



VALUE CASE FOR ACCESSIBLE TRANSIT IN CANADA





Reference

The Canadian Urban Transit Association (CUTA)

CUTA's Mission Statement

CUTA is the collective and influential voice of public transportation in Canada, dedicated to being at the centre of urban mobility issues with all orders of government, and delivering the highest value to its members and the communities they serve.

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GLOSSARY OF TERMS

Accessible Transit

Accessible transit encompasses specialized door-to-door transit services, accessible conventional transit services and/or any combination of the two.

Conventional Transit System

Conventional transit services include regular scheduled bus, light rail, subway or commuter rail services.

Mobility Restricted Users

For the purposes of this study, transit customers who use or would use specialized transit services and/or require or would require accessibility features in conventional transit are referred to as mobility-restricted users. Mobility-restricted users may have limited mobility, participation restrictions, activity restrictions, and/or impairments. Other customers who may fall into this category are those who require a companion to travel, and seniors (people 65 years of age or older).

Senior(s)

There is no consensus amongst experts as to what defines a “senior”. For the purpose of this study, we have used the age marker of 65 as it is probably one of the most practical ways of defining the senior population from a methodological point of view, as well as the most commonly used procedure (Chappell et al., 2003).

Specialized Transit Services

Specialized transit services are reservation-based, door-to-door services for use by passengers who meet specific disability criteria.

Universal Accessibility

All citizens are entitled to its benefits, at the same time and in the same manner. Universal accessibility promotes a similar use by all of the opportunities presented by infrastructure and public services. In practice, universal accessibility allows one to enter a building or public area, find one’s bearings and adequately make one’s way, as well as make full use of the services provided to the population, supported by appropriate communications and information tools.

EXECUTIVE SUMMARY

Universal accessibility of the public transportation system can improve mobility for those individuals who, as a result of a mobility restriction, have limited ability to get around their community. Regional and municipal authorities across Canada generally address transit accessibility in two ways: by providing specialized transit services (door-to-door service) and/or by designing the conventional transit system to be more universally accessible. These services are valuable to society because they link individuals to employment, education, health and other important services.

This study examines the value case of accessible transit in Canada through a qualitative and quantitative analysis that examines the benefits associated with providing accessible transit. The perceived high costs of making transit accessible make it difficult to build a business case for stable funding when dollar expenditures are considered in isolation. This study presents a range of economic and social benefits of accessible transit to consider, benefits which are not only experienced by mobility-restricted users, but by the greater community as well.

The number of seniors in Canada is forecast to more than double from 4.0 million to 9.9 million between 2006 and 2036. As the population ages, the number of people who would benefit from accessible transit is expected to increase. This is due to two main factors. First, disability rates steadily increase with age. At 0–14 years of age, 3.7% of the population reports having a disability, while at 75 years and older, that percentage increases to 56.3% (Human Resources and Skill Development Canada, 2011). Second, mobility disabilities are one of the most common types of disability among seniors. While 56.3% of seniors report having any disability, nearly as many seniors (44.7%) report having a mobility disability specifically (Human Resources and Skill Development Canada, 2011).

With the expected aging population and the resulting increased incidence of disabilities, accessible transit is becoming a growing area of public transit service. Significant advances have been made in terms of the accessibility of both fixed-routes and transit infrastructure to the point where conventional transit is becoming better able to accommodate mobility restricted individuals. Generally, transit systems have been working to improve the accessibility of their conventional or fixed route services by adding low floor buses to their fleets, ensuring rail cars and stations

are built to current accessibility standards or retrofitted when upgraded. Policy changes and education programs such as travel training are other ways that transit operators have embraced more universally accessible services.

For specialized transit service, transit authorities have continued to adopt innovations to meet the demand of a growing and aging population. These innovations include updating eligibility processes to ensure that only those with the least mobility access the door-to-door service. Technology innovations including demand response scheduling software, onboard vehicle computers and automated telephone systems are other ways that specialized transit operators have worked to keep their costs affordable. As specialized transit services expand and costs increase, transit systems are faced with the challenge of finding the right balance between accessible conventional transit and door-to-door specialized service.

By assessing the value of accessible transit this study speaks to these current challenges—the benefits outlined in this study could be magnified by facilitating a shift of some mobility restricted customers to conventional transit. This study conducted a three-part analysis to evaluate the value case of providing accessible transit: 1) case studies of accessible transit initiatives and precedents in Canada and internationally; 2) consultation interviews with experts from the public, private, and non-governmental sectors; and 3) a multiple account evaluation to examine the economic and social benefits of providing accessible transit.

The multiple account evaluation demonstrates the value case of accessible transit by highlighting the financial benefits from a quantitative economic perspective and general positive benefits from a qualitative societal perspective. This analysis does not incorporate costs because the cost structure of the transit industry includes consideration of operating revenue and expenses, capital revenues and expenses, financial performance, the costs of equipment and infrastructure and sources of funding. Given the data available, it was not possible to develop cost estimates for improvements specifically related to accessibility.

The table below summarizes several benefits that can be realized with increased access to accessible transit. The benefits of providing accessible transit are demonstrated

by the broad spectrum of annual monetary benefits to the national economy (increased income, rise in GDP, and additional tax base), the economic benefits of increased access to education, the cost savings to public health services, road-user safety, and the potential financial benefits of shifting some specialized transit customers to accessible conventional transit. The outputs generated have been tested for sensitivity to develop a range of values. Because not all costs could be included in our analysis, the most conservative estimate possible (1%) was used in the sensitivity analysis, with all other estimates summarized in the Appendix. This study determined that on a national basis, the most significant benefit was the \$40.1 million in income that can be generated by increased labour force participation, and its resulting potential to generate an additional \$120.2 million of new output. This economic activity is an important contributor to the economic vitality of communities across the country.

Beyond the economic benefits, mobility-restricted users gain social benefits, as does the greater community. At the individual level, accessible transit can lead to improved independence and quality of life. For mobility restricted users accessible transit facilitates independent participation in social opportunities, as well as attending doctors’ appointments, critical social services and recreational activities. These individual benefits reverberate into the greater community through increased participation in social and physical activities, contributing to community engagement, community building and overall social inclusion. A lack of reliable transportation for the disabled has been found to be a key barrier for engaging in the community (Canberra Transport Planning and Management, 2011). Transit authorities also benefit because providing accessible transit promotes equality of services, meets accessibility goals and demonstrates commitment to providing transit to a diverse population with a range of abilities. Improved accessible transit also provides all transit users with a better user experience.

Multiple Account Evaluation Framework		
Quantitative Criteria	Annual Benefit (Cost) (\$)	*Normalized (2011 Dollars)
Economic Benefits		
<i>Increase in Income—Mobility Restricted Individual</i>	\$36,420,000	\$40,062,000
<i>Increase in Output—Income Multiplier Effect</i>	\$109,260,000	\$120,186,000
<i>Increase in Government Taxation</i>	\$27,679,200	\$30,447,000
Educational Economic Benefits		
<i>Increase in Income—Mobility Restricted Individual</i>	\$24,947,000	\$25,446,000
Public Health Benefits		
<i>Decrease in Health Care Costs</i>	\$3,916,000	\$3,916,000
Road User Safety Benefits		
<i>Decrease in Motor Vehicle Collision Costs</i>	\$7,942,000	\$8,260,000
Qualitative Criteria	Impact	Impact
Alternative Transportation Benefits		
<i>Change in Specialized Transit Service Costs</i>	Potential Savings	Potential Savings
Accessibility & Social Inclusion Benefits		
<i>Increase in Overall Social Benefits</i>	Positive	Positive
Integration Benefits		
<i>Linkage to Other Government Policies</i>	Positive	Positive

Framework Notes:
 *All dollars have been normalized to 2011 base year. Historic rate of inflation assumed to be 2% annually. Present value estimate based on a 3.5% discount rate.

TABLE OF CONTENTS

1.0 INTRODUCTION	2
1.1 Mobility-restricted Users	3
1.2 Rights for People with Disabilities	6
2.0 CASE STUDIES OF ACCESSIBLE TRANSIT INITIATIVES AND PRECEDENTS	7
2.1 Accessible Transit Design Features	7
2.2 Incentives to take Conventional Transit	8
2.3 Specialized Transit Innovations	9
2.4 Integrating Specialized and Conventional Transit	10
2.5 Community Bus Services	11
2.6 Travel Training	12
2.7 Journey Assistants	13
2.8 Information Technology	13
2.9 Summary	13
3.0 SUMMARY OF FINDINGS FROM CONSULTATION INTERVIEWS	14
3.1 Motives for Providing Accessible Transit	15
3.2 Benefits Provided by Accessible Transit	15
3.3 Challenges to Providing Accessible Transit	16
4.0 MULTIPLE ACCOUNT EVALUATION	18
4.1 Economic Development Benefit	20
4.2 Economic Development Higher Education	21
4.3 Public Health Benefits	24
4.4 Road User Safety	25
4.5 Alternative Transportation Cost	26
4.6 Accessibility and Social Inclusion Benefits	28
4.7 Integration Benefits	29
5.0 VALUE CASE FOR ACCESSIBLE TRANSIT	30
REFERENCES	32
APPENDIX A	36
List of Interviewed Stakeholders	36
APPENDIX B	37
Quantitative Analysis	37

Figure List

Figure 1: Percentage of Canadian Population with Disabilities by Age Group	4
Figure 2: Summary of Mean Earnings Based on Education Level	22

Table List

Table 1: National Population Estimates for 2006 and 2036	5
Table 2: Multiple Account Evaluation Framework—Summary of Impacts	19
Table 3: Summary of Individual Economic Impacts	20
Table 4: Multiplier Effect in Canada	21
Table 5: Educational Attainment for Adults With and Without Disabilities. Aged 25–64, 2006	22
Table 6: Summary of Change in Income from Higher Education Qualifications	23
Table 7: Home Care Costs (Canada)	24
Table 8: National Home Care Costs—65+ Cohort	24
Table 9: Canadian Motor Vehicle Collision Calculations, 2009	26
Table 10: Specialized Transit Trip Demand, Eight Major Canadian Cities	27
Table 11: Specialized Transit Trip Forecast, Eight Major Canadian Cities	27
Table 12: Specialized Transit Trip Forecast, Canada	28



INTRODUCTION

Universal accessibility of the public transportation system can improve mobility for those individuals who, as a result of a mobility restriction, have limited ability to get around their community. Transit systems across Canada provide accessible transit to their communities through their specialized door-to-door services and/or by providing accessible conventional transit facilities, vehicles, and infrastructure. These services are valuable to society as they provide vital links to employment, education, health, and other important services. They are also services that are becoming increasingly important as the population ages, and the costs for providing specialized transit increases.

With the aging population in Canada, demand for accessible transit is expected to grow. Concurrently, specialized transit is becoming more costly. Operating expenses of specialized transit services in Canada increased by 35% between 2007 and 2011 due to an increase in cost per trip and an increase in the amount of service provided (CUTA, 2012). Significant advances have been made in terms of the accessibility of

fixed-routes, and transit infrastructure to the point where conventional transit is becoming better able to accommodate mobility restricted individuals. As specialized transit services expand and costs increase, transit systems are faced with the challenge of finding the right balance between accessible conventional transit and door-to-door specialized service.

