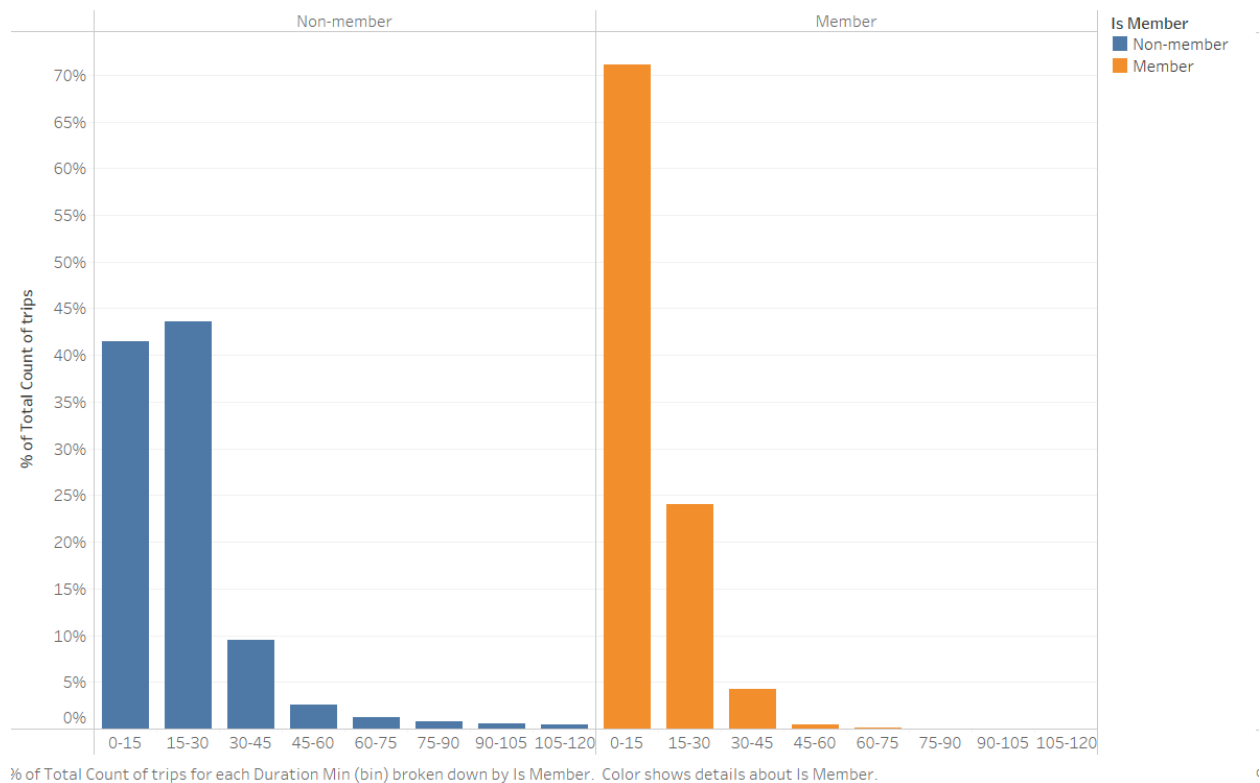
pct_member_trips vs. pct_round_trips. Color shows details about Start Station Code. Details are shown for Name.

It is clear from the above visualization that **members are most likely to not take round trips**. Most of the stations (each dot is a data point for a station) are concentrated in the high member, low round trip quadrant of the plot. Stations that have high round trip percentage are low on member count too.

A **possible explanation** is that **members use the service to commute and non-members use it mostly for leisure** (as they return their bikes to the same station).

Trip duration - Members vs Non-members

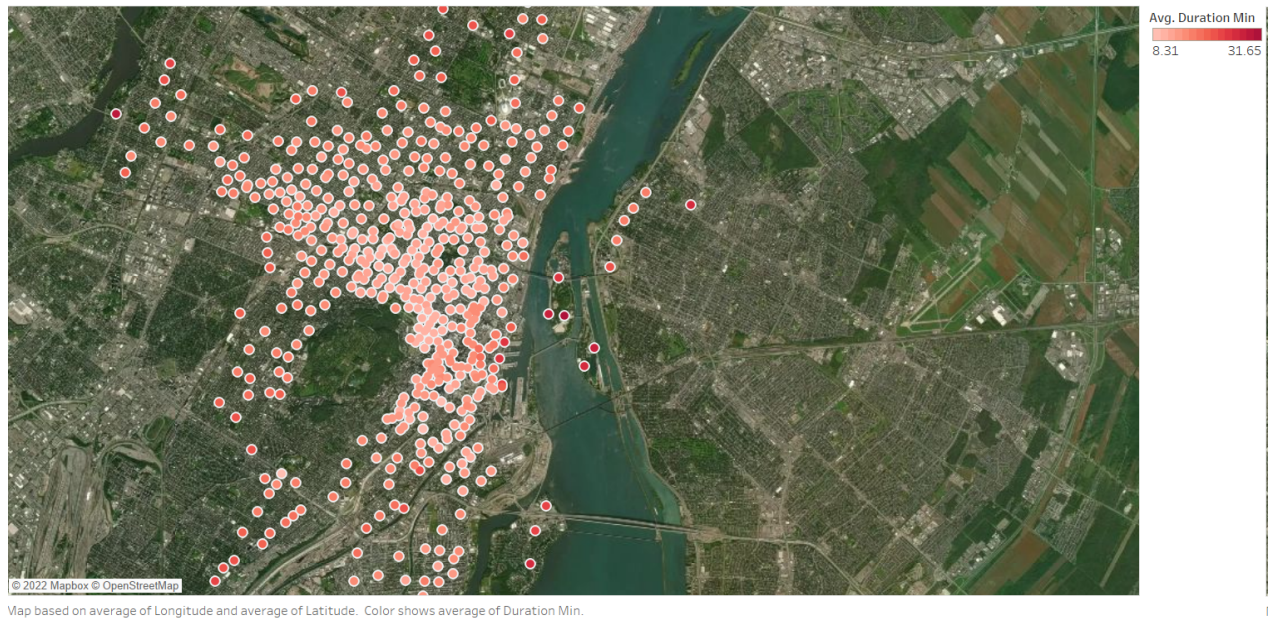
Distribution by trip duration, Members vs. non-members



