



The Analysis of Municipal Parking in Downtown Hamilton



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BACKGROUND & PROBLEM STATEMENT

This analysis seeks to examine the current public parking situation in Hamilton - relying heavily on data collated from the City of Hamilton municipal surface parking lot transaction data from in-lot pay stations and mobile pay and statistics.

Our analysis begins with a hypothesis about the notable challenges faced in the public parking system. As established parking locations are being reutilized for developmental purposes, this continues to create a problem for the townspeople.

Vehicles continue to outnumber existing parking spaces, coupled with the existing ones being re-purposed and with an increase in population, there exists a public parking catastrophe in the City of Hamilton.

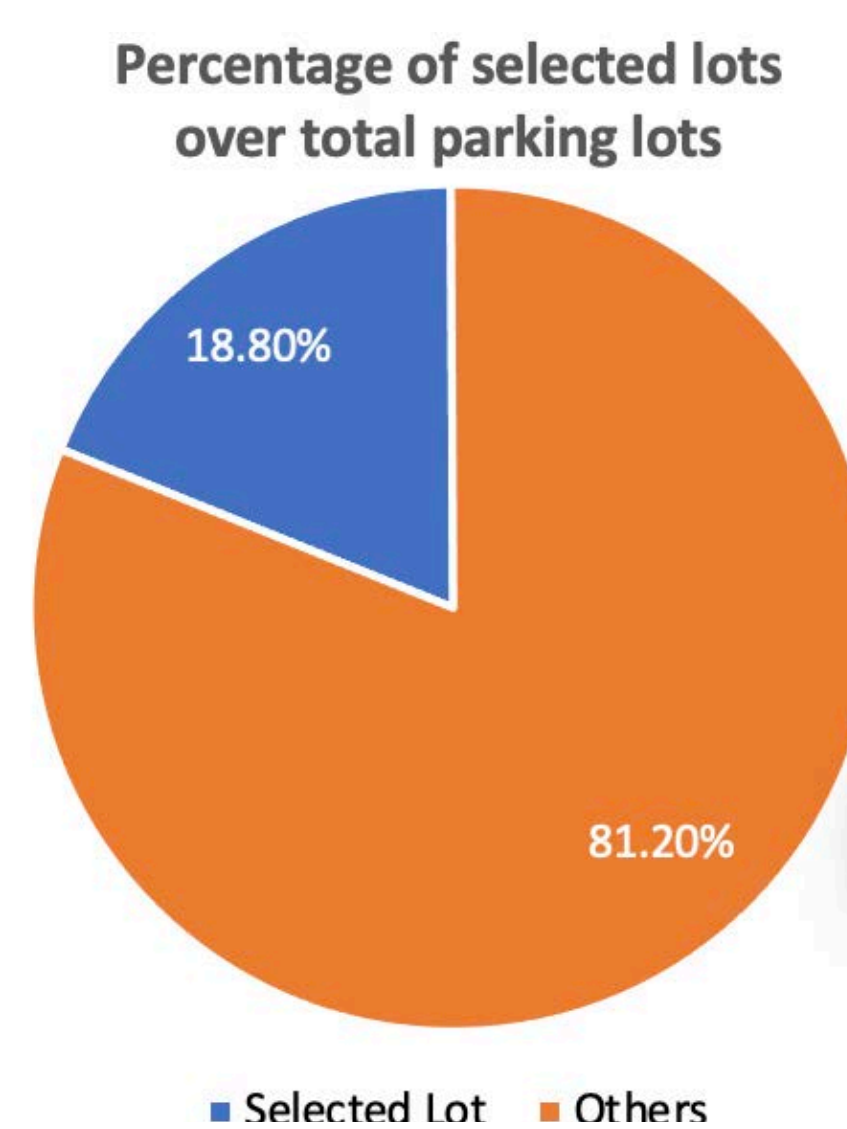
The hypothesis is: While the city manages over 4000 public parking spaces and continues to incorporate new technologies to enhance its operational efficacy. Live data is being produced for every transaction in public lots through what is called pay-by-plate technology. While this may not seem useful for expansion, there is without question, a correlation between payment and utilization. The city would go ahead to use this accumulated data to benefit the user as public parking becomes more difficult to find.

DATA ANALYSIS

1. Hamilton Municipal Parking Lot

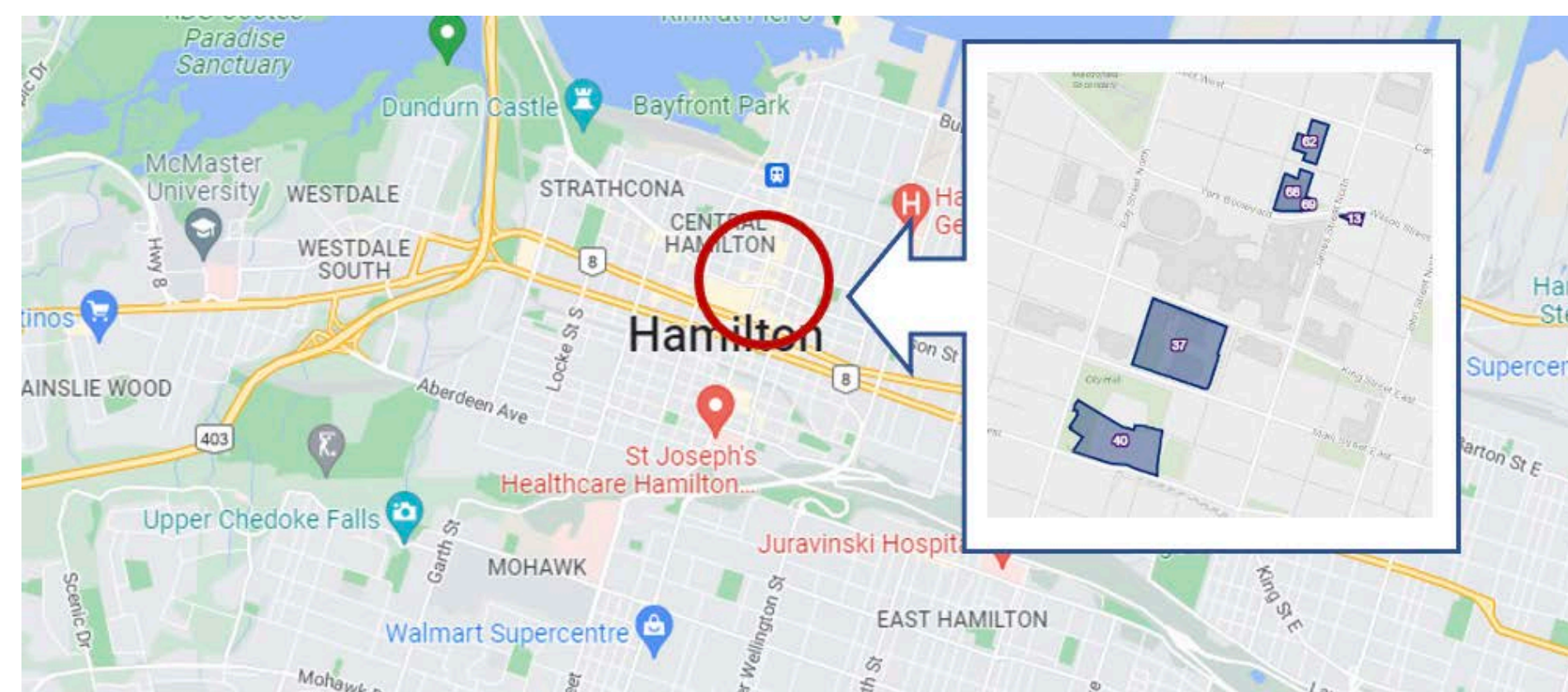
a. Which Parking Lots?

