January 2022

Understanding and Responding to the Transit Needs of Women in Canada

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Understanding and Responding to the Transit Needs of Women in Canada is co-funded by the Social Sciences and Humanities Research Council and Infrastructure Canada.

Social Sciences and Humanities Research Council of Canada

Conseil de recherches en sciences humaines du Canada

Canada

Executive Summary

Background and objectives

EXPERIENCES OF WOMEN and men with transport systems are likely to differ, particularly when related to safety, personal security, frequency, accessibility, and affordability of transport. In transport policy, gender has recently been emphasized as an issue to be featured on the agenda of developing sustainable and inclusive transport systems. However, it could be argued that a lack of systematic gender inclusion procedures in transport, anywhere from training of professionals to the design and planning of systems, services and equipment, have resulted in women's distinct transport needs being overlooked in public transit planning and policy.

This project sought to understand:

1. The differentiated needs and experiences of women's travel and the factors that explain those differentiated needs.
2. The current practice of considering women's distinct travel needs in public transit planning in Canada, including available data that are collected by transit agencies and methods to analyze these data.

The primary focus of this report is the travel behaviour and needs of women and female-presenting peoples. Despite comparisons between men and women, we acknowledge that gender and gender-based analysis are not confined to a binary perspective. We also recognize that *women* is not a homogeneous term; therefore, the analysis of women as one group is not intended to take away from the lived experience of BIPOC, disabled, migrant or LGBTQIA+ women who individually have varying travel needs.

Methodology

AN INDUCTIVE LITERATURE review of Global North grey and academic documents, and a systematic policy review of 18 transit systems from Canada's eight largest Census Metropolitan Areas (CMAs) were conducted. There is considerable cross-over between academic and practitioner-driven research; therefore, understanding the current state of both fields and identifying trends in the knowledge and subsequent gaps was deemed a necessary approach to synthesizing our knowledge of women's travel needs and behaviours. Finally, a webinar discussion with industry leaders was conducted to highlight the processes between policy and operations. This approach enabled us to synthesize the current state of knowledge and practice regarding women's distinct travel needs and behaviours and to identify opportunities to promote gender inclusivity in future research and public transit policies.

Results

THE SYNTHESIS OF the literature reveals that gender roles which lead to disparities in caregiving, income, employment, and security result in **women being more likely (as compared to men) to complete trip chains, mid-day or off-peak trips, and shorter distance trips. Women's travel, as compared to men's travel, is characterized by more multiple short-distance trips with the purpose of serving others; this behaviour does not coincide with traditional transit service planning**. Despite this, women are still more likely than men to use public transit on their commute (Statistics Canada, 2017c, 2017d, 2017b) and be in the majority (57%) of riders for agencies such as the Toronto Transit Commission (Toronto Transit Commission, 2020). The gender-based social roles that influence women's standing within families, workplaces and broader society inherently impact their mobility. Therefore, women's travel behaviours cannot be examined appropriately without the understanding and recognition of external pressures that determine travel purpose, mode, route, and time.

An assessment of publicly available policy materials found that while many public transit agencies in Canada are implementing service improvements that are aligned with the transit needs of women, the policy surrounding these improvements is not explicitly presented as responses to these needs. A review of the publicly available transit service standards suggests that there is a mismatch between the services that meet women's needs and the standards outlined that determine what transit service is provided and how it is assessed for performance. For instance, the time periods where services are more frequent are not aligned with the predominant off-peak travel exhibited by women (Los Angeles Metro, 2019). Furthermore, opportunities exist in the collection of data (e.g. smart card data) and use of gender data to understand the travel behaviour of women and to monitor the impacts of service changes. This may contribute to the use of gender-based analysis techniques as part of major projects and planning activities.

Key Messages

WITH THE ACKNOWLEDGEMENT of identified predominant travel patterns among women, public transit agencies and transportation planning should actively consider taking a gender-based lens to examine how the adaptation of public transit operations can better serve women's travel needs. Similarly, academic research regarding the transportation needs and behaviours of women is still necessary, particularly within the Canadian context. A greater number of studies seeking to understand women's travel motivators and barriers, and public transit's fulfillment of those needs, would foster novel insights and substantiate existing findings across various contexts.

The synthesis of the academic, policy and webinar findings has led to the following recommendations:

1. **Foster research partnerships between academics and practitioners to co-create knowledge and understanding of women's travel behaviour**
2. **Explore novel avenues for gender-based data collection, including real-time and passive data**
3. **Leverage customer satisfaction surveys to collect additional gender-specific data on service attributes**
4. **Implement gender-informed metrics to service standards**
5. **Integrate gender equity evaluations into business cases and planning process**
6. **Achieving gender parity in the public transit workforce**

For public transit agencies to provide equitable and accessible service, giving equal consideration to the needs of women and adapting traditional transportation planning practices is necessary. Understanding women's travel needs and behaviours is fundamental to the equitable planning of transit systems.

Abstract

THE HISTORICAL PRACTICES of transportation planning are known to be gender-neutral and as a result have marginalized the experiences of a large sub-section of the population, namely women. Identifying the motives behind women's travel behaviours works to inform equitable data collection methods, transportation planning, and public transit policy. Correspondingly, understanding how public transit services and policies (curated with gender-neutral data and transportation planning principles) impact women's travel can reveal barriers to public transit usage. An inductive literature review of Global North grey and academic documents regarding women's travel behaviour (mode choice, travel route, time of travel and distance) and needs was conducted. The synthesis reveals that gender roles which lead to disparities in caregiving, income, employment, and security result in women being more likely (as compared to men) to complete trip chains, mid-day or off-peak trips, and shorter distance trips. A systematic policy review of 18 public transit systems from Canada's eight largest Census Metropolitan Areas (CMAs) and a webinar discussing public transit policy with female industry leaders reveals that the majority of public transit systems assessed do not explicitly account for gender differences when drafting actionable policy, service standards and data collection methodology. The identification of opportunities for gender inclusivity informs future research and policies regarding women's travel. Applying a gender lens to the creation of service standards, the introduction of new public transit technologies, the collection of real-time data, the creation of customer satisfaction surveys, and the evaluation of business cases and planning processes can result in the equitable consideration of women's travel needs in public transit service and delivery.

Key Words: Women, Gender, Travel Behaviour, Public Transit, Transportation

Introduction

PUBLIC TRANSIT IS an essential service that enhances the mobility of its patrons, facilitating both short and long distance travel within municipalities. Transport, however, is not an end in itself but a means of accessing public services, amenities, social activities, income-generating and educational opportunities. **The objectives of public transit systems are diverse, as they work to increase accessibility, foster social inclusion, provide cost-effective travel, reduce traffic congestion, decrease carbon emissions and much more.** Still, the benefits of transport systems cannot be fully realized under standard gender-neutral planning practices.

Experiences with transport systems differ between men and women, particularly when related to safety, personal security, frequency and affordability of transport. These differing needs and experiences are the result of societal gender roles in which women are disproportionately responsible for domestic work (Statistics Canada, 2018b), act as caregivers for family members (Statistics Canada, 2020), earn lower wages (Statistics Canada, 2019b, 2019c) and are more frequently exposed to violence and harassment (The Globe and Mail, 2017). The multiplicity of factors that influence women's travel needs and behaviours lead to a greater reliance on public transit, most notably due to financial restraints associated with unpaid work (domestic and caregiving) and earning of lower wages (Drimonis, 2016; Los Angeles Metro, 2019). The complex travel associated with caregiving and domestic work (i.e. chauffeuring and or shopping) is further exacerbated by women's increasing participation in the paid workforce (Statistics Canada, 2015c, 2019a). The balancing of work and care in addition to considerations of cost, time, and effort reveal itself in women's travel behaviour.

In transport policy, gender has recently been emphasized as an issue to address when developing sustainable and inclusive transport systems. **Systematic gender inclusion procedures, spanning from the hiring of professionals to the design or planning of systems and equipment, are yet to be widely identified or highlighted within the Canadian context.** Not directly accounting for gender differences in public transit planning and service delivery contributes to the gender-blindness commonly witnessed in society (International Transport Forum, 2019). Better-known examples of this blindness include the gender pay gap and workplace oversights (e.g. thermostat settings, number of restrooms, and provision of breastfeeding areas). The opportunity to conduct gender-based analysis on the differentiated use and experience of public transit systems is ever prevalent.

A prominent area where transportation academia has applied a gender lens is in regards to women's sense of safety while riding public transit. Women's safety has recently substantiated a body of work outlining the "Pink Tax" (costs borne by women who resort to high-cost public transit alternatives for security purposes (Kaufman et al., 2018)). Responses to

this body of work includes design and service provisions that improve both perceived and actual security. Examples of these service provisions include a greater number of uniformed staff present, which works to provide a stronger sense of security for women at public transit stations, under the assumption that staff will intervene if a dangerous situation entails (Chowdhury, 2019). Part of the motivation for this study is to build on this safety-related work by understanding how women's mobility and accessibility needs can further be understood and thereby incorporated in public transit planning and service delivery.

A barrier to incorporating more women-specific initiatives in public transit planning is the limited data collection and analysis of gender information. **Data collection practices that do not explicitly collect gender information or nuanced travel information (highly impacted by gender) limit opportunities to disaggregate data by gender.** Furthermore, if gender information is collected but not subsequently disaggregated, it fails to generate insight regarding the distinctive use and experience of public transit by women. The extent of gender identifiers in travel behaviour data is particularly important for the development of equitable route design, service coverage and service standards in public transit planning. An in-depth understanding of women's travel needs and behaviour is needed to inform decision-making and can be accomplished with the analysis of research and policy methodologies.

As public transit agencies recover from the COVID-19 pandemic, it will be increasingly important to sustain ridership and ensure high-quality service for those most reliant on it. There is considerable cross-over between academic and practitioner-driven research; therefore, understanding the current state of both fields and identifying subsequent gaps within women-centred information will contribute to the development and continuation of equitable and inclusive transportation services.

Our study will seek to:

1. Understand the differentiated needs and experiences of women's travel and the factors that explain those differentiated needs
2. Understand the current practice of how women's distinct travel needs are considered within Canadian public transit planning, including available data that are collected by transit agencies and methods to analyze these data.

We strive to provide recommendations to researchers and Canadian public transit agencies on how data collection, analysis and planning practices can be improved to better account for women's distinctive use of public transit.

The primary focus of this report is the travel behaviour and needs of women and female-presenting peoples. Despite comparisons between men and women, we acknowledge that gender and gender-based analysis are not confined to a binary perspective. We also recognize that women is not a homogeneous term; therefore, the analysis of women as one group is not intended to take away from the lived experience of BIPOC, disabled, migrant or LGBTQIA+ women who individually have varying travel needs. We also acknowledge that other marginalized groups are to be considered (including both men and women) such as people who are visible minorities, recent immigrants, disabled, elderly, LGBTQIA+ and or low income.

Methods

Exploring and understanding women's transportation needs and behaviours was facilitated through an academic literature review, a public transit agency policy review and supplemented by a discussion with industry leaders to highlight the processes between policy, planning and operations.

THE STUDY COMMENCED with a literature review to determine the differentiated needs and experiences of women's travel on public transit. A keyword and rolling search approach were used on Google Scholar, Web of Science and Scopus databases to identify academic and grey literature pertaining to women's travel behaviour, needs and preferences. The literature selected for preliminary reading was contingent on the title including women(an), female(s) and/or gender(ed), along with the abstract indicating the primary focus of the paper was on the female or the gendered experience of travel. Titles speaking to women's safety, security, violence or harassment were excluded from preliminary searches to ensure we tapped into more understudied aspects of women's travel. However, the themes of safety and security did appear and therefore were included when explaining/supporting other travel behaviours. Further criteria for the selection of papers was for the research to be based in the Global North to maintain contextual consistency. A close reading of selected articles led to the identification of themes and selection of other publications from the cited materials. This step was repeated with each novel paper until no more novel/relevant themes emerged (as per the research team's discretion).

To understand the current practice of considering women's distinct travel needs in public transit planning in Canada, policy materials from 18 public transit agencies were assessed. The agencies studied operate within the eight largest census metropolitan areas (CMAs) in Canada. Appendix 1 presents a complete list of all public transit agencies included in our scan, as well as details regarding the materials initially identified through desktop research and those recommended through outreach that were considered in the analysis. The policy materials assessed in this analysis were identified through desktop research. The identification process was guided by knowledge of current industry practices and understandings of jurisdictional context. Representatives from each public transit agency were provided with an initial list of materials identified and were invited to provide any additional agency specific information or documents that relate to women's travel needs or any commentary pertaining to this area. A systematic keyword search (with equivalent French terms used in French language documents) was conducted to identify passages in the policy materials that specifically referenced women and/or gender to highlight the ways that women's travel needs and behaviours are considered in public transit policy. Materials were assessed to understand if and/or how a gender lens was incorporated and trends within similar policy areas (service standards, fare policy, ridership and trip data, customer experience and more) were identified. A detailed overview of the policy review process can be found in Appendix 2.

Lastly, a webinar featuring four women leaders in public transit planning was conducted to discuss the gaps between literature, policy, and real-world application and opportunities for women-centred initiatives. The webinar curated conversation and was used to add a practical lens to recommendations that emerged from the literature and policy review.

Results: Literature Review

The purpose of this review was to synthesize the broad and diverse realm of knowledge surrounding women and public transit usage in Canada and more broadly in the Global North. Minimal restrictions were set when conducting the review to allow for the organic formation of patterns and the identification of gaps within the literature.

IN A SIMILAR FASHION, the open-ended review left space to consider external pressures that influence women's use or non-use of public transit. Identifying travel behaviours and trip purposes within the context of gender and subsequent gender roles will provide a broader understanding of not only why and how women travel but also to what extent academics and practitioners discuss gender. The review set out to understand how gender impacts travel behaviour and how the intersectionality of age, race, income and ability influence the usage of public transit. The focus on women-centred literature was not only of priority for this study but also adds to the body of work surrounding inclusivity and equity in public transit literature and planning practice. This review also serves as a basis on which recommendations to public transit agencies in Canada and future studies can be founded.

Gender & Social Roles

TRADITIONALLY MEN AND women have been assigned different social roles, particularly in reference to heteronormative nuclear families in which men seek external employment and women are responsible for the caregiving of family members and functioning of the home. However, as time has gone on, the composition of families has evolved with the proportion of dual-earner families rising by 150% (39.2% to 58.8%), lone-parent families doubling (8.4% to 14.2%) and rising wife or female partner sole earner families since the 1970s (Statistics Canada, 2018b). Beyond the family, women ages 25 to 54 years old are increasingly participating in the labour market (82.0% in 2015 compared to 21.6% in 1950) along with attaining higher levels of education at a faster rate than men. In Canada, 35.1% of women had a university degree in 2015, grown from 13.7% in 1990 (21.4 percentage points) while only 26.8% of men had a university degree in 2015 grown from 17.1% in 1990 (11.5 percentage points) (Statistics Canada, 2017e). Despite these trends, **women are still overwhelmingly responsible for the caregiving of children, elderly parents and other relatives (Statistics Canada, 2020). This, paired with women's greater participation in the labour force, adds to the complexity of their travel and heightens the need for multipurpose trips.**

According to the general social survey of Canada, women spent an additional 1.5 hours on unpaid domestic work than men did in 2015 for a total of 3.9 hours of unpaid work per day, not including the simultaneous domestic work they do (i.e. multitasking) (Statistics Canada, 2018b). This is separate from the additional work that women take on as caregivers, who, as defined by Statistics Canada, provide care to a family member or friend with a long-term health condition, physical or mental disability or problems related to ageing (Statistics Canada, 2020). Women make up the majority (54%) of caregivers in Canada, of which 41% provide 1 to 3 hours of care per week and 21% provide over 20 hours (Statistics Canada, 2020). Large portions of this caregiving include the use of transportation to manage tasks such as escorting family members to school, health care appointments or retail establishments along with solo trips to fulfill those members' needs such as food shopping or medicine pickup (Statistics Canada, 2020). **In Canada, 72% of caregivers stated transportation to be a primary form of care, followed by housework, house maintenance and scheduling or coordinating appointments** (Statistics Canada, 2020). Understanding the purpose behind women's trips gives greater insight into the limitations of said trips and can provide the rationale behind travel behaviours such as mode choice, time of travel, radii of mobility and much more.

Robin Law outlines in *Beyond 'women and transport': Towards new geographies of gender and daily mobility* how gender variations in mobility choice (mode, travel purpose), mobility behaviour (purpose, timing, distance, duration, route etc.), perception

of mobility and experience of mobility are rooted in gender based social relations (Law, 1999). This serves as a conceptual framework to understand how gendered variations in mobility are still present today. These relations or social roles can be seen as the gendered division of labour, gendered access to resources (time, money, skills and technology) and gendered subject identities or, more specifically, the embodiment of masculinity and femininity (Law, 1999). The gendered access to resources, such as money, limit travel opportunities; for example, women in partnerships are typically left with lower disposable incomes and lower vehicle ownership rates while their male partners oversee the finances (Law, 1999). The gendered access to skill building is seen when women are deprived or deterred from learning cycling and driving, limiting the ability to utilize certain transport modes (Law, 1999). Similarly, the gendered use of technology (automobiles and machinery) results from cultural norms where driving and enjoying cars/trucks are masculine, thereby distancing women from using these technologies (Law, 1999). There is an established relationship between gender and mobility, and when examined by gender, women's relation to mobility is consistently more constricted than men's. Moreover, the social roles of caregiver, homemaker, and worker, along with the disciplinary norms of restricting late night travel and instilling fear of open vacant spaces, work to confine women's mobility (Kaufman et al., 2018; Law, 1999). Restricted mobility can have ripple effects on individuals' mental health and social experience; constricted mobility can result in the isolation of women from family, friends, and communities (Dobbs, 2005).

