Ridership research

Prepared for:

Metrobus

2024.03.27

MQO RESEARCH

EXECUTIVE SUMMARY

Current ridership profile

- Transit riders are more likely to be younger, in school, and newcomers to Canada
- Newcomers to Canada are much more likely than non-newcomers to be transit users. However, they are also more likely to reduce transit usage as well as purchase a vehicle within the next two years.
- There is strong support among university students who are already transit users for implementing a U-pass program and most report that would increase their transit ridership. However, there was insufficient sample to assess the views of students more broadly.
- The most common reason for using transit, as well the one considered to be most important, among current riders was the lack of their own vehicle and when non-riders were asked why they had not used transit recently, the most frequent response by a wide margin was that they primarily drive.
- The majority of transit riders take a single bus to work or school and almost all take two or fewer.

Analysis of recent ridership increases

- The majority of transit riders intend to remain transit users within the next one or two years. Only a very small proportion of non-riders intend to begin using transit in that time frame. On demand bussing is the additional service most likely to increase transit ridership among riders and the second most likely to do so among non-riders.
- Under three different population growth scenarios (low, medium, and high), transit ridership is expected to maintain its current levels or increase through 2026.

Strategic considerations

- The Bus Pass Program for Income Support Recipients (hereafter referred to as the Bus Pass Program) is associated with increased ridership and whether or not funding of the Bus Pass Program continues will have important implications for strategic planning. However, the current analysis does not allow us to distinguish whether this ridership results from new

riders or increased frequency of use among those who were already riders but increased their usage upon receiving a pass through the program. Moderate growth in transit ridership is predicted independent of the continuation of the Bus Pass Program.

- Newcomers to Canada are strongly contributing to the observed ridership trends and practices that support newcomers use of transit are important considerations.

Risk analysis and mitigation strategies

- **Risk:** Sampling bias in the ridership survey may have inflated the estimate of the proportion of Newcomers using transit. The current research suggests this group is having an important effect on ridership. An accurate picture of their transit usage will be an important consideration for strategic planning.
    - **Mitigation:** Consider other sources of information or additional research that could provide evidence to confirm or disconfirm this possibility
- **Risk:** Rapid population increases due to high immigration rates may greatly increase demand for transit.
    - Closely monitor immigration and progress towards Department of Immigration, Population Growth and Skills targets
    - Initiate a discussion around the appropriate strategic response with municipal government and other partners now to ensure service levels are maintained
- **Risk:** Newcomers to Canada are likely to decrease their use of transit over time, decreasing demand for transit
    - **Mitigation:** If the net rate of foreign immigration remains high, this should not greatly impact planning as high transit-using recent arrivals will replace those who are reducing their usage
    - If the rate of immigration drops significantly, however, long term planning should account for the possibility that transit demand would be reduced within a few years of that shift

Table of contents

St. John's transit ridership

Metrobus is experiencing unexpected increases in ridership, which amounted to a 44 percent increase in the first eight months of 2023 compared with the equivalent time period in 2019. This stands in stark contrast to the pattern of reduced ridership being observed throughout most major Canadian cities in the wake of the COVID-19 pandemic.[1]

This has resulted in overcrowding and in some cases denial of service during high traffic hours, leading to complaints from riders about limited space. Metrobus' ability to adequately address this issue is limited by its current fleet supply. The primary objective of the current study was to examine potential factors that are contributing to this increase and to determine what their expected long-term impact might be.

The report is divided into the following sections:

- Current ridership profile. Examines demographic and behavioural profiles of transit riders and non transit riders.
- Cross-jurisdictional analysis. Analyzes ridership trends in three comparator cites: Moncton, NB; Windsor, ON; and Saskatoon, SK.
- Projected scenarios. Examines and predicts potential trends using survey and Metrobus ridership data, including strategic considerations and risk analysis.

01. Current ridership profile

Table 1. Key insights: Current ridership profile.
Demographics
Current riders are more likely to be younger, in school, and newcomers to Canada when compared to non-riders.
Newcomers to Canada are much more likely than non-newcomers to be transit users.
There is strong support among university students who are already transit users for implementing a U-pass program and most report that would increase their transit ridership. However, there was insufficient sample to assess the views of students more broadly.
Travel habits and motivations

For approximately half of transit riders or more, public transit was their usual mode of transport whether for school, work, or when travelling for other reasons while almost all non-riders surveyed traveled in a private vehicle as the driver.
The most common reason for using transit, as well the one considered to be most important, among current riders was the lack of their own vehicle and when non-riders were asked why they had not used transit recently, the most frequent response by a wide margin was that they primarily drive.
The majority of transit riders take a single bus to work or school and almost all take two or fewer.
Petty Harbour was the most frequently identified area lacking service and the one considered most important by the largest proportion of current riders. However, The Battery, Mount Scio Road, and Thorburn Road (west of Goldstone Street) received only slightly lower ratings overall.

This section develops the demographic profile of current Metrobus clients, and where appropriate, compares their characteristics with those of non-transit users referred to as 'Riders' and 'Non-riders' respectively. The results are derived primarily from two surveys conducted by phone and online from between Dec 19, 2023 and Jan 14, 2024.

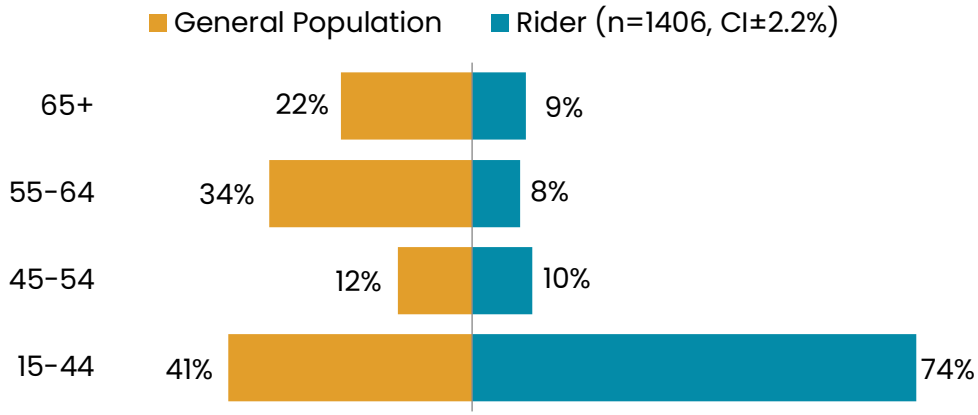
- Riders: n=1,406 recent Metrobus users who responded to an online survey link distributed to Metrobus clients. The survey results have a credibility interval of plus or minus 2.2 percentage points (see Bayesian Credibility Intervals (CI), pg. 48).
- Non-riders: A representative sample of n=401 respondents from the general population in St. John's, NL reached by phone (credibility interval of plus or minus 5.3 percentage points).

Additional details regarding the surveys are available in the Methodology Appendix (p. 49).

Demographics

Transit riders were substantially younger than the general population of St. John's.

Figure 1. Age distribution of riders compared to St. John's general population.[2]



At the time of the 2021 census, there were over 9,510 immigrants living in the St. John's metro area, a third (32.5%) of whom had arrived between 2016 and 2021.[2,3] Recent immigrants to Canada are often identified as 'newcomers' within their first five years of residence.[4] Newcomers, at least initially, may experience challenges and opportunities not common to other Canadians.

It is notable that about half of the transit riders sampled (49%±2.2%, Table 1) were born outside of Canada with 80% of those having arrived within the last five years (Table 2).

Table 1. D2. In what country were you born?

	Non-riders	Riders
Total (n)	401	1406
Canada	92%	50%
Outside Canada	8%	49%
Prefer not to answer	-	1%
CI: Non-riders ±5.3%, Riders ±2.2%		

Table 2. D3. How long have you been in Canada?
SUBSET, those born outside of Canada

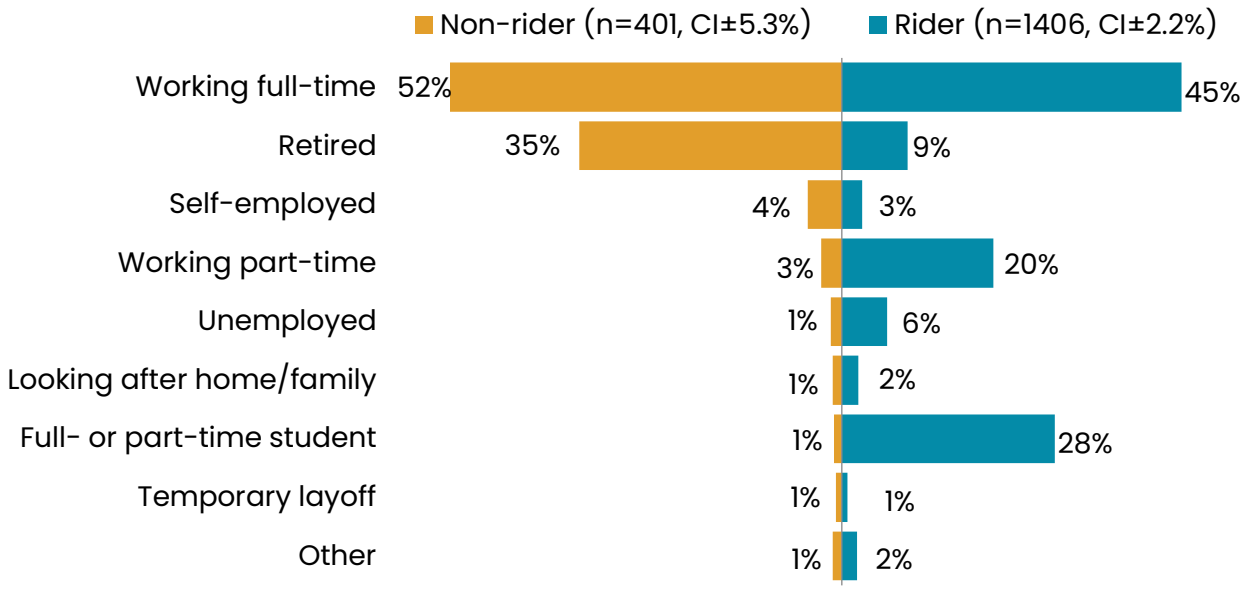
	Non-riders	Riders
Total (n)	30	687
Less than 1 year	4%	32%
1 to 5 years	29%	48%
More than 5 years	67%	19%
Prefer not to answer	-	<1%
CI: Non-riders ±14.3%, Riders ±3.1%		

Those numbers significantly exceed the ratio we would expect by chance alone, given that newcomers represent less than three percent of the overall population in St. John's (2.8% at the time of the 2021 census).[5] This provides very strong evidence that newcomers are more likely to be transit users than non-newcomers in St. John's (Bayes Factor[*BF*] = 37, see Appendix A, Bayes Factor, pg.48 for more details). We see further evidence of this by examining a series of crosstabulations by newcomer status (yes/no):

- Newcomers are more likely to use transit as their usual mode of travel to work (71%±2.2% vs. 61%±5.3%. *T6. What is your usual mode of transportation for trips to or from work? SUBSET: Respondents that are employed* [There is strong evidence for this effect, *BF = 20*])
- Newcomers are more likely to use transit as their usual mode of travel for trips unrelated to work or school (77%±2.2% vs. 63%±5.3%. *T9. What is your usual mode of travel for trips unrelated to work or school, for example, when you are shopping, meeting friends, or travelling for recreation?* [There is strong evidence for this effect, *BF = 13*])
- These results also align with previous empirical results within Canada and in other countries.[6–8] A regression analysis of transit ridership was carried out using an extensive spatio-temporal dataset compiled from 103 Canadian transit agencies which included various sources of data on four major sets of indicators including: a) built environment, b) socioeconomic, c) transit service, and d) other external/contextual factors for the period between 1991 and 2016. The results suggested that for transit agencies similar in scale to Metrobus a 10% increase in the percentage of recent immigrants was associated a 1.09% increase in ridership.[6]

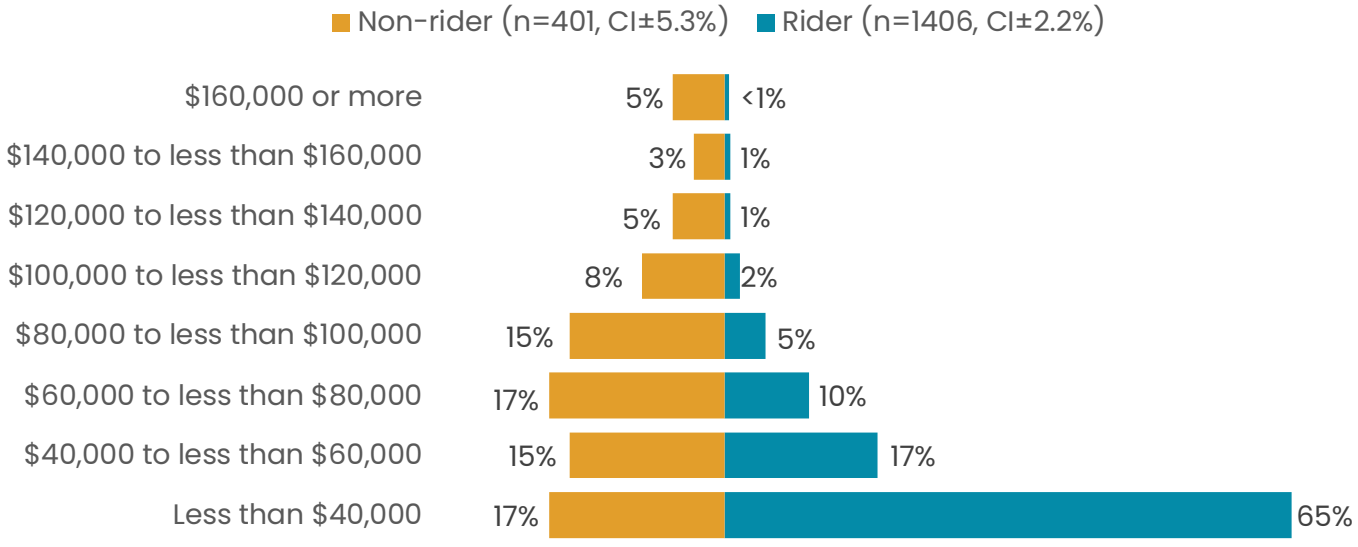
There were noticeable differences between Riders and Non-Riders by employment status, with non-riders much more likely to be retired and riders more likely to be students or employed part time (Figure 2).

Figure 2. D3. What is your current employment status?



However, those differences align with what one would expect based on the large difference in average age between the groups. The same consideration applies to income (Figure 3), with riders having lower personal income on average than non-riders.

Figure 3.D5. What was your total personal income (before taxes) in the last year? Was it...?



Transit riders were less likely to live in a single detached dwelling or to own a private vehicle and more likely to live in an apartment (Figure 4).

Figure 4. D6. What kind of dwelling do you live in?
D7. Do you, or does someone in your household, own a private vehicle such as a car, truck, or van that you routinely use for transportation?

