



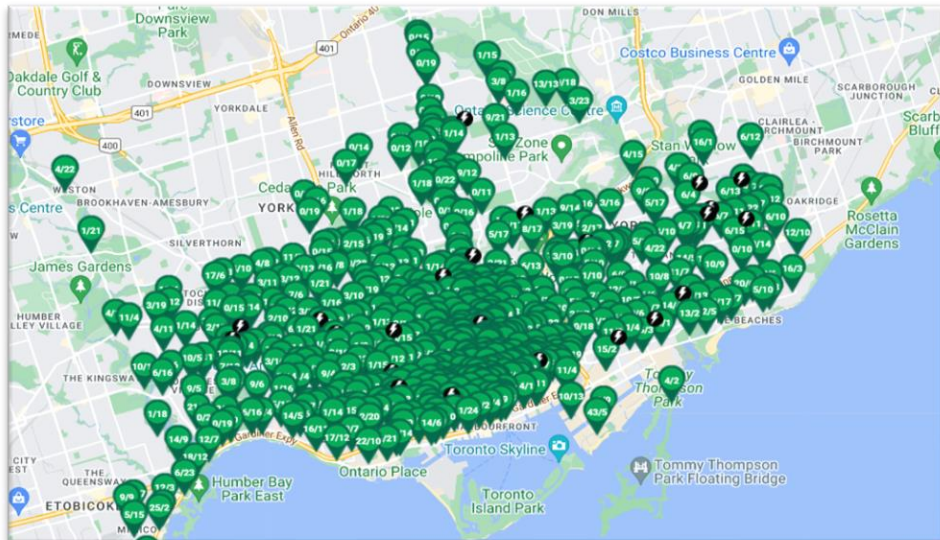
Toronto Bike Sharing Analysis

Charles Zhang

Background



621 Stations



Growing Trend



Different Pricing

Annual Members

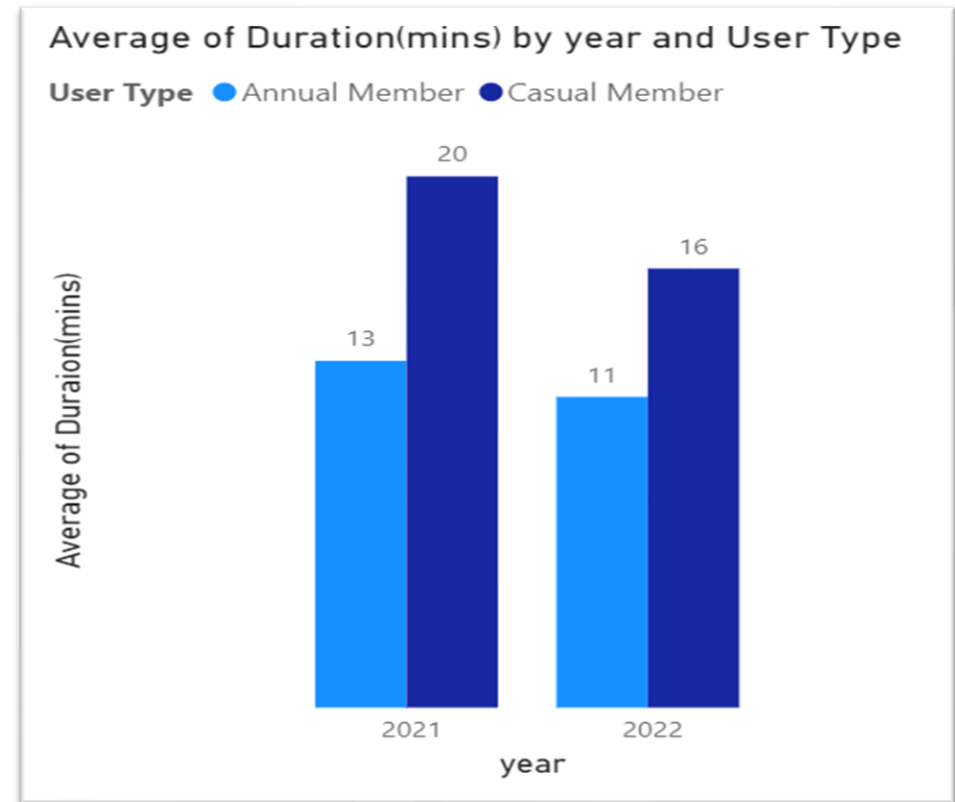
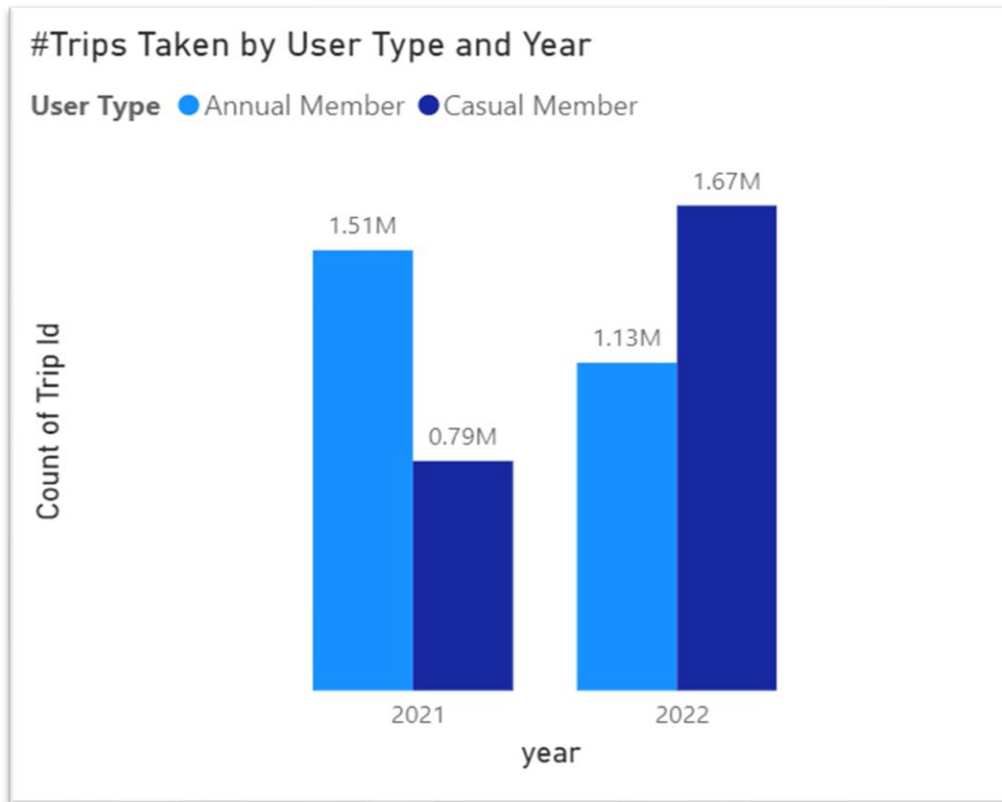
- Annually unlimited ride
- 30/45 minutes per trip

