

City of Edmonton: Mass Transit Study Equity Assessment for the 1.25 Million Population – Bus Rapid Transit Network

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1 Project Introduction

In 2023, City of Edmonton initiated an equity review as part of the Mass Transit: Implementing for 1.25 Million People project with the aim of answering two primary questions:

1. How do decisions or trade-offs made during mass transit planning, design and operations affect equity priority groups?
2. How can the City of Edmonton implement policies and measures at the planning, design and operations stages of mass transit implementation to ensure that the 1.25 Bus Rapid Transit (BRT) network is serving the needs of Edmonton's equity deserving communities?.

This equity analysis will guide the implementation of Edmonton's mass transit network for 1.25 million people, which focuses on the development of a bus-based mass transit network that includes BRT and district routes.

For the purposes of the equity analysis, we are focusing on the BRT routes on the 97 Street, Gateway Boulevard/ Calgary Trail and Whyte Avenue/87 Avenue corridors as depicted in Figure 1.

Note: Terwillegar Drive was not included in this equity assessment as the precursor Bus Rapid Transit service on this corridor launched in 2023 with the introduction of the new Route 31 Leger-University LRT Station service.

This equity analysis has three analytical lenses, which represent the core sections in this report:

Section 2.

A policy review to determine the identity factors that Edmonton considers a priority and a literature review to establish a preliminary understanding of how those different identity groups are impacted by transit service and infrastructure.

Section 3.

Data analysis of the Proposed 1.25 BRT Network corridors to inform the sequence of implementation, from an equity perspective.

Section 4.

Engagement with equity priority populations in Edmonton to refine principles for the City's Mass Transit program and establish the most critical transit planning factors that affect different identity groups.

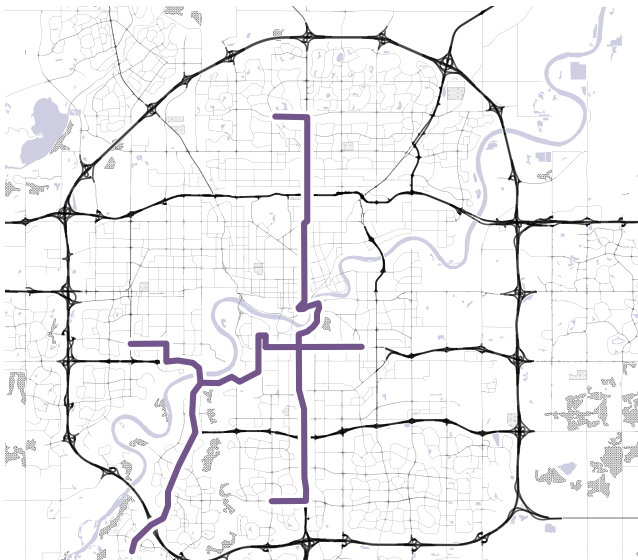


Figure 1 Proposed 1.25 BRT Network (routes subject to change through ongoing planning work).

Mass Transit Program Overview

To set a foundation for this work, the different components associated with implementing the 1.25 BRT network are identified and described as follows, including the questions or considerations that arise for each component of the program.

Public Engagement and Stakeholder Engagement: who is consulted, how is consultation completed, when in the process does engagement occur.

Network planning and corridor selection: quality of network, corridor locations relative to demand, socio-economic characteristics of corridors.

Transit alignment and right-of-way (ROW) design: level of right of way dedication, busway alignments in-street, intersection treatments and transit priority measures.

Service planning: service levels and service span.

Station and Stop Planning: stop and station locations, station distances, setbacks from intersections, micro-mobility and bike-sharing integration, pedestrian access and safety, universal accessibility.

Station and Stop Design: off board fare collection, information and wayfinding, shelters, seating, bus pads, queue management, safety and security features.

Rolling Stock Design: number of doors on bus, accessibility, capacity for bicycles, seat layout for strollers, large packages.



Figure 2 Mass Transit Program Elements

Equity Analysis and Mass Transit Program Stages

- This equity assessment is one of several work streams which were designed by the City to feed into a decision-making framework to inform BRT route alignments, corridor configurations and implementation priorities. This equity study was completed at the time when the City was undertaking work under the Transit Alignment and Right of Way Design phase of the Mass Transit program.
- Given the decisions being made with regard to implementation priorities, the data analysis task is focused on corridor-level analyses, to support the City with some information to make equitable decisions about corridor prioritization.
- The principles developed through this equity study aim to inform all of the mass transit program stages outlined above.

2 Policy and Literature Review

This technical memorandum summarizes findings from the City's relevant policies related to equity and from a review of the relevant literature to inform recommendations on which BRT infrastructure and service program elements could improve equitable outcomes for Edmontonians accessing the future Phase 1 BRT network.

The aim is to confirm the identity variables to carry forward to the data analysis and engagement phases of this project. Recommendations for the focus in the next project phases will be based on City policy and findings from the literature about the impacts on BRT and transit program elements.

As well, consideration is made for the availability of data for different identity factors.

City of Edmonton Policy Findings

We reviewed twelve City of Edmonton policies, supporting studies, plans and council reports for insights into the City's position on equity and applications to the Mass Transit program and the Phase 1 BRT Network.

The policies range from the City's corporate strategic plan to Council reporting on the specifics of equity and transit.

Figure 3 shows the documents reviewed and whether they focus on equity, public transit, or both equity and public transit.

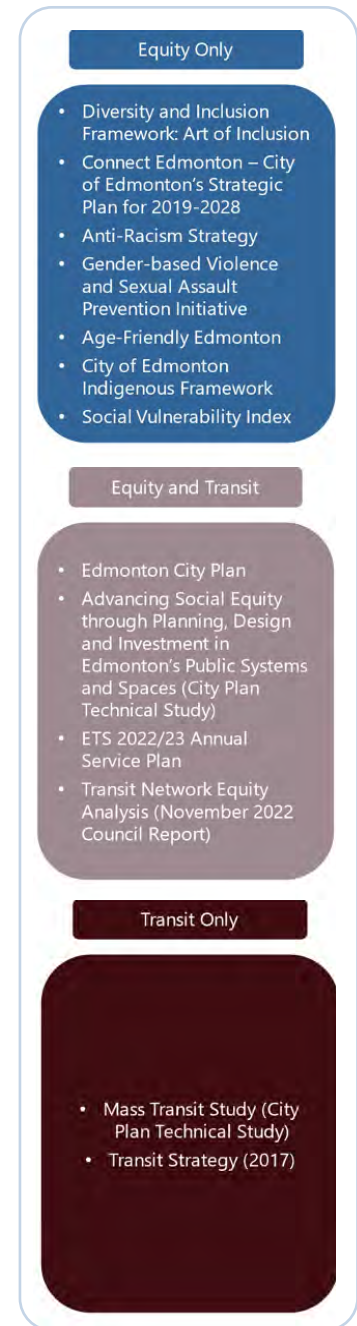


Figure 3 City Policy Documents Organized by Topic Area

The equity-focused initiatives and strategies are primarily focused on three broad goals:

- engagement with key stakeholders representing equity deserving populations,
- the aim to reduce inequality within the City Administration,
- the aim to reduce incidents of violence or inequality within the broader Edmonton community.

None of the plans featured under the equity-focused category address public transportation infrastructure or service delivery. The equity- and transit-focused plans and reports consider both transit infrastructure and service delivery, and how different equity deserving populations can inform how public transit service is planned and delivered.

The documents in this category offer guidance on the different populations that the City can prioritize but there are no clear targets or measures that clarify how to monitor success.

The City's recent transit-focused plans focus on public transit and specifically mass transit, but do not consider this topic from an equity lens.

The Mass Transit Study offers a measure of success around the number of residents and jobs located near mass transit stations, which will be adapted to include an equity lens in the second phase of this project.

Equity and Transit: Identity Factors

The City Plan is Edmonton's most robust policy document that places significant attention on different identity variables and mass transit.

Under the "Planning for People" section of the plan, it frequently directs that infrastructure and public transit should address equity and be designed for all users.

The identity factors directly considered in the plan are included in the table below, along with the identity factors addressed in the other technical documents related to equity and transit.

In the ecosystem of City of Edmonton policy documents, there are several repeating identity variables describing equity deserving populations.

The following is a consolidated list of the identity variables that the City considers a priority through its recent policies and reports:

- Seniors
- Low-income people
- Indigenous peoples
- People with disabilities
- Women
- Newcomers
- Racialized people
- LGBTQ2IA+ people

As for direction about how the implementation of the mass transit program can improve outcomes for the equity priority populations above, there is plenty of high-level guidance but limited tangible actions or measures of success.

We will now look at a review of the literature to inform this component of the study.

City Plan	Advancing Social Equity (City Plan Technical Study)	ETS 2022/23 Annual Service Plan	Transit Network Equity Analysis (November 2022 Council Report)
<p>Identities Considered:</p> <ul style="list-style-type: none"> • Seniors • People experiencing vulnerability and poverty • Indigenous Peoples • People with disabilities • Women, girls and gender minorities • Newcomers • All ages, abilities and incomes 	<p>Identities Considered:</p> <ul style="list-style-type: none"> • Voices of those who are historically not heard 	<p>Identities Considered:</p> <ul style="list-style-type: none"> • Seniors • Low-income people • Indigenous peoples • GSRM (Gender, Sexual and Romantic Minority) Community 	<p>Identities Considered:</p> <ul style="list-style-type: none"> • Seniors • Low-income people • Indigenous peoples <p>For future analysis:</p> <ul style="list-style-type: none"> • Racialized People • Newcomers • Members of LGBTQIA2S+

Table 1 Identity Factor Considerations by City Policy and Technical Reports

Literature Review: Transit Use Characteristics of Identity Groups

The following table provides an overview of the literature on different identity variables and findings on prioritizing these communities during mass transit program implementation for the Phase 1 BRT Network. There are more identity variables included in the literature review than in the key takeaways from the City policy review for the purposes of discussion and analysis.

YOUTH

Transit Use Characteristics

- Youth today are using transit more than in previous generations and youth (age 15 to 24) use transit more than other age cohorts. (Reed et al., 2021, Winters & Hosford, 2022, Statistics Canada, 2022).
- Newcomer youth are especially reliant on public transit. (Reed et al., 2021).

How to Prioritize These Individuals through the Mass Transit Program

- Aligning service with high school and post-secondary institution locations and school bell times.
- Providing transit access to entry-level jobs for younger populations
- Providing access to youth-based programs and services

SENIORS

Transit Use Characteristics

- Senior women are less likely to have a driver's license and more likely to be captive transit riders (Babbar et al., 2022) .
- Social participation is key to healthy aging. Limited access to transportation is a barrier to social participation. Transit could remove this barrier. (Turcotte, 2012).

How to Prioritize These Individuals through the Mass Transit Program

- Daytime frequency and coverage to healthcare, recreation, and social activities
- Stop locations nearby areas with high seniors populations and define an appropriate walk distance for seniors (less than 400m).
- Careful consideration of BRT station design from a health and safety perspective - shading, shelter from snow, safe pedestrian connections and access to stations/stops from communities (e.g. curb cuts at intersections, safe pedestrian crossings at/near transit stops).
- Snow and ice clearing at stops.
- Enhancement of safety features at stations (engagement can help achieve an understanding of this).

HOMELESS OR UNSHELTERED

Transit Use Characteristics

- Walking and transit are most used by homeless individuals. Transit is used to access foodbanks, part-time work and social visits (Hui & Habib, 2017).

How to Prioritize These Individuals through the Mass Transit Program

- Acknowledge in this work that transit can be a key form of transportation to enable homeless or unsheltered to access community support services, job interviews, food, etc. - so transit needs to effectively connect with social support services and other basic life necessities that can enable upward movement of unhoused or homeless.

LOW INCOME

Transit Use Characteristics

- Low-income individuals in Canada are more transit dependent and more likely to use public transit to commute (11%) than the highest income individuals (5%) (Winters & Hosford, 2022).
- Lower-income households are more likely to ride bus transit modes and higher-income households are more likely to use rail modes (Bennett & Shirgaokar, 2016, Metrolinx, 2018).

How to Prioritize These Individuals through the Mass Transit Program

- Effectively understand the travel flows and temporal demands of entry and higher-paying entry workers, and plan service accordingly.
- Transit access to entry-level jobs (that is considerate of shift work travel demand).
- Access to service-based employment, supply chain/logistics, health care/caregiver jobs
- Maximize Mass Transit (high frequency) coverage for areas with higher percentage of low-income populations.
- Service reliability in terms of facilitating a consistency of travel time to ensure on time arrival for individuals who are employed in shift work.

PEOPLE WITH DISABILITIES

Transit Use Characteristics

- Persons with disabilities experience higher rates of unemployment and have lower average annual income which limits their ability to travel by car (Canadian Urban Transit Association, 2013).
- The 2020 Canadian Core Public Infrastructure Canada Index shows: 18% of public transit stations and terminals, 28% of transit shelters, 11% of buses and 41% of commuter railcars are inaccessible to persons with a disability in urban Canadian municipalities (Infrastructure Canada, 2022b, 2022a).
- For mobility-reduced individuals that use regular transit service, long distance to transit is a major barrier to use the service. Lack of availability of accessible transit vehicles is also a barrier (Linovski et al., 2021).

How to Prioritize These Individuals through the Mass Transit Program

- Station design that promotes universal access (barrier-free access)
- Bus design that promotes universal access.
- Consider a full spectrum of disabilities (physical, visual, auditory), including neuro-diverging individuals that are perhaps more sensitive to stimulus and noise.
- Understanding of commonly travelled destinations by this population to facilitate independent travel.
- Enhancement of safety features at stations (engagement can help achieve an understanding of this).
- Careful consideration of BRT station design from a health and safety perspective - shading, shelter from snow, safe pedestrian connections and access to stations from communities. Accessible access to station safety features (e.g. emergency call buttons). This is important for all customer groups but engagement with the accessibility community may identify nuances about what is needed/expected from this group.
- Snow and ice clearing at stops.
- Clear messaging that transit is a zero-tolerance space for harassment.

INDIGENOUS PEOPLE

Transit Use Characteristics

- Indigenous commuters used transit the least, compared to any other ethnicity or background (Winters & Hosford, 2022).
- Urban Indigenous youth are one of the fastest growing segments of the Canadian population and they rely heavily on transit (Goodman et al., 2018)
- A disproportionate number of warnings and tickets are given to Indigenous transit users in Edmonton (Indigenous people make up 6% of the population and are given 44% of tickets) (Perry et al., 2021).

How to Prioritize These Individuals through the Mass Transit Program

- Engagement with indigenous populations to understand where members of this community need/want transit to take them.
- Consideration of fare payment processes/infrastructure for BRT stations (e.g. on-board or pre-board payment), as well as fare enforcement plans.
- Development of a station design plan that is explicitly considerate of safety concerns of Indigenous women and girls.
- Clear messaging that transit is a zero-tolerance space for harassment.

RACIALIZED PEOPLE

Transit Use Characteristics

- Canadian commuters who identified as Black, having multiple races, Latin American, East/Southeast Asian, Middle Eastern or South Asian used transit at higher rates than White commuters. (Winters & Hosford, 2022).
- Black transit users are given a disproportionate number of warnings and tickets despite them being minorities in major Canadian cities. Ex. Toronto where they make up 8.8% of the population but account for 19.2% of enforcement incidents (Perry et al., 2021).

How to Prioritize These Individuals through the Mass Transit Program

- Access to station and system information in different languages and overall, more accessible information on the system.
- Clear messaging that transit is a zero-tolerance space for harassment.
- Aim to increase the number of opportunities (jobs and services) an average person of colour reach by transit in 30 minutes (Miami-Dade County and Transit Alliance, 2020).

NEWCOMERS AND IMMIGRANTS

Transit Use Characteristics

- In 2021, 13.1% of immigrants commuted by public transit, compared with 4.7% of Canadian-born individuals. Of the 1 million commuters who mainly used public transit to commute, 55.9% were immigrants or non-permanent residents, while immigrants and non-permanent residents represented 27.8% of all commuters (Statistics Canada, 2022).
- Language is a barrier to using transit for newcomers in Canada (Linovski et al., 2021).
- Immigrant communities in Canada rely on transit to access food, particularly to food stores and for culturally specific grocery stores, as well as community, health and social services (Linovski et al., 2021).

How to Prioritize These Individuals through the Mass Transit Program

- Access to station and system information (e.g. route/schedule information/wayfinding) in different languages and overall more accessible information on the system.
- Clear messaging that transit is a zero-tolerance space for harassment.

WOMEN

Transit Use Characteristics

- In 2021, 9.6% of women commuted by public transit, compared with 6.0% of men (Statistics Canada, 2022b). Similarly, 15% of women reported using transit to commute compared to 11% of men in 2016 (Winters & Hosford, 2022).
- Women's travel is typically characterized by "trip-chaining" - multiple, short-distance, and off-peak trips with the purpose of serving others ("mobility of care"). (Blomstrom et al., 2018).

How to Prioritize These Individuals through the Mass Transit Program

- Transit coverage to childcare, shopping and amenity-rich locations, healthcare facilities.
- Better connection with land use eases women's travel (e.g. trip chaining) while also serves to promote higher ridership.
- Increase in off-peak frequency (e.g. weekday midday, evening, Saturday and Sunday/holidays) to better facilitate trips.
- Bus interior design - to adequately accommodate strollers, children, wheelchair/mobility users, seniors, etc.
- Careful bus station design considerations that promote real and perceived safety - and are adaptive to temporal variations in safety risk (e.g. late night). Having adequate lighting, visibility and activities for passive surveillance at stations and stops.
- Clear messaging that transit is a zero-tolerance space for harassment.

TRANSGENDER INDIVIDUALS

Transit Use Characteristics

- Transgender individuals interviewed in Portland, Oregon cite that transit spaces can sometimes feel confining (particularly on the bus compared to the LRT), affecting their ability to escape dangerous situations (Benner, 2016).

How to Prioritize These Individuals through the Mass Transit Program

- Clear messaging that transit is a zero-tolerance space for harassment.
- Development of a station design plan that is explicitly considerate of safety concerns of transgender individuals.

Identity Factors for Next Steps

The findings from the reviews of City policy and the literature are combined in the table below and are accompanied by an assessment of data availability as well as engagement potential for each different identity factor. Data include Census and Household Travel Survey data, as well as outputs from the City's Regional Travel Model.

Of the identity factors that are considered a City policy priority, the literature includes considerations for all except the LGBTQIA2+ community.

As well, there are no existing data sources representing trip or home-based data for this community, and it is estimated that engagement potential would be low on this subject.

Conversely, youth were not explicitly considered through City policy but there are important mass transit implications for youth identified in the literature.

Because there are good trip-based and home-based data representing age, it is recommended that youth are included in the equity assessment.

Identity Factor	City Policy Priority?	Literature and Intersectionality Considerations	Trip or Home-based (HB) Data Available?	Engagement Potential / Likelihood?
SENIORS	Yes	Less likely to use transit but limited access to transit is a barrier to social participation.	Yes – Trip and HB	High
YOUTH		More likely to use transit and increasing transit use, especially newcomer youth	Yes – Trip and HB	Medium
LOW INCOME PEOPLE	Yes	More transit dependent, more likely to ride bus modes	Yes – Trip and HB	Medium
HOMELESS OR UNSHELTERED PEOPLE		Primary modes are walking and transit. Transit is important for access to food banks and part time work.	No	Low
PEOPLE WITH DISABILITIES	Yes	More captive to transit due to income levels and abilities. Long distance to transit stops and inaccessible transit vehicles are barriers to travel.	Yes – Trip	High

Identity Factor	City Policy Priority?	Literature and Intersectionality Considerations	Trip or Home-based (HB) Data Available?	Engagement Potential / Likelihood?
INDIGENOUS PEOPLE	Yes	Indigenous commuters use transit the least compared to other ethnicities. Urban Indigenous youth are a growing population segment and they rely on transit.	Yes – HB	Low
RACIALIZED PEOPLE	Yes	Racialized commuters rely on transit more than white commuters.	Yes – HB	Medium
NEWCOMERS AND IMMIGRANTS	Yes	More immigrants commute by transit than Canadian-born individuals. Immigrant communities rely on transit to access food and culturally specific shopping opportunities. Language can be a barrier to transit.	Yes – HB	Medium
WOMEN	Yes	More women commute by transit than men. Women typically trip chain with shorter-distance trips and require off-peak trips.	Yes – Trip and HB	Medium
TRANSGENDER INDIVIDUALS		Transit spaces can sometimes feel confining and affect ability to escape dangerous situations or harassment.	No	Low
LGBTQIA2+ PEOPLE	Yes		No	Low

Table 3 Identity Factor Screening for Assessment

Based on the results identified in green in the table above, the following identity factors are recommended to be included in this equity assessment scope, whether through the data analysis or the engagement program:

- Seniors
- Youth
- Low Income People
- People with Disabilities
- Indigenous People
- Racialized People
- Newcomers and Immigrants
- Women

A summary of the ways in which each identity factor above is affected by the different mass transit program stages is available in Appendix A.

This information is the starting point for developing equity principles for Edmonton’s Mass Transit program, which is the basis for the engagement work described in section 4.

3 BRT Corridor Data Analysis

The analysis of BRT corridors for the 1.25 Million population horizon include the following routes:

- a north-south route running between Castle Downs and Century Park District Node via 97 Street and Calgary trail (referred to as B1), and
- an east-west route operating between Bonnie Doon and West Edmonton Mall via Whyte Ave (referred to as B2).

The alignments and station locations evaluated in this analysis were based on a preliminary corridor draft and the final route alignments might be modified according to concurrent analyses.

This analysis is developed to empirically understand the relative benefits of the two proposed BRT corridors among equity-deserving groups. While this equity analysis is in line with the federal mandate to thoroughly examine new public policies, programs, and initiatives to ensure they are inclusive and equitably designed, prior to this report there was little precedent on how to undertake such an analysis empirically.

This analytical framework demonstrates how the GBA+ lens can be applied to the evaluation of proposed transit infrastructure and how it can be built upon for equity analyses of future capital transit infrastructure investments in Edmonton and across Canadian municipalities.

Data Analysis Overview

Data employed in this analysis was acquired from the 2021 Census of Population from Statistics Canada, the City of Edmonton's 2022 Regional Travel Model (RTM), and activity-based data on users of Edmonton's Dedicated Accessible Transportation (DATS).

Other data sources were considered for analysis, namely 2021 Commuting Flows data from Statistics Canada. A cross-tabulated table of this 2021 Commuting Flows data by gender was tested for use in this analysis but ultimately disregarded in the final analysis due to data suppression and the nuances of data collection during the COVID-19 pandemic.

Our analysis extensively relied on the City of Edmonton's 2022 Regional Travel Model, which provided us with opportunities but also introduced some limitations that should be acknowledged.

The 2022 Regional Travel Model was developed using the 2015 Edmonton Household Travel Survey data and 2016 Federal Census data. The 2015 Household Travel Survey did not collect information on race or ethnicity, so there is no data on the travel behavior of Indigenous persons or racialized groups in Edmonton.

Given the importance of this information for the City's planning efforts, opportunities to improve data collection in the next iteration of Edmonton's Household Travel Survey are discussed at the end of this section. The full technical analysis is available in Appendix B.

Identity Group	Definitions	Home-based analysis		Trip-based analysis	
			Data source		Data source
SENIORS	Population aged 65 years and over	✓	2021 Census of Population	✓	City of Edmonton's 2022 Regional Travel Model
LOW-INCOME POPULATIONS	Household income < \$40,000 ¹	✓	2021 Census of Population	✓	City of Edmonton's 2022 Regional Travel Model
PEOPLE WITH DISABILITIES	No census information			✓	Dedicated Accessible Transportation (DATS) trip data (as a proxy)
INDIGENOUS PEOPLES	Indigenous Identity	✓	2021 Census of Population		
RACIALIZED GROUPS	Visible Minority population ²	✓	2021 Census of Population		
IMMIGRANTS	Immigrated to Canada between 2016-2021	✓	2021 Census of Population		
WOMEN	Gender classified as Woman	✓	2021 Census of Population	✓	City of Edmonton's 2022 Regional Travel Model
LGBTQIA2+ COMMUNITY	No census information				
YOUTH	Population aged 15-24 years	✓	2021 Census of Population	✓	City of Edmonton's 2022 Regional Travel Model

Table 4 Summary of selected identity groups, definitions, and data source

Home-based Analysis

PURPOSE

The empirical analysis delves into the potential impacts of the proposed BRT corridors in Edmonton, focusing on both home-based and trip-based analyses. In the home-based analysis, the demographic profile of people who live within a short walk of the proposed BRT stops is examined.

The underlying assumption of this analysis is that residents within walking distance of the proposed BRT route will benefit the most from this new infrastructure.

Focusing on equity-deserving groups, the assessment calculates an equity score for each proposed BRT stop, considering the information available from the 2021 Census, including shares of seniors, low-income individuals, Indigenous persons, racialized groups, women, and youth.

Trip-based Analysis

PURPOSE

The trip-based analysis examines how the two proposed BRT corridors will enhance public transit connections, or access, to the destinations deemed in high demand for transit users in Edmonton.

In this part of our analysis, we provide a baseline measure of access to a variety of destinations with meaningful opportunities, like

employment, and then estimate the extent to which each proposed BRT line increases accessibility to these same opportunities as a result of the new BRT service.

Priority destinations were determined using data sources that were readily available, including Edmonton's 2022 Regional Travel Model for women's jobs,

travel destinations for youth and seniors, and Dedicated Accessible Transportation Services (DATS) trip data.

This analysis considers how the BRT system makes these destinations more rapidly accessible, which enhances mobility overall.

Home-based Analysis Analytical Approach

The home-based analysis involved a 5-step process (illustrated in Figure 1) which was based on the methodology by LeClair et al. (2023)³ to assist practitioners in establishing equity-focused priorities for allocating limited funding. It involves the following steps.

Firstly, the project team considered the identity groups that this analysis focused on presented in Table 4.

These groups include women, youth aged between 15 and 24⁴ years, seniors aged 65 and above, low-income households (earning less than \$40,000 annually⁵), recent immigrants who arrived in Canada between 2016 and 2021, Indigenous peoples, and visible minorities.

A 600-meter⁶ network buffer was defined to estimate a short walking distance around each BRT stop location (equal to around 7 minutes of walking at a pace of 5 km/h).

This buffer helped to capture the immediate reach of the project at the station level and its potential impact on the surrounding community.

After defining the buffers, the concentration of the selected equity groups residing within each 600-meter stop buffer was calculated. This step involved obtaining Census data at the dissemination area level, which usually comprises 400-700 people, and is the smallest geographic unit for which Statistics Canada releases data.

The proportion of each equity group residing within the defined area using the residential use area proportion within the dissemination area and dissemination blocks level were determined.