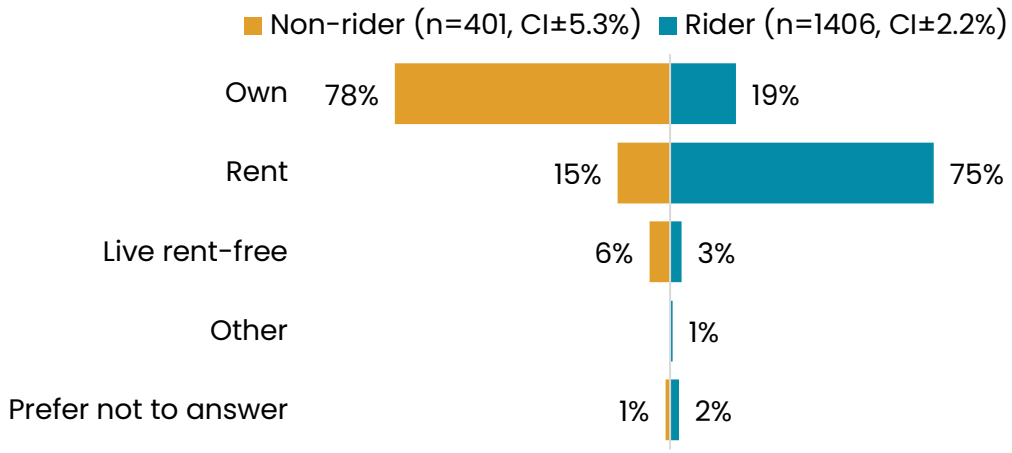
	Single detached home	Row house	Apartment	Private vehicle
Non-riders (n=401, CI±5.3%)	**81%**	**7%**	**10%**	**74%**
Riders (n=1406, CI±2.2%)	**48%**	**8%**	**38%**	**38%**

Note: Other mentions:4%; Prefer not to answer:2%

A follow up question (*D7A. Are you planning to buy or lease a private car or vehicle within the next 2 years*? SUBSET: Respondents who`s household does not have a private vehicle [n=853]) asked those without a vehicle about the intention to own a vehicle within the next two years. About one-third (38%±2.8%) intended to do so. This was more likely to be true for newcomers than non-newcomers (55%±2.8% vs. 19% ±2.8%, *BF = 125*).

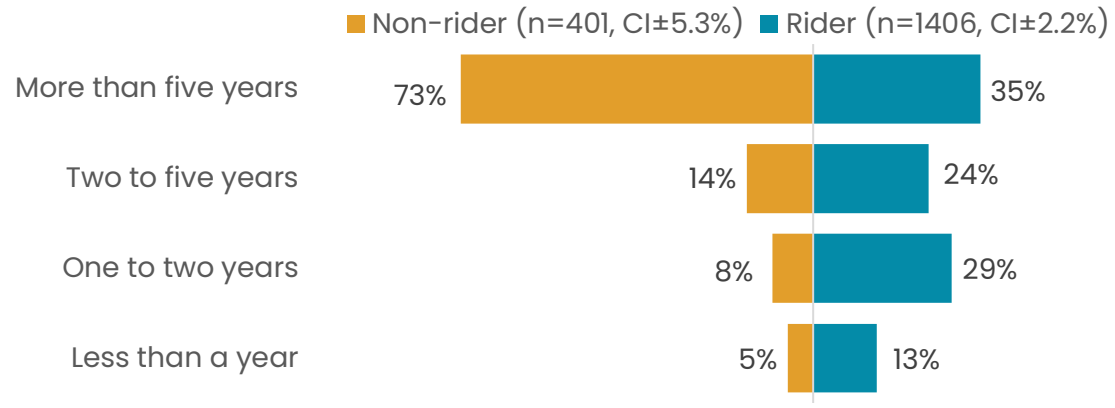
About three quarters (78%±5.3%) of non-riders owned their dwelling while about the same proportion of riders (75%±2.2%) were renters (Figure 5).

Figure 5. D6A. At your dwelling, do you...?



Transit riders were more likely to leave their current neighborhood within the next five years (Figure 6).

Figure 6. D8. How long do you plan to live in your current neighbourhood? (n=401)[a]



[a] Don't know responses not shown.

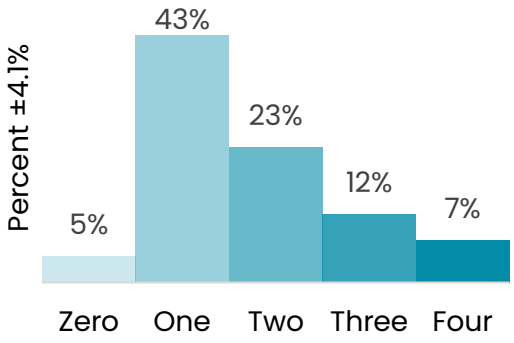
Student profile[b]

Most of the students surveyed (86%±4.1%) were in university (Table 4) with fewer than half having more than a year remaining in their program (Figure 7).

Table 3. D4a. Which of the following best describes the institution where you are a student?
Riders. SUBSET who were students (n=398, CI ±4.1%)

Response	%
University	86%
College or vocational school	11%
Secondary school/high school	1%
Prefer not to answer	1%

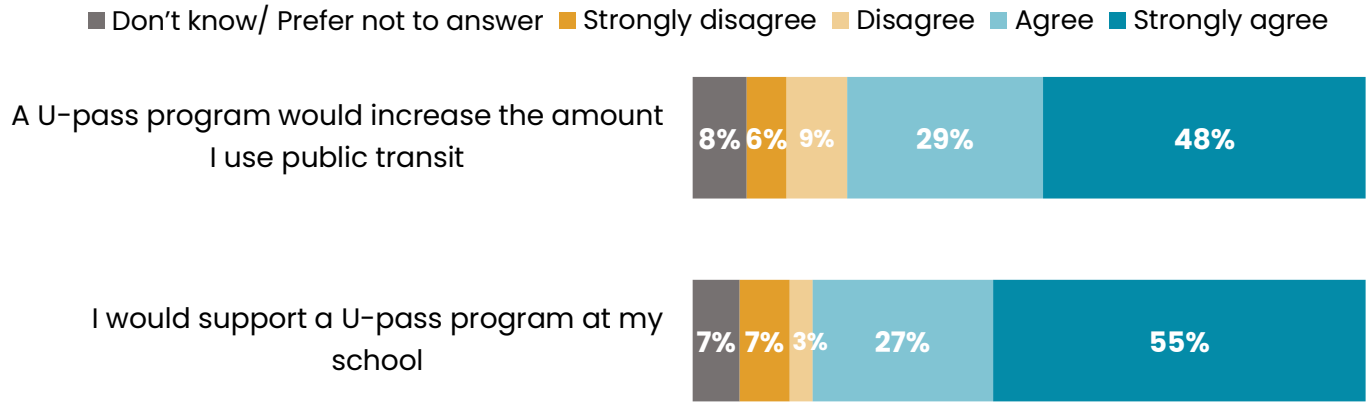
Figure 7. D4B. How many years do you have remaining until you graduate? SUBSET, Riders who were students (n=398)



There was very strong support for a U-pass program amongst university students (82%±4.1% strongly agree + agree) and about eight-in-ten suggested U-pass program would increase their use of public transit (Figure 8). However, it should be noted that these results represent the views of students who were already transit users.[b] A U-pass would therefore decrease the cost of a service this group was already paying for. It's unclear what impact this might have on ridership among students using other forms of transit.

[b] Results for students among non-riders are excluded due to small sample size (n=4).

Figure 8. T4A & T4B. Please rate your agreement with the following statements...
Riders. SUBSET. Respondents that were students in university/college (n=388, CI: ±4.1%)



Accessibility

The accessibility requirements of riders and non-riders with a disability are summarized in Table 4.

Table 4. D10A. Do you have a.....? SUBSET. Those who had a disability and did not mind sharing.			**D11A. Which of the following mobility aids do you require when using public transit? SUBSET. Those who had a disability, did not mind sharing, and required a mobility aid.**		
Response*	Non-riders (n=401)	Riders (n=1406)	Response	Non-rider** (n=401)	Rider (n=1406)
Any disability	8.2%	11.5%	Any mobility aid	1.7%	11.5%
Physical disability (mobility)	4.8%	4.7%	I do not require a mobility aid	-	8.2%
Chronic illness	3.5%	3.2%	Support cane	0.7%	2.1%
Mental health condition	1.2%	5.3%	Walker	0.7%	0.7%
Visual impairment	0.7%	1.5%	Manual wheelchair	0.3%	0.1%
Hearing impairment	0.7%	0.9%	Powered wheelchair	-	0.2%
Learning disability	0.5%	2.3%	Scooter	-	0.1%
Other	-	0.6%	Other	0.2%	0.1%
Prefer not to answer	-	0.5%	Prefer not to answer	0.3%	0.8%

*Sums may exceed 100% due to multiple mentions. CI: Non-riders ±5.3%, Riders±2.2%

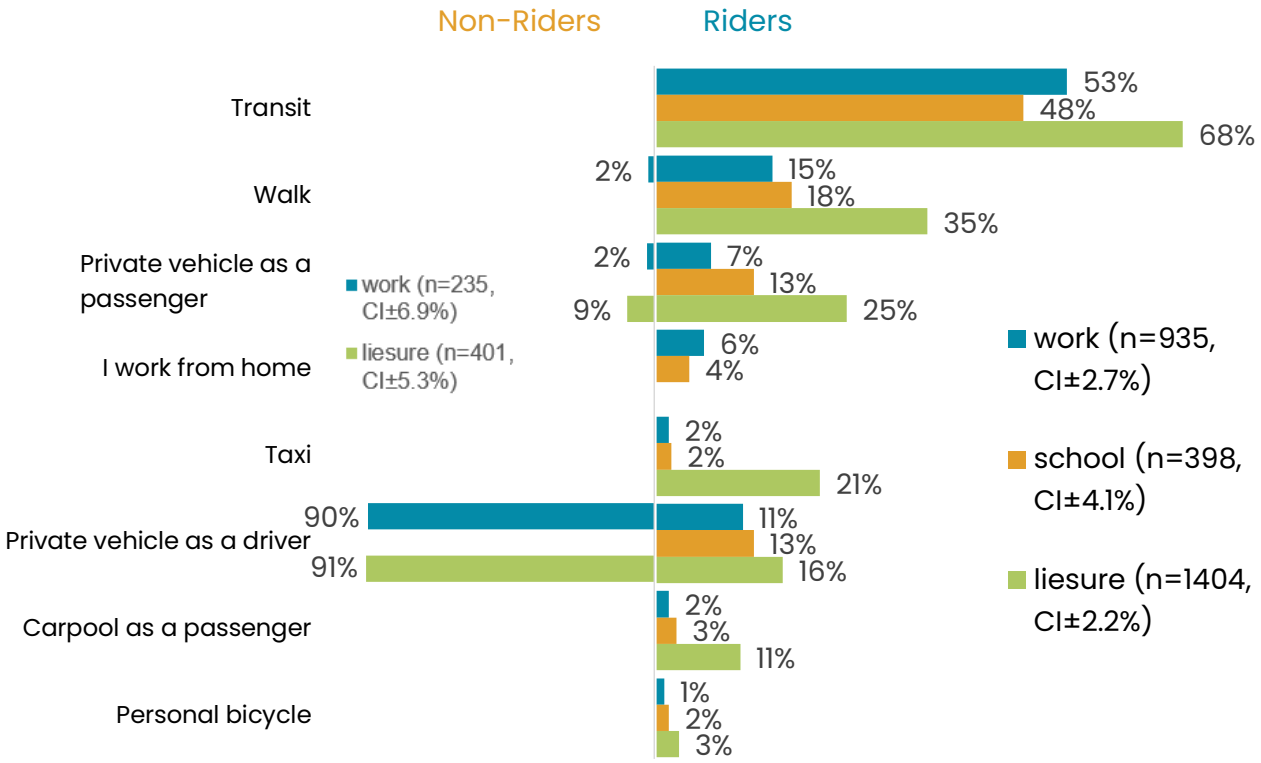
** Interpret with caution due to small sample size.

Travel habits and motivations

For approximately half of transit riders or more, public transit was their usual mode of transport whether for school, work, or when travelling for other reasons (Figure 9).

There were a range of other responses that were generally similar across these types of activities although walking, travelling as a passenger in a private vehicle, and taking a taxi were noticeably more common when travelling for reasons other than school or work. Responses among non-riders were less diverse, with almost all travelling in a private vehicle as the driver. These respondents were screened as having not used transit with the last four months, so it is unsurprising that no one reported that as their usual mode of transportation. There were insufficient students in this group to report on results (n=4).

Figure 9. T3 & T6 & T9. What is your usual mode of transportation for trips to or from school (T3)/work(T6)? Please select all that apply. T9. What is your usual mode of travel for trips unrelated to work or school…*



*Other and prefer not to answer excluded (each <2%).

When non-riders were asked why they had not used transit recently, the most frequent response by a wide margin (69%±5.3%) was that they primarily drive (Table 5).

Table 5. T7. You told us that you haven`t used public transit in the past 4 months. Why haven`t you used public transit lately? Non-riders. (n=401, CI±5.3%)	
Response	%
I primarily drive	69%
Transit takes too long	16%
Transit does not travel at times convenient to me	13%
No need to use it	6%
Transit does not go to destinations I need to go to	6%
There are no stops close to me	3%
Inconvenient in the winter	2%
I primarily walk	2%
Someone else drives me where I need to go	2%
Other	4%
Prefer not to answer	1%

Conversely, the most common reason (72%±2.2%) for using transit, as well the one considered to be most important (61%±2.2%), among current riders was the lack of their own vehicle (Figure 10). The affordability of transit was (33%±2.2%) another frequently mentioned reason.

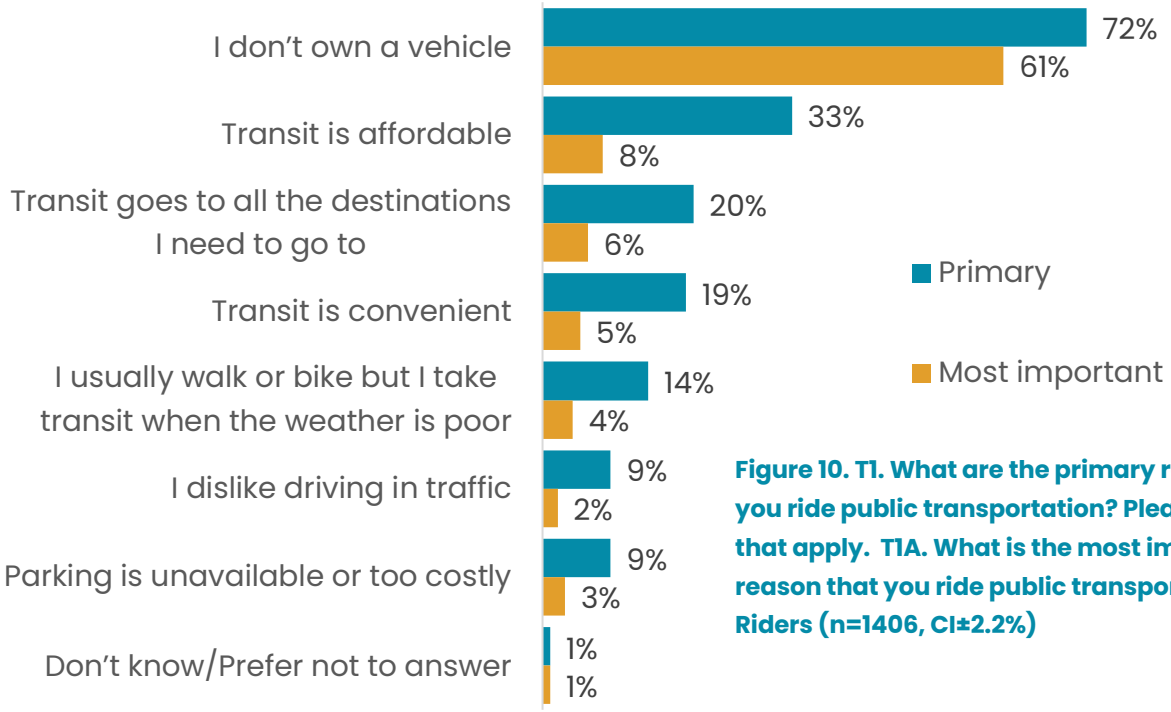
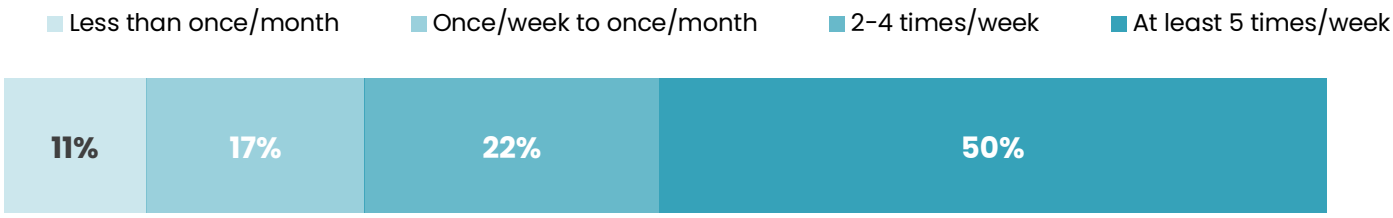


