

SMART PAYMENT SYSTEMS, DIGITAL DIVIDE AND TRANSIT INEQUITY: A STUDY
OF THE TORONTO TRANSIT COMMISSION'S IMPLEMENTATION OF THE PRESTO
SYSTEM

by

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SMART PAYMENT SYSTEMS, DIGITAL DIVIDE AND TRANSIT INEQUITY

Smart Payment Systems, Digital Divide and Transit Inequity: A Study of the Toronto Transit Commission's Implementation of the PRESTO System

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ABSTRACT

Toronto is city divided. The city's public transportation system is not an exception to this pattern. A move away from tokens, tickets, passes and cash and towards smart technology and modernization is excluding a large population of Torontonians who rely on public transportation but lack resources, face limited connectivity and rely on fare subsidy programs and traditional methods of fare payment. This paper aims to answer the question: How has the implementation of PRESTO on the Toronto Transit Commission furthered transit inequity in the City of Toronto? Through secondary data analysis and spatial analysis, this paper intends to explore the connection between the existing and worsening digital divide and the lack of access to physical PRESTO infrastructure outside of the downtown core, specifically in the inner suburbs and fringes of the city, areas where concentrations of low income and racial and ethnic minorities are higher.

Key words: smart cards, transit fare payment, PRESTO, TTC, Toronto, transit equity, digital divide, digital literacy

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DEDICATION

For my parents, Hamza Zardari and Ruby Kazmi.

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Executive Summary

Cash, token, ticket, or Metropass; if you had any one of these you could easily “Ride The Rocket”, The Toronto Transit Commission (TTC), by taking a bus, subway train or streetcar to and from your destination. All stations had a collector, seated either in a glass box booth, at the fare line or in a vehicle. In December of 2016, PRESTO’s device rollout was completed with a machine available at least one priority entrance at all TTC subway stations, and on all buses, streetcars, and para-transit vehicles, changing the way riders pay for and access transit.

A move away from tokens, tickets, passes and cash and towards smart technology that hopes to better connect its users may be excluding a large population of Toronto residents who rely on public transportation but lack resources, face limited connectivity and may rely on fare subsidy programs and traditional methods of fare payment. This paper aims to answer the question: How has the implementation of PRESTO on the Toronto Transit Commission furthered transit inequity in the City of Toronto? This paper will answer this question using the following analysis. Through secondary data analysis and spatial analysis, this paper intends to explore the connection between the existing and worsening digital divide and the lack of access to physical PRESTO infrastructure outside of the downtown core, specifically in the inner suburbs and fringes of the city, areas where concentrations of low income and racial and ethnic minorities are higher when compared to the downtown core. This is done by looking at both qualitative and quantitative data. Specifically, by comparing TTC ridership data, route maps and PRESTO data in comparison with existing data and

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research included in Hulchanski's *The Three Cities Within Toronto: Income Polarization Among Toronto's Neighbourhoods* and City of Toronto Employment Data. This research is used to highlight the pain points and design failures of the PRESTO card system and its integration on to the Toronto Transit Commission. Further, this paper will explore how the PRESTO system and its policies affect these marginalized populations, communities that already face less connectivity and transportation disadvantage. Recommendations are presented in the form of tech, design and policy changes.

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1.0 Introduction

According to the United Nations over two thirds of the global population will live in cities by the year 2050 (United Nations Department of Economic and Social Affairs, 2018). In order to accommodate this growth efficiently, many cities are adopting 'smart city' practices by collecting and using data to find more efficient methods for the management of services, assets and resources. With a global move towards 'smart' technologies, data has become a new currency.

Contactless smart card automated fare collection systems are becoming increasingly popular in major cities around the world. The reasoning for this is twofold; firstly, smart transit cards modernize the transit experience and allow seamless payment across multiple systems. Secondly, smart technologies provide comprehensive ridership and travel data that can be used to allocate resources and serve riders better. In Ontario, PRESTO has been implemented onto 11 transit authorities including Brampton Transit, Burlington Transit, Durham Region Transit (DRT), Hamilton Street Railway (HSR), MiWay, Oakville Transit, York Region Transit (YRT) and OC Transpo in Ottawa. In the Toronto context, PRESTO is now the primary method of payment for the Toronto Transit Commission (TTC) and Metrolinx's own, GO Transit and UP Express. However, what happens when those who do not have a bank account, credit or contactless cards, cell phones, computers or internet access need to take transit? What about those that may be homeless or rely on fare subsidy programs? What happens to those who do not have technical or digital literacy? Do these populations get left behind? The move away from tokens, tickets and passes and towards smart technology

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that hopes to further connect its users may be excluding a large population of Toronto residents who lack resources, face limited connectivity and rely on traditional methods of fare payment. This paper aims to explore how this change is furthering existing transit inequity in Toronto, specifically in transit deficit areas and what effects this has on the larger planning issues related to the city.

This paper begins by briefly explaining smart card technology and reviewing the history of PRESTO in Ontario and Toronto. Then relevant existing literature on transit improvement through technology, digital divide and transit equity is reviewed. This is followed by a thorough investigation and analysis of the PRESTO system and infrastructure on the TTC. Further analysis looks at the impact unreliable technology, the new station structure, transfer inequity, data privacy and surveillance and the upcoming open payment system create for TTC customers, with a specific focus on those that face barriers to access. Recommendations are presented in the form of tech, design and policy changes with a specific focus on the implications this research has on the professional practice of planning.

1.1 Smart Card Technology

Smart cards are small, portable and reusable devices typically the size of a credit card, with embedded chips concealed under plastic, designed to store and process data (Lu, 2007). There are two types of smart cards, the first which requires physical contact with the reader (e.g. a card that is tapped or swiped). The second, which transmits data

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to and from a reader through high-frequency waves (Pelletier et al, 2011). In contactless cards a small antenna is also used, which is similar to radiofrequency identification (RFID) technology.

Smart cards have come a long way since their inception in 1968 when they were first patented by German inventors, Dethloff and Grotrupp (Shelfer and Procaccino, 2002). Since then, their use has been integrated across many industries including public transportation. The technology is most often associated with being a more convenient payment method, however smart transit cards are an attractive option for transit agencies because of the detail and amount of data they are able to provide in comparison to cash, tickets, tokens, and magnetic stripe payment cards, such as New York City's MetroCard. This information creates new opportunities for innovative and flexible fare structuring (Blythe, 2004; Dempsey, 2008; Pelletier et al, 2011) by providing insight on travel patterns through ridership data. This data explains, when people travel, where they go and which public transit mode they choose to get there. This information allows transit agencies to adjust services based on user experience. Allowing for a more efficient use of resources.

Typically, smart cards used for public transit purposes require less data storage than smart cards used for other purposes, typically requiring between 2 and 4 kb of memory to store financial data, personal data, and transaction history (Blythe, 2004). This is because less memory is needed since most of the information is not stored on the card itself, which is the case for PRESTO.

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One of the most well-known smart cards in the world is the Oyster Card. Transport for London introduced their popular smart transit card in June of 2003. The card is used as a payment method for a variety of travel options including the London Underground, London Buses, the Docklands Light Railway, London Overground, Tramlink, select river boat services, and most National Rail services within the greater London area. The contactless card is popular with usage encouraged by offering significantly cheaper fares when using the card. Over 90 million unique cards have been used since the introduction of the system (Marcellin, 2019).

Smart cards are not the final step in transit payment modernization. Transit agencies across the world that have already adopted the smart card system are now making the move towards open payment systems. These systems allow for payment through contactless methods such as credit cards, debit cards and mobile phones. Smart cards use proprietary technology, which means that the system is owned by a single enterprise and as such the technology is exclusive to that particular company, as is the case with PRESTO. Due to its unique nature it can be difficult and expensive to upgrade. In comparison, open payment systems do not require proprietorial software and are considered easier to update (Manenti & Somma, 2011). Financial institutions such as banks and credit card companies have a vested interest in open payment systems and often subsidize installation and process payments in order to benefit from transaction fees (Manenti & Somma, 2011).

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1.2 History of Presto

PRESTO is an operating division of Metrolinx, an agency of the Government of Ontario. It was created to improve the coordination and integration of all modes of transportation in the Greater Toronto and Hamilton Area (Metrolinx, 2020).

The TTC began exploring the use of an electronic fare collection system in the early 2000s and pursued the possibility its own system in 2010 (TTC, 2019). However, in 2008, Ontario's Regional Transportation Plan for the Greater Toronto and Hamilton Area called, The Big Move, named creating an integrated transit fare system for all local public transit agencies in the region as one of its ten strategies (Metrolinx, 2008). The province was successful in its efforts to push PRESTO due to its existing funding relationship with the TTC. The adoption of PRESTO was approved by the TTC Board in 2011 and an agreement, known as the Master E-Fare Agreement was entered in 2012 (TTC, 2019).

The implementation of PRESTO across the TTC system is a part of the TTC's Five Year Corporate Plan initiated in 2013, to modernize all aspects of its operation (TTC, 2013). To usher in physical modernization, the Stations Transformation Program (TTC, 2016), was created to fully transform station service by overhauling both job roles and station design. In a staff report released in September of 2016 (TTC, 2016), the TTC communicated their plans to strategically introduce world-class skillsets, efficient processes, and modern assets. The report named four objectives for the model. First, to meet and exceed customer expectations. Secondly, to empower employees to own the

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customer experience. Thirdly, to pro-actively manage risk and assets and lastly, to remain financially responsible (TTC, 2016).

As a result of the stations transformation model, the TTC will no longer require Station Collectors to manage funds and fare media resulting in the phasing out of collectors in booths. Starting on January 5, 2020 the collector booths at 20 subway stations were closed, with the remaining 45 subway station's collector booths closed on March 29, 2020¹. In lieu of Station Collectors, Customer Service Agents or CSAs are made available at the fair line to assist customers but do not handle cash. This leaves PRESTO fare gates to be the primary means of entry. As such, those wishing to use cash would need exact change or would need to purchase PRESTO Tickets from Fare Vending Machines in order to be granted access through fare gates (TTC, 2019) (Spurr, 2016).

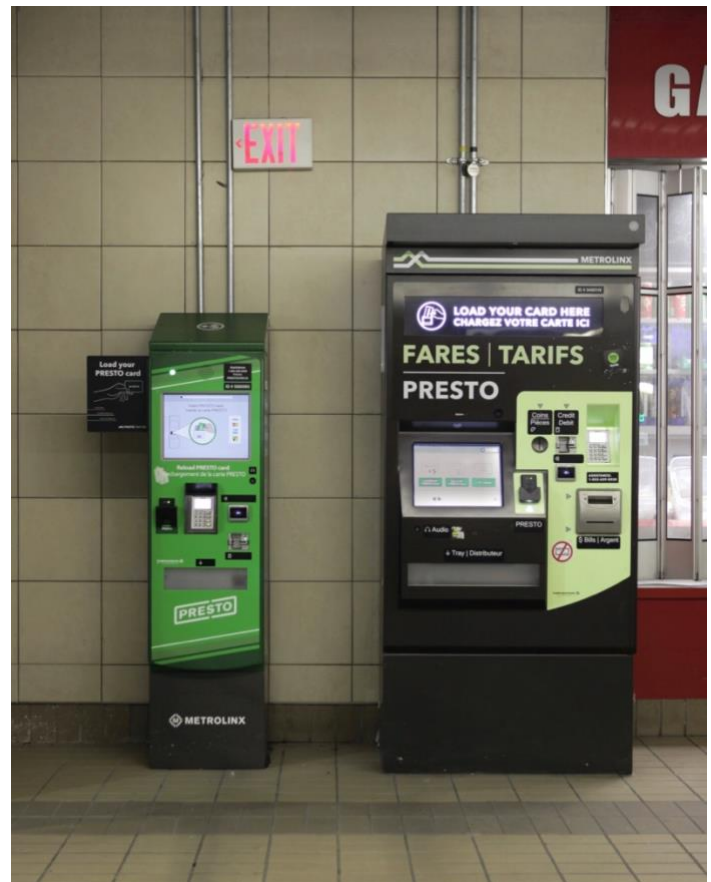


Figure 1 Photo by Masooma Ali

¹ This change was planned and made prior to the COVID-19 pandemic

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2.0 Literature Review

2.1 Transit Improvement Through Tech and Data

Literature on smart cards as a method of payment highlights the benefits which include, greater efficiency due to faster processing speeds which lead to a reduction in boarding times, detailed and comprehensive ridership and travel data that can be used to allocate resources and serve riders better through demand-based scheduling and greater cross-operator coordination, which is a goal of Metrolinx across the GTHA (Iseki, Yoh, & Taylor, 2007; Velaga et al., 2012). Supporters of smart cards argue that the technology has the potential to make transportation more equitable (Dumas, R. A. 2015). This can be done through programming specialized cards for low income users or those on social support, which is the approach taken by the City of Toronto for their Fair Pass Program.

