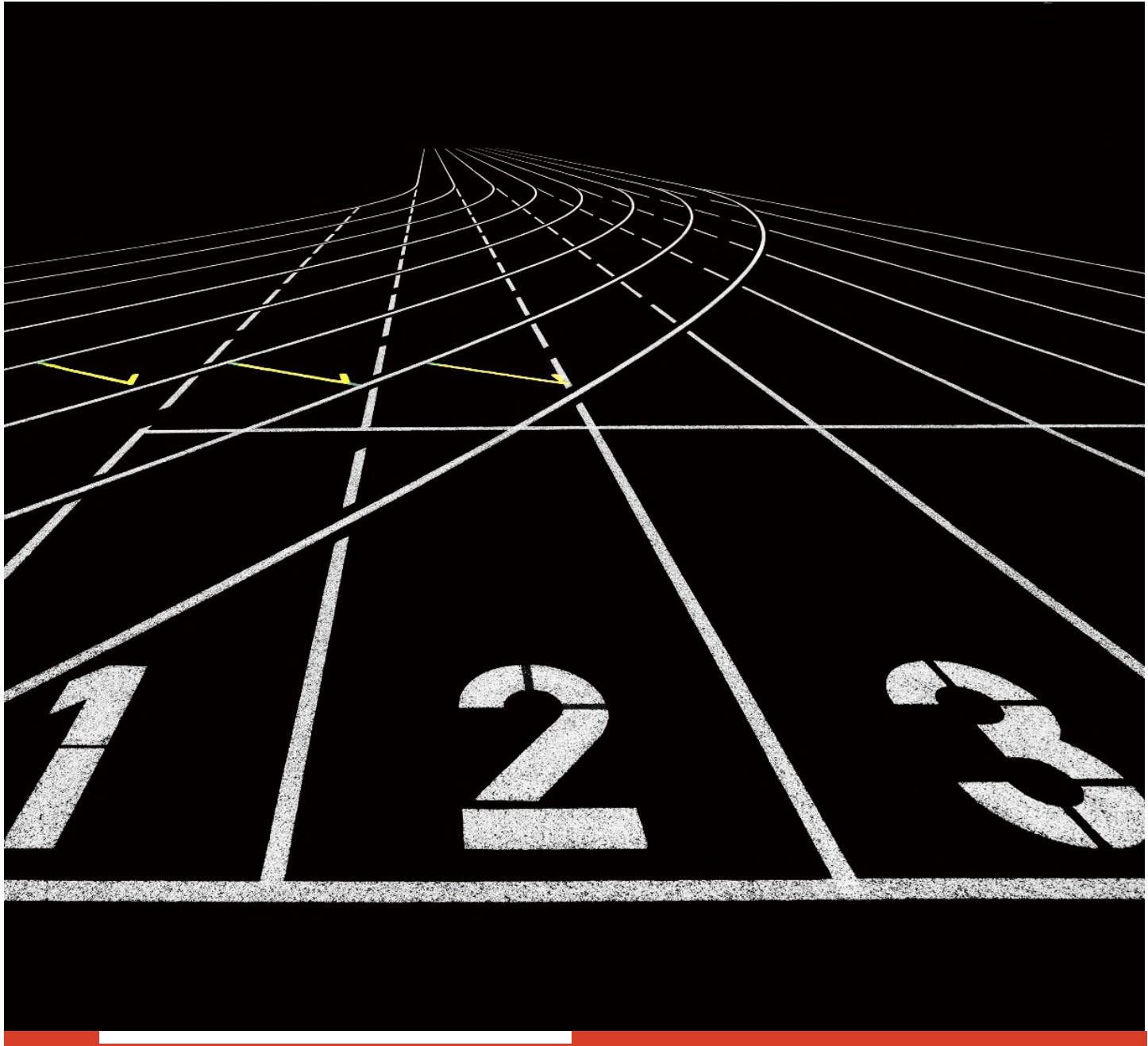




BIXI BIKING TRENDS & IMPACTS

MAXIMIZING VOLUME OF USAGE AND MEMBERSHIP

BIXI MONTRÉAL



INTRODUCTION

As a means to maximize revenue and company growth, we will analyze Bixi bike usage in 2016 and 2017. The purpose of the analysis is to find trends in usage; identify factors that impact usage; and to leverage *how* those factors effect trends to develop strategies to increase profit, membership, and company growth.