Casual Members

- 24/72 hours unlimited ride
- 30 minutes per trip

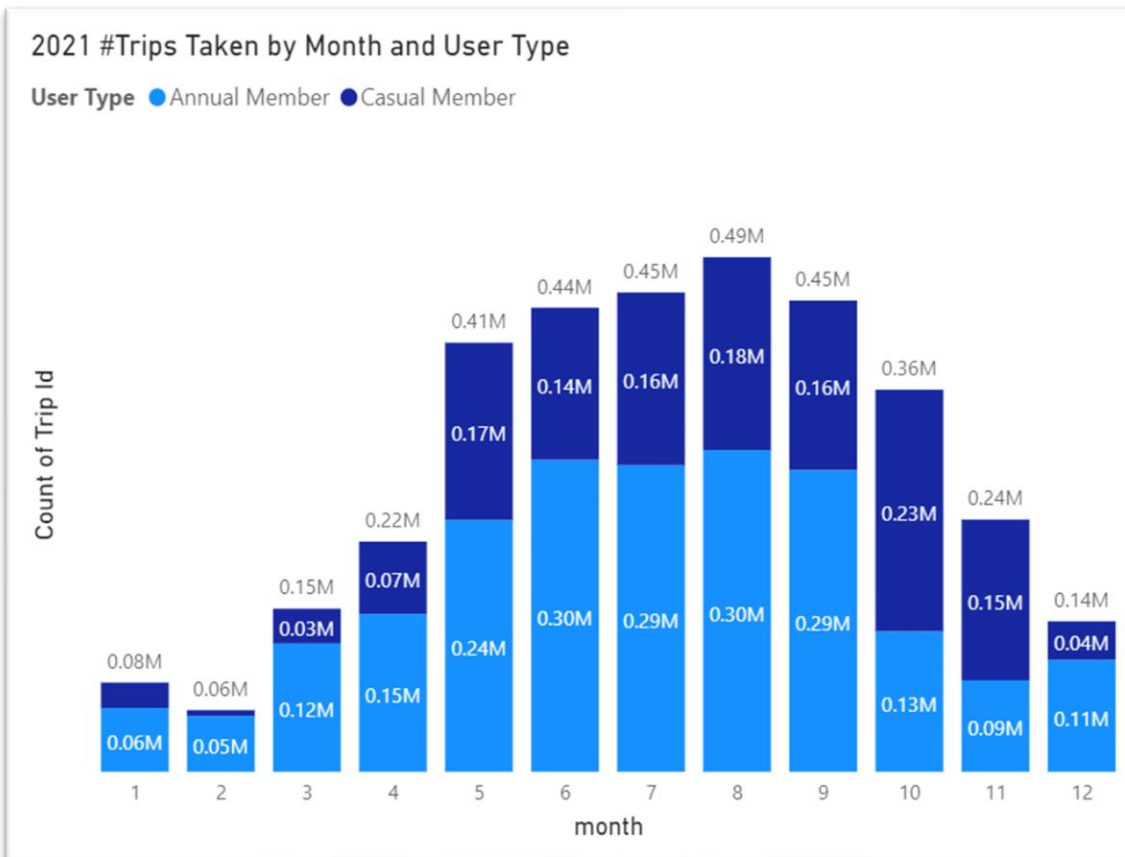
Bike Sharing Usage Overview

- From Jan to Aug, total trips taken of casual members doubled in 2022, constituting a share of 72%; in contrast, total trips of annual members declined by 25%
- Bikers spent less time per trip in 2022, especially for casual members who saw a four minutes decrease per trip on average



Bike Sharing Usage Seasonality Analysis

- Due to temperature, most bike sharing occurred between May to October, with the top five trips concentrated on lakeshore area
- In winter time, the majority trips were taken by annual members who rode for commute purpose, with the top five trips concentrated in downtown area
- TPA should **redistribute bikes on May and on November** to adapt to changing purposes of riders



Top Five Trips From Mar to Oct

Tommy Thompson Park (Leslie Street Spit)-Tommy Thompson Park (Leslie Street Spit)
Tommy Thompson Park (Leslie Street Spit)-Cherry Beach
Ontario Place Blvd / Lake Shore Blvd W (East)-Ontario Place Blvd / Lake Shore Blvd W (East)
Marilyn Bell Park Tennis Court-Humber Bay Shores Park / Marine Parade Dr
Ontario Place Blvd / Lake Shore Blvd W (East)-Lake Shore Blvd W / Ontario Dr

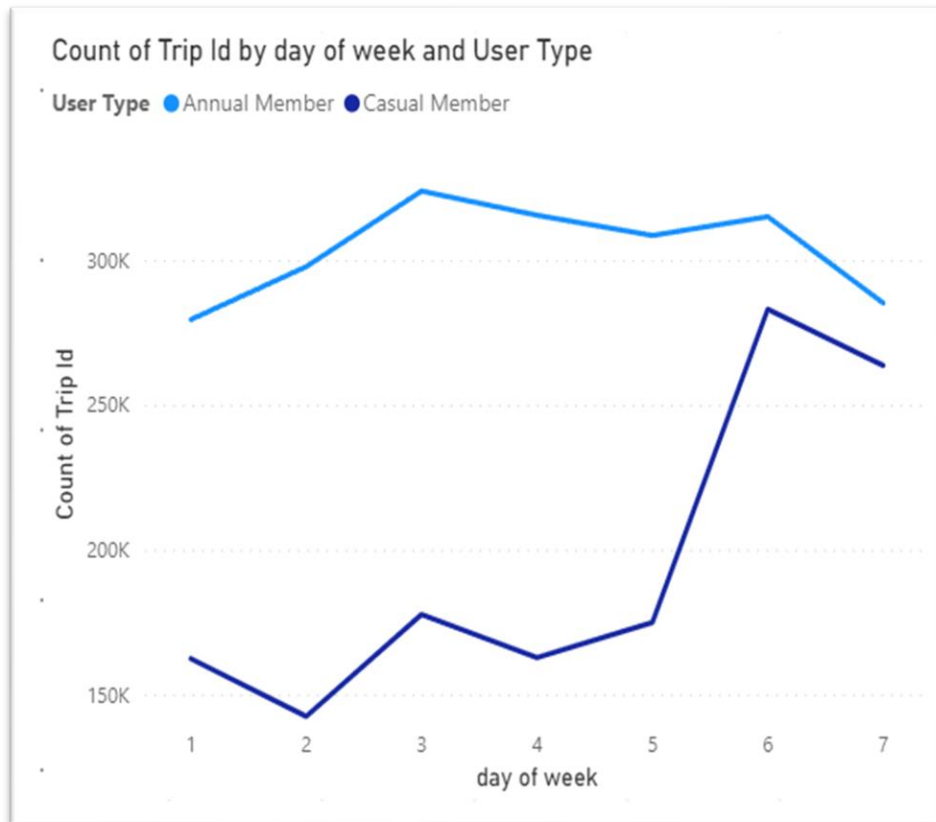
Top Five trips in Winter (Nov to Feb)

York St / Queens Quay W-Bathurst St/Queens Quay(Billy Bishop Airport)
Queens Quay E / Lower Sherbourne St-Lower Jarvis / Queens Quay E
Union Station-Front St W / Blue Jays Way
St. George St / Russell St - SMART-Charles St W / Balmuto St - SMART
Wellesley Station Green P-Sherbourne St / Wellesley St E