Next, the concentration of equity groups in the stop's buffer zone with the city-wide baseline distribution at the dissemination area level was compared. This comparison provided the socio-demographic makeup of the communities in areas adjacent to each BRT stop and allowed the project team to compare their diversity with Edmonton's city-wide population.

As a final step of this analysis, an equity score for each proposed BRT stop that summarized the relative presence of each of the identity groups in our analysis was calculated.

The final equity score for the project was calculated on a scale of 0 to 10. To achieve this, we normalized the demographic data within each stop buffer to bring different variables to the same scale and added each demographic indicator to a single demographic score.

Note, no weighting was applied to the analysis, so each equity group was given equal importance in the analysis.

The share of each demographic group contributed to the final score equally, with the lower scores corresponding to smaller shares of priority groups, and the scores being higher for the areas with larger concentration of priority groups.

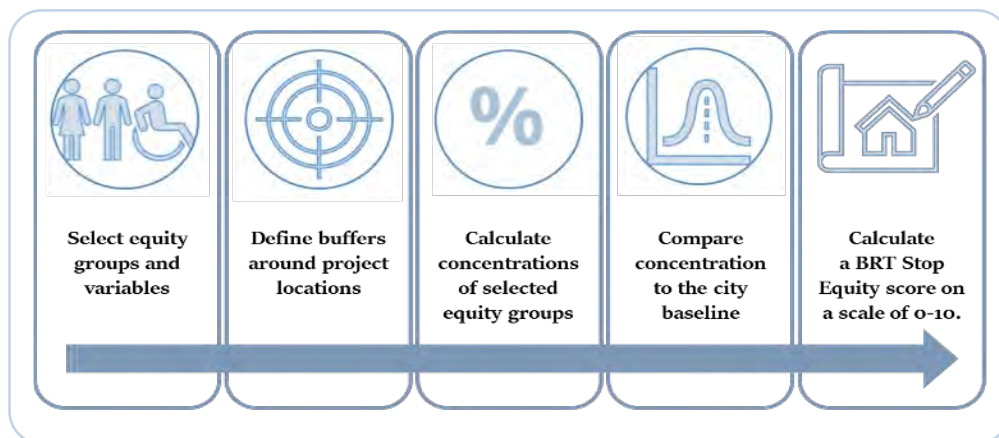


Figure 4 An illustration of the analytical approach for Home-based analysis. Adapted image from LeClair et al., 2023

Home-based Analysis Results

This section summarizes the combined results from the home-based analysis.

As a final step in the home-based analysis, the residential profiles of each identity group in our analysis were converted into a summarized standardized equity score.

This equity score allows to empirically assess each BRT stop buffer on a scale of 0-10, where a score of 0 indicates the lowest possible concentration of the seven selected identity groups, while a score of 10 signifies the highest possible concentration in the buffer area.

The final scores are provided in Figure 5 as well as the breakdown of concentrations in Table 5.

For Route B1 (97 Street-Calgary Trail/Gateway Boulevard), 9 out of 26 stops (35%) received a score above 7 (out of possible /10), indicating a high concentration of the selected priority groups. In contrast, for Route B2 (Whyte Avenue-87 Avenue), 3 out of 11 stops (27%) received a score above 7/10.

The resulting map (Figure 5) displays the location of these stops that were scored 7 or higher as symbolized by the dark green symbology.

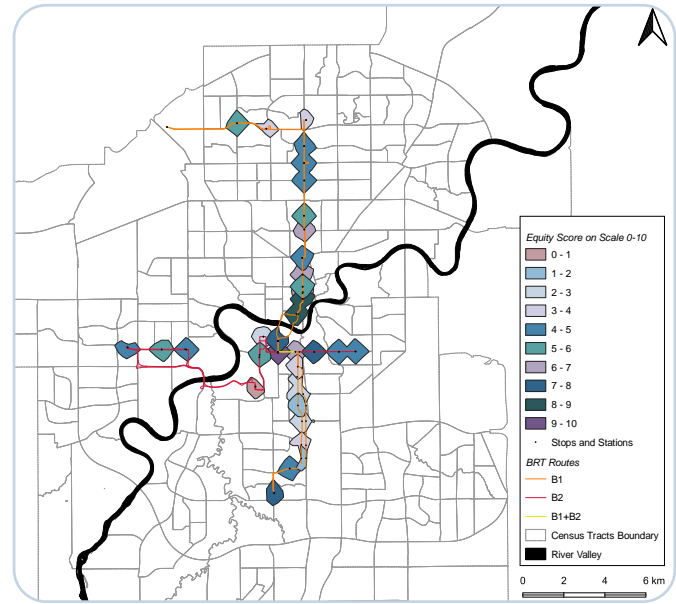


Figure 5 Equity score on a scale of 0-10 at stop-level

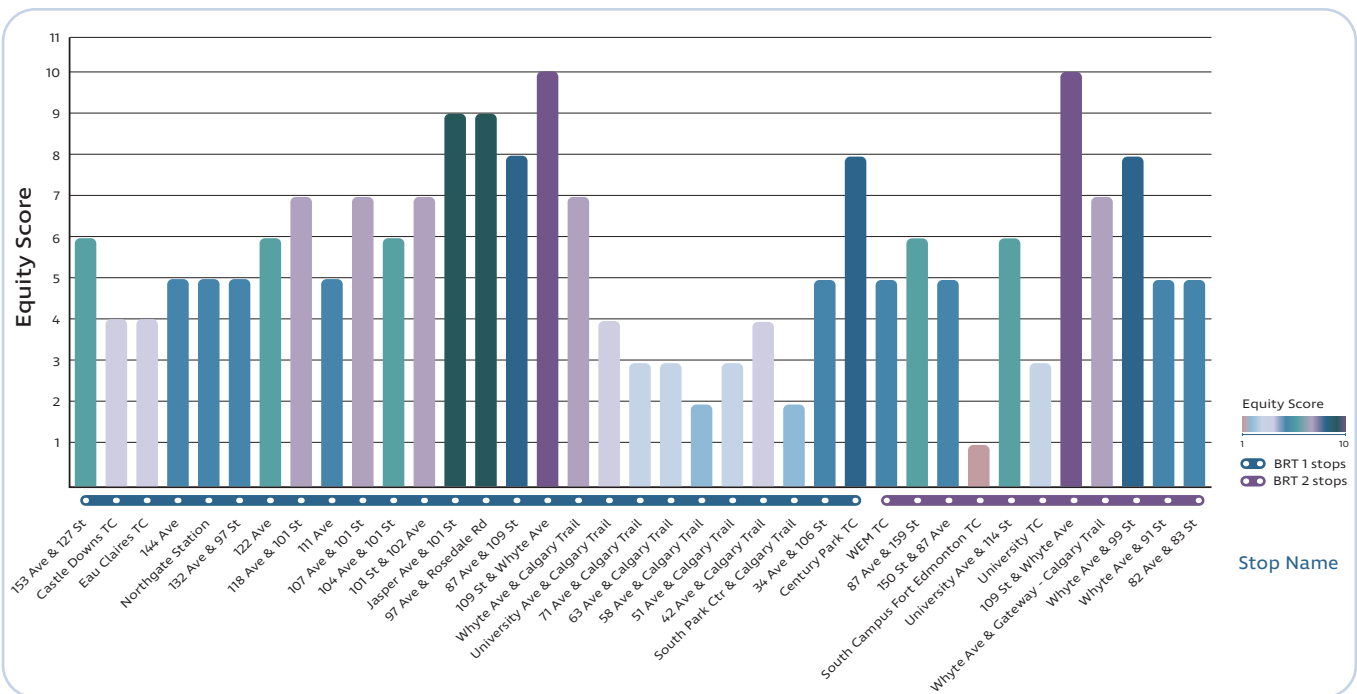


Table 5 Equity Score by BRT Stop

The home-based analysis presented in Table 6 reveals that both BRT corridors will directly benefit priority groups living near the proposed corridors, with that said, due to the length of the proposed route, B1 will benefit more equity-deserving groups in Edmonton.

In particular, B1 is projected to serve a higher percentage of visible minorities (7% more) compared to B2. B2, however, will serve a higher percentage of Youth and Women (an increase of 2-3% in both categories).

Route	Youth	Seniors	Women	Immigrants	Indigenous	Visible Minority	Low-Income
B1	13%	15%	49%	6%	6%	38%	42%
B2	16%	16%	51%	5%	5%	31%	40%

Table 6 Summary of average population concentration of selected identity groups at the corridor level

Route	Youth	Seniors	Women	Immigrants	Indigenous	Visible Minority	Low-Income
B1: Number of stops	12	10	4	14	7	20	24
B1: Total Number of Stops: 26							
B1: Percent of Stops	46%	38%	15%	54%	27%	77%	92%
B2: Number of stops	5	4	4	2	0	4	8
B2: Total Number of Stops: 11							
B2: Percent of Stops	45%	36%	36%	18%	0%	36%	73%

Table 7 Percentage & number of BRT stations with a concentration of residents from each identity group that is above the city-wide mean

Route	Total no. of stops	Equity score > 7	% of stops with score > 7
B1	26	9	35%
B2	11	3	27%

Table 8 Summary of stops with equity score > 7 at the corridor level

Trip-based Analysis Analytical Approach

The primary objective of the trip-based analysis was to assess how the two BRT lines enhance the connection between residents and various opportunities within the city. The quality of this connection is quantified using accessibility, a measure of the quality of interaction between transportation and land use.

Higher accessibility scores serve as a proxy for the ease with which individuals can reach desired destinations, such as jobs, educational institutions, healthcare facilities, and recreational areas, within a given travel time.

On the other hand, low accessibility has been found to lead to social exclusion and poor education and employment outcomes.

When measuring accessibility, two key data inputs are needed.

First, a travel time matrix, using a representative set of origins and destinations - such as the centroids of dissemination areas or grid cells drawn equally across a region, and second a dataset representing opportunities or destinations at those destinations.

Jobs are one of the most commonly used forms of spatial opportunities, as jobs are a reliable proxy for transportation demand in a region.

However, from an equity perspective, such a focus on modeling accessibility using only jobs as a proxy provides only a limited outlook. It does stem from traditional transportation planning approaches that have overemphasized service designs that operate around traditional job centers like Downtown.

This analysis aims to look beyond only jobs as priority places to plan transit service to and from, acknowledging the travel needs of equity-deserving groups that might rely on transit to travel for purposes other than work.

Adding the layers of other proxies for opportunities makes the analysis more inclusive as it identifies critical priority places that capture and emphasize the travel patterns and behaviours of priority groups.

Using available travel behaviour data, we focused on the following trip destinations:

1. Youth's trip destinations (2022 Regional Travel Model)
2. Senior's trip destinations (2022 Regional Travel Model)

3. Dedicated Accessible Transit Service (DATS) users trip destinations (trips that occurred between July 2022 to July 2023)
4. Locations of Women's Jobs⁷ (2022 Regional Travel Model)

The selected trip destinations were chosen based on the availability of existing travel data to ensure a comprehensive and reliable analysis.

The estimates of the 2022 Regional Travel Model provided valuable insights into the specific destinations for youth, seniors, and places of employment for women, capturing their travel patterns and preferences.

This data allowed us to understand the distinct mobility patterns of these demographic groups. Additionally, focusing on Dedicated Accessible Transit Service (DATS) users' trip destinations enabled us to identify key accessibility hubs and understand the travel patterns of individuals with mobility challenges.

By selecting these diverse trip destinations, we aimed to ensure that there was little overlap between the opportunities, allowing for a comprehensive understanding of travel demand and priority destinations for the priority groups.

It should be mentioned that other destinations were considered for our analysis, such as destinations of work trips with high numbers of individuals from low-income households (a proxy for low-income jobs), and non-work or education trips for all travelers in the region - data both acquired from the 2022 Regional Travel Model.

However, in each case, very similar spatial patterns were observed and levels of importance comparable to women's jobs, and for that reason, only women's jobs in the analysis was retained.

Transit accessibility for each of the opportunity proxies was measured to determine which proposed BRT corridor increased connectivity within two fixed travel time budgets: 30 and 45 minutes.

The percentage increase in accessibility of the existing network and the addition of the proposed BRT corridors were the key performance indicators in the analysis. This means that the areas that saw no change in accessibility were not included in the discussion of the results.

The project team calculated the increase in accessibility to each of these key destinations separately, and then standardized the data and equally added each accessibility metric to generate a combined accessibility score.

To estimate how the two proposed BRT corridors increase accessibility to these key destinations, travel time matrices were generated.

These matrices modeled travel time by public transit of the existing service, the existing service plus B1, and the existing service plus B2.

Assumptions for this estimation were based on the operational speed of the BRT system to be 30 km/hr⁸ and a bus frequency of 5 minutes during peak hours.

With these assumptions, General Transit Feed Specification (GTFS) data were generated for B1 and B2 and used in the travel time modeling. Note, that the alignments and station locations that were used to model B1 and B2 were based on existing alignment proposals and the final recommended network remains subject to change.

Grid cells of size 300 by 300 meters were chosen as a spatial unit to estimate accessibility across the City of Edmonton.

Travel time matrices were estimated for all three scenarios (existing service, the existing service plus B1, and the existing service plus B2) within different time thresholds (30 and 45 minutes) with a combination of walk and transit modes.

Accessibility was modeled in R5R⁹, an R package that accounts for transit schedules provided in GTFS format. The GTFS archive that represents transit operations of April 2024 in Edmonton was utilized.

In R5R, walking to and from transit stops is included in the full travel time estimation, and walking to transit is modeled using a speed of 5km/hr¹⁰ and leveraging Open Street Map data sourced from BBBike¹¹.

The percentage increase in accessibility to key destinations between the existing system and the proposed systems enhanced with one of the two BRT corridors was used in the analysis as the key performance indicator.

To illustrate the meaning of this indicator, let's consider an example of women's access to employment.

Using the existing transportation network, women in a given area can access 50 jobs within a 30-minute travel time. If BRT corridor 1 is added to the transit system, women in the same area can now access 75 jobs within the same 30-minute travel time as the coverage area has expanded due to the service improvement.

Therefore, the accessibility to employment for women in that area improved by 50% with the introduction of the B1.

Individuals with increased vulnerability due to age, income, gender, race, immigration status, and other factors can benefit from increased accessibility as it might allow them to reach better job opportunities and essential services, and result in an overall improvement in their quality of life.

By facilitating easier and faster connections to key destinations, BRT can play a crucial role in bridging the accessibility gap and fostering inclusivity within our communities.

The trip-based analysis offers valuable insights into the potential of the two BRT corridors in enhancing accessibility and connecting residents to opportunities.

This approach aligns with the goal of creating a more connected and accessible city for all.

Trip-based Analysis Analytical Approach

This section summarizes the combined results for all trip destinations from the trip-based analysis.

Accessibility Analysis Insights for All Trip Destinations

High-demand destinations as a sum of the four identified destinations: youths' and seniors' destinations, DATS trip destinations, and women's jobs (shown in Figure 6) were plotted.

While Figure 6 reveals several locations of importance for the priority groups (women's employment, youths', seniors, and DATS users destinations), the most prominent of those include downtown, the University of Alberta (both campus and surrounding hospitals), industrial areas, and recreation areas.

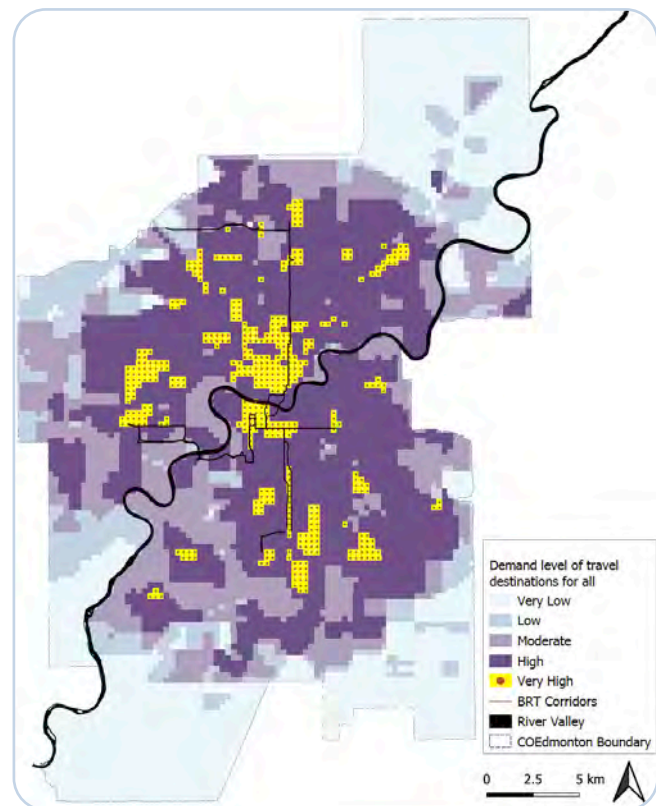


Figure 6 Map showing high-priority locations of trip destinations for all

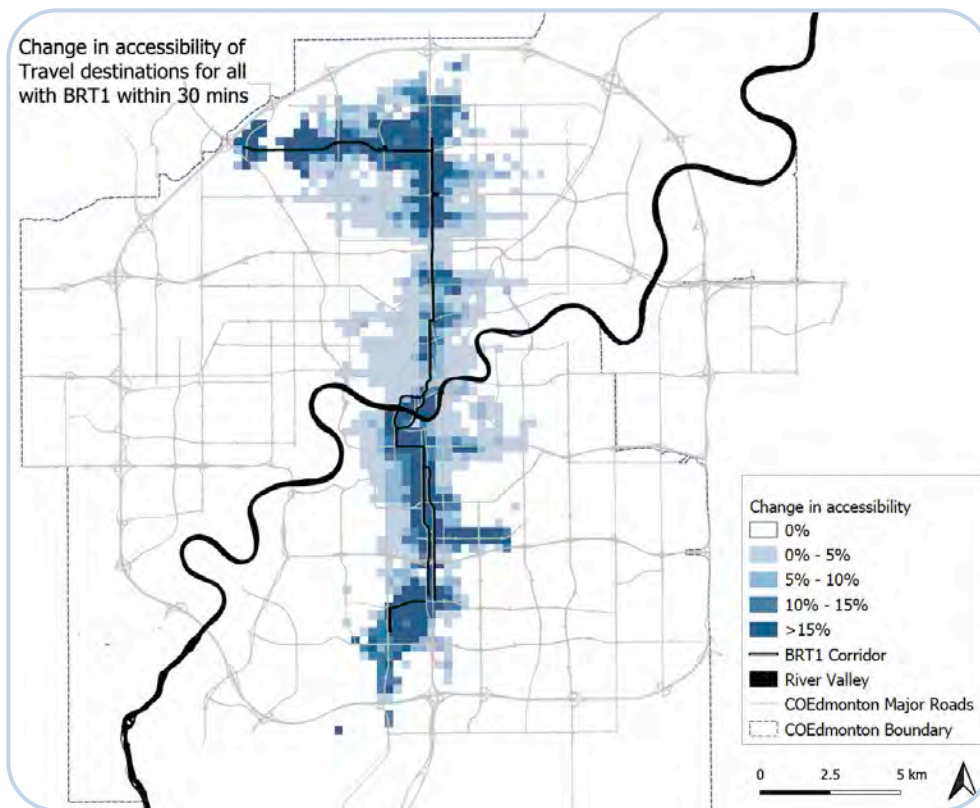


Figure 7 Increase in accessibility of trip destinations for all with B1 within 30 mins

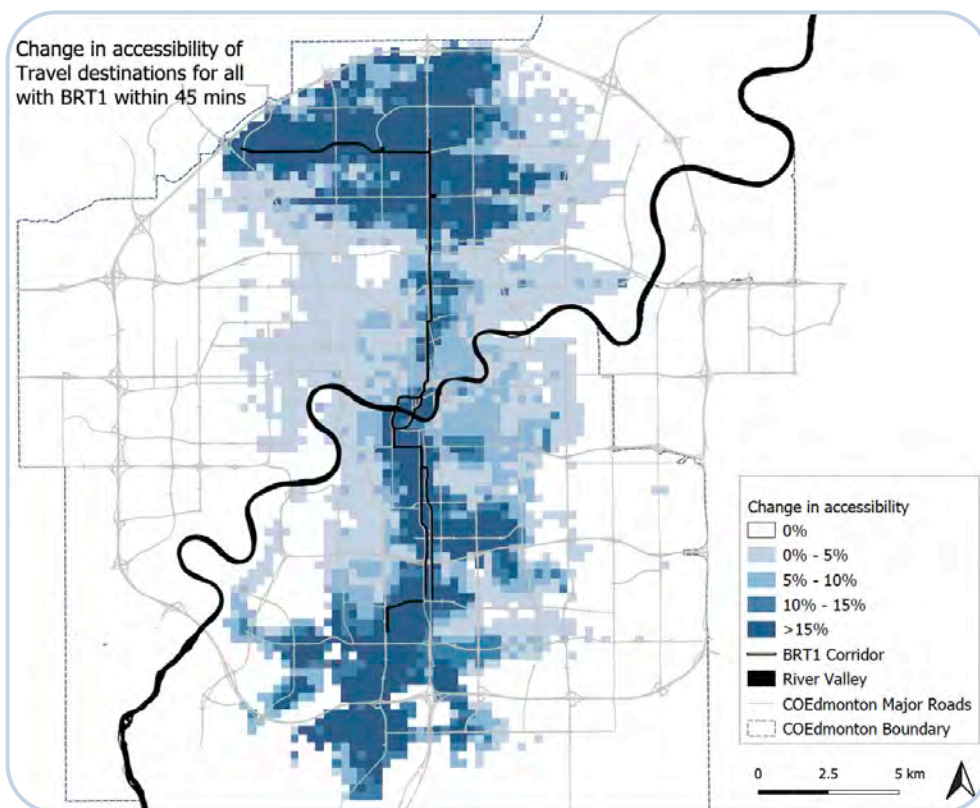


Figure 8 Increase in accessibility of trip destinations for all with B1 within 45 mins

The findings from the household travel survey data reveal a very high correlation between women's jobs and low-income jobs, as well as between non-work trips for both women and seniors.

During the analysis the project team was thoughtful in considering other potential trip destinations, we chose not to essentially double-count these opportunities to ensure the accuracy and reliability of the analysis without overestimating the overall accessibility.

To understand how B1 and B2 increase connectivity to these opportunities, measured as increased accessibility, the spatial patterns of accessibility increases are displayed in Figures 7 and 8.

The implementation of B1 is projected to significantly enhance accessibility.

On average, it will increase access to approximately 14,000 more opportunities within a 30-minute travel time and around 27,000 more opportunities within a 45-minute travel time, on average.

This represents an approximate increase of 16% in accessibility within 30 minutes and a 12% increase within 45 minutes.

Similarly, with the introduction of B2 (Figures 9, 10), average accessibility is expected to increase by an additional 7,000 opportunities compared to the existing network within both the 30 and 45-minute travel time windows.

The proposed BRT corridors are expected to improve accessibility for most of these high-demand destinations within a 45-minute travel time, with the exception of the industrial area in the northwest.

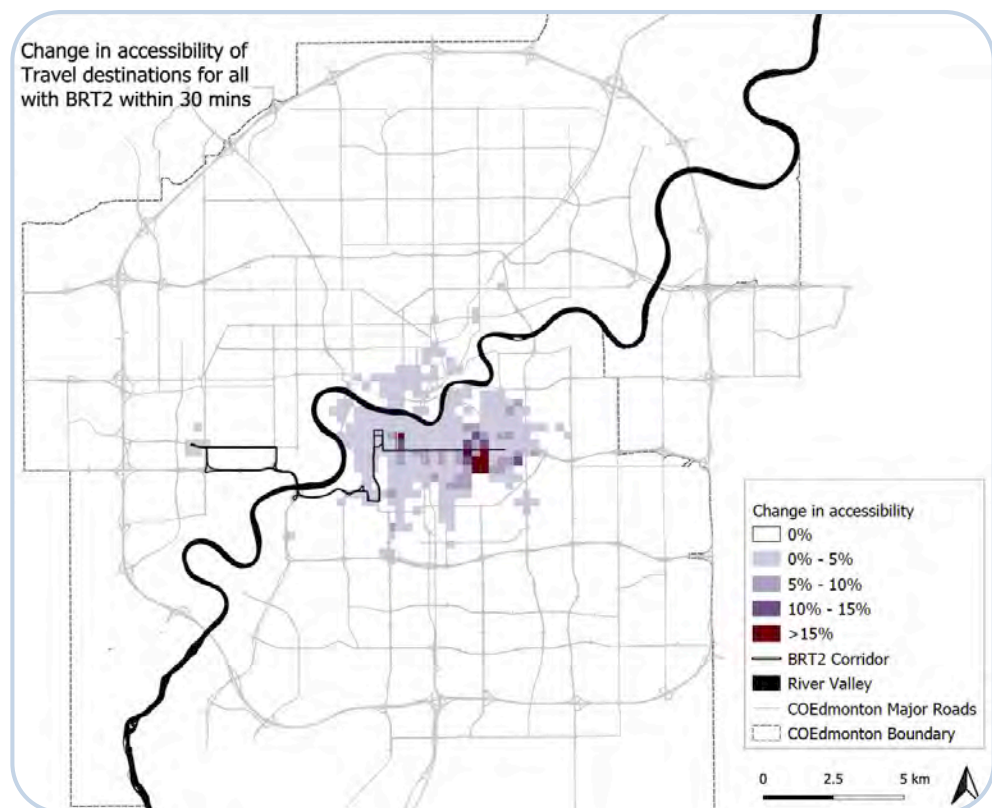


Figure 9 Increase in accessibility of trip destinations for all with B2 within 30 mins

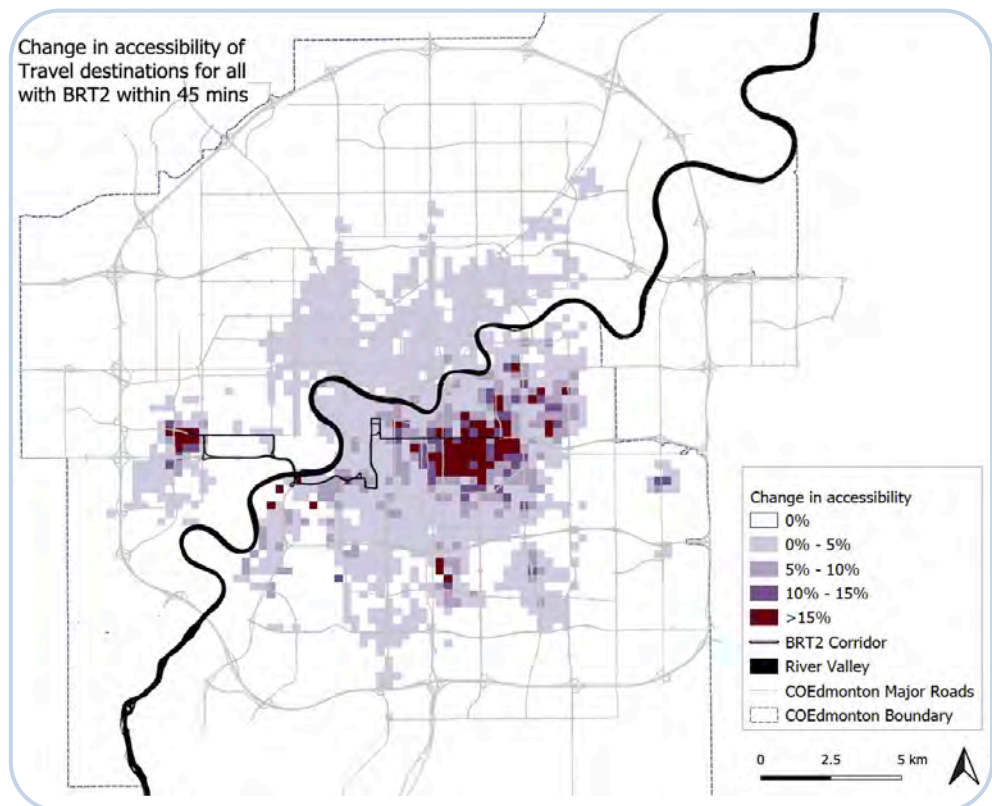


Figure 10 Increase in accessibility of trip destinations for all with B2 within 45 mins

Both of the proposed BRT corridors were estimated to increase accessibility to opportunities within 30 and 45 minutes of travel time for the destinations we identified in our analysis.