Distance-based or time-based travel that uses zoned, timed or variable fares also have the potential to create a more equitable transit system. Those who are travelling shorter distances or during off-peak hours can pay lower fares (Farber, S., Bartholomew, K., Li, X., Páez, A., & Nurul Habib, K. M. 2014). These methods are currently in place in transit systems in London and Tokyo, where smart transit cards are used to track travel data for fare pricing. However, distance-based fare structures can unequally favour or disadvantage different groups based on variations in settlement patterns, travel needs, and transit use (Farber, Bartholomew, Li, Páez, & Habib 2014). Based on research done by Farber, Bartholomew, Li, Páez, & Habib in *Assessing social*

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equity in distance based transit fares using a model of travel behavior, analysis reveals that overall distance-based fares benefit low-income, elderly, and non-white populations. However, since transportation policy is inherently spatial, the effect of distance-based fares is geographically uneven. Meaning there could be negative implications for members of these groups living on the urban fringe (Farber, Bartholomew, Li, Páez, & Habib 2014). In Toronto, research shows the urban fringe is where low-income and racialized populations are concentrated.

2.2 Transit Equity

It is nearly impossible for public transportation to be equally distributed across all areas of a city (Allen and Farber, 2019). Meaning access to transportation and access to certain destinations is also never equal among all residents. Not only does this not affect all residents in a spatially equal way, the disadvantage this creates affects different populations in various ways (Allen and Farber, 2019). Those who do not have access to a personal vehicle or adequate public transportation options are considered transportation disadvantaged. When those that are transportation disadvantaged are also socially disadvantaged through race, income, unemployment, disability etc., it is considered transport poverty (Allen and Farber, 2019 Lucas, 2012). Due to a lack of private car access, dependency on transit and a spatial mismatch of accessible employment and affordable housing, racial and ethnic minorities and low-income households face more transportation challenges, including longer commute times when compared to other demographics (Kodransky, M., & Lewenstein, G. 2014; Kramer and Goldstein, 2015).

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Across Canada, transport poverty is mostly found in two types of areas. The first are areas that are very dense, where the income is low, with a higher concentration of tower-neighbourhoods located off of the main axes of transit supply. The second is in areas where low income populations live in low-density suburban urban forms (Allen and Farber, 2019).

In the Greater Toronto Area, low-income households, youth, post-secondary students, seniors, households with young children including single parent households, the mobility impaired, new immigrants and racialized populations are highlighted as particularly impacted by transit network characteristics (Kramer and Goldstein, 2015). In order to ensure social inclusion of all groups along the social dimensions of race, ethnicity, language, class and age, public transportation options that are diverse, reliable and affordable are key (Shaheen & Cohen, 2017).

In the article, *Transit justice as spatial justice: learning from activists*, Theresa Enright highlights that urban public transportation practices are pursued for distinct purposes, for the benefit of some urban dwellers and to the detriment of others, prompting questions about “who belongs in the city, who is allowed to participate fully in urban activities, who decides how space will be planned and produced, and who gains from urban transformation?” (Enright, T. 2019).

2.3 Digital Divide

Typical conversations about the digital divide centre around the idea of a gap between demographics and their access and lack of access to technology and its evolving benefits. Usually, these ideas revolve around forms of technology such as computers, smart phones and the internet (Van Dijk, 2013). The benefits of the internet and connectivity to it cannot be denied. It allows communication, access to unlimited information and economic opportunity. The issue is when these benefits are seen as a privilege and not a right. With services, both public and commercial moving to online platforms, the digital divide between those who have access and literacy and those who do not, becomes increasingly concerning.

The 2018 Canadian Internet Use Survey done by Statistics Canada, was conducted from November 2018 to March 2019. The findings illustrate that there is inequity in internet access amongst Canadians with 9% of those aged 15 and older who report not using the internet and 6% of all Canadians who did not have internet at home, due to cost of internet service (28%) equipment (19%), and the unavailability of service (8%).

Though these factors are important, the divide is informed by more than just the lack of personal access to devices. With a global move towards automation and the integration of technological systems, there is a potential for many people to be excluded not only based on access but due to a lack of digital literacy. UNESCO (2011) describes

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digital literacy as “a set of basic skills required for working with digital media, information processing and retrieval” (Chetty, Qigui, Gcora, Josie, Wenwei, & Fang, 2018).

With the implementation of the “Internet-of-Things” (IoT) impacting a range of policy areas, including transportation, the conversation needs to shift to include the skills needed by a user and design that understands this in order to ensure these advancements are meeting the full potential intended, instead of enabling smaller groups of people with greater digital literacy to benefit, and disadvantaging the already marginalized groups in new ways (van Deursen, A. J., & Mossberger, K. 2018). Beyond, this many are unable to take full advantage of smart technology systems, due to the digital divide but also due to their unbanked or underbanked statuses creating further barriers to broader access (Brakewood and Kocur, 2013; Brown, 2018, 2019; Dinning and Weisenberger, 2017; Kodransky and Lewenstein, 2014).

In Canada, 3% of the adult population is unbanked, which translates to around a million Canadians. Unbanked are those who have no relationship with a mainstream financial institution such as a bank (Association of Community Organizations for Reform Now, 2016). In addition, 15% of the adult population, around five million Canadians, are underbanked, who are those that may have a bank account, but do not regularly access or use their account. Both unbanked and underbanked populations face financial exclusion due to a variety of barriers that include being perceived as too high-risk, not meeting rules and conditions, red-lining and geographic exclusion (Association of Community Organizations for Reform Now, 2016). This means these people are unable

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to access many online benefits due to their lack of a relationship with a financial institution.

Furthermore, in 2018, 57% of Canadian internet users reported a cyber security incident, including being redirected to fraudulent websites that asked for personal information (19%) (StatsCan, 2018). This distrust is heightened in low-income users who prefer not to disclose their private and financial information to institutions (Kodransky & Lewenstein 2014), often because they cannot afford to take the risk and are sceptical of what protection they would have if they were to be defrauded.

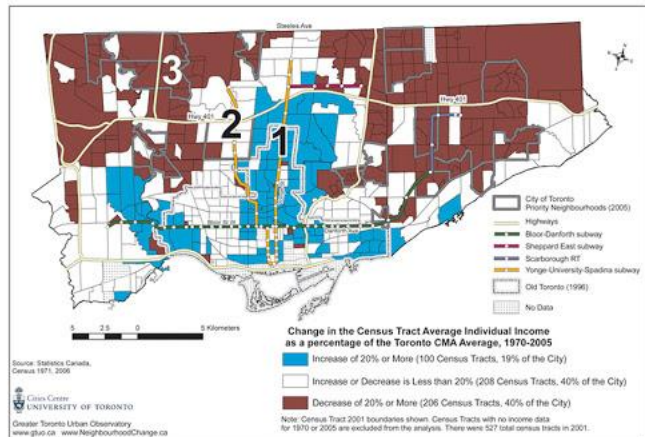
When approaching the digital divide both the issue of limited access and the lack of digital literacy needs to be addressed. Research finds these issues are more prevalent in low- and middle-income communities due to the costs associated with connectivity and a lack of infrastructure (Chetty, Qigui, Gcora, Josie, Wenwei, & Fang, 2018). The issue goes beyond just personal access and benefit. If we are to move towards digital transformation as a society, we must ensure that everyone, specifically marginalized groups are connected and equipped with the necessary digital skills needed.

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2.4 Hulchanski's The Three Cities and Toronto Employment Survey

Looking at Hulchanski's The Three Cities Within Toronto: Income Polarization Among Toronto's Neighbourhoods, 1970-2005, there is a clear spatial income divide in the city of Toronto, with some of the poorest populations living in the peripherals of the city. The first of the three cities

Figure 2. David Hulchanski



identified by Hulchanski is the high-income area, located in the centre of the city within the boundaries of the old Toronto and closest to the TTC subway and streetcar lines. City two is the middle areas between city 1 and 3 and is home to the middle-income residents. It is still close to subway and streetcar lines. City three is concentrated in the outer most parts of the city, the northeastern and northwestern parts of Toronto. These areas are where the residents earning the lowest incomes live and it has the smallest concentration of subway stations. Buses are the most common form of public transportation available in city three.

Considering Hulchanski's original report looked at Statistics Canada Census Data up until the year 2005, updates to the research have provided new insights based on 2015 data. As predicted, Toronto is slowly moving towards a 2-city model, with the middle incrementally disappearing.

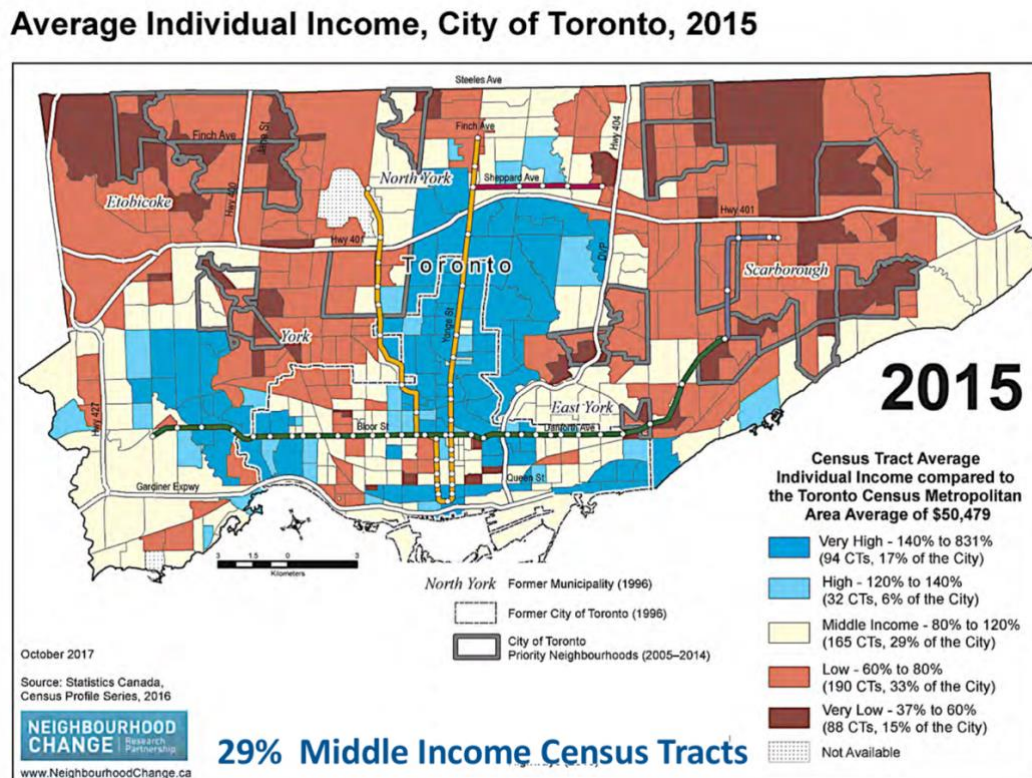
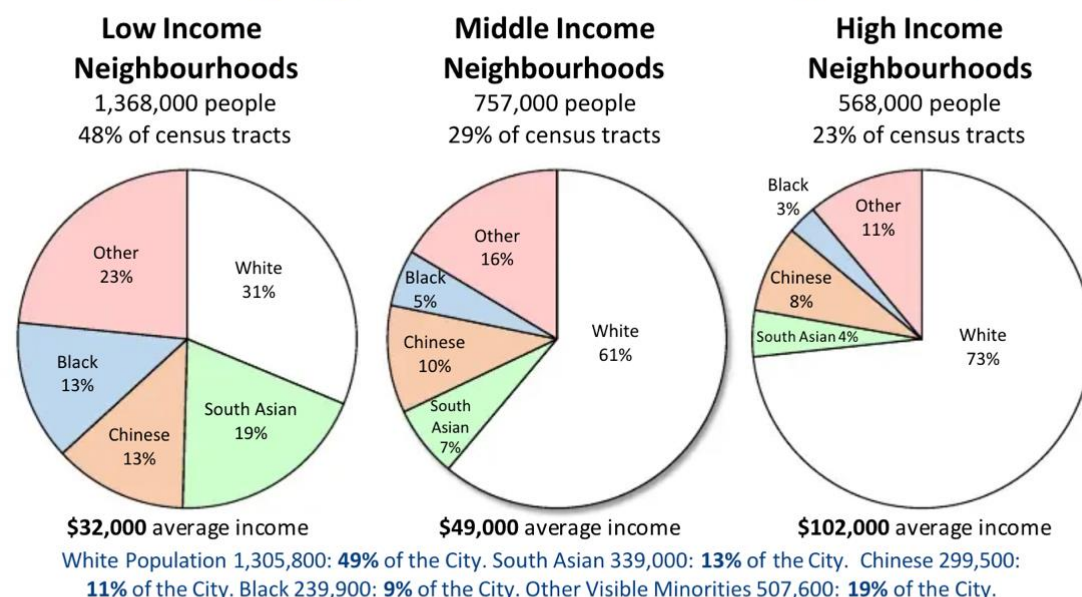