Figure 10. T1. What are the primary reasons that you ride public transportation? Please select all that apply. T1A. What is the most important reason that you ride public transportation? Riders (n=1406, CI±2.2%)

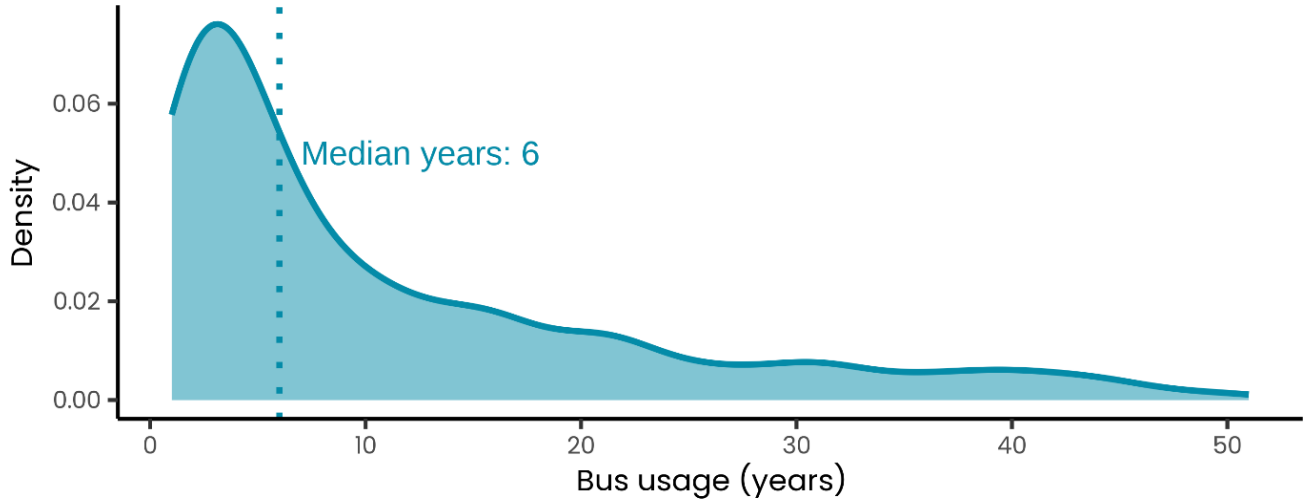
About half of current riders use transit at least five times per week and about one-quarter use transit two to four times per week (Figure 11).

Figure 11. T10. How often do you typically travel by transit?
Riders (n=1406, CI±2.2%)



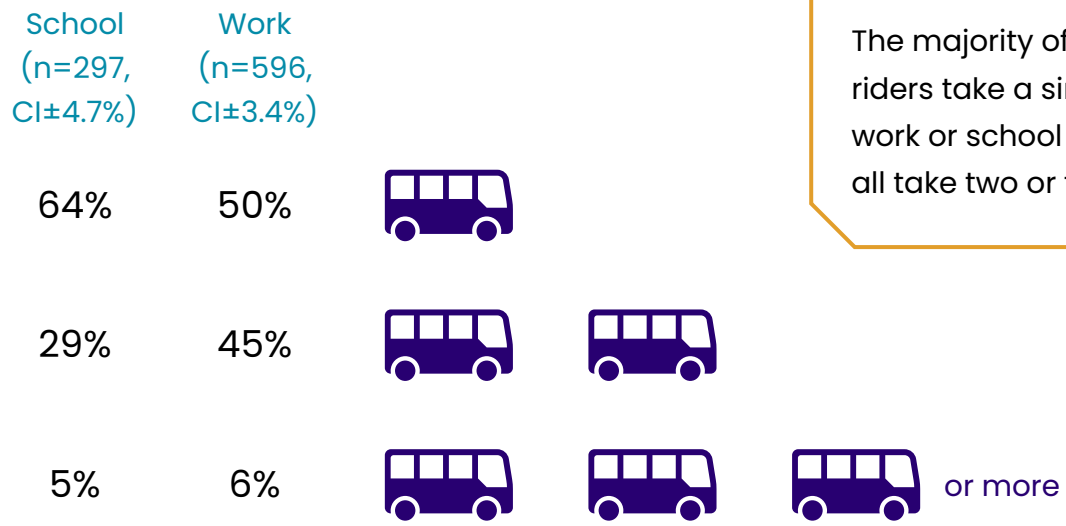
There was a wide range of responses regarding how long transit riders had been using transit with six years being the median response (Figure 12).

Figure 12. T2. For how many years have you been using public transit?
Riders. (n=1404, CI±2.2%)



Riders were asked to how many rides they typically took to work or school (Figure 13). The majority of transit riders take a single bus to work or school and almost all take two or fewer.

Figure 13. T5 & T7. During your typical commute to school (T5)/ work (T7), how many transit routes do you use to reach your destination? Riders. SUBSET who were students (T5) or working (T7)



The majority of transit riders take a single bus to work or school and almost all take two or fewer.

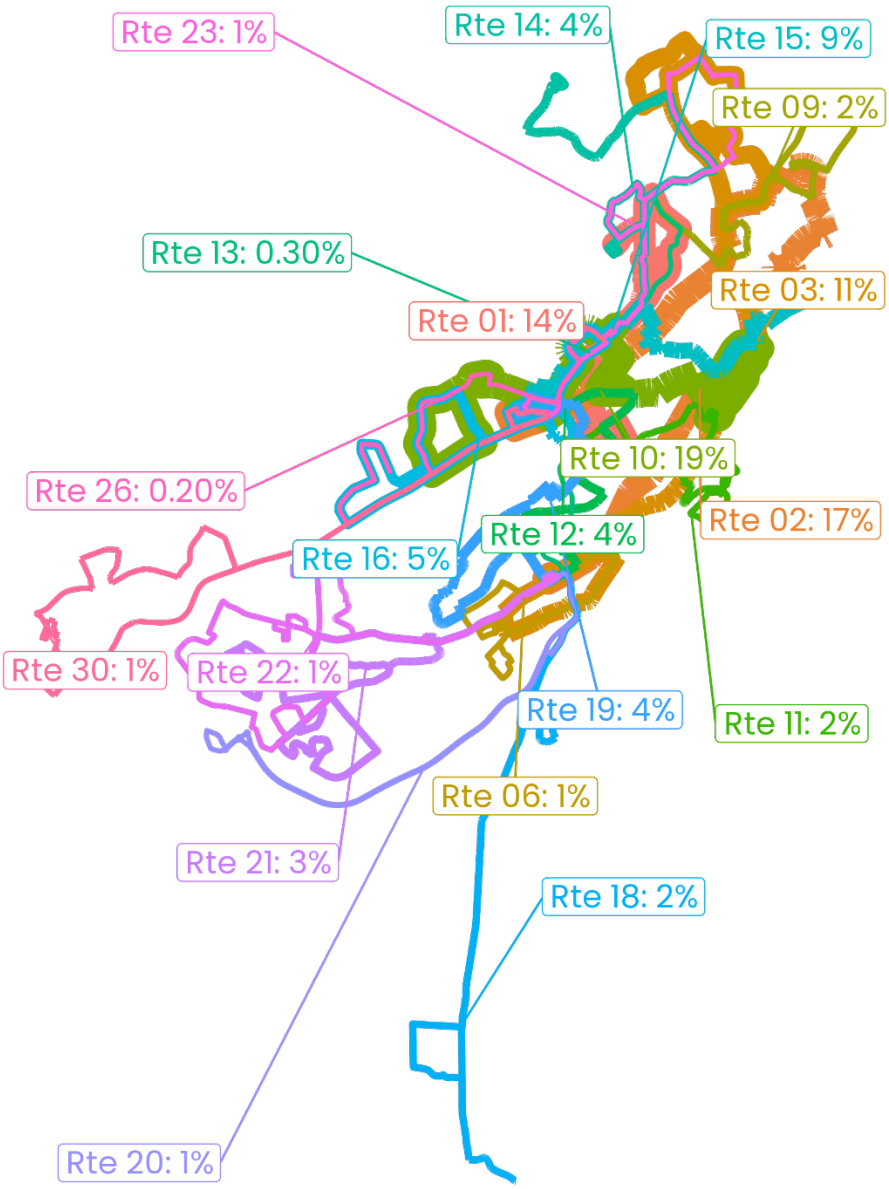
Riders were also asked which route, or routes, they used during a typical commute. The ten most frequent responses are shown in Table 6.

Table 6. T5A. Please answer the following questions about the first five routes you use. Riders – students. Top ten. (n=298, CI±6.2%)		T7A. Please answer the following questions about the first five routes you use. Riders – working. Top ten. (n=663, CI±4.1%))	
Route	%	Route	%
10 - Downtown | MUN | Avalon	26%	2 - Avalon | Virginia Park | Village	19%
1 - Village | Institutes	22%	10 - Downtown | MUN | Avalon	15%
15 - Cuckholds Cove | MUN | Avalon	14%	3 - Village | Downtown | Stavanger	14%
2 - Avalon | Virginia Park | Village	11%	1 - Village | Institutes	10%
16 - Kenmount Terrace | MUN	6%	15 - Cuckholds Cove | MUN | Avalon	7%
3 - Village | Downtown | Stavanger	4%	19 - Village | Avalon	5%
14 - Airport | Torbay Rd | MUN	3%	12 - Village | Avalon	5%
19 - Village | Avalon	3%	16 - Kenmount Terrace | MUN	4%
9 - MUN | Torbay Rd | Logy Bay Rd	2%	14 - Airport | Torbay Rd | MUN	4%
Metrobus On Demand	1%	21 - Village | Mount Pearl	3%

In addition to the individual routes shown above, proportion of overall mentions of each route (regardless of respondent type or position on route), are tabulated (Table 7) and mapped (Figure 14) below. Routes 1, 10, and 2 were mentioned substantially more frequently than other routes.

Table 7. Total mentions by route. All riders, work and school commuting. (n=961, CI±3.4%)	
Route	%
2 - Avalon | Virginia Park | Village	19%
10 - Downtown | MUN | Avalon	15%
3 - Village | Downtown | Stavanger	14%
1 - Village | Institutes	10%
15 - Cuckholds Cove | MUN | Avalon	7%
19 - Village | Avalon	5%
12 - Village | Avalon	5%
16 - Kenmount Terrace | MUN	4%
14 - Airport | Torbay Rd | MUN	4%
21 - Village | Mount Pearl	3%
18 - Village | Kilbride | Goulds	3%
11 - Shea Heights | Downtown | Avalon	2%
9 - MUN | Torbay Rd | Logy Bay Rd	2%
6 - Village | Sesame Park	1%
22 - Village | Mount Pearl	1%
30 - Paradise | Avalon	1%
20 - Village | Galway EXPRESS	1%
Metrobus On Demand	1%
23 - Avalon | MUN | Stavanger	0.3%
26 - Kenmount Terrace | MUN EXPRESS	0.3%
13 - Village | Institutes EXPRESS	0.2%
Don't know/Prefer not to answer	1%

Figure 14. Metrobus route map by proprortion of overall mentions (n=945).[c]



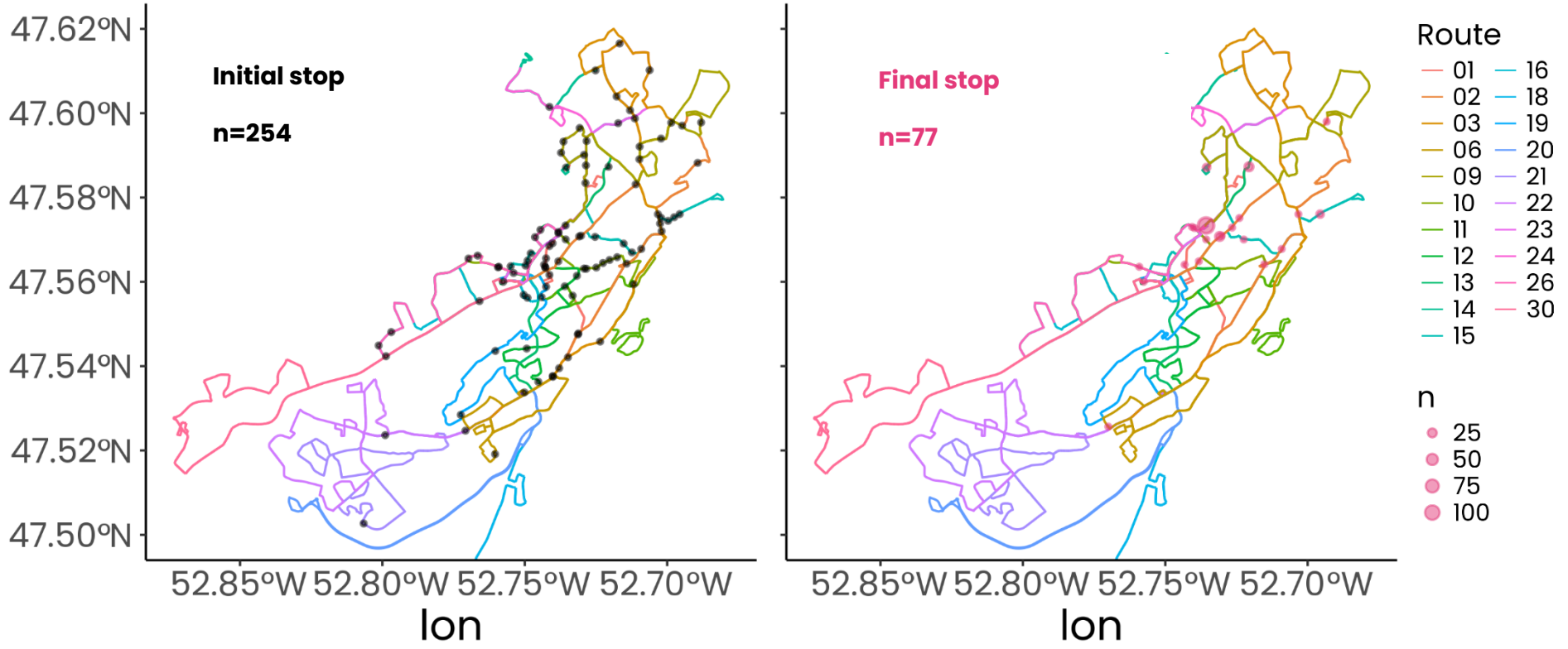
The frequency with which individual transit stop occurred as initial and final stops when commuting for work and school are shown below (Figure 15).[d]

[c] Don't know/Prefer not to answer and Metrobus on demand not shown.