Table 9 summarizes the percentage increases we estimated for each of the categories of trip destinations.

For B1, the increase in accessibility is substantial, with a 16% increase in accessibility to priority destinations for Youth, an 18% increase in access to seniors' priority destinations, a 15.7% increase in accessibility to locations where women are presently employed, and a 13.9% increase in accessibility to priority destinations accessed by DATS users - all within a 30 minute travel time window.

Within a 45-minute travel time window, modest increases in accessibility were observed above the 30-minute results. Namely, accessibility to priority destinations for Youth by B1 increases by 12.6%, goes up by 13.5% for seniors trip destinations, increases by 12.7% for women's jobs, and improves by 10.5% for DATS trips.

In contrast, the change in accessibility by B2 is relatively modest when we compare the 30 and 45-minute time windows, with changes ranging from 2-3% for all trip destinations within 45 minutes as most of the BRT route alignment is an overlay of the existing frequent Route 4 service.

The most significant changes in accessibility associated with B2 are estimated between the University of Alberta and Bonnie Doon as a result of faster service along this portion of the route.

This finding should not be minimized as a result of the demand for transit services along this corridor.

Overall, the proposed BRT system is projected to boost accessibility by approximately 15.9% with B1 and by 5% with B2 within 30 minutes. Within the 45-minute travel window, accessibility can be expected to go up by approximately 12% with the B1 alignment and 2% with the B2 route.

These findings indicate that B1 will significantly improve access to all opportunities compared to B2.

Increase in Accessibility	B1		B2	
	30min	45min	30min	45min
YOUTH	16.1%	12.6%	6.6%	3.0%
SENIORS	18.1%	13.5%	5.6%	2.5%
WOMEN'S JOBS	15.7%	12.7%	3.6%	1.9%
DATS TRIPS	13.9%	10.5%	6.0%	2.2%
OVERALL	15.9%	12.2%	5.4%	2.4%

Table 9 Summary table presenting average percentage changes in accessibility to identified destinations

Data Analysis Conclusions

While the home-based and trip-based analyses can be interpreted individually, it is recommended to consider the findings from both analyses synergistically.

The findings of both the trip-based and home-based analysis indicate that B1 is expected to benefit the selected identity groups more significantly compared to B2.

This statement is not intended to take away from the expected benefits of investing in B2, however, from the exercise of priority-setting according to equity-deserving communities, this analysis indicates that B1 should be set as a priority for the City of Edmonton to invest in if the City can not implement the full BRT program at the same time.

It is also important to note that the accessibility benefits that we predicted, as a result of introducing this new mass transit service, can only be achieved through implementing transit priority infrastructure - including bus only lanes, transit signal priority, etc. - to achieve the travel speeds that we used to model accessibility (30 km/hr) and through delivering frequent service (a bus frequency of 5 minutes during peak hours was used for our accessibility modeling).

In conclusion, leveraging existing data through these analyses enables the City to make informed decisions that prioritize equity, ensuring that the proposed BRT system effectively serves all residents of Edmonton, enhancing accessibility, and fostering inclusivity.

The project team intends for this analytical approach to serve as a benchmark for future equity-based analyses, and hope that it is useful and built upon for future projects.

Data Limitations and Considerations for Future

This analysis operationalized the concept of transport equity in the planning of new BRT routes through the introduction of a framework rooted in the application of home-based and trip-based analyses for diverse priority groups.

Nevertheless, the study was limited by the availability of reliable demographic data at the necessary level of granularity, as well as the existing level of information about travel behaviour in Edmonton.

This section provides details of these limitations and offers suggestions for addressing them.

One of the limitations encountered in the analysis was the difficulty in conducting trip-based analyses due to the lack of gender-disaggregated data or other forms of travel behaviour data that could be disaggregated by other forms of identity (e.g. race and sexuality).

While we did consider using Statistics Canada's 2021 Commuting Flows dataset which was cross-tabulated by gender, a significant portion of the city was not covered by it as a result of data suppression issues.

Namely, if fewer than 10 women commuted between a specific Census Tract (CT) pair, data for that CT pair would be suppressed. This limitation would similarly apply to the Commuting Flows data that is cross-tabulated to other demographic variables, such as income bins.

This insight underscores the importance of carefully refining data collection methods to allow for identity-disaggregated data analysis. Alternatively, data-sharing practices between public bodies and researchers could be more flexible in terms of aggregation to minimize data suppression but retain as much spatial information as possible. Special provisions and agreements could be signed to ensure the privacy of people represented in the dataset.

With regards to the home-based analysis, the project team was limited by an absence of information about individuals with disabilities and sexual and gender minorities.

Currently, there is a lack of Canadian Census data that are disseminated on these populations, which hinders the ability to conduct comprehensive home-based analyses that account for their unique travel behaviors and needs. To address this limitation, future data collection efforts should incorporate targeted sampling methods and inclusive survey questions that capture the experiences and perspectives of these marginalized groups.

Overall, improving future data collection efforts is crucial for informing future capital infrastructure investments as well as guiding operational changes to service. The next iteration of the Household Travel Survey (HTS) presents a significant opportunity to incorporate this knowledge and allow for more comprehensive equity and GBA+ analyses.

In the 2015 HTS, identity factors such as race, ethnicity, Indigenous status, and disability were not included in data collection.

This project ideally makes for a compelling case to expand the demographic questions in Edmonton's next Household Travel Survey to, at minimum, align with the identity factors prioritized in the City's policies and plans.

Lastly, the Regional Travel Model should be updated to reflect these identity factors to ensure that impacts on different identity groups are considered in planning analyses.

4 Engagement

Equity Principles for Edmonton's Mass Transit Program

Based on the results of section 2. , a series of principles were developed that reflect the barriers experienced by equity-deserving people and their needs when it comes to transit. The principles are:

1. Having routes connect to key destinations
2. Better access to transit stops and stations
3. Stations with features to improve comfort and safety
4. Frequent and reliable service
5. Bus Rapid Transit buses designed to meet customer needs
6. In addition to these five original principles, a sixth principle was added as one of the outcomes of this Assessment:
7. A Bus Rapid Transit system to be proud of

Engagement Approach

Engagement Approach
The engagement process was designed to understand the transit-related experiences and needs of participants and to apply that understanding to the refinement and prioritization of the principles described above.

Engagement included multiple tactics described below. Details about each tactic are available in Appendix C.

Ride-alongs

Local service organizations were engaged in a call for volunteers to participate in a transit ride-along and workshop, which occurred in January 2024.

Seventeen participants were ultimately chosen, representing a cross-section of the demographic groups being studied as well as many intersectionalities between them.

Especially given these intersectionalities of overlapping identities (e.g. racialized or Indigenous women, low-income seniors, etc.), many participants could be said to be part of one or more equity deserving communities.

Each participant attended one of two transit ride-alongs that were planned along the 97 Street (segment of BRT Route B1) and Whyte Avenue (segment of BRT Route B2) corridors.

Participants were paired in groups of twos or threes with a consultant team member who interviewed them throughout the ride and recorded what they said.

Workshop

Ride-along participants were also asked to attend a workshop the following morning to discuss their experiences in the context of the draft equity principles.

The conversations that were had in the workshop were represented graphically in a drawing by a graphic facilitator. The image that was created can be found in the final section of this report.

Participants were compensated with a \$100 prepaid Visa card for their participation in the process, and light refreshments were served at the workshop.



Online Survey

In March 2024, an online survey was conducted using the City of Edmonton's Insight Community to understand how respondents in the wider population feel about the importance and ranking of each principle and to explore any differences across demographic groups.

Who We Engaged

At the start of the process, secondary research was conducted to identify a series of demographic groups that are understood to be most impacted by transit inequities.

These became the target demographic (equity-deserving) groups of the process from which ride-along and workshop participants were chosen.

The groups are:

- Youth, defined for the purposes of this project as individuals under the age of 35
- Seniors, defined for the purposes of this project as individuals 55 and older
- Low-income people making an annual income under \$30,000
- Racialized people
- Immigrants and newcomers
- First Nations, Métis, Inuit and other urban Indigenous people
- Women
- People with disabilities

Some of the intersectional identities of the ride-along and workshop participants selected for this process included:

- First Nations woman
- Immigrant woman
- Racialized, low-income woman
- Disabled senior
- Indigenous senior
- Racialized, newcomer youth
- Racialized, low-income youth with a disability
- 2SLGBTQIA+ youth

The online survey saw a total of 3,449 responses over a period of 2 weeks in March 2024.

Of these respondents, the following statistics were indicated:

- 14% were under the age of 35
- 29% were over the age of 65
- 47% identified as a woman
- 43% identified as a man
- 3% identified as non-binary or transgender
- 5% had a household income of under \$30,000 before taxes
- 9% identified as racialized
- 14% identified as persons with a disability
- 3% identified as Indigenous
- 9% were born outside of Canada
- 10% identified as 2SLGBTQIA+

What We Heard

Through engagement we received rich information about the public transit experiences of equity-deserving Edmontonians.

A summary of key themes and feedback is included in the following sections. The fulsome Engagement Report is in Appendix C, which provides additional detail such as online survey results by demographics, and transit customer personas representing intersectionality of different identity factors.

Overall Themes

The following themes represent a summary of what we heard.

Frequency and reliability of the transit system are the top concern of all participants, including people from equity deserving communities.

However, we heard that people from equity-deserving communities are often accessing transit during off-peak periods (e.g. evenings and weekends), so ensuring frequent and reliable service at all times of the day will improve the transit experience for many of them.

The principles that people generally don't prioritize are more important for many equity deserving people.

For example, workshop participants from equity-deserving communities identified "Stations with features to improve comfort and safety" and "Better access to transit stops and stations" as top priorities, while survey participants did not. This reflects the barriers many equity-deserving people experience related to accessibility and safety. The principle "Bus Rapid Transit buses designed to meet customer needs" also scored low across all demographic segments in the online survey, but workshop participants generally gave it a medium to high priority in their table discussions and often identified it as being important during ride-alongs. Bus layout and seating is extremely important to people with a variety of accessibility needs, and space for cargo – especially strollers and mobility devices – would improve the quality of trips for mothers, people with disabilities, and many seniors. More space for bikes would improve trip quality for youth and many low-income people.

Safety is a top priority of everyone but what is safe is different for different people.

We heard that people from equity-deserving communities may be more highly impacted by issues of safety because they tend to use transit more during off-peak hours when fewer people are taking transit in general. However, addressing safety for people from equity-deserving communities requires careful consideration of the impacts of potential solutions. For example, while some people in our process asked for more security guards or Peace Officers, one of our Indigenous participants noted that Peace Officers do not make them feel safe and they will, in fact, avoid locations where they know there are Peace Officers for fear of being unfairly targeted. Another participant suggested she would feel safer if there were restricted fare-paid areas in stations.

When thinking about the transit accessibility needs of people with disabilities, don't forget about people with invisible disabilities.

People with disabilities experience some of the greatest barriers to transit access. We heard that people with invisible disabilities experience similar barriers but that those may not always be as obvious to others. For example, many chronic conditions can cause pain, muscle spasms, or other mobility impairments that are not entirely obvious to other people, which may make it awkward to ask someone to give up their seat. We heard that more seating would benefit this group.

Better access to real-time information supports reliability and reduces barriers.

We heard that access to real-time information, especially in the case of service disruptions or delays, can significantly improve the experience of many equity deserving people who need to plan complex trips carefully and might not have access to technology or data. Workshop participants highlighted the value of wifi on buses, enhanced stop announcements, real-time digital displays and a more customer-focused role for drivers towards improving their transit experience.



Principle-specific feedback

In-Person Workshop

The In-person workshop was held on the morning after the transit ride-alongs, while the memory of the experience and the discussions were still fresh in the minds of participants. Only ride-along participants participated in the workshop.

In-Person Workshop Feedback on Principles

Below is a table summarizing key feedback from the in-person workshop by principle, in order that the principles were ranked by participants in the workshop.



Principle	Priority	Feedback
FREQUENT AND RELIABLE SERVICE	1	<ul style="list-style-type: none"> Consider the needs of shift workers, especially those who must travel at night. It's important to maintain frequency and reliability throughout the day. For some people, especially people with disabilities or who don't speak English as a first language, reliability means drivers that are courteous and anticipate their needs (e.g. deploying a ramp without being asked) and are knowledgeable enough about the city and its transit routes to provide directions if needed.
STATIONS WITH FEATURES TO IMPROVE COMFORT AND SAFETY	2	<ul style="list-style-type: none"> Improving safety is a top priority, especially for customers travelling at night. Design for safety – good lighting, clear sightlines. Curbside stations are more accessible than centre-lane stations. Consider an education campaign to promote use of the help phone and other emergency features. Consider implementing a fare paid area with restricted access. Consider the experience of boarding a bus for a person with a disability. Stations should be clean. Consider the impacts of cold weather and design stations for comfort. Ensure supporting infrastructure is maintained and in-service as often as possible (e.g. elevators). Provide screens with real-time information and wayfinding.
ROUTES THAT CONNECT TO KEY DESTINATIONS	3	<ul style="list-style-type: none"> Significant destinations include downtown, school (e.g. University of Alberta), grocery stores, Doctors Offices/Hospitals. Important to consider frequency off-peak (e.g. very early and late morning, late evening, night). Important to consider the needs of shift workers. Make it easy to plan a trip.

Principle	Priority	Feedback
Bus Rapid Transit buses designed to meet customer needs	4	<ul style="list-style-type: none"> Dedicated Accessible Transit System (DATS) for seniors with mobility challenges needed. Consider the cargo needs of equity-deserving groups – mothers with strollers, mobility devices of people with disabilities, bikes – and make room for them. Consider flexible designs that can accommodate more cargo when needed. Design the seating plan to make room for people with mobility devices. Many women prefer single seats. Consider air conditioning on buses. All-door boarding would make boarding easier, especially for people with disabilities. Look to Vancouver as a best practice. Provide on-board real-time route information (e.g. current stop, next stop, final destination, any temporary route changes or service disruptions) and enhanced stop announcements. Provide wifi on buses. Consider high-capacity buses (e.g. articulated buses) so people are always able to board.
BETTER ACCESS TO TRANSIT STOPS AND STATIONS	5	<ul style="list-style-type: none"> People with mobility challenges need to find places to rest along the way if the trip to a transit stop is long. Prioritize pedestrians over cars along major transit corridors. Consider the experience along transit corridors of people with disabilities – it can be difficult to cross a wide street. Consider the transfer experience, especially for people with disabilities. It's important to achieve proximity between transfers. Snow presents a major impediment to accessibility in the wintertime – important to prioritize snow clearing and address windrows to ensure accessibility. Access to information needed to plan your trip is an important element of access, especially for people from equity deserving communities. Access to cellular data/wifi is important so that people can access transit information on their phones.

Table 10 Workshop Participant Feedback on the Principles

In-Person Workshop Feedback on Missing Principles

Affordable:
Consider that affordability is a barrier to many people.

Facilitating Access and Comfort:
Driver behaviour has an outsized impact on the transit experience of some people, especially those requiring accessibility assistance and people with cargo, including seniors with disabilities and mothers with strollers.

Drivers who provide excellent customer service significantly improve the transit experience for these people.

Creating an experience that inspires pride:
Taking transit can be a stigmatizing experience, especially for people who have no other choice other than to take public transit with North America's societal preference for driving.

Delivering a service that people can feel proud of can give transit riders a greater sense of dignity and improve the overall transit experience for everyone.

Online Survey

In March 2024, an online survey was open to a wide cross-section of Edmontonians collected feedback on the value and prioritization of the equity principles.

Shared below is data on the percentage of times each principle was selected by a participant as being amongst the top three most important principles that would most improve their transit experience.

Online Survey Feedback on Principles

Below is a high-level summary of the feedback received through the online survey. For the simplicity of reporting, this table only shows the percentage of people who picked each principle as being within their top three.

Priority ranks are based on the percentage of people who picked that principle to be in their top three.

A more detailed summary of the online survey results by demographic group is included in Appendix C

Principle	% who see it as one of 3 most important	Priority rank	Key principle-related feedback
Frequent and reliable service	54%	1	<ul style="list-style-type: none"> Frequency and reliability are the backbone of good transit service and are of primary importance above all the other principles. For transit to compete with driving, it needs to be frequent, reliable, and fast. More frequent service improves connections. Frequency during off-peak is important to support tradespeople and shift workers. Important to achieve better than every 15-minute frequency. Frequency can impact perceptions of safety. Real-time updates and accurate tracking are crucial to help manage expectations and support trip planning, especially during delays. Maintain frequency during bad weather so that people can rely on transit when they need it most.
Routes that connect to key destinations	50%	2	<p>Routes and schedules should be simple and understandable.</p> <ul style="list-style-type: none"> Straightforward, easy to navigate routes and clear schedules will improve usability of the system. Routes should connect to major employment areas and should serve more than just the weekday 9-5 office crowd. Consider industrial areas and other areas where shift work is common. There's a strong need for more off-peak service, including late-night and early morning service, to accommodate a wider range of schedules and to reduce wait times. Routes should ensure easy and direct access to universities, colleges, schools, hospitals and clinics. Routes should be designed in consideration of the social and cultural destinations that are important to local communities, including places of worship. Routes should cater to shopping and entertainment needs. Routes should reach deeper into residential communities to minimize walking times and better connect communities to major transit hubs. Support of multi-modal travel through integration with other modes is crucial. Connections should be seamless with other buses, trains, bikes, and walking paths. Frequency is key to improving connections, so that user do not have long wait times. Ensure routes are safe to travel.

Principle	% who see it as one of 3 most important	Priority rank	Key principle-related feedback
Stations with features to improve comfort and safety	34%	3	<ul style="list-style-type: none"> • Ensure that the system is designed to support comfort during the harshest of weather conditions, especially winter weather. Incorporate heated shelters at stations and stops. • Design stations for increased passenger safety through better lighting and strong sightlines. • Install emergency communication systems at all stations/stops to support safety. • Increase the security presence at stations. • Keep facilities, including washrooms, clean and well-maintained to improve the overall comfort and experience of transit users. • Enhance comfort for waiting passengers by providing essential amenities including washrooms and ample seating. • Install digital information displays to provide real-time information about transit schedules, service changes and other essential information to assist passengers in planning their journey.
Better access to transit stops and stations	27%	4	<ul style="list-style-type: none"> • Stations and stops should be within walking distance of residential and commercial areas to make it easier to access transit. • Enhance pedestrian infrastructure like sidewalks, crosswalks, and pedestrian paths leading to transit stops and stations to make them safer and more accessible, especially for those with mobility challenges. • Offer sufficient park-and-ride options at major transit stations to accommodate those who need to drive as part of their commute. • Feeder bus services that connect outlying areas to main transit lines should be more frequent and reliable, reducing wait times and transfer hassles. • Implement on-demand transit in areas with lower density to improve access for all users. • Install clear, visible signage and wayfinding at and around stations and stops to assist passengers in navigating to and from the transit system easily.
All of the above are equally important	25%	5	<ul style="list-style-type: none"> • Take an integrated approach that prioritizes all principles. • Take a holistic approach that enhances the user experience by carefully designing and integrating everything from the layout of buses and stations and to scheduling and routing. • Prioritize equitable access by designing for the needs of seniors, disabled, and low-income people. • Develop transit services with an emphasis on user feedback and real-world usage patterns, ensuring that all elements of the transit service are aligned with actual customer needs and preferences.

Principle	% who see it as one of 3 most important	Priority rank	Key principle-related feedback
Bus Rapid Transit buses designed to meet customer needs	15%	6	<ul style="list-style-type: none"> • Accommodate people who use wheelchairs and walkers and/or who are traveling with strollers or grocery carts. Provide sufficient space for these needs as well other types of cargo. • Provide enough priority seating to accommodate all customers comfortably. • Make the bus ride comfortable by providing comfortable seating, effective heating and cooling systems, and noise reduction technology. • Include visual and audio announcements for stops and route information to ensure accessibility for visually and hearing-impaired passengers. • Include real-time tracking systems accessible via mobile devices. • Increase safety for riders by equipping buses with safety features like secure handrails and anti-slip flooring. • Consider the use of surveillance cameras. • Design bus interiors to maximize space, improve flow, and reduce congestion, especially around entrance and exit points, to speed up boarding and disembarking processes.
None of the above are important	5%	7	<ul style="list-style-type: none"> • Skeptical that principles will be implemented effectively based on past efforts. • Proposed principles do not align with the actual needs and priorities of transit users. • There are other, more pressing priorities, including operational efficiency, management practices, and fiscal responsibility. • Doubt that, even if implemented, principles will have any measurable impact. • Based on past experiences, transit agencies can't be trusted to effectively prioritize and implement changes that truly benefit users. • The cost of implementing all of these principles will be too high and will not yield proportional benefits.

Table 11 Summary of Online Survey Feedback on Principles

What We Did

We used the feedback from the in-person transit ride-alongs, workshop and the online survey to help inform updates to and finalize the principles.

Appendix C includes a summary table of the original principles, followed by the final principle text with revisions highlighted in bold, based on feedback from the engagement program.

The final principles are showcased, with customized graphics, in the following Summary and Recommendations section of this report.



5 Summary and Recommendations

Principles for Mass Transit in Edmonton

The recommended principles for Edmonton's Mass Transit program are outlined below.

Each principle and its supporting characteristics have been iteratively refined through the engagement phase of this study.

While the principles below are listed in order of priority identified through engagement, each principle is foundational to the success of Edmonton's Mass Transit program and future BRT system. The applicable Mass Transit program input is also identified with each principle.

Principle 1 - Frequent and reliable service SERVICE PLANNING



Frequent means providing access to high frequency transit (e.g. service every 15 minutes or better, everyday), throughout the day and night to facilitate trips to serve the travel needs of all Edmontonians to key destinations (e.g. hospitals, shopping, leisure destinations, community service facilities and employment zones with high levels of shift work). Frequency also supports reliability.

Reliable means providing a predictable and reliable transit service. Introduce all-door boarding to support reliability.

Principle 2 - Having routes connect to key destinations NETWORK PLANNING AND CORRIDOR SELECTION



Connected means providing transit access to places and destinations that will improve the lives of Edmontonians without cars and create economic and social opportunities.

This includes transit access to high schools, post-secondary institutions, hospitals, medical and social services, shopping and leisure destinations, community service facilities, places of worship and employment zones with high levels of shift work.

Principle 3 - Stations with features to improve comfort and safety

STOP AND STATION DESIGN



Safe is to create a safe physical environment for all transit customers by incorporating clear sightlines, good lighting, access to help phones, and restricted fare paid areas.

Winter-Ready stations are designed with winter weather in mind, including covered pedestrian areas, heated shelters, and prioritised snow clearing (e.g. window removal to ensure accessibility)

Real-Time Information means providing real-time information at stations to indicate next vehicle arrival times, support trip planning, and communicate planned and unplanned disruptions to improve the transit experience for everyone but especially for many equity-deserving people, including newcomers, seniors, and people without access to technology.

Clean supports comfort by maintaining stations to a high-degree of cleanliness.

Principle 4 - Better access to transit stops and stations

TRANSIT ALIGNMENT AND ROW DESIGN; STOP AND STATION PLANNING



Inclusive means to design streets and Bus Rapid Transit stations in a way that eliminates barriers to access and ensures universal accessibility. Incorporate visual, tactile, and audible elements that support wayfinding for people of all abilities.

Walkable is to consider the specific needs and abilities of transit customers and minimize walking distances to Bus Rapid Transit stations from residential communities, key destinations, and between transfers.

Principle 5 - Bus Rapid Transit buses designed to meet customer needs

ROLLING STOCK DESIGN DETAILS



Accessible is to ensure transit vehicles are both universally accessible (e.g. dedicated seating for accessibility, enhanced audio and visual stop announcements). Additional seating on transit vehicles would assist people with and without physical disabilities, both visible and invisible.

Cargo-Friendly means ensuring that transit vehicles can accommodate travel accessories or equipment such as wheelchairs, walkers, strollers, bikes, grocery carriers and other large cargo.

Real-Time Information is providing information on buses including next stop announcements, route information, and information on planned and unplanned disruptions to improve the transit experience for everyone but especially for many equity-deserving people, including newcomers, seniors, and people without access to technology. Wifi on board will also improve the customer experience and support improved wayfinding.

Principle 6 - A Bus Rapid Transit system to be proud of

MASS TRANSIT PROGRAM



Taking Pride means that transit should not be a tool of last resort for Edmontonians. Edmontonians deserve a transit system that they can be proud of.

Providing a good transit system and experience that makes taking transit not just a viable, but preferred option over driving which will attract new transit riders and vastly improve the transit experience for existing riders.

Key Considerations for Mass Transit in Edmonton

Beyond the principles outlined above, there are many detailed considerations for mass transit implementation which can significantly improve the experience for equity priority populations.

The graphic below is a summary of the Workshop. It includes the considerations which are reflected in the principles and highlights the experiences of a diverse group of Edmontonians.

Analysis of currently available home-based and trip-based data was completed as a demonstration and to inform the City's prioritization of mass transit corridors for implementation.

We outlined and implemented methods for both the home-based analysis and trip-based analysis for all identity factors represented in the data.