Figure 3. David Hulchanski

Hulchanski's Average Individual Income Map based on 2015 data illustrates the spatial segregation of low-income populations in the outer areas of Toronto, furthest away from the downtown core where transit, specifically subways and streetcars are concentrated. This is further concerning when data illustrates the racial/ethno-cultural aspect of this spatial organization. Toronto's low-income neighbourhoods, where the average income is \$32,000, are comprised of 69% ethnic minorities, specifically Black, South Asian and Chinese populations. Whereas high income neighbourhoods are 73% white.

Toronto's Segregated Ethno-Cultural Population, 2016



Other Visible minorities include Filipino, Korean, Japanese, Arab, West Asian, Latin American and other non-white groups. Visible minority status is not applicable to the Aboriginal population. **Census tract average individual Income** is from all sources, before-tax. **Low income** status refers to census tracts with an average income below 80.0% of the Toronto census metropolitan area (CMA) average income of \$50,479 for 2015. **Middle income** status refers to census tracts with average income 80.0% to 119.9% of the Toronto CMA average income. **High income** status refers to census tracts with average income 120.0% and above the Toronto CMA average income.



Neighbourhood Change Research Partnership
University of Toronto. February 2018
www.NeighbourhoodChange.ca

Source: Statistics Canada,
Census Profile Series, 2016

Figure 4. David Hulchanski

When comparing Hulchanski's data to the City of Toronto's Employment Survey 2019, there is a clear spatial connection to be drawn. There is a great deal of employment activity in what would be considered Hulchanski's city three. Hulchanski describes the nature of work in city three as predominantly "blue collared" when compared to the more "white collared" jobs in city one. This is confirmed through City of Toronto data that illustrates prevalence of manufacturing/warehousing, retail and service employment in city three.

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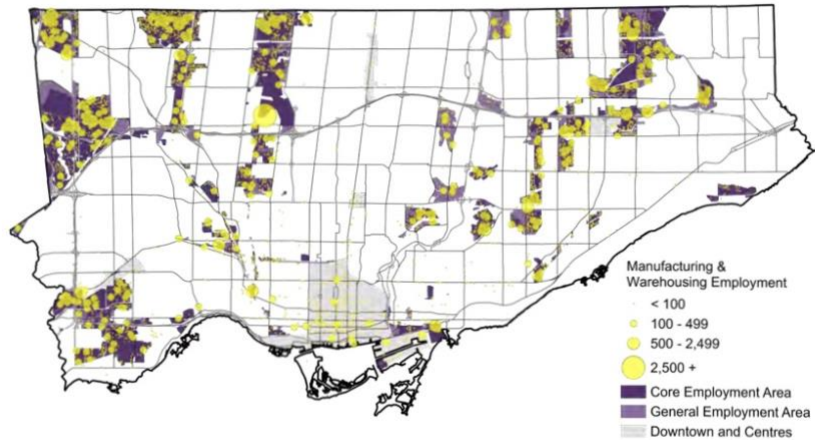
Both Hulchanski's findings and City of Toronto data illustrates the need for public transit in this area. These areas show an existence and promise of employment opportunities; however, they are already transit deficient in comparison to other areas of the city, with bus service being the only mode choice available. The intersection of that disadvantage and the racial/ethno-cultural makeup and socio-economic status of this area results in transit poverty (Allen and Farber, 2019; Lucas, 2012). Greater access to public transit is directly associated with an increase in employment rates (Sanchez, 1999; Merlin and Hu, 2017). Addressing transit inequality has the potential to foster greater economic inclusion.

This issue is larger than just fare payment, however mitigating the inequality created by the PRESTO system, would positively impact not only city three or the disadvantaged areas of Toronto, but the entire city at large. Greater transit inclusion is a step forward in minimizing the income and race-based segregation rampant in Toronto today.

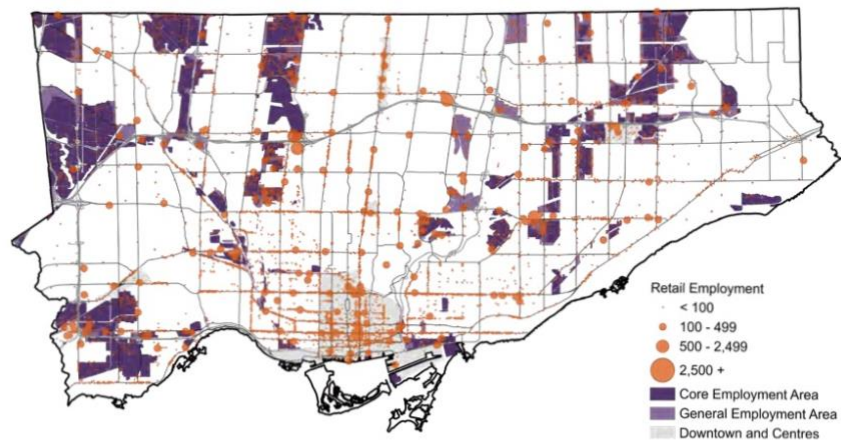
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Toronto Employment by Category, 2019

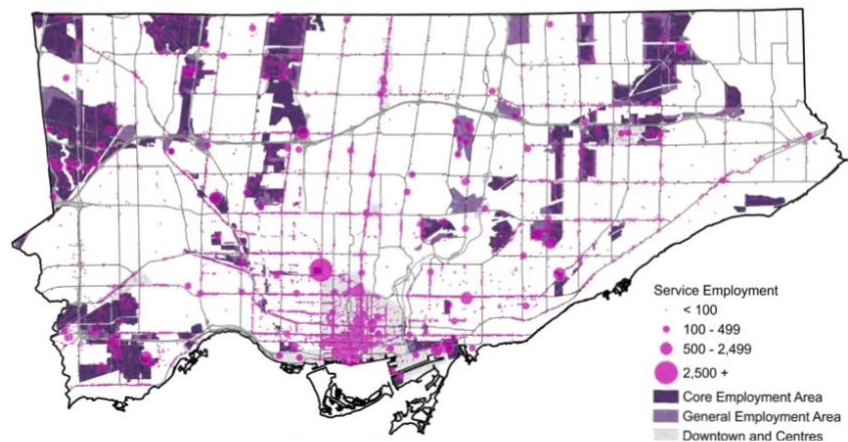
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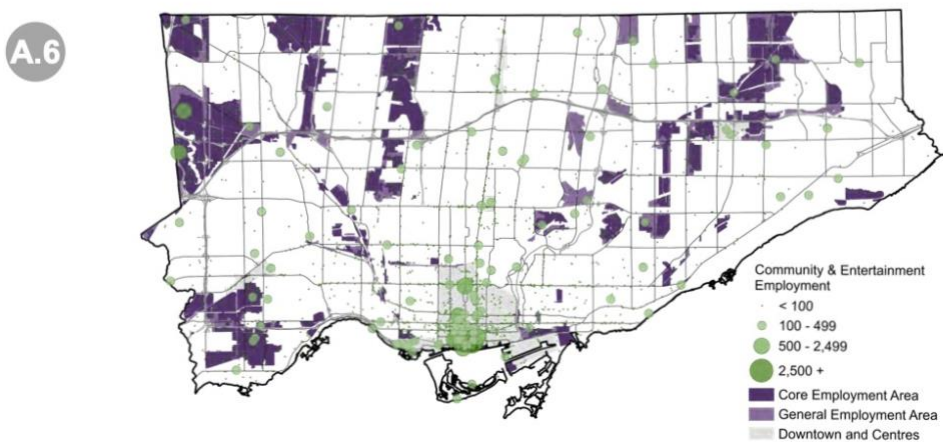
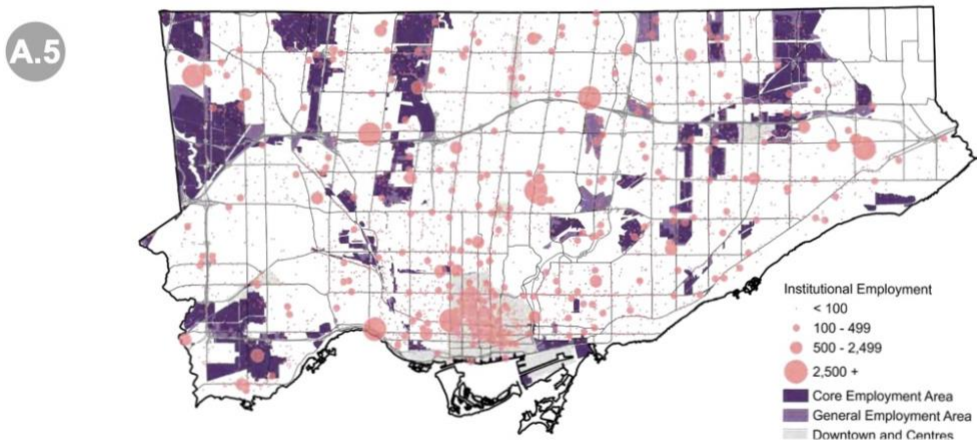
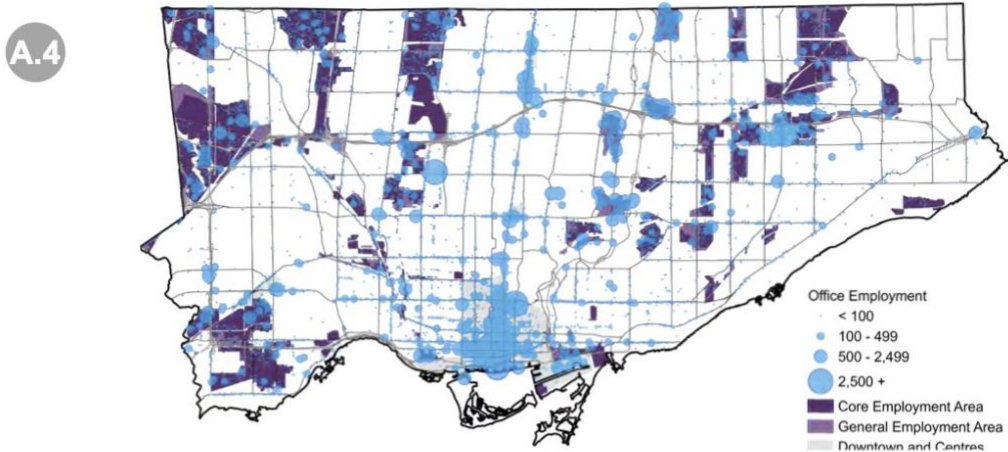


A.3



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(A.1) Manufacturing and Warehousing, (A.2) Retail, (A.3) Service,
(A.4) Office, (A.5) Institutional, and (A.6) Community and Entertainment



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3.0 Method

This paper uses secondary data in order to identify and analyze the shortcomings of the Presto automated fare collection system, specifically in the city of Toronto. A spatial analysis is done by looking at both qualitative and quantitative data. Specifically, by comparing publicly available TTC ridership data, bus route maps, policies and PRESTO data in comparison with existing data and research done by Hulchanski's *The Three Cities Within Toronto: Income Polarization Among Toronto's Neighbourhoods* and Toronto Employment Data. Statistics Canada data from the 2018 Canadian Internet Use Survey is used to understand the digital divide. Association of Community Organizations for Reform Now (ACORN) Canada data on unbanked and underbanked Canadians is also used.

