

BACKGROUND & PROBLEM STATEMENT

The City of Hamilton will complete its first two Light Rail Transit (LRT) corridors by 2024. LRT will have an impact on both the population density and the flow of traffic within the city. Added to the impact of LRT, trends in the long-term effect of Covid-19 on how people work will impact both the flow of traffic and how people choose to travel within the city.

By examining the impact LRT systems have had in other Canadian cities in the past, and comparing the likely impacts of the shifts in employment, we will have on how and when the citizens of Hamilton choose to travel, predictions can be made as to the impact on parking along the two new LRT corridors and prescriptive measures suggested to mitigate or prepare parking lots for Hamilton in 2024 and beyond.

OBJECTIVE

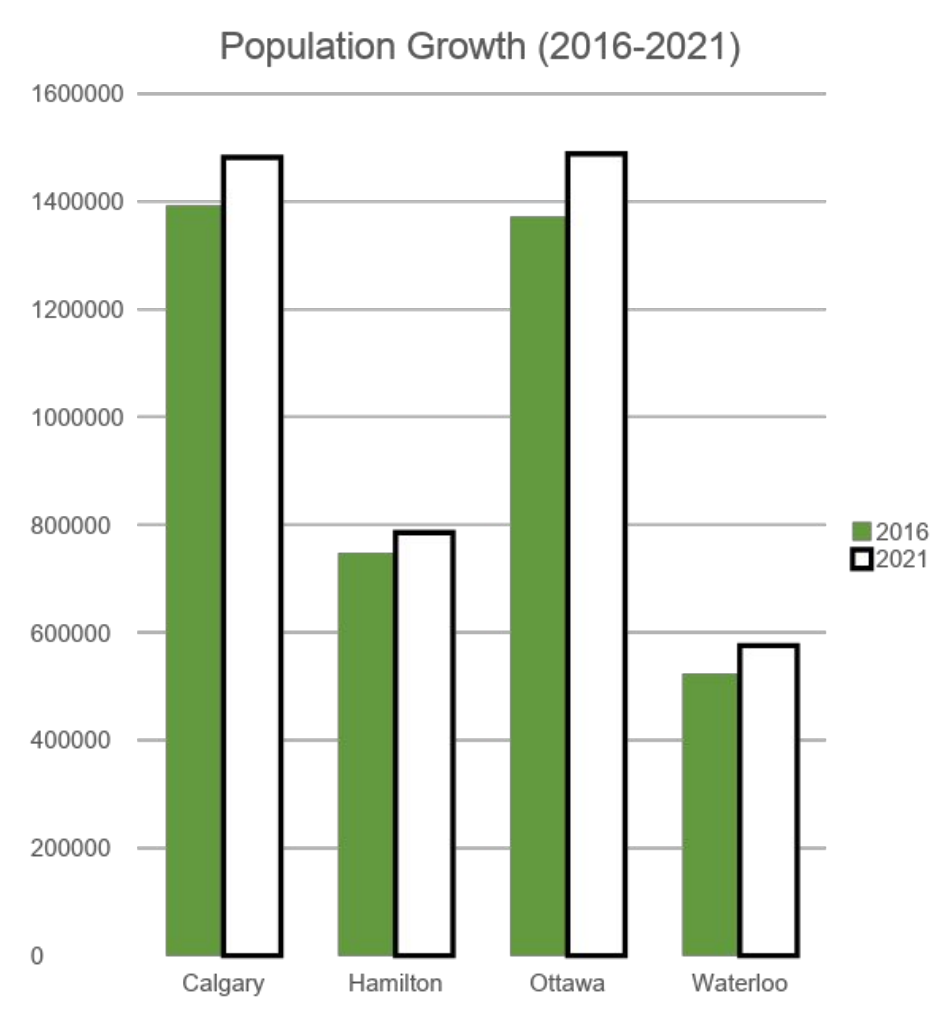
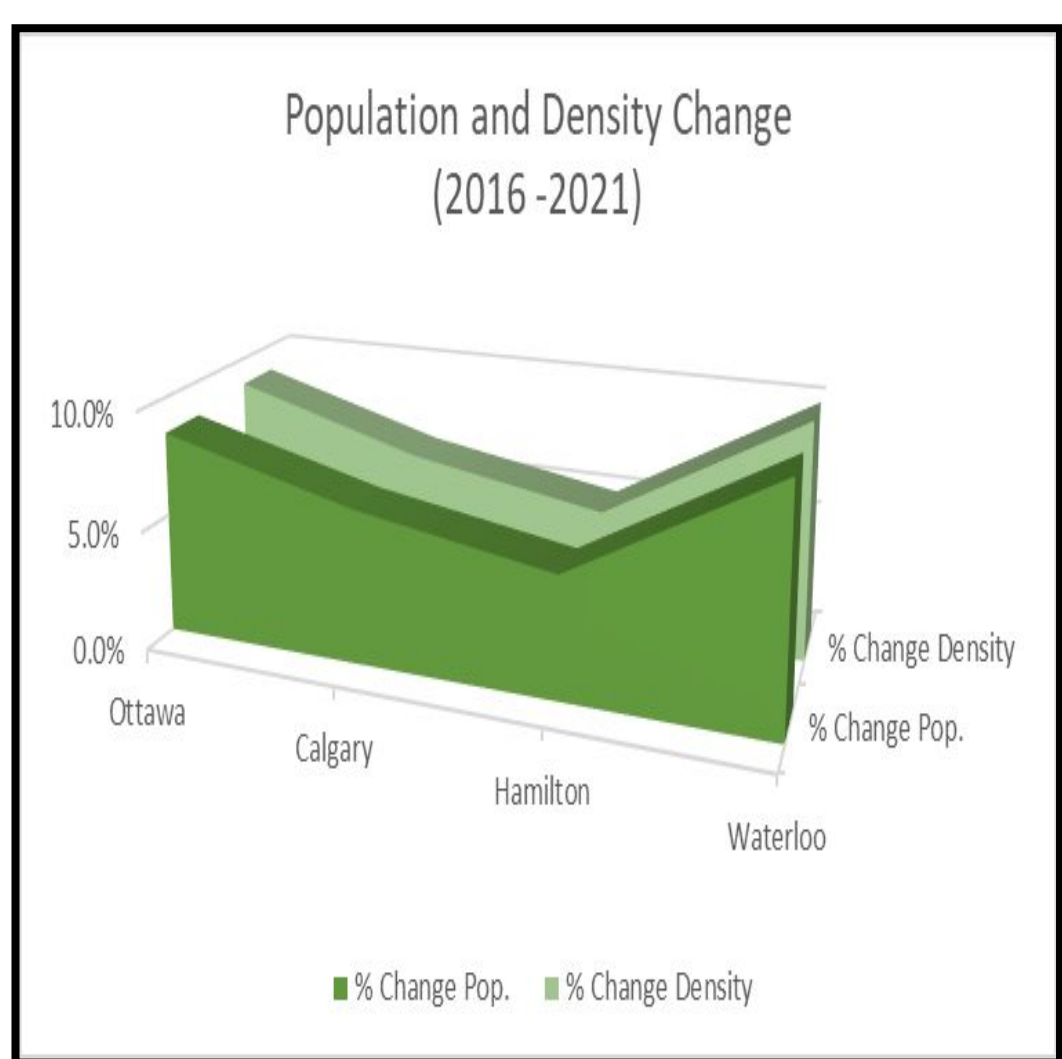
- Analyze the parking data provided by the city of Hamilton to identify the parking space capacity usage for 2020 and 2021.
- Studying the Impact of LRT in three other cities in Canada i.e., Calgary, Waterloo and Ottawa
- Analyze the Impact of COVID-19 on Transit volume and frequency.
- Study the Impact of Work From Home trend on Hamilton Parking needs.
- Give recommendations to the City regarding their future parking needs and services to improve efficiency at existing lots.