The combination of each method provides insight into the ability for different equity-deserving groups to access mass transit services from their homes (home-based), and the increased access to opportunities provided by the conceptual transit service (trip-based).

Two planned corridors were assessed:

- B1 - The north-south route running between Castle Downs and Century Park LRT Station via 97 Street and Calgary Trail.
- B2 - The east-west route operating between Bonnie Doon and West Edmonton Mall via Whyte Avenue

While the home-based and trip-based analyses can be interpreted individually, it is recommended to consider the findings from both analyses synergistically.

The findings of both the trip-based and home-based analysis indicate that B1 is expected to benefit the selected identity groups more significantly compared to B2.

This statement is not intended to take away from the expected benefits of investing in B2, however, from the exercise of priority-setting according to equity-deserving communities, this analysis indicates that B1 should be set as a priority for the City of Edmonton to invest in.

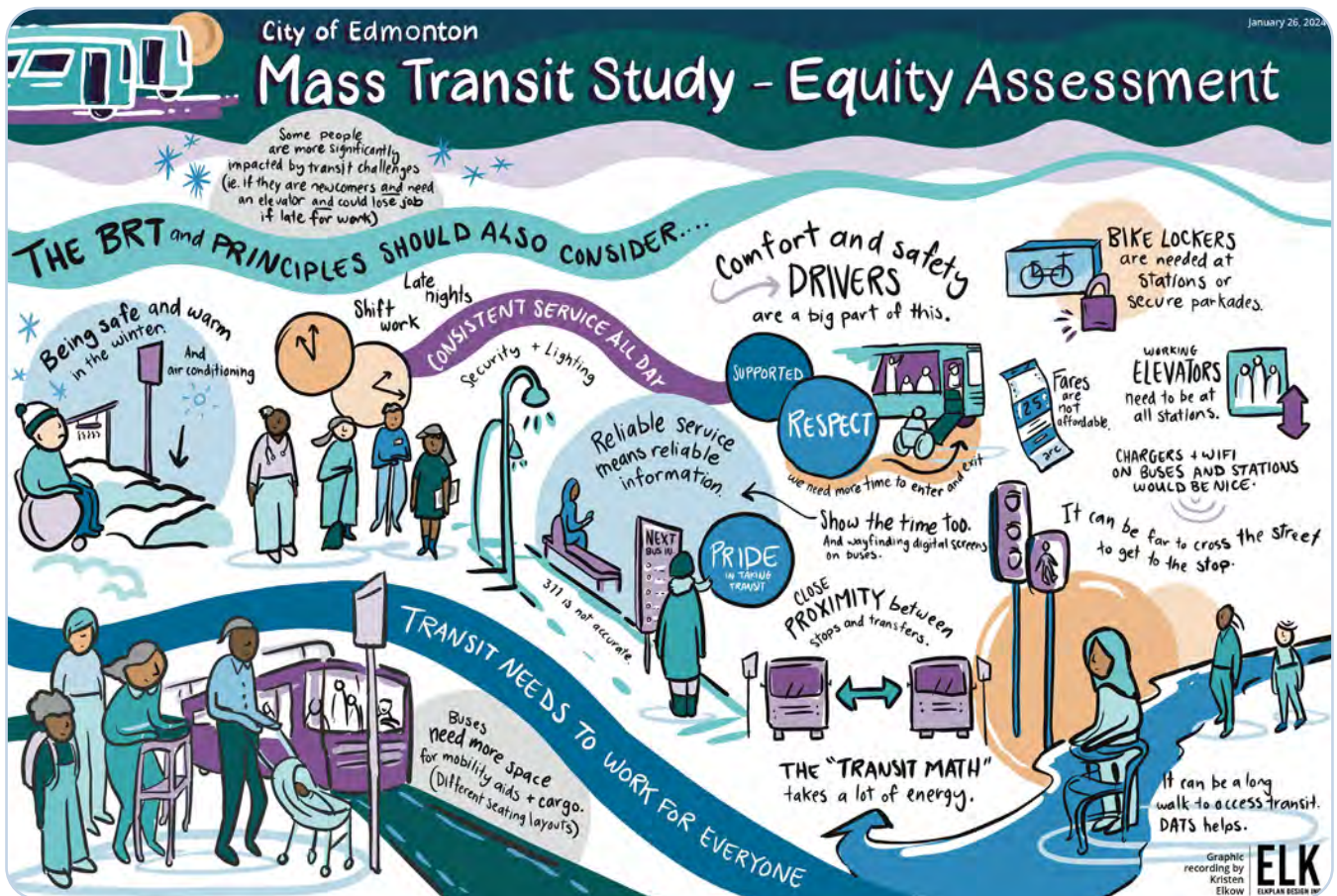


Figure 11 Graphic illustration of the key findings from the in-person workshop.

Equity-Based Decision-Making

The City of Edmonton desires to ensure equity is at the core of its infrastructure and service delivery decision and this cannot be achieved without supporting data and information about equity priority populations.

Namely, there is a significant gap in trip-level information for racialized people, and a gap in household-level information for people with disabilities.

For the LGBTQIA2+ population there is currently no data available.

Overall, improving future data collection efforts is crucial for informing future capital infrastructure investments as well as guiding operational changes to service.

The next iteration of the Household Travel Survey (HTS) presents a significant opportunity to incorporate this knowledge and allow for more comprehensive equity and GBA+ analyses.

In the 2015 HTS, identity factors such as race, ethnicity, Indigenous status, and disability were not included in data collection.

This project ideally makes for a compelling case to expand the demographic questions in Edmonton's next Household Travel Survey to, at minimum, align with the identity factors prioritized in the City's policies and plans.

Lastly, the Regional Travel Model should be updated to reflect these identity factors to ensure that impacts on different identity groups are considered in planning analyses.

Endnotes

1 As per Statistics Canada's definition of Low Income Cut-Offs (LICOs) it is stated that for regions with a population above 500,000 and a 4-person household size, an income less than \$43,110 for the year 2021 is considered to be within the low-income bracket. Source: Statistics Canada. Table 11-10-0241-01 Low income cut-offs (LICOs) before and after tax by community size and family size, in current dollars

2 The Employment Equity Act defines visible minorities as "persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in colour". For more information on how Statistics Canada defines visible minority: <https://www23.statcan.gc.ca/imdb/p3Var.pl?Function=DEC&Id=45152>

3 LeClair, K., Tiznado-Aitken, I., Klumpenhauer, W., & Farber, S. (2023). A web-based tool to incorporate social equity in infrastructure planning and delivery. *Case Studies on Transport Policy*, 13, 101068. <https://doi.org/10.1016/j.cstp.2023.101068>

4 Statistics Canada defines youth as those who are aged between 15 and 24 years.

5 According to Statistics Canada, for the regions with a population above 500,000, a 4-person household with income less than \$43,110 in 2021 is considered to be within the low-income bracket

6 Given the high-frequency nature of the proposed network and findings from travel studies, we assume that residents are willing to walk further distances for shorter waiting times, hence, a 600-meter service area is considered beyond the typical 400 meters for bus transit stops. For more in-depth reading about varying walking distances to transit, refer to this paper here.

7 These were identified as trips in the Regional Travel Model that women undertook for the purpose of work

8 Based on the current BRT networks in Canada, an average speed of 25 km/h was found when the operating speeds of BRT in Calgary and Winnipeg were calculated during the morning peak hour and number of studies advocating for an optimal operating speed of 30 km/hr.

9 Introduction to r5r: <https://cran.r-project.org/web/packages/r5r/vignettes/r5r.html>

10 For a comprehensive overview of additional functions and usage in r5r, refer this document.

11 BBBike is a free open-source tool to extract street maps in formats like csv, PBF, ESRI shapefile, GeoJSON, etc.

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Appendix

Appendix A: Planning and design considerations by Identity Factor

	Engagement	Network Planning and Corridor Selection	Transit Alignment and ROW Design	Station and Stop Planning	Station and Stop Design	Service Planning	Rolling Stock Design
Seniors	Consider getting to meetings or access to internet	Coverage to healthcare, recreation, social activities	Safe pedestrian crossings. Curb cuts	Stop locations near high seniors populations / activities. Define appropriate walk distance for seniors	Enhanced safety features at stations Snow and ice clearing at stops	Daytime frequency	Accessible vehicles
Youth	Consider time, cost, access to internet	Service to high school and postsecondary institutions. Access to entry-level jobs, youth-based programs				Highschool and postsecondary hours	
Low Income People	Consider time, cost, access to internet	Coverage for areas with low-income population Transit access to entry-level jobs, service, logistics, health, caregiving jobs		Walking distance to places of employment		Service reliability for shift workers Off peak service frequency	

People with Disabilities	Consider time, cost, access to internet	Coverage and accessibility to commonly travelled and priority destinations	Safe pedestrian crossings. Curb cuts Tactile warning strips	Define appropriate walk/access distances for station planning. Minimize crossing and walk distances	Universal access Consider full spectrum of disabilities Enhanced safety features Accessible customer information and wayfinding Snow and ice clearing	Frequency at commonly travelled times	Accessible vehicles
Indigenous People	Consider time, cost, access to internet	Coverage and accessibility to priority destinations			Consider safety concerns of Indigenous women and girls	Frequency at priority times	
Racialized People	Consider time, cost, access to internet, language	Coverage and accessibility to priority destinations			Information in different languages		
Newcomers and Immigrants	Consider time, cost, access to internet, language	Coverage and accessibility to priority destinations			Information in different languages		
Women	Consider time	Coverage to childcare, shopping and amenities, healthcare facilities		Minimize crossing and walk distances to priority destinations	Consider safety, real and perceived. Address late night safety	Trip-chaining opportunities and off-peak frequency	Accessible vehicles Accommodate children and strollers

Appendix B – Data Analysis Detailed Results

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Women

Focusing on the shares of women, Figure 3 reveals that most proposed BRT stops contain almost an equal gender split, with a few exceptions, particularly along the 97 and 101 street corridors between 122 Avenue to Rosedale Road along B1.

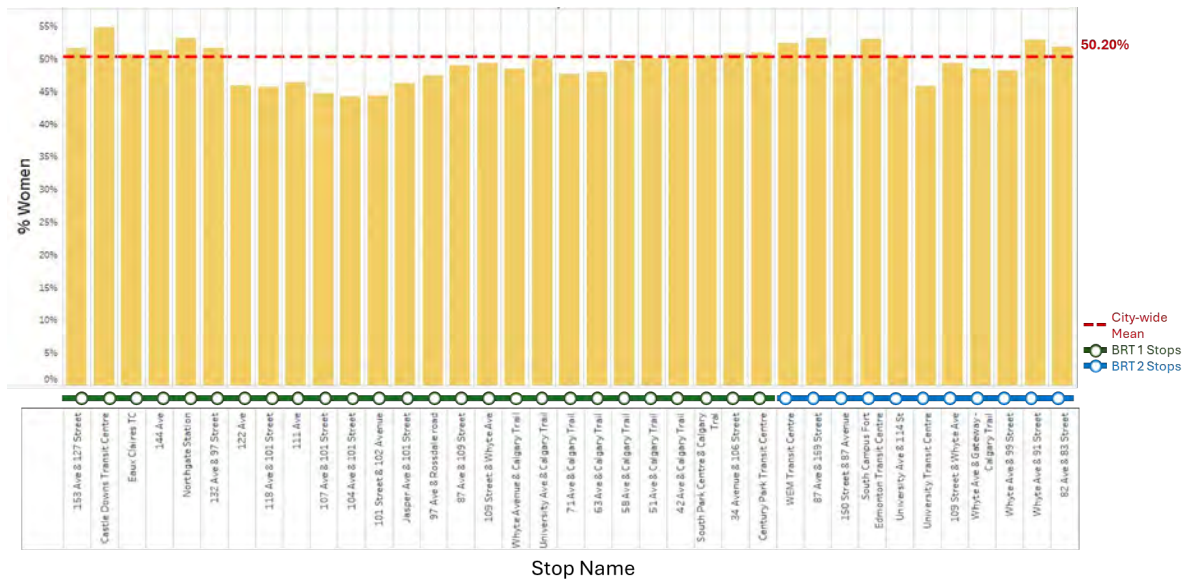


Figure 3 Proportion of Women residing near BRT stop

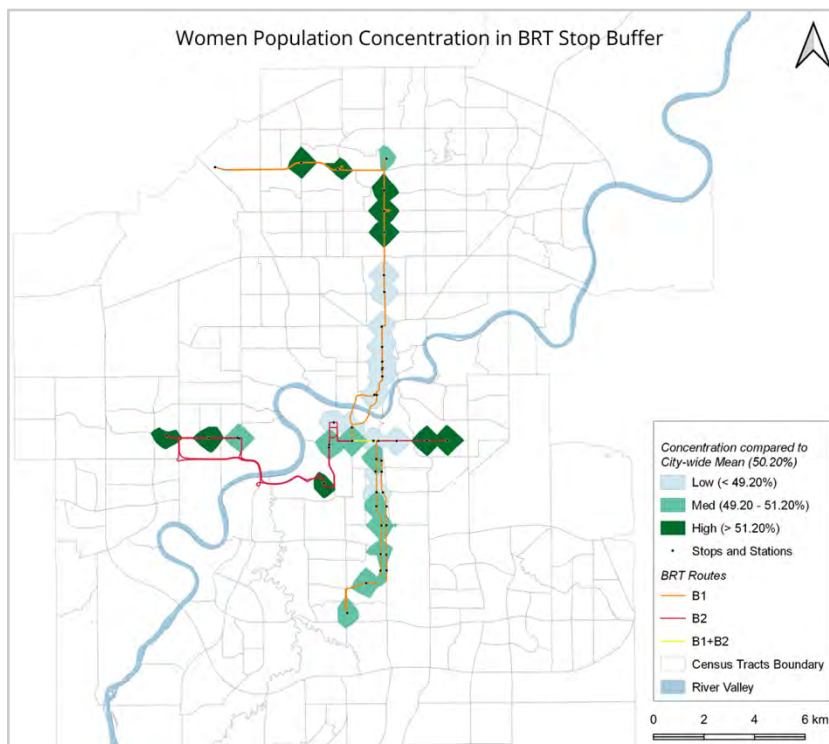


Figure 4 Map showing the concentration of Women in the BRT buffer relative to the city-wide mean

Seniors (Adults 65 years and older)

With regards to the spatial residential patterns of seniors (adults 65 years and older), Figure 5 and Figure 6 highlight several proposed BRT stops around which senior populations are clustered. In particular, nearly 35% of the population within walking distance to Castle Downs Transit Centre are seniors, and just under 30% are seniors near South Campus Fort Edmonton Park Station. It is also clear that several stops serve locations with proportions of seniors that exceed the city average.

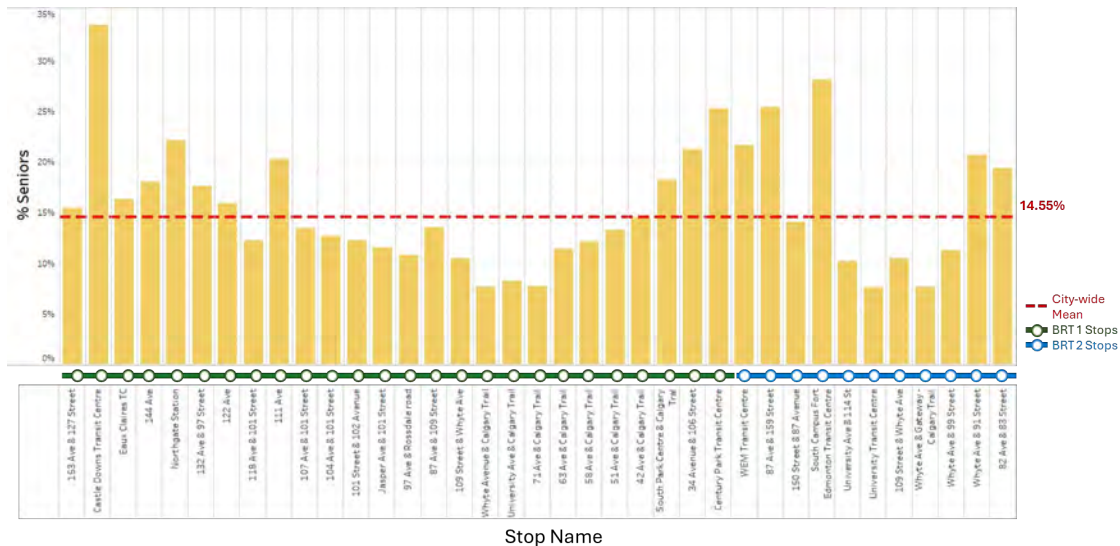


Figure 5 Proportion of Seniors (aged 65 years and above) residing near BRT stop

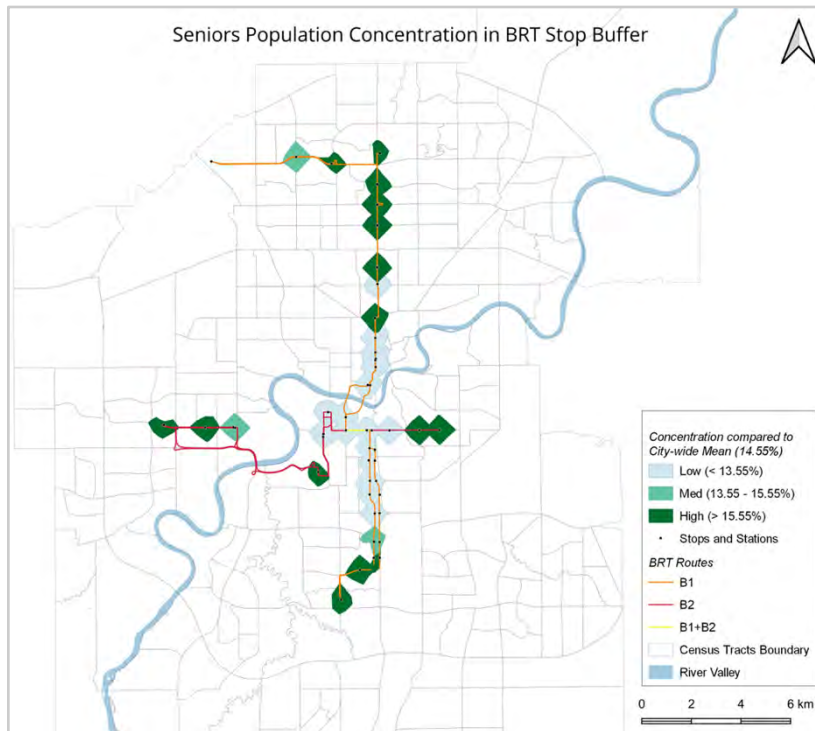


Figure 6 Map showing the concentration of Seniors in the BRT buffer relative to the city-wide mean

Recent immigrants

Along the majority of proposed BRT stops, we observe that recent immigrants show a higher concentration along the proposed BRT corridors compared with the city-wide mean. For recent immigrants, the bar graph in Figure 7 reveals that areas with concentrations exceeding 10% are clustered around 132 Avenue at 97 Street, Century Park LRT Station, West Edmonton Mall (WEM) Transit Centre & 71 Avenue at 104 Street.

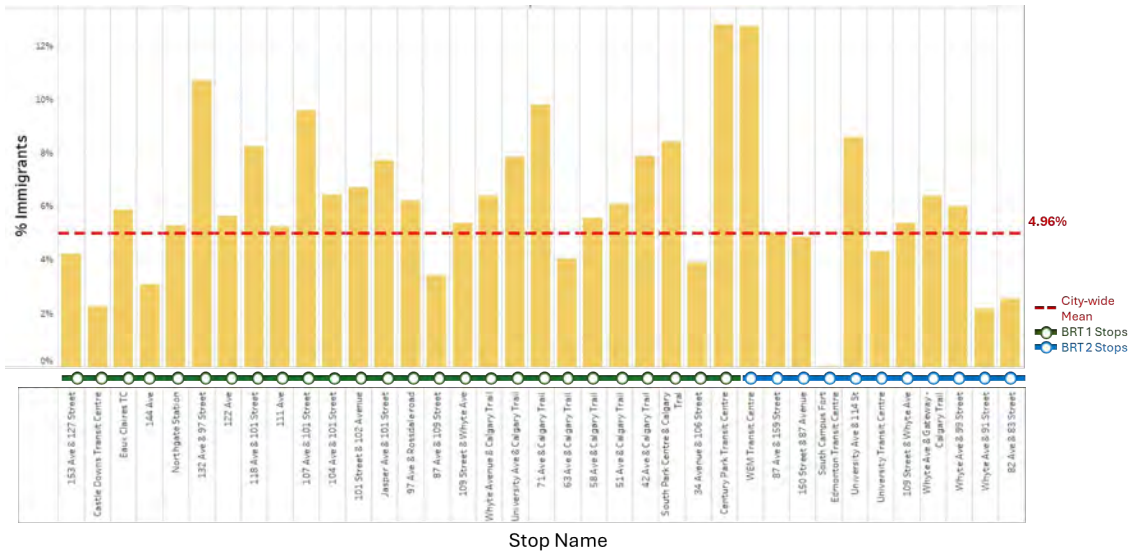


Figure 7 Proportion of Immigrants (Immigrated to Canada between 2016-2021) residing near BRT stop

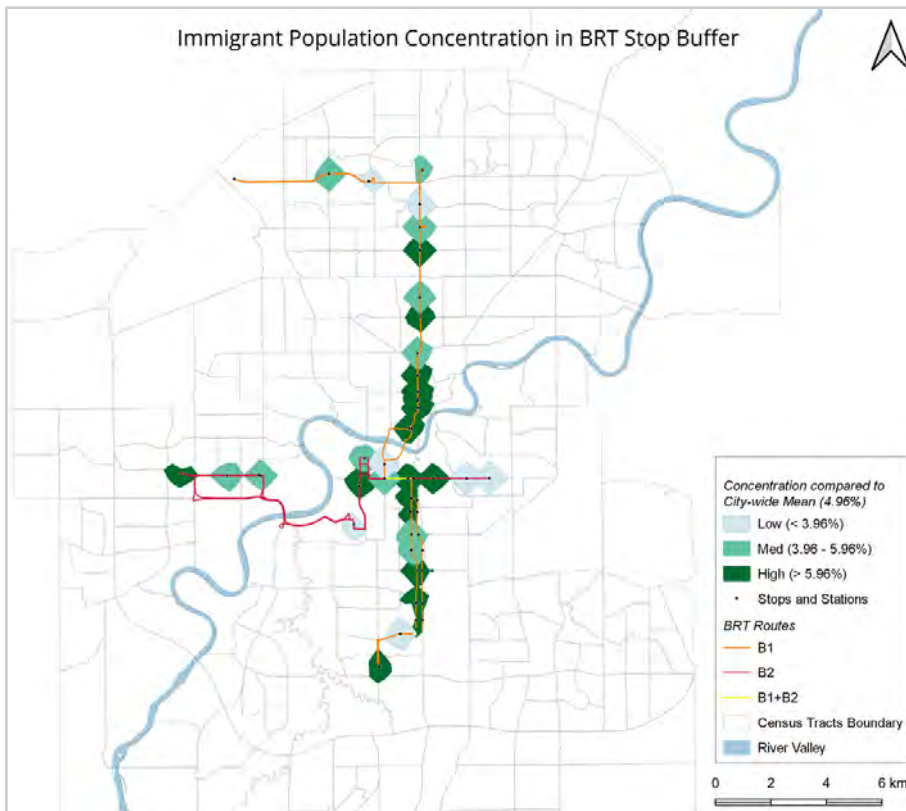


Figure 8 Map showing the concentration of Immigrants in the BRT buffer relative to the city-wide mean

Indigenous populations

The patterns for the shares of indigenous populations around the proposed BRT routes follow the same trend as observed for recent immigrants. The bar graph in Figure 9 highlights the most significant concentrations observed around the B1 route, particularly at stops located at 118 Avenue at 101 Street, 71 Avenue at 104 Street, and 63 Avenue at 104 Street.

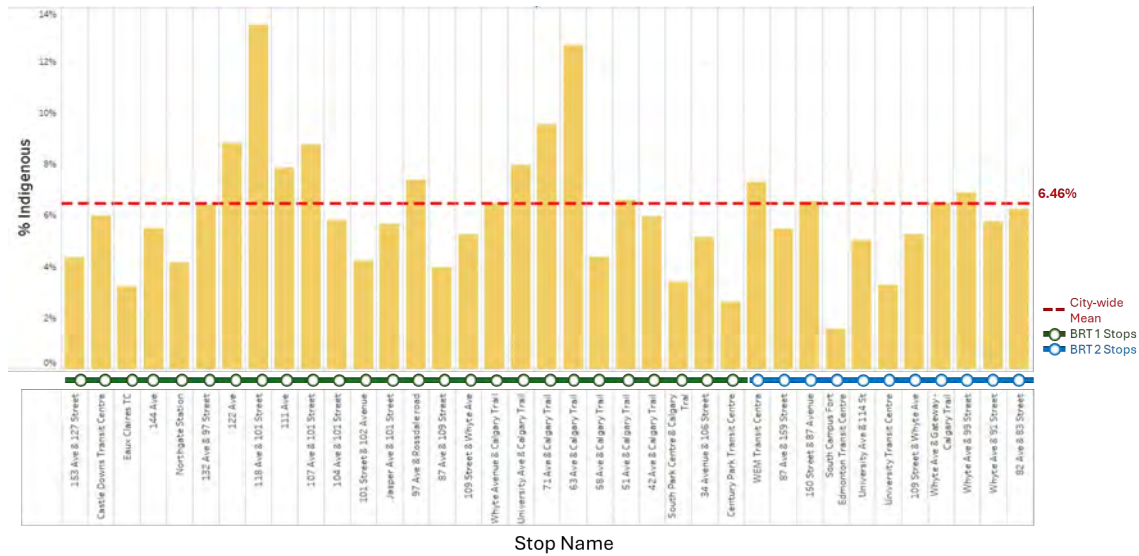


Figure 9 Proportion of Indigenous People residing near BRT stop

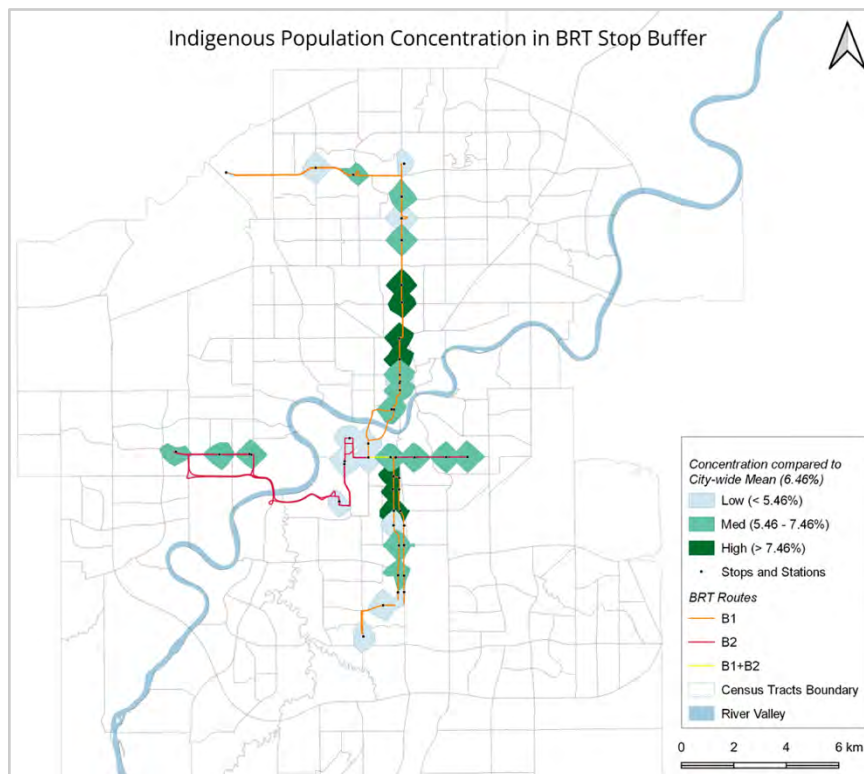


Figure 10 Map showing the concentration of Indigenous People in the BRT buffer relative to the city-wide mean

Visible minorities

Figure 12 suggests that visible minorities are concentrated around the University of Alberta area and along the B1 corridor north of the river. Figure 11 indicates variations across different segments. Particularly high concentrations are evident around Eaux Claire Transit Centre, 107 Avenue at 101 Street, and Century Park LRT Station within the B1 route, and at the West Edmonton Mall Transit Centre and University Avenue at 114 Street along the B2 route. These areas see the concentration of visible minorities higher than the citywide mean of 32%.