An accompanying online map uses GIS to spatially analyze data from Metrolinx, TTC and Shoppers Drug Mart to illustrate the location of all physical PRESTO customer infrastructure including, Fare Vending Machines and Self-Serve Reload Machines located at GO stations and TTC subway stations, and Customer Service Outlets.

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4.0 Problem Investigation

The presto system is complex and has many moving parts. In this section, the aspects of the smart card system relevant to and impacting marginalized and equity seeking TTC riders are thoroughly investigated. Information is gathered from public data available from Metrolinx, PRESTO and the TTC.

Cash fares

Fare Type	Price
Adult	\$3.25
Senior, age 65+	\$2.30
Youth, ages 13-19	\$2.30

PRESTO fares

Fare Type	Price
Adult	\$3.20
Senior, age 65+	\$2.25
Youth, ages 13-19	\$2.25

Presto Passes

Type of Pass	Price per month
Adult Monthly Pass	\$156.00
Senior Monthly Pass	\$128.15
Youth Monthly Pass	\$128.15
Post-Secondary Monthly Pass	\$128.15
Adult 12 Month Pass	\$143.00
Senior 12 Month Pass	\$117.45
Youth 12 Month Pass	\$117.45

4.1 Purchasing a Presto card

A PRESTO card costs 6 dollars and can be purchased in person at Customer Service Outlets: TTC'S Customer Service Centre at Davisville Station, GO Stations, UP Express Stations and select Shoppers Drug Marts. The card can also be ordered online

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on the PRESTO website or app. When purchased online a minimum balance load of 10 dollars is required and the card requires 7-10 business days to arrive. Once received, a card can be activated online or by phone. Cards purchased in person without an account can be used right away but do not have balance protection or access to other PRESTO features, such as Autoload, Autorenew, balance protection to name a few. PRESTO cards can be set to a concession price in order to deduct a youth or senior fare but require a visit to a physical customer service outlet. For the very vulnerable such as homeless and very low-income populations, a six-dollar card on top of TTC fare is unaffordable and thus a barrier to accessing transit.

4.2 Loading Funds

In October of 2019, almost 3 years after its rollout on the TTC began, PRESTO got rid of the ten-dollar minimum value load requirement, due to feedback that called for the minimum amount to be lowered. Today, PRESTO customers are required to load a minimum of 5 cents when buying or reloading cards from in-person customer service outlets, like Shoppers Drug Mart, TTC's Davisville Customer Service Centre and GO and UP Express stations. At Fare Vending Machines at TTC subway stations, you must load at least 5 dollars. When loading online, through the PRESTO App or at Ticket Vending Machines at GO and UP Express stations, you must load at least ten-dollars. The maximum balance that a PRESTO card can hold is one thousand dollars.

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4.3 Presto Tickets

As the TTC moved towards discontinuing tokens, the demand for a one-time ticket was raised for those who did not want to purchase a Presto card. On April 5, 2019, Presto tickets were introduced on the TTC. PRESTO Tickets are a form of a Limited Use Media cards or “LUMS”, which are a disposable fare product made of tear-resistant paper containing an embedded chip. When paying a fare, the ticket is tapped like a PRESTO card and must be tapped every time when entering a subway station and or boarding a bus or streetcar but is only valid for limited time until the fare has been used or the transfer or day pass has expired (TTC, 2019). A tapped PRESTO Ticket is a Proof-of-Payment and must be kept with the customer while travelling on the TTC system and presented to a TTC fare inspector upon request.

One-ride, two-ride and day pass PRESTO Tickets are available at all TTC subway stations, via Fare Vending Machines and at Shoppers Drug Mart locations in Toronto. A maximum of 10 tickets can be purchased at one time from the Fare Vending Machine. PRESTO Tickets are non-refundable and are only available at the adult cash fare price, Senior and Youth tickets do not exist. This is a major barrier for customers of these age groups. Firstly, for those who cannot or do not wish to purchase a PRESTO card. For example, seniors that may use public transit infrequently. Secondly, for groups that work with these demographics. For example, schools, field trips, afterschool programs and community organizations often provide one-time-fares to youth in order to boost engagement. There is significant savings in the concession prices, and not

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providing those savings for the PRESTO tickets can limit the mobility and opportunities for seniors and youth.

A major drawback of the PRESTO Tickets is that they expire 90 days after purchase. Information about active PRESTO Tickets is stored in a central PRESTO database. The expiry period is implemented to ensure an efficient use of the system and to avoid an overload due to excessive data, which would occur if PRESTO Tickets did not expire and new active tickets were constantly entering circulation (TTC, 2019). In order to look up the expiration date of a PRESTO ticket customers must bring their ticket to a participating Shoppers Drug Mart location, on Fare Vending Machines, in person at the TTC Customer Service Centre or via phone up to 30 days past expiry by contacting PRESTO Customer Service. Customers can retain the value of their PRESTO Tickets if they are unused before they expire. PRESTO Ticket exchanges can only be facilitated in person by the TTC at the Customer Service Centre at Davisville.

Unlike a PRESTO Card, PRESTO Tickets are not reloadable and single use tickets are also not recyclable even though they are made of cardboard, due to the radio-frequency identification (RFID) chip embedded inside (Spurr, 2018). With 521,403,000 TTC riders a year (TTC Operating Statistics, 2018) and 349,667,424 PRESTO taps a year (Metrolinx, 2018), and considering PRESTO tickets are soon to be the only alternative to a PRESTO card other than cash, there is a sizeable amount waste to be generated from the cardboard of the single use PRESTO tickets.

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Currently, there is no method or discount that allows the purchase of PRESTO tickets in bulk. With the restrictions of only being able to purchase 10 tickets at a time, the 90-day expiration period and the waste created from the tickets, they are unable to compare to the utility and ease tokens and traditional tickets provided. Tickets and tokens could be bought in bulk from over a thousand authorized vendors across the city. With no predetermined expiration date, once purchased the fare media could be provided to anyone and used by anyone, by being placed in a fare box at subway stations, on streetcars and buses across the TTC network. Tokens were a specialized currency, because unlike paper tickets they could be used and then recirculated and purchased again and again.

PRESTO Tickets	Price
One-ride	\$3.25
Two-ride	\$6.50
Day pass	\$13.50

4.4 My PRESTO Account and Presto App

A 'My PRESTO Account' allows customers to manage up to 10 PRESTO cards through one account. The benefits provided by the account allow customers to view account balance and transaction history, protect card balances if lost or stolen, set up Autorenew for automatic transit pass renewals and set up Autoload to automatically add funds when balance falls below a set amount.

A 'My PRESTO Account' can be accessed through the PRESTO website and through the PRESTO app. The app was officially launched in 2019 after 15,000 users

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tested it out for a month leading up to full release. Functions of the app allow you to load funds and transit passes, pay with Apple Pay and saved payment method, set up and manage Autoload and Autorenew, check your card balances, view your transaction history for the last three months, receive low balance/pass expiry reminders and email receipts for fare purchases. You can also purchase a PRESTO card and create a PRESTO account through the app.

The PRESTO app currently has a 1.7/5 rating on the Apple App Store and a 2.8/5 on the Google Play Store. In a poll taken in February of 2020 by CityNews Toronto, 74% of respondents felt they are not satisfied by the app and think “it’s not good enough” and 26% were satisfied, saying “it works well” (Burman, 2020).

For all online loads, whether through the app or website, it takes a few hours for transactions to appear and balances to update. After loading online, loads on the physical card must be activated. Customers must wait 24 hours and then tap the card on Fare Payment machine or Balance Checker machines within 30 days to activate the load.

In order to use balance protection, view transaction history, set up Autoload and Autorenew a PRESTO account is required. These benefits are available to those who have regular internet access, an email account and for Autoload and Autorenew a credit or debit card. For the app, a smart phone, WIFI connection or a data plan is required.

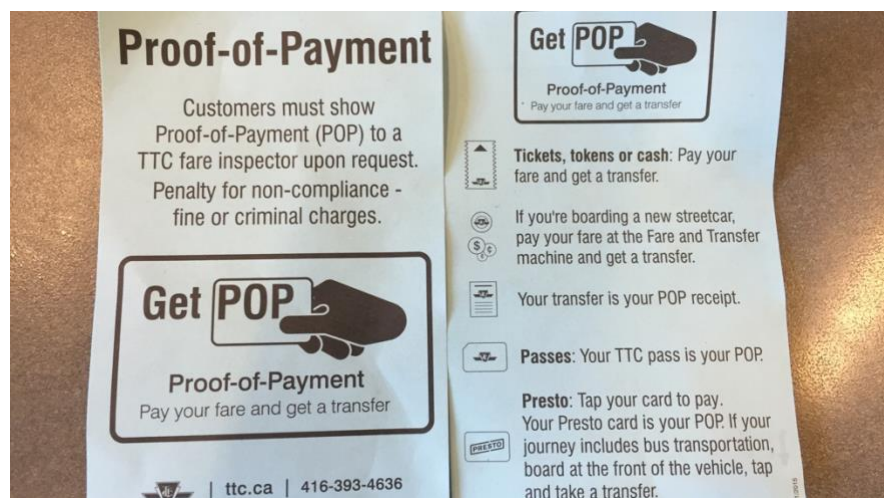
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4.5 Lost, Stolen or Damaged Cards

If a card is lost, stolen or damaged and is registered through a My Presto Account, it can be reported and the balance can be transferred to another card, which has to be purchased for six dollars. A card can be cancelled by logging into an existing My PRESTO Account through the website or app, by phone or at a Customer Service Outlet. However, it can take up to 24 hours for a PRESTO card to be cancelled once reported, which is a major design flaw. PRESTO takes no responsibility for any charges to the card during this time.

4.6 Proof of Payment and Transit Fare Inspectors

The Proof of Payment practice initially began on streetcars when backdoor boarding was allowed after the integration of PRESTO Fare Transaction Processors began on



POP hand out, 2015. Photo by CityNews.

streetcars and operators were separated on the new streetcar design. Today, all TTC customers must have valid Proof of Payment which is a PRESTO card, PRESTO Ticket or paper transfer, throughout their journey on the TTC. It may be requested at any time by a Fare Inspector, Special Constable, Operator, Station Collector or Customer

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Service Agent at any point including, at a subway station, on a vehicle, or when exiting a vehicle. Not producing a Proof-of-Payment, can result in a fine, with penalties of up to \$425 or even a criminal charge (TTC, 2020).

In 2019, 70 Transit Enforcement Personnel were approved in the TTC budget including, 45 Fare Inspectors and 22 Transit Special Constables. In 2020, 50 additional Transit Special Constables were approved (TTC, 2020).