BIXI DATA

Data Collection

The Bixi bike usage data used in our analysis was collected from Spring to Fall in 2016 and 2017. The dataset includes the date and time a bike was rented and returned, as well as which the station the bike was picked up and dropped off at, and if the customer riding is Bixi member or not. Based on this dataset, the factors identified effecting usage are time of year, station location, time of day, and membership status.

Time of Year & Membership Status

In Figure 1, we saw a major increase in usage from 2016 to 2017 as well as in the summer months for each year individually. Both years' peak month was July, with 2017 having a 0.5% increase in usage. The month that had the most growth from 2016 to 2017 was August with a 0.83% increase.

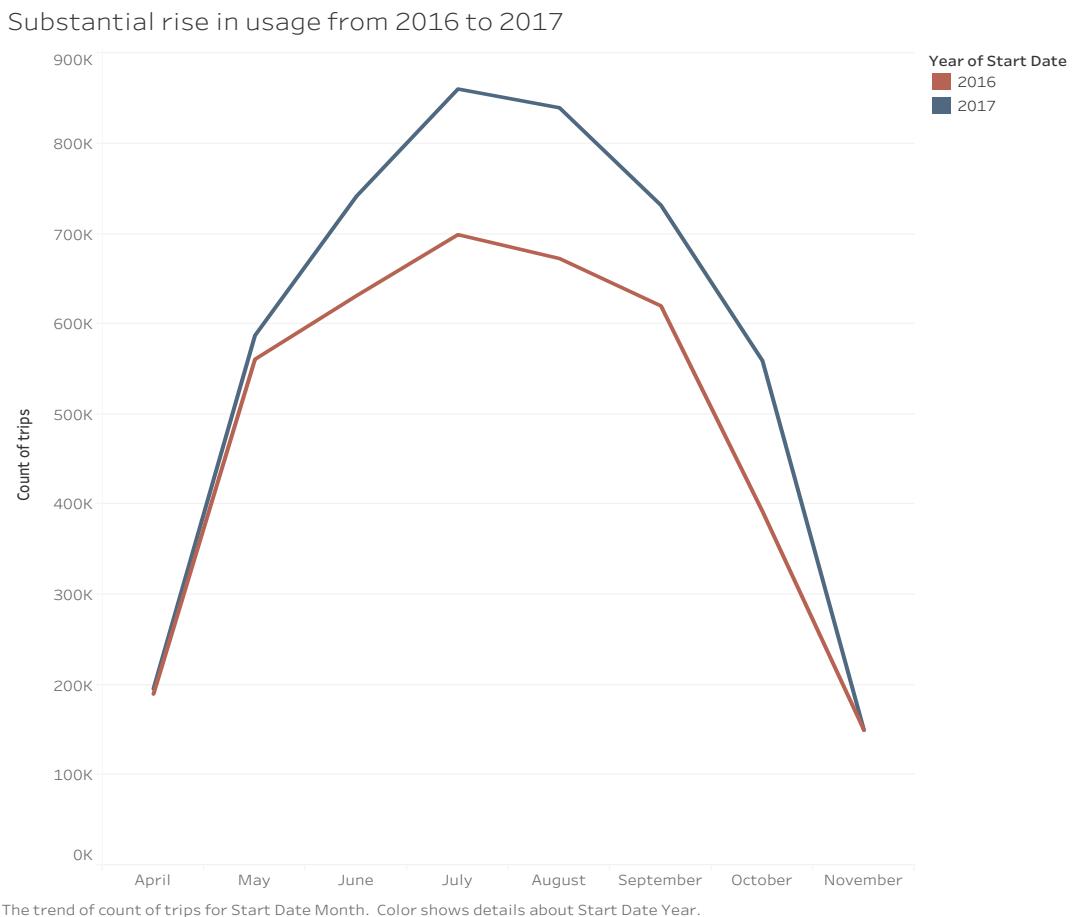


Figure 1

Below Figure 2, we found a significant decrease in the percentage of riders who are members and an increase as temperatures decreased.*¹ These two trends tell us that as usage in the summer increases, non-members usage increases. Non-members are a key factor in the summer surge. This is due to weather, and of course, tourism.