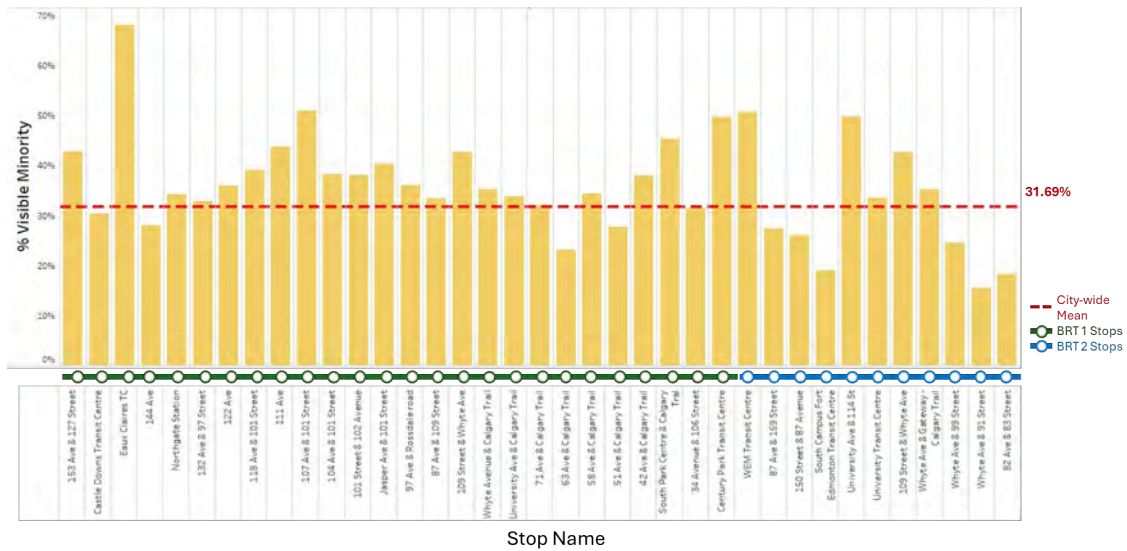


Figure 11 Proportion of Visible minority residing near BRT stop

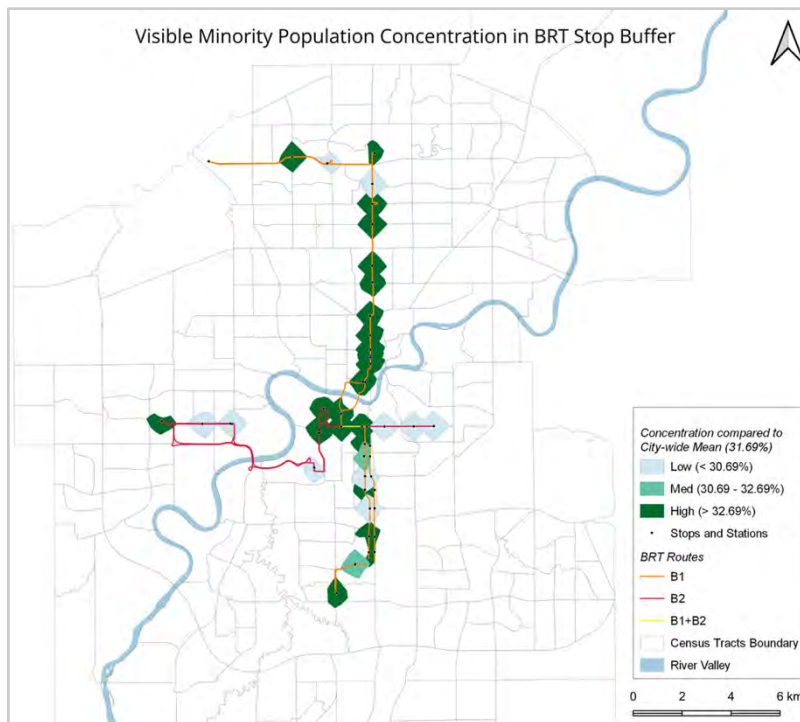


Figure 12 Map showing the concentration of Visible minority in the BRT buffer relative to the city-wide mean

Low-income populations

Lastly, we observed high concentrations of low-income people around all the proposed stops for both BRT routes. The analysis reveals that this demographic group is observed at a higher than the city average rate around the proposed BRT stops, underscoring the potential of the BRT system to provide affordable and accessible transportation options for low-income residents in Edmonton.

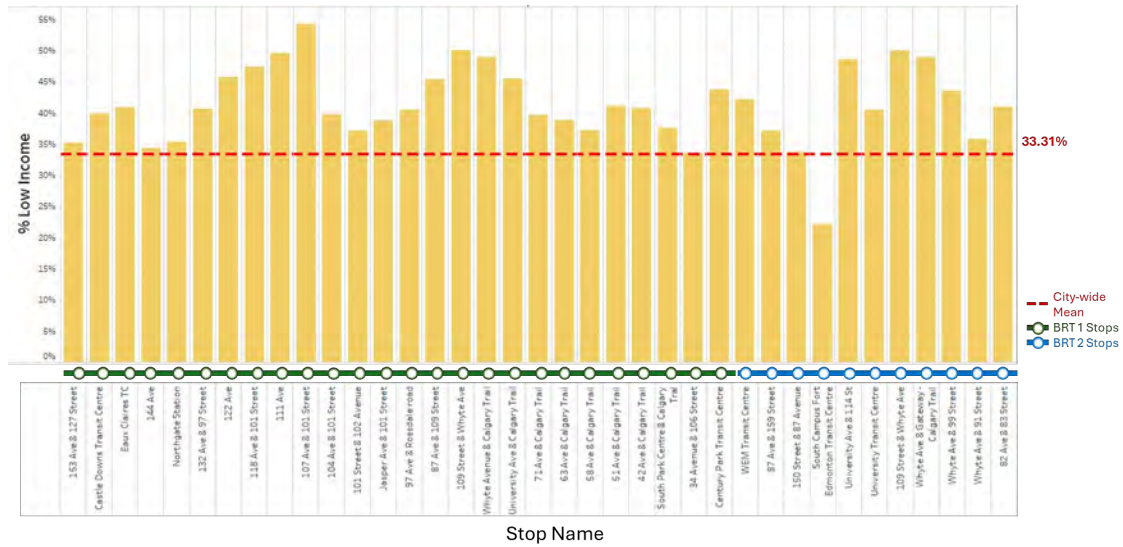


Figure 13 Proportion of Low-income households residing near BRT stop

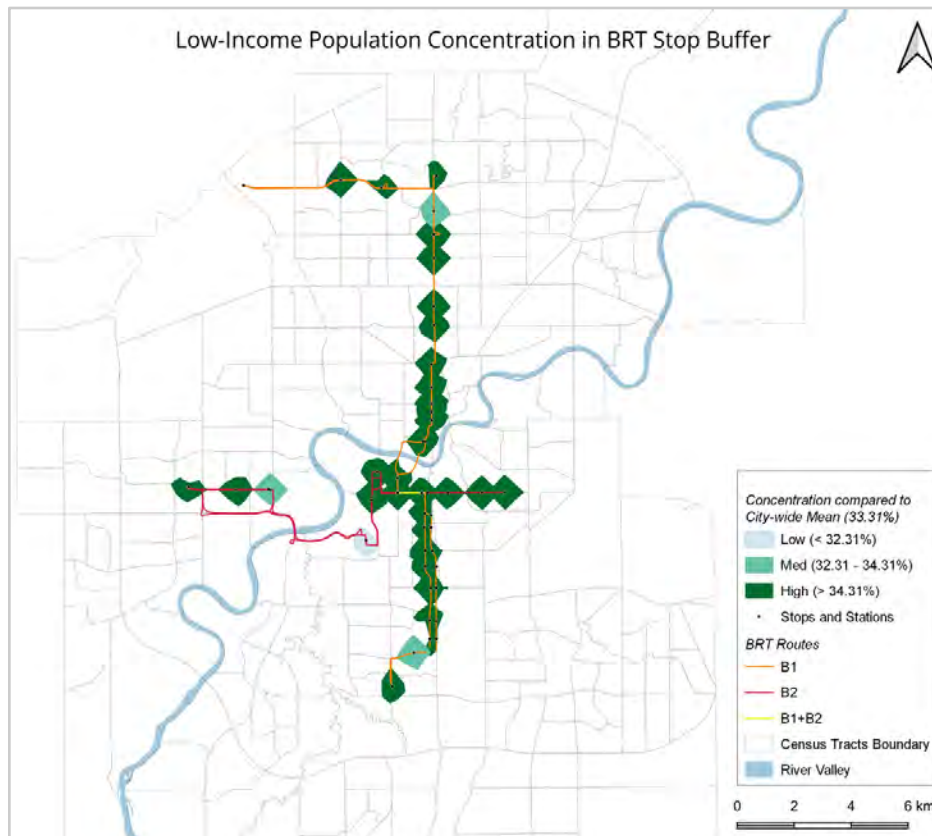


Figure 14 Map showing the concentration of Low-income households in the BRT buffer relative to the city-wide mean

Trip-based Analysis Results

Below, we present a series of maps that summarize our findings. For each of the four trip destinations, we first present the spatial patterns of the travel behaviour data which reveals priority locations in the city. We then measure existing and future accessibility to those locations for the base, and each of the BRT scenarios. A series of accessibility maps are presented to show the changes in accessibility in 30 and 45 minutes as a result of the implementation of B1 and B2.

Youths' (persons 15–24 years old) trip destinations

The high-demand trip destinations for youth (Figure 15) are predominantly concentrated around the University of Alberta, Downtown, West Edmonton Mall, Bonnie Doon area, Mill Woods, MacEwan University, Clareview LRT Station, and scattered throughout the south of the city. The accessibility results indicate that B1 will significantly increase accessibility along Gateway Boulevard/Calgary Trail and the Strathcona area within both 30 and 45 minutes (Figure 16). In contrast, B2 will have a more pronounced change in accessibility in Bonnie Doon and West Edmonton Mall neighbourhoods within both 30 and 45 minutes (Figure 17). The analysis indicates that with B1, youth will have access to an average of 3,400 more opportunities within 30 minutes and around 6,500 more opportunities within 45 minutes, on average. With B2, the increase is slightly lower, given that it's also a shorter route, providing access to approximately 2,300 more opportunities than the existing system within 30 minutes, on average. Comparing these improvements to the existing transportation network, accessibility to youth trip destinations will increase by 16% with B1 and by 6.6% with B2 within a 30-minute travel time. For a 45-minute travel time, the accessibility improvements are estimated at 12.6% with B1 and 3% with B2.

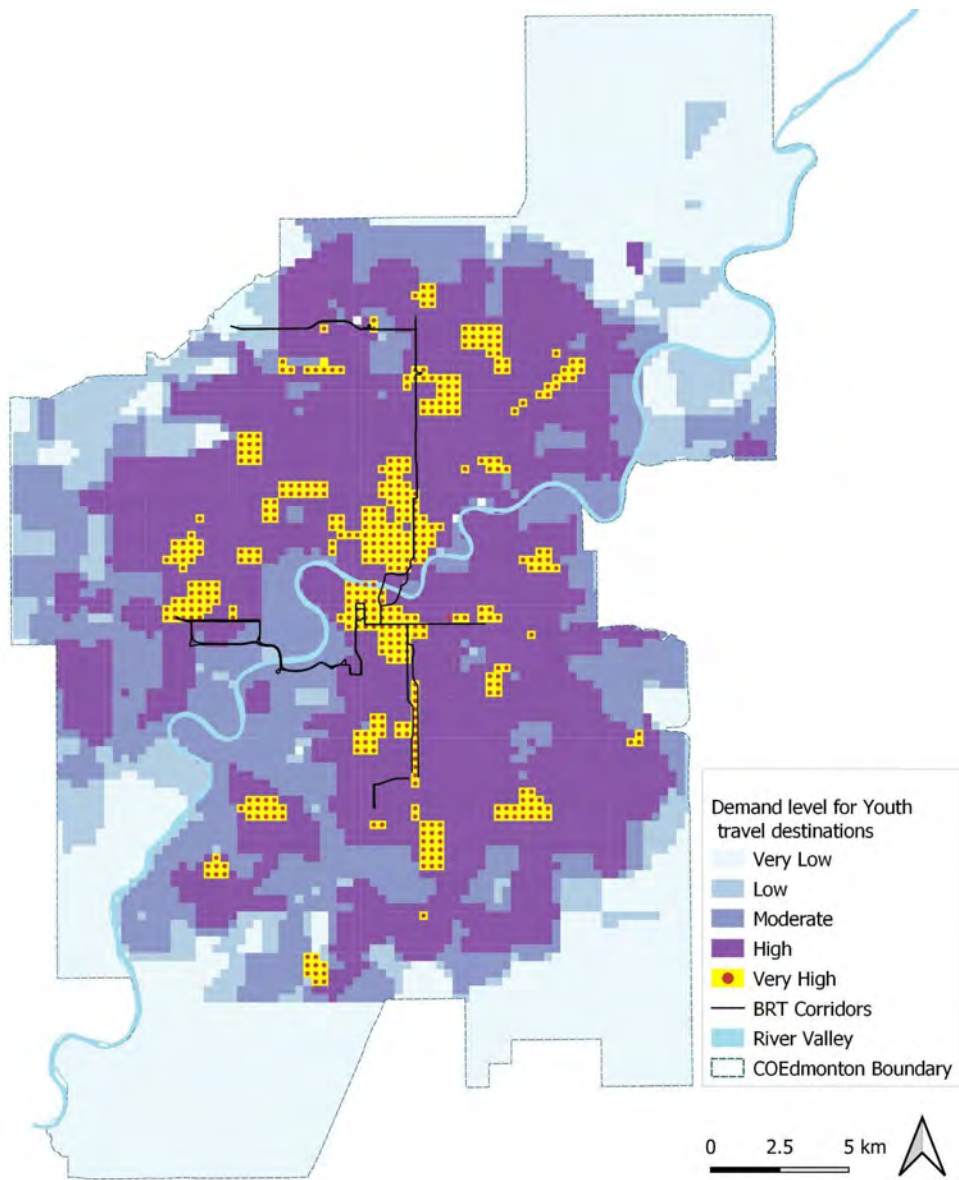


Figure 15 Map showing high-priority locations for Youth trip destinations

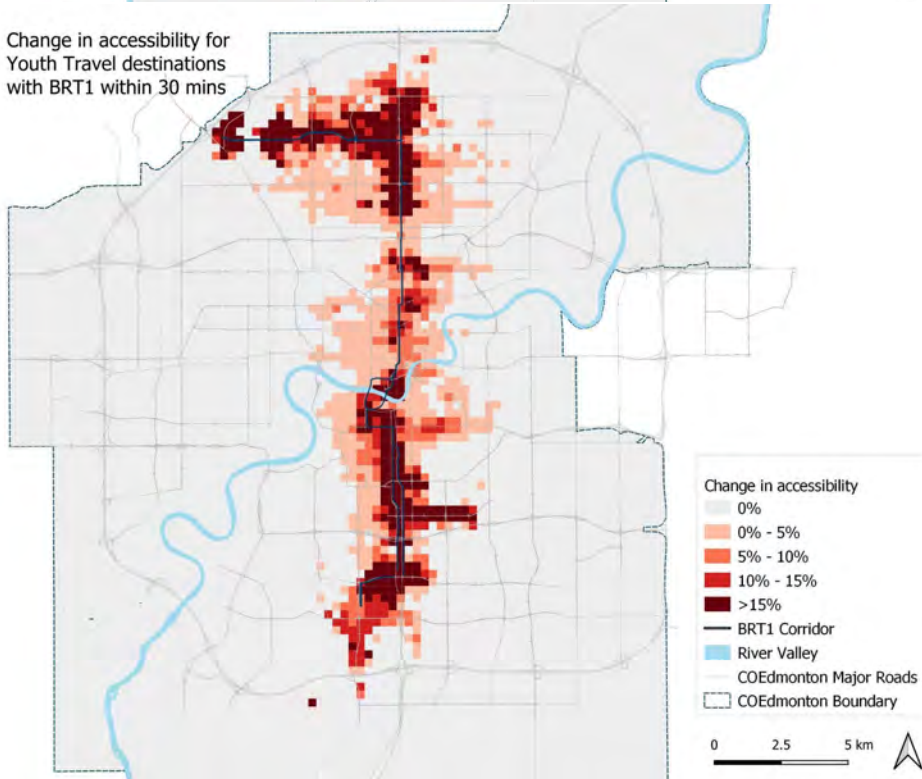
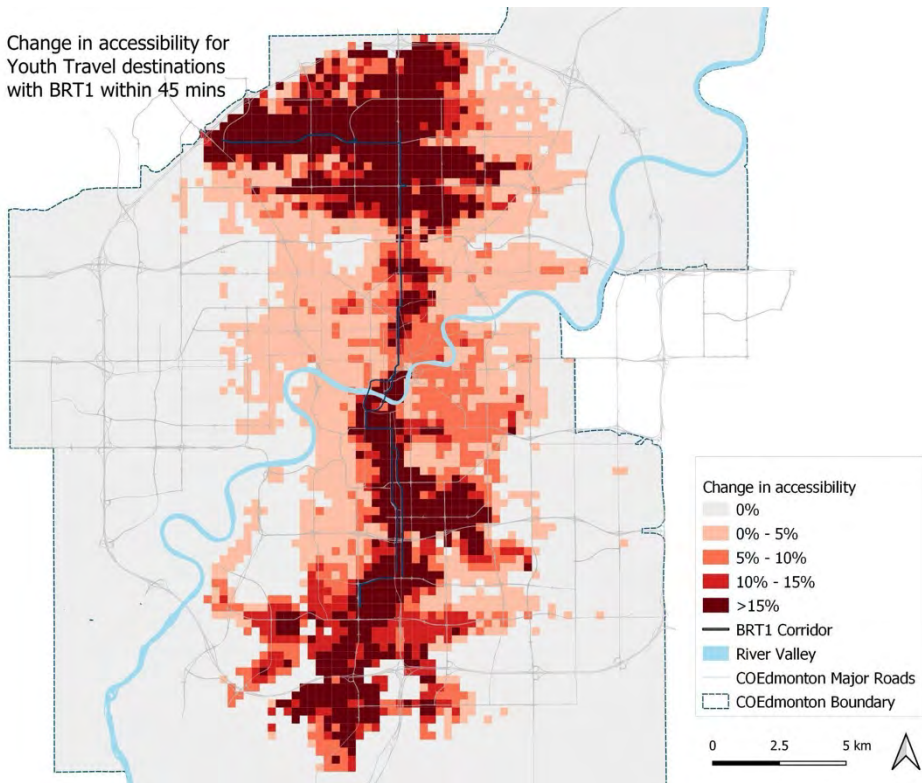


Figure 16 Increase in accessibility for Youth trip destinations with B1 within 30 & 45 mins

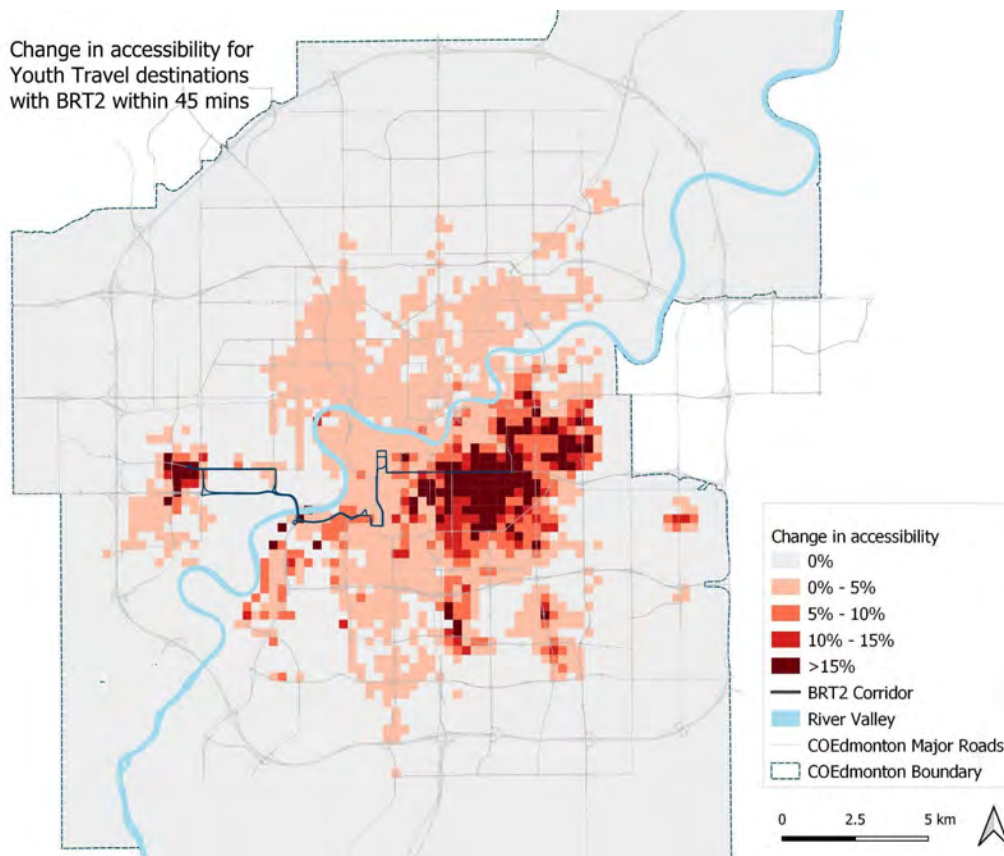
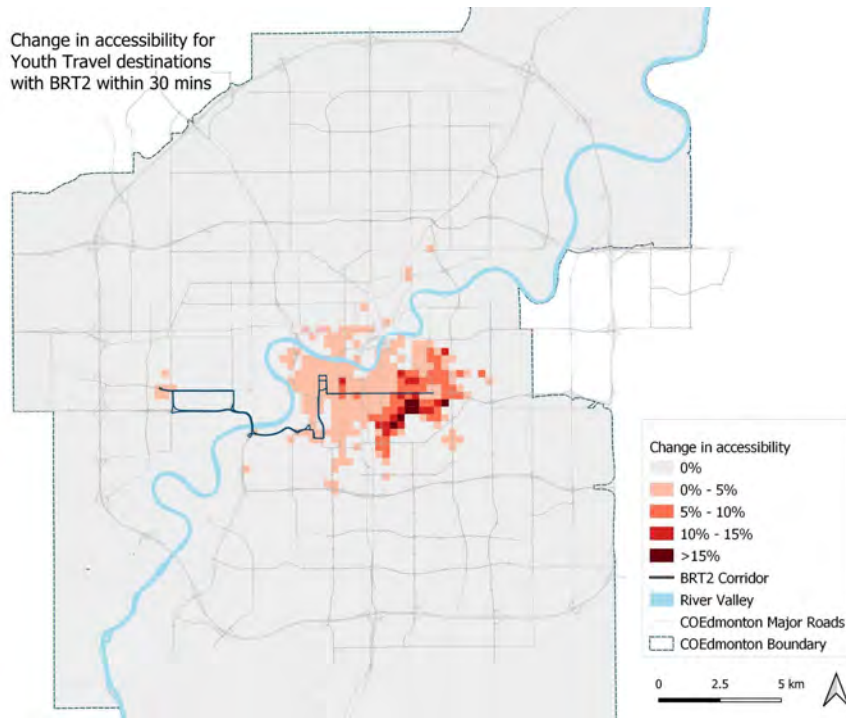


Figure 17 Increase in accessibility for Youth trip destinations with B2 within 30 & 45 mins

Seniors' (adults 65 years and older) trip destinations

Focusing on seniors' trip destinations in Figure 18 we can see that high-demand destinations for this priority group are dispersed throughout the city, with concentrations observed in downtown, the University area, recreational areas like West Edmonton Mall (WEM), Bonnie Doon, and Century Park.