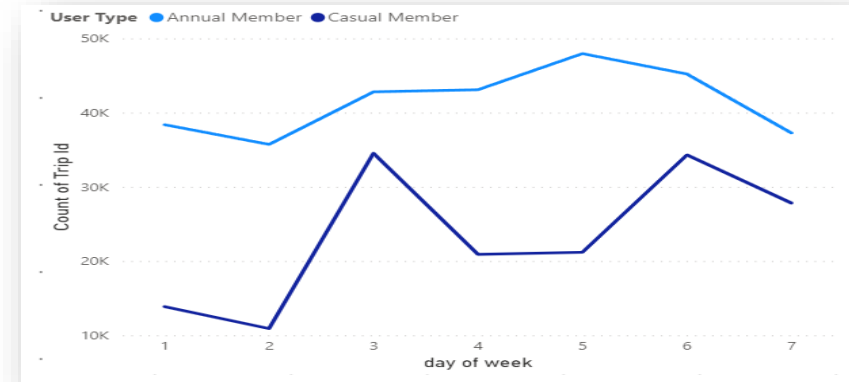
Bike Sharing Usage Weekly Trend Analysis

- For casual members, they mostly rode bikes during weekends for leisure purpose; for annual members, the weekly trend is stable overall, with Wednesday to be a particular peak day whereas Monday and Sunday seeing less usage
- TPA ran free-ride Wednesday in July 2021 to inspire “day pass” trial purchase and saw significant lift. However, the same promotion didn’t work well in 2022.05. The reason might be people who were interested in ride sharing already purchased casual membership
- Given the distribution of weekly usage trend, it may be better to **run such promotion on Sunday** to avoid impact on annual members