Generally, transit systems have been working to improve the accessibility of their conventional or fixed route services by adding low floor buses to their fleets, ensuring rail cars and stations are built to current accessibility standards or retrofitted when upgraded. Policy changes and education programs such as travel training are other ways that transit operators have embraced more universally accessible services. Capital funding programs often require local municipalities to build infrastructure projects that meet applicable accessibility criteria.

On the specialized transit service front, transit authorities have continued to adopt innovations to meet the demand

of a growing and aging population. These innovations include updating eligibility processes to ensure that only those with the least mobility access the door-to-door service. Other innovations include introducing conditions on eligibility such as ‘snow and ice only’ which means that an individual is eligible for specialized transit only under these circumstances. Technology innovations including demand response scheduling software, onboard vehicle computers and automated telephone systems are other ways that specialized transit operators have worked to keep their costs affordable.

By assessing the value of accessible transit this study also speaks to these current challenges—the benefits outlined in this study could be increased by facilitating a shift of some mobility restricted customers to conventional transit. This study provides the first value case account of accessible transit in Canada. The perceived high costs of accessible transit make it difficult to build a business case for stable funding when dollar expenditures are considered in isolation. Accessible transit provides many benefits to individuals and society that are difficult to quantify. While a traditional cost-benefit analysis would quantify all economic and social (including indirect) costs and benefits, it could not adequately account for qualitative aspects such as social inclusion. To gain a deeper understanding of the value associated with accessible transit, the benefits are analyzed using a multiple-account evaluation, which examines both qualitative and quantitative social and economic indicators. Analyzing the added value of providing accessible transit also helps to demonstrate the economic and social benefits that may be experienced by both mobility-restricted users as well as the greater community.

This study provides a background to accessible transit by conducting an overview of mobility-restricted users and the trends that could potentially influence the number of people in this group. This initial review provides the basis for understanding the factors that are examined in the value analysis for accessible transit. This study then undertakes a three-part analysis to evaluate the value case of providing accessible transit:

- Case studies of accessible transit initiatives and precedents in Canada and internationally (Chapter 2);

- Consultation interviews with experts from the public, private, and non-governmental sectors (Chapter 3); and
- Multiple-account evaluation to examine the economic and social benefits of providing accessible transit (Chapter 4).

In the concluding chapter (Chapter 5), the key findings and highlighted economic and social benefits are summarized to articulate the value case for accessible transit. The study’s key findings represent an important first step in helping to fill a gap in existing knowledge on ‘accessible transit’ in Canada and can serve as a foundation to develop further recommendations.

1.1 MOBILITY-RESTRICTED USERS

This study investigates the existing and potential use of transit by those who are mobility-restricted. The study considers those mobility-restricted users who would begin to use conventional transit system if it were to be more universally accessible and/or if the user were to receive training; users who are participants in specialized transit service programs; and users who would use a combination of both services. The focus of this study is to identify the value that is gained by providing accessible transit to the segment of the population that is unable to access non-accessible conventional transit as a result of mobility-restrictions. It is noted that specialized transit

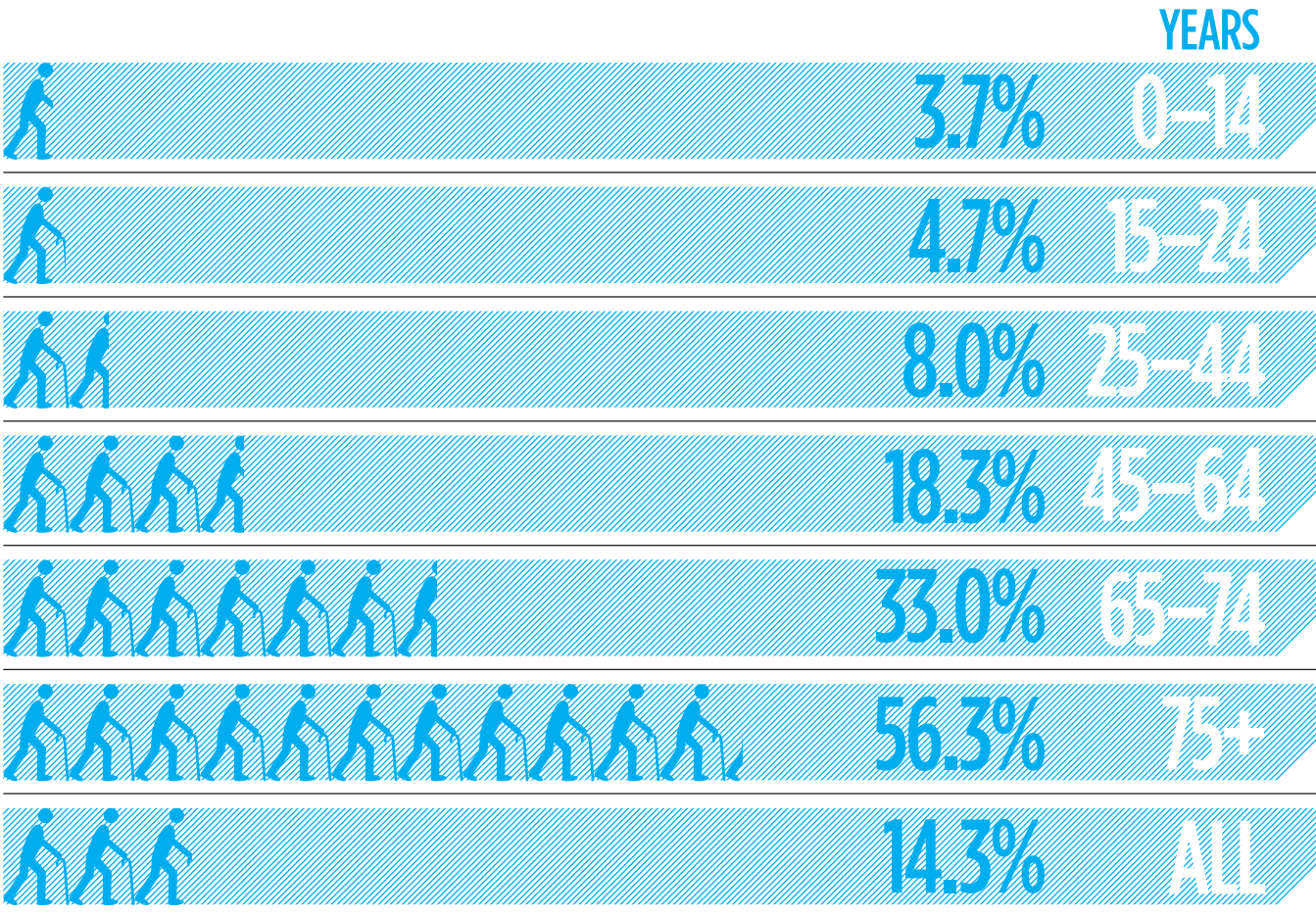
“This study provides the first value case account of accessible transit in Canada”

services will always be used and needed by a segment of the population and it is not the purpose of this study to identify who are the eligible users.

For the purposes of this study, transit customers who use or would use specialized transit services and/or require or would require accessibility features in conventional transit are referred to as mobility-restricted users. Mobility-restricted users may have limited mobility, participation restrictions, activity restrictions, and/or impairments. Other customers who may fall into this category are those who require a companion to travel, and seniors (people 65 years of age or older).

In 2006, 4.4 million Canadians reported having a disability, approximately 14% of the total population (Human Resources and Skill Development Canada, 2011). Only 3.7% of the people aged 0-14 years in Canada had a disability, while more than half of the population aged 75 years and older reported a disability (56.3%). This contrast reveals that the percentage of Canadians with disabilities increases with age (see Figure 1). Similar demographics are found in Europe, where 12% to 14% of the total population is disabled and the percentage of people with disabilities also increases with age (UNDP, 2010).

FIGURE 1: Percentage of Canadian Population with Disabilities by Age Group



Source: Federal Disability Report by Human Resources and Skills Development Canada, 2011 p.13.

By 2036, Canada's population is forecast to be 43.8 million, which is an additional 12.9 million as compared to the 2006 population, reflecting an annual population growth of 1.3% (Human Resources and Skill Development Canada, 2011a). Comparatively, the number of people with disabilities is forecast to increase even faster, at an annual rate of 2.5%.

This is likely due in part to the number of seniors in Canada being forecast to more than double from 4.0 million in 2006, to between 9.9 and 10.9 million in 2036 (see Table 1). With the expected aging population and the resulting increased incidence of disabilities, transit demand for mobility-restricted users is anticipated to increase.

TABLE 1: National Population Estimates for 2006 and 2036

POPULATION (IN MILLIONS)	2006	2036
Number of people in Canada	30.9	43.8
Number of people with disabilities ¹	4.4	7.7–8.7
Number of seniors, 65 years and older	4.0	9.9–10.9
Number of seniors with disabilities	1.8	4.6–5.1

Source: Adapted from Figure 1.9: Population estimates, 2006 and 2036 (millions) in Federal Disability Report by Human Resources and Skills Development Canada, 2011 p.13.

¹ Note: These figures represent the entire disabled population, not solely the mobility restricted portion.

There will likely be more need and public pressure for accessible transit in the coming years as the population of seniors, and particularly seniors over 75, grows. The Human Resources and Skills Development Canada (HRSDC) Federal Disability Report (2011) indicates that over 22% of seniors between 65 to 74 years of age are affected by physical limitations (disabilities relating to mobility, agility and pain). The percent increases for seniors 75 years of age or older, where mobility disability and agility disability affect 44.7% and 42.0% of the population, respectively. The HRSDC Report (2011) describes mobility disability as “difficulty walking up and down a flight of stairs, standing in one spot for 20 minutes or moving from one room to another”, and agility disability as “difficulty bending down, dressing or undressing, getting in and out of bed or grasping small objects”. The percentage of the population 75 years of age or older who are affected by mobility and agility disabilities is almost double as compared to the younger senior age group, aged 65–75 years. This data shows a trend that may lead to an increased senior population with mobility restrictions, particularly seniors 75 years of age or older.

The rationale for providing accessible transit for people with mobility disabilities differs from that of seniors. In the 2006 profile report of disability in Canada, the unemployment rate

for adults with disabilities was 8.7%, which is greater than the unemployment rate of 5.1% for adults without disabilities. The average employment income for adults with disabilities between 25 and 54 years of age was just over \$32,000, compared to \$43,785 for adults without disabilities in the same age group (Human Resources and Skill Development Canada, 2011b). This data shows that people with disabilities have a higher rate of unemployment and a lower average annual income. These trends may, in part, be a result of a limited ability to access employment opportunities as a result of distance or lack of accessible transit options and/or limited ability to use private transportation alternatives as these may be cost prohibitive.

Public transit offers a more affordable mode of transportation when compared to private service alternatives, such as, taxis or private vehicle ownership. In addition, conventional transit services operate on regular schedules allowing a transit user to plan trips in advance or at the last minute rather than having to rely on a ride through private arrangements. The importance of having affordable transportation is identified in a recent study that concluded that people with disabilities need affordable and reliable transportation options in order to participate in the workforce. The study also found that lack

of reliable transportation for the disabled is a key barrier for engaging in the community (Canberra Transport Planning and Management, 2011).