COVID-19, WORK FROM HOME AND LRT COMPARATIVE ANALYSIS

POPULATION AND DENSITY CHANGE

The Population and Density census data figures (2016-2021) from STATSCANADA reveal that Waterloo, Calgary and Ottawa have had significantly more increases than Hamilton.

- Waterloo – 9.9%
- Calgary – 6.4%
- Ottawa – 8.5%



City name	% Change Pop.	% Change Density
Ottawa	8.5%	8.8%
Calgary	6.4%	6.4%
Hamilton	5.0%	5.0%
Waterloo	9.9%	9.9%

Cities with recent LRT had the most population increase. Despite Hamilton being close to the GTA, it saw the least amount of population increase in the last 5 years.

HAMILTON CURRENT PARKING UTILITY

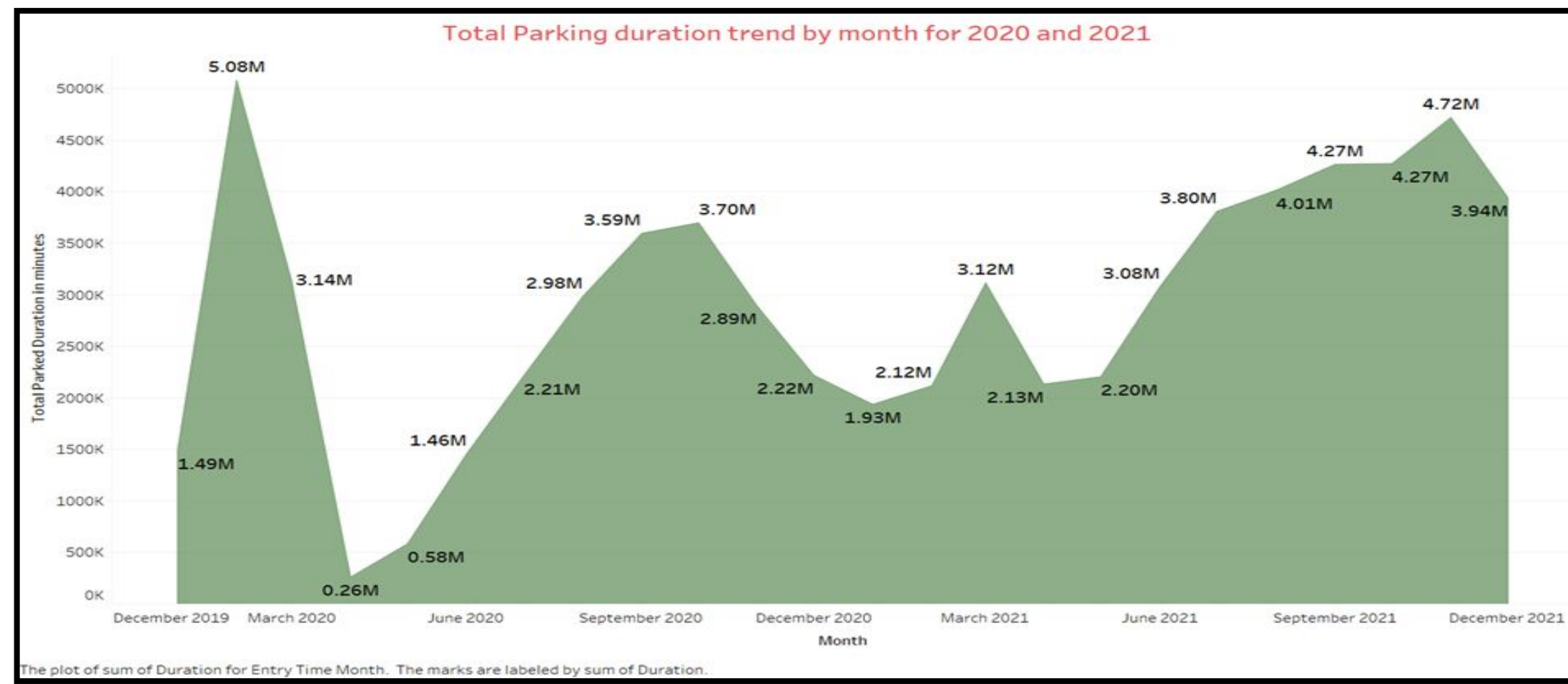
The Analysis of the parking trend for the year 2020 and 2021 reveals:

- Huge drop in March/April 2020 due to lockdown.
- December 2021 and January 2021 a drop due to lockdown.
- March/April 2021 saw a drop in parking space utility.
- The average parking comes to approx. 320K Minutes.

HAMILTON PARKING: THE FUTURE BEYOND 2024

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Pareto's Principle (80-20 Rule)

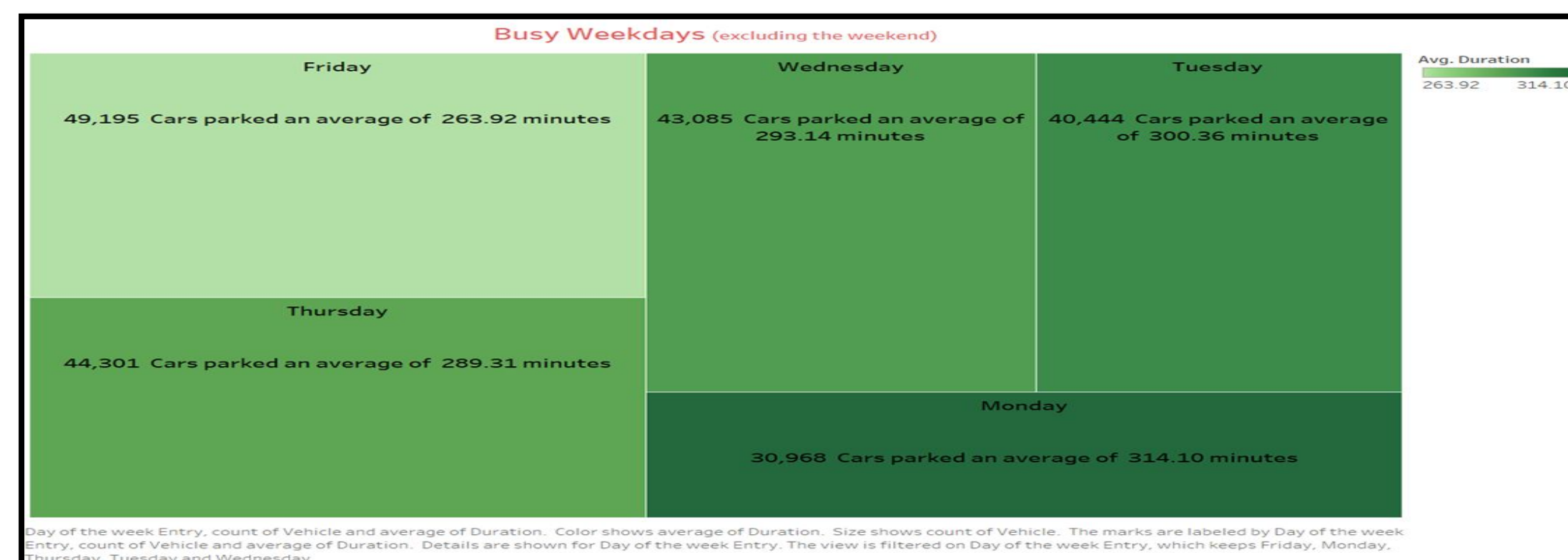
80% of the parking space was utilized by 20% of the cars.

- Total Cars – 67,033
- Total Minutes of Parking – 69,199,404
- 13,176 Cars (19.66%) account for 55,358,544 Minutes
- 53,857 Cars (80.34%) account for 13,840,860 Minutes
- Majority of the parking revenue is generated by people who park for longer durations.