Women's Public Transit Usage

Women are known to have a greater reliance on public transit; in Toronto, 44.3% of women used public transit as their primary commute mode to work as opposed to 30.1% of men (Statistics Canada, 2017c) **along with the Toronto Transit Commission identifying that 57% of riders are women** (Toronto Transit Commission, 2020). Similar trends are found in Vancouver and Montreal, where 35.0% and 26.0% of women used public transit as their primary mode on their commute in 2016 as opposed to 24.6% and 18.7% of men who did, respectively (Statistics Canada, 2017d, 2017b). This reliance is based on a multitude of factors such as lower car priority within households, lower acquisition of drivers licences and lower incomes (Drimonis, 2016; Los Angeles Metro, 2019). A factor contributing to women's lower incomes is the prevalence of the gender wage gap. In 2018, Canadian women working both full and part-time, ages 25 to 54, earned an average of $26.92 per hour while same-aged men made $31.05 (Statistics Canada, 2019c). In other words, women on average made $0.87 for every $1.00 men did (Statistics Canada, 2019c). The differences in wage, from the *Gender and wage gap in Canada* study, are said to be attributed to men working in higher-paying sectors and occupations (construction, manufacturing, mining, natural and applied sciences) and women working part-time (which generally pays less than full-time work); however, self admittedly determinants of the gap were beyond the scope of the study and were thought to be attributed to work experience and gender-related biases (Statistics Canada, 2019c). Low incomes and wage gaps can lead to women being captive riders of public transit, meaning public transit is their only feasible mode of transportation due to social and economic constraints. The gender-based social roles that influence women's standing within families, workplaces, and broader society inherently impact their mobility. Therefore, women's travel behaviours cannot be examined appropriately without the understanding and recognition of external pressures that impact travel purpose, mode, route, and time.

Gender Neutral Transportation Planning

PUBLIC TRANSIT SYSTEMS are generally designed with a gender-neutral approach. Many public transit systems are organized to take large groups of people from the suburbs to the central business district in the morning (a.m. peak), provide movement within the central business district through the middle of the day and then mobilize the same group of people back to the suburbs at the end of the workday (Blumenberg, 2003; Rosenbloom, 2011). This system, however, is implicitly tailored to the predominantly able-bodied white male experience of travel and does not account for the diversity in the spatial distribution or time distribution that characterizes women's travel behaviour. Women are more likely than men to be conducting caregiving and home management related trips that are in close proximity to the home, so public transit systems that primarily provide service to the core of cities are less equipped to adequately transport women to their more localized needs (Lang, 1992; Primerano et al., 2008).

The COVID-19 pandemic has highlighted and exacerbated several previously known equity issues related to access to public transit, affordable housing, and health outcomes. With respect to public transit, the pandemic has revealed a mismatch between how public transit systems are configured and people's travel needs. For example, in Toronto, the prevailing focus on service to the downtown core has left people commuting between its suburbs on crowded public transit routes and with fewer transportation options, this can partially be explained by significant employment growth in the suburbs in recent years (Simmons et al., 2009; Spurr, 2020).

The physical design of public transit vehicles, commonly based on average able-bodied male specifications, also hinder women's use of public transit. Higher step heights, overhead grab handles and push bells can pose issues for women (who on average are shorter than men) (Blomstrom et al., 2018; CBC News, 2016; Hamilton et al., 2005; Schmitt, 2019b). Women's higher propensity to be caregivers is also disadvantaged when vehicles are designed without space for strollers, medical equipment or wheelchairs in mind. Agencies that require parents to fold strollers to board vehicles pose an inconvenience and, at times, a stressful task that ultimately discourages women from using public transit (Schmitt, 2019a, 2019b). Similarly, accessibility of public transit is decreased when stations do not have elevator access; this ceases wheelchair users' access and discourages patrons with strollers from using public transit. A study found that lack of access to elevators at public transit metro stations resulted in significant declines in accessibility to jobs, with wheelchair users having access to only 75% and 45% of jobs that non-disabled riders would have in Toronto and Montreal, respectively (Grisé et al., 2019). These findings highlight the importance of equitable public transit vehicle and station design and how its lack has domino effects on potential riders' accessibility and income-generating opportunities (Grisé et al., 2019).

Trip Chaining

TRIP CHAINING IS an integral part of women's travel behaviour. The definition of trip chaining itself varies; authors such as McGuckin and Murakami (1999) define trip chaining as short-duration stops between the anchor points of home and workplace. Other definitions focus on trips anchored solely by the home, in which trip chaining is the measurement of travelling to two or more activities from home and then returning to the home (Holzapfel, 1986; Primerano et al., 2008).

Trip chaining is an efficient way to complete multiple tasks in a single outing, making it an attractive travel schema for women. Women are more likely than men to trip chain (McGuckin & Murakami, 1999; Primerano et al., 2008; Rogalsky, 2010; Root et al., 2000; Rosenbloom, 1998; Steiner, 2011). Primerano et al. (2008) and Root et al. (2000) **found that women undertake significantly more shopping, drop-off/pick-up, and passenger serving trip chains compared to men.** Due to the greater responsibility of childcare, domestic work and caregiving, women tend to be "time poor"; therefore, they link recreational, shopping and chauffeuring trips together (Hamilton et al., 2005). As mentioned earlier, Canadian women spend an additional 1.5 hours doing unpaid domestic work as compared to men and therefore incorporating multiple tasks within a single trip is crucial for the fulfilment of all their responsibilities (Statistics Canada, 2018b). In addition, mothers, in particular, are known to trip chain, specifically those with young children (Scheiner & Holz-Rau, 2017). A study in Germany found through household surveys and travel diaries that having children increased the entropy (diversity/ complexity) of mothers' trips more so than fathers (Scheiner & Holz-Rau, 2017). In cases where the burden of care is higher, such as for single mothers, higher rates of trip chaining are borne from the necessity to balance employment, domestic work and caregiving (Blumenberg, 2003). Women are more likely to head single-parent households, with lone mothers making up 81% of all lone families in Canada in 2014 (Statistics Canada, 2015a). Therefore women are disproportionately responsible for the care of children, much of which requires transportation.

Women's role as caregivers and responsibility for domestic work influence their travel purpose and the number of trips they take (Golob & McNally, 1997; Lang, 1992; Primerano et al., 2008; Root et al., 2000). Golob and McNally (1997) tested their activity participation and travel interaction model using Portland, Oregon 1994 travel survey and activity diary data and found that females (women) perform more activities, take more trips and complete more home-based chains. The link between women's chaining behaviours, caregiving and household maintenance responsibilities can be seen as the life cycle changes progress (children age) (Golob & McNally, 1997). As children age, women's work unrelated trips decrease and trip chain formations become simpler (Golob & McNally, 1997). In the analysis of the United States nationwide personal transportation survey (NPTS), McGuckin & Murakami (1999) found that although women with children made more stops (chains) than single men or women, single moms make substantially more stops than single dads (McGuckin & Murakami, 1999). A majority (65%) of single

moms with children five and under will make stops (complete multiple activities in a single outing) compared to only 33% of single dads with same-aged children (McGuckin & Murakami, 1999). This pattern is seen in women who are primary caretakers of their children; however, more needs to be discovered as to how the travel behaviour of women who are responsible for the care of parents or parents-in-law changes, if at all. This is important because of all caregivers in Canada, 47% are taking care of parents or parents-in-law, who have different needs and create different activity patterns than children do (Statistics Canada, 2020).

In addition to domestic responsibilities, employment type also influences women's travel behaviours. There is a circular relationship between women's employment and trip chaining. Women's choice of employment impacts their ability to trip-chain, and similarly, women's need to fulfil caregiving responsibilities influences their choice of employment. Women are overrepresented in minimum wage jobs, with 58.8% of Canadian minimum wage workers in 2018 being women (Statistics Canada, 2019b). A majority of these jobs are retail, accommodation and food service, which include flexible/irregular scheduling (Statistics Canada, 2019b). Non-traditional shift start and end times make it more plausible to integrate work and personal trips; for example, a mother ending work at 3:00 pm may be able to drive back home and pick up her child from school at 3:30 pm in a single trip. Interestingly, in Germany, people who work part-time were found to have increased entropy within their journeys (Scheiner & Holz-Rau, 2017). This can help explain women's propensity to trip chain as women in Canada are twice as likely to be working part-time as compared to men (Statistics Canada, 2017e). Women have also been seen to limit their choice and location of employment in response to the needs of their families (Madden, 1981). Displays of spatially confined employment can be observed when women constrict their job search to the surrounding area of their spouse's work location or only accept jobs near childcare or their children's schools (Blumenberg, 2003; Kwan, 1999). In two-parent households, a study by Singell and Lillydahl (1986) found that women's influence on residence relocation was lower than males, who were more likely to move in response to employment opportunities. With this notion, women's employment opportunities became constrained to the employment of men (Singell & Lillydahl, 1986). Localizing needs can allow women to continue trip chaining and complete multiple tasks in a short period of time. Localization also enables women to remain in the vicinity of their children in cases of emergency (Kwan, 1999).

Despite women's need to efficiently complete tasks in limited amounts of time, it is not always feasible for activities to be completed via public transit. Using household travel survey data in Adelaide, Australia, Primerano et al. (2008) found that households with no vehicle take less complex trip chains than those with vehicle access. A contributing factor to the decreased chains made by public transit may be the cost. Low-income women who struggle with the upfront cost of a monthly transit pass are disadvantaged if they trip-chain in areas where a new fare must be paid for each boarding. Implementation of a cost-effective transfer system would allow more women to complete their tasks in a timely manner. Examples of this fare scheme would include the Toronto Transit Commission's two-hour transfer scheme that was introduced

to alleviate the financial burden of low-income riders by allowing re-entry into stations and re-boarding onto vehicles with no additional cost within a two-hour window (Toronto Transit Commission, 2017). As captive riders, a question remains to what extent are women completing these trip chains on public transit. Canadian-based research examining gender-specific trip chaining behaviours would benefit both women and public transit agencies as insights towards both rate and time of transfers would better inform public transit policy and thereby women's travel experience. Similarly, study into women's desire to trip-chain should be examined as desired behaviour cannot be captured by data that collects revealed behaviour. Research surrounding trip chaining is especially needed in areas where transfers are not integrated into the fare scheme as comparative analysis with systems with free/timed transfers would reveal how large of a barrier cost is when trip chaining.

Mid-day and Off-Peak Trips

LITERATURE REVEALS THAT mid-day trips are highly characteristic of women's travel, particularly for those travelling via public transit. A driving factor for this travel behaviour is safety and security concerns. Statistics Canada survey of safety in public and private spaces found that 32% of women had experienced unwanted sexual behaviour in public, with increased odds of victimization if younger in age and or of a sexual orientation other than heterosexual (Statistics Canada, 2019d). As compared to men, women were more likely to have been victim to multiple incidents of unwanted behaviour or violence while on the street in the past six months (Statistics Canada, 2019d). The realities of these statistics make public spaces, including public transit, places of concern for many women. An analysis by the Globe and Mail of Canada's 22 largest public transit systems found that of the four thousand instances of sexual assault or harassment recorded from 2013 to 2017, 90% of the incidents were perpetrated against women by men (The Globe and Mail, 2017). The fears of assault or unwanted attention are heightened at night for women (Gardner et al., 2017). Travelling at night is perceived as less safe than daytime travel because of the lack of surveillance, decreased ability to perceive surroundings, decreased number of people and increased perception of crime (AitBihiOuali & Graham, 2021; Carver & Veitch, 2020; Gardner et al., 2017; Hamilton et al., 2005; Los Angeles Metro, 2019; Lynch & Atkins, 1988). This fear is exceptionally high for women of colour. When asked in a Southampton, UK survey, Afro-Caribbean women felt much less safe than white women to travel by tube at night, along with 95% of Asian female participants who stated that because of safety concerns, they do not go out at night at all (Lynch & Atkins, 1988). This sentiment is echoed by literature review and interviews in the UK in which ethnic women were distinctly found to have a greater fear of travelling by public transit at night (Hamilton et al., 2005).

Although security is a significant concern and deterrent for late-night travel, women's greater propensity to take mid-day trips can also be explained by their greater caregiving and domestic responsibilities. A large proportion of caregiving (72%) is transport used to serve children, spouses, friends, siblings, grandparents, parents and parents-in-law (Statistics Canada, 2020). The activities needed for caregiving are generally ones of daytime nature, for example, doctor's appointments, prescription fulfillment, recreational activities, grocery shopping or clothes shopping. **A study based in Los Angeles, USA, found that not only were women**

more likely than men to travel mid-day but that the peak travel time for women was approximately 2:00 pm (Los Angeles Metro, 2019). Navigating crowded buses or trains can be infeasible or stressful for women travelling with young children, groceries, strollers or other large loads; therefore, it is more convenient for them to travel at these less crowded or off-peak times (Los Angeles Metro, 2019). The physical design of public transit adds to this congestion, as buses in Canada are designed only to accommodate 1-2 strollers at a single time.

Many women are caught in a double bind as travelling on-peak times poses crowding issues, and travelling off-peak comes with its own set of challenges. **A concern with off-peak travel is the low public transit frequency associated with these times. Less frequent service can result in long wait times, which are physically tiring and expose women to more security threats** (Blomstrom et al., 2018). The challenge of long wait times, missing transfers and expensive fares may motivate women to bypass public transit altogether and instead carry out their trips at a later time when they have access to a private vehicle (Bianco & Lawson, 1996; Noack, 2011; Rogalsky, 2010).

People with physical disabilities (men and women) share a similar sentiment as seat availability or open space for wheelchairs, mobility scooters and other medical equipment is required when using public transit, and so travelling at off-peak times increases the likelihood of space being available. However, off-peak travel is followed by its own set of constraints. Using data from focus groups in Portland, Oregon, responses from disabled participants noted that long waits during off-peak times can be unbearable, specifically in extreme weather conditions, along with the extended amount of time it took to reach appointments or shops (Lubitow et al., 2017). Further, the authors reported that since buses and trains have limited shared space for all disabled, elderly, stroller and car seat carrying passengers, this creates frustration for those with a physical disability who note the lack of space for the diversity of riders. In addition, at times, public transit vehicles are not able to accommodate multiple wheelchairs users at once. Participants in the Lubitow et al. (2017) study recall being passed by buses that had already boarded two wheelchair users; instances like these are not uncommon and add additional stress when planning a trip via public transit. With Canada's ageing population, the demand for passengers with mobility needs is rising year over year as 47% of people ages 75 and older have a disability (Statistics Canada, 2018c). In 2019, nearly one-fifth (17.5%) of Canada's population was made up of seniors (Public Health Agency of Canada, 2020). The proportion of seniors is predicted to rise to one-fourth of the Canadian population by 2040; therefore, the need for accessible public transit will be increasingly prevalent (Public Health Agency of Canada, 2020). When considering the travel behaviour of older

women, they may also opt to travel mid-day or off-peak to ensure a seat is available and avoid crowding in general. Older women are a key demographic that public transit agencies should be considering; since as people age their ability and confidence in driving decreases, leading to a mismatch in travel needs and abilities (Statistics Canada, 2010).

Women are more likely than men to be travelling outside of peak times because of their caregiving duties and their greater involvement in low-wage and or part-time service-based work (Lang, 1992). Giuliano (2005) found when examining US national personal travel survey data that low-wage workers are less likely to travel to work during the a.m. peak (62% of low-income workers travel during the morning peak versus 75% of non-low-income workers) due to their non-traditional schedules. However, this large group of workers still rely on public transit to service their needs at other hours of the day. Using the same data, it was found that in the United States, 5% of all households do not have any drivers (a person holding a valid driver's license), but 12% of low-income households (households that did not exceed 80% of the regional median household income) and 22% of poor households (as per 1995 U.S. census poverty threshold adjusted by household size) have no drivers (Giuliano, 2005). These findings were cavitated in that they may be skewed by retired persons, of which a majority are female, making up a large portion of poverty households (Giuliano, 2005). However, this further exemplifies how women, more specifically low-income and elder women, rely on public transit and frequent service during off-peak hours.

Short Distance Trips

DESPITE WOMEN BEING more likely to take a greater number of trips than men, these trips tend to be shorter in distance. **In Canada, 31.1% of women had a commute that was less than 15 minutes, whereas only 25.2% of men had a commute that short (Statistics Canada, 2017a).** Similarly, 61.3% of women commute within their residences' census subdivision compared to 55.2% of men (Statistics Canada, 2017a). This means that women are less likely than men to be commuting out of their municipality (census subdivision) for work. Much of the research surrounding women's travel distances are centred around the commute to work. Although this can inherently disclude large groups of women (due to women's lower participation in the labour force than men), it is still informative of gender travel differences. Multiple studies have found that women's work trips are shorter than men's (Blumenberg, 2003; Crane, 2007; Ericksen, 1977; Gordon et al., 1989; Hanson & Pratt, 1988; Johnston-Anumonwo, 1992; Lang, 1992; Madden, 1981; Mensah, 1995). Using the American Housing survey results from 1985 to 2005, Crane (2007) found that across all demographics, work commute distance was lengthening over time, but despite the upwards trend, women still consistently had shorter commutes than men. The reasoning behind this, however, is varied; some researchers such as Blumenberg (2003), Gordon et al. (1989) and Ericksen (1977) expect that the spatial distribution of feminized occupations (jobs with traditionally large proportions of female workers) results in work being closer to women. This is a function of employers taking advantage of the labour supply in the suburbs and understanding the demographics of their potential employees (Blumenberg, 2003; Hanson & Pratt, 1988). This theory is backed by a study from Madden (1981) using the Survey of Income Dynamics from Michigan, USA, in which men were found to be more responsive to wage gradients than women. Meaning, men are more likely to select a job based on wage (despite the distance from the home) than women are, the only exception being women-headed lone-parent families (Madden, 1981). Similar surveys conducted in Alberta, Canada, found that an "unfavourable schedule," as opposed to other factors such as salary, was a critical factor in job search characteristics among women (Mensah, 1995). This adds to the narrative that women have shorter work distances because of the social pressures and responsibilities linked to caregiving and home management. However, more updated research and specifically Canadian-based research is needed to confirm how the spatial distribution of jobs and wages influences women's employment.

Women's caregiving and home responsibilities can be seen to take priority over their external jobs, thereby restricting the time they can allocate to work (Ericksen, 1977). This social pressure results in women working less than men (greater part-time employment) and travelling less distance for work (Ericksen, 1977). In Germany, when men mirror "women's" roles and either work part-time or become the primary homemaker, they begin taking more trips per day, have shorter trip lengths, and lower car share than their female counterparts (Nobis & Lenz, 2005). This finding highlights the impact of gender roles and social constraints on women's travel and how being

the predominant member responsible for the maintenance of the home impacts a variety of travel behaviours.