4.7 Presto Transfers

In August of 2018, the TTC introduced the Two-Hour Transfer system exclusively for PRESTO customers. The new system allows customers a two-hour window beginning after the first tap onto the PRESTO system. Within the two hours, the card or ticket can be used for unlimited rides on any TTC vehicle, in any direction. To obtain a transfer, customers must tap a PRESTO card or PRESTO Ticket on a Fare Transaction Processor when entering a subway station or boarding a vehicle. The appropriate fare will be deducted, and a transfer will be applied to the card or ticket. Customers are then required to continue tapping whenever they enter a station or vehicle. Each tap that takes place within the two-hour window will not charge a new fare. If transferring to another vehicle or entering a subway station once the transfer has expired a new fare will be charged even when on the same journey.

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If a rider is on a vehicle or enters a station with a few minutes remaining in the transfer window, they may continue to complete the journey and do not need to tap once again if the transfer expires while on that same vehicle. For example, if a rider taps on to a vehicle 1 hour and 55 minutes after the first tap and is still on the same vehicle 20 minutes later the transfer is still valid even though the two-hour transfer window has ended (TTC, 2020).

Though the two-hour transfer system was introduced over a year ago, currently PRESTO machines don't indicate when a transfer has been made or when a transfer will end. There is currently no way for customers to know or check when their transfer window will end while on their journey. Riders are expected to remember when they tapped on and calculate when their transfer will expire. For the public a great deal of confusion surrounds the transfer system. In March of 2020, a misleading tweet was sent out by the TTC's twitter account which told customers they would be charged for fare evasion if they remained on a vehicle after their two-hour window was over, even if they tapped onto the same vehicle while the window was still valid. Information hasn't been made clear, with many customers not knowing that they have to continue tapping when changing transit modes. With aggressive POP policies, fare inspectors and large fines in place this can be costly or even a dangerous situation for those who do not understand the system, especially those who are visibly marginalized, (Black, Indigenous and people of colour, homeless etc.)

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In the traditional fare media system, paper transfers are available to those paying by cash, tickets or tokens for free from an operator on a bus, streetcar or from a transfer machine at all subway stations. Paper transfers allow customers to transition from one TTC vehicle to another for a one-way continuous trip (TTC, 2020).

4.8 Presto Vouchers

The PRESTO Vouchers Program allows PRESTO, participating transit agencies, and organizations (such as universities, colleges, community service groups, businesses, or other organizations) to issue PRESTO cardholders a unique code in order to remotely load passes, value to PRESTO cards for customers involved in the participating program facilitated by the respective organization. To use a PRESTO Voucher code, the customer must own a PRESTO card and have a My PRESTO Account. If a customer does not have an existing presto account, they must create a new card, wait 24 hours before the card can be tapped on a PRESTO device for the transaction to complete. Then an additional hour is needed before the voucher can be loaded onto the card. It may take up to 24 hours after redeeming the PRESTO Voucher code for the product or credit to be processed. After that time, the card needs to be taped on a PRESTO device within 30 days to complete the transaction.

4.9 City of Toronto Fair Pass Program

Launched in April 2018, the program provides a discount for eligible adult residents who receive Ontario Disability Support Program (ODSP), Ontario Works (OW)

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assistance or a Toronto Child Care Fee Subsidy. The Fair Pass discount is only available on PRESTO card, and participants are responsible for loading funds onto the discounted PRESTO card in order to use the discount for TTC adult fare or TTC monthly pass.

The Fair Pass discount is valid for 1 year from the date of issue and is intended for the approved Fair Pass discount cardholder only. The program is not available to Seniors, Youth and Post-Secondary Students that may meet the programs criteria since the TTC offers discounted fare prices for those that are between the ages of 13 and 19, over the age of 65 and currently enrolled in a post-secondary institution.

Pass Discount Rates:

TTC Fare Types	Regular Adult Fare*	Fair Pass User Pays	Savings
Single Ride	\$3.20	\$2.10	\$1.10
Monthly Pass	\$156.00	\$123.25	\$32.75

Since the program is run by the City of Toronto, it is only available to Toronto residents who fall into one of the three categories:

1. Receiving Ontario Works (OW) assistance and not receiving transportation supports equal or greater than \$100 in the current month (i.e. Employment or Medical Related) through OW.
2. Receiving Ontario Disability Support Program (ODSP) and not receiving transportation supports equal to or greater than \$100 in the current month (i.e. Employment or Medical Related) through OW or ODSP.

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3. Receiving Child Care Fee Subsidy and registered for a My Child Care Account, with a current Canada Revenue Notice of Assessment listing an income level that meets Fair Pass program criteria.

Applications for the Fair Pass Discount Program can be obtained in person at any City of Toronto Employment & Social Services or Ontario Disability Support Program office, by mail or online and completed forms can be submitted by mail, fax, or in-person at one of 15 selected Toronto Employment & Social Services locations.

Both the Voucher Program and Fair Pass Program are administered through PRESTO. These programs are meant to benefit low-income demographics, which are known to be affected by digital divide and under-banking. The limitations of the Fair Pass Program are also exclusionary to those who may be low-income but are not currently enrolled in a social support program for a variety of reasons.

4.10 TTC GO Discount program

In January of 2018, the Wynne Liberal provincial government began a program that offered riders transferring between GO or the Union Pearson Express and the TTC \$1.50 off their trip when using a Presto fare card. The Ford Conservative provincial government announced that the program will end at the end of March of 2020 (Spurr, 2020). PRESTO was pressured to be the chosen fare payment system for local transit authorities across the GTHA, in order to support coordination and was a huge plus point

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for both new and existing PRESTO users. The cancellation of programs like this illustrates the opposite message.

Table 1:
Summary of PRESTO features

	Pro	Con
PRESTO card	<ul style="list-style-type: none"> A card can be purchased in person at Customer Service Outlets: TTC'S Customer Service Centre at Davisville Station, GO Stations, UP Express Stations and select Shoppers Drug Marts. The card can also be ordered online on the PRESTO website or app. PRESTO cards can be set to a concession price in order to deduct a youth or senior fare PRESTO customers can load a minimum of 5 cents when buying or reloading cards from in-person customer service outlets, such as Shoppers Drug Mart, TTC's Davisville Customer Service Centre and GO and UP Express stations. 	<ul style="list-style-type: none"> A PRESTO card costs 6 dollars For the very vulnerable such as homeless and very low-income populations, a six-dollar card on top of TTC fare is unaffordable and thus a barrier to accessing transit. When purchased online a minimum balance load of 10 dollars is required and the card requires 7-10 business days to arrive. Once received, a card can be activated online or by phone. Cards purchased in person without an account can be used right away but do not have balance protection or access to other PRESTO features (give examples). At Fare Vending Machines at TTC subway stations, you must load at least 5 dollars. When loading online, through the PRESTO App or at Ticket Vending Machines at GO and UP Express stations, you must load at least 10 dollars. Concession cards can only be programmed in person at a customer service outlet
PRESTO tickets	<ul style="list-style-type: none"> PRESTO Tickets are an alternative for those who do not wish to buy the PRESTO card. One-ride, two-ride and day pass PRESTO Tickets are available at all TTC subway stations, via Fare Vending Machines and at Shoppers Drug Mart locations in Toronto. A tapped PRESTO Ticket is a Proof-of-Payment and must be kept with the customer while travelling on the TTC system and presented to a TTC fare inspector upon request. Customers can retain the value of their PRESTO Tickets if they are unused before they expire and can be in person at the TTC at the Customer Service Centre at Davisville. 	<ul style="list-style-type: none"> A maximum of 10 tickets can be purchased at one time from the Fare Vending Machine. PRESTO Tickets are non-refundable Only available at the adult cash fare price, Senior and Youth tickets do not exist. Unlike a PRESTO Card, PRESTO Tickets are not reloadable and single use tickets are also not recyclable PRESTO tickets cannot be purchased in bulk. PRESTO Tickets expire 90 days after purchase. In order to look up the expiration date of a PRESTO ticket customers must bring their ticket to a participating Shoppers Drug Mart location, on Fare Vending Machines, in person at the TTC Customer Service Centre or via phone up to 30 days past expiry by contacting PRESTO Customer Service.

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<p>My PRESTO Account and App</p>	<ul style="list-style-type: none"> • A My PRESTO Account allows customers to manage up to 10 PRESTO cards through one account. • The benefits provided by the account allow customers to view account balance and transaction history, protect card balances if lost or stolen, set up Autorenew for automatic transit pass renewals and set up Autoload to automatically add funds when balance falls below a set amount. • A My PRESTO Account can be accessed through the PRESTO website and through the PRESTO app. Functions of the app allow you to load funds and transit passes, pay with Apple Pay and saved payment method, set up and manage Autoload and Autorenew, check your card balances, view your transaction history for the last three months, receive low balance/pass expiry reminders and email receipts for fare purchases. You can also purchase a PRESTO card and create a PRESTO account through the app. • If a card is lost, stolen or damaged and is registered through a My Presto Account, it can be reported and the balance can be transferred to another card or the card can be cancelled through the website or app, by phone or at a Customer Service Outlet. 	<ul style="list-style-type: none"> • In order to use balance protection, view transaction history, set up Autoload and Autorenew a PRESTO account is required. These benefits are available to those who have regular internet access, an email account and for Autoload and Autorenew a credit or debit card. • For the app, a smart phone, WIFI connection or a data plan is required. • For all online loads, whether through the app or website, it takes a few hours for transactions to appear and balances to update. After loading online, loads on the physical card must be activated. Customers must wait 24 hours and then tap the card on Fare Payment machine or Balance Checker machines within 30 days to activate the load. • The PRESTO app currently has a 1.7/5 rating on the Apple App Store and a 2.8/5 on the Google Play Store. In a poll taken in February of 2020 by CityNews Toronto, 74% of respondents felt they are not satisfied by the app and think “it’s not good enough” and 26% were satisfied, saying “it works well”. • It can take up to 24 hours for a PRESTO card to be cancelled once reported. PRESTO takes no responsibility for any charges to the card during this time.
<p>PRESTO Transfers</p>	<ul style="list-style-type: none"> • Allows customers a two-hour window beginning after the first tap onto the PRESTO system. • Within the two hours, the card or ticket can be used for unlimited rides on any TTC vehicle, in any direction, whereas paper transfers can only be used for a one-way continuous trip 	<ul style="list-style-type: none"> • Only available to those using PRESTO cards or tickets • If transferring to another vehicle or entering a subway station once the transfer has expired a new fare will be charged even when on the same journey. • Though the two-hour transfer system was introduced over a year ago, currently PRESTO machines don’t indicate when a transfer has been made or when a transfer will end. There is currently no way for customers to know or check when their transfer window will end while on their journey. • Information hasn’t been made clear, with many customers not knowing that they have to continue tapping when changing transit modes. With aggressive POP policies, fare inspectors and large fines in place this can be costly or even a dangerous situation for those who do not understand the system, especially those who are visibly marginalized, (Black, Indigenous and people of colour, homeless etc)

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<p>PRESTO Vouchers</p>	<ul style="list-style-type: none"> The PRESTO Vouchers Program allows PRESTO, participating transit agencies, and organizations (such as universities, colleges, community service groups, businesses, or other organizations) to issue PRESTO cardholders a unique code in order to remotely load passes, value to PRESTO cards for customers involved in the participating program facilitated by the respective organization. 	<ul style="list-style-type: none"> To use a PRESTO Voucher code, the customer must own or purchase a PRESTO card and have a My PRESTO Account. If a customer does not have an existing presto account, they must create a new card, wait 24 hours before the card can be tapped on a PRESTO device for the transaction to complete. Then an additional hour is needed before the voucher can be loaded onto the card. It may take up to 24 hours after redeeming the PRESTO Voucher code for the product or credit to be processed. After that time, the card needs to be taped on a PRESTO device within 30 days to complete the transaction.
<p>City of Toronto Fair Pass Program</p>	<ul style="list-style-type: none"> The program provides a discount for eligible adult residents who receive Ontario Disability Support Program (ODSP), Ontario Works (OW) assistance or a Toronto Child Care Fee Subsidy. 	<ul style="list-style-type: none"> The Fair Pass discount is only available on PRESTO card Participants are responsible for loading funds onto the discounted PRESTO card in order to use the discount for TTC adult fare or TTC monthly pass. The program is not available to Seniors, Youth and Post-Secondary Students that may meet the programs criteria since the TTC offers discounted fare prices for those that are between the ages of 13 and 19, over the age of 65 and currently enrolled in a post-secondary institution.