Percentage of active member trips decrease in summer months as total non-member trips increase

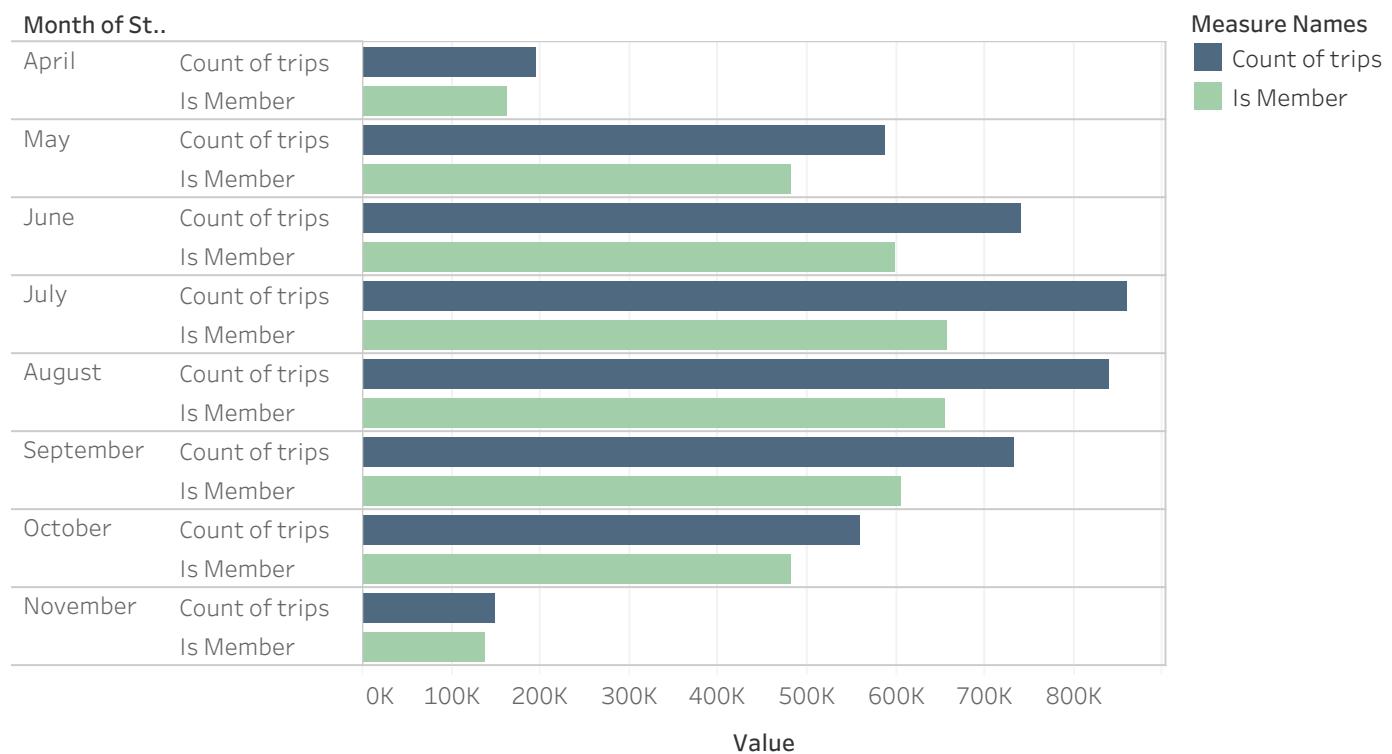


Figure 2

Station Locations & Roundtrips

In our analysis we also looked at which stations had the highest percentage of roundtrips. Highest roundtrip percentage is 30% at Métro Jean-Drapeau, the next station has 23% roundtrips. The majority of trips are not roundtrip, yet there are 14 stations with abnormally high roundtrip rates. We discovered that the stations with high roundtrip rates are either popular tourist attractions or entertainment and arts districts, both attracting short- and long-term members. Profits can be increased by surging prices during high traffic times. We can amp up our partnering businesses by starting at the attractions near these stations. Members can get discounts at partnering museums and restaurant.