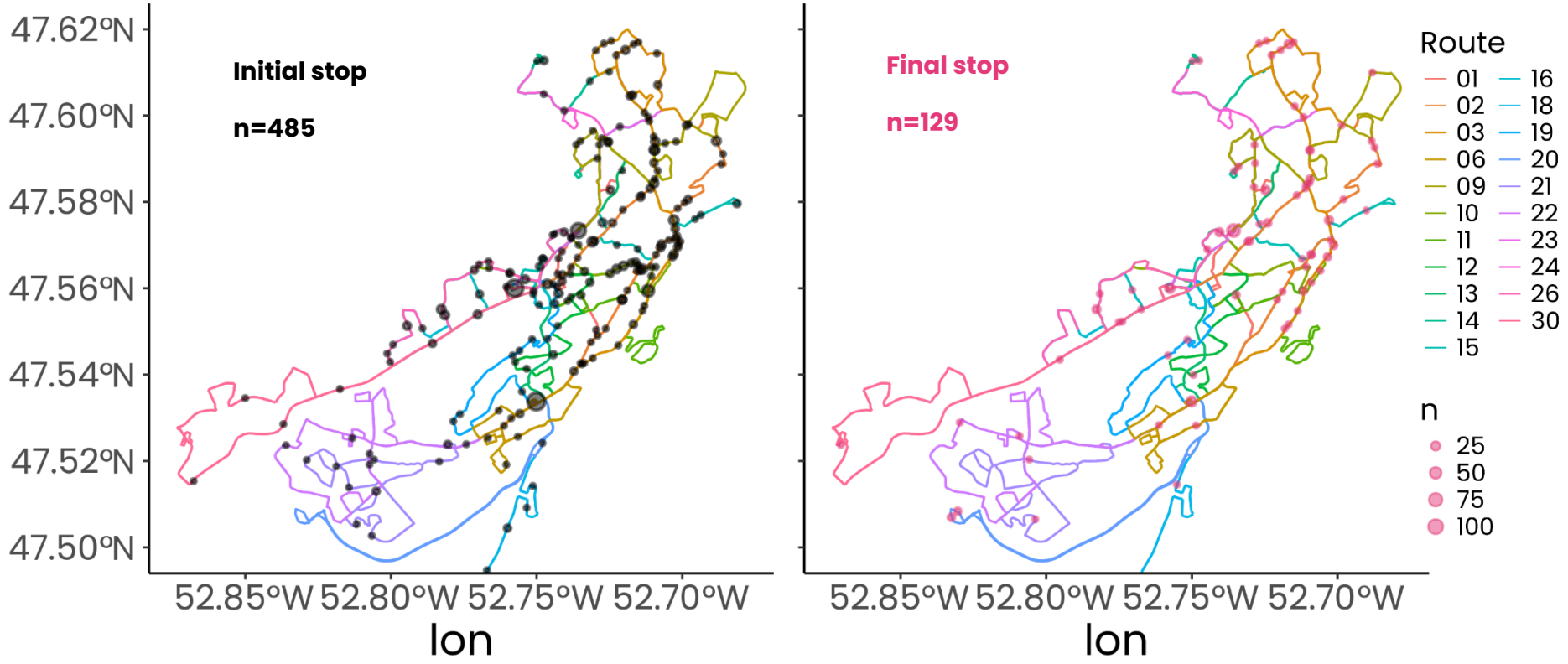
[d] There are 902 total Metrobus transit stops. Because all sample sizes fall well below this number, caution should be used when interpreting these results due to sparse sampling.

Figure 15. Initial and final bus stops used for school and work commutes.

School commute

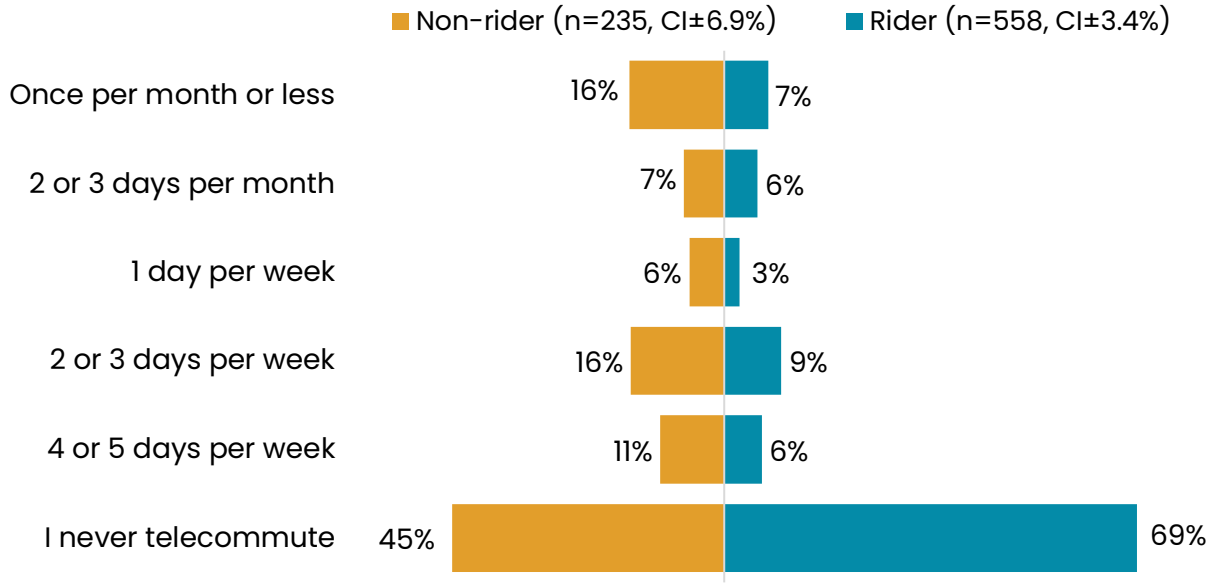


Work commute



About half (45%±6.9%, n=235) of non-transit riders indicated they never worked from home or telecommuted into their job. Among the remainder, just under four in ten did so for two to five days per week (Figure 16). Transit riders were less likely to telecommute (69%±3.4% never worked from home) and those that did, did so somewhat less frequently.

Figure 16. T5/T8. How often do you 'telecommute' and work from home rather than going to your usual workplace for your job?
Non-riders. SUBSET. Respondents that are working or self-employed (n=235, CI±6.9%)
Riders. SUBSET. Respondents that use transit (n=596[e], CI±3.4%)



System coverage

Current riders were asked what areas of the city they wished to travel to that they currently could not reach by transit (or was insufficiently serviced by current routes). Petty Harbour was the most frequently identified area and the one considered most important by the largest proportion of current riders (Table 8). However, The Battery,

[e] "Prefer not to answer" responses (n=38) have been excluded prior to analysis.

Mount Scio Road, and Thorburn Road (west of Goldstone Street) received only slightly lower ratings overall.

Table 8. T12. What areas of the city would you like to travel to/from by transit that do not currently have service, or have insufficient service? Please select all that apply. T12A. Which area is the most important one for you to be able to access by public transit?*

Location	Multiple mention (n=1406, CI±2.2%)	Most important (n=946, CI±3.5%)
Petty Harbour[f]	31%	11%
The Battery	29%	13%
Mount Scio Road	25%	11%
Thorburn Road (west of Goldstone Street)	24%	11%
Southlands	21%	7%
Brookfield Road/Heavy Tree Road	18%	4%
Southside Road	15%	2%
Castle Bridge	11%	1%
Clovelly Estates	11%	1%
Mount Pearl	3%	3%
Paradise	2%	3%
Conception Bay South	2%	2%
Airport Heights area	1%	1%
Kenmount Road	1%	<1%
Torbay	1%	1%
Other	12%	18%
No areas	1%	1%
Don't know/Prefer not to answer	33%	8%

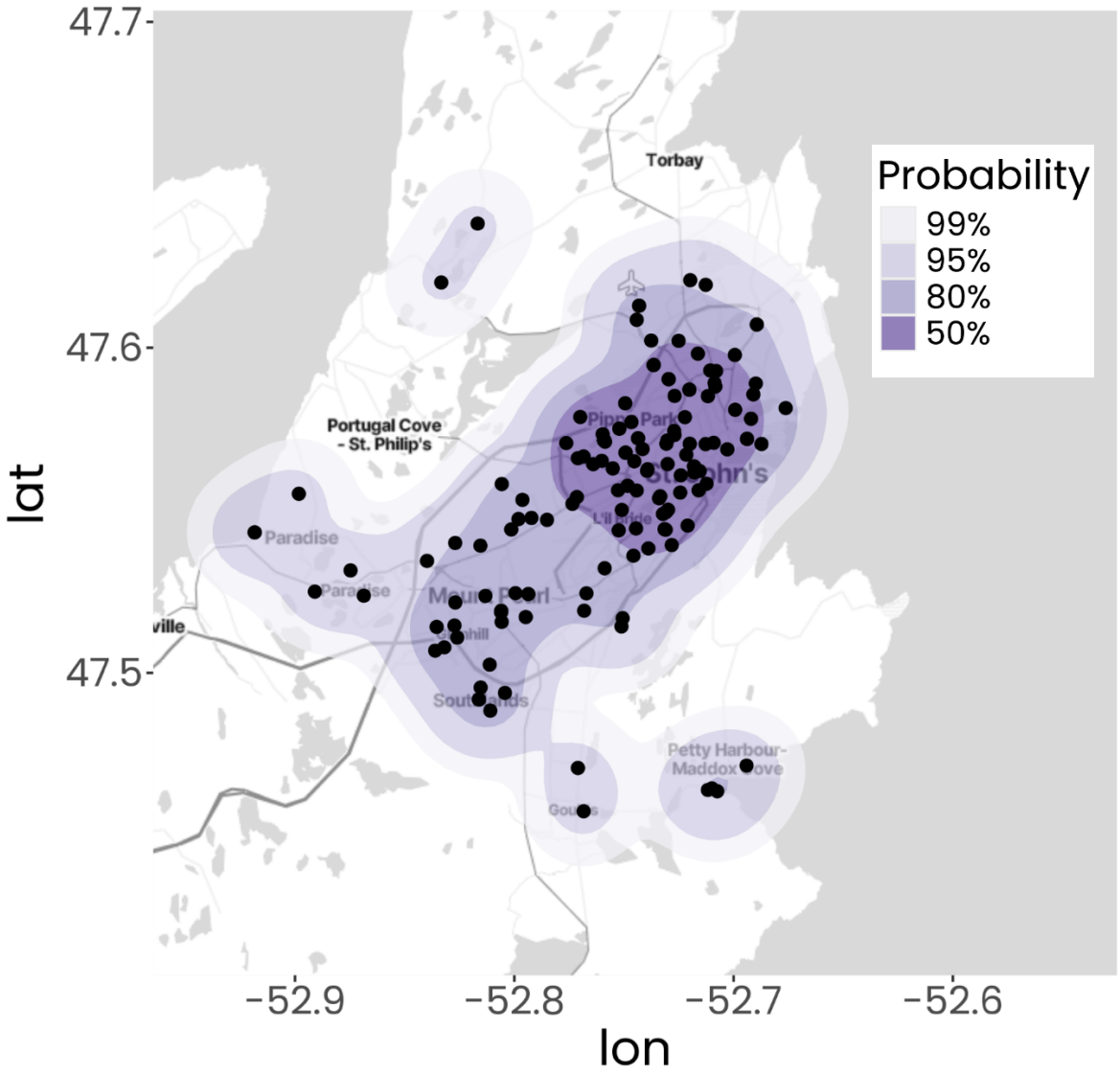
*If respondents provided more than one response, they were prompted to indicate the most important one. Locations in italics were specified through 'Other' responses, all other locations were presented as initial prompts.

[f] This response received such a much higher proportion of responses than would be predicted based on interest expressed through periodic requests received by Metrobus. This may be an effect of presenting it as an initial prompt that allowed multiple mentions. Notably, it is considered the most important destination by substantially fewer respondents.

A follow up question sought more information about the specific locations in the city that riders were trying to reach. Where possible with the information provided (n=181), addresses were reverse geocoded using the Google Maps API interface. The resulting coordinates are mapped and overlaid with a density plot below (

Figure **17**).

Figure 17. T12B. Highest density region map of requested new stops (n=181)



Analysis of recent ridership increases

02. Cross-jurisdictional insights

Table 9. Key insights: Cross jurisdictional.
Population growth is a key driver of transit ridership, particularly among newcomers to Canada.
The Bus Pass Program is a contributing factor to increased transit ridership.

Four comparator cities were chosen to examine their respective experiences and responses to increased transit ridership. The cities were chosen by MQO in consultation with Metrobus.

Statistics Canada identified an overall trend of reduced transit ridership relative to the period before COVID-19 in many Canadian cities, with most urban centres with at least 100,000 commuters experiencing ridership levels in 2022 well below those of 2016.[1] However, Windsor, ON and Saskatoon, SK were notable exceptions. Given they are similar in scale to St. John's, they were included in the jurisdictional scan. The city of Moncton was also included to serve as regional baseline and comparator who was not experiencing high transit ridership. Although Moncton was initially selected as a potential control condition, it is notable that the transit authority there has also reported recent increases in ridership and crowding.[14]

For each city, and Canada overall, demographic characteristics known to be relevant to understanding transit ridership are shown in Table 10.[9]

[9] Selected based on results of an analysis of 103 transit agencies in Canada between 2002 and 2016.[6]

Table 10. Comparison of demographic characteristics.[9–12]						
	Association with ridership	St. John's	Moncton	Windsor	Saskatoon	Canada
Demographic profile						
Population	↑	110,525	79,470	29,660	266,141	36,991,981
% 65 +	↑	19.7%	19.2%	18.6%	15.2%	19.0%
% Recent immigrants*	↑	2.4%	4.2%	3.8%	5.6%	3.7%
% Attending post-secondary	↑	57.1%	40.1%	48.7%	46.6%	50.2%
Median household income	↓	$75,000	$68,000	$70,000	$85,000	$73,000
Dwellings						
% Apartments	↑	37.0%	37.6%	27.0%	31.9%	34.4%
% Row house	↑	9.5%	2.2%	6.2%	6.4%	6.5%
% Single-detached house	↓	38.8%	39.8%	56.8%	50.5%	52.8%
% Renters		35.8%	41.5%	35.4%	32.5%	33.1%
Commuting						3.7%
% Work from home	↑	20.0%	20.9%	16.5%	17.1%	20.0%
% Commuting outside CSD	↓	9.4%	12.0%	17.0%	3.6%	22.1%
Main mode of commuting - Public transit	↑	5.3%	3.5%	3.5%	3.6%	7.7%
*Based on Statistics Canada data 2016-2021[5]						

Potential contributing factors

POPULATION GROWTH

Rapid population growth was identified as one of the possible causes of high ridership by customer support and engagement manager Cory Shrigley of Saskatoon Transit.[13] This sentiment was echoed by Angela Allain in Moncton, Codiac Transpo's director of public transit. She attributed ridership growth to Moncton's population boom, including an influx of newcomers to Canada and people leaving urban centres in other provinces as well as increased enrollment at some of the city's universities and colleges.[14]

Each of the comparator cities experienced population growth in excess of the national average between 2016 and 2021 with the exception of St. John's (Table 11).

Table 11. Population growth by CMA.	
CMA	Population growth from 2016 to 2021[15]
Canadian central municipalities (average)	5.5%
St. John's	2%
Saskatoon	7.7%
Windsor	5.7%
Monton	8.9%

However, it is notable that Paradise (population 22,957 in 2021), which is also served by Metrobus, grew by 7.3% from 2016 to 2021[9] and that in 2022, negative natural population loss in St. John's was offset by a spike in net in-migration (+3,759), creating a notable uptick in population for the St. John's CMA.[16]

NEWCOMER POPULATION

Evidence from a variety of sources confirms that newcomers to Canda are more likely to be transit users.[6–8,17,18] About one-half of all immigrants living in Moncton (48.4%), and almost one-third of the immigrant population St. John's (32.5%) and Saskatoon (31.2%) were admitted from 2016 to 2021 (Table 12).[19]

Table 12. Immigrant status by location.[5]			
	All Immigrants	Established Immigrants (prior to 2016)	Recent Immigrants (2016-2021)
Canada	23%	19.4%	3.7%
St. John's	4.6%	3.1%	2.4%
Moncton	8.7%	4.5%	4.2%
Windsor	23.3%	19.5%	3.8%
Saskatoon	18%	12.4%	5.6%

In Newfoundland, these trends have accelerated since 2021. The population of the St. John's CMA was estimated at 219,119 in 2022, a 2.3% increase from 2021 primarily due to gains in immigration (+2,170) and net non-permanent residents (+1,977).[20] The

population of Newfoundland and Labrador increased by 1,813 persons, or 0.3%, from July 1, 2023 to October 1, 2023, largely due to net gains in international migration (+2,635).[21]

Each of the comparator cities has a proportion of newcomers greater than the national average according to census data from 2021, apart from St. John's (Table 12). However, as noted above, there has been a marked increase in international immigration to St. John's since 2021. Although Moncton was initially selected as a potential control condition, it is notable that the transit authority there has also reported recent increases in ridership and crowding.[14]

The population trends and known pattern of increased transit usage among newcomers supports the interpretation that the newcomer population is a factor that is increasing transit ridership.