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5.0 Analysis of PRESTO card features and systems design and the impacts on marginalized and equity seeking communities

In this section, information gathered in chapter four is analyzed and compared to existing literature, demographic, employment and spatial data. The findings illustrate the effects of the smart card payment system and its integration onto the TTC.

5.1 Unreliable Technology

Since PRESTO's introduction, it has been shrouded with complaints of faulty technology. Fare Vending Machines and Self-Serve Machines have over charged customers (Spurr, 2017) and have been reported out of service often. The delay in online payment methods has been a major pain point and individual cards have also malfunctioned (Foran, 2020). This has led to confusion and fare evasion tickets handed out to customers who were failed by a glitchy system.

The delay in loading funds, passes and cancellations is the most common barrier that limits the full potential of the smart card system. In a report titled, Review of Toronto Transit Commission's Revenue Operations: Phase Two – PRESTO/TTC Fare Equipment and PRESTO Revenue released by Toronto's Auditor General on October 21, 2019, the TTC lost 3.4 million dollars of revenue in 2018 alone due to malfunctioning PRESTO fare equipment. 300 frozen PRESTO card readers were identified by 100 TTC bus operators for 168 buses over the course 2 days in 2018.

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One of the best examples of this is both a design and process issue. PRESTO fare vending machines do not function when their coin boxes are full (TTC, 2019). This indicates that a significant number of people are using cash as a fare payment method and rely on these machines to function properly in order to use the streetcar and avoid fare evasion consequences. This has been a recurring issue with the Single Ride Vending Machines located on all new streetcars. There are two machines on all streetcars, but customers have complained that during rush hours, packed streetcars filled with crowds of riders and the placement of the machines results in customers being unable to reach the machines and pay for their ride by cash.

The auditor's report found that:

- 56% of the out-of-service incidents raised for PRESTO vending machines on new streetcars due to 'coin box full' during August 2019
- One instance took 7 days to collect coins after the "coin box was full" – previous coin collection for that same streetcar was 14 days prior.
- For August 2019, the coin box was full for 188 PRESTO vending machines. On average per day, approximately six PRESTO vending machines were out-of-service as a result of the coin box being full, the highest being 15 vending machines.
- Six PRESTO vending machines out-of-service on average per day for August 2019 due to the coin box being full (TTC, 2019)

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According to the report's Incident Management Process of the Single Ride Vending Machines, it was found that the reason for the issue is due to a lack of responsibility between TTC and Presto when ensuring the coin box is emptied on a regular basis. The design of the machines does not indicate when the coin box is full, instead a "not in service" error message appears on the screen. The lack of coordination and communication between TTC and PRESTO is causing both agencies to lose money, however it is directly affecting passengers who are unable to purchase tickets and thus face fare evasion consequences. The Toronto Transit Commission is a public transportation agency, and its priorities should be rooted in serving the public. The introduction of faulty technology and a continued mismanagement of it creates distrust amongst its users. Lost revenue also results in a lack of investment back into the system which has the potential to further perpetuate transit inequity, through reductions of service or the lack of needed upgrades and expansion. While fare prices continue to rise, so do the frustrations associated with PRESTO and the transit agency in general. Though this is bad for ridership, this is especially harmful for those who rely on the TTC as their only form of transportation due to their lack of access to alternative methods. This is especially true for low income and racialized minorities that are concentrated in areas of the city where other transportation options are limited, or further distances must be travelled. For those in the downtown core who are most often earners of a higher income, there are a variety of alternative methods based on proximity and financial access, including active transportation and rideshare services. Continued disapproval

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and frustration are an inconvenience for most users, but for those who have no choice but to rely on Toronto's public transportation system this is a barrier to access.

5.2 Unbanked/Underbanked Populations and the Digital Divide

The move towards automated and electronic systems is not exclusive to public transit payment methods. Across the world a move towards cashless payments is happening at different paces. The problem is, these practices exclude those who do not have bank accounts or credit cards and are unable to get one because of low-income, newcomer status, bad or a lack of credit, lack of ID or permanent address.

In order to take full advantage of the PRESTO features created to provide better access and ease like balance protection, autoloading, auto-renew and transaction history, a customer must have regular internet access, a device which can connect to the internet (computer or smart phone) and a bank account, debit card or credit card. A move towards cashless payment systems across the city could further isolate those who struggle with technical literacy, establishing credit and the cost of financial services which include low-income populations, new immigrants and seniors (Peesker, 2019).

Though cash options currently exist, being considerate of the digital divide and lack of access, moving into an electronic fare system which uses data to create a more efficient system and better serve its customers creates the potential for a gap of information, due to a lack of data provided from those who are excluded from using new

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technology due to barriers of access and ease. There is a clear spatial concentration of low-income and racial and ethnic minorities who have less access to the PRESTO system in the outer areas of Toronto compared to the city centre. These areas are already under-served by transit options and the lack of quality data creates a dangerous disparity that can further this transportation inequity and segregation in the city of Toronto.

5.3 New Station Structure

The TTC's new station structure which removes a designated space for TTC employees on site in the station can make it hard for newcomers, those with disabilities or those who do not speak English to identify where to go to for help. The removal of human vendors within the TTC system who can sell customers tickets and solve fare related issues is a major problem. Considering how unreliable the PRESTO system is and how aggressive fare inspection has become, customer service agents don't have the ability to solve fare related issues since they are not dealing with cash and fare media any longer.

Though exact cash is still accepted when customer service agents are present at a fare box, the new automated system favours PRESTO customers. With the aggressive move towards a Revenue Protection Department, those who use traditional fare media and cash are only equipped with paper transfers as a proof of payment, leaving them susceptible to the risk of being charged a large fine for fare evasion or the danger associated with fare inspectors.

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5.4 Transfer Inequity

Though the new two-hour fare system is a step in the right direction it is only available to those who use the PRESTO system and favours those who have shorter commuting times. Based on commute time data of Toronto residents (FIGURE #), that is those who live in the downtown core; close to transit and around a variety of TTC mode options. Those who live in the outer areas of the city and in the inner suburbs have longer commute times and are unable to take the same advantage of the transfer window as those who live in the downtown core, closer to work, school and other common destinations.

The previous transfer system worked better for those who live further or have to travel longer distances on trips because they could get paper transfers at any point in their travel rather than the system now which only measures two hours from the moment the customer enters the system.

For lower income populations the allure to switch to PRESTO comes in the fare savings that are available when using the PRESTO card and the additional features available when using the electronic system over cash. Programs that can benefit low income populations through transit subsidy like City of Toronto's Fair Pass Program or the PRESTO Voucher program also require the switch over to the electronic system. Since the TTC discontinued the selling of tokens and considering PRESTO tickets expire and cannot be bought in bulk, community and non-profit organizations that typically offer their own transit fare support programs are now in a paralyzed position.

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When traditional fare mediums were the primary method of payment, riders could purchase tokens, tickets and passes at more than 1,100 authorized Fare Media Sellers in Toronto in addition to Collector Booths at all Subway and Rapid Transit stations (TTC, 2020). Today, PRESTO cards, tickets and passes can be physically bought at 75 TTC stations via PRESTO machines and at 137 Shoppers Drug Mart locations. This totals 212 locations which is a significantly lower number compared to the 1,100 authorized Fare Media Sellers that sold tokens, tickets and passes. This creates a clear access problem, specifically in areas outside of the city centre where subway stations are not concentrated. In these areas where subway stations are less common, Shoppers Drug Marts are the only customer service outlet where PRESTO TTC fare is available. It is especially concerning when there have been clear connections drawn about the concentration of low-income and racial and ethnic minority populations in these areas.

Low income residents have limited options for other modes of transportation since alternatives including personal vehicles and ride sharing apps may not be accessible or affordable options. Active transportation may not be an option due to safety, health, longer distances travelled, weather, affordability and might not be a suitable option for families.

The PRESTO system seems more suitable for a subway/station-oriented transit system which currently exists in cities like New York, London and Tokyo. These cities have expansive webs of subway lines that provide coverage to most, if not all areas of

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the city. However, in a city like Toronto, where the most popular vehicle mode choice is buses at 50.7% of yearly TTC ridership, PRESTO does not serve its users equitably especially those who live in the areas of the city where buses are the predominant TTC mode choice. The 4 busiest bus routes in the city of Toronto all serve locations outside of the downtown core in York, North York and Scarborough.

Yearly Passengers by Vehicle Mode:

Vehicle Mode	Passengers per year	Percentage of total yearly ridership
Buses	264,535,858	50.7%
Subway Trains	216,736,775	41.6%
Streetcars	35,865,779	6.9%
Scarborough RT	4,264,942	0.8%
Total	521,403,354	100%

(TTC, 2018)

Busiest bus routes:

Bus Route	Estimated daily usage on average business day	City Region
36 Finch West	47,300	York
52 Lawrence West	43,900	North York
32 Eglinton West	38,500	York
54 Lawrence East	33,300	Scarborough/North York

(TTC, 2018)

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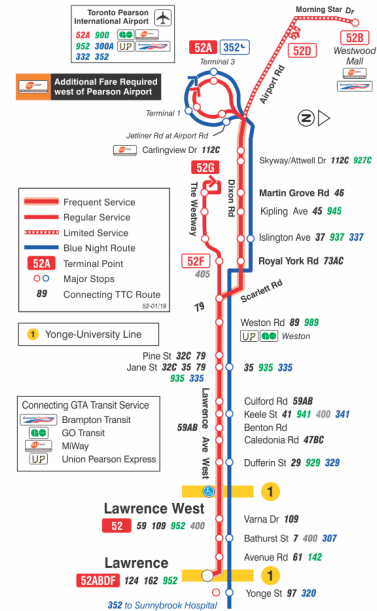
36 Finch West

The 36 Finch West bus route operates between Finch Station on Line 1 Yonge-University and the Humberwood Boulevard area, generally in an east-west direction. It also serves Finch West Station on Line 1 Yonge-University. Service is provided between Finch Station and Finch West Station. Service is provided between Finch West Station and the Humberwood Boulevard area. At most times of the week buses do not operate through Finch West Station, and a change of buses is required.



52 Lawrence West

The 52 Lawrence West bus route operates between Lawrence Station on the Yonge Subway and the area of The Westway and Martin Grove Road, Pearson International Airport, and Westwood Mall, generally in an east-west direction. It also serves the Lawrence West Station on the Spadina Subway and connects to Weston GO station.



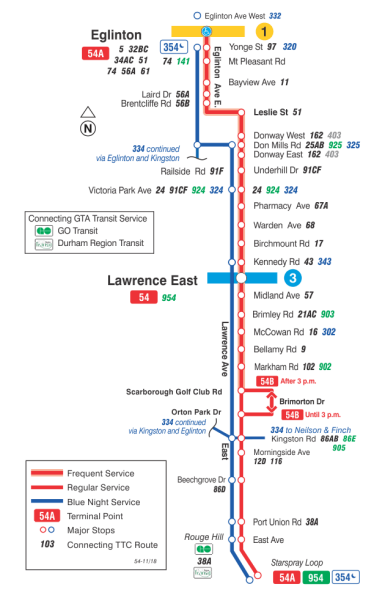
32 Eglinton West

The 32 Eglinton West bus route operates between Eglinton Station on Line 1 Yonge-University and the area of Eglinton Avenue West and Renforth Drive, generally in an east-west direction. It also serves Eglinton West Station on Line 1 Yonge-University and connects to Renforth GO station.