Other aspects of women's employment are also constrained by their home-based responsibilities. Women's job satisfaction has been linked to their ability to cope with the double burden of home and work responsibilities (Hanson & Pratt, 1988). In contrast, Hanson and Pratt (1988) observed that men's job satisfaction has been explicitly tied to job conditions. This trend has resurfaced recently with the onset of the COVID-19 pandemic, in which 850,000 women left the U.S workforce (a number four times greater than men) in September 2020 alone (Gogoi, 2020). This decrease has been explained by the overwhelming burden of childcare, elder care and household responsibilities that at-home orders have created (Gogoi, 2020). The decline in workforce participation from women can also be attributed to the gender pay gap since women tend to earn less money than their male counterparts; when one partner in a couple must step back from work, it is likely the lesser earner who will do so (Gogoi, 2020).

Beyond employment, women's tendencies to conduct short distance trips can also be seen as a function of their income and mode accessibility. Long-distance travel is expensive; owning a vehicle and maintenance costs are household expenses that some women cannot afford. Similarly, public transit fares can act as another barrier to long-distance travel. When using GO Transit in the Greater Toronto and Hamilton area, fare rates are determined by the distance you travel between fare zones, so long-distance travel results in a costlier trip (GO Transit, 2021). Even when fares can be afforded, the (non-monetary) cost of taking public transit is still prevalent as the additional time it takes to use this mode is time that women must spend on childcare or is time that could be used to earn money through employment. Women are more vulnerable to experience low income than men due to the gender wage gap that causes women with equal qualifications to be paid less than men for similar work (Statistics Canada, 2018a). Lower income, or lower disposable income, is a barrier to long distance travel due to the financial cost (public transit fares or vehicle fuel/maintenance cost) and the time cost of long commutes. Women are more likely to reduce their work hours or forgo external employment entirely to act as caregivers or fulfill domestic duties (Statistics Canada, 2018a). This is in addition to the time women take off for child-bearing, which leads to the maternal wall, a phenomenon in which women are subject to reduced perception of their ability and dedication to work after returning from maternity leave, thereby creating a barrier to promotions and pay raises (Ferrante, 2018; Gogoi, 2020). The realities of the gender pay gap, maternal wall and caregiving responsibilities put women in a disadvantaged position to earn wages. According to the Canadian Women's Foundation, over 1.5 million Canadian women live in poverty with senior, single parent, First Nation, disabled, 2SlGBTQI+ and visible minority women at even greater risk (Howard, 2021). **The fiscal and time disadvantage of having a long commute is likely to impact women's employment selection; therefore, women's short distance trips can be seen at times as a function of financial disadvantage.**

Women of ethnic minorities, specifically black women, showcase different patterns of short trips; although their commutes are still shorter than men, they are somewhat longer than white women's trips (Ericksen, 1977; Johnston-Anumonwo, 2000). Two explanations for this anomaly are that the concentration of black women in the central business district who move opposite to peak travel end up having longer commutes (Ericksen, 1977). Other explanations include that white women are not able/willing to work unless the employment is near them, whereas black women have flexible roles that allow them to travel further (Ericksen, 1977). However, indications from the time period suggest that black women may not have had the privilege to be as selective with their employment. Later studies conducted in Detroit, Michigan had similar results using Public Use Microdata Samples (PUMS) data, black women were more likely to use public transit (10.9% compared to 0.8% of white women) and had longer commute times (23.9 minutes) in comparison to white women (21.1 minutes) when comparing commutes by all travel modes (Johnston-Anumonwo, 2000). This disparity continued when comparing women in service and industrial fields in which black women's commutes were 4 minutes longer than white women in the same field of work (Johnston-Anumonwo, 2000). When travelling from the suburbs to the central city, white women had a longer commute (28.5 minutes) than black women (21.3 minutes); however, when travelling from the central city to the suburbs, black women had longer commutes (25.4 minutes) than white women (23.5 minutes) (Johnston-Anumonwo, 2000). The authors note that white women's longer commute times do not indicate disadvantage in this scenario as white suburb-to-central city commuters are also of higher socioeconomic status with fewer dependent children than central city-to-suburb black commuters (Johnston-Anumonwo, 2000). Near identical findings can be seen in a study using PUMS data in Kansas City, where black men and women have longer commutes than white men and women in suburban workplaces (Johnston-Anumonwo, 2001). The greater use of public transit by black people is likely the key factor in the increased commute length. Public transit is traditionally designed for suburban-to-central city travel, therefore decreased service when travelling in the opposite direction results in time delays. Further research is needed to address whether black women's commutes are still longer than white women's in modern times and the contributing factors that create this disparity.

Furthermore, additional research within the Canadian context and about other ethnic minorities will be informative of women's travel behaviours. As women's roles have changed and access to transit has increased, reconforming and reassessing why women continue to have shorter trips compared to men would better inform policy on women's travel behaviour.

Mode Choice

IN CANADA, WOMEN are more likely than men to use sustainable transportation modes (public transit, walking, cycling), with 33.8% of women doing so as opposed to 29.1% of men in 2016 (Statistics Canada, 2017f). This difference can be partially attributed to women's greater use of public transit on their journey to work, as 14.7% of women commuted on public transit in 2016 while only 10.3% of men did (Statistics Canada, 2017a). Despite women utilizing public transit more than men, there is still a considerable reliance on private transportation, as 70.2% of women drove to work and another 6.8% travelled by car, truck or van as a passenger (Statistics Canada, 2017a). When determining women's mode choice, there are two streams of knowledge that will be discussed, one being intersectionalities and social forces that cause women to be more dependent on public transit, and the second being the combination of limitations of public transit paired with the benefits of driving which lead to women's underuse of public transit.

As previously stated, women are more likely to be low income due to differences in wages based on gender, over-representation in low wage jobs and lower participation in the labour force (Statistics Canada, 2018a). The lower participation rate in the paid labour force, 59.9% for women and 69.5% for men, constricts women's mobility options (Statistics Canada, 2021). The cost of private vehicle travel can be expensive, and this leaves women more reliant on sustainable forms of transportation such as walking, cycling and public transit because of their affordability. The linkage between income and public transit use has been observed by Jin and Yu (2021) through analyzing the 2017 US National Household Travel Survey, factors such as high household income was associated with lower public transit use, more so in women than men. In other countries such as Sydney, Australia, similar trends emerge as women with lower socioeconomic status were more likely to use public transit as compared to women of higher socioeconomic status when controlling for the environment (suburbs) (Black, 1976). In addition, a King County Metro study in Seattle using origin and destination surveys, found that the three primary factors that caused women to use public transit more than men was the possession (or lack thereof) of a driver's licence, income level and employment status (Guiliano, 1979). In Canada, fewer females hold a driver's license than men; with 12.9 million female drivers and 13.6 million male drivers, males consistently held more licenses than females in every age category in 2018 (Transport Canada, 2018). Senior women typically make up a large number of those without a drivers license; with Canada's ageing population and women's greater life expectancy, it can be assumed that for this reason, senior women may become captive riders of public transit (Canada Institute for Health Information, 2021; Statistics Canada, 2009, 2010, 2015b).

Another significant factor contributing to women's greater use of public transit compared to men is the lower car priority women tend to have in the household. In North East England, Dobbs (2005) found through the distribution of surveys and focus groups that despite 86.7% of women living in homes with access to private transport, only 29.1% said

they had full access, 21.2% share the vehicle and have equal access to it with their partner, 16.7% have access to private transport when they need it, and 13.3% said that although the household has a private vehicle, they themselves do not have access to it. Other studies based in Germany found that in car deficient households, where the number of drivers exceeds the number of vehicles, men got access to the vehicle for 56.6% of their trips compared to women who only got it for 36.5% of their trips (Scheiner & Holz-Rau, 2012). However, even in fully equipped households, where the number of drivers equals the number of vehicles, women still drove less than men (Scheiner & Holz-Rau, 2012). These gender differences are expected to result from activity patterns, trip distances, and "choice" of the driver in situations where either partners or two household members are travelling together (Scheiner & Holz-Rau, 2012). The lack of vehicle priority within households impacts other forms of women's travel; for example, this limits women's potential to use public transit via park and ride, making walkable access to public transit of more importance (Lang, 1992).

Lastly, women's greater use of public transit and sustainable modes of transport can be linked to women's strong environmental ties. Interviews in Bochum, Germany, revealed that women are more willing to reduce car use and prefer public transit because of their stronger ecological norms and weaker car habits (Matthies et al., 2002). Similar sentiments were found in the Automobility in Sweden survey. Female respondents were more willing, in comparison to men, to reduce their vehicle use and support measures that lead to the overall reduction of vehicle use, such as expanding public transit services (Polk, 2003).

The fear of crime and harassment on public transit is another influential determinant of travel behaviour. An online New York survey found that 75% of female respondents had faced some form of harassment or theft while using public transit, and 54% expressed concern about being harassed compared to only 20% of male respondents (Kaufman et al., 2018). Safety is a large consideration in women's mode choice; women may even take more inconvenient or more costly options to bypass public transit, such as asking friends or family for rides or using for-hire vehicles or taxis (Bianco & Lawson, 1996; Gardner et al., 2017; Kaufman et al., 2018; Law, 1999). The use of expensive travel modes due to fears of violence and harassment is better known as the pink tax on women's transportation (Kaufman et al., 2018). The pink tax is prevalent as women are more willing than men to change their travel behaviour as a result of fear (Bianco & Lawson, 1996; Gardner et al., 2017; Kaufman et al., 2018; Law, 1999). This fear is not unwarranted, as women are more likely to be victims of assault and harassment on public transit (The Globe and Mail, 2017). These security concerns impact all women; however, only a select group of women have the opportunity

to change their travel behaviour. For example, when Taiwanese Californian women who were captive riders were asked how/if they would alter their use of public transit after the harassment they endured, a majority indicated that there was nothing they could do because public transit was their only means of travelling to work or school (Hsu, 2010). For women whose travel mode is more flexible, it was found in New Zealand that female drivers were three times more inclined to use public transit on a route that included a transfer if there were security guards present (Chowdhury, 2019). Analysis of preferential safety and security-based service improvements by public transit agencies would allow for the tailored implementation of safety measures, thereby elevating the attractiveness of public transit to direct consumers.

The logistics of public transit can be a barrier to its use. Low bus frequency and large distances to bus stops make coordinating multiple activities using public transit complex and potentially unfeasible, particularly for women in rural areas (Noack, 2011). Urban women face similar barriers to using public transit due to long waiting times, multiple transfers or slower travel pace (Chowdhury, 2019). These barriers make trip chaining, a common component of women's travel behaviour, more difficult to complete on public transit; if public transit systems are unable to fulfil trip chaining needs, it becomes less attractive to women as a mode choice (Hamilton et al., 2005; Patterson et al., 2005). In addition to women's travel patterns being disconnected from traditional public transit servicing, their travel locations face similar barriers. **Women are more likely to be members of the service industry, in which the spatial distribution of locations is not limited to a single core; therefore, public transit systems radial design to the central business district leaves these employment centers underserved** (Blumenberg, 2003; Rosenbloom, 2011). The limited use of public transit is echoed by US household travel survey data in which trips for maintenance and recreation negatively impact public transit usage, unlike subsistence-based trips (Jin & Yu, 2021), likely a result of public transit planning accounting for accessibility to major employment and education hubs rather than social, recreational, medical or essential locations (Jin & Yu, 2021).

Physical barriers also prevent and or discourage women from using public transit. Women are more likely than men to carry large loads, travel with young children, or travel with a stroller (Lang, 1992; Lubitow et al., 2017; Transport for London, 2012). Women's travel by public transit is discouraged because there can be confusion as to the rules of having a stroller on board, high curbs or steps make on/off-boarding more strenuous and navigating within the tight space can be challenging (Lang, 1992; Nordbakke, 2013; Transport for London, 2012). The design of trains and buses are generally made with the average (healthy/fit) male body and journey in mind; this results in higher steps, grab bars and reduced space (which otherwise would be needed for strollers, wheelchairs or medical devices) on public transit (Blomstrom et al., 2018). Focus groups in Portland, Oregon, reveal how women would rather walk than board a bus in which they would have to endure the stress of folding strollers, waking a sleeping child and potentially receiving off-putting looks/comments from the bus driver or other

passengers (Lubitow et al., 2017). **Household travel survey data from the United States indicates that households with children are 50% less likely to use public transit, likely due to the physical barriers associated with moving children and their supplies** (Jin & Yu, 2021). Similar findings are seen in the Greater Montreal area, where households with one or more children had a sharp decline in public transit use between the ages of 20-30 (when their children were born) as compared to households with no children who had a steady decline in public transit use as they aged (Grimsrud & El-Geneidy, 2014). The complications associated with public transit make it an unattractive mode choice, resulting in more women opting for private vehicle travel (Blomstrom et al., 2018).

While some women are captive riders of public transit, a larger group of women are not using transit, irrespective of its availability. In Northeast England, surveys show that although 98% of households live within a 13-minute walk of public transit with services at least once an hour, only 26.9% of women use public transit to travel to work (Dobbs, 2005). The time and therefore cost savings associated with driving make it an attractive mode choice. Private vehicles allow for comfortable wait times, with protection from the elements during congestion and avoidance of transfers, crowds and unwanted social interactions. Private vehicles give women the flexibility to trip-chain, travel at all times of day, transport large loads and travel with others. In 2011, bus riders, subway users, and light rail passengers in Canada took 40.4, 44.6 and 52.5 minutes respectively to travel to work compared to the 23.7 minutes those who used private vehicles did (Statistics Canada, 2012). The time savings are undeniable when travelling by private vehicle. Longitudinal analysis of 25 North American public transit agencies revealed that car ownership is strongly (negatively) associated with public transit ridership, in that households with low car ownership have increased public transit usage (Boisjoly et al., 2018). Car ownership is also positively correlated to economic opportunity, as a function of the built environment (that promotes vehicle use and ownership) in American cities . In the study by King et al. (2019) they found that in Manhattan, New York, where the built environment was not modified to accommodate cars, the probability of a car-less home being considered poor was 16% compared to car-oriented cities such as Los Angeles, California where the probability was 35% (King et al., 2019). A common theme among women, who may even struggle to afford private transportation, is that the overall benefits (time-saving, stress, flexibility) of a vehicle outweigh its cost (Dobbs, 2005; Rogalsky, 2010). This along with the greater accessibility a private vehicle provides, may add to the social pressure to own a vehicle, even when it is beyond a households budget (King et al., 2019). Private vehicles pose a high standard for public transit agencies to meet; however, the consideration of women's needs and travel behaviours will better equip public transit agencies to improve service and attract more ridership.

Gaps and Limitations

FROM THIS REVIEW, it can be concluded that trip-chaining, off-peak travel, and short-distance trips are all common features of women's travel behaviour. The observation of these travel characteristics are based on the limited number of women-centred studies within the literature, in tandem with the general lack of women-focused studies in planning academia and practice. The standing of women within society, in regards to their role within labour markets and family structure, heavily influences their mobility and accessibility. Understanding women's travel needs and behaviours is fundamental to the equitable planning of public transit systems. Implementing this knowledge will allow women to access more opportunities on transit and use public transit as a primary mode for their daily needs. Although women do use public transit more than men, there still remains a preference for driving. Modifying public transit service routes, timings, vehicle design, fare structures can capture a new set of users and improve the quality of public transit experience for women. Improving service standards to meet the diversity of women's needs is mutually beneficial as a more diverse system can increase ridership within municipalities and reduce carbon emissions from unsustainable transport modes. Despite the revealed behaviours discussed in this review, there still remain gaps within the literature that, if studied, would give greater insight to women's travel behaviour and needs.

Travel by private vehicle is found to be more conducive with trip chaining; therefore, collecting both qualitative and quantitative data about trip chains completed (on public transit and other modes) may give insights to public transit system service designs (such as bus network redesign plans) that support or hinder this travel schema. Bus network redesigns have been undertaken by many public transit agencies in Canada and the United States recently for reasons such as to better align their operational structures with present travel patterns and rider expectations (National Academies of Sciences, 2019). Considerations include providing more frequent off-peak services and improving local connections (e.g., connections within suburban areas), which directly work to meet off-peak and localized trips. Further, high-frequency transfer-based network designs are designed to allow riders to efficiently access multiple destinations with the use of transfers (Grisé et al., 2021), and this bus network model has potential to more effectively meet travel patterns, such as trip chaining. Information relating to trip-chaining via public transit is limited, as trips not taken have not been recorded, meaning, there may be trends of suppressed trip-chaining by women due to the limitations of public transit. The necessity of trip chaining is largely centred around caregiving and domestic responsibilities that result in both chauffeuring and shopping-based trips. A large gap within the literature is the lack of studies pertaining to how the caregiving of adults impacts travel behaviour, since a majority of caregivers are looking after elderly parents, in-laws, spouses and other relatives. Examining how the caregiving of these family members impacts women's travel behaviour may result in novel patterns and barriers to travelling via public transit.

Mid-day trip taking was commonly categorized by a fear of travelling at night due to safety and security concerns for women. Although safety is a significant barrier to women's travel, more research is needed to understand how the low frequency and availability of public transit during off-peak times (evening and weekends) impacts travel behaviour. Off-peak transit service is especially of concern to women, who are more likely to participate in part-time service-based work, which typically requires evening/late night travel. Data and information regarding weekend travel is missing from the knowledge surrounding women's travel behaviour. The correlation between employment type, job location and public transit access through a gender-based lens is still underdeveloped within the literature, specifically within Canada. Understanding these relationships would better inform how women's labour force participation is impacted by public transit and vice versa.

A lack of literature pertaining to the travel needs of women resulted in many of the papers and studies discussed being less recent and stand alone (unsubstantiated) in nature. Themes and patterns identified in the review would benefit from being reconfirmed and reassessed for relevance in modern times. Comparisons to older work would help identify influential factors that result in women trip-chaining, taking short-distance trips, mid-day/off-peak trips and would indicate how/if these patterns have changed.

The general limitations of the literature are an overall lack of studies conducted within Canada. Although papers were restricted to the Global North to maintain a similar context in understanding how women travel, having more information on Canada's existing public transit systems would be beneficial. In addition, more broadly, having a wider variety and number of studies focus on women of colour and women with disabilities would work to identify their specific needs and travel behaviour. Women are diverse; therefore, findings cannot be generalized or applied to all women. Similarly, public transit and its use differ by mode; therefore, more intensive studies that separate travel by rail, bus, bus rapid transit (BRT), and light rail transit (LRT) would give a more precise picture of women's travel behaviour and reveal considerations taken when selecting the mode of transport. Definitions or data collection methods that focus solely on trips between home and workplaces inherently disclude women as they (despite increasing participation in the labour force) are less likely to be employed (57.9% to 65.4%) as compared to men (Statistics Canada, 2019a). Therefore a large portion of women's activity is not captured from studies following definitions that center around workplace travel.