Busiest Weekday:

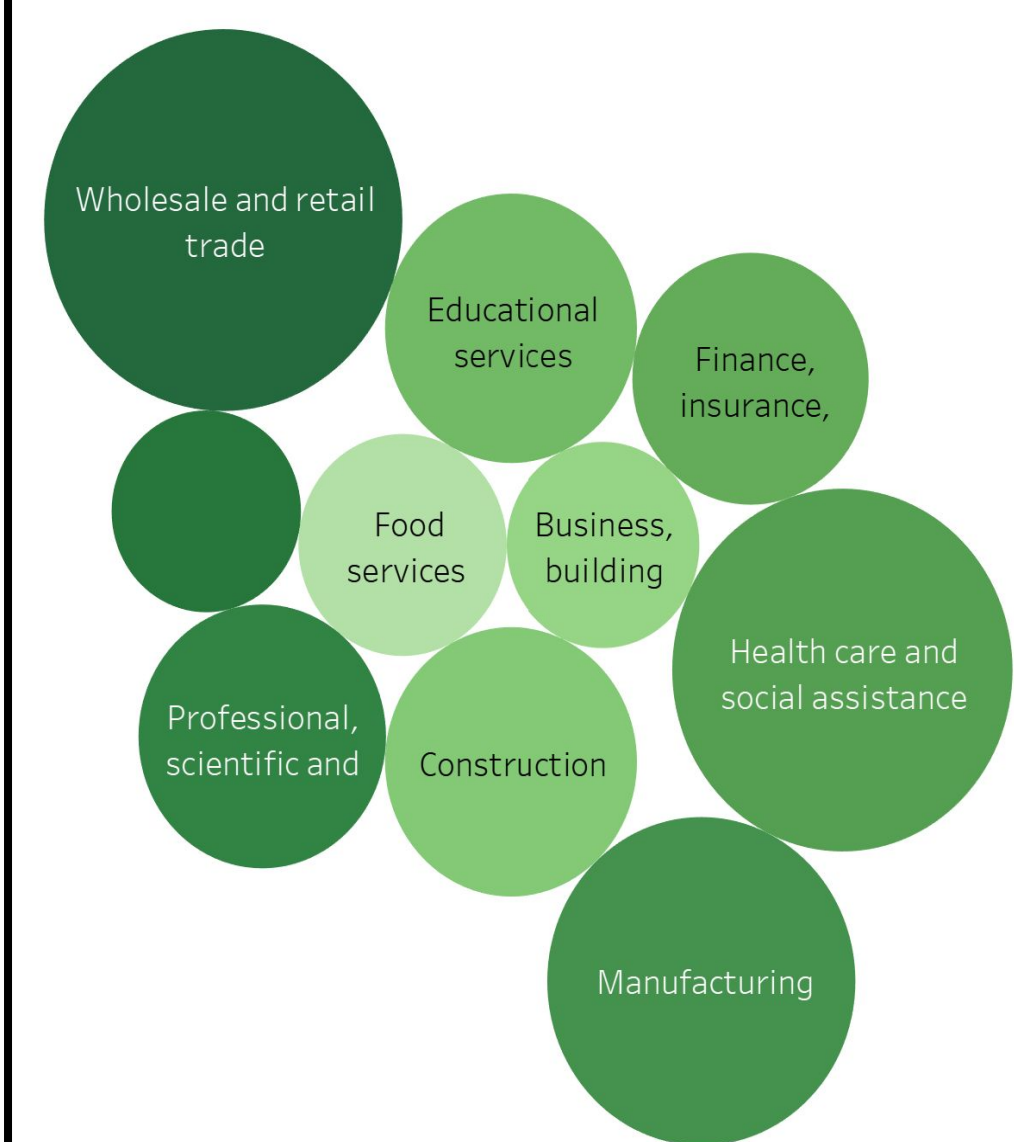
- Friday and Thursday have the greatest number of cars being parked but have the lowest average duration that the cars are parked.
- Monday has the lowest number of cars being parked and the highest average duration parked in minutes.
- Indicative of the type of customer using the parking lot. i.e., Office worker.