Parking Lot	Spaces
Lot 13	16
Lot 40	635
Lot 62	137
Lot 69	17
Total	805



Reason for selecting:

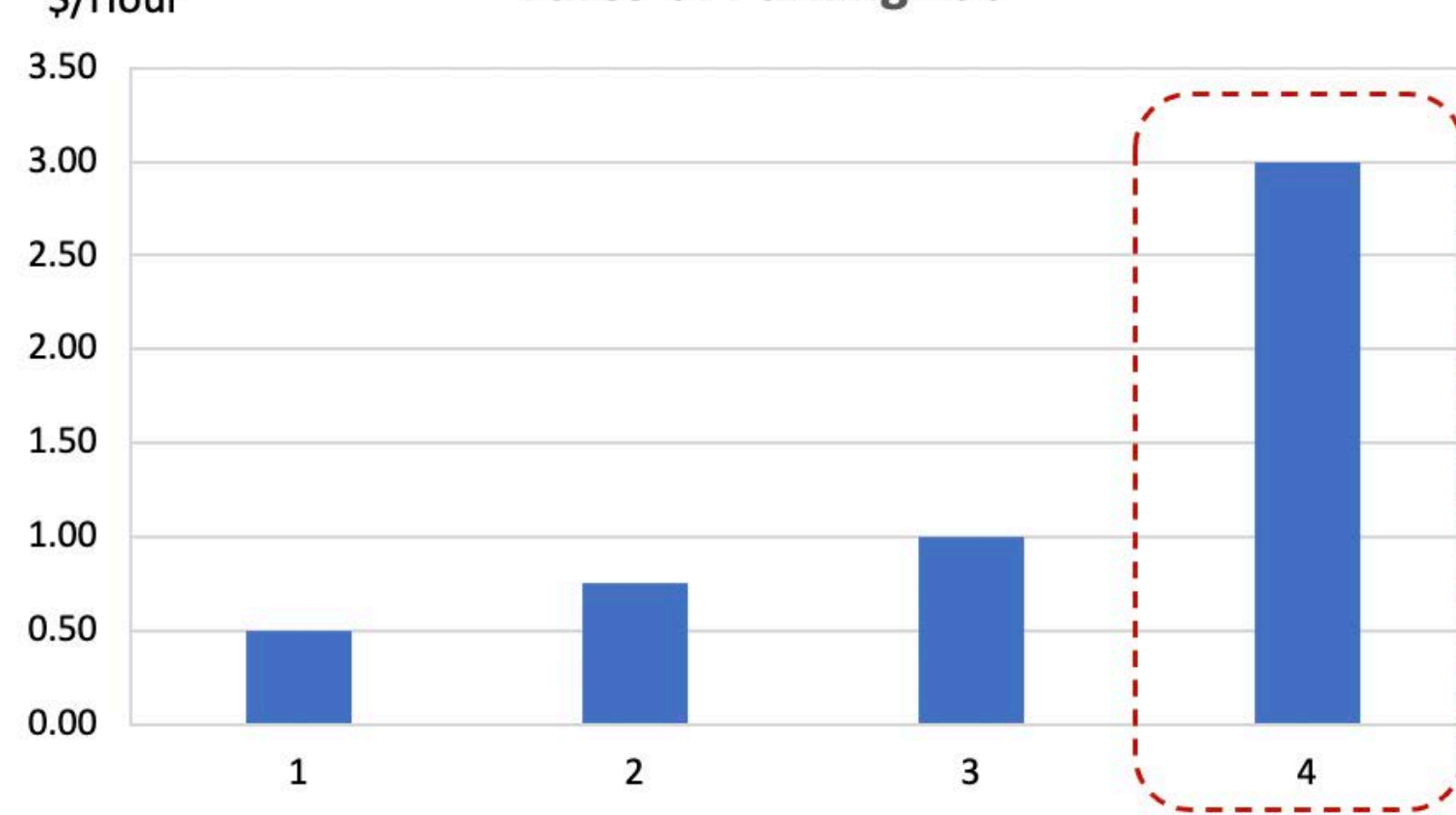
- Located in central area of downtown of Hamilton – the busiest area in the city
- Equal to nearly one-fifth (18.80%) of whole city's parking lots



Price range:

Since they are in busiest area, the selected parking lots have the highest fares at CAD 3.00/Hour. The fares for other car parks would range from CAD 0.50 – 1.00/Hour.