Lastly, the majority of the papers and studies reviewed used surveys or travel diaries as the primary source of data. While effective, there is a lack of studies conducted with the use of passive "big" data to collect information surrounding women's travel behaviour. Utilizing methods such as smart cards, smartphones, or GPS tracking can support existing knowledge by providing a large amount of data without the limitations of bias on a larger scale. A critical barrier to including women's needs in public transit planning relates to a lack of gender-specific data. Little gender-specific insight can be generated with an absence of data collection practices designed to capture gender differences in public transit use and travel demand. This is acutely problematic as data are applied in several aspects of public transit planning, such as developing service standards and business cases for major public transit projects. For equitable, gender-inclusive planning and design, the collection and analysis of gender-disaggregated data is vital.

Results: Policy Review

A review of policy materials was conducted to understand how policy frameworks and decision making processes within public transit agencies in Canada factor in the needs of women when making operational and service decisions.

PUBLICLY AVAILABLE MATERIALS were identified through desktop research. The identification process was guided by knowledge of current industry practices and understandings of jurisdictional context. Representatives from each public transit agency were provided with an initial list of materials identified and were invited to provide any additional agency specific information or documents that relate to women's travel needs or any commentary pertaining to this area. This review addressed the fundamental question: **In what ways do the publicly available materials that pertain to the planning activities of public transit agencies in Canada consider the travel behaviour and needs of women?**

Each policy category begins with a summary of findings. This is followed by an overview of the types of materials considered in the review, an assessment of how women's travel behaviour and needs are acknowledged in the materials and what this means in practice, and finally, a gap in the existing policy is identified, along with an opportunity to address this gap.

The examples of policies and best practices in this section are not exhaustive. Rather, they are provided to illustrate the findings of the policy review. Appendix 3 provides additional information on selected best practices. Selected best practices have been identified to highlight ongoing work to respond to and understand women's travel needs in public transit planning and policymaking in Canada. This section assists in knowledge sharing of activities and provides supplemental information on activities referenced throughout this report. The selected best practices are not an exhaustive list, rather they are illustrative examples of how women's travel needs have been addressed by public transit agencies and associated entities across Canada.

Service Standards

While there are aspects of service standards that are supportive of women's travel needs, overall, there is a mismatch between the services that meet women's needs and the standards outlined.

IN THIS POLICY review, "service standards" refers to documents that allow a public transit agency "to evaluate its service in an objective, consistent, and equitable manner" (Perk & Hinebaugh, 1998, p. 200). These documents are produced specifically for a public transit agency and include criteria such as service coverage, route design, and service frequency.

A review of the publicly available service standards documents from the public transit agencies included in this study found no explicit references to women's travel behaviour or needs. The lack of criteria to guide public transit service planning in a way that is supportive of the public transit needs of women has a tangible impact on the delivery of public transit services. For instance, in a study examining the travel behaviour of women in Los Angeles County, the peak travel period for women is found to be around 2:00pm (Los Angeles Metro, 2019). This is outside of the peak weekday service period defined by York Region Transit (York Region Transit, 2016), TransLink (TransLink, 2018a), and Toronto Transit Commission (Toronto Transit Commission, 2017). This suggests that public transit agencies are providing lower service levels during the period where public transit is potentially in high demand among women.

Despite the absence of explicit references to women in these documents, there are aspects of the service standards reviewed that are supportive of women's travel needs. For example, the Toronto Transit Commission outlines the use of a grid network as part of their service standards, noting that this allows public transit services to meet the majority of potential origins and destinations within a service area (Toronto Transit Commission, 2017). This is supportive of the characteristics that define women's travel behaviour as outlined in the academic literature, specifically trip chaining – a grid network allows public transit services to be linked in numerous ways to serve multiple destinations.

Policy Gap and Opportunity

By not referencing women's travel needs or behaviour within public transit service standards, public transit agencies are limited in their ability to monitor and assess whether their services are meeting the transit needs of women. A detailed and consistent set of criteria to determine how public transit services meet or do not meet women's travel needs will enable service improvements and provide transparency for the implementation of service and operational changes.

Public Transit Fare Policy

Work to implement more equitable public transit fare policies have been initiated in cities across Canada. However, as women's public transit needs have not been explicitly outlined as part of these efforts, there are limitations in measuring the impact of these changes on women.

IN THIS POLICY review, public transit fare policies refer to materials that reference intentions, plans, or proposals to change or update public transit fares produced by public transit agencies or associated entities.

Public transit agencies and associated entities do not reference women's travel needs in materials pertaining to public transit fare policies. However, agencies have implemented or indicated the intention to transition towards more equitable fare policies. Many of the factors that contribute to more equitable fare policies are supportive of women's travel needs and are aligned with the academic literature on women's travel behaviour.

For example, fare and service integration across multiple public transit providers across the Greater Toronto and Hamilton Area (GTHA) (see Metrolinx (Metrolinx, 2020) would enable public transit users to make trips across multiple public transit operators without paying multiple fares (Metrolinx, 2018). This may assist those engaging in "trip chaining" – when trips involve travel to multiple locations served by different public transit providers – an identified characteristic of women's travel behaviour. An additional example of actions to implement a more equitable fare policy are distance-based fare structures (see Metrolinx (Metrolinx, 2020), Calgary Transit (Calgary Transit, 2017)). Distance-based fare structures result in a fare policy that does not discourage short trips (Calgary Transit, 2017). As short trips are identified as a characteristic of women's travel behaviour in the academic literature, this policy is aligned with women's travel needs.

Furthermore, segmenting public transit fares into different prices is a frequently used component of fare policies. Common factors considered in public transit fare segmentations are age (such as child or senior fares), disability, and income. As women more often play a larger role in caregiving and chauffeuring responsibilities, the introduction or expansion of child and senior fares, including the removal of fares for children aged 12 and under by the Toronto Transit Commission (Toronto Transit Commission, 2021a) and public transit services in British Columbia, such as TransLink services (CBC News, 2021), is aligned with women's travel needs as they allow for lower cost travel when conducting these trips. Additionally, the Société de transport de l'Outaouais intends to specifically consider vulnerable single-parent households in the development of their fare policy (Société de transport de l'Outaouais, 2019), which are predominantly led by women (Statistics Canada, 2015a).

Policy Gap and Opportunity

While public transit agencies are not explicitly pursuing fare policies that specifically respond to women's travel needs, efforts suggest that public transit agencies and associated agencies are aware of the challenges that arise from existing fare policies and are taking steps to meet the needs of equity-seeking groups, including women. The collection and use of gender-disaggregated data would further guide the development of fare policies that consider the needs of women and provide a basis for monitoring outcomes.

Ridership and Trip Data

Opportunities exist for the use of existing gender data collected through household travel surveys (HTSs), as well as the automatic collection of gender-disaggregated ridership data. Detailed ridership and trip data would assist planners and policymakers in monitoring and implementing policies that meet the transportation needs of women.

IN THIS POLICY review, materials considered under ridership and trip data include HTSs and associated summary reports, as well as publicly available transit ridership reports and dashboards and information on smart fare ticketing systems.

HTSs typically collect and report information over 24 hours from a representative sample of households regarding personal travel via multiple modes of transportation (walking, driving, public transit, cycling). HTSs can be conducted solely by municipal and provincial bodies or can be the result of a combined effort of a municipality and a public transit agency. This information is a primary tool for decision-making regarding transportation networks and land use planning. A majority (5/9) of HTS summary reports included in this review addressed the gender divide between mode share, stating findings of a greater use of public transit (City of Edmonton, 2018b) or lower car share among women in comparison to men (TRANS Committee, 2013)(see full list of reports examined in Appendix 1). A minority of reports (2/9) discussed gender in relation to travel variables other than mode share. For instance, the Calgary My Travel Log 2015 Annual Report discussed women's travel purpose, while the 2019 Vancouver Panel Survey Summary results include findings from a "trip experience" portion of the HTS, in which gender was briefly mentioned, noting trips on public transit were equally uncomfortable for men and women. Reports from both Calgary and Vancouver discussed trip frequency and gender, outlining women's propensity to take a greater number of trips in comparison to men (City of Calgary, 2018; City of Vancouver, 2019). An overwhelming majority (368/395) of women-centred keywords were found through the methodology (sampling procedures) and demographic-related sections (detailed description of the method can be found in Appendix 2). Now, although these mentions are not travel-specific, they provide evidence that HTSs collect gender information and could conduct gender-based analysis and present gender disaggregated results.

While HTSs collect and provide some discussion on women's travel behaviour, materials that include public transit ridership and trip data do not report statistics by gender (see City of Calgary (City of Calgary, 2020), City of Edmonton (City of Edmonton, 2021), Toronto Transit Commission (Toronto Transit Commission, 2021b), City of Ottawa (City of Ottawa, 2021a)). Additionally, gender is not reported as part of Canada-wide ridership and operational statistics initiatives, such as the Canadian Urban Transit Association – Canadian Conventional Transit Statistics report (Canadian Urban Transit Association, 2020). However, recognition of the need for gender-disaggregated data has been highlighted as part of GBA+ initiatives (see City of Calgary (City of Calgary, 2019)). Additionally, an equity-based analysis, including a gender perspective, that made extensive use of an HTS has been commissioned by the Autorité régionale de transport métropolitain (ARTM) and the Ville de Montréal to further understand equity in urban transportation in the Montreal Metropolitan Region (Lachapelle et al., 2020). Although not directly targeting HTS, the Ministère des Transports du Québec (MTQ) has published a guide to raise awareness and provide guidance to MTQ employees and collaborators, including transit authorities, on the use of gender-based analysis practices in the transportation sector (Ministère des Transports du Québec, 2019).

Furthermore, while almost all public transit agencies considered in this policy review have adopted smart fare ticketing systems, only two agencies collect gender data when registering the smart card online and, in both cases, providing this information is optional (Société de transport de l'Outaouais (Multi card); Winnipeg Transit (peggo card)).

Policy Gap and Opportunity

The summary reports from HTSs currently provide limited gender-disaggregated results, which can contribute to women's distinct travel behaviours being overlooked. As a rich data source that is inclusive of gender information, HTSs can be analyzed and gender-disaggregated to generate more insight on women's travel behaviour and purpose across a variety of modes. Furthermore, widespread use of smart fare ticketing systems suggests that there are opportunities for automated gender-based ridership and trip data collection.

Customer Experience and Satisfaction

Customer experience and satisfaction surveys frequently highlight differences across demographic groups, including gender. An opportunity exists for public transit agencies and associated entities to make further use of this data to inform planning activities to meet the public transit needs of women.

MATERIALS PERTAINING TO surveys produced or requested for the use of a public transit agency or associated entities that consider customer experience and satisfaction of public transit have been considered as part of this policy review.

Surveys to evaluate customer experience and satisfaction among public transit riders frequently gather and report gender and other demographic characteristics. **Specific references to gender in customer experience and satisfaction surveys and reports has occurred in both ongoing and regular evaluation studies** (see City of Calgary (Calgary Transit, 2017), Edmonton Transit Service (Edmonton Transit Service, 2019), TransLink (TransLink, 2021)) and as a component of broader public engagement processes to support transportation planning activities (see City of Winnipeg (City of Winnipeg, 2019)).

Furthermore, personas have been used by public transit agencies and associated entities. Personas are often constructed with qualitative research methods, such as interviews, surveys, or focus groups, and provide a description of users and their goals to illustrate differences and experiences with a system or product (Siddall et al., 2011).

Public transit agencies have used personas to demonstrate the varying behaviour and preferences of people using the public transit system, as well as potential riders and gender has been included as a demographic characteristic of personas (see Metrolinx (Metrolinx, 2018), City of Edmonton (City of Edmonton, 2020a)).

Policy Gap and Opportunity
Many agencies collect insights that highlight differences in satisfaction and experience of using public transit between different demographic groups, including gender. By creating tangible response plans to customer experience and satisfaction insights, that include cross-department sharing of these insights, public transit agencies can ensure that this data is reflected in future public transit service planning and operations.

Safety and Security

Public transit agencies and associated entities recognize the increased safety and security concerns among women while using public transit. Practices that aim to further understand these concerns and make actionable changes demonstrate the opportunities available to public transit agencies and associated entities.

REFERENCES TO SAFETY and security specific to women are incorporated into a broad range of planning materials, as well as specific safety and security documents, and have been considered as part of this policy review.

Materials assessed through this policy review suggest that there is an awareness of increased safety and security concerns while using public transit among women and that women experience different perceptions of safety while using public transit (see Metro Vancouver (Metro Vancouver, 2021), City of Edmonton (City of Edmonton, 2017) and York Region Transit (York Region Transit, 2019)). The use of engagement techniques, including GBA+ (see City of Edmonton (City of Edmonton, 2020b) and City of Calgary (City of Calgary, 2019)) have been used to identify and examine safety concerns among women and contribute to initiatives to further understand how they affect women's travel experiences.

Furthermore, **practices have been initiated that directly reference safety and security concerns among women.** For instance, the Société de transport de Montréal has initiated the "Entre 2 arrêts" program, which allows female passengers travelling alone during evening and at night to request that a bus allow them to disembark between two regular stops (Société de transport de Montréal, 2021a). The Société de transport de l'Outaouais has a similar program, "Arrêt de courtoisie", which allows individuals to be dropped off between two stops for safety reasons (Société de transport de l'Outaouais, 2021). Additionally, concerns around the safety and security of women are frequently cited among policies to improve the overall safety and security for public transit riders (see City of Edmonton (City of Edmonton, 2020c), Hurontario-Main LRT Project (Hurontario-Main LRT Project, 2014)).

Policy Gap and Opportunity
While the increased safety and security concerns among women while using public transit are broadly recognized, opportunities exist to further engage riders in understanding how safety and security concerns affect travel experience.

Workplace Gender Equity

There is a recognition of gender disparities in public transit workforces and steps are being taken to overcome this gap. Further integration of workforce gender equity initiatives with broader policy goals would contribute to operational and planning changes that meet the public transit needs of women.

REFERENCES TO WORKPLACE gender equity have been included as part of equity, diversity, and inclusion strategies, as well broader planning materials and strategies.

Public transit agencies, as well as public sector entities more broadly, have recognized that their workforces have higher proportion of male-identified staff compared to female-identified staff (see City of Edmonton (City Edmonton, 2020), City of Calgary (City of Calgary, 2019), Toronto Transit Commission (Toronto Transit Commission, 2018)). Furthermore, researchers from the University of Windsor, with support from the Canadian Urban Transit Research and Innovation Consortium (CUTRIC) and Mitacs, have initiated a study to examine gender parity in the public transit industry (University of Windsor & CUTRIC, 2021).

Improving gender parity in the public transit workforce has been cited as a factor in improving service delivery due to the additional perspectives of women being brought into the delivery of public transit services (see City of Edmonton (City Edmonton, 2020)) and some public transit agencies have set targets or initiated programs or strategies to increase the proportion of female staff (City Edmonton, 2020; Réseau de transport de la Capitale, 2021; Société de transport de Montréal, 2020).

Policy Gap and Opportunity
While public transit agencies and public sector bodies have recognized gender disparities among their workforces, integration with broader policy aimed at meeting the travel needs of women would provide a basis for translating workforce changes into operational planning changes.

Business Cases for Major Projects

While broad social improvements and design solutions that incorporate safety features are commonly cited in business cases, women's travel needs are rarely explicitly included in these materials. However, recently implemented requirements for gender-based analysis as part of federal infrastructure funding highlight the potential for women's needs to be incorporated into future projects.

THIS POLICY REVIEW considered both the business cases for major projects, as well as the materials that guide business case development, where available.

Business cases and guiding materials for business cases recognize broad social improvements as part of projects (see Metrolinx (Metrolinx, 2017), City of Calgary (City of Calgary, 2016) and City of Ottawa (City of Ottawa, 2016)). Additionally, design solutions that incorporate safety and security features have been incorporated into business cases. This has occurred with explicit reference to increased safety and security concerns among women (see Metrolinx (Hurontario LRT) (Metrolinx, 2016)), as well as part of broader safety components (see TransLink (TransLink & Mayors' Council on Regional Transportation, 2017)). However, **overall, there appears to be limited explicit reference to women's travel needs in the business cases and guiding materials for business cases for major projects.**

While explicit references to the consideration of gender as part of business cases for major projects are presently limited, a major federal infrastructure program is incorporating gender-based analysis as an application requirement. The "Investing in Canada Infrastructure Program" provides $33 billion in federal infrastructure funds to support projects, including public transit projects (Infrastructure Canada, 2018). As part of the application process, applicants are required to submit a gender-based analysis to support the federal government's analysis: for applications requesting a federal contribution of between $50 million and $250 million, a streamlined analysis is required; for a project requesting a federal contribution over $250 million, a full analysis is required (Government of Ontario, 2019).

Policy Gap and Opportunity
The currently limited number of references to women in the business cases and guiding materials for business cases for major projects suggests that women's travel needs and behaviours are not being explicitly considered. The introduction of gender-based analysis as a requirement for business cases would ensure that women's needs are considered.

Planning Processes for Major Projects and Plans

Consultation processes with representative samples of the population are frequently used as part of planning processes. Additional data collection and the use of gender-based analysis tools could further enhance these processes to ensure women's needs are represented in planning processes.

SUMMARY REPORTS OF consultation sessions and major planning documents were considered to assess planning processes.

Long-range, strategic, and business planning materials provide high-level policy guidance to public transit agencies, or in some cases, public transit agencies and other public services (see York Region (York Region, 2019) and City of Brampton (City of Brampton, 2018)). Broadly, these materials highlight the need for services to meet the needs of diverse communities (see Metrolinx (Metrolinx, 2018), Peel Region (Region of Peel, 2019) and York Region (York Region, 2012).

Processes for major projects and plans often include engagement components that seek to receive input of many different groups, including women. For instance, as part of the "10 Year Vision Investment Plan", TransLink conducted public engagement initiatives with a weighted sample of the population to account for the demographic characteristics of the region, including gender (TransLink, 2018b). Similarly, the Autorité régionale de transport métropolitain (ARTM) included an equal representation of men and women as part of a comprehensive consultation process to support the development of the Plan stratégique de développement du transport collectif (PSD) (Strategic Development Plan) (Autorité régionale de transport métropolitain, 2019). Additionally, the City of Toronto highlighted the need for diverse groups to be included in the engagement processes for the "Feeling Congested?" initiative (City of Toronto, 2013).