Demographic trends across Canada forecast a growing senior population, where the majority of aging citizens have the desire to remain living independently in their own homes and to remain active in society (Turcotte, 2012). As seniors age their health may weaken and access to a private vehicle either as a driver or passenger may become more challenging. These mobility factors can limit the ability for a person to maintain independence. Accessible transit provides a transportation alternative that allows seniors to continue living independently and participating in society. Further, accessible transit provides an affordable means of transportation for fixed income households.

1.2 RIGHTS FOR PEOPLE WITH DISABILITIES

In 1990, the *Americans with Disabilities Act* (ADA) was enacted to protect the rights of people with disabilities. ADA led the way in making it illegal to discriminate against people who have a mental or physical disability in transportation, employment, and public services. Many Canadian transit authorities follow the principles espoused in the ADA. In Canada, currently, the *Accessibility for Ontarians with Disabilities Act* (AODA) (2001) is the only example of similar legislation. Through the AODA, the Ontario government has developed its own specific accessibility standards for transportation. The standards apply to conventional & specialized transportation and help ensure that these services remain accessible by providing technical guidelines on lifting devices, steps, grab bars/handrails, floor surfaces, signage, etc.

Nationally, the *Canadian Human Rights Act* (1976-77) prohibits discrimination against people with disabilities. Additionally, the equality rights section of the Canadian Charter of Rights and Freedoms (1982) guarantees people with disabilities equal benefit and protection before and under the law (Council of Canadians with Disabilities, 2012). Furthermore, under the provincial Human Rights Commission's Human Rights Code, the rights of people with physical and cognitive disabilities are protected. Particularly for public transportation, the law ensures that people with disabilities have reasonable access to public transit and/or are accommodated in their use of public transit.

Accessible transportation guidelines and legal requirements also exist in other jurisdictions in Canada. For instance, in 2005 the province of Quebec, through *article 67* of the *Act to secure handicapped persons in the exercise of their rights with a view to achieving social, school and workplace integration* (RSQ, chapter E-20.1) required all public transit authorities, municipal, inter-municipal or regional transport companies to develop a program, vetted by the provincial Minister of Transport, for the purpose of providing, within a reasonable period, public transportation for handicapped persons within the territory served by it.



CASE STUDIES OF ACCESSIBLE TRANSIT INITIATIVES AND PRECEDENTS

Case studies were selected to recognize effective approaches and accomplishments in accessible transit, both in Canadian and international contexts. The case studies provide examples of innovative projects, programs, and initiatives and illustrate how accessible transit is being delivered and implemented in municipalities and transit systems around the world.

Transit authorities and municipalities as well as non-profit organizations have taken an increasingly progressive approach to ensuring that transportation is accessible to all. The chapter is organized according to the particular accessible transit features, components or technologies that were noted through the analysis of the case studies.

2.1 ACCESSIBLE TRANSIT DESIGN FEATURES

Accessible design features are important considerations to encourage ridership among seniors and persons with disabilities and reduce the need for specialized services that are separated from the mainstream of society. With the high costs associated with specialized transit systems, modifications to conventional transit systems that make the systems more accessible is helping reduce the demand on specialized transit systems as well as normalizing the full integration of all citizens, regardless of ability, into society. In 2011, the national

average cost per passenger for specialized transit services was \$25.75, as compared to a cost per passenger of \$3.31 for conventional transit in the same year (CUTA, 2012). This demonstrates the importance of investing in making conventional transit accessible in order to reduce demand of more costly specialized transit. However, specialized transit systems continue to be an important element of supporting accessibility for persons with disabilities to fully access their communities to reach their full potential.

Low floor buses equipped with kneeling capability and ramps on existing transit routes are a key accessible transit feature, allowing mobility restricted persons and those using mobility aids (e.g., wheelchairs, walkers, etc.) to access conventional transit systems. The use of low floor buses on existing transit routes is now the prevalent practice in communities throughout North America and Europe.

From a Canadian perspective, the case study review of the Toronto Transit Commission (TTC) showed a noteworthy example where transit design features have been implemented. The TTC has made significant improvements over the past decade to make public transit more accessible for everyone. In fact, its entire bus fleet is now wheelchair and scooter friendly, as are all 170 bus routes. The TTC runs 1,797 accessible buses that are equipped with a flip-ramp or lift and plans to have all its future streetcars be low-floor and accessible. Furthermore, today more than 60 per cent of the train fleet is fully accessible, and nearly half of all Subway/RT stations are wheelchair and scooter friendly. The delivery of the TTC's next-generation subway trains will continue to make the service even more accessible (TTC, 2012).

“...number of kilometres travelled on specialized transit services in Canada has increased by 56%”

In Europe the case study review revealed Gothenburg, Sweden and Berlin, Germany as strong examples of cities where transit design features have been put into service. In 2004, an accessible transit program was initiated in Gothenburg, Sweden with the aim to provide a public transportation system that was universally accessible by 2010. The main objective of this program was to decrease dependence on specialized transit services to reduce the funding requirements for that service. By 2010, 90% of all tram (passenger rail vehicle) stops were fully accessible and 100% of main tram stops were fully accessible. The program resulted in a 23% reduction in the use of specialized transit services between 2005 and 2010 (ELTIS, n.d.).

Subway stations in Berlin, Germany are completely barrier free and accessible. They have integrated a unique system for guiding the blind that includes the use of grooved white paving stones that can be felt with a cane.

2.2 INCENTIVES TO TAKE CONVENTIONAL TRANSIT

Encouraging and incentivizing mobility-restricted users to take conventional transit diverts ridership from the specialized transit system. As noted above, the cost per passenger of specialized transit services exceeds that of conventional transit. In addition to the high cost, the demand for specialized transit services, in terms of number of kilometers travelled, has increased over time. In 2003, there were 237,479 registrants in Canada travelling a total of 55,753,517 km using dedicated services and by 2011 this had grown to 312,967 registrants travelling a total of 86,714,141 km (CUTA, 2004 and CUTA, 2012). Although the number of registrants climbed modestly over the eight year period, the number of kilometres travelled on specialized transit services in Canada has increased by 56%. Further, unaccommodated trips increased by 27% in the same time period. The limited growth in the number of registrants in relation to the more significant increase in the number of kilometres travelled demonstrates that trip frequency and/or trip distance, has increased over time as well as demand for specialized transit services.

“Providing incentives to mobility-restricted transit users promotes transit usage and encourages first time users...”

The case study research revealed that incentive programs are used as a method to increase transit ridership amongst those with mobility-restrictions. TriMet, the public transit provider in Portland, Oregon created the Honored Citizen Downtown Portland Pass (HCDP) which is intended to encourage seniors and people with disabilities to take conventional transit and to live in an area with publicly accessible amenities nearby. The HCDP pass enables eligible seniors (65+) and people with disabilities to use public transportation in the downtown Portland area free of charge. Historically, TriMet offered the free-ride zone in downtown Portland for everyone, but as of 2012 it is only available for people with disabilities and seniors. HCDP participants are referred to as ‘Honored Citizens’ and are required to pay a \$10 administrative fee for the pass which is valid for up to two years (TriMet, 2012).

Incentive programs are also used in Canadian municipalities to encourage seniors to use conventional public transit. The public transit authority in the City of Ottawa, OC Transpo, offers free service for seniors all day on Wednesdays and in the afternoons on Monday and Friday (OC Transpo, 2012). In addition, OC Transpo permits those who are assisting a mobility-restricted individual during their public transit trip to ride free of charge. The Attendant Card is issued to any person who, because of their disability, requires assistance while traveling on the OC Transpo system. The application process requires a health care professional to confirm the applicant's eligibility for the card. The card is issued in the name of the mobility-restricted customer, as opposed to the attendant to allow the customer to travel with different attendants. A similar service is offered by TransLink in the Greater Vancouver area and in Edmonton, Alberta.

In Belgium, seniors are permitted to travel for free. In Brussels, Belgium, STIB, the local transit authority issues

a card by mail to individuals who are 65 years and older allowing those persons to travel for free on the transit system (STIB, 2012).

Providing incentives to mobility-restricted transit users promotes transit usage and encourages first time users, who may be hesitant to take transit, to try the transit network. Further, it minimizes the upfront cost for those who do not know the rewards or benefits of using the system.

2.3 SPECIALIZED TRANSIT INNOVATIONS

With the growth in demand for door-to-door specialized transit services, transit agencies have been adopting several strategies to continually improve their approach to service delivery. This includes incorporating best practices into their operations to offer affordable service for those who have the greatest need for this level of accessible transit.

In-person assessments are now viewed as the best practice in determining eligibility for specialized transit and are the prevalent practice in several major centres in the United States. In Canada, Toronto, Calgary and Winnipeg have used this practice for a number of years with Hamilton and Edmonton now adopting this approach to eligibility determination. Several others are assessing their needs for updating their eligibility practices.

Adopting technology to support efficient shared ride trip delivery is another example of how specialized transit service providers are innovating to maintain a cost-effective offering. Demand response scheduling software is now standard among specialized transit service providers



augmented with onboard vehicle computers with electronic manifests and automated call ahead features to ensure clients are ready at the door when the vehicle arrives for pick-up. Web and telephone-based booking services offer specialized transit users the ability to access self-serve features to check rides and book trips. Tools are available to track the on-time performance of the specialized transit service and several Canadian systems manage recurring ‘no shows’ among clients using automated reporting solutions.

Paratransit conditional eligibility is another means that specialized transit service providers use to ensure that this highly valued accessible transit service is meeting the needs of those with the greatest mobility restrictions. Conditional eligibility refers to conditions under which a mobility restricted individual might be expected to access the specialized transit service. Such conditions in Canada include ‘when snow and ice is present’ and a Paratransit eligible client would not be able to access fixed route service. On the other hand, when ‘snow and ice conditions’ are not present, the individual would be expected to use the conventional transit system. Conditional eligibility is now a common practice in most specialized transit systems where the conventional transit service is partially or fully accessible.

Many specialized transit systems in North America are starting to promote accessible taxis as part of their ‘family of services’ to help keep up with increasing demands for accessible transit. Accessible taxis are often used in Canada as a cost-effective way of accommodating some specialized transit trips for their clients. This major initiative in the industry is often

being implemented through sub-contracting to taxi companies. For example, the Société de Transport de Montréal (STM) contracts out their services to taxi companies in order to keep up with growing demand and to continue to guarantee its accessible transit service to customers. The STM counts on the services of 16 different taxi service suppliers in the region of Montreal to help provide Paratransit services. To get an idea of the importance of the taxi industry to Paratransit in Montréal, it should be noted that in 2011, taxis carried out 86% of the total Paratransit trips provided by the STM during that year (STM, 2011).

2.4 INTEGRATING SPECIALIZED AND CONVENTIONAL TRANSIT

Demand Responsive Transport (DRT) generally refers to a service that is provided ‘on demand’ at the request of its passenger’s pick up and drop off locations. Its exact meaning can vary, but always has the overall ‘on demand’ theme tied to it. DRT can also introduce public transit to new areas and/or new users; can reduce the demand on other specialized transit services and can increase ease of travel on conventional public transit by providing connections to and from stations (Transport Planning and Management, 2011).