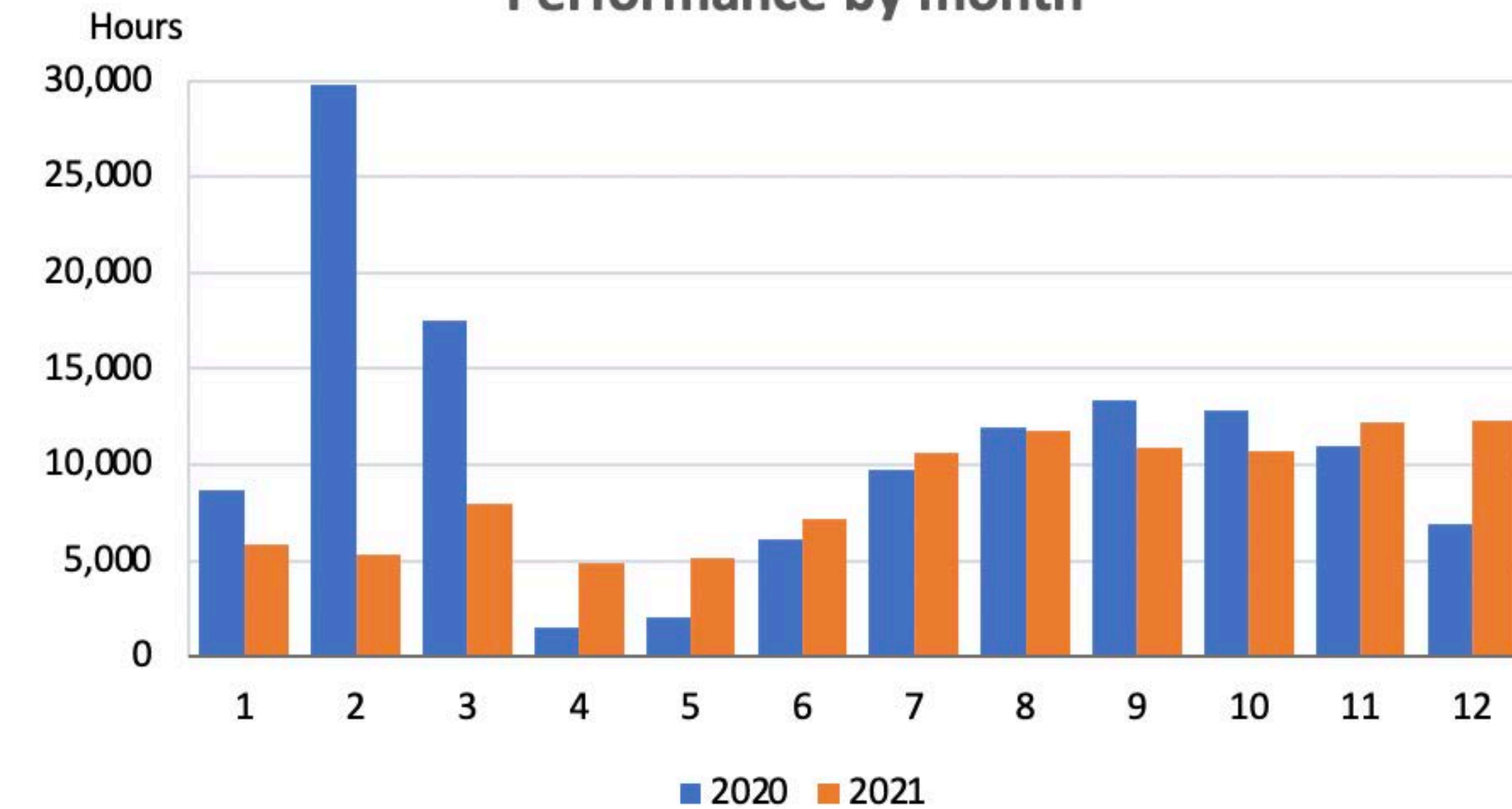
Fares of Parking Lot



b. Performance: Capacity decreased by -20.40% YoY in 2021.

- Performance peaked on Feb 2020 before sharply decreasing due to Covid-19 pandemic.
- Q4/2021 has highest performance with 33.60% capacity of whole year.

Performance by month



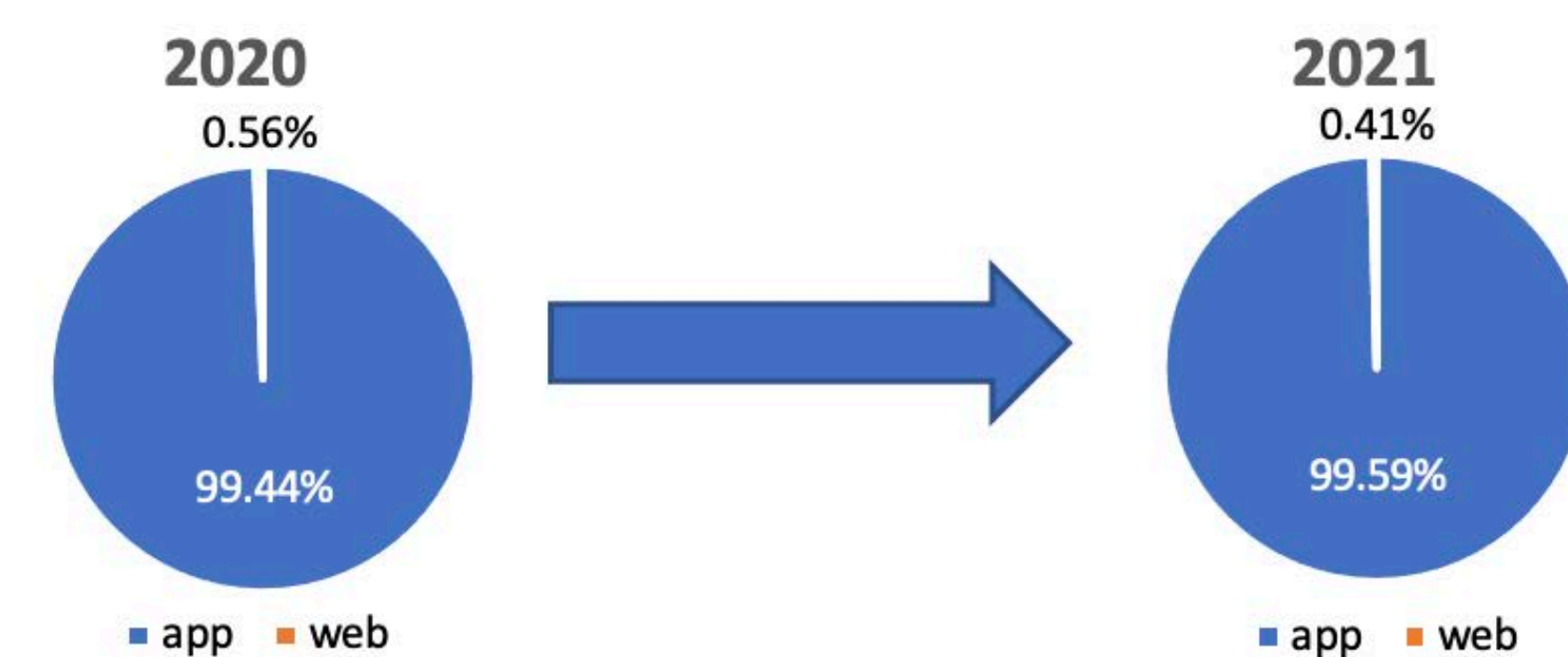
Number of parking activities decreased -30.80% YoY in 2021. Number of vehicles using parking services also declined by -14.71% YoY in the same year. The drop can be explained by Covid-19 pandemic. However, there was a recovery in Q3 and Q4/2021 since the statistic for parking activities in those two quarters was 11.08% than same period in previous year.

