Access360: Maximizing Mobility for Hamilton's ATS Riders

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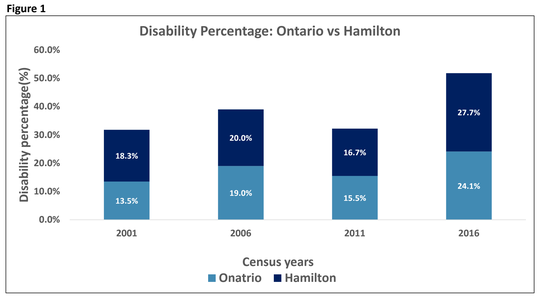
Problem Statement

As of the 2016 Census, Hamilton has a disabled population comprising 27.7% of its total populace, and this proportion has exhibited an upward trend over the years. Consequently, this trend may cause difficulties for the disabled population in accessing their preferred destinations owing to the amplified demand for Accessible Transportation Services ("ATS"). This situation may, in turn, hinder their social, educational, and employment opportunities. In light of these challenges, there arises a pressing need for an upgraded ATS that can integrate effectively with the public transportation systems, such as Hamilton Street Railway ("HSR"), Go Transit ("GO"), and the imminent Light Rail Transit ("LRT") corridor.

Figure 1



Research Objective

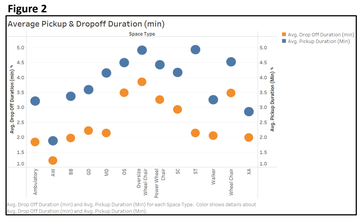
- Which are the busiest regions?
- What is the average trip duration in these regions?
- Are the pickups on time?
- Can on demand pickup service be provided?
- How many trips fall along the LRT Corridor?
- Can trips be transferred onto LRT?
- How does ATS trip time compare with HSR and car trips?
- Suggestions for improvement based on findings.

Data-Driven Investigation

Employing a rigorous approach, the investigation conducted a meticulous examination of the provided dataset to ascertain the most pivotal factors warranting additional exploration. Subsequent to a comprehensive analysis, the **pick-up** and **drop-off** times, **space type**, **rider count**, **postal codes** of the **pick-up** and **drop-off** locations, and the **total number of trips** emerged as the primary metrics of utmost importance for obtaining valuable insights into the utilization behaviors of the ATS users.

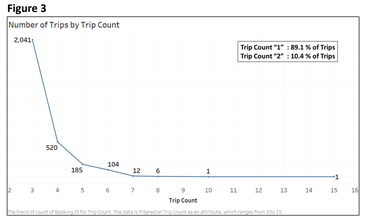
To gain additional insights, the dataset was cross-referenced with other publicly available relevant data sources. This approach enabled the study to extract valuable trends and insights, which could be utilized to optimize ATS and enhance the user experience. By utilizing this data-driven approach, The City of Hamilton and ATS providers can make informed decisions to enhance their services and meet the evolving needs of their customers.

Figure 2



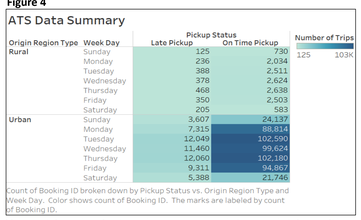
Trips with mobility equipment Wheelchairs, Stroller and Scooters have the highest drop-off and pickup times.

Figure 3



Trips with 1 and 2 riders make up 99.5% of the total trips.

Figure 4



Urban trips dominate when compared to rural trips with Monday to Friday being the busiest.