In Canada and in the U.S., DRT is an option that is part of the ‘family of services’ used by several transit systems. The Region of York’s transit operator, York Region Transit (YRT) uses Demand-Responsive Community routes where there is some demand for service, but not enough for a fixed-route service. YRT’s specialized transit system has a zero percent unaccommodated rate, which is an especially good example of supportive service. The transportation authority is committed to accommodate all requests so long as passengers are willing take conventional transit in part of their trip journey.

The Baldwin Area Transportation System (BRATS) in Baldwin County, Alabama, provides flexible transportation services where all routes are dictated by demand. Examples of the type of routes offered include: Dial-A-Ride, work routes, routes for users needing rides to health facilities for cancer

“...an extensive DRT program which is called “flex route” and is a mix between a traditional bus service and a taxi.”

treatments, for physical therapy, and routes for trips to common locations of users such as community association meetings and health centers (Baldwin County Alabama, 2012). The funding schemes for the transit services are unique. For example, on work routes, the vehicles are driven by workers of the business (employer) and paid for by the riders (employees) and other routes that are driven by BRATS drivers are billed to the business/organization monthly. For routes taken by individual passengers, tickets are purchased in advance.

Gothenburg, Sweden has an extensive DRT program which is called “flex route” and is a mix between a traditional bus service and a taxi. Routes are developed according to the needs of the customers, stopping only when a passenger requests drop-off or pick-up. This service is specifically tailored to the needs of people with mobility impairments. The flex route is intended to reduce costs for local specialized transportation systems and to increase the mobility for seniors and people with disabilities who are not eligible for the specialized transit system, but who may have problems using conventional public transit (Westerlund et al. n.d.).

Similar to the flex route offered in Gothenburg, Public Transport Victoria (PTV), which administers transit in the state of Victoria in Australia, offers the Telebus system. The Telebus has been in operation for 30 years, providing both a fixed route and flex route services enabling passengers to get picked up and dropped off virtually anywhere in its

service areas. The success of the Telebus system has been attributed to the fact that it has been kept as simple as possible. For an additional cost, passengers may call the Telebus driver and request to be picked up from their home (Transport Planning and Management, 2011).

2.5 COMMUNITY BUS SERVICES

For many people in rural suburban areas, conventional bus services are inadequate and frequently unavailable. These people still need transportation to shopping malls, healthcare centres and places of employment. Community transport can help in these circumstances. Community transport is a broadly defined term and can be quite different from one community to the next. Often communities will have scheduled, timetabled, community buses that are fully integrated with the conventional transit schemes, providing a more direct transportation route to and from main transit stations.

In other cases, community transport operates as a hybrid between specialized transit and community transit. Rocky View Regional Handibus is such a service meeting the needs of several communities surrounding the city of Calgary in Alberta. The society was originally formed in the early 1980s by the communities of Crossfield, Rocky View, Airdrie and Balzac. This service is operated by a non-profit society with funding support from fares, fundraising and participating municipalities. Rocky View now works with some 25 agencies and organizations with passengers from 10 municipalities. It serves the needs of seniors and persons with disabilities as well as other citizens requiring transportation from rural areas and small communities to school, health services, etc. This is but one Canadian example of how residents of smaller municipalities are offering accessible transit services to their communities.

The community of Tsawwassen, a small suburb of Vancouver for example, runs mini bus shuttles through various routes in the community, terminating at a TransLink bus loop, providing connectivity to urban areas. This service is fully integrated with TransLink's bus and light rail services, charging the same fare and issuing valid transfers. Another

example of a transit authority providing community transit services is York Region Transit (YRT). YRT's bus shuttles are provided to seniors and persons with disabilities who are able to take conventional transit. This lightens the burden on more specialized transit services such as the Mobility Plus service for persons unable to take conventional transit. YRT also offers the GO Shuttles program that arrives at GO train stations and waits until the train arrives before leaving, ensuring that no one misses their connection.

In other communities, community buses are run by volunteers and though their main objective may be to transport people to major transit stops, the service is completely separate from regional transit authority services. For example, in the state of Oregon, the Washington County Bus Service, transports rural Washington County community members to the Hillsboro Transit center. This service is run by volunteers and is free of charge, though donations are encouraged (Ride Connect, 2012).

2.6 TRAVEL TRAINING

Travel training is an important component of improved accessibility in transit because it increases awareness of the accessible services and technologies available to mobility-restricted persons. Offering training on how to use public transit and its many accessible features is often sufficient to help mobility-restricted individuals become confident conventional transit system users.

The City of Edmonton's Transit System created the Mobility Choices Travel Training program to provide local seniors and people with disabilities with information about the accessible transit options in the system. Mobility Choices is a free program, comprised of videos and a presentation that can be customized to various individuals or groups with mobility challenges. The program is flexible and can involve one-on-one training or ongoing training as needed. The City's website also provides a series of videos that teach members of the community with mobility challenges how to take advantage of the accessible transit features, including low floor buses, community buses, light rail transit, and Edmonton's Disabled Adult Transit Service (DATS). In addition, Edmonton Transit has been offering a program

called 'Seniors on the Go' every summer since 2007. Groups of seniors receive a charter bus outing to a destination of their choice within the city and along the way receive detailed information on how to use the transit system to get around their community. This program was modeled on a similar approach in Orange County, California.

The regional transit authority in the City of Victoria, British Columbia, uses a combination of door-to-door transit, called handyDART and conventional low floor bus services to meet the accessibility needs of their users. The transit authority has combined travel training programs for both handyDART and the local conventional low floor buses. These programs provide free training on how to board buses with a wheelchair or scooter, as well as individualized coaching plans that can be targeted for work trips, appointments, or other commitments. Travel training programs educate people with disabilities or mobility challenges to occasionally use regular transit services in addition to the handyDART service.

Travel training for people with visual impairments has been provided in Edinburgh, Scotland through the Royal Blind School, an independent residential school. The mobility training program teaches those with severe visual impairments to develop mobility skills and techniques that enable them to travel in a variety of outdoor environments, including public transit (Scottish Government, 2012). The program is divided into levels or "passes" which are awarded according to a pupil's level of achievement. The fourth level of the program allows participants to travel independently on the bus. Skills developed include knowledge of relevant bus stop locations, touch techniques and diagonal cane use outdoors, and use of traffic sounds for orientation. A similar program also exists through the CNIB's community based-services which teaches blind or partially blind individuals skills for everyday life, including how to travel alone and ride transit.

Transit agencies and municipalities have taken varying approaches to training; however, information dissemination through web-based videos, or more official training sessions that outlines the types of services available and how to access them is important to ensure that the systems can be utilized to their full potential.

2.7 JOURNEY ASSISTANTS

Journey assistants for transit riders are offered in the Netherlands and Dresden, Germany; however, their roles varied between the two cities. In the Netherlands, journey assistants are available at over 100 stations to assist mobility restricted users (Holland by Train, 2012). The journey assistants are either an employee of the transit authority or a taxi driver. In Dresden, Germany, 15 specially trained travel assistants are available to assist those with disabilities in using public transit. Travel assistants pick up the user requiring assistance from either a bus stop or their homes and the service is provided at no charge, but must be pre-booked. The travel assistants are employees of the city's transit authority (PT Access, n.d.).

Journey assistants provide security and build confidence for users who may need additional support taking transit or who are first time users unfamiliar with the system. Journey assistants can help to encourage mobility-restricted users to take transit and be active.

2.8 INFORMATION TECHNOLOGY

Information technology (IT) is being used by transit authorities to improve access and dissemination of information. OC Transpo offers many website accessibility features allowing for easy website browsing. Customers using the OC Transpo website can install Browse Aloud software that reads webpages out loud on their computer or mobile device. Different texts are available for selection when viewing the website, as well as alternative text or “alt text” images. Alt text images are images that also contain an associated description. Descriptive links are also provided on the website. These links work similarly to the alt text by providing a link with a description attributed to it that becomes visible when the mouse hovers over the link. The OC Transpo website is also Screen Reader compatible (OC Transpo, 2012). Screen Reader software attempts to describe what is being displayed on the website through text to speech, audible icons, or braille output.



A new smartphone application, called Tiramisu, was created by Carnegie Mellon University in Pittsburgh, Pennsylvania to improve the way public transit information is relayed to transit customers. The application provides information on when a bus or train will arrive and more notably, can provide real time information on a bus location and occupancy levels. This allows persons using wheelchairs to make informed decisions on route based available space and timing (Carnegie Mellon University, 2012).

Global Positioning Systems (GPS) and smartphone applications allow people to check the availability or scheduling of transit services. For example, a user could check the availability of and existing capacity on low floor buses, real time of bus arrivals, and plan trip routes in advance. These IT programs not only help to make transit more accessible but improve the convenience for all users.

2.9 SUMMARY

Accessible transit has become a greater priority in Canada and internationally and the case studies illustrate that there is no single solution to providing a level of accessible transit. The case studies highlight the range of programs, services and improvements to infrastructure and vehicles that can and have been applied. The following section will connect these findings with the operational benefits and challenges experienced in implementation of these innovative programs and technologies.



SUMMARY OF FINDINGS FROM CONSULTATION INTERVIEWS

Consultation interviews were conducted with employees of transit authorities, non-profit organizations that represent persons with disabilities, and international transportation experts to collect information and insight on accessible transit, with a focus on observed benefits and challenges. The purpose of the consultation interviews was two-fold:

- i. Identifying benefits provided by accessible transit and challenges experienced in developing an accessible transit system, and
- ii. Developing categories to be evaluated in the cost-benefit analysis.

The consultation interviews were conducted with a wide range of individuals and organizations:

- **Transit authorities**, Members of the Canadian Urban Transit Association representing both conventional and specialized transit systems across Canada;
- **Non-profit organizations**, representing groups with different disabilities;
- **International organizations**;

The findings from the interviews have been summarized and categorized into three topic areas: motives and drivers for providing accessible transit services; benefits gained from the providing accessible transit services, and challenges associated with the implementation of accessible transit.

“... the impact of an aging population and an expectation that there will be a greater use of accessible transit by the growing population of seniors”

3.1 MOTIVES FOR PROVIDING ACCESSIBLE TRANSIT

An objective of the interview consultations was to identify rationale for provision of accessible transit services. The discussions with one of transit authorities interviewed revealed that specialized transit was initially provided by a non-profit organization in 1975. This specialized service filled a need that had not been provided by the region or municipality at the time. Another transit authority commented that specialized transit began 20 years ago because conventional transit was simply not accessible to all users. Of note, during this time, is that people with disabilities were generally transitioning from being institutionalized to living independently and thus demand for specialized transit services became a growing need.

A number of transit authorities commented that their future demand forecasts incorporate the impact of an aging population and an expectation that there will be a greater use of accessible transit by the growing population of seniors. The mandate of accessibility and provision of specialized transit services are the responsibility of and monitored by the transit authority. The transit authority identifies needs and determines whether accessibility within the system is improving.