Parking activities by quarter



Payment transaction:

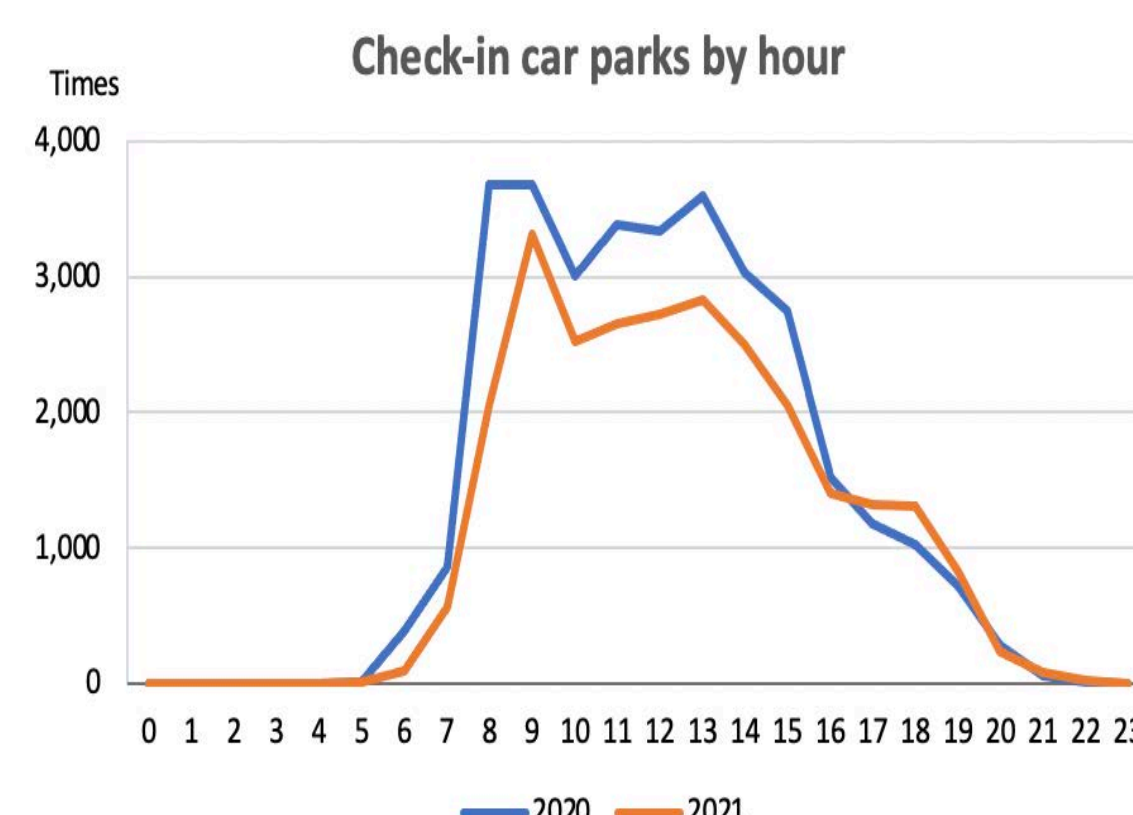
Majority of transaction was undertaken through application since 99.59% of user paid for parking via application in 2021, an increase of 0.15 percentage point compared to 2020.



c. Customer Behavior:

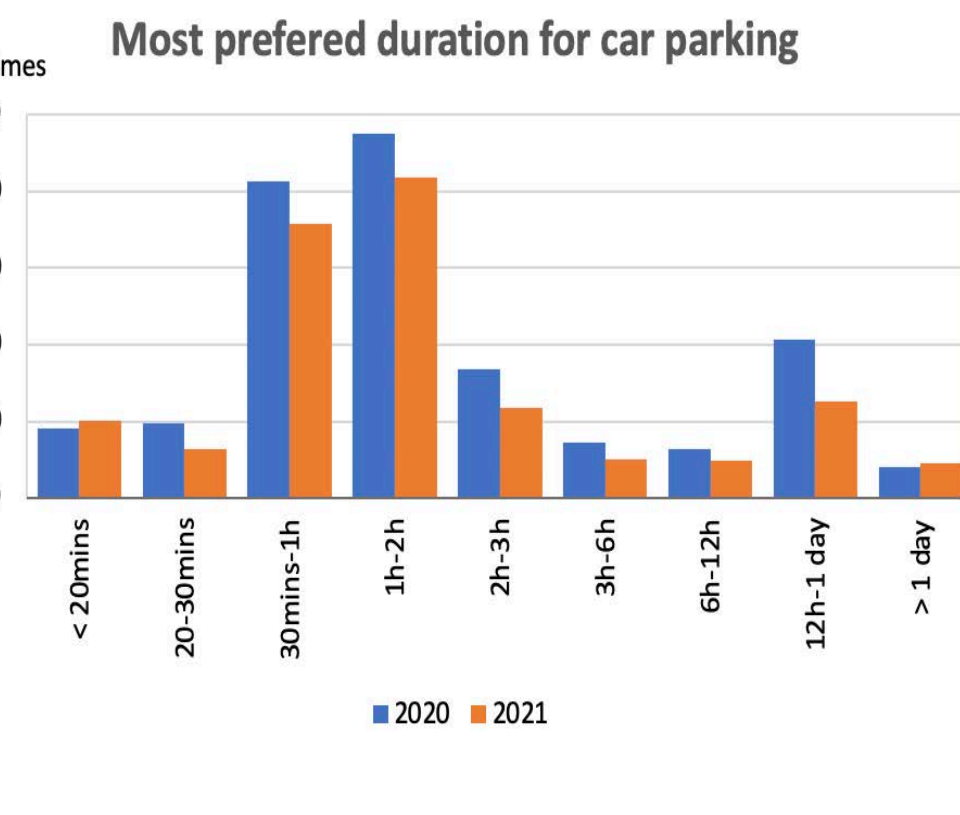
Enter time by hour

In 2020, most favored enter time is 8:00-10:00AM with averaged 22.63% parking during the day. In 2021, the preferred time range shifted to 9:00-11:00AM with averaged 21.98% parking during the day.