Parks & tourist attractions have the highest portion of roundtrips

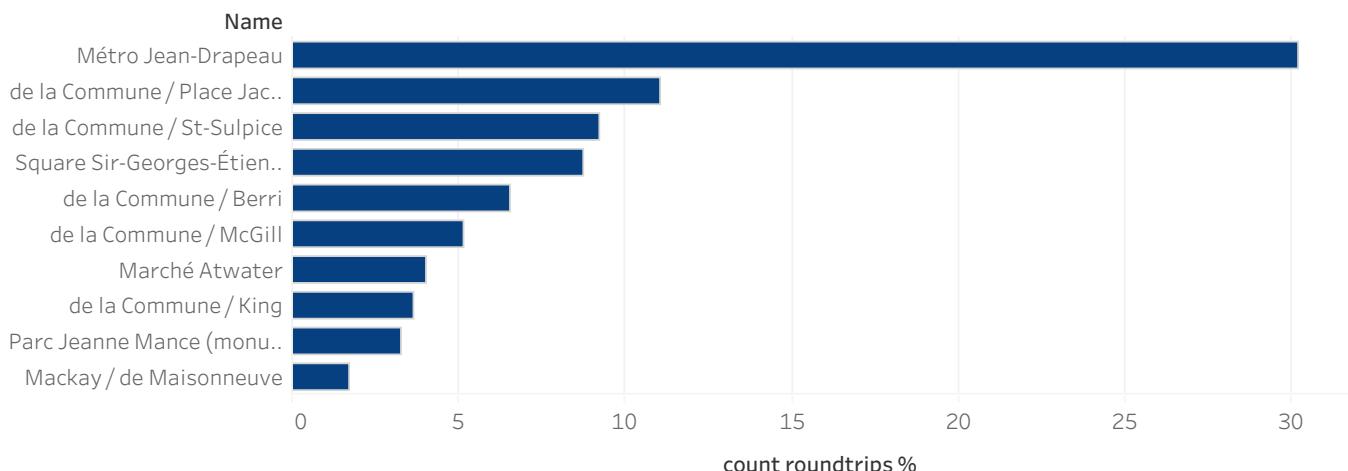
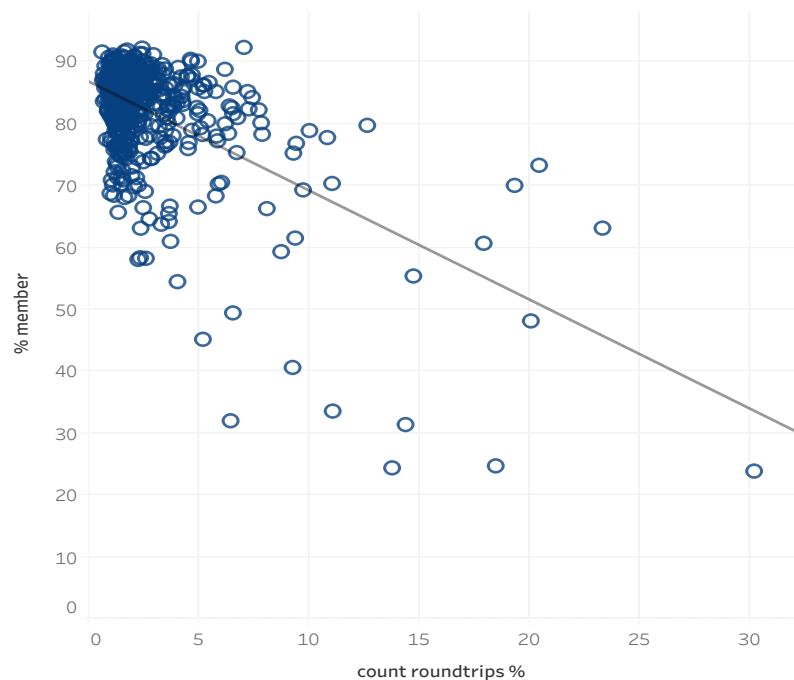


Figure 3

Membership Status & Roundtrips

We were not surprised to find that there is a negative correlation between active members making roundtrips. We excluded the Métro Jean-Drapeau since it had the highest percentage of roundtrips by twenty percent and one of the lowest active member trip percentages. With or without Métro Jean Drapeau, there is a negative correlation. We know from our last analysis that roundtrips are most often done at parks or tourist attractions. The negative trend for active members is most likely due to their use of Bixi bikes for commute rather than leisure or tourism.