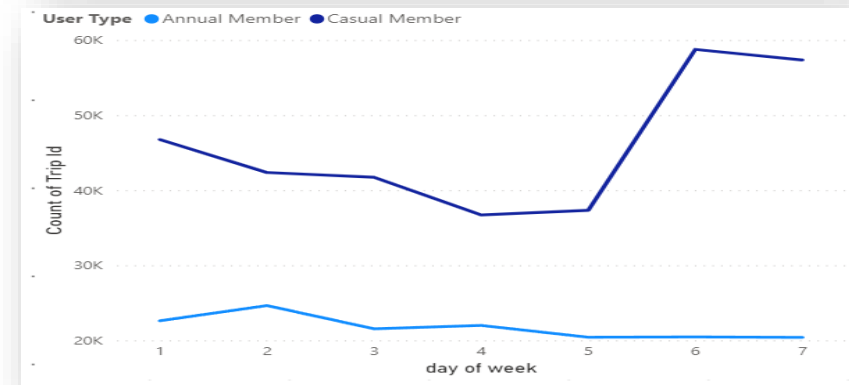
2021 & 2022



2021. 07



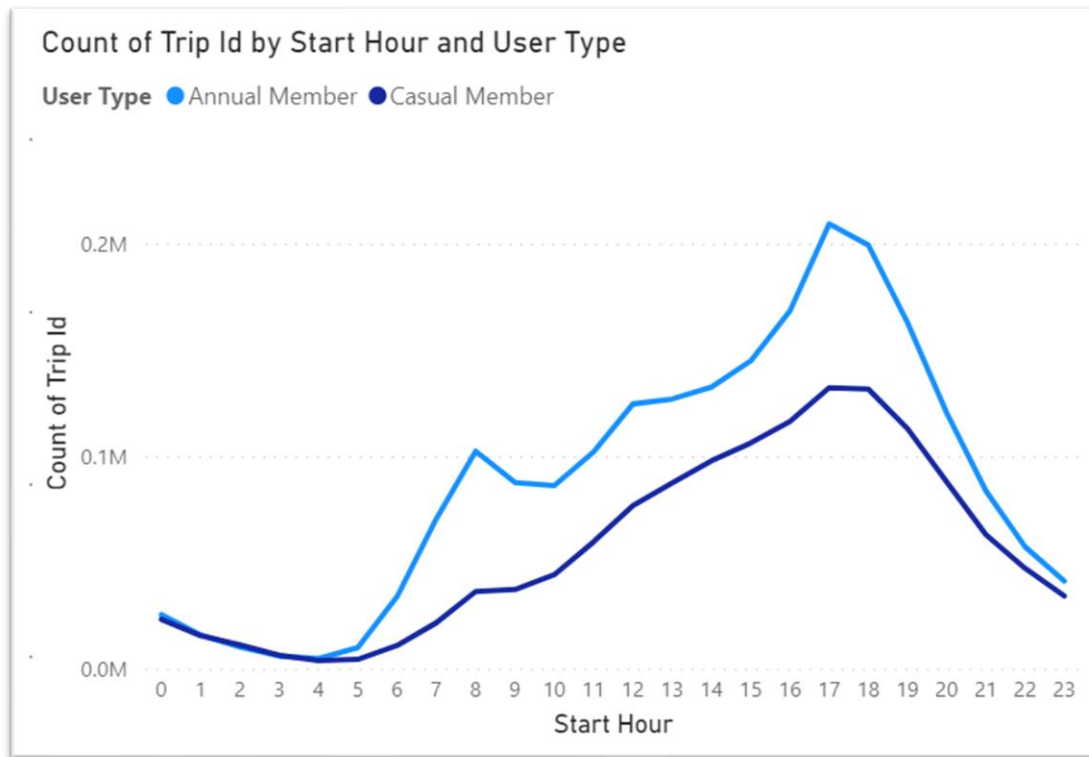
2022. 05



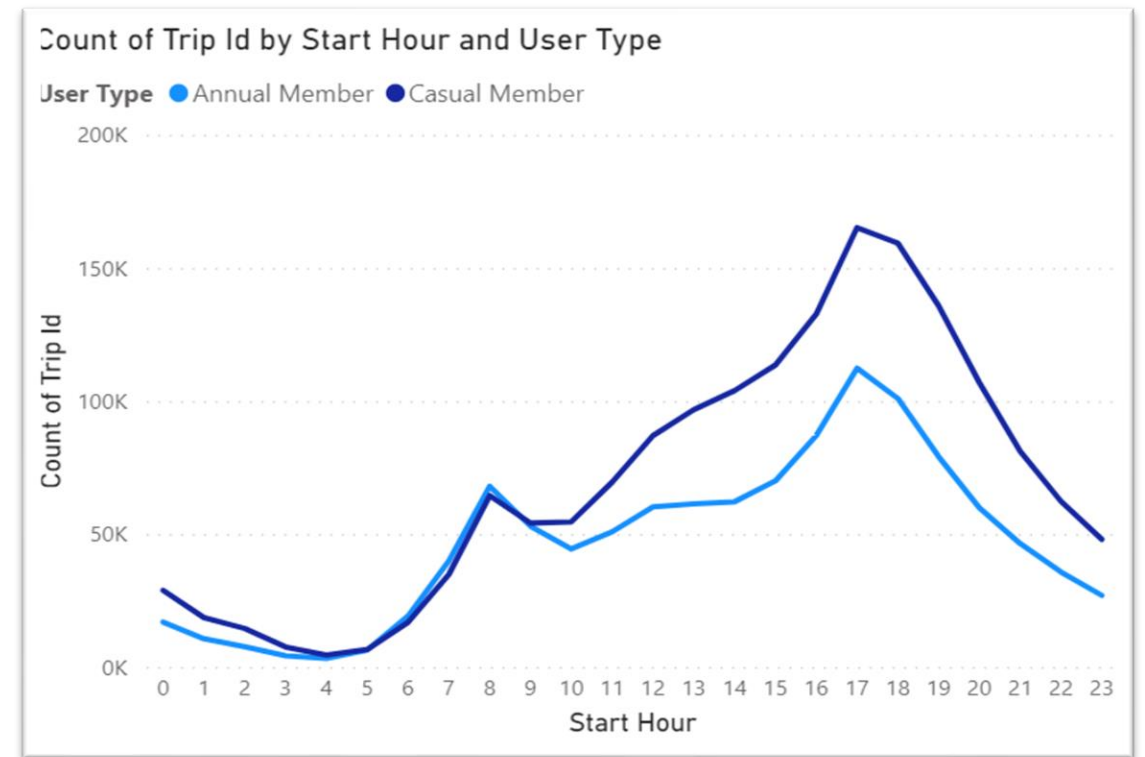
Bike Sharing Usage Daily Trend Analysis

- For annual members, two peak usage time are 8am and 5pm when people biking to work
- For casual members, in 2021 the usage started to increase only after 10am; however, in 2022, the daily trend is very similar as annual members, suggesting that many people start to choose purchase casual membership for commute purpose
- Research should be conducted on why commuters started to favor casual memberships

2021



2022



Popular Trips Comparison Between 2021 and 2022

- For casual members, most popular trips are concentrated in lake shore area in both 2021 and 2022; in 2022, many casual members also rode a route in downtown area, which further suggests people were buying casual membership for commute purpose
- For annual members, it seems in 2022 only commuters purchased the membership as top 5 trips are all located in downtown
- TPA could try lower annual membership price to invite people who are not daily commuters to purchase annual memberships