Parking duration

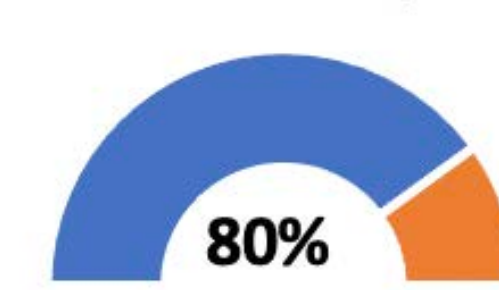
In 2021, 58.42% of car owners parked their vehicles from 30mins – 2 hours in the car parks. It indicates that most car owners visited the metropolis area for the services rather than works.



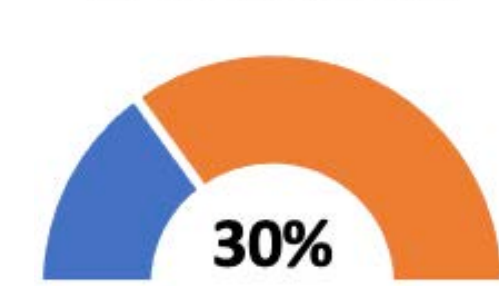
Parking occupancy on Weekday vs. Weekend

Demand on weekday peaked at 80% of occupied parking spaces. The figure for weekend is only 30% of parking spaces.

Weekday

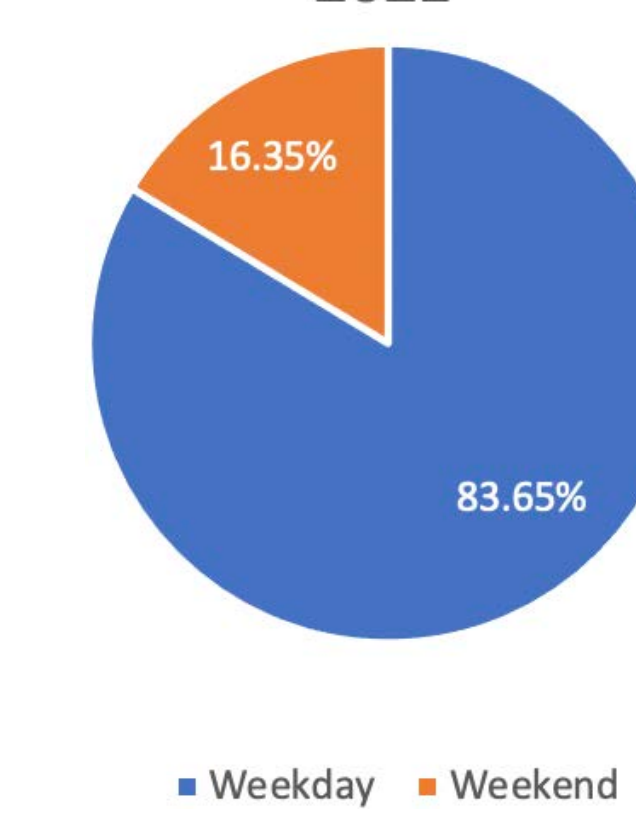


Weekend



In 2021, 83.65% of parking activities was conducted during weekdays, a decrease of 4.08 ppt compared with 2020.

2021

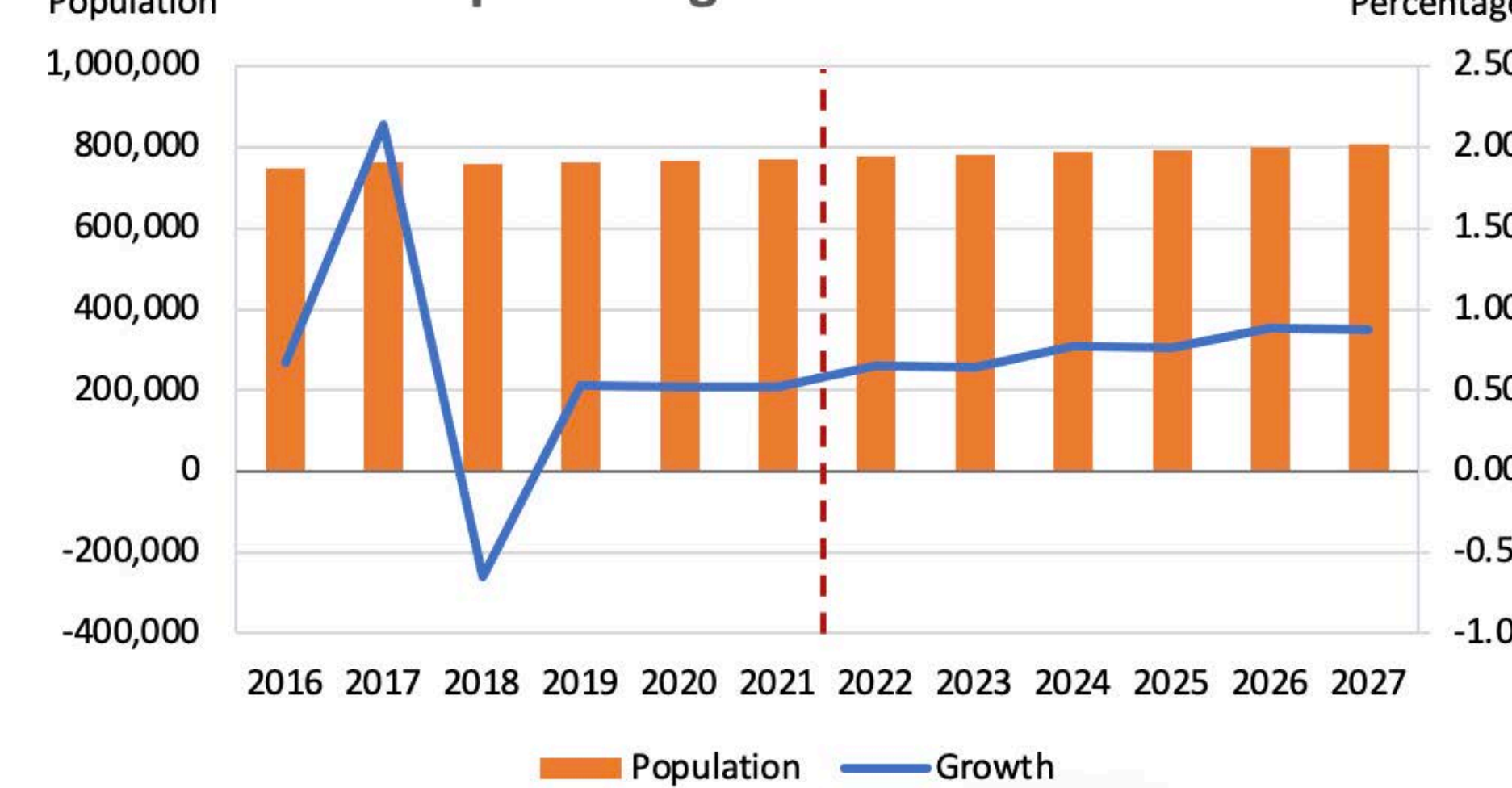


2. External Factors

a. Population growth in Hamilton:

There were 771 thousand people in Hamilton in 2021 and the population's compound annual growth rate (CAGR) is expected at 0.76% per year. The modest growth rate is expected to not put much pressure on the city transport system.

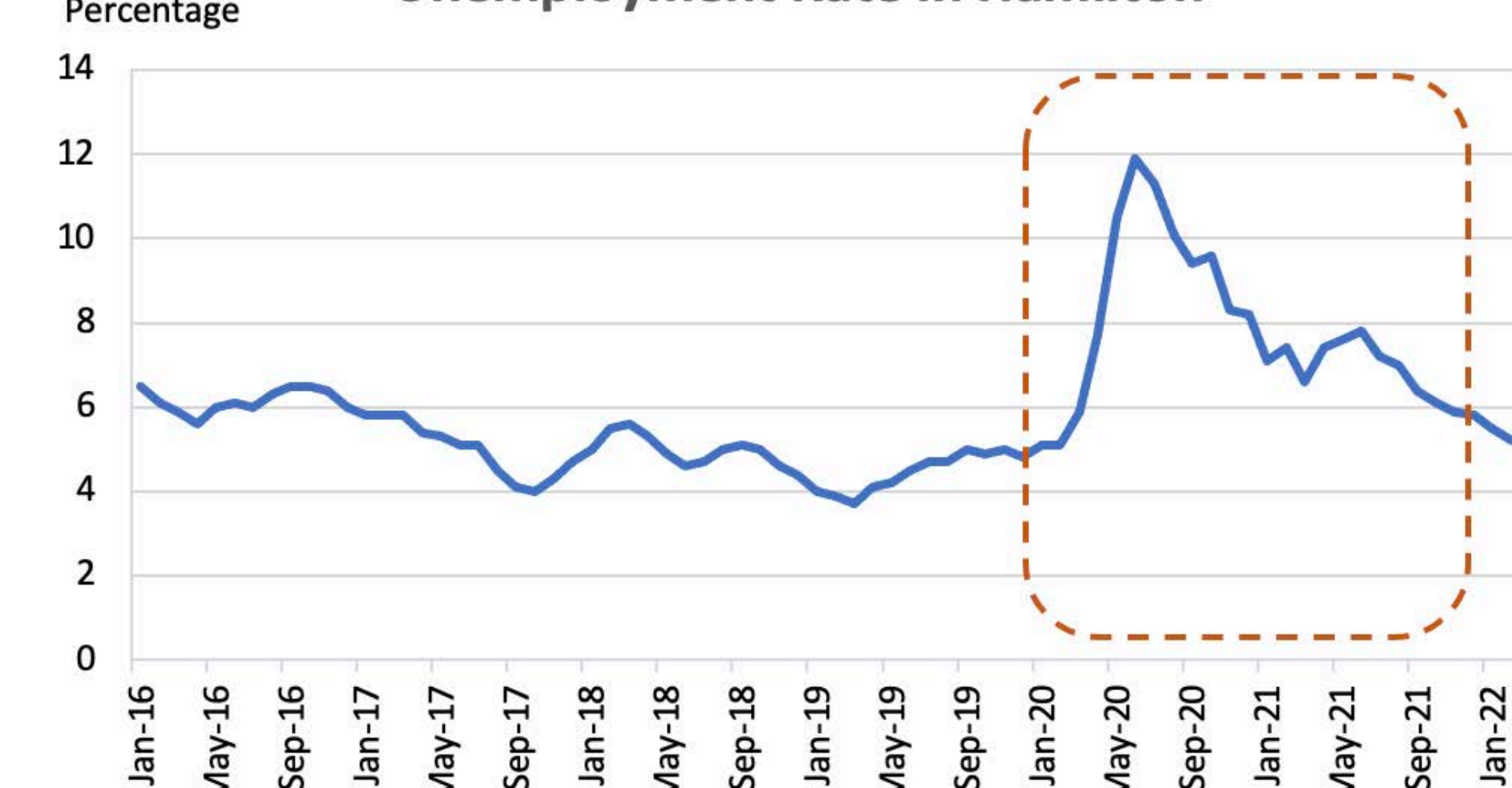
Population growth in Hamilton



b. Unemployment Rate in Hamilton

The unemployment rate in Hamilton decreased by -56.30% from 11.90% in June 2020 to 5.20% in February 2022. The decline in unemployment rate represents economic recovery. It also means that there would be more people back to work with car commuting.