WORK FROM HOME IMPACT ON TRANSIT PATTERN

One of the main causes of decrease in transit across the country is the popularity of work from home. The above data is a breakdown of Hamilton's workforce. Before Covid, the percentage of people working from home was approximately 7%. During the peak pandemic, that figure rose to more than 40% countrywide. Currently, that figure sits at about 20% for big cities in Canada. Working from home is now an acceptable form of work practice, and the researchers are projecting this number to hold even when things return to normal post-pandemic. This will also have a significant impact on the usage of parking spaces in the city. However, there is a nuance to this argument. Not all jobs have the same propensity to telework. Job sectors like IT, Education, Customer service, and Finance etc. have high propensity to telework and have transitioned easily to remote working. Whereas the service industries, retail, construction, and trades don't cannot shift to work from home.

Workforce Breakdown



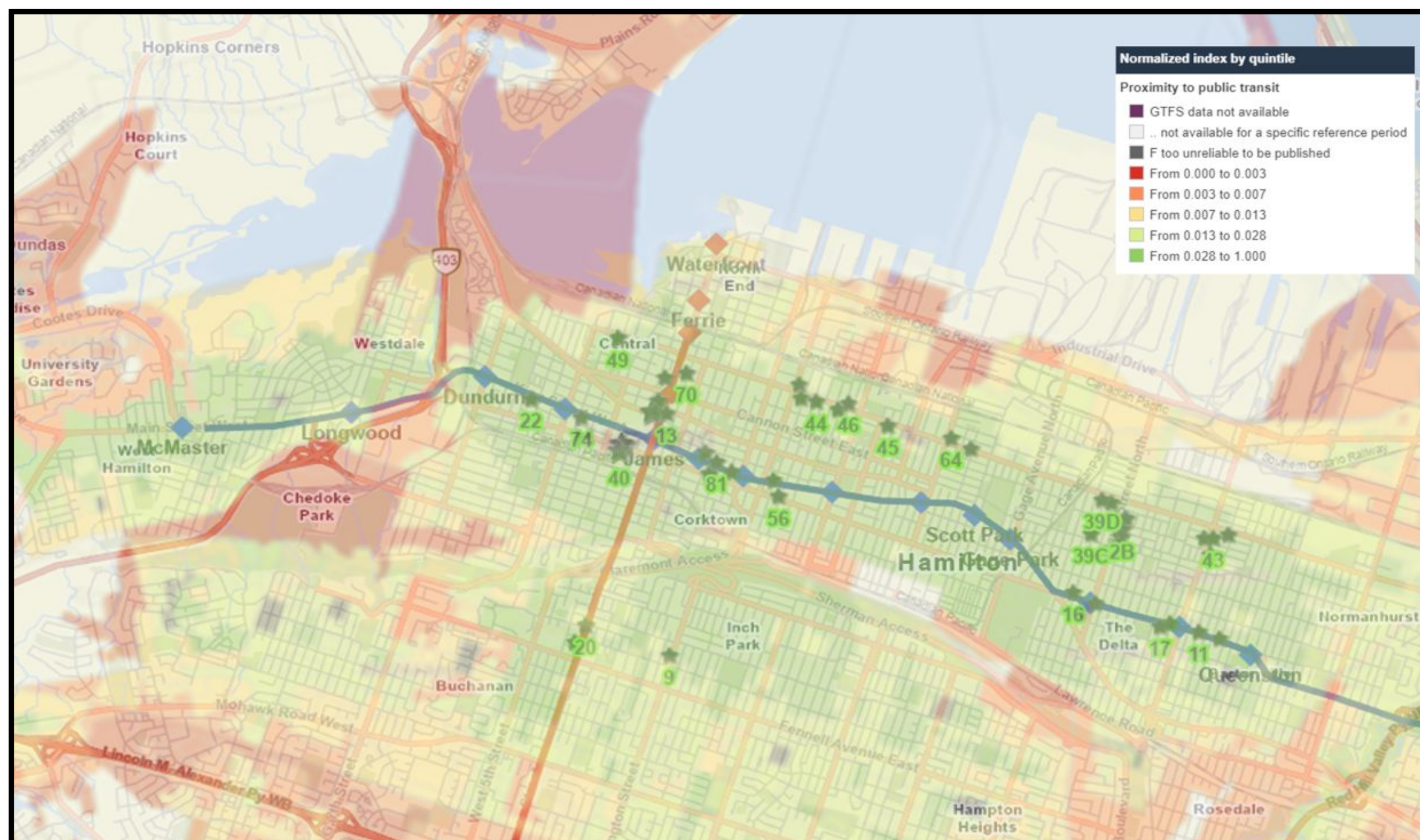
For that specific reason, we studied the industry break-down of Hamilton's workforce. Hamilton has a workforce of approximately 400K workers. The biggest sectors are Retail, Healthcare, Social Assistance, and manufacturing. The route A of the LRT goes directly from the port to the Airport; it will have a significant impact on the way people use parking spaces. They might end up using LRT to commute to work instead of taking their own cars.