Opportunities expanding on existing planning processes exist. For instance, the City of Edmonton has highlighted the use of GBA+ tools in the development of new mobility projects as a way of better capturing the needs of residents through an intersectionality lens (City of Edmonton, 2018c). Additionally, the ARTM has introduced a policy to integrate GBA+ practices into planning processes (Autorité régionale de transport métropolitain, 2021).

Policy Gap and Opportunity
Dedicated gender-based analysis and data underpinning engagement and research processes to understand and incorporate women's perspectives into major projects and plans would provide a basis for these projects to meet the specific travel needs of women.

Knowledge Mobilization Activities

Understanding and Responding to the Transit Needs of Women Industry Webinar
Tuesday, October 12

The Understanding and Responding to the Transit Needs of Women Webinar, presented by Leading Mobility, the University of Alberta, and Polytechnique Montréal, was the primary knowledge mobilization activity for this study, showcasing the unique perspectives of women in transit planning and operations. This webinar brought together over 150 attendees from across Canada with representation from transit agencies, consultants, academics, students and the nonprofit sector.

Hosted in English by David Cooper, Principal Consultant at Leading Mobility, and in French by Dr. Geneviève Boisjoly, Assistant Professor at Polytechnique Montréal, the webinar gathered the project team working on the report and a group of four female transit leaders. These women represented leading public transit organizations from across Canada and the US for a robust discussion on gender equity in transit planning. Dr. Emily Grise, Assistant Professor from the University of Alberta School of Urban and Regional Planning, Priyanka Babar, Graduate Research Assistant and Joseph Peace, Assistant Transportation Planner, Leading Mobility were on hand to provide a summary of the literature and policy review conducted by the study team. The moderated Q&A panel featured the following female transit leaders:

Christine Gauvreau
Director of Planning and Development,
Société de Transport de Laval

Elba Higueros
Chief Policy Officer,
Los Angeles Metro

Carrie Hotton-MacDonald
Branch Manager,
Edmonton Transit Service

Shelagh Pizey-Allen
Executive Director,
TTCriders advocacy group

Key Discussion Themes

Leveraging Data Collection to Understand Women's Unique Transit Needs

A gender-neutral approach to transit planning is misguided and does not reflect the diversity in trip planning differences between customer groups. Higueros from Los Angeles Metro emphasized that understanding differences in travel needs and behaviour among the diversity of transit riders is key to planning equitable service.

Without collecting gender data it is impossible for transit agencies to understand the unique ways women use their respective transit systems. Agencies should ensure customer satisfaction surveys are collecting gender data, as well as investigate opportunities to use smart card and other "big data" sources to understand women's revealed travel patterns. However, data cannot tell the whole story on its own, and it is equally important for agencies to be in regular conversation with customers to better understand the (unmet) needs and concerns among diverse customers. Planners should look to engage with community groups and leverage online platforms for maximum reach. Transit leaders should ensure they are working to address customer feedback in a timely manner or stakeholders will give up on consultations. Gender-based metrics should be a part of service performance standards and reporting.

Uplifting Women in the Transit Industry and Leadership

Panelists discussed the importance of hiring and uplifting women at all levels across transit agencies. **When women have a seat at the table from front-line operations through to leadership, their perspectives are more likely to be included in decision-making.** Transit professionals in training should be learning about the needs of diverse groups including women, and how intersectionality impacts their work. Transit leaders should study gender-based analysis to ensure they are incorporating it into their business decisions. When leaders are champions of gender equity, it builds trust with customers and staff.

Adding the Gender Lens to Operations, Policies, and Planning

Transit service standards and policies should be public for full transparency and specifically identify how they serve the needs of women. For example, **crowding standards should be considerate of space for strollers or wheelchairs on board vehicles. Women are more likely to trip chain and make frequent, localized, off-peak trips, so changes such as increased all-day service frequencies benefit women.** Gauvreau from Société de transport de Laval revealed that requests for higher off-peak frequencies is the most frequent customer feedback they receive. Service planning that focuses only on commutes to work in employment centres are a disservice to the diversity of trips made by women. In Laval, they now focus the majority of their service on all-day local trips within the suburb, rather than peak hour commutes to Montréal. Pizey-Allen of TTCriders emphasized that transit agencies should not forget that service standards are political documents, and if standards are not being met, customers will lose trust in agencies to implement positive changes.

A gender-based lens should be used when implementing new transit technologies and service plans. For example, when Edmonton Transit Service was rolling out their on-demand bus service pilot, Hotton-MacDonald focused on how women would access the new vehicles with strollers, groceries, and children which can take up more space onboard the transit vehicle.

The Journey to Equity and Building Trust with Customers

All agencies contacted for the study identified that serving the unique needs of women was important to them, but different agencies are at different points on this journey. Some have public policy documents stating their gender equity standards and priorities, and others have just started exploring how gender impacts their services. The biggest difference between regions is whether gender equity is a priority for agency leadership. Hotton-MacDonald suggested that leaders can focus on "quick wins" to rapidly address feedback from customers and front-line employees. Edmonton Transit Service implemented a text messaging line to contact transit security based on requests from women's groups, allowing women to discreetly report unsafe situations rather than needing to make a phone call.

Improvements to agency planning processes that benefit women often benefit all users. For example, sexual harassment is more likely to occur on crowded vehicles, so reducing crowding can improve the customer experience while also reducing these incidents.

Next Steps

The project team will be presenting the study's findings at various transportation and transit conferences including the SSHRC Mobility and KSG Forum and the Transportation Research Board Conference in early 2022. The study team is looking to commence discussions with several transit agencies that have expressed interest in establishing a working group to scope further research studies in the realm of gender and transit planning in Canada in Q1 of 2022.

Conclusion and Recommendations

This study examined the differentiated needs and experiences of women's travel, and the current practice of considering women's distinct travel needs in public transit planning in Canada. This was done through an academic and grey literature review, a review of policy materials from 18 public transit agencies, and a webinar discussion with industry leaders.

Key Findings

Trip-chaining, off-peak travel, and short-distance trips are all common features of women's travel behaviour that are not well served by public transit in its current state. Women's travel, as compared to men's travel, is characterized by more frequent short-distance trips with the purpose of serving others; this behaviour does not coincide with traditional public transit service planning. The gender-based social roles that determine women's standing within families, workplaces and broader society inherently impact their mobility. Therefore, women's travel behaviours cannot be examined appropriately without the understanding and recognition of external pressures that influence travel purpose, mode, route, and time. Women's commonly greater time dedication to domestic work facilitates the need to consider trip chaining to efficiently complete activities.

Similarly, domestic work and caregiving-related tasks impact when women can travel as the nature of the tasks along with barriers, such as crowding on public transit, push women to travel off-peak. These behaviours are then linked to women's employment type. For women in part-time service-based work,

their travel patterns (timings and routes) are less likely to fall within traditional 9-5 business hours nor within a singular location such as a central business district. The spatial distribution of employment tied with the familial responsibilities women take the greater burden of, restrict mobility resulting in shorter distance trips. Phenomenons such as the Pink tax and gender wage gap paired with greater caregiving responsibility result in women being more likely (as compared to men) to trip chain, take mid-day or off-peak trips, and shorter distance trips.

Academic research regarding the transportation needs and behaviours of women, in particular related to public transit, remains a ripe area of research for exploration. Much of the work explored in this report are not recent findings or highly verified results, therefore a greater number of novel studies seeking to understand women's travel motivators and barriers would generate more recent findings and substantiate existing findings across various contexts. With the acknowledgement of these behaviours observed in the literature, public transit agencies and transportation planning as a whole would gain from taking a gender-based lens to research regarding how the adaptation of public transit operations can better serve women's travel needs.

This policy review has revealed several trends in how the planning activities of public transit agencies in Canada consider the travel needs of women. First, while many public transit agencies are implementing service improvements that are aligned with the public transit needs of women, the policy surrounding these improvements is not explicitly presented as responses to women's needs. Second, a review of the publicly available service standards suggests that many public transit agencies considered in this review do not have publicly available service standards or standards that explicitly reference women, which limits policymakers and planners in their accountability to maintain or improve services that meet the transportation needs of women. Third, opportunities exist in the collection and use of gender data to understand the travel behaviour of women and to monitor the impacts of service changes. For instance, Household Travel Surveys, a primary tool for decision-making and a rich data source that is inclusive of gender information, have the potential to be further analyzed and gender-disaggregated to generate more insight on women's travel behaviour and purpose across a variety of modes. Finally, while the processes that guide major projects and planning highlight broad social impacts and the need for consultation practices that are representative of the population, the analysis reveals that there is growing recognition of the potential and the use of gender-based analysis practices, specifically GBA+, to understand and respond to the specific travel needs of women.

Recommendations

Based on our findings from the Literature Review, Policy Review and Webinar we have developed the following recommendations to be explored as opportunities to better meet the public transit needs of women.

Foster research partnerships between academics and practitioners to co-create knowledge and understanding of women's travel behaviour

The sharing of gender-inclusive data and findings between academics and public transit agencies or other transport authorities can enable the collaborative effort of understanding women's travel behaviours and needs. **The intersection between gender/equity experts, transit planning professionals, and transport researchers, combined with access to gender data, can help generate novel findings regarding women's travel patterns, needs and experiences.**

Areas for future research include examining women's travel behaviour and needs within the Canadian context, as well as studies that focus on women of colour and women with disabilities would work to identify their specific needs and travel behaviour. Finally, additional research that uses large datasets, as well as studies that examine opportunities to collect and use gender data in transportation planning, would provide further insights into women's travel behaviour and would inform practice. In addition, such partnerships can present as effective opportunities for the training of highly qualified personnel who can bring experience and knowledge of considering gender-equity in transportation research to their future careers.

Explore novel avenues for gender-based data collection, including real-time and passive data

Gender disaggregated data is crucial for informed planning and decision-making that supports women's travel needs. **Almost all of the public transit agencies considered in this study use a smart fare collection system, therefore opportunities may exist to use these systems to collect real-time ridership and travel behaviour data by gender.** This would provide detailed and extensive data allowing to uncover gender-specific travel patterns. Smartphone or GPS applications may also be another space to explore gender-specific data collection. Additionally, in times of project development, for example when upgrading or creating a smartcard system, looking for ways to integrate the collection of gender-based data while balancing the needs for privacy, could work to provide novel and greater amounts of gender specific data.

Leverage customer satisfaction surveys to collect gender-specific data on service attributes

Transit agencies regularly undertake customer satisfaction surveys, and **there is an opportunity to incorporate more gender-specific questions that pertain to service attributes such as frequency of service, span of service or overall trip time.** Efforts to share this data and feedback among different departments within an agency would allow for a better understanding of the service needs for women and contribute to more informed planning.

Implement gender-informed metrics to service standards

By defining performance indicators directly from the travel behaviour of women, public transit agencies can better meet the needs of women. An example of equity-based service standards can be seen with the Toronto Transit Commission (Toronto Transit Commission, 2021) and Durham Region Transit (Durham Region Transit, 2021), where a ridership multiplier is used to give higher weighting to services that directly impact certain equity seeking communities. A similar approach could be looked at for services that are known (through ridership data) to have a higher proportion of women riders.

Integrate gender equity evaluations into business cases and planning processes

The inclusion of gender equity evaluations would provide insight into the ways that projects impact women, as well as increase transparency in how the merits of a project are evaluated. An example of this in practice is the new gender-based analysis requirement for business case submissions in the "Investing in Canada Infrastructure" program.

Achieve gender parity in the public transit workforce

Increasing the number of women employed across all levels of the public transit sector can directly contribute to a greater consideration of women's distinct needs: when women have a seat at the table from front-line operations through to leadership, their perspectives are more likely to be included in decision-making.

Policy Implications

Women's greater use of public transit in comparison to men does not negate the fact that overall women have a higher propensity to use private vehicles. Modifying public transit service routes, timings, vehicle design, and fare structures can attract a new set of users while improving function for existing public transit riders. The barriers of infrequent public transit service that limit women's ability to trip-chain and therefore willingness to use public transit can be modified with the implementation of women-specific initiatives that are borne from gender-based data collection.

The collection of gender inclusive data would allow agency-specific travel behaviour analysis on their served population. More quantitative gender information collected in tandem with qualitative research (surveys, focus groups, interviews) will not only expose common patterns of women's travel barriers to trips that result in the non-use of public transit, but also implementation of these gender-specific service adaptations will build towards a more equitable system for women. In a similar regard, **with current compressed ridership during the weekday peak periods (as a result of the COVID-19 pandemic) a redistribution of service to better cover weekends and off-peak hours will work to serve the needs of women (part-time employees, caregivers) and may lead to increased ridership.** This service improvement may also spread out travel demand across the day and relieve the burden of demand during peak travel times, resulting in an enjoyable experience for all users.

The improvement of service standards for women is beneficial for all riders as a system that is tailored to a diversity of users can increase public transit ridership within municipalities and contribute to greater financial stability for transport agencies and help cities reach transportation carbon reduction targets. For public transit to provide equitable access to all members of a municipality, giving equal consideration to the needs of women and adapting traditionally male transportation planning practices is necessary. Similarly, improving service for women can work to improve service for other users, whose travel needs and preferences are diverse by a factor of their age, race, gender, income and or ability. Overall, integration of gender in data collection, equitable fare schemes and consistent service frequency throughout the day benefit not only women but all riders. Understanding women's travel needs and behaviours are fundamental to the equitable planning of public transit systems. Implementing this knowledge will better allow women to meet their needs and access opportunities on public transit.

Bibliography

AitBihiOuali, L., & Graham, D. J. (2021). The impact of the MeToo scandal on women's perceptions of security. *Transportation Research Part A: Policy and Practice*, *147*, 269–283. https://doi.org/10.1016/j.tra.2021.02.018

Autorité régionale de transport métropolitain. (2019). *Le rapport du Groupe consultatif de citoyens de l'ARTM sur la mobilité*. https://www.artm.quebec/wp-content/uploads/2019/10/ARMT_RapportFinal_AUG26.1.pdf

Autorité régionale de transport métropolitain. (2021). *Plan stratégique de développement du transport collectif (2021-2035)*. 210.

Bianco, M., & Lawson, C. (1996). Trip chaining, childcare and personal safety: Critical issues in women's travel behavior. In *Womens Emerging Travel Patterns*.

Black, J. (1976, December). *Working women who live on outer suburbs of Sydney: Transport problems and prospects*. Ergonomics Society of Australia and New Zealand Conference, 13th, 1976, Canberra. https://trid.trb.org/view/1208916

Blomstrom, E., Gauthier, A., & Jang, C. (2018, May). *Access For All: Access and Gender*. Institute for Transportation and Development Policy. https://www.itdp.org/publication/access-for-all-gender/

Blumenberg, E. A. (2003). *En-gendering Effective Planning: Spatial Mismatch, Low-Income Women, and Transportation Policy*. https://escholarship.org/uc/item/7kc7v38f

Boisjoly, G., Grisé, E., Maguire, M., Veillette, M.-P., Deboosere, R., Berrebi, E., & El-Geneidy, A. (2018). Invest in the ride: A 14 year longitudinal analysis of the determinants of public transport ridership in 25 North American cities. *Transportation Research Part A: Policy and Practice*, *116*, 434–445. https://doi.org/10.1016/j.tra.2018.07.005

Calgary Transit. (2017). *2016 Calgary Transit Customer Satisfaction Survey*. https://www.calgarytransit.com/content/dam/transit/about-calgary-transit/reports/surveys/2016_calgary_transit_customer_and_non-user_satisfaction_survey_final_report.pdf

Canada Institute for Health Information. (2021). *Seniors in Transition: Exploring Pathways Across the Care Continuum | CIHI*. https://www.cihi.ca/en/seniors-in-transition-exploring-pathways-across-the-care-continuum

Canadian Urban Transit Association. (2020). *Canadian Conventional Transit Statistics: 2019 Operating Data*.

Carver, A., & Veitch, J. (2020). Perceptions and patronage of public transport – are women different from men? *Journal of Transport & Health*, *19*, 100955. https://doi.org/10.1016/j.jth.2020.100955

CBC News. (2016, July 26). *Canadians still getting taller, but not as fast as others| CBC News*. CBC. https://www.cbc.ca/news/health/height-growth-canada-1.3695398

CBC News. (2021, September 1). *Children 12 and under now ride for free on B.C. public transit*. CBC. https://www.cbc.ca/news/canada/british-columbia/free-transit-kids-12-and-under-bc-1.6161464

Chowdhury, S. (2019). Role of Gender in the Ridership of Public Transport Routes Involving Transfers. *Transportation Research Record*, *2673*(4), 855–863. https://doi.org/10.1177/0361198119837155

City Edmonton. (2020). *Report: CR_7026: Attachment 1—Response to Stakeholder Feedback—Background Checks for Operators/Drivers*.

City of Brampton. (2018). *Living the Mosaic: Brampton 2040 Vision*. https://www.brampton.ca/EN/City-Hall/Documents/Brampton2040Vision/brampton2040Vision.pdf

City of Calgary. (2016). *Green Line LRT: Business Case*.

City of Calgary. (2018). *My Travel Log 2015 Annual Report*. https://www.calgary.ca/content/www/en/home/transportation/tp/planning/forecasting/forecasting-surveys.html

City of Calgary. (2019). *Gender Equity, Diversity and Inclusion Strategy*. https://www.calgary.ca/content/dam/www/csps/cns/documents/gedi-strategy.pdf

City of Calgary. (2020). *Calgary Transit Ridership | Open Calgary*. https://data.calgary.ca/Transportation-Transit/Calgary-Transit-Ridership/iema-jbc4

City of Calgary. (2021). *2020 Calgary Transportation Plan*. https://www.calgary.ca/content/dam/www/transportation/tp/documents/ctp2020/2020-calgary-transportation-plan.pdf

City of Edmonton. (2017). *Edmonton's Transit Strategy*. https://www.edmonton.ca/city_government/documents/RoadsTraffic/Transit_Strategy_June-29-2017.pdf

City of Edmonton. (2018a). *Comprehensive Report—Fare Policy Research and Engagement*. https://www.edmonton.ca/sites/default/files/public-files/assets/transit/Comprehensive_Report_City_of_Edmonton_Fare_Policy_Research_and_Engagement.pdf?cb=1629388740

City of Edmonton. (2018b). *2015 Edmonton and Region Household Travel Survey Summary Report* (p. 49). https://www.edmonton.ca/sites/default/files/public-files/assets/RoadsTraffic/2015_HTS_SummaryReport.pdf?cb=1638495152

City of Edmonton. (2018c). *Smart Transportation Action Plan* (p. 34).