TRANSIT FARE PROGRAMS

The reduced fare policies across the comparator cities are summarized in Table 13 below.

Table 13. Comparison of reduced transit fare programs				
	St. John's	Moncton	Windsor	Saskatoon
Name	Bus Pass Program/Bus Pass	Community Transit Pass Program	Affordable Pass Program (APP)	Low-Income Bus Pass Program
Subsidy	Free bus pass	Single ride and 10-ride passes are sold at a 50% discount. These are available until the quarterly budget is exhausted. Most recently posted budget was $3300 (November 2023). This budget would provide just under 123 full month passes.	The APP covers 49% of the cost for a full-price 30-day Smart Pass, and registrants pay the remaining 51% at the time of purchase.	80% of the full cost fares for a 30-day pass.
Eligibility	People who qualify for Income Support who reside in, or move into, the areas of St. John's, Mount Pearl or Paradise, Youth receiving services from Youth Services Program , Seniors receiving Guaranteed Income Supplement.	Discounted passes are sold to charitable organizations, who determine how they are distributed.	Residents that are living with low income (Household income is less than Statistics Canada's Low Income Cut-off [LICO]), recipients of Ontario Works (if they are not provided a pass by Social Services), and Ukrainian visitors. Post-secondary students are currently not eligible for the APP.	Sliding income scale for households numbering from 1 ($22,926) to 7 ($60,670).
Funded By	Government of Newfoundland and Labrador and City of St. John's.	City of Moncton, Codiac Transpo, and United Way of Greater Moncton and Southeastern NB	City of Windsor and County of Essex	City of Saskatoon

St. John's is the only city to provide a transit pass entirely without cost. As can be seen in the trend data (see Model Predictions, pg. 35), the Bus Pass Program passes are being used and accounted for about a quarter (24%) of all rides during Q4 of 2023. The trend data suggests that the Bus Pass Program is a contributing factor to increased transit ridership.

Responses to high ridership levels

- Transit Windsor to add 18,000 more service hours with new and expanded routes[22]

03. Projected scenarios

Table 14. Probable ridership trends key insights.
The majority of transit riders intend to remain transit users within the next one or two years. Only a very small proportion of non-riders intend to begin using transit in that time frame. On demand bussing is the additional service most likely to increase transit ridership among riders and the second most likely to do so among non-riders.
Under three different population growth scenarios (low, medium, and high), transit ridership is expected to maintain its current levels or increase through 2026.

Probable ridership trends

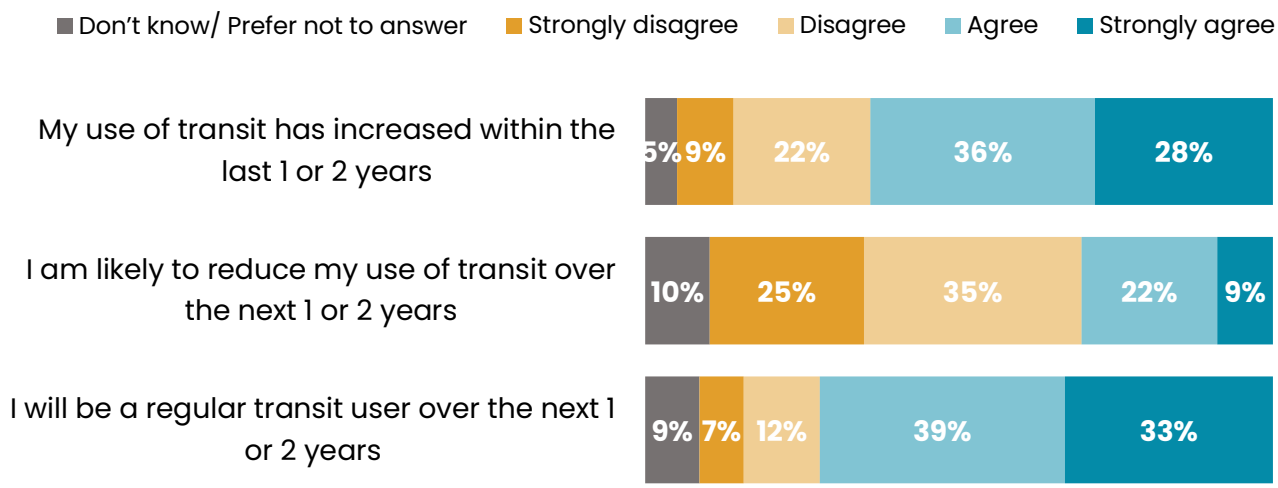
WHAT WE HEARD

When interpreting the stated preferences of survey participants, it is important to consider the possibility of 'hypothetical bias'. Hypothetical bias is the degree to which hypothetical or stated willingness to pay or engage with a service exceeds the real or behavioural willingness to pay, a phenomenon which has been well documented.[23,24] There are many factors that influence this difference and no fully general principle has been proven. However, a meta-analysis based on 77 studies has proposed that the average magnitude of this bias is approximately 21%.[24]

About two-thirds of current riders agree (64%±2.2% strongly agree + agree) that their transit usage has increased within the last two years and almost three quarters intend to remain regular transit users within the next one or two years (72%±2.2% strongly agree + agree) (Figure 18). About one-third of riders agree (31%±2.2%

strongly agree + agree) that they are likely to reduce the frequency with which the use transit in the next one or two years. Taken together, these facts suggest that current ridership levels are unlikely to drop significantly within the next two years at least.

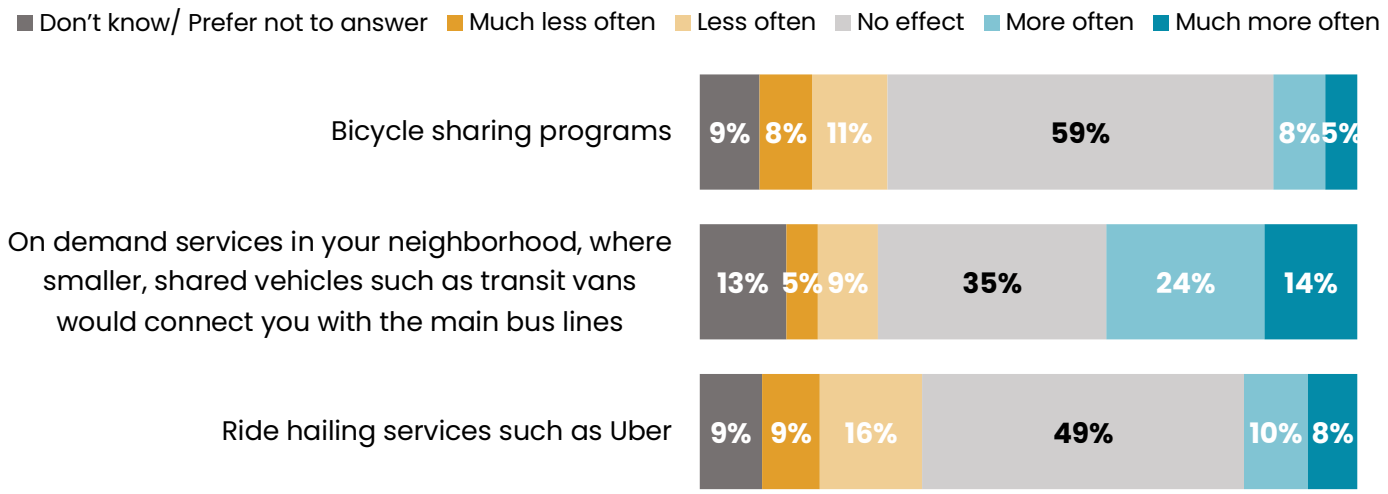
Figure 18. T11a. Please rate your agreement with the following statements...
Riders (n=1404, CI±2.2%)



The addition of bicycle sharing programs or the entry of ride-sharing programs into St. John's were likely to increase transit usage for only a small number of current riders (13%±2.2% and 18%±2.2% would take transit more often or much more often respectively) (Figure 19). On demand services were somewhat more likely to increase ridership among current riders (38%±2.2% would take transit more often or much more often).

Figure 19. T11-1A. How would the presence of the following services in St. Johns affect your use of public transit? Would you take transit...
Riders (n=1404, CI±2.2%)[h]

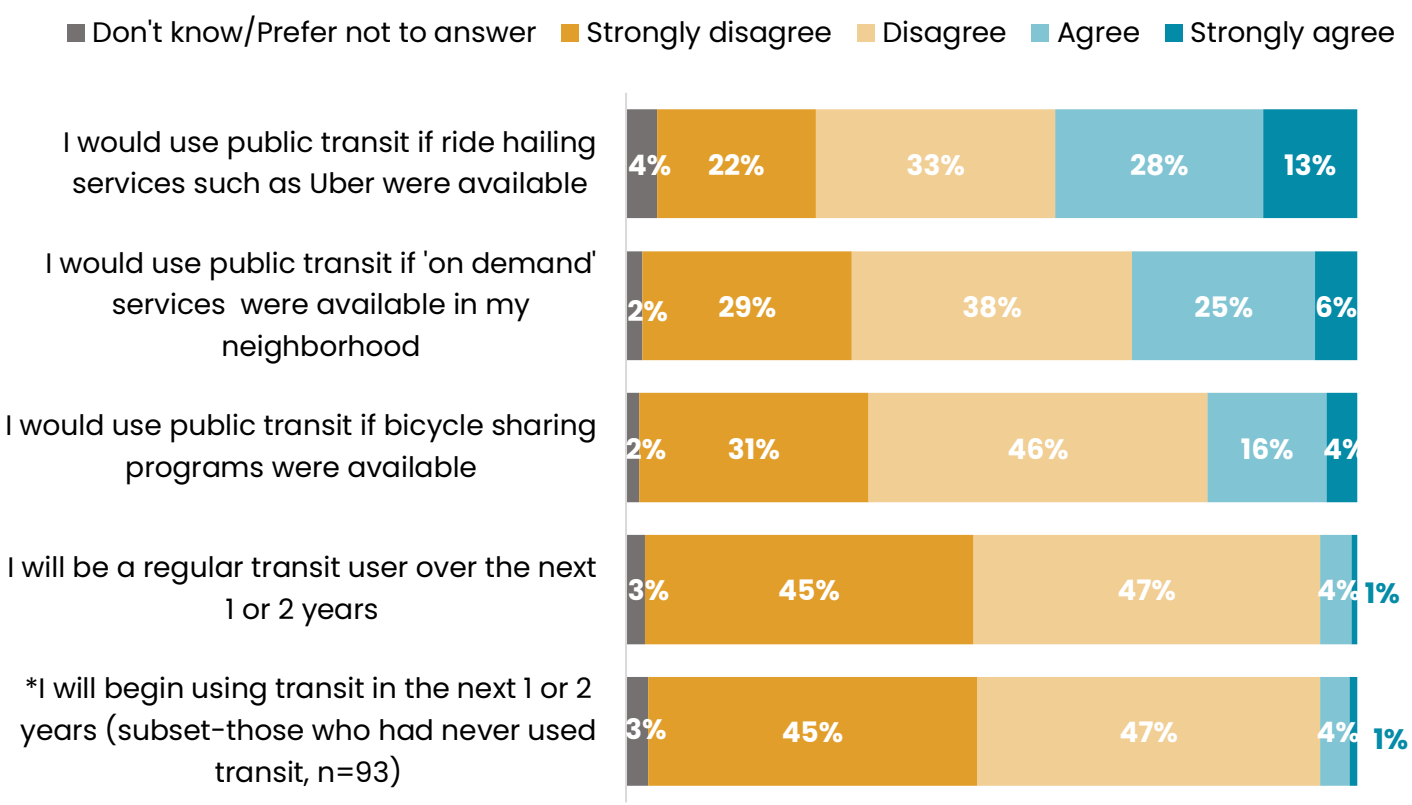
[h] The question did not explicitly note that ride sharing services themselves are not considered part of the public transit system. This should be interpreted with that caveat in mind.



Non-riders were very unlikely to consider becoming regular transit users in the near future, with only 5%±5.3% agreeing (strongly agree + agree) they were likely do so in the next two years (Figure 20). About one in five agreed that they would use transit if bicycle sharing programs were available and about one-third would so if on-demand services were available in their neighborhood or if ride-hailing services were present.

Figure 20. T8. Please rate your agreement with each of the following statements…
Non-riders (n=401, CI±5.3%)[i]

[i] The question did not explicitly note that ride sharing services themselves are not considered part of the public transit system. This should be interpreted with that caveat in mind.



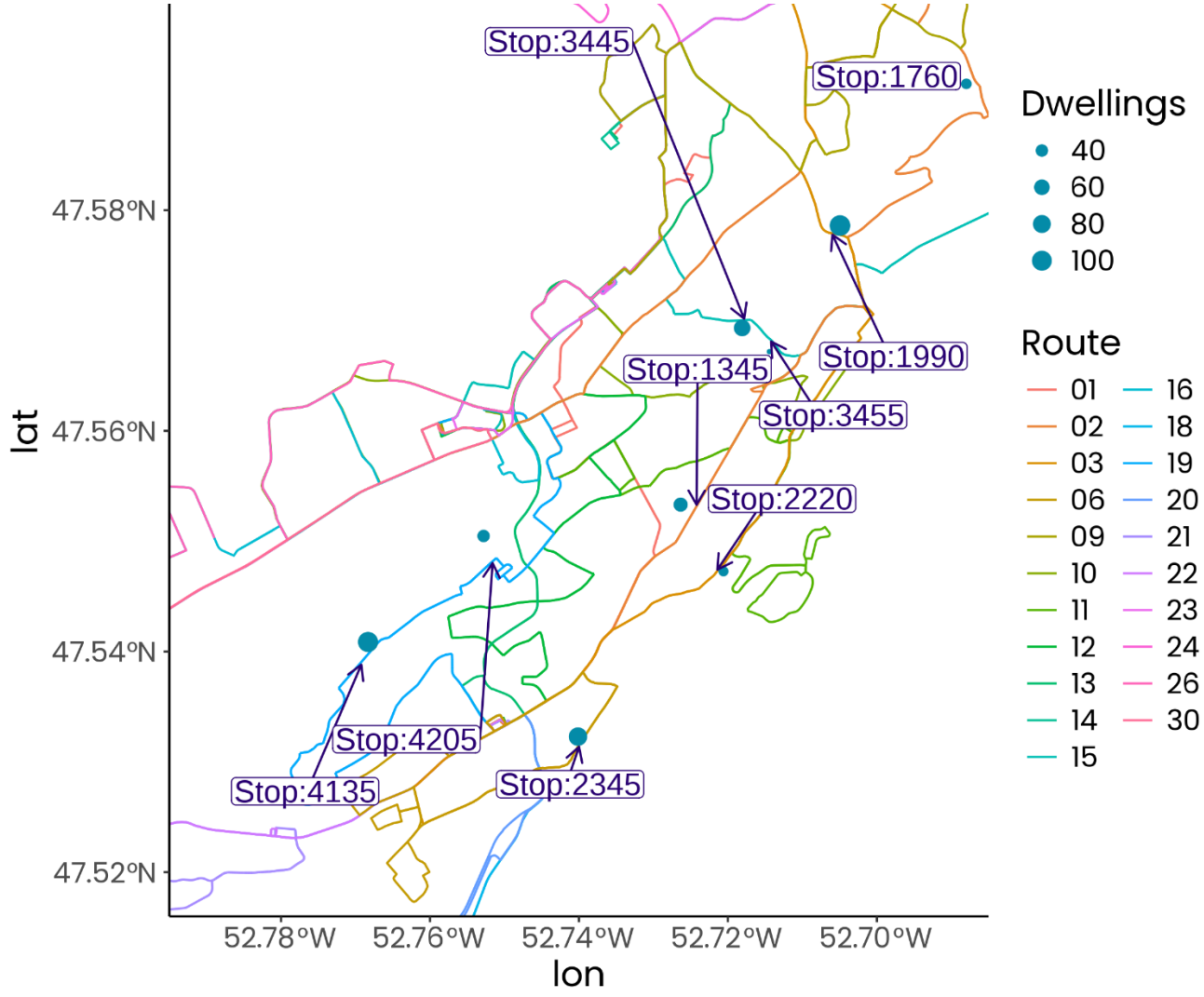
BUILT ENVIRONMENT

Previous empirical results have shown that a 10% increase in the numbers of apartments and row houses is associated with an approximate increase in transit ridership of 5% and 3%, respectively.[6] To flag areas where densification could increase demand for transit, planned developments in St. John's of more than 20 units are tabulated in Table 15 and their locations are mapped in Figure 21.