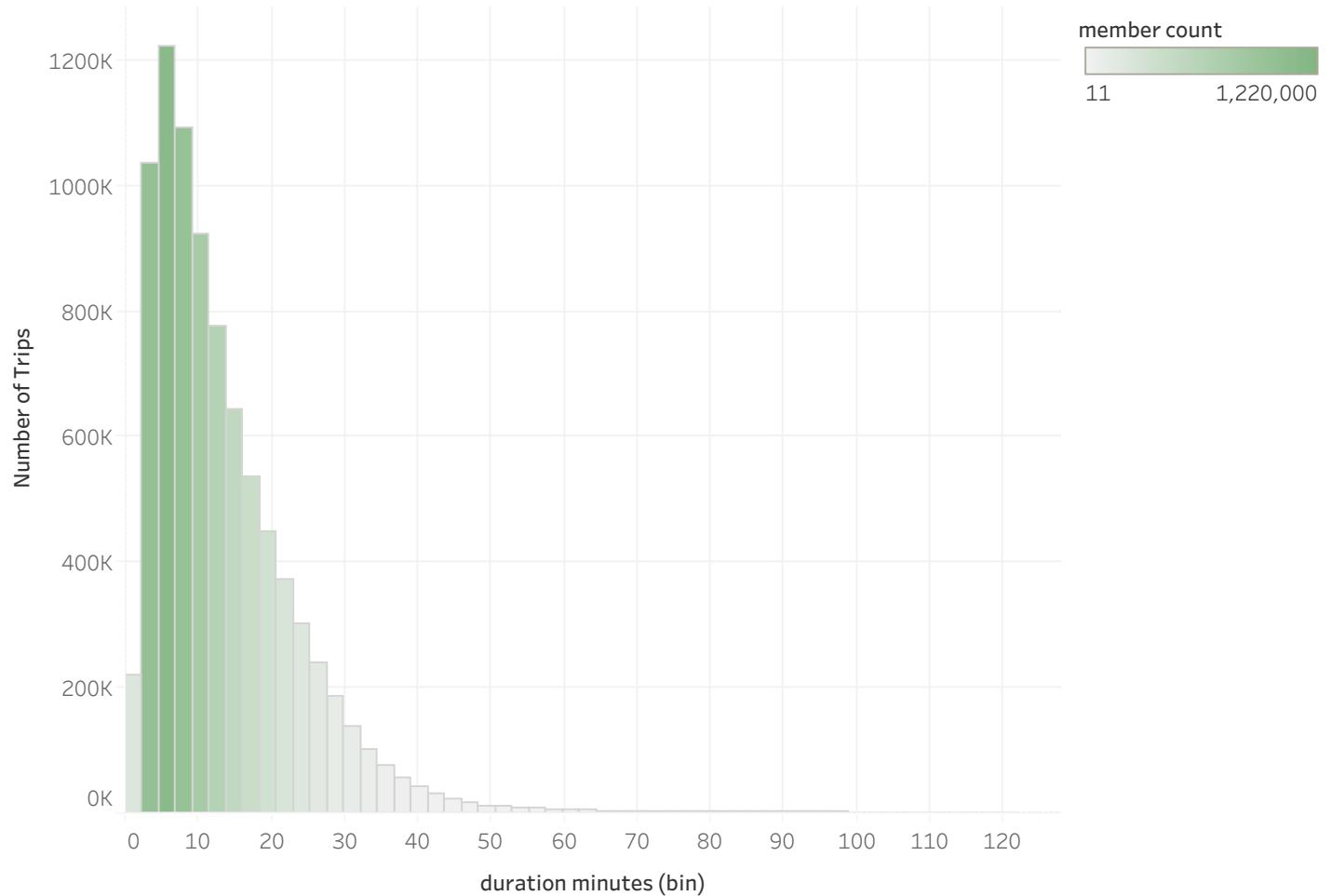
Stations with a higher rate of roundtrips have a lower rate of member usage



Active Members & Trip Duration

Active members make up the bulk of trips less than ten minutes. Since active members have already paid to use the bike, riding a Bixi bike for a short amount of time is worth it. This also suggests that active members live in a more central location. We also gather from this visualization that non-members make-up the bulk of longer trips. Since non-members have to pay to use the bike for each trip, they want to get their money's worth for having to pay the single trip flat rate.