Figure 5

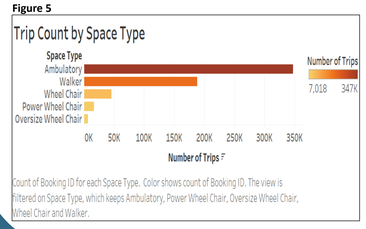
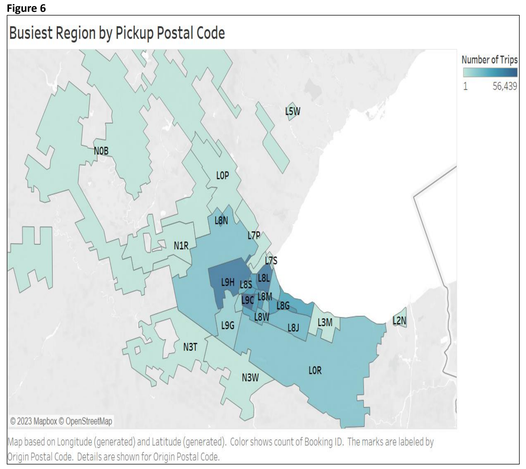


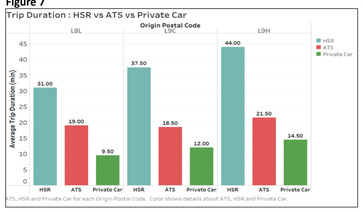
Figure 6



Map based on Longitude (generated) and Latitude (generated). Color shows count of Booking ID. The marks are labeled by Origin Postal Code. Details are shown for Origin Postal Code.

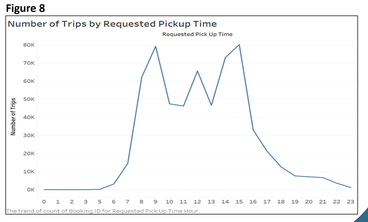
L9C, L8L and L9H are the busiest Origin Postal code for ATS.

Figure 7



HSR has the longest trip duration compared to ATS and private cars, based on the busiest destination postal code associated with the top 3 busiest origin postal codes (L9C, L8L, and L9H).

Figure 8



The trend of count of Booking ID for Requested Pick Up Time Hour.

The Permissible time window for Pick-up is ±15 mins. from the Requested Pick-up Time as per The City of Hamilton.

89.6% of the pickups were on time out of the all the trip data provided.

10.4% of the pickups were 15 mins. late. The average late Pick-up time was 22 mins.

Image 1

'Needs to be improved': DARTS users calling for better service, communication

Contracted DARTS service is 95 per cent on time, says city

The Flamborough Review

By Mac Christie Reporter
Thu., March 9, 2023 · 4 min. read · Set Flamborough as My Local news

"An hour late," she said, noting she didn't even receive a courtesy call. When she spoke to DARTS, she was told she should have booked the service to arrive an hour ahead of schedule.

Image 2

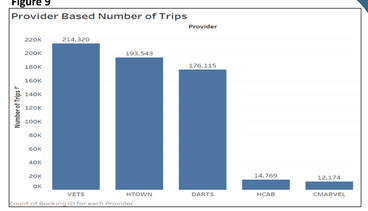
City demands DARTS pull a third of accessible transit off Hamilton roads citing safety concerns

Executive director of DARTS says it will be changing its inspection process

Dan Taekema · CBC News · Posted: May 19, 2022 12:56 PM EDT | Last Updated: May 19, 2022

"Of those, 82 passed, while 17 failed. Thirty-six vehicles still need to be inspected. Staff also said one vehicle had been "retired," bringing the total DARTS fleet to 135 vehicles."

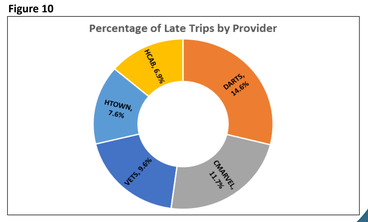
Figure 9



Count of Booking ID for each Provider

VETS has the highest number of trips followed by HTOWN and DARTS.

Figure 10



Conclusion/Recommendations

- The data indicates that among the different types of mobility equipment and assistance available, "Wheelchairs," "Scooters," and "Strollers" exhibit the lengthiest pickup and drop-off durations. As a consequence of the extra time required for passengers utilizing these categories of equipment to embark and disembark from the vehicle, it is not a pragmatic solution to promote public transit as an alternative mode of transportation for them.