From the above visualization, it is clear that when broken down into slots of 15 minutes (0-15, 15-30 and so on), more than 70% of members take trips shorter than 15 minutes. 43.5% of non-members slightly favor longer trips ranging from 15-30 minutes () and 41% take trips shorter than 15 minutes. A combined 84% of non-members take trips less than 30 minutes, but they skew slightly towards trips between 15 and 30 minutes. **It can be said that on average, non-members take slightly longer trips than members.**

Map of average trip duration

Average trip duration by Station



It is observed from the above map that the **average trip duration is higher on the islands and around the Mont-Royal park and cemetery area**. This is most likely due to these being leisure and tourist oriented destinations thus causing longer average trip times compared to the average commute stations.

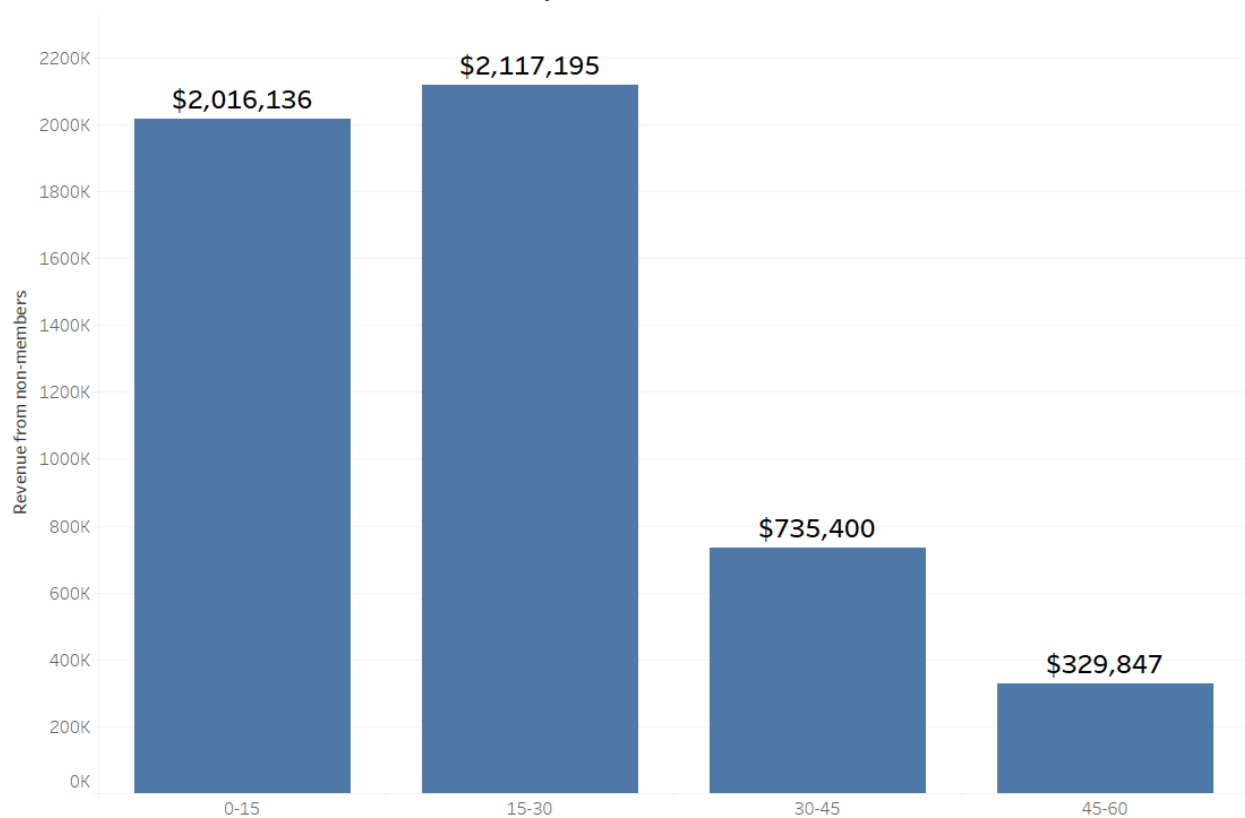
Non-member Revenue

Bixi has the following pricing model for infrequent users (non-members)