Table 15. Planned developments greater than 20 units.			
Address	New Units	Lifecycle[j]	Source
50 Bennett Av.	50 dwelling units, a four-plex and three apartment buildings	Site plan under review	Planning St. John's
20 George's Pond Rd.	40 apartments and 62 townhouses	Land Use Report (LUR) Completed	Planning St. John's
20 Janeway Pl.	32 units across 4 two-storey apartment buildings	Amendment to Municipal and Provincial Affairs for registration	Planning St. John's
57 Margaret's Pl.	60 apartments and 8 townhouse dwellings	Application to Regular Council Meeting	Planning St. John's
4 Merrymeeting Rd.	22 dwellings in two apartment buildings	Amendment sent to Municipal and Provincial Affairs for provincial review	Planning St. John's
34 New Cove Rd.	108 new one- and two-bedroom units along with a parking level	Application to Regular Council Meeting	CBC News; Planning St. John's
188 New Pennywell Rd.	40 to 52 units in four townhouse clusters/buildings	Application to Regular Council Meeting	Planning St. John's
7 Waterford Bridge Rd.	30 units across 3 apartment buildings and a four-plex	Application to Regular Council Meeting	Planning St. John's
214 Waterford Bridge Rd.	85 dwelling units, four-storey apartment building	Public comment period open	Planning St. John's

[j] Lifecycle steps occur in this order: 01. Application to Committee of the Whole. 02. Application to Regular Council Meeting. 03. Heritage and Land Use Report (LUR). 04. Public comment period open. 05. Public Meeting. 06. Amendment to Council for Adoption-in-Principle. 07. Amendment sent to Municipal and Provincial Affairs for provincial review. 08. Amendment to Council for Adoption and appointment of Commissioner for Public Hearing. 09. Commissioner's Report and Amendment to Council for Approval. 10. Amendment to Municipal and Provincial Affairs for registration. 11. Notice of registration placed in the NL Gazette

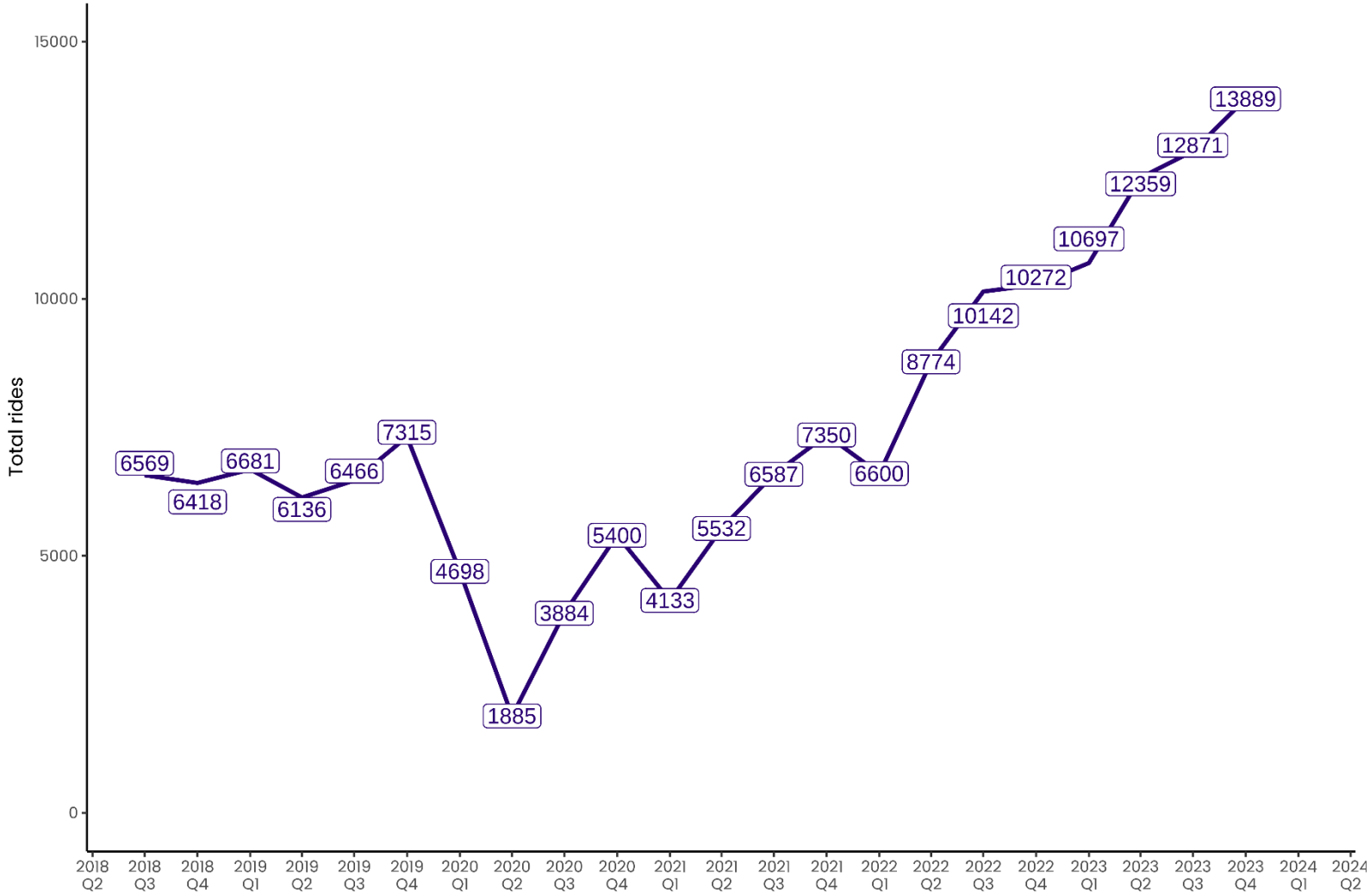
Figure 21. Map of planned developments greater than 20 units. Labels represent the ID of the nearest transit stop.



MODEL PREDICTIONS

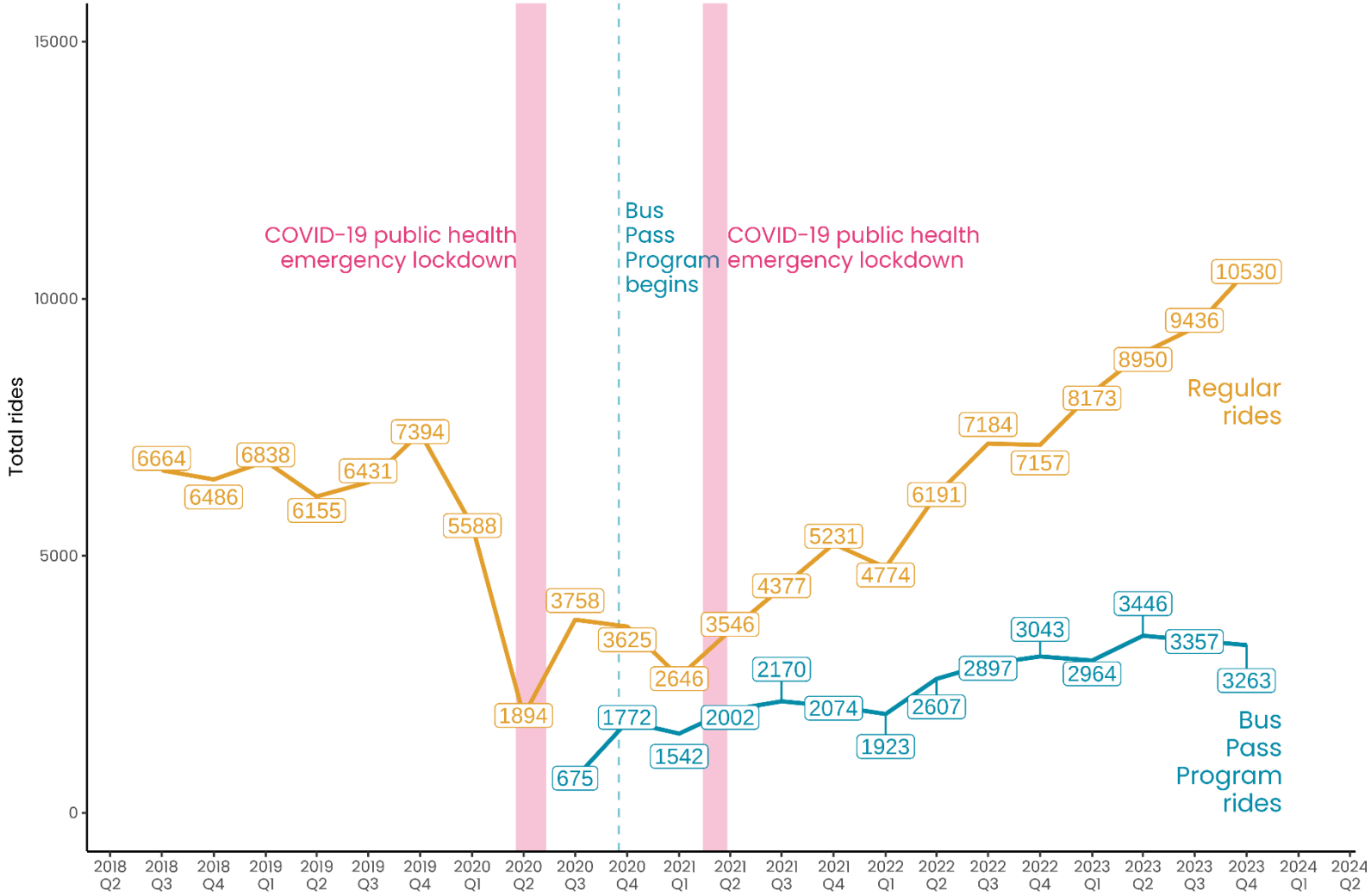
MQO received anonymous, daily ridership data from Metrobus covering the period from 2018-09-01 to 2023-12-31. Fitting a curve to the number of rides per day suggested that there was an increasing trend present within the data over time (Figure 22).

Figure 22. Total rides by quarter. Labels represent mean daily rides by quarter.



To correctly interpret this trend, it is important to consider the potential influence of the COVID-19 related lockdowns as well as the introduction of the Bus Pass Program (Figure 23).

Figure 23. Total riders by quarter & Bus Pass Program. Labels represent mean daily rides by quarter.

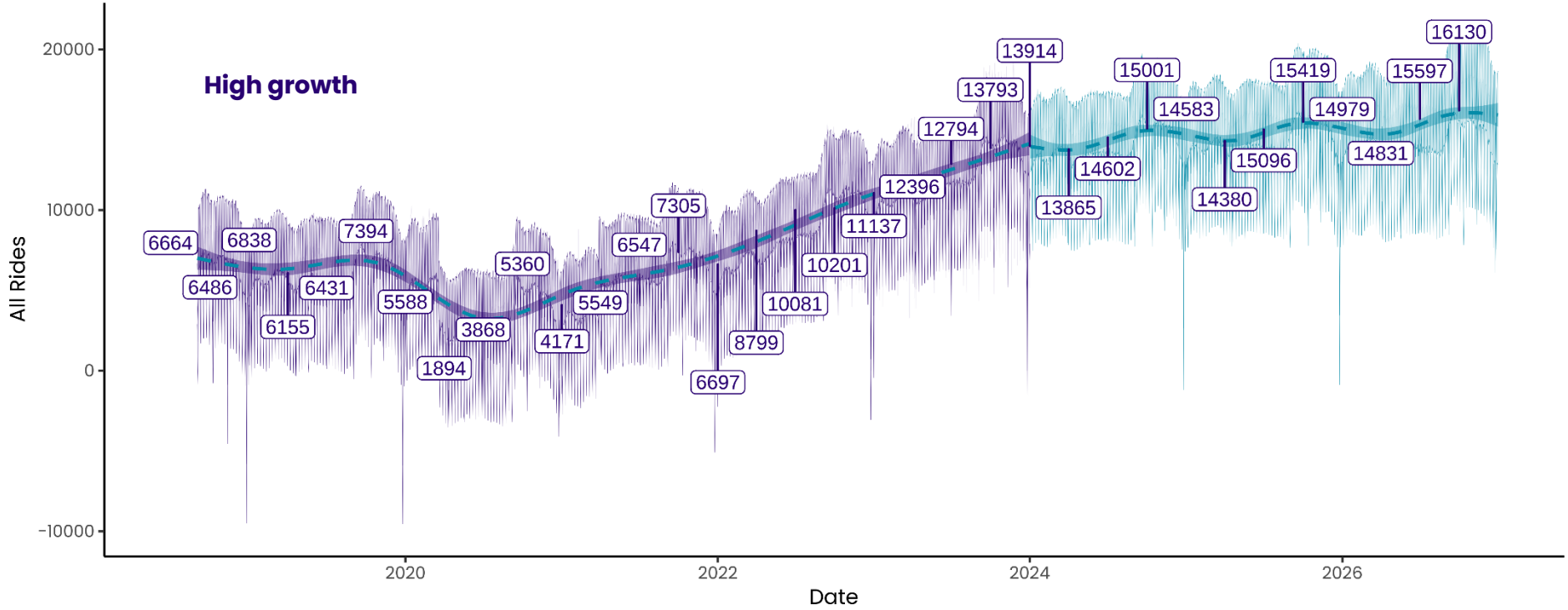


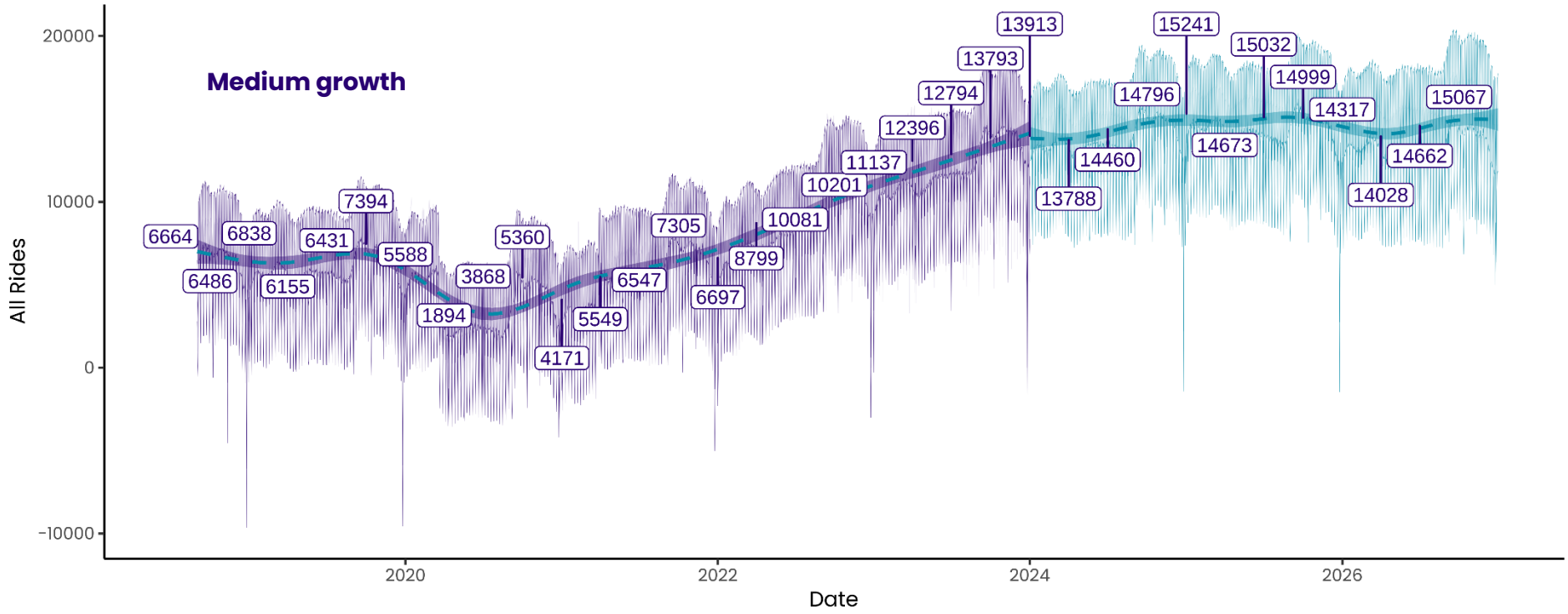
To examine this data a growth trend was fit to the time series using a decomposable additive model.[25] This is a standard approach to modelling time-series data that accounts for non-linear trends due to, for example, seasonal variation which uses flexible changepoints to model non-linear patterns. Three different growth scenarios were modelled, based on the low, medium, and high growth projections developed by the Government of Newfoundland and Labrador, Department of Finance.[16] The medium growth scenario is the one cited as the most probable.