During the interviews it was noted that governments at the provincial and municipal levels have mandated accessibility through policy direction and legislation, such as accessibility

plans, Ministry mandates, and Council goals, as well as provincial regulations such as the *Accessibility for Ontarians with Disabilities Act* (AODA). A transit authority member noted that extended operating times for specialized transit services is a requirement under AODA. Another transit authority member spoke to the impact of Human Rights Commission case decisions on the operation of transit services such as how fare structures are determined for specialized transit. The policy direction and regulations demonstrate that there is a public mandate to provide transit service that is inclusive and that provides an equal opportunity for all individuals to access transit.

In the Netherlands, universal transit access is a national priority. A key reason for this mandate is to help people live at home as long as possible. The alternative would be assisted care living or seniors housing, which is subsidized by the government and therefore, there is a cost savings if individuals are able to stay at home longer and access social services by transit.

3.2 BENEFITS PROVIDED BY ACCESSIBLE TRANSIT

The benefits gained from providing accessible transit identified during the consultation interviews are described below by category. Benefits of accessible transit are wide ranging and include benefits to mobility-restricted users, and operators, as well as social and community benefits.

Direct Benefits to the Mobility-restricted Users

- Independence, expands lifestyle choices and options (for example, ability to live at home longer), and improved quality of life;
- Increases mobility and in some cases, the only transportation option to access employment, school, medical, healthcare and other services; and
- More affordable transportation option and alternative to driving or private vehicle use.

Transit Service Provider and Customer Benefits

- Accessible services provide improved service for all customers (for example, stop announcements, people with strollers); and
- Meeting accessibility objectives.

Community and Societal Benefits

- Promotes social inclusion and encourages participation and involvement in the community;
- Promotes access to transit service for everyone and focuses on providing transit to marginalized or disadvantaged groups;
- Lowers reliance on family members and caregivers to provide private transportation;
- Savings and lowering demand for government and social services such as assisted living accommodation and seniors housing; and
- Possibility to coordinate trips for public services and community programs (for example, group training programs and seniors activities).

Economic Benefits

- More people who can participate in the labour force;
- Increases the number of consumers of products and services; and
- Ability to access volunteering opportunities (for example, large number of seniors who volunteer).

3.3 CHALLENGES TO PROVIDING ACCESSIBLE TRANSIT

Challenges associated with providing accessible transit and issues arising from existing accessible services discussed during the consultation interviews are summarized below.

Transit Operations and Investment

- There is an expectation that there will be increasing demand in the coming years for accessible transit from the growing senior population.
- Demand for specialized transit services is outpacing existing services, which has significant budget implications. The national average cost for specialized transit services in Canada was \$25.75 per passenger in 2011 (compared to \$3.31 per passenger for conventional transit in the same year) (CUTA, 2012);
- Sensitivity training for transit operators is important to ensure that mobility-restricted users are able to use transit with dignity and support;
- A key component of providing accessible transit is travel training for those unfamiliar with transit services and using it for the first time. For example, a senior who has driven all of their working lives and now can no longer drive may have never used transit;

- A person with a visual impairment must always be with a sighted person or trained instructor on their first trip when going to a new location in order to memorize the route. Therefore, each trip to a new location requires assistance. This results in an additional barrier for full use of the conventional transit system because despite added features to encourage ridership, a person with a visual impairment can still be limited in their available routes; and
- Winter maintenance and snow clearance are important to maintaining accessibility.

Institutional

- For transit systems that fall under municipal departments, budget requests for accessible transit infrastructure fall under the transportation department and therefore compete for funding within a department and with other municipal services. However, some municipalities offer dedicated grants to fund accessibility projects;
- Although many municipalities have accessibility plans, some may need updating. As accessibility is provided by different departments (e.g., transportation, planning, and community services) and under varying programs, its overall implementation and delivery may be uncoordinated and disconnected; and
- A portion of medical trips are for dialysis treatment (and other urgent healthcare treatment), where ambulatory customers are accommodated on specialized transit vehicles. This service is perceived by some to be more of a health service cost, and local health integration networks could be assuring those patients have adequate transportation to free up limited resources for those who rely on wheelchairs and walkers.

Technology and Design

- Implementing accessible infrastructure design at locations of trip origins and destinations (such as consistent sidewalk widths and depressed curbs) are outside the domain of the transit authority and can make transit trips inaccessible on the onset;
- Looking for an improved way to secure wheelchairs on conventional transit buses. The seatbelts provided for front-facing seating are seldom used due to inconvenience and non-usage may raise liability concerns. Some transit authorities use rear-facing seating as the alternative solution.

Public Perception

- Caregivers or family members of mobility-restricted transit users may have negative perceptions of public transit and therefore not encourage its use.
- It is more than developing a sense of trust between transit operators and mobility restricted users but also promoting awareness to all transit customers as part of a complete program to promote accessibility. Public awareness will help to generate support for the needs of mobility-restricted users, for example, abiding by priority seating guidelines.



MULTIPLE ACCOUNT EVALUATION

There are a myriad of socio-economic factors that are impacted by transit projects, both monetary and non-monetary. The previous sections have focused on the qualitative aspects of this analysis to gain a deeper understanding of the type of accessible transit programs and technologies that are in use, as well as the benefits and challenges of providing accessible transit. To provide a fulsome analysis of the value of providing accessible transit, both the social and economic issues must be considered quantitatively, or where not possible, qualitatively. This analysis therefore differs from traditional cost-benefit models as these analyses often tend to exclude many of the difficult to measure yet key influencing non-monetary factors. To more broadly assess the many factors that are impacted by accessible transit projects, economic, social, and accessibility effects have been considered in a comprehensive manner through the use of a multiple account evaluation (MAE) approach. In the application of the MAE framework, the underlying challenge is to understand the impact that investment in accessible transit has on the socio-economic wellbeing of the community.

This study evaluated the high-level impacts of accessible transit. Some potential benefits and costs have been assessed, however a full evaluation of costs could not be accurately developed. This is because the cost structure of the transit industry includes consideration of operating revenue and expenses, capital revenues and expenses, financial performance, the costs of equipment and infrastructure and sources of funding. Given the data available, it was not possible to develop cost estimates for improvements specifically related to accessibility. Additionally, allocation of capital and operations/maintenance costs for accessibility features varies greatly by municipality.

The findings of the MAE illustrate that economic and societal benefits can be realized with greater investment in accessible transit. This study analyzed and quantified the benefits related to:

- economic impacts from investment in accessible transit, both at the individual level and for the national economy,
- impacts on higher educational qualifications,

- impacts on health care costs,
- impacts on road user safety, and
- impacts on specialized transit service delivery.

These outputs were assessed through a sensitivity analysis, providing greater support into the relationship between the input and output variables. “What if” estimates were developed to illustrate outcomes under a different range of scenarios. The MAE within this report illustrates the conservative output (1% increase or decrease, depending on the variable). Because not all costs could be included in our analysis, the most conservative estimate possible was used in the sensitivity analysis. Appendix A details “what if” estimates to illustrate outcomes under medium and high scenarios. The degree of benefit ranges from substantial when evaluated under medium (10%) and higher boundary scenarios (25%), to less substantial

but potentially more tangible, when evaluated under the 1% conservative estimate.

The study also qualitatively evaluated benefits that are likely to arise from investment in accessible transit as a result of greater social inclusion, user satisfaction and overall integration with other government policies.

The MAE criteria used in this study are summarized in Table 2: Multiple Account Evaluation Framework—Summary of Impacts.

It should be noted that although the outcomes summarized within the MAE framework demonstrate potential benefits, these benefits are dependent on other non-accessible factors also being addressed.

TABLE 2: Multiple Account Evaluation Framework—Summary of Impacts

MULTIPLE ACCOUNT EVALUATION FRAMEWORK		
Quantitative Criteria	Annual Benefit (Cost) (\$)	*Normalized (2011 Dollars)
Economic Benefits		
<i>Increase in Income—Mobility Restricted Individual</i>	\$36,420,000	\$40,062,000
<i>Increase in Output—Income Multiplier Effect</i>	\$109,260,000	\$120,186,000
<i>Increase in Government Taxation</i>	\$27,679,200	\$30,447,000
Educational Economic Benefits		
<i>Increase in Income—Mobility Restricted Individual</i>	\$24,947,000	\$25,446,000
Public Health Benefits		
<i>Decrease in Health Care Costs</i>	\$3,916,000	\$3,916,000
Road User Safety Benefits		
<i>Decrease in Motor Vehicle Collision Costs</i>	\$7,942,000	\$8,260,000
Qualitative Criteria	Impact	Impact
Alternative Transportation Benefits		
<i>Change in Specialized Transit Service Costs</i>	Potential Savings	Potential Savings
Accessibility & Social Inclusion Benefits		
<i>Increase in Overall Social Benefits</i>	Positive	Positive
Integration Benefits		
<i>Linkage to Other Government Policies</i>	Positive	Positive

Framework Notes:

*All dollars have been normalized to 2011 base year. Historic rate of inflation assumed to be 2% annually.

Present value estimate based on a 3.5% discount rate.

The following sections present a summary of the analysis and concluding estimated benefits (or cost savings). Where data was available, national estimates were first generated and if not, available provincial estimates were made. All monetary benefits are expressed in Canadian dollars and have been normalized to reflect a 2011 base year.

4.1 ECONOMIC DEVELOPMENT BENEFIT

The economic evaluation reflects the net marginal user impact resulting from having increased availability of safe and reliable accessible transit. National labour force data identifies the participation rate among working age (15 to

64 year old) individuals with mobility related disabilities at 53.6%. This is slightly lower than the 66.8% participation rate within the general population. This indicates that approximately 46.4% of mobility restricted individuals do not currently participate. It is assumed that mobility disabilities are the most likely disability to hinder a person's ability to get to work. To quantify the income potential of this group, the study determined the total working age population and the percentage of individuals whose disability impairs their ability to work (63.6%). The analysis focused on this 'incremental group' as they are most likely to benefit from investment in accessible transit. Median earnings of an individual with a disability, netting out the average of individual benefits received from Ontario Disability Support Program (ODSP) and British Columbia Person with Disability (PWD) was calculated to generate final output potential.

TABLE 3: Summary of Individual Economic Impacts

INDIVIDUAL ECONOMIC IMPACT		
	Direct values from sources	Calculated values
15–64 Individuals With Mobility Restrictions (No. of people)	1,861,625	
Mobility Restricted Participation Rate ¹ (%)	53.60%	
Total Participating in Labour Market (No. of people)		997,831
Total Not Currently in Labour Market (No. of people)		863,794
Disability Fully Prevents Ability to Participate (%)	63.60%	
Remaining Incremental Group (No. of people)		314,421
Median Earnings Individual With Disability(\$)	\$22,600 ²	
Average of ODSP & PWD Net Benefit (\$)	\$11,016 ³	
Net New Earnings per individual (\$)		\$11,584
Total Potential Annual Increase (\$)		\$3,642,252,864
Rounded (\$)		\$3,642,000,000
Conservative Output		
1.0% increase in number of individuals participating in the labour force (\$)		\$36,420,000

¹ Source: Employment among the Disabled. Diane Galarneau and Marian Radulescu. Statistics Canada, 2010.