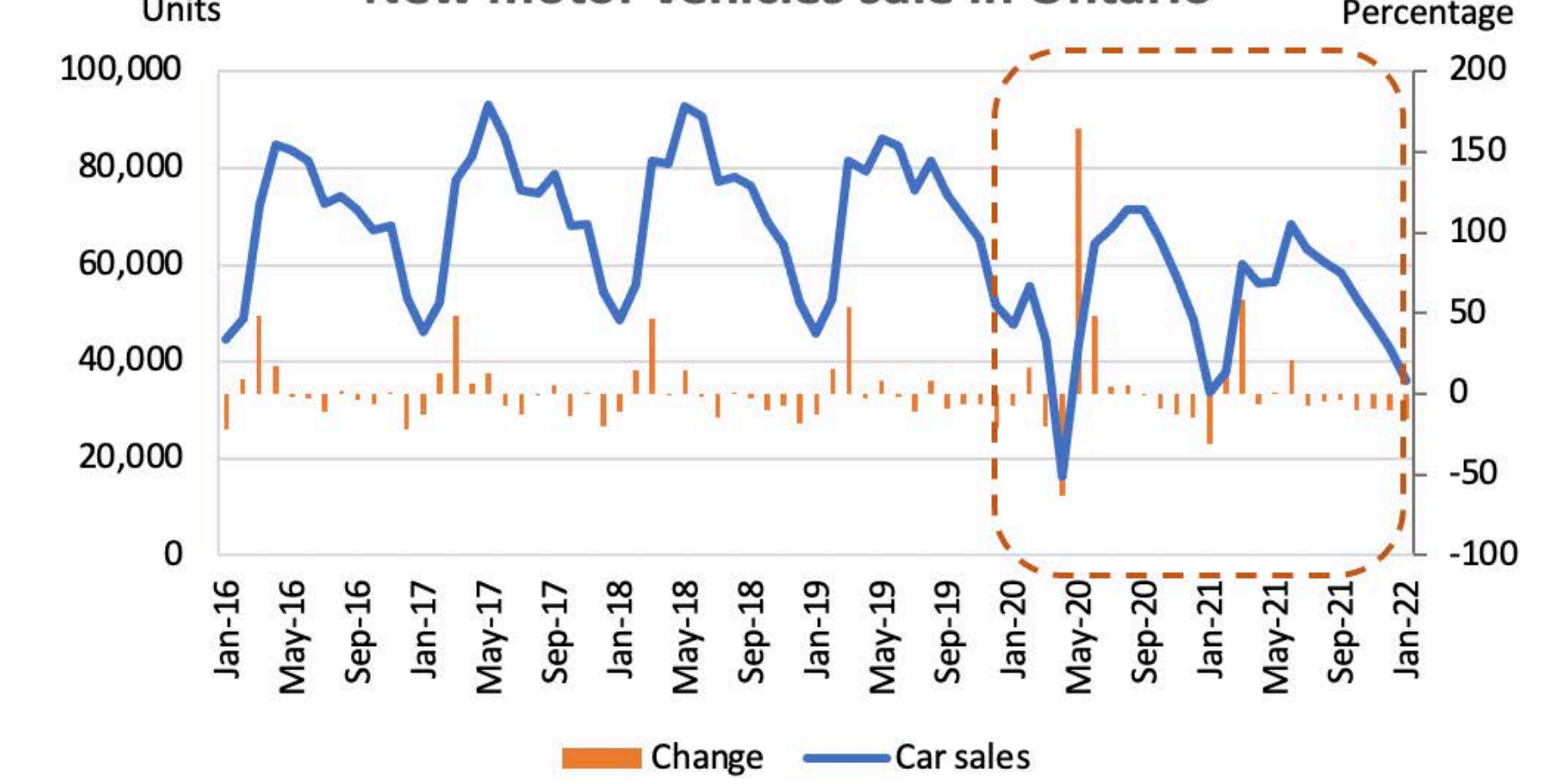
Unemployment Rate in Hamilton



c. New motor vehicles sale in Ontario

Car sales in 2021 decreased -13.28% per annual (pa) in comparison with pre-COVID period in 2019. The amount of new car sales in January 2022 is -13.43% smaller than the same figure in January 2021. Therefore, the statistic of new car sales has not showed any signal of recovery in number of car in Ontario, including Hamilton.

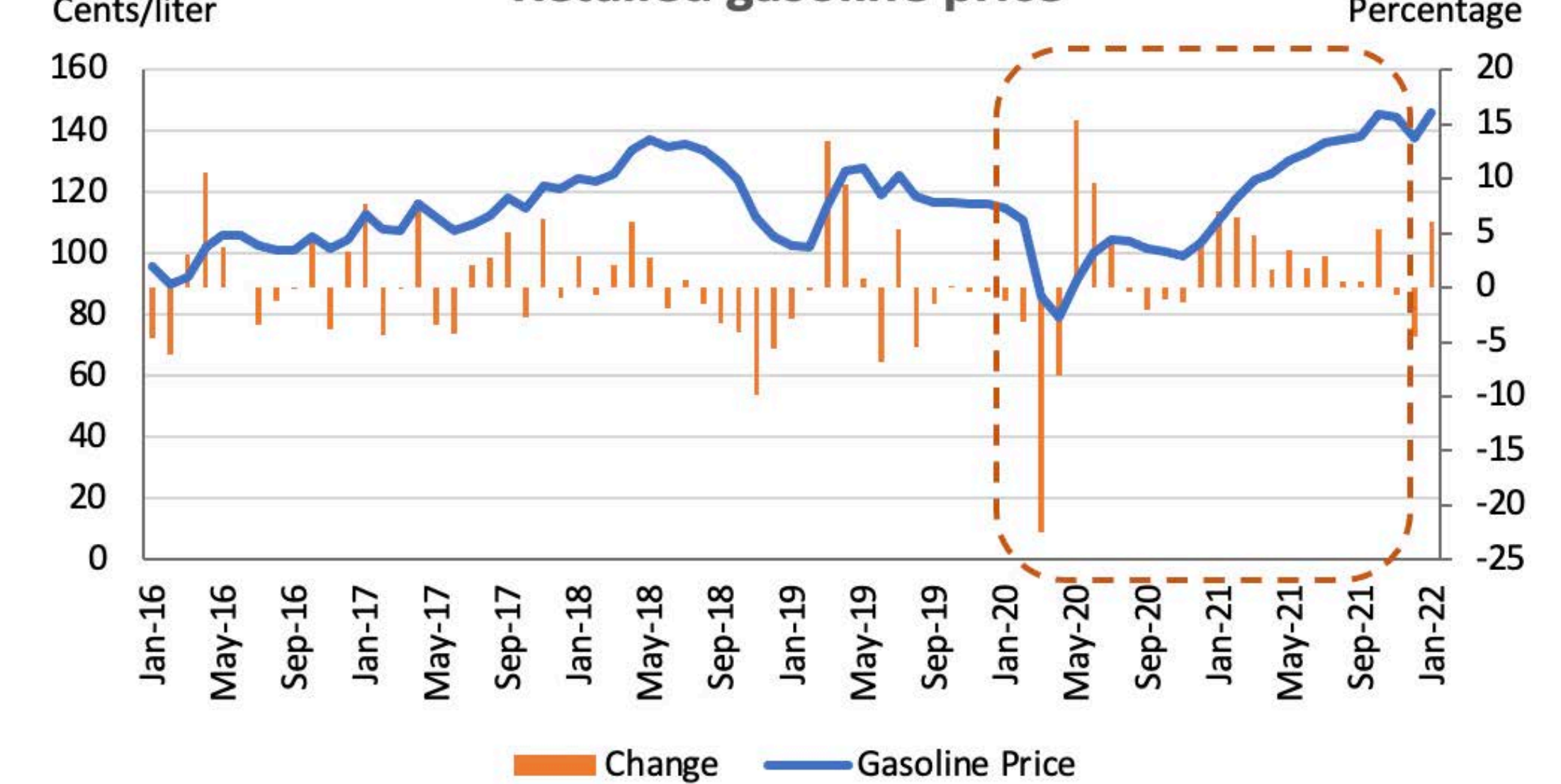
New motor vehicles sale in Ontario



d. Retailed Gasoline Price

Besides, fuel price is increasing dramatically. One of the reasons for the increase is current Russian-Ukrainian war. The sharp increase in gasoline prices can lead to economic instability and inflation. Besides, people may prefer public transportation to private vehicle in case of increase in fuel price.