Space Type	Avg. Drop Off Duration (min)	Avg. Pickup Duration (Min)
Wheel Chair	3.8	4.9
Scooter	3.5	4.5
Stroller	2.1	4.9

- The data pertaining to "Space Type" suggests that the "Ambulatory" and "Walker" categories account for a significant proportion of the total trips, specifically 87.7%. Providing accommodations for both types of passengers on public transit can offer greater convenience and flexibility. To promote the use of public transit among these riders, several measures can be implemented. By doing so, it would decrease reliance on ATS and allow them to focus on catering to those who require more extensive assistance.
- The analysis of Origin Postal Codes reveals that the regions of L9C, L8L and L9H exhibit the highest activity levels. Further scrutiny of these busy areas in conjunction with "Pickup" times indicates that the most substantial demand for transportation services occurs between 8:00 am to 10:00 am and 2:00 pm to 4:00 pm. To encourage ridership on public transit, it may be beneficial to introduce a community bussing service during the busiest periods of the day in these regions.

L9C St. Joseph's Healthcare
10,253 Trips
9 mins avg. trip duration

L8L Hamilton General Hospital
5,999 Trips
9 mins avg. trip duration

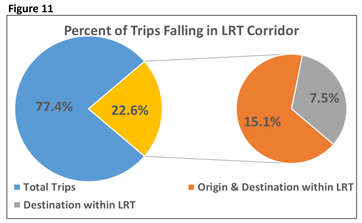
L9H Dundas, Hamilton
12,932 Trips
11 mins avg. trip duration

- Upon analyzing the given dataset, it becomes evident that VETS had the highest number of trips in 2019. DARTS was the third largest provider but had the highest percentage of late trips. Further scrutiny of DARTS, which currently functions as the sole ATS provider, has revealed numerous complaints from riders regarding delayed pickups and unreliable customer service. Furthermore, one-third of the DART fleet fails to meet the safety standards established during an audit conducted in May 2022. Considering these factors, it appears that an on-demand ATS service, utilizing the present infrastructure, would not be a viable option.
- Upon scrutinizing the "Trip Count" in correlation with the number of bookings, it has been ascertained that the overwhelming majority, 99.5% to be precise, of total trips involve 1 or 2 riders. Given this insight, it would be prudent to consider implementing a ride pooling system that grants riders the choice to opt-in to a "Share & Save" scheme for their preferred trips. This scheme would offer a sharing discount to the riders, reducing the overall cost of the ride, thereby encouraging the use of shared transportation.

89.1 %
10.4 %
0.5 %

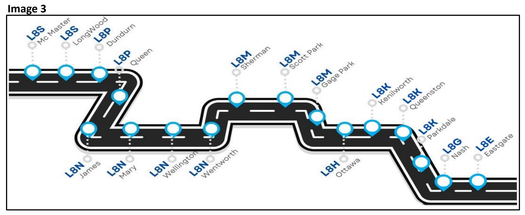
- A study of postal codes corresponding to the planned stops of the LRT corridor reveals that 15.1% of trips both originate and end within the planned corridor, while 7.5% originate outside the corridor but end within it. The LRT corridor is expected to become operational by the year 2024. In keeping with this timeline, the City of Hamilton could organize awareness programs for ATS riders to elucidate the advantages and user-friendliness of the LRT. Such initiatives would allow riders to familiarize themselves with the system beforehand.

Figure 11



22.6% of the total trips either originate and finish along the upcoming LRT corridor or finish in the LRT corridor.

Image 3



The roadmap of the LRT corridor illustrates the postal codes of the 17 planned stops.

138,068 Trips

Est. Project Completion
2024

Corridor Length
14km

Travel Time
32 min

Transfer Points
McMaster University GO
West Harbour GO
Hamilton GO Centre
Eastgate Terminal
Confederation GO

Image 4

McMaster University Terminal to Eastgate Terminal Average Travel Time

LRT
32 min.

Private Car
24 min.

ATS
41 min.

HSR
37 min.

References

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  https://open.hamilton.ca/search?collection=Dataset
- **ATS Hamilton:**
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- **Light Rail Transit Hamilton:**
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