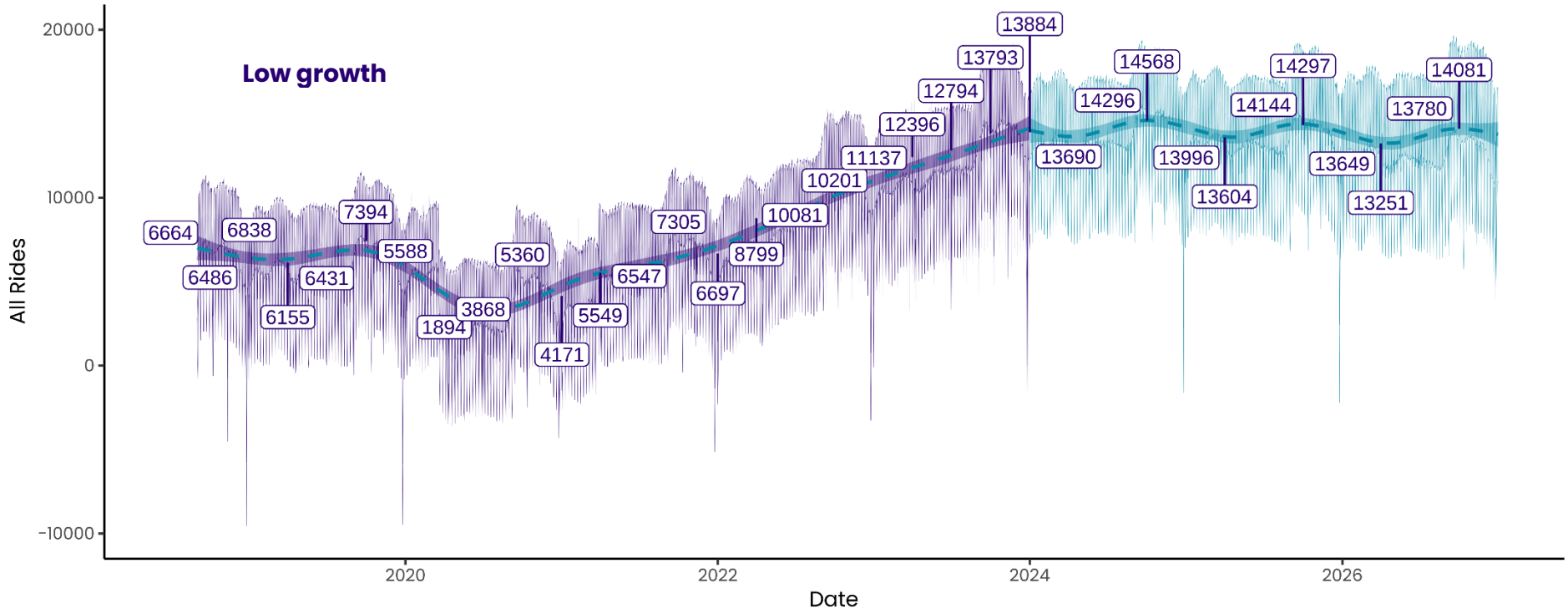
In addition to the ridership time series, each model included additional regressors to account for Canadian holidays, net population change, percent of the population over 65, percent of the population who are newcomers to Canada, a lockdown variable (1 when between March 18, 2020 and March 27, 2021 and 0 elsewhere), and a dummy variable tracking the start of the Bus Pass Program.[k] After fitting the models, a prediction was generated through the end of 2026 (Figure 24).

[k] These were selected based on a comprehensive analysis of predictors of transit ridership in Canadian cities.[6]

Figure 24. Ride projections under three different population growth assumptions. Labels are mean daily rides by quarter.



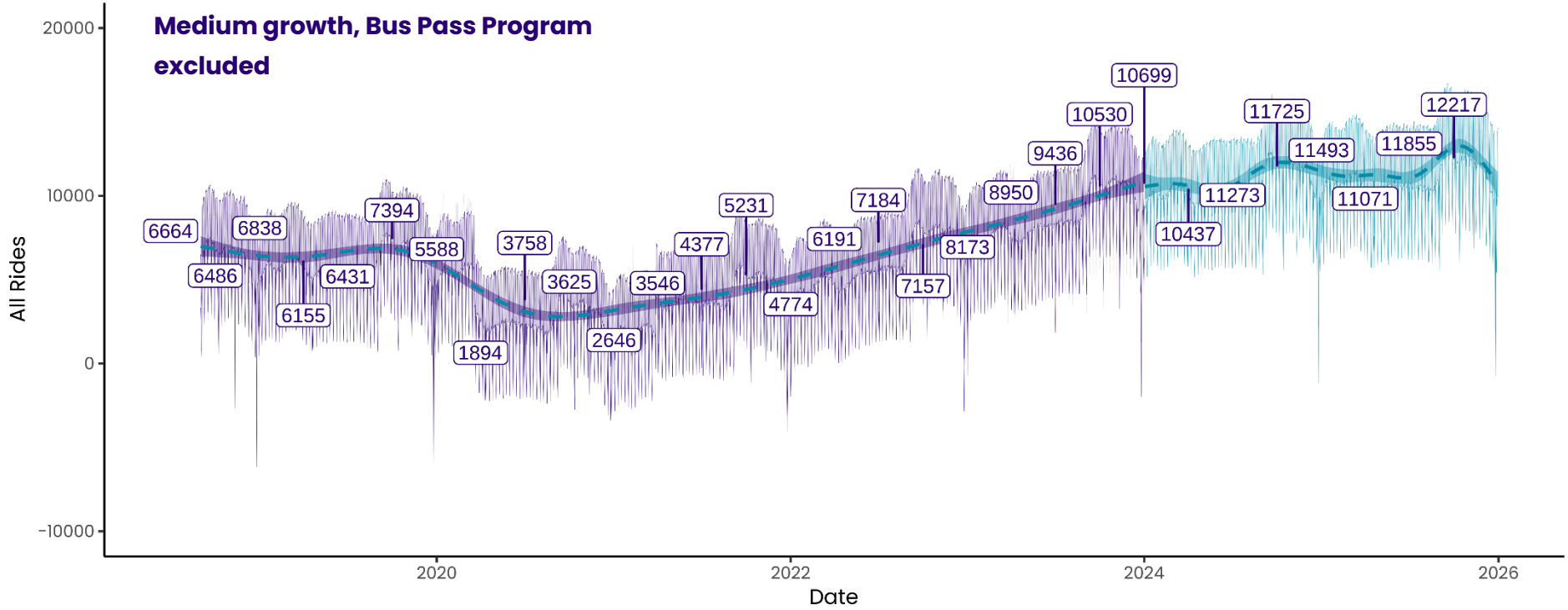

Medium growth
All Rides
Date
20000
10000
0
-10000
2020
2022
2024
2026
6664
6838
6431
7394
5588
6486
6155
1894
3868
5360
4171
5549
6547
7305
6697
8799
10081
10201
11137
12396
12794
13793
13913
13788
14460
14796
14673
15241
15032
14999
14317
14028
14662
15067


Low growth
All Rides
Date
20000
10000
0
-10000
2020
2022
2024
2026
6664
6838
6486
6431
6155
7394
5588
1894
3868
5360
4171
5549
6547
7305
6697
8799
10081
10201
11137
12396
12794
13793
13884
13690
14296
14568
13996
13604
14144
14297
13649
13251
13780
14081

The medium and high growth models predict continued growth in ridership, although not as rapidly as happened in 2023 – suggesting that daily ridership should reach an average of 15,067 and 16,130 per day (respectively) by the end of 2026. The low growth model results in a relatively flat trend, which is predicted to reach an average of 14,081 rides per day by the end of 2026.

A final model was fit which excluded all Bus Pass Program rides (Figure 25). This serves to demonstrate that ridership growth is not dependent solely on the addition of Bus Pass Program riders and a moderate upward trend in ridership is expected independent of that program with the assumption of medium population growth.

Figure 25. Ride projections under medium population growth assumption, Bus Pass Program excluded. Labels are mean daily rides by quarter.



Strategic considerations

BUS PASS PROGRAM

- The Bus Pass Program is associated with increased ridership. However, the current analysis does not allow us to distinguish whether this ridership results from new riders or increased frequency of use among those who were already riders but increased their usage upon receiving a pass through the program.
- Whether or not funding of the Bus Pass Program continues will have important implications for strategic planning.
- However, moderate growth in transit ridership is predicted independent of the continuation of the Bus Pass Program.

NEWCOMERS

- Newcomers to Canada are strongly contributing to the observed ridership trends.
- Practices that support newcomers use of transit are important considerations. Examples would include:
    - Providing signage and information using iconography or symbolic representation rather than written text where possible
    - Providing resources in multiple languages where possible

Risk analysis and mitigation strategies

POSSIBLE OVERSAMPLING OF NEWCOMERS

Risk:

- Statistical bias in the survey sample may have inflated the estimate of the proportion of Newcomers using transit. The current research suggests this group is having an important effect on ridership. An accurate picture of their transit usage will be an important consideration for strategic planning.

Mitigation:

- Consider other sources of information or additional research that could provide evidence to confirm or disconfirm this possibility

There were 551/1404 (39%) recent immigrants in the current riders sample. Approximately 3.3% of St. John's population in 2022 were recent immigrants, up from 1.4% in 2021.[16,20] On the assumption that this group used transit at the same rate as the general population, we would expect that less than 3.3% (given that transit usage among newcomers would not be 100%) of a random sample of

transit riders would be newcomers, approximately. As previously mentioned, the literature supports the notion that that newcomers to Canda are more likely to be transit users.[6,17,18] However, the observed proportion of 39% far exceeds what we should expect by random chance even if all newcomers used transit.[l] These results should be considered with the caveat that the riders sample was not randomly selected, and it is possible that other factors are also influencing this number. Things to consider when interpreting the high proportion of recent immigrants in the sample include:

- Are recent immigrants being directed to transit or being provided with financial or other forms of support when using transit, potentially by agencies assisting with settlement? For example, Government Assisted Refugees (GARs) receive $75 per month towards transit passes under the Resettlement Assistance Program[m], the 'Welcome to Canada' guide provided by Citizenship and Immigration Canada discusses transit options and the Association for New Canadians NL offers support related to navigating public transit routes.[27–29]
- Individuals paying cash fares were not sampled. Are recent immigrants more likely to be pass holders than other transit riders?

RAPID POPULATION GROWTH DUE TO DEPARTMENT OF IMMIGRATION, POPULATION GROWTH AND SKILLS TARGETS

Risk:

- Rapid population increases due to high immigration rates may greatly increase demand for transit

Mitigation strategies:

- Closely monitor immigration and progress towards Department of Immigration, Population Growth and Skills targets
- Initiate a discussion around the appropriate strategic response with municipal government and other partners now to ensure service levels are maintained

The Department of Immigration, Population Growth and Skills identified attracting newcomers as one of its three key priority areas to help meet the social and

[l] A 95% credible interval that estimates the population proportion of newcomers based on a random sample of this size is (36.7%, 41.8%). Stated another way, there is extremely strong evidence that a 39% sample proportion would not occur if the true population proportion was 3.3% (BF = 961).

[m] This group was a small proportion of immigrants each year, between 75 and 160 GARs immigrated to Newfoundland each year from 2018 to 2023.[26] In 2022, they represented ~4% of newcomers.

economic needs of the province: “Attract newcomers to the province to support inclusive communities, population growth, and job market demands in the province.”[30]

In 2023 the Department announced a doubling of yearly immigration spaces (from 1,500 to 3,050 people) which represents the potential for 6,700 newcomers nominated annually with families included. They have also set out the explicit targets below (Table 16). These results were not modelled because they far exceed historical rates as well as the provincial projections provided by the Department of Finance. Thus, if achievable, we must assume it will be a process substantially different than what would be modeled with historic data. Nonetheless, this should be monitored closely as it would be expected to have a large impact on ridership. The transit riders survey included 39% newcomers to Canada with a credible interval of ± 2.2 percentage points. If a similar proportion of newly arriving immigrants used transit, this could potentially add several thousand riders over that period.

Table 16. Department of Immigration, Population Growth and Skills targets.				
Date	Targeted annual immigration rate[30]	Credible interval for newcomer ridership	Projected additional riders based on survey proportions of newcomers	High population growth estimate (Dept. of Finance)[25]
2023	3950	37%-41%	(1461-1619)	4900
2024	3950	37%-41%	(1461-1619)	2400
2025	4500	37%-41%	(1665-1845)	2233
2026	5100	37%-41%	(1887-2091)	2066

RIDERSHIP MAY DECLINE DUE TO 'TRAVEL ASSIMILATION'

Risk:

- Newcomers to Canada are likely to decrease their use of transit over time, decreasing demand for transit

Mitigation strategies:

- If the net rate of foreign immigration remains high, this should not greatly impact planning as high transit-using recent arrivals will replace those who are reducing their usage
- If the rate of immigration drops significantly, however, long term planning should account for the possibility that transit demand would be reduced within the few years following that shift

Immigrants tend to use public transit to commute to work more frequently when they are new to Canada (independent of other factors such as age and income), but this rate declines the longer they reside in Canada.[7] This process is referred to as travel assimilation and has been observed in numerous nations across many studies.[8]

This aligns with results from the riders survey. Newcomers were more likely to reduce their transit use in the short term (28%±2.2% vs. 17%±5.3% agree [*BF* = 18] and 12%±2.2% vs. 7%±5.3% [*BF* = 8] strongly agree with question *T11b. I am likely to reduce my use of transit over the next 1 or 2 years*) and over half of those asked intended to purchase a vehicle within the next two years (*D7A. Are you planning to buy or lease a private car or vehicle within the next 2 years? SUBSET: Respondents who`s*

household does not have a private vehicle [n=853] 55%±2.8% of newcomers said yes vs. 19%±2.8% of non-newcomers [*BF* = 125]).