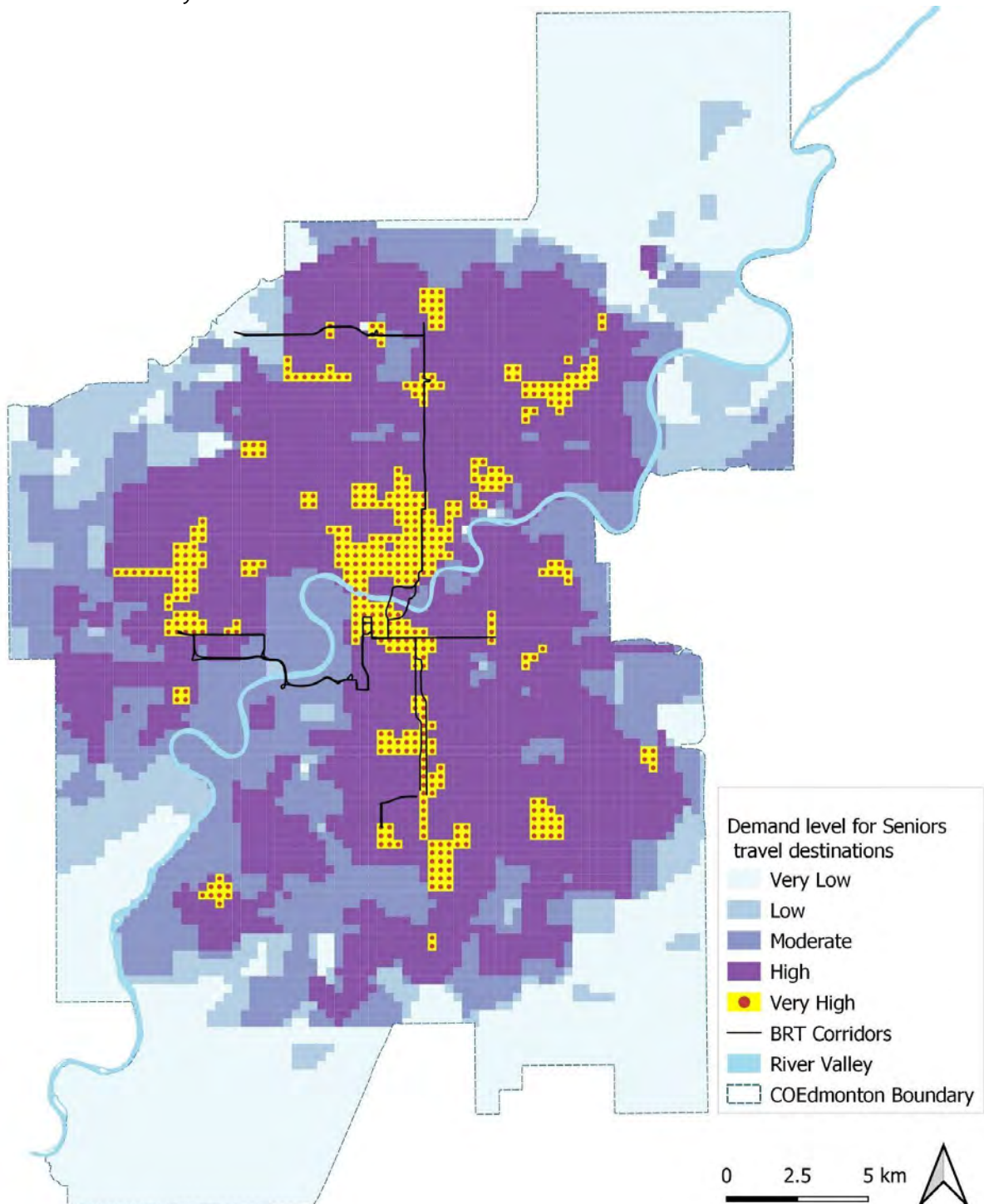


Figure 18 Map showing high-priority locations for Seniors' trip destinations

With the implementation of B1B1, seniors will gain access to an average of 4,000 more opportunities within a 30-minute travel time. This represents an 18% increase compared to the existing transportation network. Furthermore, within a 45-minute travel time, B1B1 is expected to provide seniors with access to around 7,000 more opportunities, on average, equating to a 13.5% increase compared to the existing network. The spatial patterns are displayed in Figure 22 (30 minutes) and Figure 23 (45 minutes).

On the other hand, the introduction of B2 will, on average, improve access for seniors to approximately 1,700 more opportunities within both 30 and 45 minutes of travel time. This translates to an increase of around 5% within a 30-minute travel time (Figure 21) and a 2.5% increase within a 45-minute travel time (Figure 22) compared to the existing transportation network.

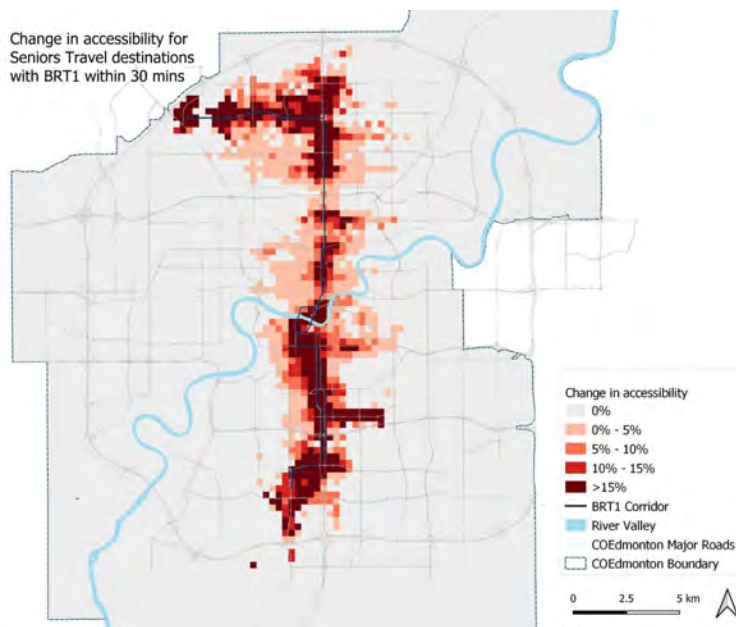


Figure 19 Increase in accessibility for Senior trip destinations with B1 within 30 mins

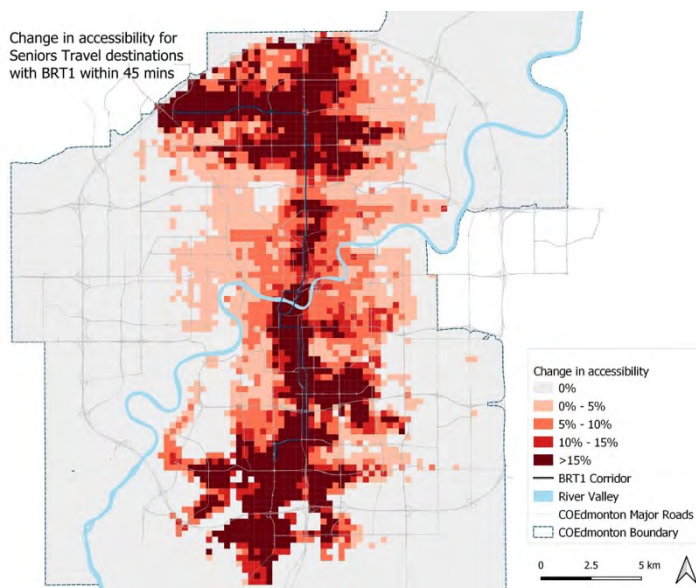


Figure 20 Increase in accessibility for Senior trip destinations with B1 within 45 mins

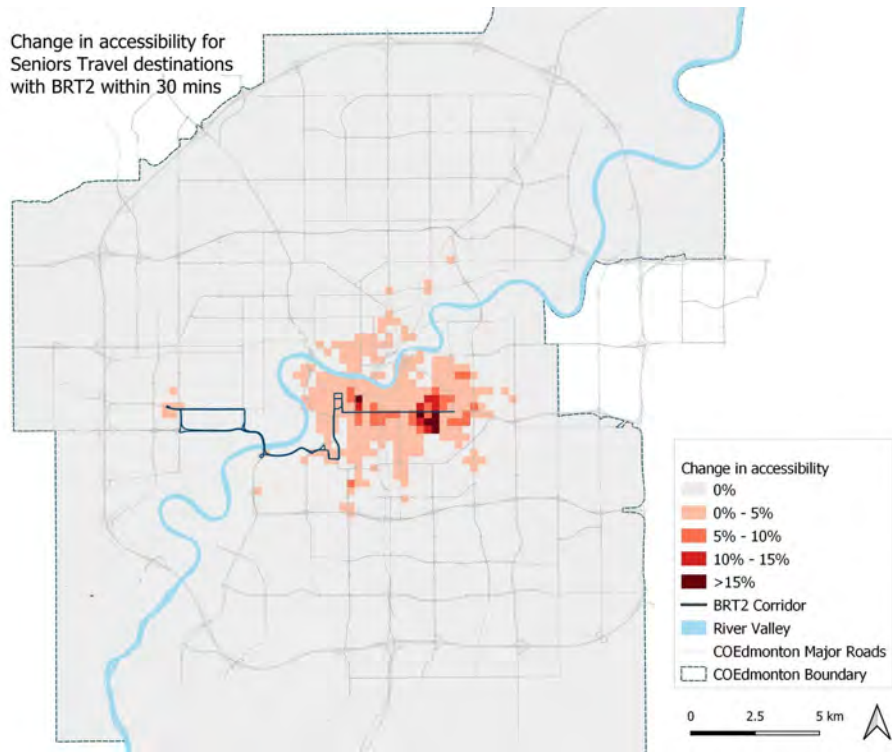


Figure 21 Change in accessibility for Senior trip destinations with B2 within 30 mins

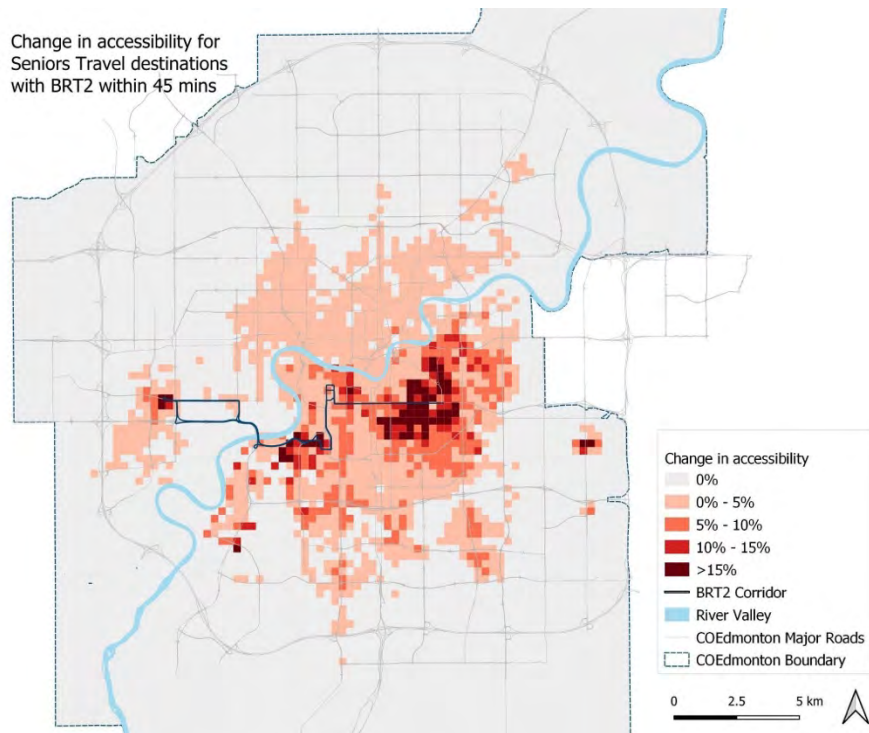


Figure 22 Increase in accessibility for Senior trip destinations with B2 within 45 mins

Women's job locations

For women's jobs, high-demand destinations (as presented in Figure 23) are primarily concentrated around downtown, the University of Alberta (including hospitals), and industrial areas, particularly along the Gateway Boulevard and Calgary Trail corridor. With the implementation of B1B1, women are expected to gain access to an average of approximately 5,800 more jobs within a 45-minute travel time. In contrast, B2 is expected to provide access to around 1,200 more jobs within the same travel time.

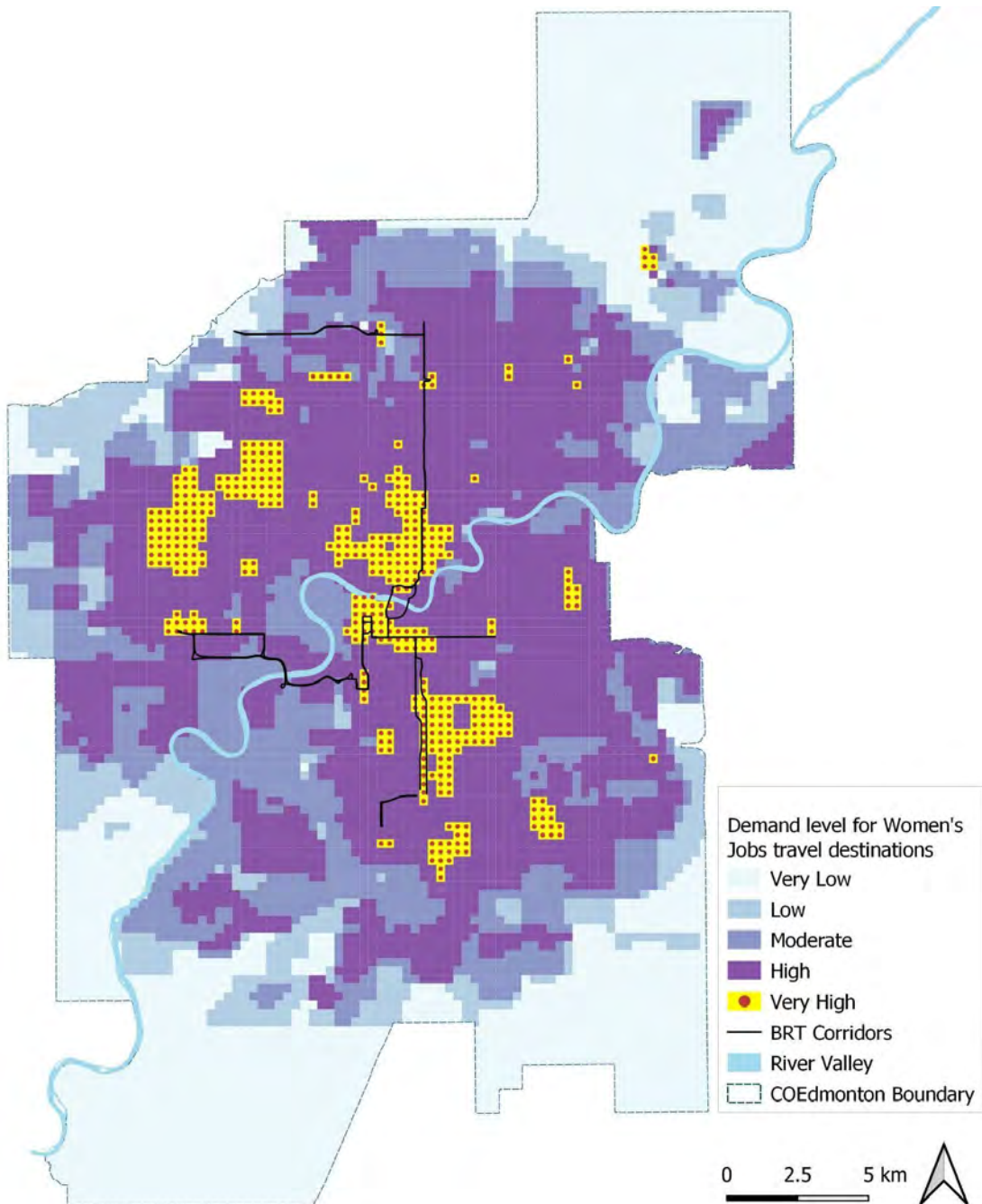


Figure 23 Map showing high-priority locations for Women's Job locations

Spatially, the analysis indicates that B1 will substantially improve accessibility for women traveling for work in areas such as Eaux Claires and Castle Downs in the north, as well as along the Gateway Boulevard and Calgary Trail corridor in the south. On the other hand, B2 is anticipated to have a more pronounced impact on accessibility in the Bonnie Doon area. The accessibility analysis shows patterns of accessibility improvements in 30 minutes (Figure 24 and Figure 26) and 45 minutes (Figure 25 and Figure 27) as a result of the proposed BRT corridors.

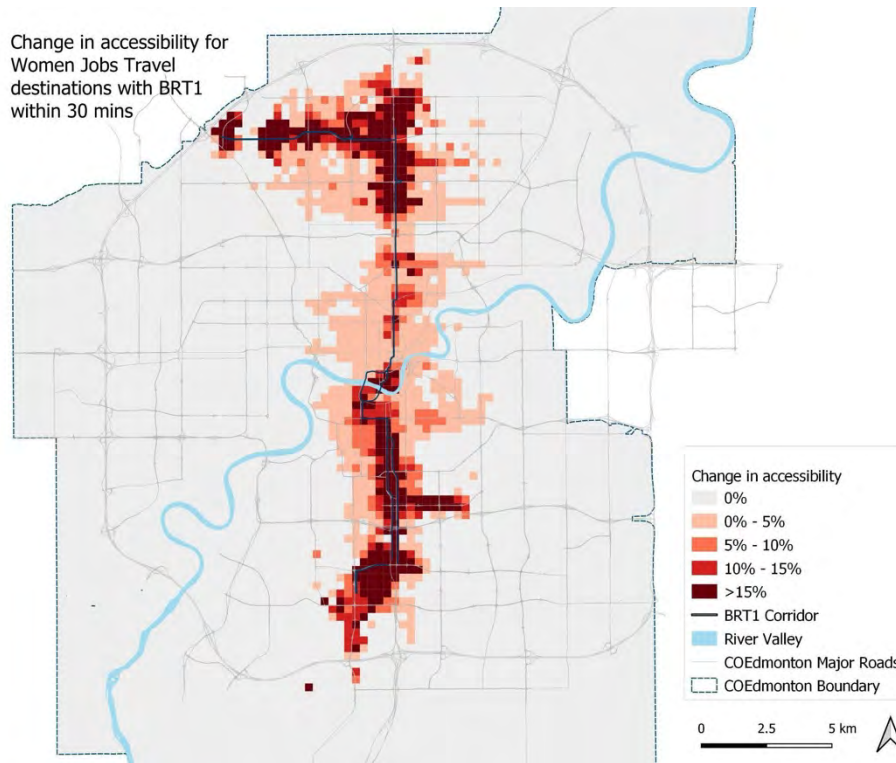


Figure 24 Increase in accessibility for Women's Jobs locations with B1 within 30 mins

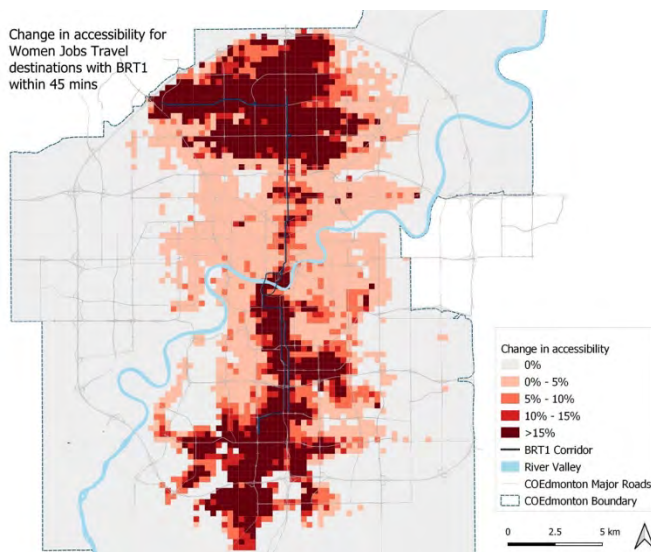


Figure 25 Increase in accessibility for Women's Jobs locations with B1 within 45 mins

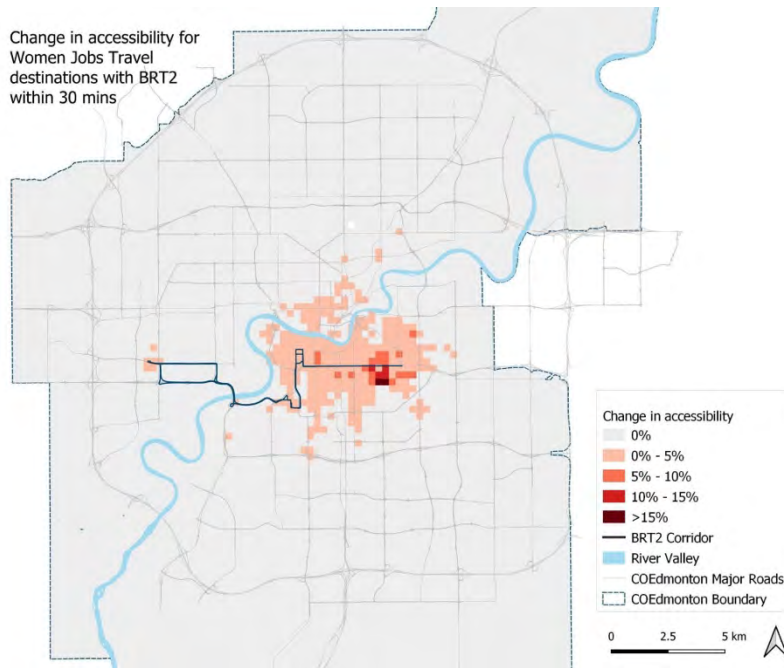


Figure 26 Increase in accessibility for Women's Jobs locations with B2 within 30 mins

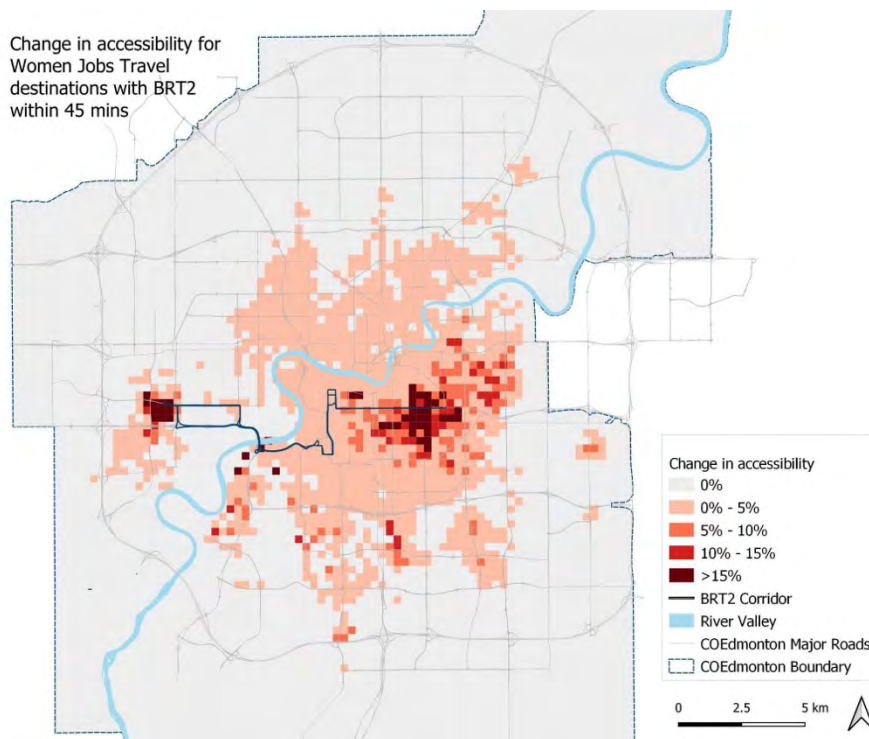


Figure 27 Increase in accessibility for Women's Jobs location with B2 within 45 mins

DATS trip destinations

In the case of persons with disabilities, DATS data is used as a proxy to understand the trip destinations of the members of this population group. Regarding the spatial distribution of DATS trips (displayed in Figure 28), high-demand destinations are widely spread across the city, unlike the destinations for the other priority groups discussed in the trip-based section of the analysis. The accessibility analysis reveals that the proposed BRT system will improve accessibility to these dispersed areas, enhancing mobility and connectivity for DATS users across the city.