City of Edmonton. (2020a). *Transit Service Journey Map*.

City of Edmonton. (2020b). *Further Analysis of Alternative Transit Solutions*.

City of Edmonton. (2020c). *Council Report: Current Policies—Transportation Services Users—Increased Safety Measures—Transportation Services Users*.

City of Edmonton. (2021, June 8). *ETS Statistics* (Edmonton, Alberta, Canada). The City of Edmonton. https://www.edmonton.ca/ets/ets-statistics.aspx

City of Hamilton. (2021). *Information Report: (Re)envision the HSR Update and Guiding Principles (PW20005(a)) (City Wide)*. https://www.hamilton.ca/sites/default/files/media/browser/2021-02-23/reenvision-the-hsr-guiding-principles-report-gic.pdf

City of Ottawa. (2016). *Stage 2, Ottawa LRT - Business Case (Version 2.0)*. http://ottwatch.ca/meetings/file/438431

City of Ottawa. (2020). New Official Plan (Preliminary Draft: November 20, 2020). https://ehq-production-canada.s3.ca-central-1.amazonaws.com/eb377ee608a585c07ebf3533152863c681d7a6be/original/1607108990/Volume_1_-Draft_Official_Plan-_EN_%281%29.pdf_924e7bdad983507a86362aa2cf543714?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIAIBJCUKKD4ZO4WUUA%2F20210703%2Fca-central-1%2Fs3%2Faws4_request&X-Amz-Date=20210703T200511Z&X-Amz-Expires=300&X-Amz-SignedHeaders=host&X-Amz-Signature=bf724c74c09fd011f3e7f8a6a39f5fed243b9f4e0f897a8d3f8d561f1fbe974a

City of Ottawa. (2021a). *OC Transpo Performance Measurement and Reporting*. https://app05.ottawa.ca/sirepub/mtgviewer.aspx?meetid=8286&doctype=AGENDA

City of Ottawa. (2021b). *Transit Service Evaluation Criteria*. https://app05.ottawa.ca/sirepub/mtgviewer.aspx?meetid=8288&doctype=agenda&itemid=411908

City of Toronto. (n.d.). *TO Prosperity: Toronto Poverty Reduction Strategy*. https://www.toronto.ca/wp-content/uploads/2017/11/9787-TO_Prosperity_Final2015-reduced.pdf

City of Toronto. (2013). *Staff Report: Update on the "Feeling Congested?" Initiative – A Consultative Approach to Transportation Planning*.

City of Vancouver. (2019). *Annual transportation survey | City of Vancouver* (pp. 1–74). https://vancouver.ca/streets-transportation/annual-transportation-survey.aspx

City of Winnipeg. (2019). *Winnipeg Transit Master Plan Phase One: Public Engagement Report*. https://winnipegtransit.com/assets/2454/WTMP_-_Phase_1_Full_PE_Engagement_Report__FINAL.pdf

Crane, R. (2007). Is There a Quiet Revolution in Women's Travel? Revisiting the Gender Gap in Commuting. *Journal of the American Planning Association*, *73*(3), 298–316. https://doi.org/10.1080/01944360708977979

Dobbs, L. (2005). Wedded to the car: Women, employment and the importance of private transport. *Transport Policy*, *12*(3), 266–278. https://doi.org/10.1016/j.tranpol.2005.02.004

Drimonis, T. (2016, February 17). *Rethinking public transit to meet women's needs*. Ricochet. https://ricochet.media/en/956

Durham Region Transit. (2021). *Transit Executive Committee Agenda—October 06, 2021* (p. 113).

Edmonton Transit Service. (n.d.). *Edmonton Transit Service Annual Service Plan 2019/2020*.

Edmonton Transit Service. (2019). *Edmonton Transit Service Customer Satisfaction Tracking Survey—2019 Annual Report*.

Ericksen, J. (1977). *Analysis of the Journey to Work for Women* | Social Problems | Oxford Academic*. https://academic.oup.com/socpro/article-abstract/24/4/428/1632251

Ferrante, M. B. (2018, October 31). *Before Breaking The Glass Ceiling, Women Must Climb The Maternal Wall*. Forbes. https://www.forbes.com/sites/marybethferrante/2018/10/31/before-breaking-the-glass-ceiling-women-must-climb-the-maternal-wall/

Gardner, N., Cui, J., & Coiacetto, E. (2017). Harassment on public transport and its impacts on women's travel behaviour. *Australian Planner*, *54*(1), 8–15. https://doi.org/10.1080/07293682.2017.1299189

Giuliano, G. (2005). Low Income, Public Transit, and Mobility. *Transportation Research Record*, *1927*(1), 63–70. https://doi.org/10.1177/0361198105192700108

GO Transit. (2021). *Calculate Fare | Trip Planning | GO Transit*. https://www.gotransit.com/en/trip-planning/calculate-fare

Gogoi, P. (2020, October 28). *Stuck-At-Home Moms: The Pandemic's Devastating Toll On Women*. NPR.Org. https://www.npr.org/2020/10/28/928253674/stuck-at-home-moms-the-pandemics-devastating-toll-on-women

Golob, T. F., & McNally, M. G. (1997). A model of activity participation and travel interactions between household heads. *Transportation Research Part B: Methodological*, *31*(3), 177–194. https://doi.org/10.1016/S0191-2615(96)00027-6

Gordon, P., Kumar, A., & Richardson, H. W. (1989). Gender Differences in Metropolitan Travel Behaviour. *Regional Studies*, *23*(6), 499–510. https://doi.org/10.1080/00343408912331345672

Government of Ontario. (2019). *Investing in Canada Infrastructure Program Public Transit Stream—Program Guide*.

Grimsrud, M., & El-Geneidy, A. (2014). Transit to eternal youth: Lifecycle and generational trends in Greater Montreal public transport mode share. *Transportation*, *41*(1), 1–19. https://doi.org/10.1007/s11116-013-9454-9

Grisé, E., Boisjoly, G., Maguire, M., & El-Geneidy, A. (2019). Elevating access: Comparing accessibility to jobs by public transport for individuals with and without a physical disability. *Transportation Research Part A: Policy and Practice*, *125*, 280–293. https://doi.org/10.1016/j.tra.2018.02.017

Grisé, E., Stewart, A., & El-Geneidy, A. (2021). Planning a high-frequency transfer-based bus network: How do we get there? *Journal of Transport and Land Use*, *14*(1), 863–884. https://doi.org/10.5198/jtlu.2021.1742

Guiliano, G. (1979). PUBLIC TRANSPORTATION AND THE TRAVEL NEEDS OF WOMEN. *Traffic Quarterly*, *33*(4). https://trid.trb.org/view/147882

Hamilton, K., Jenkins, L., Hodgson, F., & Turner, J. (2005). *Promoting gender equality in transport* (Working Paper Series No. 34). Equal Opportunities Commission.

Hanson, S., & Pratt, G. (1988). Reconceptualizing the Links between Home and Work in Urban Geography. *Economic Geography*, *64*(4), 299–321. https://doi.org/10.2307/144230

Holzapfel, H. (1986). *TRIP RELATIONSHIPS IN URBAN AREAS*. https://trid.trb.org/view/280790

Howard, J. (2021). *Sexual Assault And Harassment in Canada | The Facts*. Canadian Women's Foundation. https://canadianwomen.org/the-facts/sexual-assault-harassment/

Hsu, H.-P. (2010). How does fear of sexual harassment on transit affect women's use of transit? *Volume 2: Technical Papers, Transportation Research Board of the National Academies, Washington, D.C.*, *2*, 85–94.

Hurontario-Main LRT Project. (2014). *System Design Guidelines*. http://www.metrolinx.com/en/projectsandprograms/projectpages/documents/Hurontario/System_Design_Guidelines.pdf

Infrastructure Canada. (2018, September 6). *Investing in Canada Infrastructure Program*. https://www.infrastructure.gc.ca/plan/icp-pic-INFC-eng.html

International Transport Forum. (2019). *Transport Connectivity. A Gender Perspective* [Internet]. OECD Publishing. https://www.itf-oecd.org/sites/default/files/docs/transport-connectivity-gender-perspective.pdf

Jin, H., & Yu, J. (2021). Gender Responsiveness in Public Transit: Evidence from the 2017 US National Household Travel Survey. *Journal of Urban Planning and Development*, *147*(3), 04021021. https://doi.org/10.1061/(ASCE)UP.1943-5444.0000699

Johnston-Anumonwo, I. (1992). The Influence of Household Type on Gender Differences in Work Trip Distance*. *The Professional Geographer*, *44*(2), 161–169. https://doi.org/10.1111/j.0033-0124.1992.00161.x

Johnston-Anumonwo, I. (2000). Commuting Constraints on Black Women: Evidence from Detroit, Michigan. *Great Lakes Geographer*, *7*.

Johnston-Anumonwo, I. (2001). Persistent Racial Differences in the Commutes of Kansas City Workers. *Journal of Black Studies*, *31*(5), 651–670. https://doi.org/10.1177/002193470103100508

Kaufman, S. M., Polack, C. F., & Campbell, G. A. (2018). *The Pink Tax on Transportation*. 9.

King, D. A., Smart, M. J., & Manville, M. (2019). The Poverty of the Carless: Toward Universal Auto Access. *Journal of Planning Education and Research*, 0739456X1882325. https://doi.org/10.1177/0739456X18823252

Kwan, M.-P. (1999). Gender and Individual Access to Urban Opportunities: A Study Using Space–Time Measures. *The Professional Geographer*, *51*(2), 210–227. https://doi.org/10.1111/0033-0124.00158

Lachapelle, U., Boisjoly, G., & Vermesch, P. (2020). *Réalisation d'un portrait des besoins et des habitudes de déplacements des personnes vivant en situation de précarité dans la région de Montréal*. https://archipel.uqam.ca/13354/1/Rapport_mandat_Ville_ARTM_30mars_final.pdf

Lang, J. (1992). Women and Transport. *Urban Policy and Research*, *10*(4), 14–25. https://doi.org/10.1080/08111149208551529

Law, R. (1999). Beyond 'women and transport': Towards new geographies of gender and daily mobility. *Progress in Human Geography*, *23*(4), 567–588. https://doi.org/10.1191/030913299666161864

Los Angeles Metro. (2019, August 30). *Understanding How Women Travel Report*. https://www.metro.net/projects/wggc/economic-developments/

Lubitow, A., Rainer, J., & Bassett, S. (2017). Exclusion and vulnerability on public transit: Experiences of transit dependent riders in Portland, Oregon. *Mobilities*, *12*(6), 924–937. https://doi.org/10.1080/17450101.2016.1253816

Lynch, G., & Atkins, S. (1988). The influence of personal security fears on women's travel patterns. *Transportation*, *15*(3), 257–277. https://doi.org/10.1007/BF00837584

Madden, J. F. (1981). Why Women Work Closer to Home. *Urban Studies*, *18*(2), 181–194. https://doi.org/10.1080/00420988120080341

Matthies, E., Kuhn, S., & Klockner, C. (2002). *Travel Mode Choice of Women: The Result of Limitation, Ecological Norm, or Weak Habit? - Ellen Matthies, Silke Kuhn, Christian A. Klöckner, 2002*. https://journals.sagepub.com/doi/abs/10.1177/001391650203400201?casa_token=f5qpTJSOnrEAAAAA:Igbgf6scK2O2L8eodDcJeWzxRyg9sGeUx5PFv88P2cRA0X3bCiMZEVZB6uWovT3S1CxjWItvq-yMKA

McGuckin, N., & Murakami, E. (1999). Examining Trip-Chaining Behavior: Comparison of Travel by Men and Women. *Transportation Research Record*, *1693*(1), 79–85. https://doi.org/10.3141/1693-12

Mensah, J. (1995). Journey to work and job search characteristics of the urban poor. *Transportation*, *22*(1), 1–19. https://doi.org/10.1007/BF01151616

Metro Vancouver. (2021). *Metro Vancouver Regional District Regional Planning Committee: Regular Meeting (March 5, 2021)*. http://www.metrovancouver.org/boards/RegionalPlanning/RPL_2021-Mar-5_AGE.pdf

Metrolinx. (2016). *Hurontario LRT Benefits Case Analysis*. http://www.metrolinx.com/images/greaterregion/projects/hurontario-lrt/Benefits_Case-Hurontario_Main.pdf

Metrolinx. (2017). *Business Case Manual Volume 1: Overview*. http://www.metrolinx.com/en/regionalplanning/projectevaluation/benefitscases/Metrolinx%20Business%20Case%20Overview%20Volume%201.pdf

Metrolinx. (2018). *2041 Regional Transportation Plan*. http://www.metrolinx.com/en/regionalplanning/rtp/Metrolinx%20-%202041%20Regional%20Transportation%20Plan%20%E2%80%93%20Final.pdf

Metrolinx. (2020). *2020-21 Metrolinx Business Plan*. http://www.metrolinx.com/en/aboutus/publications/2020-21-Business-Plan-Final-English-Version.pdf

Ministère des Transports du Québec. (2019). *Guide d'analyse du genre adapté au domaine des transports*. http://collections.banq.qc.ca/ark:/52327/4012416

National Academies of Sciences. (2019). *Comprehensive Bus Network Redesigns* (p. 25487). Transportation Research Board. https://doi.org/10.17226/25487

Noack, E. (2011). Are Rural Women Mobility Deprived? – A Case Study from Scotland. *Sociologia Ruralis*, *51*(1), 79–97. https://doi.org/10.1111/j.1467-9523.2010.00527.x

Nobis, C., & Lenz, B. (2005). *Gender differences in travel patterns.* Transportation Research Board.

Nordbakke, S. (2013). Capabilities for mobility among urban older women: Barriers, strategies and options. *Journal of Transport Geography*, *26*, 166–174. https://doi.org/10.1016/j.jtrangeo.2012.10.003

Patterson, Z., Ewing, G., & Haider, M. (2005). Gender-Based Analysis of Work Trip Mode Choice of Commuters in Suburban Montreal, Canada, with Stated Preference Data. *Transportation Research Record*, *1924*(1), 85–93. https://doi.org/10.1177/036119810519240011 1

Perk, V. A., & Hinebaugh, D. P. (1998). Current Practices in the Use of Service Evaluation Standards at Public Transit Agencies. *Transportation Research Record*, *1618*(1), 200–205. https://doi.org/10.3141/1618-24

Polk, M. (2003). Are women potentially more accommodating than men to a sustainable transportation system in Sweden? *Transportation Research Part D: Transport and Environment*, *8*(2), 75–95. https://doi.org/10.1016/S1361-9209(02)00034-2

Primerano, F., Taylor, M. A. P., Pitaksringkarn, L., & Tisato, P. (2008). Defining and understanding trip chaining behaviour. *Transportation*, *35*(1), 55–72. https://doi.org/10.1007/s11116-007-9134-8

Public Health Agency of Canada. (2020, December 16). *Aging and chronic diseases: A profile of Canadian seniors* [Education and awareness]. https://www.canada.ca/en/public-health/services/publications/diseases-conditions/aging-chronic-diseases-profile-canadian-seniors-executive-summary.html

Region of Peel. (2018). *Sustainable Transportation Strategy*. https://walkandrollpeel.ca/projects/sts/pdf/peel-STS-main.pdf

Region of Peel. (2019). *Let's Move Peel: Long Range Transportation Plan 2019*. https://www.peelregion.ca/pw/transportation/pdfs/TPL-0092-CS6-Long%20Range%20Transportation%20Plan-Final%20Report.pdf

Réseau de transport de la Capitale. (2021). *Rapport d'activité 2020*. https://cdn.rtcquebec.ca/sites/default/files/2021-05/RTC_Rapport_Activite_2020_FINAL.pdf

Réseau de transport de Longueuil. (2015). *Guide du client*. https://m.rtl-longueuil.qc.ca/CMS/MediaFree/file/Accessibilit%C3%A9%20universelle/GuideClient_int_2015_final.pdf

Rogalsky, J. (2010). The working poor and what GIS reveals about the possibilities of public transit. *Journal of Transport Geography*, *18*(2), 226–237. https://doi.org/10.1016/j.jtrangeo.2009.06.008

Root, Am., Schintler, L., & Button, Ke. (2000). Women, travel and the idea of "sustainable transport." *Transport Reviews*, *20*(3), 369–383. https://doi.org/10.1080/014416400412850

Rosenbloom, S. (1998, July 30). *Trends in Women's Travel Patterns*. Women's Travel Issues Second National Conference Drachman Institute of the University of Arizona; Morgan State University; Federal Highway Administration. https://trid.trb.org/view/720092

Rosenbloom, S. (2011). *Trends in Women's Travel Patterns: (736202011-004)* [Data set]. American Psychological Association. https://doi.org/10.1037/e736202011-004

Scheiner, J., & Holz-Rau, C. (2012). Gendered travel mode choice: A focus on car deficient households. *Journal of Transport Geography*, *24*, 250–261. https://doi.org/10.1016/j.jtrangeo.2012.02.011

Scheiner, J., & Holz-Rau, C. (2017). Women's complex daily lives: A gendered look at trip chaining and activity pattern entropy in Germany. *Transportation*, *44*(1), 117–138. https://doi.org/10.1007/s11116-015-9627-9

Schmitt, A. (2019a, May 17). More Transit Agencies Allow Open Strollers on Buses. *Streetsblog USA*. https://usa.streetsblog.org/2019/05/17/why-more-transit-agencies-are-allowing-open-strollers-on-the-bus/

Schmitt, A. (2019b, August 29). How Our Transport System is Biased Against Women. *Streetsblog USA*. https://usa.streetsblog.org/2019/08/29/all-the-ways-u-s-transport-system-is-biased-against-women/

Siddall, E., Baibarac, C., Byrne, A., Byrne, N., Deasy, A., Flood, N., Goulding, C., O'Driscoll, S., Rabbitt, N., Sweeney, A., Wang, Y., & Dyer, M. (2011). Personas as a user-centred design tool for the built environment. *Proceedings of the Institution of Civil Engineers - Engineering Sustainability*, *164*(1), 59–69. https://doi.org/10.1680/ensu.1000015

Simmons, J. W., Bourne, L. S., Kamikihara, S., & University of Toronto Cities Centre. (2009). *Changing economy of urban neighbourhoods: An exploration of place of work data for the Greater Toronto Region*. http://epe.lac-bac.gc.ca/100/200/300/univ_toronto/cities_centre/research_paper/no1_to_no224/www.citiescentre.utoronto.ca/publications/Research_Papers.htm

Singell, L. D., & Lillydahl, J. H. (1986). An Empirical Analysis of the Commute to Work Patterns of Males and Females in Two-Earner Households. *Urban Studies*, *23*(2), 119–129. https://doi.org/10.1080/00420988620080111

Société de transport de l'Outaouais. (2019, February 28). *Bilan ÉCHO*.