54 Lawrence East

The 54 Lawrence East bus route operates between Eglinton Station on Line 1 Yonge-University-Spadina, the area of Lawrence Avenue East and Orton Park Drive, and the area of Lawrence Avenue East and Starspray Boulevard in an east-west direction. It also serves Lawrence East Station on Line 3 Scarborough and connects to Rouge Hill GO Station.



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Commute Times by Community:

%	Total	Former City of Toronto + East York	North York	Etobicoke + York	Scarborough
Sample Size	1157	476	222	265	194
Less than 15 minutes	16%	21%	14%	15%	12%
15-30 minutes	20%	27%	17%	18%	15%
More than 30 minutes but less than 45 minutes	19%	19%	18%	18%	20%
45 minutes to one hour	17%	10%	21%	17%	22%
More than one hour but less than an hour and a half	8%	7%	8%	9%	8%
More than one hour and a half	7%	4%	8%	10%	8%
You don't travel to work or school	13%	12%	13%	13%	14%
Mean	42 minutes	35 minutes	45 minutes	46 minutes	46 minutes

(Schatten, 2019)

Commute and quality of life:

Do you agree or disagree the time you spend traveling to and from work or school reduces your quality of life?

%	Total	Former City of Toronto + East York	North York	Etobicoke + York	Scarborough
Sample	875	365	167	202	141
Agree	60	50	62	72	64
Disagree	27	37	22	21	23
Don't Know	13	13	17	7	13

(Schatten, 2019)

The figures above illustrate longer travel times for Toronto residents outside of the downtown core. With less variety of options amongst mode choice and longer distances travelled, those who live in the outer regions of the city face longer travel times on the TTC than those in the city centre. Based on City of Toronto open data available for TTC delays in 2019, there is an average of 34.5 delays per month. Of which, over 40 were delays lasting an hour or more which would result in even longer

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commute times when a delay is present (TTC, 2019). Considering this, the two-hour transfer system does not equally benefit those who live further away from the downtown core.

5.5 COVID-19

The divide between the service of buses and trains and streetcars became clear during the COVID-19 pandemic. Beginning on March 24, 2020, the TTC announced that it would no longer be accepting cash on its buses to minimize customer driver contact in order to keep employees safe (Draaisma, 2020). Back-door boarding would be in affect and those using a PRESTO card were instructed to tap at the back of the vehicle. Initially, it was not made clear how those paying by cash or token would access service, however clarification was made via TTC's social media accounts that those who do not have a PRESTO card would not be denied service (TTC Customer Service, 2020). However, the TTC did not admit to providing service for free and encouraged those who typically pay by cash or token to purchase and begin to use PRESTO payment methods (TTC Customer Service, 2020).

The demographic of TTC's bus ridership also became clear during the COVID-19 pandemic, when certain routes remained crowded, particularly in the early morning rush hours. The TTC reported an 80% drop in ridership due to the pandemic, however on April 1, 2020 the TTC identified 15 bus routes that remained crowded (TTC, 2020). These routes were mostly focused in the northwest area of the city, with a few routes

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also in the southwest and east end of Toronto. Most of these bus routes serve Neighbourhood Improvements Areas and are located within Hurlburt's city three.

- 300 Bloor-Danforth Blue Night
- 320 Yonge Blue Night
- 29 Dufferin
- 35 Jane
- 37 Islington
- 39 Finch East
- 41 Keele
- 44 Kipling South
- 52 Lawrence West
- 96 Wilson
- 102 Markham Rd
- 117 Alness-Chesswood
- 119 Torbarrie
- 123 Sherway
- 165 Weston Rd North

Neighbourhood Improvement Areas are identified through a process done by the city of Toronto, in which all 140 neighbourhoods in the city were measured based on five domains, which are: Physical Surroundings, Economic Opportunities, Healthy Lives, Social Development and Participation in Civic Decision-Making (Toronto Strong Neighbourhoods Strategy, 2020). The city created an Equity Score for each neighbourhood based on research that included a wide range of factors such as unemployment, high school graduation, walkability, access to community space and access to healthy food in the neighbourhood (Toronto Strong Neighbourhoods Strategy, 2020). Based on this score, 31 neighbourhoods fell “below the benchmark” identified for a strong neighbourhood. These neighbourhoods have been identified as having issues such as poor access to services and higher concentrations of low-income families and require extra investment so inequities can be identified and addressed through policy.

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In April of 2020, Sean Marshall a Toronto-based transit-advocate and writer mapped the busy bus routes (Marshall, 2020). His research found that these routes serve two hospitals and industrial employment lands where there is a particular concentration of warehouses, food processing plants, light industrial facilities, and industrial bakeries. Specifically, routes 117 and 119 are within industrial services, connecting warehouses and food service plants. Routes 96, 102, and 165 extend into major industrial areas and route 123 serves distribution centres (Marshall, 2020). Beyond the industrial context, these routes also serve medical care workers considering four bus routes in particular, 41, 96, 119, and 165 serve the Humber River Regional Hospital. The 96 Wilson bus directly serves Etobicoke General Hospital (Marshall, 2020).

To mitigate the rush in the morning, the TTC asked riders to delay their commutes past 8 am. However, industrial employers concentrated in these areas rely on low-paid, often temporary workers, with early morning start times (Spurr, 2020). These workers along with healthcare workers are considered essential and are unable to, delay start times, work from home or not at all. Along with those that live in the Neighbourhood Improvement Areas, they face limited transportation options due to their socio-economic status. When speaking to the Toronto Star, TTC spokesperson Stuart Green recognized that for some, the TTC is “the only way around Toronto for essential goods and services” (Spurr, 2020).

This clearly illustrates the divide between bus service and streetcar/subway service in Toronto, not only in demographic but in design. Currently, buses and bus stops are

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not equipped with the technology and infrastructure required for customers to purchase PRESTO tickets or load up their cards. In direct comparison, all TTC stations have machines that allow the purchase of a ticket or value addition to a card and streetcars have single use ticket vending machines. Due to the lack of infrastructure, buses are the only TTC vehicles affected by the payment changes brought forth by the COVID-19 pandemic (TTC Customer Service, 2020). Further investment in integrating PRESTO fare purchasing systems on the bus network and widening the availability of customer service outlets in the areas where bus service is the primary TTC mode choice would have minimized the impact of this change. A greater assessment of the transit inequity prevalent in Toronto and investment in areas where low-income and precarious, industrial or service work is concentrated would result in a more equitable transit system.

5.6 Data Privacy and Surveillance

All PRESTO cards contain ridership data. Registered cards also contain personal data of users. Those who use online features and those who receive vouchers or participate in the city's Fair Pass Program must have their personal information attached to their cards. PRESTO uses data to improve its services but has explicitly stated that it provides data to law enforcement authorities when asked.

Based on the 2019 PRESTO Law Enforcement Requests Data Transparency Report released on February 20, 2020 (Metrolinx, 2020), in 2019 Metrolinx received 154

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requests from law enforcement for PRESTO customer data. Of these 154 requests, some or all of the information requested was provided for 58 instances and relating to 238 unique cards or accounts (Metrolinx, 2020).

“Just over half of the requests (52%, or 80 instances) related to law enforcement investigations such as criminal offences, and approximately 40% (62 instances) of the requests related to emergencies such as locating missing persons in circumstances where there were concerns for their health or safety and other methods to locate them had been unsuccessful” (Metrolinx, 2020).

In 2019, the Supreme Court of Canada stated, “We have arrived at a place where the research now shows disproportionate policing of racialized and low-income communities” (Ontario Human Rights Commission, 2020). Distrust of Toronto Police Services already exists amongst Toronto’s racialized populations and low-income neighbourhoods, due to past practices like carding which involved random stops of Black, Indigenous and people of colour (BIPOC), and the collection of personal data (CBC Firsthand, 2019). PRESTO’s sharing of rider data with police has the potential to create a lack of trust in a system which requires customer information and is known to use ridership data, particularly in populations that have already faced profiling.

It is assumed that technology creates ease and efficiency leading to more comfort and the freedom to push the boundaries further. However, in her book, *Automating inequality: how high-tech tools profile, police, and punish the poor*, Virginia

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Eubanks states the exact opposite. Her work argues that data, especially that which is used by the government creates new systems of surveillance, profiling, punishment, containment and exclusion. Instead of providing what the marginalized need, it is a way to “manage the individual poor in order to escape our shared responsibility for eradicating poverty.” It is assumed that digital tools are neutral, but just as people and systems can hold objective and bias, so can technology (Eubanks, 2018). Excluding those who feel unsafe sharing data, or those who are unable to use PRESTO, is the perfect example of this. If technology is not equitably integrated it has the potential to create blind spots, restrict us from engaging deeper, and further worsening existing inequality.

5.7 Open Payment Systems

Through a Request for Proposal (RFP) procurement process overseen by the Ontario Ministry of Transportation, Accenture, the system builder was awarded a 10-year contract to design, build and operate the PRESTO e-fare system (TTC, 2019). As part of the deal made between Metrolinx and the TTC in 2012, an open payment system was eventually expected (Romeo-Beehler, 2019). An open payment system allows for users to pay with a contactless payment method, most commonly done by credit card, debit card, apps or phone payment systems, such as Apple Pay or Google Pay.

PRESTO machines and the network were created knowing that an open system would be implemented at a future date, though network upgrades are required to

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accommodate the change. Around the world, transit companies are modernizing by moving into open payment systems by allowing users to ride transit without the need for specialized fare products such as cards, tokens or tickets. New York City's popular MetroCard is set to be replaced by OMNY (Metropolitan Transportation Authority, 2020), London's Transport For London has allowed riders to use contactless cards for fare payment since 2012 (Spurr, 2019) and Vancouver's TransLink adopted the 'Tap to Pay' feature in 2018 (Translink, 2018).

In late 2019 at a press conference, Metrolinx announced plans to begin testing the open payment function. The plan looks to begin by testing the feature exclusively on GO buses and then expanding further based on feedback. Though plans exist for the system to be integrated on the TTC, there is currently no timeline for when the feature will be available on TTC's PRESTO machines (Spurr, 2019).

With an open payment system guaranteed in the future, the PRESTO system as it currently exists has the potential to be outdated quickly. If majority of transit riders move to using the open payment method, the need to expand PRESTO as it currently exists could diminish drastically. Not only does this threaten the necessary further expansion of the system, particularly fare purchasing infrastructure and customer service outlets specifically in underserved areas, it may result in a scaling back of existing infrastructure across the city. This would directly impact those who are unable to participate or benefit from the open payment system. Specifically, those who are unbanked or underbanked do not have a contactless bank or debit card and those being

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impacted by the digital divide, who may not have access, or the digital literacy required to use a mobile phone for payment. The open payment system has the potential to be far more exclusionary to those who rely on cash and other traditional fare payments methods. This is especially concerning when PRESTO in its current form is already worsening transit inequity in Toronto. If the current system is not expanded to include all populations in an equitable manner, a rise in popularity of the open payment system can directly result in further transit inequity.

The popularity of contactless payment through an open system is best illustrated with Transport for London. As part of the 'Future Ticketing Programme' contactless payment was first introduced by the transit agency in 2012 and has supplemented the Oyster card, the smart card system used by the agency (Transport for London, 2014). Transport for London was the first public transportation agency in the world to accept payment by contactless bank and credit cards. In just the first four years, over 12 million unique bank and credit cards had been used to make over 500 million journeys on the system (Transport for London, 2016).

5.8 Transit Inequity and Planning

Transportation equity does not exist in a bubble. There are direct and indirect implications that can be drawn to planning at large. It is important for planners to take transit accessibility into account and is increasingly being used to evaluate the effectiveness of land use policy (Papa et al., 2014; Merlin et al., 2018).