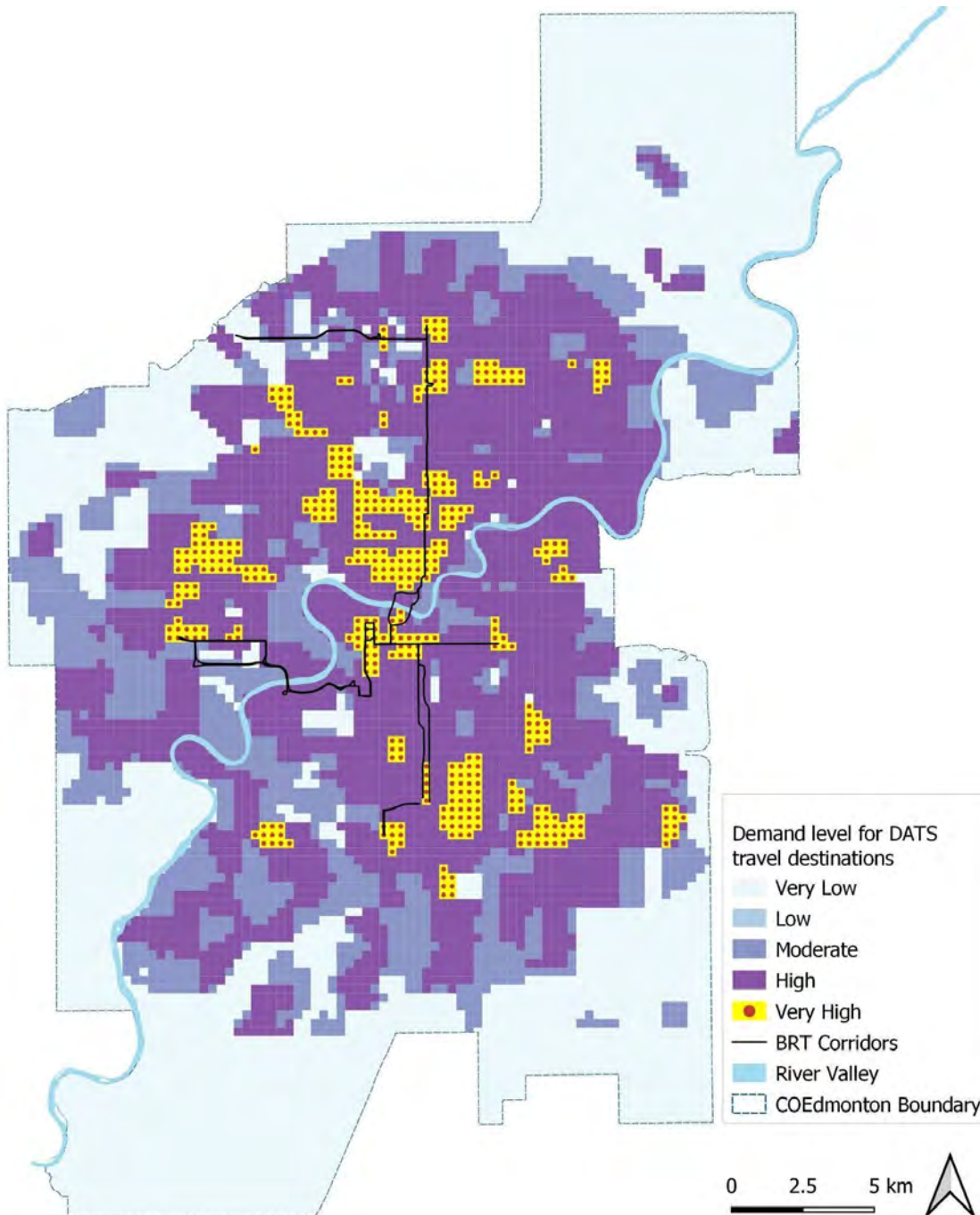


Figure 28 Map showing high-priority locations for DATS trip destinations

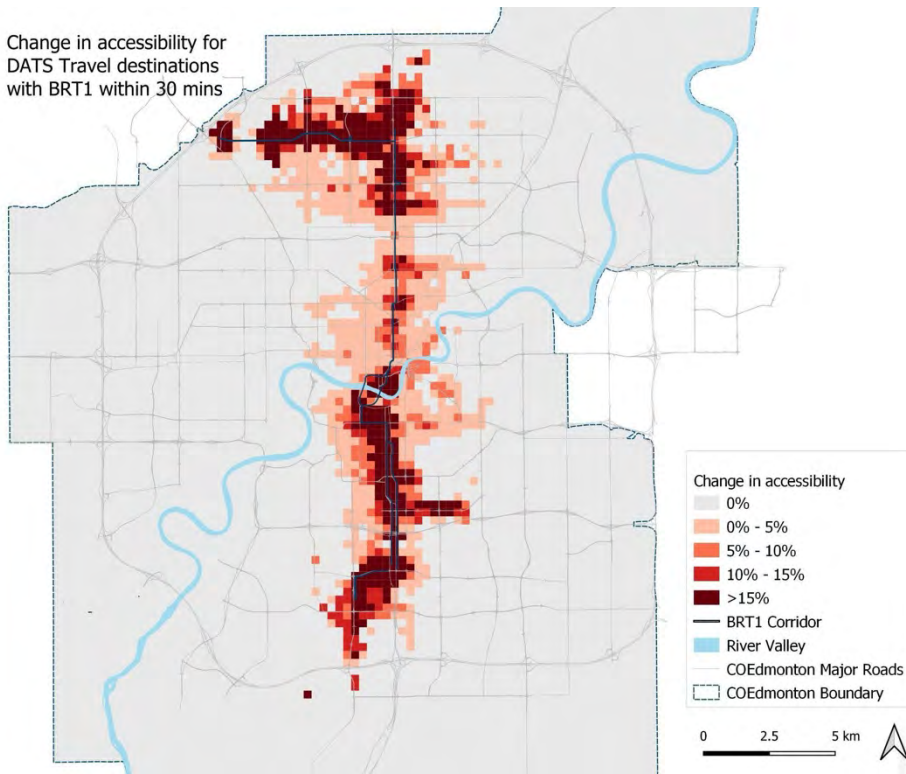


Figure 29 Increase In accessibility for DATS trip destinations with B1 within 30 mins

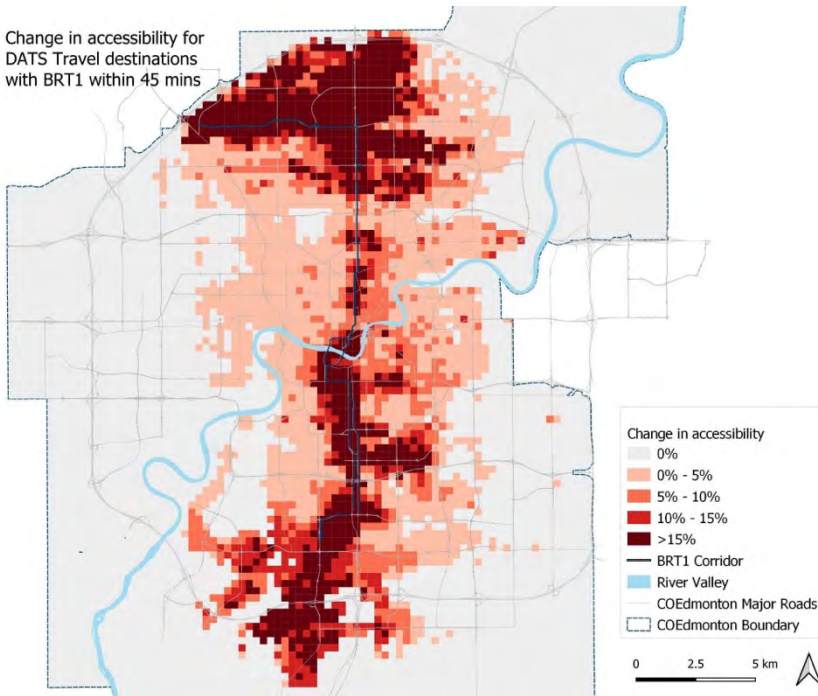


Figure 30 Increase in accessibility for DATS trip destinations with B1 within 45 mins

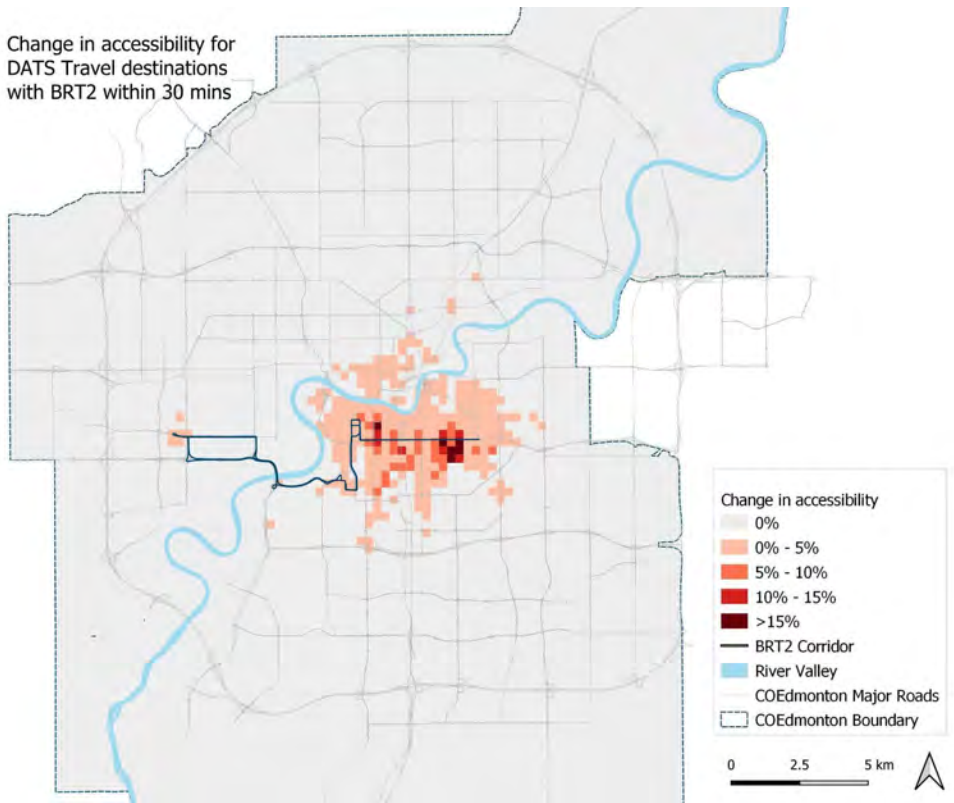


Figure 31 Increase in accessibility for DATS trip destinations with B2 within 30 mins

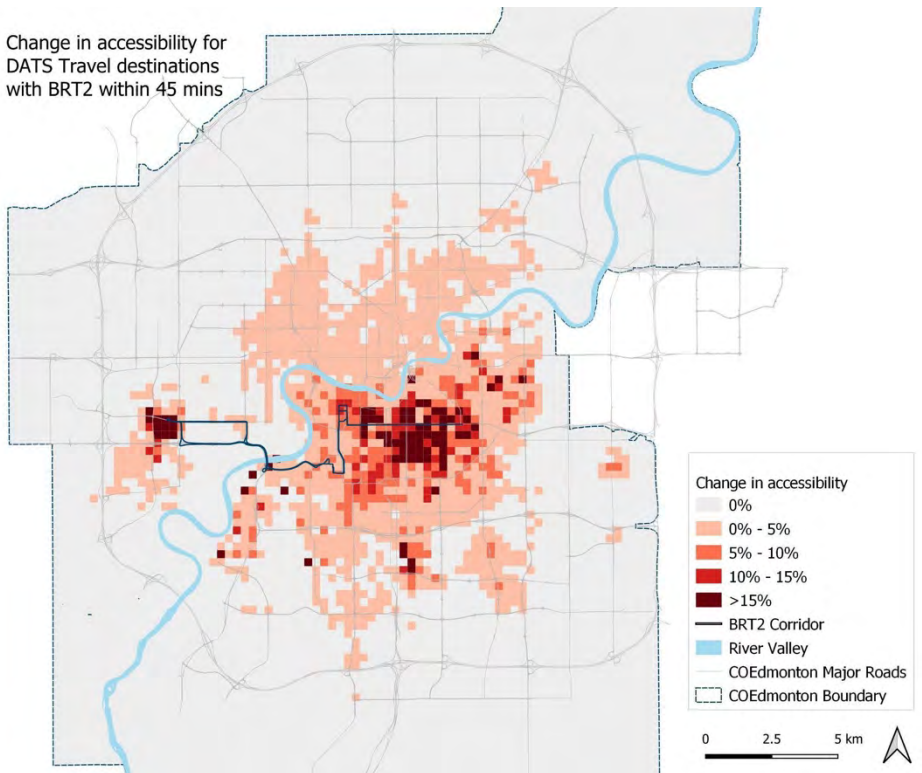


Figure 32 Increase in accessibility for DATS trip destinations with B2 within 45 mins

Appendix C: What We Heard Report

Mass Transit Study Equity Assessment

July 2024

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Edmonton

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Mass Transit Study Equity Assessment: What We Heard Report

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Mass Transit Study Equity Assessment: What We Heard Report

1. Project Summary

a) Mass Transit Project Overview

Why Mass Transit?

The City Plan - Edmonton's combined Municipal Development Plan and Transportation Master Plan – is helping shape how Edmonton grows towards an expected population of 2 million people. The intent is to create a healthy, urban, climate-resilient city where everyone can easily access amenities and services to meet their daily needs within a short walk, bike, roll or transit trip.

A robust, seamless transit system, with mass transit serving as the backbone, is critical to achieving The City Plan vision. Per The City Plan's direction, Edmonton's mass transit system is being expanded to include the development of bus-based mass transit to complement the expanded LRT network.

Expanding the mass transit network to include bus-based options will provide Edmontonians with increased access to safe, reliable and convenient transit service with faster journey times. Not only does expanding mass transit provide people with more choice in how they move around, it also helps reach our climate resiliency goals by making [less carbon intensive modes](#) like transit more viable. It also supports [regional and economic prosperity](#) and builds a more welcoming and inclusive city by removing travel barriers and making it easier for both employees and Edmontonians to get around.

Bus-Based Mass Transit for 1.25 Million People

The City is implementing bus-based mass transit in a phased approach, with the first phase supporting a population of 1.25 million people. The bus-based mass transit network for 1.25 million people includes the development of three citywide Bus Rapid Transit (BRT) routes, which provide a comparable level of service to LRT, as well as 15 District Routes, which will connect into and support the citywide BRT routes.

Three BRT routes are included in the network for 1.25 million people:

- Castle Downs to Century Park via Downtown (by way of 97 Street and Gateway Boulevard/Calgary Trail), referred to as B1
- West Edmonton Mall to Bonnie Doon via University (by way of Whitemud Drive and Whyte Avenue), referred to as B2
- Ambleside to University (by way of Terwillegar Drive – currently partially constructed as part of the Terwillegar Drive Expansion with ETS's Super Express Route 31 currently operating from Leger Transit Centre to the University LRT Station)

The City is currently in the process of developing route alignment (which streets the routes will run along) options for each of the three BRT routes. Once the route alignments are

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Mass Transit Study Equity Assessment: What We Heard Report

confirmed, more detailed concept planning will be done to determine station locations, corridor design (how the streets with bus mass transit will look) and ultimately transit service targets.

The route alignments and other elements are being determined through a decision-making framework that incorporates City Plan policies, technical considerations such as connection to surrounding land uses, integration with other modes of transportation and environmental impact, an equity assessment and public input.

b) Mass Transit Equity Assessment

An Equity Assessment is one of six different ways that the City is planning and evaluating the proposed BRT routes in the mass transit network for 1.25 million people. The purpose of the Equity Assessment is to help inform the service and infrastructure design and implementation for the three BRT routes in a way that effectively serves and supports Edmonton's diverse population. The City retained Leading Mobility Consulting to undertake the Equity Assessment.

The two main equity-related questions that this project has tried to understand through the Equity Assessment are:

- How do decisions or trade-offs made during mass transit planning, design and operations affect people of different genders and demographic groups differently? In particular, how do they affect people from equity-deserving groups like racialized and urban Indigenous people, newcomers, and people with disabilities, who face barriers to transit access?
- How can the City of Edmonton implement policies and measures at the planning, design and operations stages of mass transit implementation to ensure that the new BRT network for 1.25 million people serves the needs of Edmonton's diverse communities?

This Equity Assessment analysis will also inform future capital budget submissions for the BRT network for 1.25 million people.

Findings from this *What we Heard report* will be included in the broader technical report for the project which includes the following:

- Review of city policy to identify the City's equity deserving groups
- Literature review to identify any additional groups the City should consider in mass transit planning.
- Confirmation of the equity deserving groups based on City policy priority, literature and intersectionality considerations, home or trip-based data availability and engagement potential. The confirmed equity deserving groups for this assessment

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Mass Transit Study Equity Assessment: What We Heard Report

- are seniors, youth, low-income people, people with disabilities, indigenous people, racialized people, newcomers and women.
- Conducted home and trip-based analysis on the identified equity deserving groups
 - Undertaken engagement (e.g. transit ride-alongs, in-person workshop and Edmonton Insight Community survey), findings of this engagement program are the purpose of this What we heard report.
 - Recommendations summary on the final equity principles for the mass transit program from the city policy review, literature review, home and trip-based analysis and engagement.

c) Equity Principles

Based on secondary research done to support this Equity Assessment, a series of principles were developed that reflect the barriers experienced by equity-deserving people and their needs when it comes to transit. The principles are:

1. Having routes connect to key destinations
2. Better access to transit stops and stations
3. Stations with features to improve comfort and safety
4. Frequent and reliable service
5. Bus Rapid Transit buses designed to meet customer needs

In addition to these five original principles, a sixth principle was added as one of the outcomes of this Assessment:

6. A Bus Rapid Transit system to be proud of

2. Public Engagement Approach

a) How we engaged

The process was designed to understand the transit-related experiences and needs of participants (see Section B below) and to apply that understanding to the refinement and prioritization of the principles described above.

Ride-alongs

Local service organizations were engaged in a call for volunteers to participate in a transit ride-along and workshop, which occurred in January 2024. Seventeen participants were ultimately chosen, representing a cross-section of the demographic groups being studied as well as many intersectionalities between them (see Section B below for details on specific groups that were represented). Especially given these intersectionalities of overlapping identities (e.g. racialized or Indigenous women, low-income seniors, etc.), many participants could be said to be part of one or more equity deserving communities.

Each participant attended one of two transit ride-alongs that were planned along the 97 Street (segment of BRT Route B1) and Whyte Avenue (segment of BRT Route B2) corridors (see **Appendix A for ride-along route maps**). Participants were paired in groups of twos or and threes with a consultant team member who interviewed them throughout the ride and recorded what they said. (see **Appendix A for what we asked**).

Workshop

Ride-along participants were also asked to attend a workshop the following morning to discuss their experiences in the context of the draft equity principles. The conversations that were had in the workshop were represented graphically in a drawing by a graphic facilitator. The image that was created can be found in Section 3B.

Participants were compensated with a \$100 prepaid Visa card for their participation in the process, and light refreshments were served at the workshop.

See Appendix A for the workshop agenda.

Online Survey

In March 2024, an online survey was conducted using the City of Edmonton's Insight Community to understand how respondents in the wider population feel about the importance and ranking of each principle and to explore any differences across demographic groups.

b) Who we engaged

At the start of the process, secondary research was conducted to identify a series of demographic groups that are understood to be most impacted by transit inequities. These

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Mass Transit Study Equity Assessment: What We Heard Report

became the target demographic (equity-deserving) groups of the process from which ride-along and workshop participants were chosen. The groups are:

- Youth, defined for the purposes of this project as individuals under the age of 35
- Seniors, defined for the purposes of this project as individuals 55 and older
- Low-income people making an annual income under \$30,000
- Racialized people
- Immigrants and newcomers
- First Nations, Métis, Inuit and other urban Indigenous people
- Women
- People with disabilities

Some of the intersectional identities of the **ride-along and workshop participants** selected for this process included:

- First Nations woman
- Immigrant woman
- Racialized, low-income woman
- Disabled senior
- Indigenous senior
- Racialized, newcomer youth
- Racialized, low-income youth with a disability
- 2SLGBTQIA+ youth

The **online survey** saw a total of 3,449 responses over a period of 2 weeks in March 2024.

Of these respondents, the following statistics were indicated:

- 14% were under the age of 35
- 29% were over the age of 65
- 47% identified as a woman
- 43% identified as a man
- 3% identified as non-binary or transgender
- 5% had a household income of under \$30,000 before taxes
- 9% identified as racialized
- 14% identified as persons with a disability
- 3% identified as Indigenous
- 9% were born outside of Canada
- 10% identified as 2SLGBTQIA+

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Mass Transit Study Equity Assessment: What We Heard Report

3. What We Heard

a) Overall Themes

The following general themes represent an overall summary of what we heard:

Frequency and reliability of the transit system are the top concern of all participants, including people from equity deserving communities.

However, we heard that people from equity-deserving communities are often accessing transit during off-peak periods (e.g. evenings and weekends), so ensuring frequent and reliable service at all times of the day will improve the transit experience for many of them.

The principles that people generally don't prioritize are more important for many equity deserving people.

For example, workshop participants from equity-deserving communities identified “Stations with features to improve comfort and safety” and “Better access to transit stops and stations” as top priorities, while survey participants did not. This reflects the barriers many equity-deserving people experience related to accessibility and safety. The principle “Bus Rapid Transit buses designed to meet customer needs” also scored low across all demographic segments in the online survey, but workshop participants generally gave it a medium to high priority in their table discussions and often identified it as being important during ride-alongs. Bus layout and seating is extremely important to people with a variety of accessibility needs, and space for cargo – especially strollers and mobility devices – would improve the quality of trips for mothers, people with disabilities, and many seniors. More space for bikes would improve trip quality for youth and many low-income people.

Safety is a top priority of everyone but what is safe is different for different people.

We heard that people from equity-deserving communities may be more highly impacted by issues of safety because they tend to use transit more during off-peak hours when fewer people are taking transit in general. However, addressing safety for people from equity-deserving communities requires careful consideration of the impacts of potential solutions. For example, while some people in our process asked for more security guards or Peace Officers, one of our Indigenous participants noted that Peace Officers do not make them feel safe and they will, in fact, avoid locations where they know there are Peace Officers for fear of being unfairly targeted. Another participant suggested she would feel safer if there were restricted fare-paid areas in stations.

When thinking about the transit accessibility needs of people with disabilities, don't forget about people with invisible disabilities.

People with disabilities experience some of the greatest barriers to transit access. We heard that people with invisible disabilities experience similar barriers but that those may not always be as obvious to others. For example, many chronic conditions can cause pain,

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Mass Transit Study Equity Assessment: What We Heard Report

muscle spasms, or other mobility impairments that are not entirely obvious to other people, which may make it awkward to ask someone to give up their seat. We heard that more seating would benefit this group.

Better access to real-time information supports reliability and reduces barriers.

We heard that access to real-time information, especially in the case of service disruptions or delays, can significantly improve the experience of many equity deserving people who need to plan complex trips carefully and might not have access to technology or data. Workshop participants highlighted the value of wifi on buses, enhanced stop announcements, real-time digital displays and a more customer-focused role for drivers towards improving their transit experience .

b) Principle-specific feedback

In-Person Workshop

The In-person workshop was held on the morning after the transit ride-alongs, while the memory of the experience and the discussions had were still fresh in the minds of participants. Only ride-along participants participated in the workshop.

In-Person Workshop Feedback on Principles

Below is a table summarizing key feedback from the in-person workshop by principle, in order that the principles were ranked by participants in the workshop.

Principle	Priority	Feedback
Frequent and reliable service	1	<ul style="list-style-type: none">● Consider the needs of shift workers, especially those who must travel at night.● It's important to maintain frequency and reliability throughout the day.● For some people, especially people with disabilities or who don't speak English as a first language, reliability means drivers that are courteous and anticipate their needs (e.g. deploying a ramp without being asked) and are knowledgeable enough about the city and its transit routes to provide directions if needed.
Stations with features to improve comfort and safety	2	<ul style="list-style-type: none">● Improving safety is a top priority, especially for customers travelling at night.● Design for safety – good lighting, clear sightlines.● Curbside stations are more accessible than centre-lane stations.● Consider an education campaign to promote use of the help phone and other emergency features.

Mass Transit Study Equity Assessment: What We Heard Report

		<ul style="list-style-type: none"> • Consider implementing a fare paid area with restricted access. • Consider the experience of boarding a bus for a person with a disability. • Stations should be clean. • Consider the impacts of cold weather and design stations for comfort. • Ensure supporting infrastructure is maintained and in-service as often as possible (i.e. elevators). • Provide screens with real-time information and wayfinding.
Routes that connect to key destinations	3	<ul style="list-style-type: none"> • Significant destinations include downtown, school (e.g. University of Alberta), grocery stores, Doctors Offices/Hospitals. • Important to consider frequency off-peak (e.g. very early and late morning, late evening, night). • Important to consider the needs of shift workers. • Make it easy to plan a trip.
Bus Rapid Transit buses designed to meet customer needs	4	<ul style="list-style-type: none"> • Dedicated Accessible Transit System (DATS) for seniors with mobility challenges needed. • Consider the cargo needs of equity-deserving groups – mothers with strollers, mobility devices of people with disabilities, bikes – and make room for them. Consider flexible designs that can accommodate more cargo when needed. • Design the seating plan to make room for people with mobility devices. • Many women prefer single seats. • Consider air conditioning on buses. • All-door boarding would make boarding easier, especially for people with disabilities. • Look to Vancouver as a best practice. • Provide on-board real-time route information (e.g. current stop, next stop, final destination, any temporary route changes or service disruptions) and enhanced stop announcements. • Provide wifi on buses. • Consider high-capacity buses (e.g. articulated buses) so people are always able to board.
Better access to transit	5	<ul style="list-style-type: none"> • People with mobility challenges need to find places to rest along the way if the trip to a transit stop is long.

Mass Transit Study Equity Assessment: What We Heard Report

<p>stops and stations</p>		<ul style="list-style-type: none"> ● Prioritize pedestrians over cars along major transit corridors. ● Consider the experience along transit corridors of people with disabilities – it can be difficult to cross a wide street. ● Consider the transfer experience, especially for people with disabilities. ● It's important to achieve proximity between transfers. ● Snow presents a major impediment to accessibility in the wintertime – important to prioritize snow clearing and address windrows to ensure accessibility. ● Access to information needed to plan your trip is an important element of access, especially for people from equity deserving communities. ● Access to cellular data/wifi is important so that people can access transit information on their phones.
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In-Person Workshop Feedback on Missing Principles

Affordable: Consider that affordability is a barrier to many people.

Facilitating Access and Comfort: Driver behaviour has an outsized impact on the transit experience of some people, especially those requiring accessibility assistance and people with cargo, including seniors with disabilities and mothers with strollers. Drivers who provide excellent customer service significantly improve the transit experience for these people.

Creating an experience that inspires pride: Taking transit can be a stigmatizing experience, especially for people who have no other choice other than to take public transit with North America's societal preference for driving. Delivering a service that people can feel proud of can give transit riders a greater sense of dignity and improve the overall transit experience for everyone.

Visual representation of workshop conversations

City of Edmonton
January 26, 2024

Mass Transit Study - Equity Assessment

Some people are more significantly impacted by transit challenges (ie. if they are newcomers and need an elevator and could lose job if late for work)

THE BRT and PRINCIPLES SHOULD ALSO CONSIDER...

- Being safe and warm in the winter. And air conditioning
- Shift work
- Late nights
- Security + Lighting
- 377 is not accurate.
- Reliable service means reliable information.
- RESPECT: we need more time to enter and exit
- PRIDE IN TAKING TRANSIT
- Show the time too. And wayfinding digital screens on buses.
- BIKE LOCKERS are needed at stations or secure parkades.
- WORKING ELEVATORS need to be at all stations.
- Fares are not affordable.
- CHARGERS + WIFI ON BUSES AND STATIONS WOULD BE NICE.
- It can be far to cross the street to get to the stop.
- Close PROXIMITY between stops and transfers.
- THE "TRANSIT MATH" takes a lot of energy.
- It can be a long walk to access transit. DATS helps.
- TRANSIT NEEDS TO WORK FOR EVERYONE
- Buses need more space for mobility aids + cargo. (Different seating layouts)

Graphic recording by Kristen Elkow
ELK ELKPLAN DESIGN INC.

Mass Transit Study Equity Assessment: What We Heard Report

Online Survey

In March 2024, an online survey open to a wide cross-section of Edmontonians collected feedback on the value and prioritization of the equity principles. Shared below is data on the percentage of times each principles was selected by a participant as being amongst the top three most important principles that would most improve their transit experience.

Online Survey Feedback on Principles

Below is a high-level summary of the feedback received through the online survey. For the simplicity of reporting, this table only shows the percentage of people who picked each principle as being within their top three. For a summary of what was asked, see Appendix A. Priority ranks are based on the percentage of people who picked that principle to be in their top three.

Principle	% who see it as one of 3 most important	Priority rank	Key principle-related feedback
Frequent and reliable service	54%	1	<ul style="list-style-type: none"> • Frequency and reliability are the backbone of good transit service and are of primary importance above all the other principles. • For transit to compete with driving, it needs to be frequent, reliable, and fast. • More frequent service improves connections. • Frequency during off-peak is important to support tradespeople and shift workers. • Important to achieve better than every 15-minute frequency. • Frequency can impact perceptions of safety. • Real-time updates and accurate tracking are crucial to help manage expectations and support trip planning, especially during delays.

Mass Transit Study Equity Assessment: What We Heard Report

- Maintain frequency during bad weather so that people can rely on transit when they need it most.