Société de transport de l'Outaouais. (2021). *Sécurité*. http://www.sto.ca/index.php?id=212&L=fr

Société de transport de Montréal. (2020). *Plan d'accès à l'égalité en emploi 2020*. https://www.stm.info/sites/default/files/pdf/fr/rpaee2018.pdf

Société de transport de Montréal. (2021a). *Se déplacer seule le soir*. Société de transport de Montréal. https://www.stm.info/fr/infos/conseils/se-deplacer-seule-le-soir

Société de transport de Montréal. (2021b, April 1). *La STM remporte le Prix Droits et Libertés décerné par la Commission des droits de la personne et des droits de la jeunesse*. Société de transport de Montréal. https://www.stm.info/fr/presse/communiques/2021/la-stm-remporte-le-prix-droits-et-libertes-decerne-par-la-commission-des-droits-de-la-personne-et-des-droits-de-la-jeunesse

Spurr, B. (2020, June 2). *How Toronto can make transit better now and forever after COVID-19*. Thestar.Com. https://www.thestar.com/news/gta/2020/06/02/how-toronto-can-make-transit-better-now-and-forever-after-covid-19.html

Statistics Canada. (2009). *Canadian Community Health Survey – Healthy Aging*. https://www150.statcan.gc.ca/n1/pub/11-008-x/2012001/c-g/11619/c-g01-eng.htm

Statistics Canada. (2010). *Profile of seniors' transportation habits*. https://www150.statcan.gc.ca/n1/pub/11-008-x/2012001/article/11619-eng.htm

Statistics Canada. (2012). *Commuting to work*. https://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-012-x/99-012-x2011003_1-eng.cfm

Statistics Canada. (2015a, June 24). *Lone-parent families*. https://www150.statcan.gc.ca/n1/pub/75-006-x/2015001/article/14202/parent-eng.htm

Statistics Canada. (2015b, November 27). *Chart 1 The difference between men and women with a driver's licence is greatest among those 85 and over*. https://www150.statcan.gc.ca/n1/pub/11-008-x/2012001/c-g/11619/c-g01-eng.htm

Statistics Canada. (2015c, December 17). *The surge of women in the workforce*. https://www150.statcan.gc.ca/n1/pub/11-630-x/11-630-x2015009-eng.htm

Statistics Canada. (2017a, February 8). *Census Profile, 2016 Census—Canada [Country] and Canada [Country]*. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=PR&Code1=01&Geo2=PR&Code2=01&SearchText=01&SearchType=Begins&SearchPR=01&B1=Journey%20to%20work&TABID=3&type=1

Statistics Canada. (2017b, February 8). *Census Profile, 2016 Census—Montréal [Census metropolitan area], Quebec and Quebec [Province]*. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CMACA&Code1=462&Geo2=PR&Code2=24&SearchText=Montreal&SearchType=Begins&SearchPR=01&B1=Journey%20to%20work&TABID=1&type=1

Statistics Canada. (2017c, February 8). *Census Profile, 2016 Census—Toronto, City [Census subdivision], Ontario and Ontario [Province]*. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=3520005&Geo2=PR&Code2=35&SearchText=Toronto&SearchType=Begins&SearchPR=01&B1=Journey%20to%20work&TABID=1&type=0

Statistics Canada. (2017d, February 8). *Census Profile, 2016 Census—Vancouver, City [Census subdivision], British Columbia and British Columbia [Province]*. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5915022&Geo2=PR&Code2=59&SearchText=Vancouver&SearchType=Begins&SearchPR=01&B1=Journey%20to%20work&TABID=1&type=1

Statistics Canada. (2017e, March 8). *Women and Paid Work*. https://www150.statcan.gc.ca/n1/pub/89-503-x/2015001/article/14694-eng.htm

Statistics Canada. (2017f, November 29). *The Daily — Journey to work: Key results from the 2016 Census*. https://www150.statcan.gc.ca/n1/daily-quotidien/171129/dq171129c-eng.htm

Statistics Canada. (2018a, May 16). *The Economic Well-being of Women in Canada*. https://www150.statcan.gc.ca/n1/pub/89-503-x/2015001/article/54930-eng.htm

Statistics Canada. (2018b, July 30). *Time Use: Total work burden, unpaid work, and leisure*. https://www150.statcan.gc.ca/n1/pub/89-503-x/2015001/article/54931-eng.htm

Statistics Canada. (2018c, November 28). *A demographic, employment and income profile of Canadians with disabilities aged 15 years and over, 2017*. https://www150.statcan.gc.ca/n1/pub/89-654-x/89-654-x2018002-eng.htm

Statistics Canada. (2019a, January 4). *Unemployment rate, participation rate, and employment rate by sex, annual, inactive*. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410001802

Statistics Canada. (2019b, April 16). *Maximum insights on minimum wage workers: 20 years of data*. https://www150.statcan.gc.ca/n1/pub/75-004-m/75-004-m2019003-eng.htm

Statistics Canada. (2019c, October 7). *The Gender Wage Gap in 2018*. https://www150.statcan.gc.ca/n1/pub/11-627-m/11-627-m2019065-eng.htm

Statistics Canada. (2019d, December 5). *Gender-based violence and unwanted sexual behaviour in Canada, 2018: Initial findings from the Survey of Safety in Public and Private Spaces*. https://www150.statcan.gc.ca/n1/pub/85-002-x/2019001/article/00017-eng.htm

Statistics Canada. (2020, January 8). *Care counts: Caregivers in Canada, 2018*. https://www150.statcan.gc.ca/n1/en/catalogue/11-627-M2020001

Statistics Canada. (2021, June 4). *Labour force characteristics by province, monthly, seasonally adjusted*. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410028703

Steiner, R. (2011). *Women's Travel for Shopping in Traditional Neighborhoods: How Does a Woman's Role in the Household Affect Activity and Travel for Shopping?: (736202011-018)* [Data set]. American Psychological Association. https://doi.org/10.1037/e736202011-018

The Globe and Mail. (2017). *Thousands of Canadian transit passengers target of sexual violence between 2013 and 2017, Globe analysis finds*. https://www.theglobeandmail.com/canada/article-data-gap-transit-sexual-assault-investigation/

Toronto Transit Commision. (2015, December 15). *Making the TTC a Diverse and Inclusive Organization. 5 Year Diversity and Human Rights Plan*. https://www.ttc.cahttps://www.ttc.ca//en/about-the-ttc/Making-the-TTC-a-Diverse-and-Inclusive-Organization

Toronto Transit Commision. (2017). *Staff Report: Introducing a Two-Hour Transfer Policy*.

Toronto Transit Commission. (2017). *Service Standards and Decision Rules for Planning Transit Service*. https://www.ttc.ca/PDF/Transit_Planning/TTC_Service_Standards.pdf

Toronto Transit Commission. (2018). *Report for Action: TTC Corporate Plan 2018-2022*. https://www.ttc.ca/Coupler/PDFs/1_Corporate_Plan_2018-2022.pdf

Toronto Transit Commission. (2020). *Embrace Diversity: The TTC's 10-Point Action Plan and Five-Year Diversity and Human Rights Plan*. https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2020/December_15/Reports/7_Embrace_Diversity_10_Point_Action_Plan.pdf?rev=113c7a2e8bd147f59a7c4c32a6d92782&hash=14F4798DF8F1039289B43760071667FE

Toronto Transit Commission. (2021a). *TTC Children*. https://www.ttc.ca/Fares_and_passes/Fare_information/Seniors_students_and_children/Children.jsp

Toronto Transit Commission. (2021b). *TTC Operating Statistics*. https://www.ttc.ca/About_the_TTC/Operating_Statistics/index.jsp

Toronto Transit Commission. (2021c). *TTC 2021 Annual Service Plan*. https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2020/December_15/Reports/9_2021_Annual_Service_Plan.pdf?rev=b5eaa8afcd56499b9b66aa4cf8f40fa6&hash=9400162C7DC6038A9F97B56173266E14

TRANS Committee. (2013). *2011 NCR Household Origin-Destination Survey Summary of Results* (pp. 1–150). http://www.ncr-trans-rcn.ca/surveys/o-d-survey/o-d-survey-2011/

TransLink. (2018a). *2018 Transit Service Guidelines*. https://www.translink.ca/-/media/translink/documents/plans-and-projects/managing-the-transit-network/transit-services-guidelines-public-summary.pdf

TransLink. (2018b). *Phase Two of the 10-Year Vision: 2018-2027 Investment Plan*. https://tenyearvision.translink.ca/-/media/tenyearvision/document-library/vision/10-year_vision_phase_2_investment_plan.pdf

TransLink. (2021). *Together all the way: TransLink's 2019-2025 Customer Experience Action Plan*. https://www.translink.ca/-/media/translink/documents/about-translink/customer-experience-action-plan/translink-customer-experience-action-plan.pdf

TransLink & Mayors' Council on Regional Transportation. (2017). *Update to Phase One of the 10-Year Vision: 2017-2026 Investment Plan*. vhttps://tenyearvision.translink.ca/-/media/tenyearvision/document-library/vision/final-20170727-investment-plan_phase-one-of-the-10year-vision.pdf

Transport Canada, T. (2018). *Canadian Motor Vehicle Traffic Collision Statistics: 2018*. ASFCC. https://tc.canada.ca/en/road-transportation/motor-vehicle-safety/canadian-motor-vehicle-traffic-collision-statistics-2018

Transport for London. (2012). *Understanding the travel needs of London's diverse communities*. http://content.tfl.gov.uk/women.pdf

United Nations Economic Commission for Europe. (2020). *Gender and transport | UNECE*. https://unece.org/gender-and-transport

University of Windsor & CUTRIC. (2021, August 13). *Gender Parity in the Canadian Transit Industry Study*. https://uwindsor.ca1.qualtrics.com/jfe/form/SV_eglHvnILQqgkv7D

York Region. (2012). *Vision 2051*. https://www.york.ca/wps/wcm/connect/yorkpublic/a6d9d1ce-0813-4376-a593-daccf2b7fd6e/vision+2051.pdf?MOD=AJPERES&CVID=muliVE5

York Region. (2019). *2019 to 2023 Strategic Plan: From Vision to Results*. https://www.york.ca/wps/wcm/connect/yorkpublic/e9612765-7323-40bf-904c-715cd0c21d6b/18453_CorporateStrategicPlan-Approved.pdf?MOD=AJPERES&CVID=mLVOUvn

York Region Transit. (2016). *Transit Service Guidelines*. https://www.yrt.ca/en/about-us/resources/Transit-Service-Guidlines_2016.pdf

York Region Transit. (2019). *2020 Transit Initiatives*. https://view.publitas.com/york-region-transportation-services/2020-transit-initiatives

Appendix 1

Policy Materials: Initially Identified Materials and Recommended Materials

Public Transit Agency: Winnipeg Transit / **CMA:** Winnipeg, Manitoba

Initial Identified Materials:

- Winnipeg Transit Master Plan and associated materials, including engagement reports and summaries
- Winnipeg Transportation Master Plan
- Community Trends and Performance Report - Volume 1 for 2021 Budget
- OurWinnipeg 2045 materials

Recommended Materials:

Commentary pertaining to the Winnipeg Transit Master Plan

Public Transit Agency: Calgary Transit / **CMA:** Calgary, Alberta

Initial Identified Materials:

- 2016 Calgary Transit Customer Satisfaction Survey
- Calgary Transit: Full Service Plan from the City's Budget Planning Process
- Municipal Development Plan/Calgary Transportation Plan 2018 Monitoring Progress Report
- Next 20: Making Life Better for Calgarians - State of the City
- 2020 Calgary Transportation Plan
- Municipal Development Plan 2020
- RouteAhead: A Strategic Plan for Transit in Calgary (Part 1)
- RouteAhead: A Strategic Plan for Transit in Calgary (Part 2)
- Gender Equity, Diversity and Inclusion Strategy
- 2021 Spring Pulse Survey
- One Calgary: 2019-2022 Service Plans and Budgets

Recommended Materials:

No additional material was recommended.

Public Transit Agency: Edmonton Transit Service / **CMA:** Edmonton, Alberta

***Initial Identified Materials*:**

- Edmonton Transit Service Annual Service Plan 2020-2021
- Edmonton's Transit Strategy
- City of Edmonton Transportation Master Plan
- Edmonton Transit Service Statistics
- Edmonton Transit Service Customer Satisfaction Tracking Survey - 2018 Annual Report
- Smart Transportation Action Plan
- Park and Ride Guidelines
- Edmonton City Plan
- CONNECTEDMONTON - Edmonton's Strategic Plan 2019 - 2028
- Corporate Business Plan 2019-2022 (2021 Update)

***Recommended Materials*:**

Recommended materials from outreach

***Public Policies*:**

- Service Standards Policy (Administrative Procedure - Transit Service Standards)
- Fare Policy

***Bylaws*:**

- Conduct of Transit Passengers Bylaw
- Public Spaces Bylaw

***Council Reports*:**

- Safety and Security Framework - Initial Report (October 2018)
- Safety and Security Framework – Update (November 2018)
- On Demand Service - Council Report
- and GBA+ attachment (February 2020)

***Customer surveys*:**

- 2019 Customer Satisfaction Report
- Q1 2021 Customer Satisfaction Report

***Annual Service Plan*:**

- 2019/2020
- 2020/2021

***City Plan*:**

- Mass Transit Study to 2M
- City Plan policy search tool

UN Safe Cities - Community Collaboration Committee Scoping Report and Recommendations Report

GBA+ Training – Details of new training that was developed by the City of Edmonton and made available to staff

***Recommended through earlier outreach*:**

- Council Reports: Current Policies - Transportation Services Users - Increased Safety Measures - Transportation Services Users and LRT Station Security Update
- Making transit safer for women and girls with 'smart technology' - CTV News
- Gender-based Analysis Plus course - Women and Gender Equality Canada. Federal government training program being used by cities, including Edmonton
- Fourth UN Women Safe Cities and Safe Public Spaces Global Leaders' Forum: Proceedings Report
- Government of Alberta Gender-Based Analysis Plus materials

Public Transit Agency: Société de transport de Montréal / **CMA:** Montreal, Quebec

***Initial Identified Materials*:**

- Plan stratégique organisationnel 2025
- Plan stratégique organisationnel 2025 – Tableau synoptique
- Indicateurs de performance
- Rapport annuel 2020
- Budget 2021
- Déclaration en matière de diversité et d'inclusion
- Plan de développement durable 2025

***Recommended Materials*:**

No additional material was recommended.

Public Transit Agency: Société de transport de Lavall / **CMA:** Montreal, Quebec

***Initial Identified Materials*:**

- Plan stratégique organisationnel 2019-2028
- Indicateurs de performance
- Budget 2021
- Plan d'affaires 2016-2018
- Engagement en matière de diversité et d'inclusion

***Recommended Materials*:**

No additional material was recommended.

Public Transit Agency: Réseau de transport de Longueuil / **CMA:** Montreal, Quebec

***Initial Identified Materials*:**

- Plan stratégique du RTL 2013-2022
- Rapport annuel 2019
- Budget 2021
- RTL universel

***Recommended Materials*:**

No additional material was recommended.

Public Transit Agency: Le Réseau de transport métropolitain (Exo) / **CMA:** Montreal, Quebec

***Initial Identified Materials*:**

- Plan stratégique organisationnel 2018-2020
- Rapport annuel 2020
- Budget d'exploitation 2021
- Plan de développement de l'accessibilité 2018-2020

***Recommended Materials*:**

- Materials and commentary pertaining to the le plan stratégique organisationnel 2021-2025 d'exo
- Additional commentary pertaining to gender data collection through polls and survey

Public Transit Agency: OC Transpo / **CMA:** Ottawa-Gatineau, Ontario/Quebec

Initial Identified Materials:

- Transit Services 2021 Business Plan and Reporting on 2020 Business Plan
- OC Transpo performance measures and reporting
- Transit Service Evaluation Criteria
- Equity & Inclusion Lens Handbook
- City of Ottawa - New Official Plan materials and resources
- Stage 2 Light Rail Transit Project materials

Recommended Materials:

No additional material was recommended.

Public Transit Agency: Société de transport de l'Outaouais / **CMA:** Ottawa-Gatineau, Ontario/Quebec

Initial Identified Materials:

- Plan stratégique 2016-2027
- Rapport annuel 2020
- Enquête de la satisfaction à l'égard des services de la STO 2019
- Budget sommaire 2021
- Plan quinquennal de développement de l'accessibilité universelle 2021-2025

Recommended Materials:

- Materials and commentary pertaining to:
- Bilan de l'année du Programme ECHO
- Retour sur le plan de déconfinement et la relance des activités
- Arrêt de nuit après 21 h

Public Transit Agency: Réseau de transport de la Capitale / **CMA:** Quebec City, Quebec

Initial Identified Materials:

- Plan stratégique 2018-2027
- Rapport d'activité 2020
- Engagement qualité
- Plan de développement en accessibilité universelle 2020-2024

Recommended Materials:

No additional material was recommended.

Public Transit Agency: Metrolinx/GO Transit / **CMA:** Greater Toronto & Hamilton Area, Ontario

Initial Identified Materials:

- 2017-2022 Metrolinx Five-Year Strategy
- 2020-2021 Metrolinx Business Plan
- Business Case Manual Volume 1: Overview
- Business Case Manual Volume 2: Guidance
- Business Cases for Metrolinx projects
- 2041 Regional Transportation Plan
- Metrolinx Fare Integration materials

Recommended Materials:

No additional material was recommended.