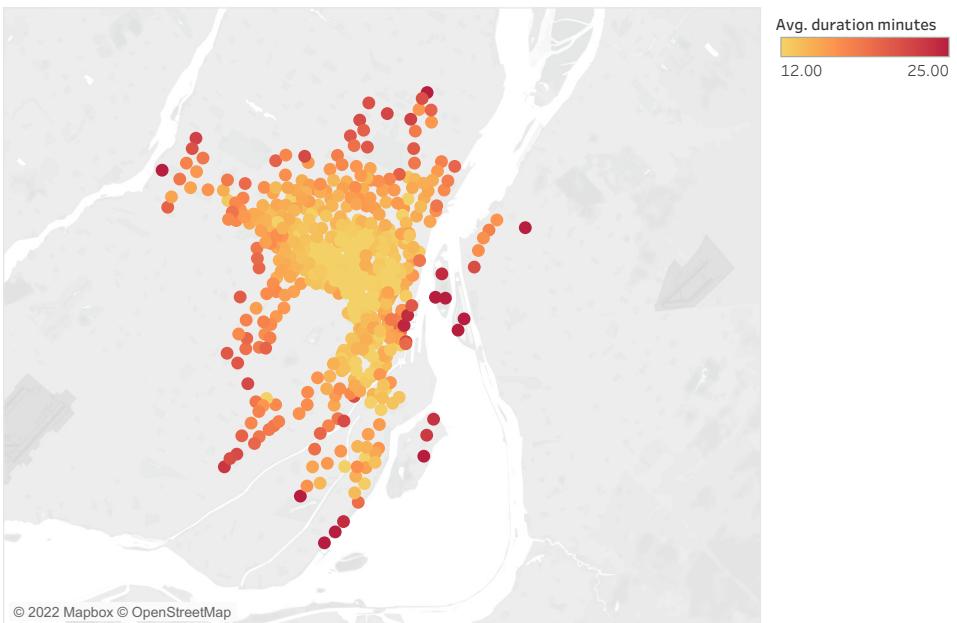
Members make-up the bulk of trips less than 10 minutes



Station & Trip Duration

This map showing each start stations' average trip duration confirms that shorter rides start in the city center. The brighter yellow dots are the stations with an average trip duration of 12 minutes or less. The other dots encircling Montréal are a darker red, representing stations with an average trip duration of 25 minutes or more; most of them being along the water, a tourist attraction itself.

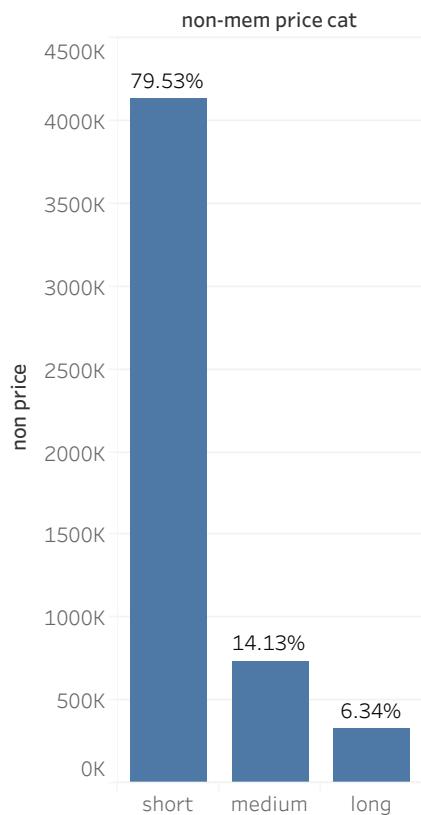
A station's average trip length depends on its distance from the city's center