Popular Trips for Casual Members

2021

Tommy Thompson Park (Leslie Street Spit)-Tommy Thompson Park (Leslie Street Spit)
Tommy Thompson Park (Leslie Street Spit)-Cherry Beach
Ontario Place Blvd / Lake Shore Blvd W (East)-Ontario Place Blvd / Lake Shore Blvd W (East)
HTO Park (Queens Quay W)-HTO Park (Queens Quay W)
Northern Dancer Blvd / Lake Shore Blvd E-Lake Shore Blvd E / Leslie St
Ontario Place Blvd / Lake Shore Blvd W (East)-Lake Shore Blvd W / Ontario Dr

2022

Tommy Thompson Park (Leslie Street Spit)-Tommy Thompson Park (Leslie Street Spit)
Tommy Thompson Park (Leslie Street Spit)-Cherry Beach
HTO Park (Queens Quay W)-HTO Park (Queens Quay W)
Marilyn Bell Park Tennis Court-Lake Shore Blvd W / Ontario Dr
Marilyn Bell Park Tennis Court-Humber Bay Shores Park / Marine Parade Dr
York St / Queens Quay W-Bathurst St/Queens Quay(Billy Bishop Airport)

Popular Trips for Annual Members

Tommy Thompson Park (Leslie Street Spit)-Cherry Beach
Northern Dancer Blvd / Lake Shore Blvd E-Lake Shore Blvd E / Leslie St
Tommy Thompson Park (Leslie Street Spit)-Tommy Thompson Park (Leslie Street Spit)
Queens Quay E / Lower Sherbourne St-Cherry Beach
York St / Queens Quay W-Bathurst St/Queens Quay(Billy Bishop Airport)

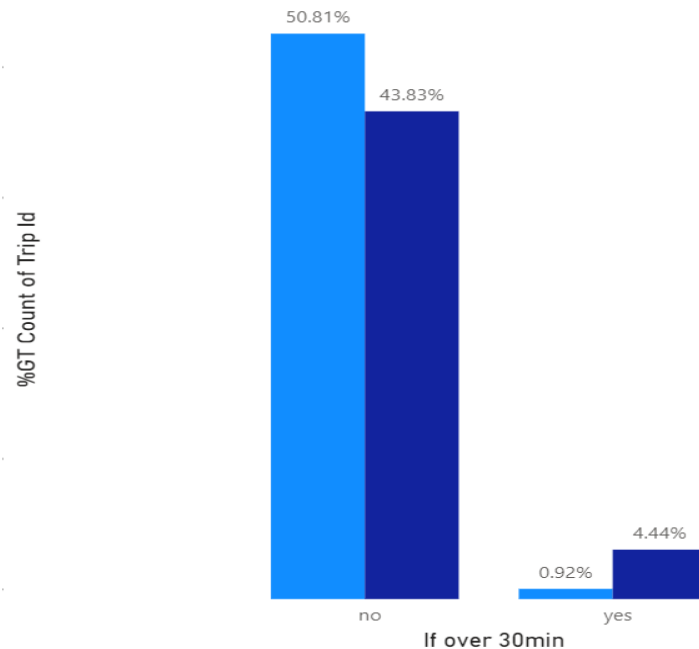
Union Station-Front St W / Blue Jays Way
Lynn Williams St / East Liberty St - SMART-King St W / Brant St
Victoria St / Queen St E-College Park- Gerrard Entrance
College St / Huron St-Bay St / College St (East Side)
York St / Queens Quay W-Bathurst St/Queens Quay(Billy Bishop Airport)

Ride Overage Analysis

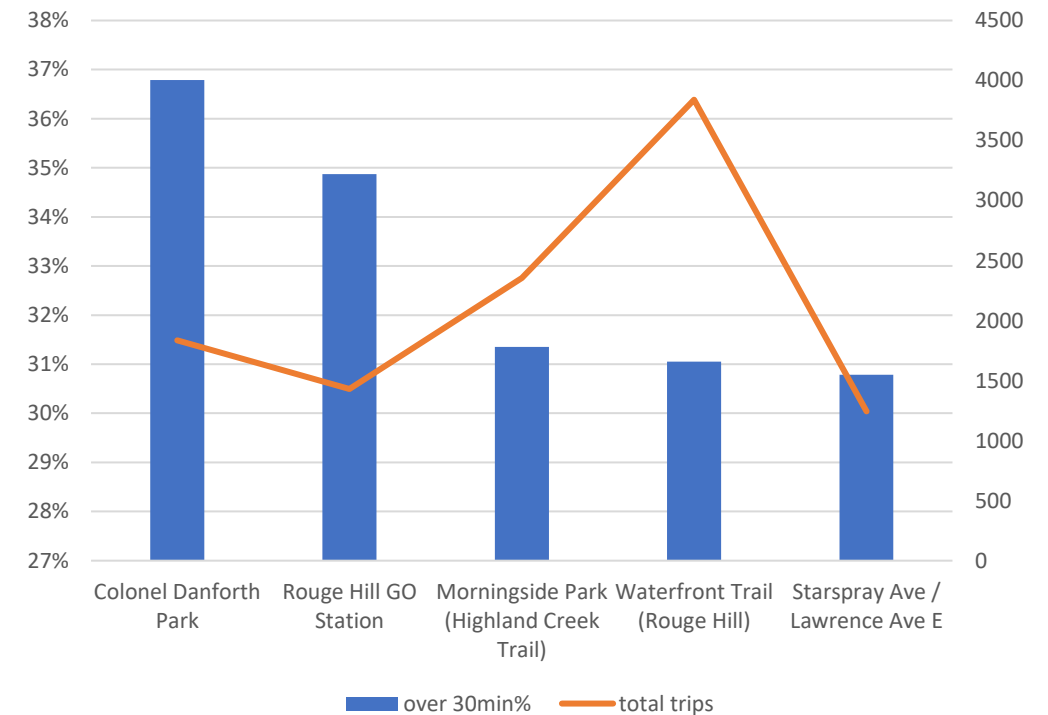
- Overage trip (over 30min) accounts for 5% of total trips and the vast majority comes from casual bikers
- It should be reasonable to offer “45 minutes” option to casual members under a higher price, or marketing the “45 minutes” annual membership to casual bikers
- As TPA tries to build more “e-bike” stations, it should prioritize building them close to stations that have a high percentage of overage ride (over 30%)