LRT IMPACT ON PARKING SITUATION



The City of Hamilton has started work on a Light Rail Transit (LRT) System. In the first phase, they will construct two routes for the LRT. Route A will be from the Harbour to the Airport, and route B will start from McMaster University and end at Queenston. The routes are passing through the busiest sections of the city and will have a significant impact on the parking needs of the city.

- More than 80% of all the city-run parking lots are within the catchment areas of the LRT.
- LRT will reduce the amount of parking needed.



- The above map shows the LRT lines and the parking lots along the lines.
- Red line represents the A-line running north to south (Harbour to Airport).
- Blue B-Line runs east to west (McMaster to Queenston).

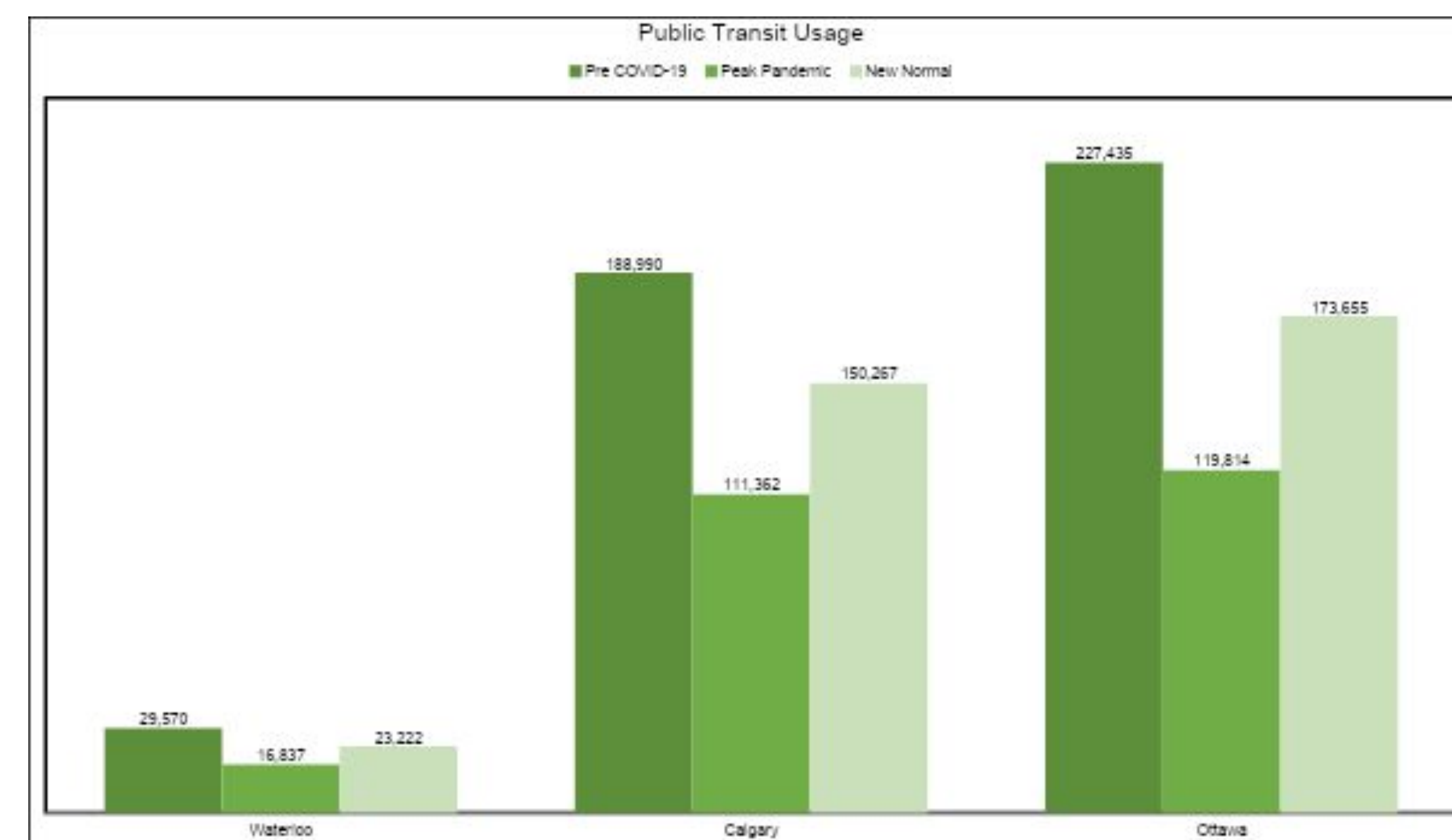


COVID-19 IMPACT ON TRANSIT

Covid Transit Data

- During Covid - Public transit dropped by 43% on Avg.
- Post Covid - Transit numbers are at 22%.
- Hamilton has similar population density and demographics as the other three cities in consideration.

Impact on Potential Public Transit Ridership			
	Waterloo	Calgary	Ottawa
Total daily public transit commuting trips in 2016 (Baseline)	29,570	188,990	227,435
Estimated daily public transit commuting trips during the peak of the pandemic (First Scenario)	16,837	111,362	119,814
Change between 2016 and the peak of the pandemic (%)	-43%	-41%	-47%
Estimated daily public transit commuting trips in the "new normal" (Second Scenario)	23,222	150,267	173,655
Change between 2016 and the "new normal" (%)	-21%	-20%	-24%



RECOMMENDATIONS

- The user breakdown of the parking data reveals that 80% of the parking revenue is generated by 20% of the users. The city could create a monthly parking pass for these users to offer them discounts and secure that revenue.
- An application can be developed on which people can book their parking spaces in advance, that saves them the time and trouble of finding a parking space. The Application could also direct to specific lots and ensure that the lots are maximizing utilization. Any Lot with low traffic can be repurposed to something that adds value to the residents.
- The super users will be most impacted by LRT and Work From Home trend. These users account for 80% of the parking space utility. The city will have more spaces than they need if these trends continue.
- In future, a lot of people are opting for electric vehicles. Providing charging stations in parking lots will allow the city to generate more revenue by getting paid for this facility.
- A huge section of LRT Route A doesn't have any parking lot. The city will have to build parking lots there. The proximity analysis and historical data from other cities with LRT's suggests that the population concentrates along the catchment area of LRT. Which means there will be higher population density in those areas, thus a higher need for parking lots.

REFERENCES

- Government of Canada. (2022, 03 16). Population counts, for census metropolitan areas, census agglomerations, population centres and rural areas. Retrieved from Statistics Canada: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=9810000601>
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