Non-members & Trip Duration

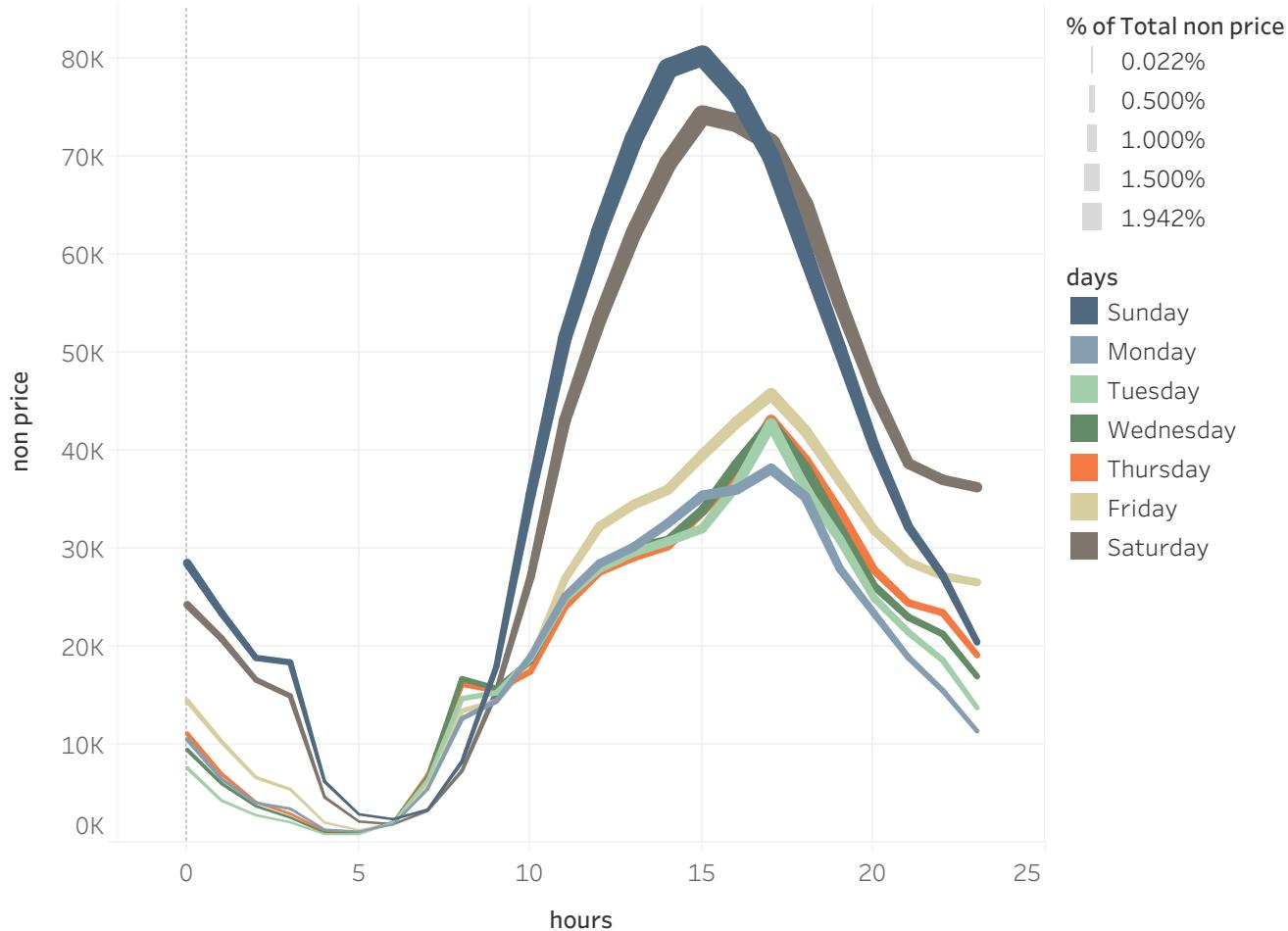
Non-members take more longer trips, but which length of trips by is Bixi profiting off of the most? To calculate this, we will focus on trips less than an hour and then identify the trip durations as either short ($0 \text{ min} < \text{duration} \leq 30 \text{ min}$); medium ($30 \text{ min} < \text{duration} \leq 45 \text{ min}$), or long ($45 \text{ min} < \text{duration} \leq 60 \text{ min}$). Then the number of trips in each category will be counted up and multiplied by the price rate for that duration range. Below we see that the revenue from short trips is quadruple that of medium and long combined. Short trips accounted for 79.53% of revenue. Though active members account for the bulk of trips 10 minutes or less, the bulk of non-members ride for less than 30 minutes.

Revenue from short trips is quadruple of medium and long trips combined



Non-members Short-Trips & Time of Week

Sundays & Saturdays have generate the most revenue from non-members riding 30 minutes or less