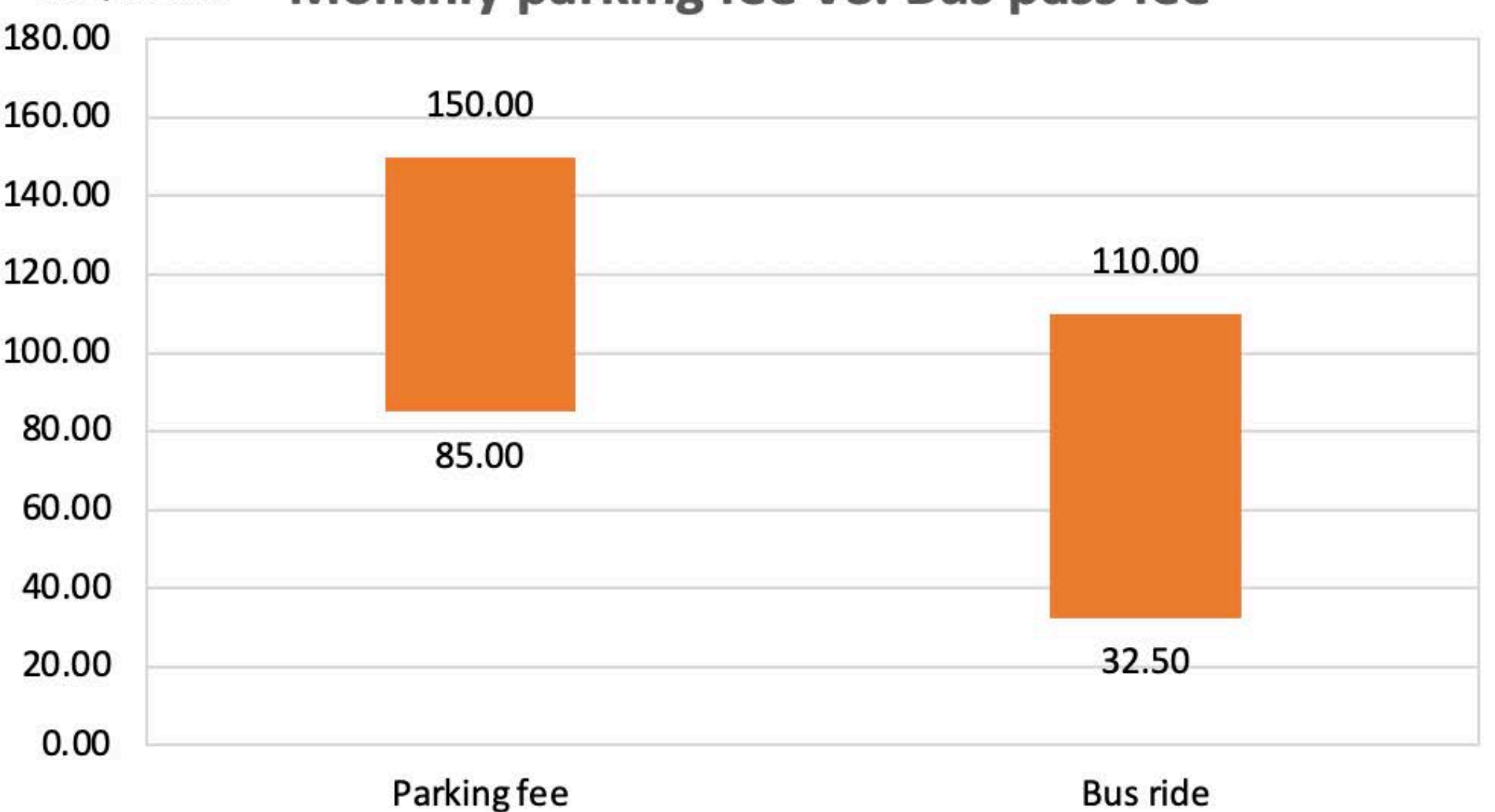
Retailed gasoline price



e. Transition fees comparison

Monthly parking permits are available ranging from \$85 to \$150 per month. This rate is highly competed by total monthly passes for riding bus.

Monthly parking fee VS. Bus pass fee



Conclusion

- Parking demand is projected to grow modestly along with the recovery of Hamilton's economy after 2 years of Covid-19 pandemic and population growth rate.
- However, the surge of parking demand is dragged down by the increase in gasoline price and inflation risk. Besides, traveling by private vehicles is facing competition from drop-off service (Uber, Lyft, etc.) as well as public transportation. Those factors would impact on parking demand.
- Besides, Parking price increases are anticipated to be required to manage parking demand and collect sufficient parking revenue to fund operations. However, the increase in parking fee would make parking be less attractive in comparison with its competitor since their prices are already lower.
- Downtown Hamilton parking supply provided through surface parking lots is projected to decrease as new development occurs.

Recommendation

- Application of high-tech (sensor or AI) could help to improve management of Hamilton Municipal Parking's occupancies. As a result, supporting financial sustainability of the parking lots operation and benefiting customers as well.
- Better system is required based on the increasing pressure to parking lots since the parking supply in downtown Hamilton is expected to be reduced. Benefits of this action is producing more accurate metric data for the purpose of monitoring and managing the parking lots effectively.
- However, City of Hamilton should be careful with the cost/budget of application of new technology. The city also needs to balance between the increasing parking fare to cover the cost of new technology installation and residents' tolerance.
- The parking lot upgrade should be implemented within the next one to two years and in moderate scale since the parking demand would not surge dramatically during that period, and therefore, installation of new technological devices won't greatly affect the operation and can be monitored on usefulness.
- Short-term incentive or discount can be applied to attract customers since the parking lots have not achieved their full capacities. It is also useful to reduce shocks when parking fares rise.