Appendix A

04. Methodology

Statistical analyses

Bayesian Credibility Intervals (CI)

To calculate an accurate margin of error, the probability of participation in the survey for each member of the survey must be known. To use classical margins of error for online polling, one would be forced to assume non-response was completely random, or that the effect of omitting these non-responders would be so small that it could be functionally ignored. However, we know that is not the case and there are many well documented sources of *non-response bias* and *coverage bias* (most notably, not all individuals have internet access).

Unlike a margin of error, Bayesian credibility intervals generalize from a sample to a population and the probabilities of selection are not required to calculate these values.[31] As an added benefit, they have a straightforward interpretation. A 95% credible interval means that the probability that the estimated value lies within the stated interval is 95%, given the evidence provided by the observed data.

Unless otherwise noted, 'CI' represents a 95% credible interval throughout this report.

Bayes Factor

A Bayes factor (BF) is the ratio of the likelihood of a given hypothesis to the likelihood of another (conventionally expressed as H0 and H1). It can be interpreted as a measure of the strength of evidence in favor of one theory over another. Although context matters, a general guide to the interpretation of BF has been suggested as shown in Table 17.[32]

Table 17. Interpretation of Bayes factors.	
BF	Provides....
> 100	Extreme evidence for H1
30 – 100	Very strong evidence for H1
10 – 30	Strong evidence for H1
3 – 10	Moderate evidence for H1
1 – 3	Anecdotal evidence for H0
1	No evidence
1/3 – 1	Anecdotal evidence for H0
1/3 – 1/10	Moderate evidence for H0
1/10 – 1/30	Strong evidence for H0
1/30 – 1/100	Very strong evidence for H0
< 1/100	Extreme evidence for H0

Current riders survey

- Sample: N=1,404. 20,091 email addresses were provided to MQO by Metrobus from their database of pass purchases. Each participant was sent a unique link by email, with two, evenly spaced reminder emails.
- Field operations were conducted from Dec 19, 2023 to Jan 13, 2024.
- An optional prize draw was offered for participation.

General population survey

- Sample: N=401. A random sample of cell (pulled from MQO's cell phone number database) and landline numbers (pulled from MQO's ASDE Survey Sampler[n] software). The region for landlines was restricted to the St. John's Census Metropolitan Area. Participants were screened for age (>=15), region (postal code in Metrobus service areas), and had not taken transit with the last 4 months.
- Field operations were conducted from Jan 2, 2024 to Jan 13, 2024. Age and gender were balanced to match the general population and weighted where necessary.
- An optional prize draw was offered for participation.

[n] ASDE Survey Sampler Software: http://surveysampler.com/samples/sampling-software/

Jurisdictional scan

- Four comparator cities were chosen to examine their experiences and responses to increased transit ridership. The cities were chosen by MQO in consultation with Metrobus. Statistics Canada identified an overall trend of reduced transit ridership relative to the period before COVID-19 in most Canadian cities, with most urban centres having at least 100,000 commuters experiencing ridership levels in 2022 well below those of 2016.[1] However, Windsor, ON and Saskatoon, SK were notable exceptions. Given they are similar in scale, they were included in the jurisdictional scan. The city of Moncton was also included to serve as regional baseline and comparator. Although Moncton was initially selected as a potential control condition, it is notable that the transit authority there has also reported recent increases in ridership and crowding.[14]
- Documents were collected by systematic search of municipal websites and online keyword search (Table 18).

Table 18. Jurisdictional scan documents.			
Document Name	**Document Type**	**Date**	**Summary**
St. John's, NL			
What We Heard Metrobus Accessibility Plan Survey	Project overview	June 2023	This document summarizes key findings from the Metrobus Accessibility Plan Survey, focusing on barriers faced by people with disabilities in using public transit. While most respondents did not report obstacles, the document highlights specific instances where barriers were identified. The information will guide the Metrobus Accessibility Advisory Committee in evaluating and making decisions to enhance services and address customer needs.
How does Metrobus Transit compare to other Canadian transit systems	Statistics Insight	2022	The insights highlight comparisons of various metrics such RC Ratio, Revenue/Revenue Vehicle Hour, Rides/Capita, Average Adult Cash Fare of Metrobus Transit and national average. It also includes ridership information of Metrobus Transit for the year 2022
Executive Summary Report – Regular October 2023	Report	Oct 2023	This summary report includes details on finance, human resources, maintenance, operations, Gobus and marketing & information services of Metrobus Transit for the month of Oct 2023. Ridership: - 67% of pre-pandemic levels - Passengers per hour – 3.1 - Ride duration – 16.8 minutes - Shared ride percentage – 47.8% - Ridership on Metrobus – 2,983
City of St. John's – Transit Service Review	Report	Nov 2019	Dillon Consulting reviewed St. John's transit services, aiming to enhance efficiency and meet future challenges. Metrobus, serving St. John's, Mount Pearl, and Paradise, faces challenges in route design due to historic road networks. GoBus provides specialized transit for 1,600 registered customers, operated by MVT Canada. The peer review indicates that Metrobus operates shorter hours and has lower ridership efficiency compared to peers. GoBus, while offering extensive service, has lower productivity and higher municipal contribution per capita than its peers.
Public Transit Infrastructure Investments Announced for St. John's	News Article	April 2023	St. John's and the Canadian government are investing $27.8 million to upgrade public transit, including eight hybrid buses for sustainability and wheelchair accessibility. The plan also involves constructing 5 km of shared-use paths, like the Kelly's Brook route,

Table 18. Jurisdictional scan documents.			
Document Name	**Document Type**	**Date**	**Summary**
			to encourage healthier and more accessible travel. This initiative underscores a commitment to economic growth, community resilience, and enhancing residents' quality of life.
Saskatoon, SK			
Saskatoon Transit Annual Report 2022	Annual report	2022	The 2022 Saskatoon Transit report stated a 10.40 million rides using formula-based ridership on Fixed-Route Transit, with approximately 4.90 million using electronic-based ridership. This records over 350,000 hours of services under an operating budget of $55.3 million. The report also Provides data on: -FTE between 2018-2022 -Trips, services, demographics -Ridership data
Electric Bus Trial	Project Overview	Oct 2020 -Sept 2021	The info card provides details on the 1-year electric bus trial plan and budgets.
Bus Rapid Transit: Moving People Forward	Project Overview	June 2020	Saskatoon is implementing a Bus Rapid Transit (BRT) system approved in April 2019 to address the city's growing transportation needs. BRT focuses on reliability by optimizing routes, reducing stops, and offering dedicated lanes. The system aims to attract more transit users, alleviate road congestion, and reduce carbon emissions. The final stages of design and development are underway. The BRT service is expected to launch in 1st June 2025
A population boom in our city is putting a strain on the transit system. How does Saskatoon Transit plan to fix it?	CBC interview	Dec 2023	City acknowledges ongoing issues with overcrowded buses passing stops, especially affecting students in new neighborhoods heading to high school. Candice Lipski interviews Mike Moellenbeck, director of Saskatoon Transit, to discuss the problem and potential solutions. Number of buses in service was considered a key issue as well as increased population growth. Routes that service schools most impacted. Long term strategy involves fleet renewal.
$152M in combined spending announced for rapid transit, new leisure centre in Saskatoon	News Article	Nov 2023	Saskatoon approves a $152 million bus rapid transit system with federal, provincial, and municipal funding. The project includes 55 new buses, infrastructure improvements, and a new east side leisure center, showcasing collaborative efforts to enhance public transit and community amenities.
Saskatoon Transit outlines strategy to tackle bus overcrowding	News Article	Jan 2024	Saskatoon Transit tackles bus overcrowding, particularly impacting students in new areas.

Table 18. Jurisdictional scan documents.			
Document Name	**Document Type**	**Date**	**Summary**
			Regular reviews, data analysis, and input from student unions aim to address high-traffic route issues. Unexpected population growth in 2023 strained services, leading to ongoing efforts to improve, including fleet upgrades and collaboration for route planning.
Windsor, ON			
Transit Windsor – 2019 Transit Master Plan	Plan Overview	2019	Transit Windsor's outdated master plan, "The Way Forward," needs an overhaul due to changes in technology, societal values, and the local economy. The new plan, "More Than Transit," acknowledges these shifts and aims to address challenges in the existing downtown-focused transit network, including low frequencies during peak periods. The goal is to set ambitious targets and leverage contemporary tools to enhance effectiveness and convenience, aligning with the evolving community's needs.
On Demand Transit Strategic Assessment Final Report	Report	Sept 2021	Transit Windsor is assessing On Demand transit service options to qualify for COVID-19 recovery funding in Ontario. The report aims to set principles, evaluate suitable options, propose a short-term pilot, plan for integration with existing services, and establish success metrics. The goal is to meet funding requirements and guide future transit enhancements.
Transit Windsor experiences bus driver shortage	News Article	Oct 2023	Transit Windsor faces a 10% bus driver shortage, relying on overtime due to U.S. Department of Transportation regulations, including drug testing. Overtime raises sustainability and fatigue concerns, with factors like increased ridership, selective hiring, non-competitive wages, and safety fears contributing to the shortage.
Moncton, NB			
Active Transportation Plan Phase Two Report	Report	May 2022	Moncton's Phase Two Active Transportation Plan aims to enhance pedestrian and cycling connections, building on the 2002 Phase One. It seeks to improve safety, access, and the overall experience, addressing network gaps and incorporating best practices. The plan engages stakeholders through two rounds of community consultation, emphasizing user experiences and needs. The proposed network and sidewalk approach received positive feedback, emphasizing safety and inclusivity.

Table 18. Jurisdictional scan documents.

Document Name	Document Type	Date	Summary
Moncton - Strategic Plan 2023-2025	Plan Overview	2023	The Strategic Plan serves to align municipal decisions, guide service areas in work plan development and budget alignment and monitor progress. The plan is regularly reviewed by City Council to adapt to emerging challenges. Core values include sustainability, inclusivity, innovation, accountability, excellence, and bilingualism, emphasizing a commitment to environmental, social, and economic considerations, diversity, continuous improvement, honesty, quality services, and bilingualism.
Moncton buses increasingly packed with riders as city's population surges	News Article	Oct 2023	Moncton's Codiac Transpo grapples with surging demand as the city experiences unprecedented population growth, leading to buses exceeding capacity. With a 50% increase in passenger boardings, challenges include supply-chain delays for new buses and a need for investment in zero-emission vehicles. The transit service seeks strategic solutions for sustainable growth amid evolving demographics.

Trend analysis

- The predictive models were piece-wise constant rate of growth trend models, with future change rates estimated as Bayesian priors using Markov chain Monte Carlo sampling:

$$g(t) = (k + a(t)^{T}\delta)t + (m + a(t)^{T}\gamma)$$

  where k is the growth rate, δ has the rate adjustments, m is an offset parameter, and γj is set to $-sj\delta j$ to make the function continuous.[33]

- Each model fit a daily count of rides with additional regressors: population, percent of the population over 65, percent of the population who are newcomers to Canada, and a dummy variable tracking the start of the Bus Pass Program. Predicted data derived from provincial forecasts.[16]
- Daily ridership was calculated based on the same standard used by Metrobus°

° Tallies used the full dataset provided by Metrobus with the following exclusions by variable: transtype ≠ {3,11,12,99}, rte ∈ {1:30}, nClass ∈ {1:3,7:9,11:16}

Appendix B

05. References

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Appendix C

Table 19. Jurisdictional scan: documents reviewed.

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St. John's, NL			
What We Heard Metrobus Accessibility Plan Survey	Project overview	June 2023	This document summarizes key findings from the Metrobus Accessibility Plan Survey, focusing on barriers faced by people with disabilities in using public transit. While most respondents did not report obstacles, the document highlights specific instances where barriers were identified. The information will guide the Metrobus Accessibility Advisory Committee in evaluating and making decisions to enhance services and address customer needs.
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Public Transit Infrastructure Investments Announced for St. John's	News Article	April 2023	St. John's and the Canadian government are investing $27.8 million to upgrade public transit, including eight hybrid buses for sustainability and wheelchair accessibility. The plan also involves constructing 5 km of shared-use paths, like the Kelly's Brook route,

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			to encourage healthier and more accessible travel. This initiative underscores a commitment to economic growth, community resilience, and enhancing residents' quality of life.
Saskatoon, SK			
Saskatoon Transit Annual Report 2022	Annual report	2022	The 2022 Saskatoon Transit report stated a 10.40 million rides using formula-based ridership on Fixed-Route Transit, with approximately 4.90 million using electronic-based ridership. This records over 350,000 hours of services under an operating budget of $55.3 million. The report also Provides data on: -FTE between 2018-2022 -Trips, services, demographics -Ridership data
Electric Bus Trial	Project Overview	Oct 2020 - Sept 2021	The info card provides details on the 1-year electric bus trial plan and budgets.
Bus Rapid Transit: Moving People Forward	Project Overview	June 2020	Saskatoon is implementing a Bus Rapid Transit (BRT) system approved in April 2019 to address the city's growing transportation needs. BRT focuses on reliability by optimizing routes, reducing stops, and offering dedicated lanes. The system aims to attract more transit users, alleviate road congestion, and reduce carbon emissions. The final stages of design and development are underway. The BRT service is expected to launch in 1st June 2025
A population boom in our city is putting a strain on the transit system. How does Saskatoon Transit plan to fix it?	Audio	Dec 2023	City acknowledges ongoing issues with overcrowded buses passing stops, especially affecting students in new neighborhoods heading to high school. Candice Lipski interviews Mike Moellenbeck, director of Saskatoon Transit, to discuss the problem and potential solutions.
$152M in combined spending announced for rapid transit, new leisure centre in Saskatoon	News Article	Nov 2023	Saskatoon approves a $152 million bus rapid transit system with federal, provincial, and municipal funding. The project includes 55 new buses, infrastructure improvements, and a new east side leisure center, showcasing collaborative efforts to enhance public transit and community amenities.
Saskatoon Transit outlines strategy to tackle bus overcrowding	News Article	Jan 2024	Saskatoon Transit tackles bus overcrowding, particularly impacting students in new areas. Regular reviews, data analysis, and input from student unions aim to address high-traffic

Document Name	Document Type	Date	Summary
			route issues. Unexpected population growth in 2023 strained services, leading to ongoing efforts to improve, including fleet upgrades and collaboration for route planning.
Windsor, ON			
Transit Windsor – 2019 Transit Master Plan	Plan Overview	2019	Transit Windsor's outdated master plan, "The Way Forward," needs an overhaul due to changes in technology, societal values, and the local economy. The new plan, "More Than Transit," acknowledges these shifts and aims to address challenges in the existing downtown-focused transit network, including low frequencies during peak periods. The goal is to set ambitious targets and leverage contemporary tools to enhance effectiveness and convenience, aligning with the evolving community's needs.
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Moncton, NB			
Active Transportation Plan Phase Two Report	Report	May 2022	Moncton's Phase Two Active Transportation Plan aims to enhance pedestrian and cycling connections, building on the 2002 Phase One. It seeks to improve safety, access, and the overall experience, addressing network gaps and incorporating best practices. The plan engages stakeholders through two rounds of community consultation, emphasizing user experiences and needs. The proposed network and sidewalk approach received positive feedback, emphasizing safety and inclusivity.
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			emerging challenges. Core values include sustainability, inclusivity, innovation, accountability, excellence, and bilingualism, emphasizing a commitment to environmental, social, and economic considerations, diversity, continuous improvement, honesty, quality services, and bilingualism.
Moncton buses increasingly packed with riders as city's population surges	News Article	Oct 2023	Moncton's Codiac Transpo grapples with surging demand as the city experiences unprecedented population growth, leading to buses exceeding capacity. With a 50% increase in passenger boardings, challenges include supply-chain delays for new buses and a need for investment in zero-emission vehicles. The transit service seeks strategic solutions for sustainable growth amid evolving demographics.