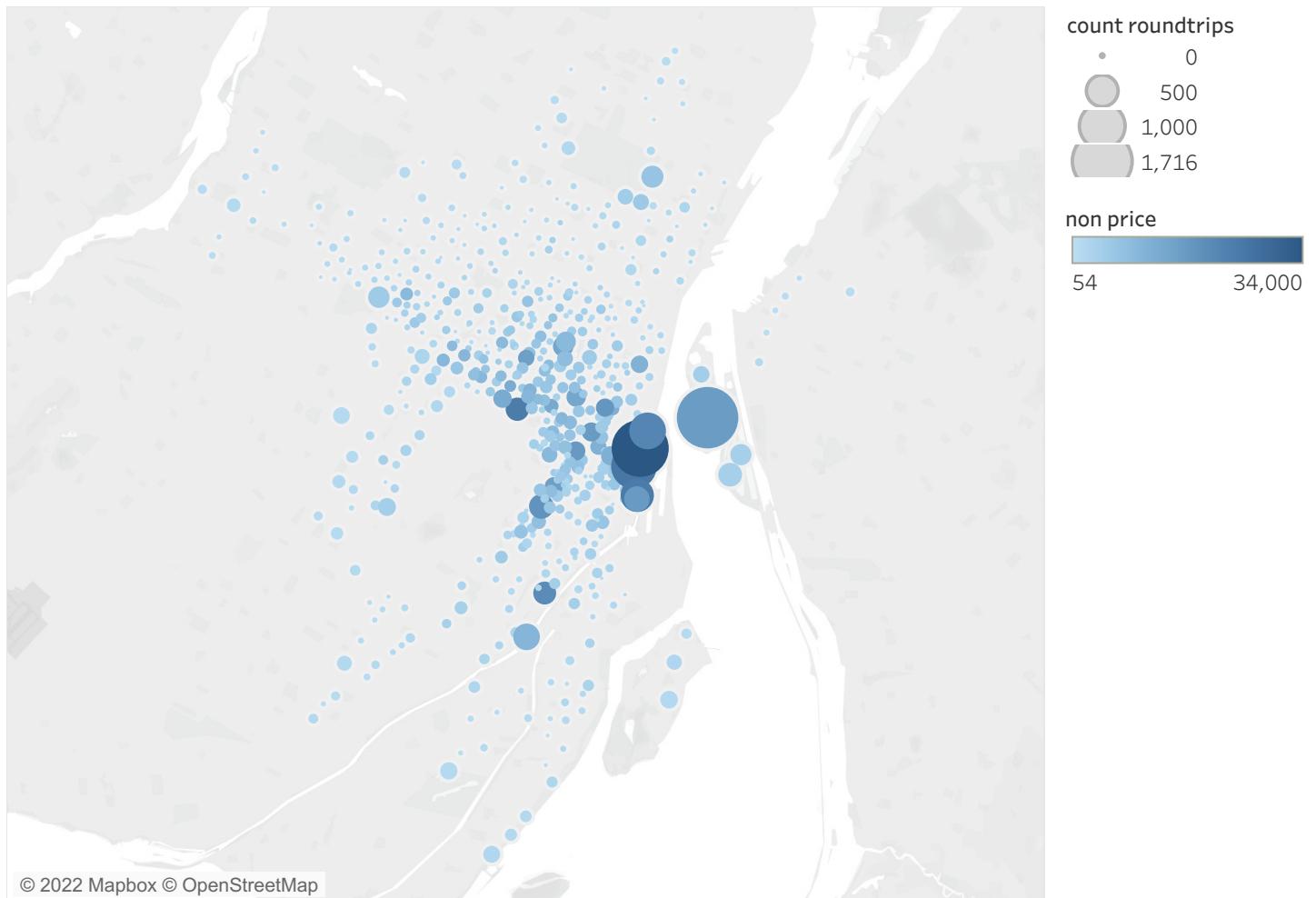


To gain further insight on non-member short-trips, we analyzed what day of the week and what time of day Bixi is profiting the most from these trips. Saturday and Sundays between 11am -8pm are the peak days and times for revenue and non-member trips. The peak times, just after noon, on Saturdays and Sundays see double the revenue than the next best day. Saturdays' sum peak revenue is \$80,296 around 3pm, Sundays' is \$74,257 also right around 3pm, and Fridays' is \$45,774 around 5pm. All of the weekday peak times are right around 5pm when people are getting off of work. Based on this a possible promotion to get more members and users would be to offer long-term weekend memberships. Just like a regular membership, except it only works on weekends. It could be for one weekend or for two months of weekends.

Non-members Short-Trips & Station Location

Of the short-trips made by non-members, the vast majority of them started at stations near the water.

Top stations for non-member revenue are near the water



CONCLUSION

Time of year, time of day, station location, season, and membership status all play a vital role in the usage of Bixi bikes throughout the year. Analyzing these factors and why they fluctuate has given us key insights on why people use Bixi. People use Bixi for work and school, and summer tourism. With bulk-membership packages offered to employers and universities, we will see a rise in long-term membership and revenue. Special promotions through summer events and attractions will further build our base of short-term members and maximizing our profits when Bixi bikes are in peak demand.