² Source: Disability in the Workplace. Cara Williams. Statistics Canada, 2006.

³ Source: ODSP (Hyland and Mossa, More barriers than opportunity) and PWD (Disability Without Poverty Network, 2012)

Assumptions:

1 All individuals within working age group are considered to be looking for employment

2 It should be noted that other pertinent factors beyond accessible transit are also required to produce this output

Given the underlying assumptions (detailed in the table footnotes above) and financial data (see Table 3), \$36.42 million in additional income could be created by enabling employment for 1% of mobility-restricted individuals whose disability would not prevent labour market participation.” From a macroeconomic perspective income earned is magnified throughout the economic system by the multiplier effect.

The multiplier is an economic concept used to determine the extent to which initial earnings are magnified throughout the economic system, and helps to determine the full impacts of additional income. Research into Canadian consumer behaviour revealed that 66.5% of household income earned is spent on consumption and approximately 19.0% is subject to taxation (Statistics Canada, 2010). This study used the multiplier effect to determine the extent to which the calculated income increase will contribute to the



Canadian economy (see Table 4). Using the household income consumption value, the multiplier was calculated to be 3. This indicates that new income of \$1.00 results in \$3.00 of total additional income to the economy.

TABLE 4: Multiplier Effect in Canada

MULTIPLIER EFFECT CANADA, 2009		
Multiplier Formula	$1 / (1 - \text{Marginal Propensity to Consume})$	
Canadian Multiplier Impact	$1 / (1 - 0.665)$	
Multiplier	3.0 (rounded)	
For every 1% increase (\$)	$\$36,420,000 * \3.00	\$109,260,000
Increased Taxation (\$)	$(\$36,420,000 + \$109,260,000) * 0.19$	\$27,679,200

Assumptions:

- 1 For conservative purposes it is assumed that mobility restricted individuals have the same spending and taxation level as the general public. As mobility restricted median earnings are less than national averages a greater portion of income will likely be consumed to meet one’s basic living needs. Therefore consumption rates are likely higher than general public average.

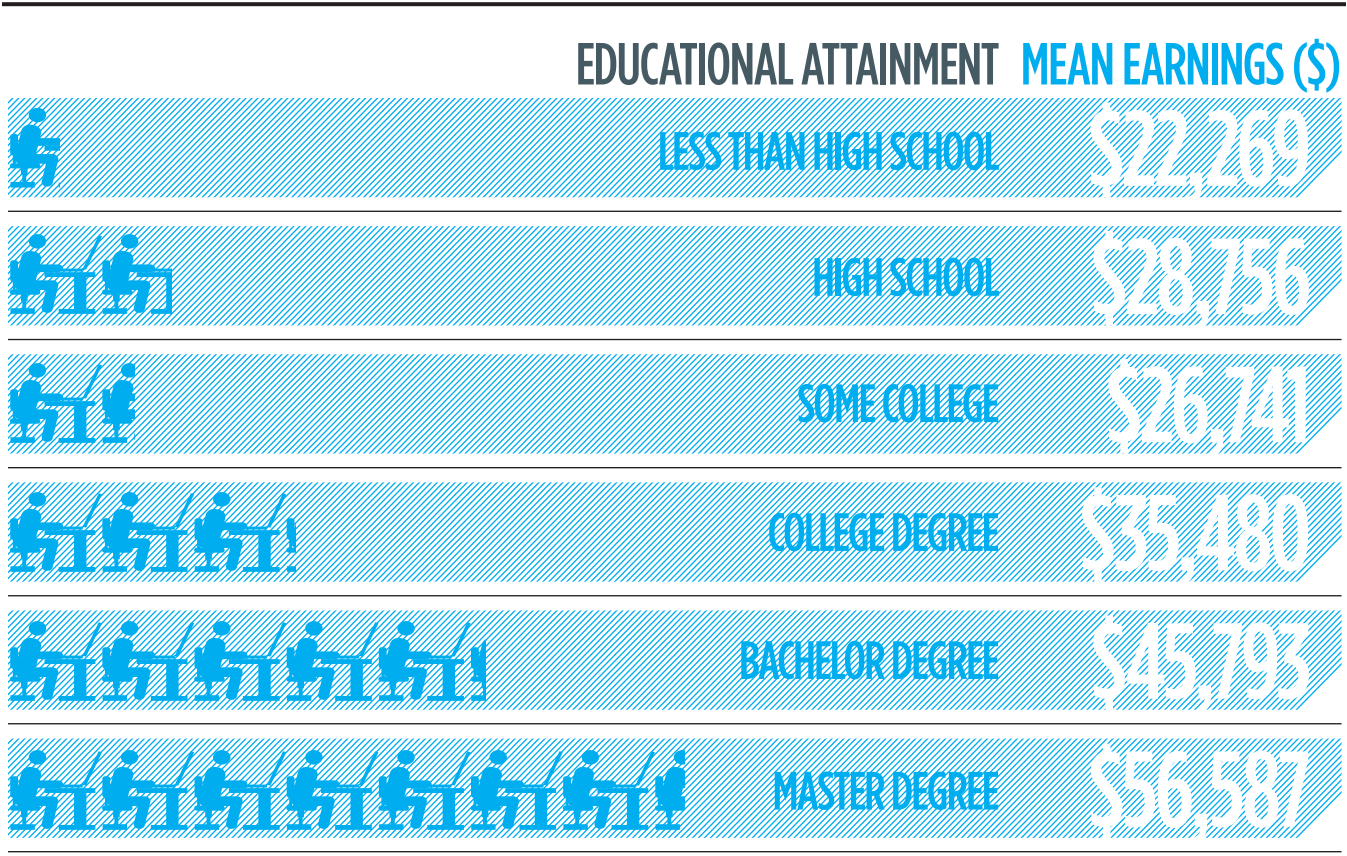
4.2 ECONOMIC DEVELOPMENT HIGHER EDUCATION

As detailed in Table 5 a direct relationship exists between higher educational qualifications and higher earnings.

Research on education attainment for adults aged 25 to 64 years old with and without disabilities (not only mobility

restrictions) revealed a noticeable disparity. Table 6: Educational Attainment for Adults With and Without Disabilities, Aged 25–64 illustrates the higher proportion of individuals with higher education exists within the non-disabled group. Creating a more inclusive, accessible environment can help narrow this gap. Our study analyzed the change in earnings potential by assuming equivalent education levels between the two groups in Table 7 Summary of the Change in Income from higher education qualifications.

FIGURE 2: Summary of Mean Earnings Based on Education Level



Source: Rotman School of Management, University of Toronto, Martin Prosperity Institute

TABLE 5: Educational Attainment for Adults With and Without Disabilities. Aged 25–64, 2006

Level of Education	PEOPLE WITH DISABILITIES		PEOPLE WITHOUT DISABILITIES	
	Number	%	Number	%
Total	2,243,430	100%	14,830,000	100%
No Certificate	569,610	25.4%	2,002,340	13.5%
High School Diploma	545,720	24.3%	3,545,970	23.9%
Trades or Registered Apprenticeship Certificate	329,590	14.7%	1,785,910	12.0%
College, CEGEP, University Certificate Below Bachelor's	488,730	21.8%	3,933,010	26.5%
Bachelor's degree	187,300	8.3%	2,274,630	15.3%
Graduate degree	122,480	5.5%	1,289,890	8.7%

¹ Source: Human Resource and Skills Development Canada, 2009 Federal Disability Report: Advancing the Inclusion of People with Disabilities, 2009.

TABLE 6: Summary of Change in Income from Higher Education Qualifications

EDUCATION ECONOMIC IMPACT					
Level of Education	People with Disabilities	People Without Disabilities	Summary If two groups matched (No. of Disabled people)	Change in Proportion (No. of People)	Change in Income (\$)
Total	2,243,430	14,830,000		-2,243,430	
No Certificate	569,610	2,002,340	302,907	-266,703	-\$6,053,626,000
High School Diploma	545,720	3,545,970	536,422	-9,298	-\$267,379,000
Trades or registered apprenticeship certificate	329,590	1,785,910	270,166	-59,424	-\$2,090,531,000
College, CEGEP, university certificate below bachelor's	488,730	3,933,010	594,972	+106,242	\$3,737,588,000
Bachelor's degree	187,300	2,274,630	344,098	+156,798	\$7,180,250,000
Graduate degree	122,480	1,289,890	195,130	+72,650	\$4,111,046,000
Net Total Change					\$6,617,348,000
<i>Mobility Restricted = 37.7% of disabled population</i>					
Total Potential Annual Increase (\$)					\$2,494,740,000
Conservative Output					
1.0% increase in number of people attaining higher education (\$)					\$24,947,000

Assumptions:

- 1 It should be noted that other pertinent factors are also required to produce this output
- 2 It should be noted that people with mental/learning disabilities would be expected to account for a larger proportion of the groups with lower levels of education, and are potentially less likely to achieve higher levels with more accessible transit

4.3 PUBLIC HEALTH BENEFITS

Public health benefits were evaluated by analyzing the potential cost savings impacts in home care costs (these include day programs, respite programs, nursing, social work, physiotherapy, speech language pathology, and occupational therapy). Although home care services are

considered to provide relative cost advantages over other forms of care, its net cost represents a significant expenditure to the health care system. There has also been a remarkable growth in home care expenditures in Canada over the last twenty five years and between 1999 and 2010 public home support spending in Canada increased from \$1.58 billion to \$3.23 billion (Côté and Fox, 2007). Home care labour costs are a large expense to the Canadian public health system (see Table 8).

TABLE 7: Home Care Costs (Canada)

HOME CARE COSTS CANADA, 2007				
Year	No. of Recipients	No. of Hours of Care	Average Cost(\$)/Hour	Total Home Care Employee Cost (\$)
2007	1,327,530	67,254,971	\$25.00 ¹	\$1,681,374,275

¹ Source: Comfort Life, Home Care Costs

Home Care Costs – Costs related to all publically funded home care related services

This specific research examined the potential national home care labour costs for individuals 65 years of age or older with mobility-related disabilities. As noted in Table 9, National Home Care Costs—65+ Cohort, total labour costs \$391.6 million or \$1,266 per individual. The situation becomes even more profound when one factors in the economic impacts of family caregivers. It is estimated that approximately 2.7 million Canadians provide home care for

seniors, representing 80.0% of Canada's home care services. It is estimated that these individuals provide \$6.0-\$9.0 billion annually in unpaid care, forgoing time available for other activities (Canadian Caregiver Coalition, 2008). In addition informal home care imposes a cost on business. In 2007, it was estimated that \$1.3 billion in lost productivity was a result of informal care givers missing work, quitting or losing their jobs (Canadian Alliance for Sustainable Healthcare, 2012).

TABLE 8: National Home Care Costs—65+ Cohort

HOME CARE COSTS MOBILITY RESTRICTED 65+ GROUP, 2011				
Year	No. of Recipients	No. of Visits/Hour	Average Cost (\$)/Hour	Total Home Care Employee Cost (\$)
2011	309,188	15,664,000	\$25.00	\$391,600,000
Conservative Output				
1.0% Decrease in costs (\$)				\$3,916,000

“...informal home care imposes a cost on business.”