- \$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

Based on this, a quick calculation reveals the amount of revenue generated by each tier of their pricing structure

Revenue from non-members based on trip duration in minutes

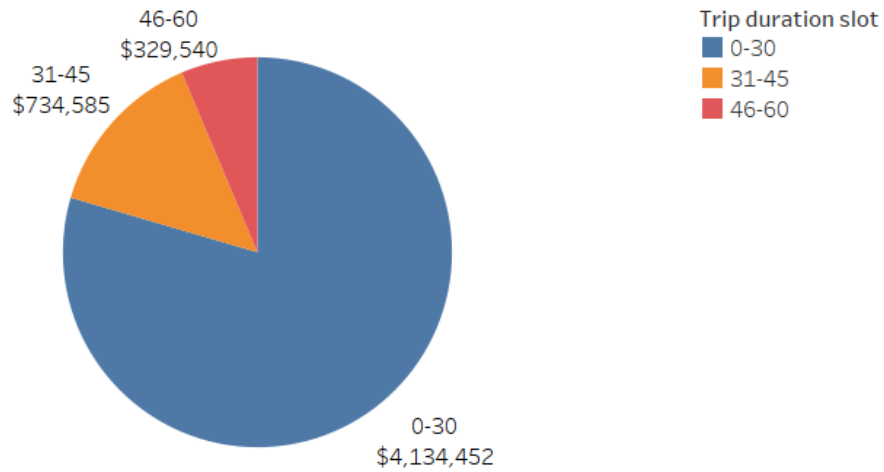


Sum of revenue_non_members for each Duration Min (bin). The marks are labeled by sum of revenue_non_members. The view is filtered on Duration Min ('bin'), which keeps 0-15, 15-30, 30-45 and 45-60.

It is no surprise that the **\$2.99 tier generates the most revenue** as a majority of non-members (85%) use the service for less than 30 minutes per trip.

Percentage of non-member revenue by trip duration

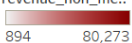
Revenue from non member trips by trip duration



The cheapest tier that is applicable for **trips less than 30 mins** generates **79.5% of the total non-member revenue**.

Detailed non-member revenue

Heat map of non-member revenue based on day of the week and hour

Hour of S..	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	revenue_non_me..
0	28,543	10,558	7,636	9,493	11,138	14,490	24,294	
1	23,457	6,521	4,321	6,058	7,050	10,313	20,834	
2	18,867	4,066	2,832	3,746	4,162	6,671	16,627	
3	18,415	3,486	2,111	2,592	2,966	5,469	14,989	
4	6,258	1,363	894	1,044	1,229	2,078	4,661	
5	2,915	1,142	894	939	972	1,292	2,180	
6	2,416	1,896	2,111	2,159	2,150	2,030	1,908	
7	3,382	5,484	6,443	6,730	6,991	5,974	3,271	
8	8,276	12,681	14,711	16,726	16,194	13,461	7,349	
9	17,958	14,454	15,315	15,757	15,527	14,454	15,396	
10	35,506	19,073	18,789	18,574	17,480	18,550	27,116	
11	51,524	25,125	24,868	24,996	24,102	26,937	43,137	
12	62,365	28,477	27,945	28,061	27,649	32,247	53,351	
13	71,718	30,178	29,616	30,064	29,153	34,493	62,192	
14	78,960	32,597	30,737	30,860	30,304	36,003	69,320	
15	80,273	35,414	32,056	33,868	33,832	39,552	74,239	
16	76,356	36,038	36,460	38,586	37,360	42,883	73,434	
17	69,993	38,137	42,736	42,754	43,056	45,768	71,362	
18	60,147	35,270	36,080	38,293	39,002	42,004	64,994	
19	50,370	27,968	30,970	32,175	33,751	36,971	55,121	
20	40,449	23,388	24,969	26,204	27,831	31,897	46,049	
21	32,238	18,915	21,468	23,005	24,473	28,647	38,682	
22	27,257	15,536	18,631	21,304	23,472	27,188	37,010	
23	20,467	11,398	13,778	16,974	19,151	26,578	36,269	

The above heat map shows that most of the non member revenue is generated on weekends (Saturday and Sundays) during the daytime hours of 10 am - 7 pm. This **reinforces the previous theory that non-members mostly use the service for leisure and not for commuting** as the typical commute times, 8 am -10 am and between 5pm - 6pm do not generate a major part of the revenue.

CONCLUSION

To summarize, most of the trips taken are by members who do not take round trips indicating that these are most likely commutes. Revenue from members is well documented but revenue from non-members can be maximized by offering incentives during commuting hours. Offering a season membership at lower costs during the warmer months to non-members will ensure more usage of the service during the whole season hence ensuring higher overall revenues.