%GT Count of Trip Id by If over 30min and User Type

User Type ● Annual Member ● Casual Member



" Most Likely Overage" Stations



Distribution of Trips in Toronto Broken by FSA

- Regions remote from downtown see a higher percentage of casual members as well as fewer trips as bikers in these areas won't ride bikes for daily commute
- Lakeshore area is the best to try converting casual bikers into annual members as this area sees relatively higher percentage of casual bikers when compared with other areas with similar number of trips

Total #Trips in all FSA Regions

Very Low



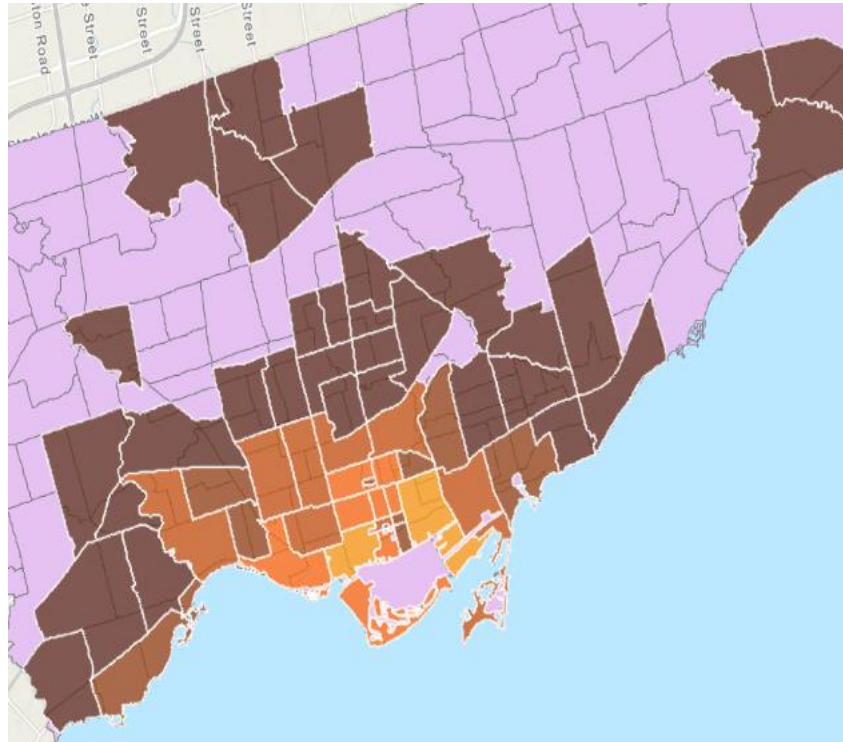
Low



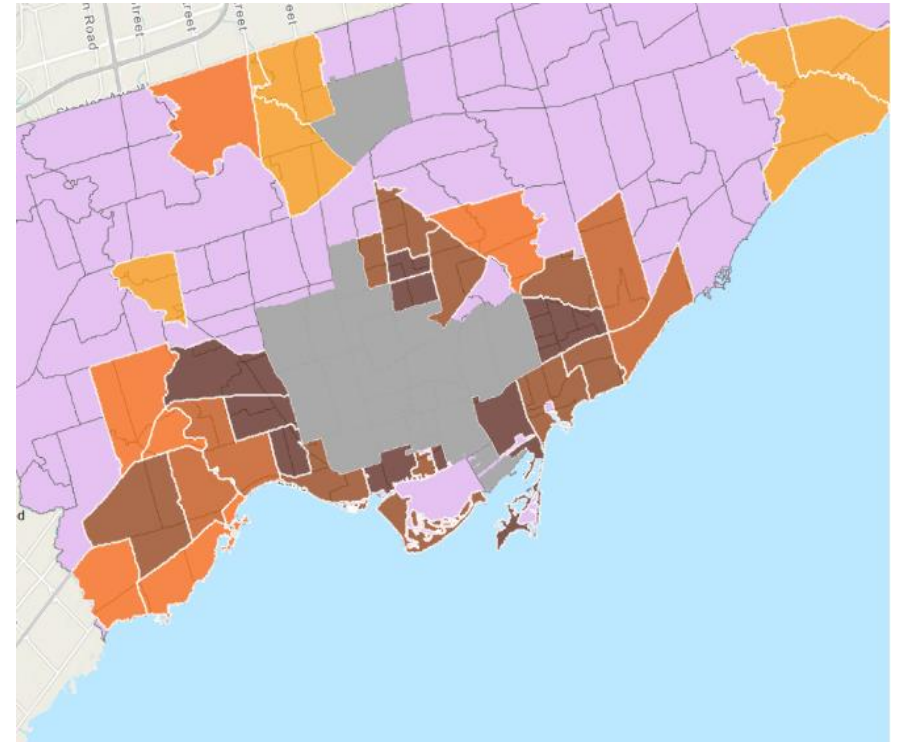
Medium