Investment in accessible transit can help to reduce the need for home care services for mobility restricted individuals who would be physically capable of riding specialized or accessible transit vehicles. Accounting for a conservative 1% decrease in home health needs, this could result in \$3.9 million in annual home health care costs savings (see Table 9).

It should be noted that home care is provided to all age groups, with caregivers providing assistance to children, young adults and others in need of support. Providing a suitable alternative mode of transit to the younger population will likely increase these cost savings. However it should also be noted that as the mobility restricted group increase their use of transit, facility care costs will likely increase, thus decreasing the potential benefit. As the population continues to age access to healthcare services faces a growing challenge. This issue has the greatest consequence on those individuals who cannot provide their own transportation. Not being able to access non-emergency medical transportation to attend health care appointments may expose individuals to increased risks of future medical condition complications. This may lead to greater healthcare costs if specialized treatment or hospitalization becomes needed. In Northeastern Ontario for example, the average cost of care in a hospital bed equated to \$850 per night (North East Local Health Integration Network, 2011). Additionally, healthcare facility inefficiencies may arise from increased staff overtime and overcrowding. In the analysis of home care costs, it was noted that a significant amount of unpaid care is provided from family, friends or other loved ones. In a similar way these unpaid caregivers will likely realize improved productivity and less work absenteeism from increased access to non-emergency medical transport.

4.4 ROAD USER SAFETY

The majority of seniors drive cars (Statistics Canada, 2012). Although medical conditions that affect driving can occur at any age, they are more likely to be associated with older ages. As a result seniors are more likely to be considered medically at-risk drivers (MARD, 2012). In 2009, 3.25 million people aged 65 and over had a driver's license, representing three-quarters of all seniors (Statistics Canada, 2012). Canadian data indicate that less than 6% of seniors use public transportation (Statistics Canada, 2010). This dependence on motor vehicles presents an opportunity to encourage public transit use by providing accessible services, and possibly increase road user safety by giving medically at risk drivers alternative transportation options. Statistics indicate that individuals aged 70 and older have a higher accident rate per kilometer driven than every age group except young male drivers. Furthermore seniors are more likely to be killed when involved in a collision (Statistics Canada, 2012). The negative effect of these incidences is likely to continue to increase as the population continues to age. The following analysis highlights the potential for real collision related cost savings if this age group opted to use an alternative mode of transport.

This MAE framework evaluated the road user safety benefits of providing accessible transit by analyzing the costs and potential savings related to motor vehicle collisions. The traffic injury research foundation has estimated the total economic and social costs of motor vehicle collisions at \$25.0 billion annually in Canada. In 2009, a total of 125,203 collisions occurred across Canada, resulting in an average cost of \$200,000 (rounded) per collision. Of these collisions, 2,011 were fatal in nature with the remaining 123,192 involving a personal injury. In 14.8% of the fatality cases and 10.4% of the personal injury collisions the driver involved was aged 65 and older (Transport Canada and Canadian Council of Motor Transport Administrators, 2012). Multiplying these figures together indicates approximately 13,110 collisions involved individuals 65 and older. Accounting for a conservative 1% decrease in accidents, this could result in \$7.9 million in potential annual savings (see Table 10).

TABLE 9: Canadian Motor Vehicle Collision Calculations, 2009

CANADIAN MOTOR VEHICLE COLLISION CALCULATIONS, 2009	
Total Population 65+ (No. of people)	4,344,500
Population Aged 65+ with a Driver License (DL)	3,254,500
Proportion of Population Aged 65+ with a Driver License (%)	75.00%
No. of Collisions with Driver 65+	13,110
No. of Seniors 65+ with Mobility Restriction (mr)	1,314,573
No. of Drivers 65+ with MR	$1,314,573 * 0.75 = 985,929$
Drivers 65+ with MR in Proportion to Total 65+ Drivers (%)	$985,929 / 3,254,500 = 30.29\%$
Potential Accidents Related to 65+ with Mobility Restriction (No.)	$13,110 * 0.3029 = 3,971$
Estimated Total Collision Related Costs (\$)	$\$3,971 * \$200,000 = \$794,200,000$ (rounded)
Conservative Analysis	\$7,942,000
1.0% decrease in number of accidents (\$)	

Due to data availability, this study considers seniors aged 65+ as potential medically at-risk drivers. This does not imply that all seniors are at a higher risk of causing an accident, or that age directly results in more accidents. This assumption is based on research that the medical conditions of ageing can create driving impairments that in turn lead to accidents (MARD, 2012). This calculation also assumes that seniors with mobility restrictions are equally as likely to have a driver's license as those without a disability. Data are not available to assess this assumption, therefore it may result in an over estimation of the results. The results may also be underestimated because accidents that result in property damage but no injuries were not included in the calculation, and their inclusion would have potentially increased the financial benefits.

4.5 ALTERNATIVE TRANSPORTATION COST

The final quantitative component of this study's MAE delves into the possible benefits of shifting mobility-restricted customers from specialized service to accessible conventional service. The first step in this analysis is to evaluate potential demand and costs for specialized transit (Table 11). This study analyzes the 2001 vs. 2011 per capita registrants, annual number of trips per registrant, and annual trips per capita in two categories: 1) Eight major Canadian cities (where specialized transit is more utilized) and 2) all of Canada (CUTA, 2012).

TABLE 10: Specialized Transit Trip Demand, Eight Major Canadian Cities

SPECIALIZED TRANSIT TRIPS — EIGHT MAJOR CITIES, CANADA			
Year	Average Registrants/ per Capita	Average Annual Trips per Registrant	Average Annual Trips per Capita
2001	0.016	62	0.86
2011	0.014	79	1.05
Compounded Annual Growth Rate (%)	-0.82%	2.47%	1.96%

Cities used: Toronto, Vancouver, Montreal, Edmonton, Hamilton, Ottawa, Calgary, and Winnipeg.

Source: CUTA Specialized Transit Services Fact Book, 2001 & 2011.

The data provide valuable insights into demand trends for specialized transit. While the number of registrants per capita has remained relatively stable, there was a marked increase in the number of trips and number of trips per registrant between 2001 and 2011. Given the aging population trend, a forecast was generated to determine the potential demand for specialized transit in 2021. Assuming the registrants per capita remains constant and to remain

conservative by assuming the same ten year compounded annual growth rate in annual trips per registrant (0.014 and 2.47% conservative assumptions), produces a noticeable increase in both annual trips per registrant and total number of specialized trips within the eight major cities of Canada (Table 12). The same approach was applied to assess all of Canada (Table 13).

TABLE 11: Specialized Transit Trip Forecast, Eight Major Canadian Cities

SPECRANSIT 10 YEAR FORECAST – EIGHT CITIES					
Year	Population Served	Total Registrants	Registrants per Capita	Average Annual Trips per Registrant	Total Specialized Service Trips
2001	9,627,792	119,005	0.016	62	7,203,067
2011	10,618,577	152,950	0.014	79	11,260,156
2021	11,999,377	173,455	0.014	*101 Est.	17,489,620 Est.
Compounded Annual Growth Rate (CAGR)	1.23%	1.27%	0.00%	2.47%	4.50%

*Note: Calculation = $79 * (1.0247)^{10}$

Cities: Toronto, Vancouver, Montreal, Edmonton, Hamilton, Ottawa, Calgary, and Winnipeg.

TABLE 12: Specialized Transit Trip Forecast, Canada

SPECIALIZED TRANSIT 10 YEAR FORECAST—CANADA					
Year	Population Served	Total Registrants	Registrants Per Capita	Average Annual Trips per Registrant	Total Specialized Service Trips
2001	18,634,383	208,847	0.011	53	11,131,850
2011	21,604,923	312,967	0.014	56	17,524,248
2021	23,836,478	345,293	0.014	59*	20,305,066
Compounded Annual Growth Rate (CAGR)	0.99%	0.99%	0.00%	0.49%	1.5%

Notes:

- 1 2021 Population served derived from ratio of Population served within 2011 CUTA Specialized Transit Fact Book to total 2011 Canadian population.
- 2 To remain conservative, 2011-12 CAGR average annual trips/registrant is 0.49% (constant with 2001-11 CAGR).
- 3 This analysis used extrapolation from eight cities study above. It should be noted that specialized transit varies by city, which may vary results.

In 2011, total Canadian operating expenditures for specialized transit was \$451.2 million, with an average cost per trip equaling \$25.75 per passenger (CUTA, 2012). Because conventional and specialized transit customers pay the same fare per trip, shifting some customers to the comparatively less expensive conventional transit (average net cost of \$1.50 per trip) could provide large cost savings to transit systems. To make a conservative estimate, this study has indexed the 2011 cost per trip (2% per annum) to 2021 and multiplied this amount by the 2021 forecasted number of specialized trips. This results in approximately \$637.4 million in total operating expenditures for specialized transit in Canada in 2021. In 2011 present value dollars, (with a 3.5% discount rate) the total estimated expenditure would be approximately \$451.9 million. This expenditure is comparable to current operating costs and indicates that future costs will remain high. These high costs highlight the value of shifting some customers to conventional transit because the average cost per trip is considered much lower.

4.6 ACCESSIBILITY AND SOCIAL INCLUSION BENEFITS

Participation in society is vitally important to a healthy community, especially for those who are elderly and who are most at risk for social exclusion. As noted in the research above, seniors' rely on their vehicles as a preferred mode of transportation; however, the analysis also indicates that notwithstanding reduced mobility there does not appear to be an increased use of transit by this cohort to compensate for the reduction of private vehicle operation as people age. This places significant reliance on motor vehicle access as a means for social inclusion.

Improved accessible transit can lead to a multitude of societal benefits. For example, mobility-restricted individuals can better participate in volunteering activities. This social benefit is especially true for seniors who may be retired from the workforce. Increased volunteering or formal help can provide a means where mobility-restricted individuals can showcase their strengths instead of being limited by their condition.

“...mobility-restricted individuals can better participate in volunteering activities.”

The foregoing will help to provide the non-profit sector with the critical resources to better deliver their mandates. Improved accessibility can also result in improved access to informal help that is provided to family members, friends or neighbours. This can include activities like babysitting grandchildren or care giving for other loved ones. Research indicates that the market value of the unpaid assistance of individuals aged 55 and older was 1.5% (Robb et al., 2007) of Canadian GDP in 1992. In 2012 that would translate into nearly \$21.0 billion dollars. Given the aging population and the correlation between age and disability it is critical that investments in accessible transit be made to continue to accommodate this unpaid care and volunteerism.

At the individual level improved accessible transit leads to less isolation and improved quality of life. Restricted mobility users gain a new sense of liberation, as they are more capable of independently participating in social opportunities, attending doctors' appointments, critical social services and recreational activities.

Improved accessible transit also provides all transit users with a better user experience and higher satisfaction rates. Universal design features, which are intended to accommodate users with disabilities provide greater comfort and ease for all riders and speeds up the boarding process. The overall benefit leads to a more effective and efficient local transit system.