Principle	% who see it as one of 3 most important	Priority rank	Key principle-related feedback
Routes that connect to key destinations	50%	2	<ul style="list-style-type: none"> • Routes and schedules should be simple and understandable. • Straightforward, easy to navigate routes and clear schedules will improve usability of the system. • Routes should connect to major employment areas and should serve more than just the weekday 9-5 office crowd. Consider industrial areas and other areas where shift work is common. • There's a strong need for more off-peak service, including late-night and early morning service, to accommodate a wider range of schedules and to reduce wait times. • Routes should ensure easy and direct access to universities, colleges, schools, hospitals and clinics. • Routes should be designed in consideration of the social and cultural destinations that are important to local communities, including places of worship. • Routes should cater to shopping and entertainment needs.

Mass Transit Study Equity Assessment: What We Heard Report

- Routes should reach deeper into residential communities to minimize walking times and better connect communities to major transit hubs.
- Support of multi-modal travel through integration with other modes is crucial. Connections should be seamless with other buses, trains, bikes, and walking paths.
- Frequency is key to improving connections, so that user do not have long wait times.
- Ensure routes are safe to travel.

Principle	% who see it as one of 3 most important	Priority rank	Key principle-related feedback
Stations with features to improve comfort and safety	34%	3	<ul style="list-style-type: none"> • Ensure that the system is designed to support comfort during the harshest of weather conditions, especially winter weather. Incorporate heated shelters at stations and stops. • Design stations for increased passenger safety through better lighting and strong sightlines. • Install emergency communication systems at all stations/stops to support safety. • Increase the security presence at stations. • Keep facilities, including washrooms, clean and well-maintained to improve the overall comfort and experience of transit users.

Mass Transit Study Equity Assessment: What We Heard Report

- Enhance comfort for waiting passengers by providing essential amenities including washrooms and ample seating.
- Install digital information displays to provide real-time information about transit schedules, service changes and other essential information to assist passengers in planning their journey.

Principle	% who see it as one of 3 most important	Priority rank	Key principle-related feedback
Better access to transit stops and stations	27%	4	<ul style="list-style-type: none"> • Stations and stops should be within walking distance of residential and commercial areas to make it easier to access transit. • Enhance pedestrian infrastructure like sidewalks, crosswalks, and pedestrian paths leading to transit stops and stations to make them safer and more accessible, especially for those with mobility challenges. • Offer sufficient park-and-ride options at major transit stations to accommodate those who need to drive as part of their commute. • Feeder bus services that connect outlying areas to main transit lines should be more frequent and reliable, reducing wait times and transfer hassles. • Implement on-demand transit in areas with lower density to improve access for all users.

Mass Transit Study Equity Assessment: What We Heard Report

- Install clear, visible signage and wayfinding at and around stations and stops to assist passengers in navigating to and from the transit system easily.

Principle	% who see it as one of 3 most important	Priority rank	Key principle-related feedback
All of the above are equally important	25%	5	<ul style="list-style-type: none"> • Take an integrated approach that prioritizes all principles. • Take a holistic approach that enhances the user experience by carefully designing and integrating everything from the layout of buses and stations and to scheduling and routing. • Prioritize equitable access by designing for the needs of seniors, disabled, and low-income people. • Develop transit services with an emphasis on user feedback and real-world usage patterns, ensuring that all elements of the transit service are aligned with actual customer needs and preferences.
Bus Rapid Transit buses designed to meet	15%	6	<ul style="list-style-type: none"> • Accommodate people who use wheelchairs and walkers and/or who are traveling with strollers or grocery carts. Provide sufficient space for these needs as well other types of cargo.

Mass Transit Study Equity Assessment: What We Heard Report

customer needs	<ul style="list-style-type: none"> • Provide enough priority seating to accommodate all customers comfortably. • Make the bus ride comfortable by providing comfortable seating, effective heating and cooling systems, and noise reduction technology. • Include visual and audio announcements for stops and route information to ensure accessibility for visually and hearing-impaired passengers. • Include real-time tracking systems accessible via mobile devices. • Increase safety for riders by equipping buses with safety features like secure handrails and anti-slip flooring. • Consider the use of surveillance cameras. • Design bus interiors to maximize space, improve flow, and reduce congestion, especially around entrance and exit points, to speed up boarding and disembarking processes.
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Principle	% who see it as one of 3 most important	Priority rank	Key principle-related feedback
None of the above are important	5%	7	<ul style="list-style-type: none"> • Skeptical that principles will be implemented effectively based on past efforts. • Proposed principles do not align with the actual needs and priorities of transit users.

Mass Transit Study Equity Assessment: What We Heard Report

- There are other, more pressing priorities, including operational efficiency, management practices, and fiscal responsibility.
 - Doubt that, even if implemented, principles will have any measurable impact.
 - Based on past experiences, transit agencies can't be trusted to effectively prioritize and implement changes that truly benefit users.
 - The cost of implementing all of these principles will be too high and will not yield proportional benefits.
-

Online Survey Prioritization by demographic group

Survey participants generally agreed on the order in which the equity principles should be prioritized. However, it is interesting to note where certain demographic groups prioritized principles slightly differently, because it suggests needs that are more specific to that community. In the case of equity-deserving communities, such as low-income, immigrant, racialized, and Indigenous people, those differences tell an important story about ensuring an equitable bus rapid transit system. Below is a table which shows the percentage of people who selected each principle to be in their top three most important principles by demographic group under consideration in the Equity Assessment. Percentages in each demographic group do not add up to 100% because they represent the percentage of people who selected each principle as one of their top three and the top three. Values in each row are colour-coded along a gradient to highlight differences in how different groups prioritized each principle.

Mass Transit Study Equity Assessment: What We Heard Report

Top 3 Choices							
	Frequent and reliable service	Routes that connect to key destinations	Stations with features to improve comfort and safety	Better access to transit stops and stations	Bus Rapid Transit buses designed to meet customer needs	All of the above are equally important	None of the above are important
Women	1 (54%)	2 (47%)	3 (35%)	4 (29%)	6 (16%)	5 (28%)	7 (3%)
Seniors (55+)	2 (47.7%)	1 (47.8%)	3 (36%)	5 (22%)	6 (15%)	4 (30%)	7 (6%)
Youth (under 35)	1 (68%)	2 (55%)	4 (31%)	3 (36%)	6 (16%)	5 (21%)	7 (2%)
Low-income people (household income under \$30,000)	1 (44%)	3 (39%)	4 (28%)	5 (26%)	6 (11%)	2 (41%)	7 (3%)
Racialized people	1 (56%)	2 (54%)	3 (29%)	4 (28%)	6 (17%)	5 (26%)	7 (6%)
First Nations, Inuit, Metis & Urban Indigenous people	1 (53%)	2 (49%)	3 (32%)	4 (25%)	6 (14%)	5 (22%)	7 (11%)
Immigrants	1 (55%)	2 (51%)	3 (29%)	5 (25%)	6 (17%)	3 (29%)	7 (4%)
Newcomers	1 (53%)	2 (50%)	3 (22%)	3 (22%)	7 (11%)	3 (22%)	6 (19%)
People with disabilities	1 (52%)	2 (40%)	3 (33%)	4 (31%)	6 (23%)	5 (30%)	7 (3%)
All Participants	1 (54%)	2 (50%)	3 (34%)	4 (27%)	6 (15%)	5 (25%)	7 (5%)

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Below is a similar table, but demonstrating which principles were selected as the top most important principle of participants in different demographic groups. In the table below, all of the Above and None of the Above are excluded.

Top Choice					
	Frequent and reliable service	Routes that connect to key destinations	Stations with features to improve comfort and safety	Better access to transit stops and stations	Bus Rapid Transit buses designed to meet customer needs
Women	1 (27%)	2 (14%)	3 (12%)	4 (5%)	5 (3%)
Seniors (55+)	1 (21%)	2 (15%)	3 (14%)	4 (4%)	5 (3%)
Youth (under 35)	1 (42%)	2 (15%)	3 (10%)	4 (4%)	5 (1%)
Low-income people (household income under \$30,000)	1 (25%)	2 (10%)	3 (9%)	4 (4%)	5 (2%)
Racialized people	1 (29%)	2 (18%)	3 (9%)	4 (4%)	5 (3%)
First Nations, Inuit, Metis & Urban Indigenous people	1 (31%)	3 (10%)	2 (15%)	4 (2%)	5 (1%)
Immigrants	1 (29%)	2 (18%)	3 (8%)	4 (4%)	5 (2%)

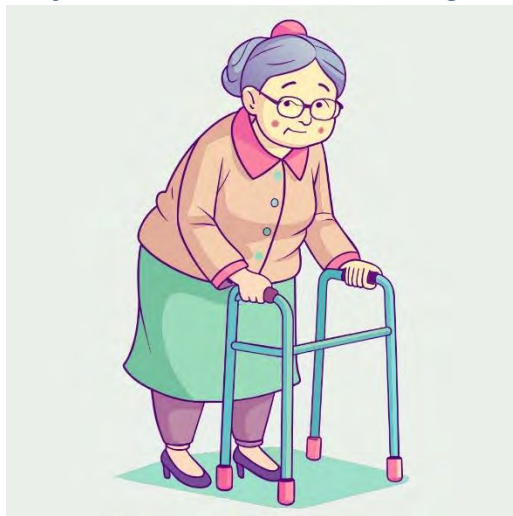
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	1 (36%)	2 (8%)	3 (6%)	4 (0%)	4 (0%)
Newcomers					
People with disabilities	1 (27%)	2 (10%)	2 (10%)	4 (7%)	5 (6%)
All Participants	1 (28.%)	2 (15%)	3 (12%)	4 (4%)	5 (3%)

4. Transit Customer Personas

The customer personas below represent fictional people developed through the feedback heard through this Equity Assessment, in particular through the ride-alongs. They were created to represent some of the specific equity-deserving communities that participants in this process were part of. Each persona’s story is an aggregate of the experiences of participants from the transit ride-along.

Sally - Senior, low-income immigrant woman with a disability



What taking transit is like for me: I take transit often to get to medical appointments. I have bad knees and use a walker, so walking to a transit stop is hard for me. I injured my brain in a fall and my English is not as good as it used to be as a result, which makes it extra difficult to navigate the transit system.

My barriers to transit access: My walk to the bus stop is long, and I need to find frequent places to rest. Crowding can make it difficult for me because I have a walker, but it also saves me sometimes when there aren’t any seats because I

can use it to sit down.

How I work around my barriers: I pay close attention to the schedule and plan my trip carefully. I write down the routes I need to take and their schedules. When I need to sit down, I can use my walker.

My desires for the transit system: I want it to be easier to get on the bus, especially in the wintertime when there’s a lot of snow. I also want more comfortable stops that are heated in the winter. As someone who doesn’t speak English well and has a disability, I sometimes rely a lot on the driver. Drivers who deliver excellent customer service anticipate my needs and are responsive and helpful when I engage them.

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Priya - Female, racialized newcomer youth



What taking transit is like for me: I'm new to Canada and I take transit 5 days a week to get to both school and work. I find it overwhelming and confusing to figure the routes and I spend a lot of time doing that. I'm often left planning excessively to avoid getting lost. I often feel scared when I'm on transit and I'm extra vigilant about making sure I know what's going on around me.

My barriers to transit access: My main barrier is bus infrequency and the wait times that result from that, especially during off-peak hours. This makes every trip a hassle and means I can't really

rely on transit when I need it the most. The lack of a really good transit app compounds this problem. The other thing that acts as a barrier is feeling unsafe by some of the people I encounter on the transit system, especially people who are doing drugs or are in emotional distress.

How I work around my barriers: To cope, I listen to music to relax and help me not to think about the wait. When I feel unsafe, I look for security guards. I'll also spend a lot of time planning alternate routes to avoid complicated bus centres and other places that I know are less safe.

My desires for the transit system: More frequent service that reduces wait times and better heated shelters in the winter to make waiting more bearable would make my life a lot better. I'd also love to see a real, functioning ETS app that helps me with real-time planning. Simplifying big transit centres like Meadows, where there are lots of transfers, would make the system safer and more straightforward. I also think safety could be improved by implementing fare-paid areas with restricted access.

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Zoe - Urban Indigenous non-binary person



What taking transit is like for me: I mostly drive but I do take transit periodically when I expect not to be able to find parking where I'm going.

My barriers to transit access: Frequency, reliability and trip times are big problems. If I'm going to choose transit over my car, it needs to make sense. It can't take 3 times longer, and it would be nice to have a seat. I also don't often feel safe when I take transit, which also discourages me from taking it.

How I work around my barriers: When the bus is crowded, I try to stay close to the doors to avoid being squished. When I'm taking transit and I don't feel safe, I'm extra vigilant. I won't put on headphones or wear any visible jewelry or anything. I try to avoid places where I expect there to be peace officers. As an Indigenous person, I do not feel safe around them.

My desires for the transit system: I would take transit more often if it were more comfortable and reliable. I would love for the system to be less crowded and for wait times to be lower. I also want to feel safe but I don't want to feel policed.

Katy - Racialized woman with a disability



What taking transit is like for me: I take the bus with my young daughter. I have cerebral palsy, which is an invisible disability. As a disabled person, travelling is always difficult, but it is even harder when you are travelling on transit with a baby stroller. I don't feel like people respect me and I'm scared to ask for a seat. They won't even move for a senior, why would they move for me?

My barriers to transit access: Accessibility is a significant issue. I need to be able to sit down to be comfortable and I need to be able to have my baby next to me in her stroller. Safety is also a major concern. I do not want to encounter

people taking drugs or drug paraphernalia lying around, especially when I'm with my daughter.

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How I work around my barriers: When I can, I travel at off-peak hours when it's less busy and I also feel safer.

My desires for the transit system: I want a safe transit system with more peace officers patrolling stations and stops. I want my experience to be as comfortable as possible, with reliable service, snow removal at transit stops, heated shelters and wifi on buses. I would love for the walk to my nearest bus stop to be shorter, and for there to be digital real-time next bus and route information when I get there. Finally, I want drivers to deliver better customer service, be more courteous and helpful when I need it.

5. What we did

We used the feedback from the in-person transit ride-alongs, workshop and the online survey to help inform updates to and finalize the principles. Below is a summary table of the original principles, followed by the final principle text with revisions highlighted in bold, based on feedback from the engagement program.

Principle	Original Text	Final Text
Having routes connect key destinations	<p>Connected</p> <p>Provide transit access to places and destinations that will improve the lives of Edmontonians without cars and create economic and social opportunities.</p> <p>This includes transit access to schools, hospitals, medical and social services, shopping and leisure destinations, community service facilities and employment zones with high levels of shift work.</p>	<p>Connected</p> <p>Provide transit access to places and destinations that will improve the lives of Edmontonians without cars and create economic and social opportunities.</p> <p>This includes transit access to high schools, post-secondary institutions, hospitals, medical and social services, shopping and leisure destinations, community service facilities, places of worship and employment zones with high levels of shift work.</p>
Better access to transit stops and stations	<p>Inclusive</p> <p>Design streets and Bus Rapid Transit stations in a way that eliminates barriers to access and</p>	<p>Inclusive</p> <p>Design streets and Bus Rapid Transit stations in a way that eliminates barriers to access and</p>

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	<p>ensures universal accessibility. Incorporate visual, tactile, and audible elements that support wayfinding for people of all abilities.</p> <p>Walkable</p> <p>Consider the specific needs and abilities of transit customers at key destinations (e.g. hospitals, shopping, leisure destinations, community service facilities and employment zones with high levels of shift work) to determine appropriate walking distances to Bus Rapid Transit stations.</p>	<p>ensures universal accessibility. Incorporate visual, tactile, and audible elements that support wayfinding for people of all abilities.</p> <p>Walkable</p> <p>Consider the specific needs and abilities of transit customers and minimize walking distances to Bus Rapid Transit stations from residential communities, key destinations, and between transfers.</p>
Principle	Original Text	Final Text
Stations with features to improve comfort and safety	<p>Safe</p> <p>Create a safe environment for all transit customers (e.g. ensuring sightlines, lighting, access to help phones).</p> <p>Winter-Ready</p> <p>Include consideration for winter maintenance in station design (e.g. covered pedestrian waiting areas, prioritized snow and ice clearing).</p>	<p>Safe</p> <p>Create a safe physical environment for all transit customers by incorporating clear sightlines, good lighting, access to help phones, and restricted paid areas.</p> <p>Winter-Ready</p> <p>Design stations with winter weather in mind including covered pedestrian areas, heated shelters, and prioritized snow clearing (e.g. windrow removal to ensure accessibility).</p> <p>Real-Time Information</p>

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		<p>Provide real-time information at stations to indicate next vehicle arrival times, support trip planning, and communicate planned and unplanned disruptions to improve the transit experience for everyone but especially for many equity-deserving people, including newcomers, seniors and people with access to technology.</p> <p>Clean</p> <p>Maintain Bus Rapid Transit stations to a high degree of cleanliness.</p>
Principle	Original Text	Final Text
Frequent and reliable service	<p>Frequent</p> <p>Provide access to high frequency transit (e.g. service every 15 minutes or better, everyday), throughout the day and night to facilitate trips to serve the travel needs of all Edmontonians to key destinations (e.g. hospitals, shopping, leisure destinations, community service facilities and employment zones with high levels of shift work).</p>	<p>Frequent</p> <p>Provide access to high frequency transit (e.g. service every 15 minutes or better, everyday), throughout the day and night to facilitate trips to serve the travel needs of all Edmontonians to key destinations (e.g. hospitals, shopping, leisure destinations, community service facilities and employment zones with high levels of shift work). Frequency supports reliability.</p>
	<p>Reliable</p> <p>Provide a predictable and reliable transit service.</p>	

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<p>Bus Rapid Transit buses designed to meet customer needs</p>	<p>Accessible</p> <p>Ensure transit vehicles are both universally accessible (e.g. dedicated seating for accessibility, enhanced audio and visual stop announcements).</p> <p>Cargo-Friendly</p> <p>Ensure that transit vehicles can accommodate travel accessories or equipment such as strollers, grocery carriers and other large cargo.</p>	<p>Accessible</p> <p>Ensure transit vehicles are both universally accessible (e.g. dedicated seating for accessibility, enhanced audio and visual stop announcements). Additional seating on transit vehicles would assist people with and without physical disabilities, both visible and invisible.</p> <p>Cargo-Friendly</p> <p>Ensure that transit vehicles can accommodate travel accessories or equipment such as wheelchairs, walkers, strollers, bikes, grocery carriers and other large cargo.</p> <p>Real-Time Information</p> <p>Provide real-time information on buses including next stop announcements, route information, and information on planned and unplanned disruptions to improve the transit experience for everyone but especially for many equity-deserving people, including newcomers, seniors, and people without access to technology. Wifi on board will also improve the customer experience and support improved wayfinding.</p>

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Principle	Original Text	Final Text
<p>A Bus Rapid Transit system to be proud of</p>	<p>New principle developed from findings from the engagement program.</p>	<p>Transit should not be a tool of last resort for Edmontonians. Edmontonians deserve a transit system that they can be proud of.</p> <p>Providing a good transit system and experience that makes taking transit not just a viable, but preferred option over driving which will attract new transit riders and vastly improve the transit experience for existing riders.</p>

6. What's Next

Feedback from the transit ride-alongs, in-person workshop and online survey helped the project team finalize the six equity assessment principles for the Mass Transit Program. These six principles will be incorporated into the final equity assessment report. The equity assessment report will be posted publicly on the City's Mass Transit study website and referred to in an upcoming City Council report.

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Appendix A: What We Asked

Transit Ride-Alongs

Participants in the transit ride-alongs were asked the following questions relating to transit:

- What is taking transit like for you?
- What barriers do you experience accessing or taking transit?
- What is pleasant about your experience?
- What would make your experience better?
- What do you do (if anything) to address the barriers that you experience? What are some of the things that you do to overcome/work around these barriers?
- How has the transit ride-along made you feel?
- Are those feelings similar to or different from what you usually feel when you take transit? (Why do you think that is?)
- What have you seen on the ride-along that reflects your typical transit experience? What has been different?
- Reflect on the barriers that you experienced during the ride-along. Were these the same or different than the barriers you said you typically experience taking transit? What can the City do to help make those barriers go away?

In-Person Workshop

At the Day 2 Workshop, participants sat at round tables with a member of the consultant team facilitating at each table. The workshop began with a presentation by the City and consultant teams, followed by a small group discussion and a report-back. The meeting closed with a second small group discussion.

For the first small group discussion, participants were to reflect on their ride-along and typical transit experiences to evaluate the draft transit equity principles. To facilitate the conversation, the following prompts were used:

- *Reflect on yesterday's ride-along and your typical transit experience*
- *Do these principles address the key barriers you experience?*
- *Do they speak to opportunities that are important to you?*
- *How can they be improved?*
- *Should any be prioritized over others?*
- *Is there a principle or principles that you think is missing?*

For the second small group discussion, facilitators led a short discussion about each principle, asking participants to discuss how each might relate to different aspects of their typical commute.

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In-Person Workshop Agenda

Date: January 26, 2024 (9am - 11am)

Location: [Edmonton Tower \(10111 104 Avenue NW, 2nd Floor Meeting Space\)](#)

#	Item	Time
1	Welcome & Introductions (David/Daniel)	15 mins
2	Introductory Presentation (City)	10 mins
3	Questions of Clarification (City/Consultant Team)	10 mins
3	Small Group Discussions 1 (ALL) Questions: <ul style="list-style-type: none">● Reflect on yesterday's ride-along and your typical transit experience● Do these principles address the key barriers you experience?● Do they speak to opportunities that are important to you?● How can they be improved?● Should any be prioritized over others?● Is there a principle or principles that you think is missing?	25 mins
4	Report-Back (Daniel/Kristen)	15 mins
5	Small Group Discussions 2 (ALL) Further reflect on the ride-alongs and the user's typical transit experience in ways that apply to the principles: <ul style="list-style-type: none">● Routes connect to key destinations: 5 mins● Better access to transit stops and stations: 10 mins● Stations with features to improve comfort and safety: 10 mins● Reliable and Frequent Service: 5 mins● Buses designed to meet customer needs: 10 mins	40 mins
6	Wrap-Up (David)	5 mins

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Online Survey

The online survey was a simple questionnaire conducted through the Edmonton Insight Community and designed to try to understand how people would rate the potential impact of each equity principle on their commutes if the principles were addressed in the design of the new BRT system. They were also asked to identify their top three priority principles. The survey questions were the following:

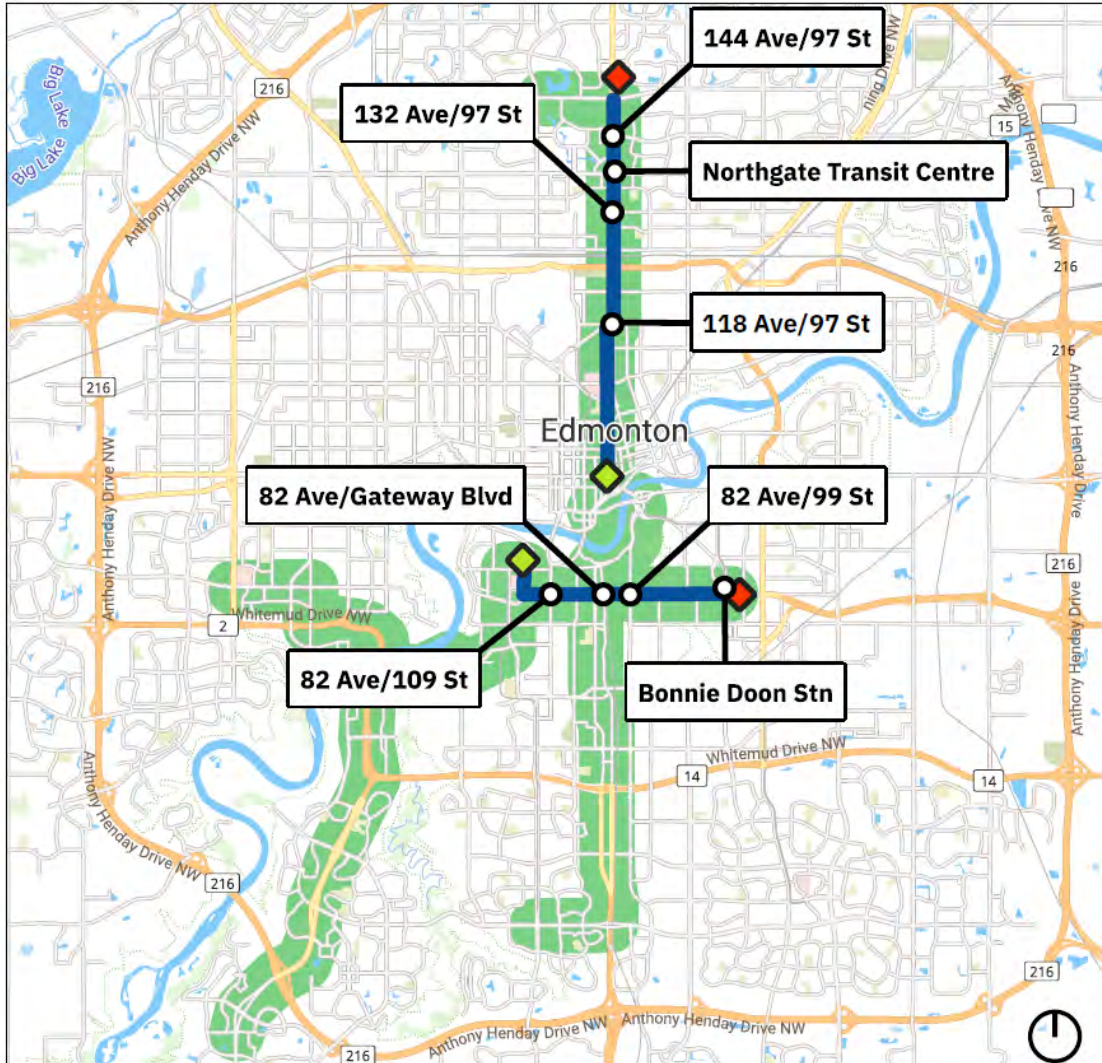
1. How often do you currently use available transit services (such as Bus or LRT)?
2. For each of the equity principles, participants were asked: Thinking about how you and your family might use non-LRT (Bus Rapid Transit) mass transit in the future, please respond to the following: Principle X will significantly improve my transit experience using Bus Rapid Transit.
3. Thinking about the equity principles presented above, which of these principles do you feel are most important to inclusive mass transit?
4. Of the ones you chose, which one do you feel is the most important?
5. Do you have any other feedback you want to share about these equity principles?

Appendix B: Ride-Along Route Map

Mass Transit Study



Equity Assessment Transit Ride-Alongs



Legend

- Notable tour stops
- Tours
- BRT corridors
- ◇ Tour Start/End
- ◇ Start
- ◇ End