High



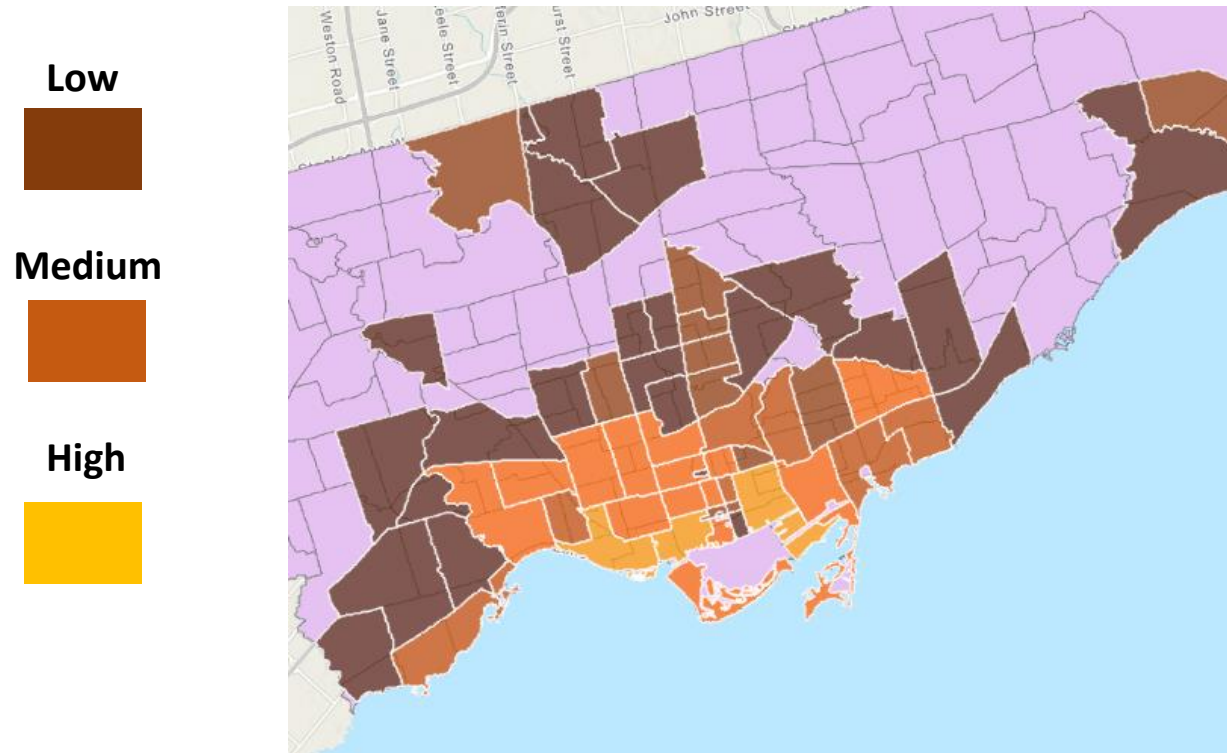
% of Trips by Casual Members in all FSA Regions



Bike Station Distribution and Usage Analysis

- As TPA tries to build more bike stations, beside building on areas where bike sharing is currently unavailable, it should also consider areas that see higher usage per bike station but don't have many available bike stations at the moment
- By comparing #stations and usage of all FSA, it is clearly to see FSA "M2N" should have more bike stations; currently this region only has one bike station but the usage is among the highest

Number of Bike Stations in all FSA Regions



Usage (#Trips) per Bike Station in all FSA Regions