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The purpose of a public transportation systems is to provide all members of the population with the opportunity to participate in employment, education, fulfill daily needs and social interaction. A lack of transit access minimizes the ability of people to meet these needs and causes social exclusion (Casas, 2007; Preston and Rajé, 2007; Pereira et al., 2017). High levels of transit accessibility have been directly linked to outcomes that positively impact cities. Firstly, greater access is associated with an increase in employment rates (Sanchez, 1999; Merlin and Hu, 2017). Activity participation has also been shown to rise due to increased access (Paez et al., 2009; Cordera et al., 2017) which leads to the reduction of social isolation and results in greater inclusion (Garrett and Taylor, 1999; Lucas, 2012).

Specifically, in the Greater Toronto Area, research from Farber and Allen found “a significant and positive relationship between transit accessibility and out-of-home activity participation, with this being strongest in low-income and carless households” (Farber and Allen, 2019).

In the case of PRESTO, not only does the new system create an issue to access, it also creates a disparity in user experience between those who are able to use the smart transit card system and those who are not. Data is not collected in the same way for those who opt to pay fare through non-presto methods. Though many actively chose this method for privacy purposes, those who are forced to use cash go unrepresented by the transit data collected. In the Toronto context, this is incredibly problematic due the existing socio-economic and spatial correlation. It means that the transit data

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collected by PRESTO and used by the TTC has a potential to be excluding low-income and racialized populations that are concentrated in specific areas and more likely to live further away from the downtown core.

There are direct negative implications of this in planning, both at a general level and within transportation. Considering that many municipalities and planners are moving towards smart city practices that use data to inform planning decisions, the exclusion of already marginalized populations has the ability to create further inequity in transportation and in planning in general.

Investment into public transportation systems is argued from many perspectives and almost always supported. Creating new subways or light rail lines are projects that take many years and millions of dollars to produce. However, ensuring the that current systems in place, such as the PRESTO payment system, are not excluding residents, especially those of minority backgrounds from accessing transit is something that can be addressed with far more ease. Greater public transit not only benefits these populations but the entire city at large through greater social and economic inclusion (Karner and Niemeier, 2013; Manaugh et al., 2015; Pereira et al., 2017; Wee and Geurs, 2011).

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6.0 Recommendations

With the introduction of the new smart card system, meant to improve and modernize the public transit experience, The TTC could have used this opportunity to address existing inequality. The PRESTO rollout has been reactionary to negative criticism and not pro-active in creative positive change. For most Toronto residents, it is a nuisance but for the most vulnerable populations in this city it is exclusionary. Replacing people with an electronic payment system, and rapidly moving towards a program that limits traditional fare media, while creating aggressive policing practices before seeking out and creating the necessary initiatives and programs, such as single use tickets, bulk buying, equity training for Fare Inspectors, that account for the marginalized populations of the city is irresponsible. It creates confusion and distrust and damages the reputation of the TTC, which is bad for ridership across the city but especially harmful for many who rely on the TTC as their only option for transportation throughout the city. Through these recommendations the TTC and PRESTO can confront the challenges of the existing and future challenges presented by the fare payment system.

The overarching priority of the TTC should be to ensure inequity in data is addressed between PRESTO users and non-PRESTO users. Since this data is going to inform service and future investment, the TTC needs to ensure that this disparity is recognized and addressed, either through further investment in PRESTO infrastructure, subsidization of PRESTO technology and services or through alternative data collection methods.

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To ensure equal access to transit, The TTC should consider selling traditional fare media. This can be done until all major issues with the PRESTO system are sorted or until alternatives like bulk buying of PRESTO tickets are available.

More authorized customer service outlets for PRESTO need to be allocated, specifically in areas of the city that do not have subway stations. When traditional fare mediums were the primary method of payment, riders could purchase tokens, tickets and passes at more than 1,100 authorized Fare Media Sellers in Toronto in addition to Collector Booths at all Subway and Rapid Transit stations. Today, PRESTO cards, tickets and passes can be physically bought at 212 locations, 75 TTC stations via PRESTO machines and at 137 Shoppers Drug Mart locations.

The TTC must study and address the disparities between bus service, when compared to streetcar and subway service. Especially, considering that low income and racialized Toronto's rely on the bus system. Greater access to PRESTO infrastructure needs to be made available to bus users, in the same way Single Fare Vending Machines are available for streetcar users and Fare Vending Machines are available at subway stations.

A design and strategy overhaul of Single Fare Vending Machines available on street cars needs to be done by the TTC and PRESTO. The current design of the machine shuts down when the coin box is full and there is not indicator outside of the machine that the coin box is full. There are two machines on all streetcars, but riders

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have complained that during rush hours, packed streetcars filled with crowds of riders and the placement of the machines results in customers being unable to reach the machines and pay for their ride via cash.

The two-hour transfer policy that is only available to PRESTO customers, needs to be reassessed. A three-hour transfer window would better serve those who live in the outer areas of the city, face longer commute times and are limited in public transit mode options and transit alternatives especially when delays are very common on the TTC.

An overhaul of TTC fare evasion and policing practices, including aggressive media campaigns, Fare Inspectors, Special Constables, new plainclothes practices and the sharing of personal data with law enforcement agencies. An emphasis should be placed on ensuring that the PRESTO system is as equitable as possible. While these changes are being made, aggressive revenue protection policies should be relaxed.

The forthcoming open payment system needs to supplement the existing PRESTO fare system, because the open payment system is even more exclusionary to those relying on cash for fare payment. Before an open payment system is implemented, the PRESTO system and its fare purchasing infrastructure needs to be expanded and made permanent. The availability of this infrastructure needs to be unaffected by the popularity of an open payment system.

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6.1 Takeaways for Planners

What does this mean for planners? As we begin to move into 'smarter' practices, we must ask ourselves if the data we are using is actually accurate. As planners, we must check for bias and ensure that we are fixing inequities through positive community development, not furthering it. Smart systems and technology are meant to create efficiency, but we must ensure that it does not lead to the exclusion of marginalized populations. In a city like Toronto, there are patterns in the spatial organization and socio-economic status and racial and ethnic origin of residents. Though the integration of smart systems like PRESTO may not be able to alleviate these existing inequalities, it is important to ensure that these systems are not deepening the divide.

As planners we must also remember the importance of public transportation. For many public transit may be an attractive option because it could be the cheaper, more efficient, quicker or environmentally friendly method around the city. However, for a lot of people, it is their only connection to work, school, social needs and essential services. For many, it is the only way they are able to move throughout the city and be a part of it. When expanding these systems, it is essential to think of the needs of those to rely on them. Modernization is an attractive goal. To be a city with a sophisticated transit system that allows a rider to enter with a tap of a card or the wave of a cell phone is a good vision to work towards. However, if it comes at the cost of leaving behind the most vulnerable, it is something that we simply cannot afford.

7.0 Appendices

7.1 Presto Infrastructure and Devices

7.1.1 Customer Service Outlets

Customer Service Outlets refer to in-person outlets where you can add funds or purchase PRESTO cards including, TTC'S PRESTO Customer Service Centre at Davisville Station, GO Stations, UP Express Stations and select Shoppers Drug Marts.



7.1.2 Fare Vending Machines

– found at TTC subway stations

allow PRESTO customers to:

- Buy adult PRESTO cards with cash, debit or credit card
- Load funds or adult passes instantly with cash, debit card or credit card
- Check balances and transaction history
- Buy PRESTO Tickets



7.1.3 Self-Serve Reload Machines

– found at most TTC, GO and UP Express Stations

allow PRESTO customers to:

- Load value instantly with a credit card or debit
- Pickup online loads and update card balance
- Check balance and transaction history
- Activate online activity, such as autoloading or registration
- Self-Serve Reload Machines also offer audio support for the visually impaired via headphone jack
- TTC passes cannot be bought on self-serve reload machines



7.1.4 Ticket Vending Machines

– Found at GO and UP Express Stations

allow PRESTO customers to:

- Instantly load funds with cash, debit or credit card.
- Check balance, transaction history and fare type.
- Settle overdraft or missed tap off charges (for GO customers only).
- Activate Autoload or an Online Registration.
- Buy PRESTO cards at select TVMs.
 - GO Bus locations
 - Centennial College
 - Dixie Transitway
 - Durham College/VOIT
 - Finch Bus Terminal
 - Oshawa Bus Terminal
 - Sheridan College
 - Square One Bus Terminal
 - Trent University
 - U of T Scarborough
 - University of Guelph
 - Yorkdale Bus Terminal
 - Union Station
 - York Concourse
 - York West Teamway
 - UP Express stations
 - Pearson
 - Union
 - Weston
- Cards purchased at TVMs are automatically set as an adult farecard but can be changed at any Customer Service Outlet, GO station or UP station
- *TTC passes cannot be bought on TVMs



7.1.5 Presto Fare Transaction Processor & Fare Gates

The device used by customers to tap on and pay fares. Located on buses and street cars in subway stations in the form of a paddle-design fare gate. Allows payment via the PRESTO card and validation of e-tickets.



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7.1.6 Single Ride Vending Machine

Also known as an SRVM, these machines are located onboard new streetcars that were supplied by Metrolinx (PRESTO) for cash customers to pay their fare. Early iterations of the machines were red and accepted only cash coins and tokens. A second iteration was grey and accepted tokens, cash coins and credit and debit. Today's version of the machine is grey and only accepts tokens and cash. All streetcars are equipped with two SRVMs. Customers must keep their ticket as proof of payment and for transferring to intersecting routes or entering stations.



7.1.7 Balance Checkers:

Presto customers are able to hold their card to the Balance Checker to view usage details including balance and recent transactions. The longer a card is held against the device, the more information is displayed. Online transactions can be completed by tapping a presto card on a Balance Checker however, online transactions can take up to 24 hours to sync across all PRESTO devices.

In Toronto, Balance Checkers are only available at all GO Transit stations. TTC customers can check their balance by visiting a balance checker at a GO Station, but it will only display any value on the card, not any passes. Though Balance Checkers are not available for TTC customers, they are available for a select few local transit authorities including, Brampton Transit, Burlington Transit, MiWay and Oakville Transit and are green and grey. For GO Transit customers, the Balance Checkers are yellow.



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7.2 Presto Timeline

2006 - through a Request for Proposal (RFP) procurement process overseen by the Ontario Ministry of Transportation, Accenture was awarded a 10-year contract to design, build and operate the PRESTO e-fare system.

2007 The first PRESTO deployment was at select GO Transit stations as a pilot project in 2007

2009 a phased roll out was initiated to all of the participating “905” municipal transit agencies in the GTHA including full implementation across the GO network.

2011 July PRESTO became an operating division of Metrolinx.

2012 November, Metrolinx and the Toronto Transit Commission (TTC) signed a Master Agreement for PRESTO to begin full deployment throughout the TTC.

2015 – PRESTO infrastructure began to appear on the TTC network

2015 December - Proof-of-Payment (POP) began, initially on streetcars to allow backdoor boarding

2016 Metrolinx finalized an agreement to extend its contract with Accenture to ensure the continued stability, quality and advancement of the PRESTO system.

2016 September - frequent reports emerged that Presto loading machines, fare gates, and the units for tapping cards were not functioning as initially expected

2016 December - The accelerated device rollout was completed with PRESTO available at one priority entrance at all TTC subway stations, and on all buses, streetcars, and para-transit vehicles

2017 June monthly Metropasses available on the Presto card

2018 January TTC and Metrolinx introduced a discounted double co-fare for customers transferring between Union Pearson Express, GO Transit and the TTC

2018 February - TTC estimated that from January 2016 to February 2018, it had lost \$4.2 million in fare revenue as a result of problems with Presto readers. As per the master agreement of 2012 Metrolinx was obligated to reimburse the TTC

2018 August – The Two-Hour Transfer program was launched

2018 November soft launch of the PRESTO App

2019 January New PRESTO App was launched

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2019 April 5 – Presto Tickets were launched

2019 April - the TTC Board approved an exchange policy that would allow customers to exchange their unused expired tickets within one year of the expiry date

2019 December 1 - The TTC discontinued the sale of tokens at subway stations and retailers

2020 January - Wheel-Trans customers using a Wheel-Trans sedan taxi can pay the fare from the stored value on a Presto Card or by using a Presto ticket

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