Public Transit Agency: Toronto Transit Commission / **CMA:** Greater Toronto & Hamilton Area, Ontario

Initial Identified Materials:

- TTC Corporate Plan 2018-2022
- 5-Year Service Plan and 10-Year Outlook
- Service Standards and Decision Rules for Planning Transit Service
- COVID-19 Response and Recovery Update (May 12, 2021)
- COVID-19 Transitioning from Response to Restart and Recovery (June 17, 2020)
- COVID-19 Restart and Recovery Update (September 24, 2020)
- City of Toronto Transit Expansion materials and 2018 Council Issue Notes on Transit Network Expansion
- City of Toronto Official Plan
- Surface Transit Network Plan Update (November 3, 2020)
- Surface Transit Network Plan - Consultation Plan (March 16, 2021)
- Toronto Strong Neighbourhoods Strategy 2020
- TO Prosperity: Toronto Poverty Reduction Strategy
- Update: 5-Year Fare Policy and 10-Year Fare Collection Outlook (May 12, 2021)
- Toward a Policy Framework for Toronto Transit Fare Equity (June 17, 2014)
- 2018 Council Issue Notes on Equity, Diversity and Inclusion within the City of Toronto

Recommended Materials:

- Materials and commentary pertaining to:
- Annual Service Plan development process, specifically the equity lens
- Diversity and Inclusion Lens and Toolkit
- SafeTTC App
- Communications Campaigns
- #ThisIsWhere campaign
- General PSAs
- Materials pertaining to Designated Waiting Areas
- Accessibility Improvements and Infrastructure
- Request Stop program
- Special Constable Service
- Diversity Commitments

Public Transit Agency: York Region Transit / **CMA:** Greater Toronto & Hamilton Area, Ontario

Initial Identified Materials:

- York Region Transit - Transit Service Guidelines
- Moving to 2020: YRT/Viva 2016-2020 Strategic Plan
- 2020 Transit Initiatives
- York Region Diversity and Inclusion materials
- The Regional Municipality of York Official Plan (2019 office consolidation)
- Vision 2051
- 2016 Transportation Master Plan
- Transportation Master Plan update materials

Recommended Materials:

No additional material was recommended.

Public Transit Agency: Mississauga Transit (MiWay) / **CMA:** Greater Toronto & Hamilton Area, Ontario

Initial Identified Materials:

- Mississauga Transportation Master Plan
- MiWay Infrastructure Growth Plan
- Strategic Plan: Our Future Mississauga
- MiWay: 2020-2023 Business Plan & 2020 Budget
- Mississauga Official Plan
- Diversity and Inclusion: 2021 Survey Results Report
- Let's Move Peel: Long Range Transportation Plan 2019
- Sustainable Transportation Strategy
- Peel's Community Safety and Well-being Plan 2020-2024
- Region of Peel Official Plan (Office Consolidation 2018)
- Hurontario LRT materials

Recommended Materials:

No additional material was recommended.

Public Transit Agency: Durham Region Transit / **CMA:** Greater Toronto & Hamilton Area, Ontario

Initial Identified Materials:

- Durham Transportation Master Plan 2017
- Durham Region Transit - Five-Year Service Strategy
- Durham Regional Official Plan (Consolidation May 26, 2020)
- Fostering a Strong and Inclusive Workplace: 2018-2021 Diversity and Inclusion Strategy
- Growing Together Reaching Further Aspiring Higher: A New Strategic Plan for Durham Region (2015-2019)

Recommended Materials:

No additional material was recommended.

Public Transit Agency: Hamilton Street Railway / **CMA:** Greater Toronto & Hamilton Area, Ontario

Initial Identified Materials:

- Service Quality and Consumers Preferences for Hamilton Street Railway (HSR)
- (Re)envision the HSR Update and Guiding Principles
- Hamilton King-Main Benefits Case
- Hamilton Light Rail Transit materials
- Equity, Diversity & Inclusion Handbook (Draft)
- Urban Hamilton Official Plan
- Rural Hamilton Official Plan

Recommended Materials:

No additional material was recommended.

Public Transit Agency: Brampton Transit / **CMA:** Greater Toronto & Hamilton Area, Ontario

***Initial Identified Materials*:**

- Transportation Master Plan Update: Final Report
- Brampton Transit: Projects and Initiatives
- Brampton Transit: 2019 Commitments
- Brampton Transit: 2018 Commitments
- Living the Mosaic: Brampton 2040 Vision
- 2006 Official Plan (Official Consolidation September 2020)
- Materials included in the Orientation Manual: Brampton Transit Advisory Committee
- Let's Move Peel: Long Range Transportation Plan 2019
- Sustainable Transportation Strategy
- Peel's Community Safety and Well-being Plan 2020-2024
- Region of Peel Official Plan (Office Consolidation 2018)
- Hurontario LRT materials

***Recommended Materials*:**

Materials and commentary pertaining to:

- City of Brampton Complete Streets Guide
- City of Brampton Age-Friendly Strategy
- City of Brampton Transportation Master Plan
- The Transportation & Connectivity Discussion Paper prepared as part of the ongoing Official Plan Review
- Brampton Transit: Customer Satisfaction among Brampton Transit Users

Public Transit Agency: TransLink / **CMA:** Vancouver, British Columbia

***Initial Identified Materials*:**

- 2019 Transit Service Performance Review Summary Tables
- 2020 Transit Service Performance Review: COVID-19 Snapshot
- 2018 Transit Service Guidelines
- Transit Network Review: 2019
- Together all the way: TransLink's 2019-2025 Customer Experience Action Plan
- 10-Year Vision for Metro Vancouver Transit and Transportation
- Phase One of the 10-Year Vision (2017-2026)
- Phase Two of the 10-Year Vision (2018-2027)

***Non-TransLink documents*:**

- Vancouver: A City for All Women: Women's Equity Strategy 2018-2028 (City of Vancouver)
- Corporate Plan 2020 (City of Vancouver)
- Planning Vancouver Together: Vancouver Today Reference Guide (City of Vancouver)

***Recommended Materials*:**

- 2017 Trip Diary Dashboard
- Social equity and planning/transportation study completed with Metro Vancouver

Household Travel Surveys

Montreal
Autorité régionale de transport métropolitain. (2018). *Enquete Origine-Destination 2018.* https://www.artm.quebec/wp-content/uploads/2020/01/CA_Faits-saillants_EOD_COMPLET_WEB_14012020_R002.pdf

Calgary
City of Calgary. (2018). *My Travel Log 2015 Annual Report*. Https://Www.Calgary.Ca. https://www.calgary.ca/content/www/en/home/transportation/tp/planning/forecasting/forecasting-surveys.html

Edmonton
City of Edmonton. (2018). *2015 Edmonton and Region Household Travel Survey Summary Report* (p. 49). https://www.edmonton.ca/sites/default/files/public-files/assets/RoadsTraffic/2015_HTS_SummaryReport.pdf?cb=1638495152

Hamilton (Greater Toronto & Hamilton Area)
City of Hamilton. (2018). *TTS 2016 CITY OF HAMILTON SUMMARY BY WARD MARCH 2018*. 1–30.

Toronto (Greater Toronto & Hamilton Area)
City of Toronto. (2018). *TTS 2016 CITY OF TORONTO SUMMARY BY WARD MARCH 2018*. 1–59.

Vancouver
City of Vancouver. (2019). *Annual transportation survey | City of Vancouver* (pp. 1–74). https://vancouver.ca/streets-transportation/annual-transportation-survey.aspx

Winnipeg
City of Winnipeg. (2009). *2007 Winnipeg Area Travel Survey Results- Final Report*.

Quebec City
Quebec. (2019). EOD 2017 *Enquete Origine-Destination Region Quebec-Levis*. https://www.transports.gouv.qc.ca/fr/ministere/Planification-transports/enquetes-origine-destination/quebec/2017/Documents/EOD17_sommaire.pdf

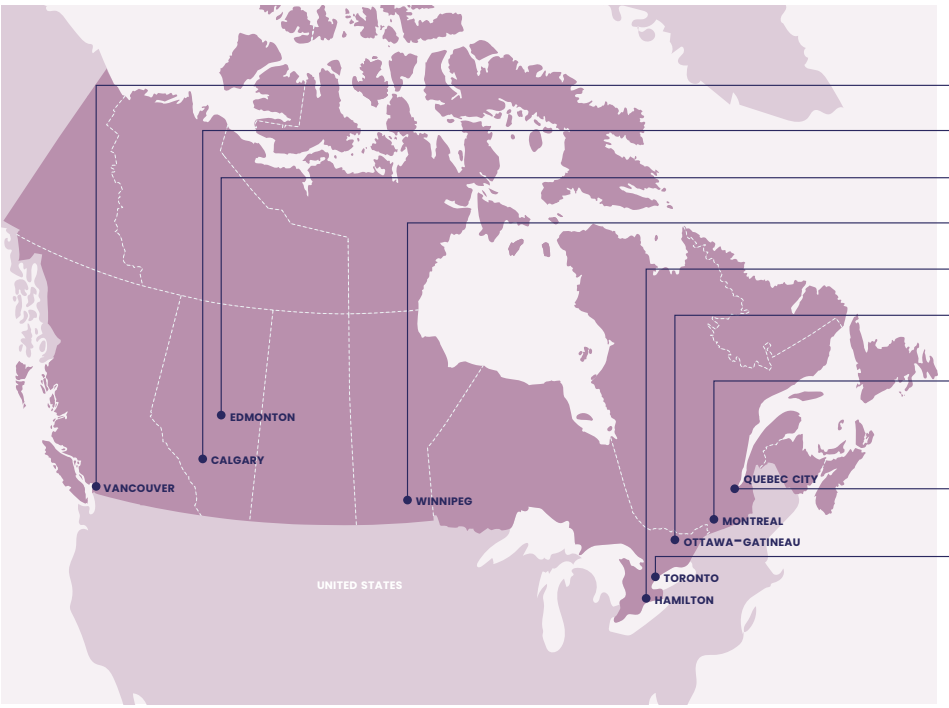
TRANS Committee. (2013). *2011 NCR Household Origin-Destination Survey Summary of Results* (pp. 1–150). http://www.ncr-trans-rcn.ca/surveys/o-d-survey/o-d-survey-2011/

Appendix 2

Detailed Policy Review Process

The study team assessed the policy materials from 18 public transit agencies across Canada. These agencies operate within the eight largest census metropolitan areas (CMAs) in Canada (with Hamilton, Ontario included as part of the larger Greater Toronto and Hamilton Area (GTHA)). For CMAs with more than one public transit agency, agencies with an annual ridership of 10,000,000 and greater have been included (based on the Canadian Urban Transit Association - Canadian Conventional Transit Statistics: 2019 Operating Data (2020)). See Table 1 for a full list of public transit agencies included in this study.

Table 1: Public transit agencies included in this study



PUBLIC TRANSIT AGENCY

Vancouver
TransLink

Calgary
Calgary Transit

Edmonton
Edmonton Transit Service

Winnipeg
Winnipeg Transit

Hamilton
Hamilton Street Railway

Ottawa-Gatineau
OC Transpo
Société de transport de l'Outaouais

Montréal
Société de transport de Montréal
Société de transport de Laval
Réseau de transport de Longueuil
Réseau de transport métropolitain (Exo)

Quebec City
Réseau de transport de la Capitale

Toronto
Toronto Transit Commission
Metrolinx/GO Transit
York Region Transit
Durham Region Transit
MiWay (Mississauga Transit)
Brampton Transit

Desktop research for each public transit agency included in this study was conducted to identify publicly available materials that guide their planning activities. Materials considered include those produced by public transit agencies. Materials produced by municipal, regional, and provincial government entities are also considered, where relevant.

Representatives from the executive leadership and planning departments of each public transit agency were provided with an initial list of materials identified through our desktop research and were invited to provide any additional agency specific information or documents that relate to women's travel needs or any commentary pertaining to this area. While representatives were contacted to provide additional context and materials, interviews were not conducted.

The policy review was conducted as a three-step process:

1. Materials were organized into categories based on their overall purpose. The selected categories for this review are:
   II. Service Standards
   III. Transit Fare Policy
   IV. Ridership and Trip Data
   V. Customer Experience and Satisfaction
   VI. Safety and Security
   VII. Workplace Gender Equity
   VIII. Business Cases for Major Projects
   IX. Planning Processes for Major Projects and Plans

   These categories are based around major policy areas. In some cases, the categories will refer to a specific type of document (such as a set of service standards), while for others, policies can be found through a variety of documents.

2. A systematic keyword search was conducted in both English and French, with the search conducted in the primary language of the location of the public transit agency. This was used to identify passages in the policy materials that specifically referenced women, gender, and associated terms to highlight ways that women's travel needs and behaviours are considered (see Table 2), as well as more general terms that may indicate activities that are aligned with meeting women's travel needs but were not stated as a specific intention (see Table 3). For materials that specifically pertained to gender, equity, and/or inclusivity that were not produced directly by the public transit agency, keywords associated with transportation and public transit were used to identify relevant passages (see Table 4). In this case of this policy review, only English language documents were identified to fit this criteria, and as such, only English language search terms were used. Materials with no identified passages from the keyword search were recorded.

   For Household Travel Survey (HTS) summary reports, keywords were selected based on terms that could identify women in the data, as well as categories that are primarily made up of women. Findings from the literature review detail how women are more likely to be single parents, caregivers and responsible for the general care of children (Statistics Canada, 2015a, 2020), and terms were selected accordingly (see Table 5). Understanding how parents, caregivers, and children (whose travel is typically assisted by a parent or adult) travel can be used to generate insights on women's travel. French language keywords were used for the Montreal and Quebec City CMAs, while searches for all other CMAs used English language keywords.

3. Materials were assessed to understand if and/or how a gender lens was incorporated. Trends were identified based on the category of material and the major policy area that the materials pertain to. Assessment of the materials included identifying policy gaps and opportunities.

Table 2: List 1 – Keyword Search Terms

English	French
• Women • Female • Gender • Sex • GBA/GBA+	• Genre • Sexe • Femme • ACS (Analyse comparative entre les sexes)

Table 3: List 2 – Keyword Search Terms

English	French
• Inclusive/Inclusivity • Harassment • Diversity • Accessibility • Family • Child/Children • Mother • Security • Equality • Egality	• Inclusivité/Inclusif • Harcèlement • Diversité • Accessibilité • Famille • Enfant(s)/Mère • Sécurité • Équité • Égalité

Table 4: List 3 – Keyword Search Terms

• Transit • Transportation • The name of the associated public transit agency

Table 5: List 4 – Household Travel Survey Keyword Search Terms

English	French
• Gender • Female(s) • Women(an) • Parent(s) • Caregiver(s) • Child(ren)	• Genre • Femme(s) • Parent(s) • Enfant(s)

Appendix 3

Selected Best Practices

Use of GBA+ in improvement of safety of women on Calgary Transit
Calgary Transit
Calgary Transit used Gender-Based Analysis (GBA+) techniques to identify safety and security enhancements with a specific focus on women. This took shape through surveying transit users to tailor safety initiatives to meet the needs of those most impacted, specifically women with disabilities, members of the LGBTQ2S community, and racialized women (City of Calgary, 2019).

Transit operator recruitment campaign, focused on recruiting more women into this role
City of Edmonton
The City of Edmonton plans to initiate a recruitment campaign focused on hiring more women in Transit Operator roles (City Edmonton, 2020). Currently, 18% of Transit Operators with the Edmonton Transit Service identify as women. As part of an engagement campaign among transportation users, hiring more women into transit operator roles was brought forward as a suggestion (City of Edmonton, 2020c), demonstrating responsiveness to the community concerns.

Multi-modal Strategies – Sustainable Transportation Strategy
Region of Peel
As part of the Sustainable Transportation Plan, Peel Region has both highlighted the barriers that restrict access to sustainable transportation options among vulnerable populations, as well as the strategies to overcome these impediments (Region of Peel, 2018). This plan emphasizes the physical characteristics of the urban environment that reduce comfort and access to sustainable transportation, including public transit, such as wide roads, and provides guidance for future development patterns that can overcome these challenges.

Hurontario LRT Benefits Case Analysis – Women's Safety Perceptions
Metrolinx
A safety perception assessment was conducted as part of the Hurontario LRT project, which included recognition of lower perceptions of safety among women while using public transit, with findings from this assessment incorporated into station and vehicle design (Metrolinx, 2016). These practices are aligned with academic findings that perceptions of safety affect mode choice and time of travel. This analysis was conducted by a consulting company for Metrolinx.

Updated Fare Policy Engagement Initiatives
City of Edmonton
In 2018, The City of Edmonton conducted public engagement activities to support the development of an updated public transit fare policy. As part of this engagement process, participants were asked to use a slider tool to consider the fare discounts that should be applied to different groups, with the caveat that these discounts would lead to an increase in the regular adult pass (City of Edmonton, 2018a). While this process was not specifically focused on fare policy to support women's public transit needs, it improved transparency for how fare policy decisions are made and asked the public to consider what an equitable fare policy would consist of.

Groupe consultatif de citoyens - Plan de développement stratégique
Autorité régionale de transport métropolitain (ARTM)
As part of the consultation process for their Strategic Development Plan, the ARTM created a public consultation group composed of 32 citizens that were brought together during four days to discuss the mobility challenges they see in the region. The intention was to create a group representative of the diversity of needs in the region. Between other considerations, an equal number of men and women were included.

Equity and Inclusion Lens
City of Ottawa
The City of Ottawa has adopted the "Equity and Inclusion Lens", which requires "any potential decision be evaluated for its effect on groups of people who are already disadvantaged" (City of Ottawa, 2021b, p. 14), with women included as an identified group. The Equity and Inclusion Lens applies to OC Transpo services (City of Ottawa, 2021b) and despite the fact that it is not a dedicated set of public transit service standards, it could be considered a standardized process for evaluating changes to public services. As part of an evaluation of transit service changes in light of the COVID-19 pandemic, the Equity and Inclusion Lens was used to highlight that the groups identified represent most of OC Transpo customers, and that while a full assessment of the effect of service cuts on these groups may offset potential cost savings of service cuts due to its time-intensive nature, an assessment would still be provided (City of Ottawa, 2021b).

Parité Hommes-Femmes
Société de transport de Montréal (STM)
STM initiated a series of initiatives to promote gender parity in the workforce, including developing partnerships and increasing the visibility of opportunities to attract applications from under-represented populations, participation from all levels of the organization in a conference to promote best practices in inclusion and gender diversity, and achieving gender parity within senior management (Société de transport de Montréal, 2021b).