4.7 INTEGRATION BENEFITS

Improved accessible transit provides benefits with other government policies, including health, infrastructure, environmental and economic. When these linkages are viewed as a collective whole significant insights and implications can be drawn. For example, converting a user from a private motor vehicle to transit supports climate change objectives. This improves public health; especially for seniors whose existing health conditions may be more sensitive to air pollution. The foregoing will also result in more regular physical activity which reduces the risks associated with sedentary lifestyles.

The World Health Organization (WHO) defines an age friendly city as an inclusive and accessible urban environment promoting active aging. In 2007, the WHO developed guidelines to support more age friendly cities and communities. One criterion included having reliable, available and affordable public transit system. Investments in accessible transit can help to fulfill these guidelines and further Canada's position as a progressive leader in fostering age friendly communities.

The Province of Ontario has developed *the Places to Grow and the Growth Plan for the Greater Golden Horseshoe* to frame future development. The objective of these plans is to create communities that enable all citizens to live within the same community, thereby allowing individuals to remain in their home as they age. The development plans require investments that are transit supportive and provide enhanced transit amenities. Investing in accessible transit provides the necessary support to ensure individuals can remain in their residences.



VALUE CASE FOR ACCESSIBLE TRANSIT

The case studies highlight the exciting work and innovation occurring in Canada and around the world in the area of accessible transit implementation and delivery. The examples drawn from across Canada and the globe demonstrate that accessible transit is more than a national issue but a global topic. As illustrated in this study, the number of mobility-restricted users is anticipated to increase due to demographic changes, an aging population and the resulting increase in mobility disabilities. This trend is expected to create a growing demand for accessible transit services.

The value of accessible transit is composed of social and economic benefits. The value case development was underscored by key themes of universal accessibility, inclusion, participation, and health, which emerged from the work on the precedent case studies, consultation interviews, and a multiple account evaluation.

While costs could not be evaluated, as demonstrated through the MAE framework the value case for accessible transit comprises financial benefits from an economic perspective. Table 2 summarized the benefits that can be realized with increased investment, the largest contributor being the \$40.1 million in income that can be generated by increased labour force participation. This has the potential to generate an additional \$120.2 million of new output. Looking at the broader picture, this economic activity is an important contributor to economic growth in Canada.

The value case for accessible transit also comprises positive social benefits, which are gained by the mobility-restricted users, the transit authority, and the greater community. For mobility-restricted users, the most significant social value of being able to access transit is independence, supported by having more lifestyle choices and having equal access to transit. The potential for increased community involvement

and participation in social activities supported by accessible transit can contribute to improved quality of life and social inclusion. From the perspective of transit authorities, providing accessible transit is promoting equality of services and meeting accessibility goals that are legislated as well as policy directives, which demonstrate overall public support for accessible transit. The governing body, whether it be municipal, regional, or provincial, through its transit authority delivers a public service that can be equally accessed by all and encourages transit usage as an affordable mode of transportation. The value added to the greater community is community building and having more visitors, volunteers, and people who are involved in activities (i.e., social and physical).

“...most significant social value of being able to access transit is independence, supported by having more lifestyle choices and having equal access to transit.”

As the portion of the population that is older grows, accessible transportation will become even more critical to the independence and economic participation of Canadians with mobility restrictions. This report shows that the case for providing accessible transit is supported by the broad spectrum of annual monetary benefits to the national economy (increased income, rise in GDP, and additional tax base), the economic benefits of increased access to education, the cost savings to public health services, road user safety, and the potential financial benefits of shifting some

specialized transit customers to accessible conventional transit. Accessible transit also provides many societal benefits, which include the opportunity to provide volunteer services or unpaid care to family members and individuals. These benefits can go a long way in improving the productivity of the not-for-profit sector and society at large.

Accessible transit consists of both specialized door-to-door services and accessible conventional services. Generally, transit systems have been working to improve the accessibility of their conventional or fixed route services by adding low floor buses to their fleets, ensuring rail cars and stations are built to current accessibility standards or retrofitted when upgraded. Policy changes and education programs such as travel training are other ways that transit operators have embraced more universally accessible services.

Specialized transit services are more costly, but continue to adopt innovations to meet the demand of a growing and aging population. These innovations including updating eligibility processes to ensure that only those with the least mobility access the door-to-door service. Technology innovations including demand response scheduling software, onboard vehicle computers and automated telephone systems are other ways that specialized transit operators have worked to keep their costs affordable.

As specialized transit services expand and costs increase, transit systems are faced with the challenge of finding the right balance between accessible conventional transit and specialized door-to-door service. The results of this study provide a value case for accessible transit that summarizes all the benefits, benefits that could be further augmented by facilitating a shift of some mobility restricted customers to conventional transit. While specialized transit services will continue to be an important element of supporting accessibility for persons with disabilities to fully access their communities, the results of this study can demonstrate the importance of investing in making conventional transit accessible in order to reduce demand of more costly specialized transit.

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APPENDIX

LIST OF INTERVIEWED STAKEHOLDERS

The consultation interviews were conducted with a wide range individuals and organizations:

- **Transit authorities, Members of the Canadian Urban Transit Association representing both conventional and specialized transit systems across Canada:** Grand River Transit (Waterloo Region, Ontario), Para Transpo (Ottawa, Ontario), York Region Transit (York Region, Ontario), Regina Transit (Regina, Saskatchewan), Saskatoon Transit (Saskatoon, Saskatchewan), Access Calgary (Calgary, Alberta), Edmonton Transit System (Edmonton, Alberta), BCTransit (Victoria, British Columbia), and Access Transit (Vancouver, British Columbia);
- **Non-profit organizations, representing groups with different disabilities** – CNIB (charity dedicated to assisting Canadians who are blind or living with vision loss), War Amps (a Canadian charity operated under the direction of war amputees), and LiveWorkPlay (an Ottawa-based organization supporting individuals with intellectual disabilities to have greater participation in the community);
- **International organizations** – Johan Diepens, founder and director of Mobycon (Dutch transport and mobility consulting firm), and Julia Wadoux, policy officer for Health, Information and Communication Technologies (ICT) and Accessibility of AGE Platform Europe (a European network of organizations that promote the needs of European Union residents aged 50 years and older); and
- **MMM/MRC international transportation experts** – George Hazel, chairman, and Matt Hanrahan, principal consultant (MRC McLean Hazel, Edinburgh, United Kingdom), and Neil Cagney, managing director (MRC Cagney, Brisbane, Australia).

QUANTITATIVE ANALYSIS

INDIVIDUAL ECONOMIC IMPACT			
15–64 Individuals With Mobility Restrictions (No. of people)	1,861,625		
Mobility Restricted Participation Rate ¹ (%)	53.60%		
Total Participating in Labour Market (No. of people)	997,831		
Total Not Currently in Labour Market (No. of people)	863,794		
Disability fully prevents ability to participate (%)	63.60%		
Remaining Incremental Group (No. of people)	314,421		
Median Earnings Individual With Disability(\$)	\$22,600 ²		
Average of ODSP & PWD Net Benefit (\$)	\$11,016 ³		
Net New Earnings per individual (\$)	\$11,584		
Total Potential Annual Increase (\$)	\$3,642,252,864		
Normalized, 2011	\$4,006,200,000	\$4,006,200,000	

Sensitivity Analysis	(%) Increase	(\$) Increase	(\$) Multiplier	(\$) Taxation	Normalized (\$) Increase	(\$) Multiplier	(\$) Taxation
Increase of	1.00%	\$36,422,529	\$109,267,586	\$27,681,122	\$40,062,000	\$120,186,000	\$30,447,120
Increase of	5.00%	\$182,112,643	\$546,337,930	\$138,405,609	\$200,310,000	\$600,930,000	\$152,235,600
Increase of	10.00%	\$364,225,286	\$1,092,675,859	\$276,811,218	\$400,620,000	\$1,201,860,000	\$304,471,200
Increase of	15.00%	\$546,337,930	\$1,639,013,789	\$415,216,826	\$600,930,000	\$1,802,790,000	\$456,706,800
Increase of	20.00%	\$728,450,573	\$2,185,351,718	\$553,622,435	\$801,240,000	\$2,403,720,000	\$608,942,400
Increase of	25.00%	\$910,563,216	\$2,731,689,648	\$692,028,044	\$1,001,550,000	\$3,004,650,000	\$761,178,000
Increase of	30.00%	\$1,092,675,859	\$3,278,027,578	\$830,433,653	\$1,201,860,000	\$3,605,580,000	\$913,413,600
Increase of	35.00%	\$1,274,788,502	\$3,824,365,507	\$968,839,262	\$1,402,170,000	\$4,206,510,000	\$1,065,649,200
Increase of	40.00%	\$1,456,901,146	\$4,370,703,437	\$1,107,244,871	\$1,602,480,000	\$4,807,440,000	\$1,217,884,800
Increase of	45.00%	\$1,639,013,789	\$4,917,041,366	\$1,245,650,479	\$1,802,790,000	\$5,408,370,000	\$1,370,120,400
Increase of	50.00%	\$1,821,126,432	\$5,463,379,296	\$1,384,056,088	\$2,003,100,000	\$6,009,300,000	\$1,522,356,000
Increase of	55.00%	\$2,003,239,075	\$6,009,717,226	\$1,522,461,697	\$2,203,410,000	\$6,610,230,000	\$1,674,591,600
Increase of	60.00%	\$2,185,351,718	\$6,556,055,155	\$1,660,867,306	\$2,403,720,000	\$7,211,160,000	\$1,826,827,200
Increase of	65.00%	\$2,367,464,362	\$7,102,393,085	\$1,799,272,915	\$2,604,030,000	\$7,812,090,000	\$1,979,062,800

INDIVIDUAL ECONOMIC IMPACT							
Sensitivity Analysis	(%) Increase	(\$ Increase	(\$ Multiplier	(\$ Taxation	Normalized (\$ Increase	(\$ Multiplier	(\$ Taxation
Increase of	70.00%	\$2,549,577,005	\$7,648,731,014	\$1,937,678,524	\$2,804,340,000	\$8,413,020,000	\$2,131,298,400
Increase of	75.00%	\$2,731,689,648	\$8,195,068,944	\$2,076,084,132	\$3,004,650,000	\$9,013,950,000	\$2,283,534,000
Increase of	80.00%	\$2,913,802,291	\$8,741,406,874	\$2,214,489,741	\$3,204,960,000	\$9,614,880,000	\$2,435,769,600
Increase of	85.00%	\$3,095,914,934	\$9,287,744,803	\$2,352,895,350	\$3,405,270,000	\$10,215,810,000	\$2,588,005,200
Increase of	90.00%	\$3,278,027,578	\$9,834,082,733	\$2,491,300,959	\$3,605,580,000	\$10,816,740,000	\$2,740,240,800
Increase of	95.00%	\$3,460,140,221	\$10,380,420,662	\$2,629,706,568	\$3,805,890,000	\$11,417,670,000	\$2,892,476,400
Increase of	100.00%	\$3,642,252,864	\$10,926,758,592	\$2,768,112,177	\$4,006,200,000	\$12,018,600,000	\$3,044,712,000

¹ Source: Employment among the Disabled. Diane Galarneau and Marian Radulescu. Statistics Canada, 2010.

² Source: Disability in the Workplace. Cara Williams. Statistics Canada, 2006.

³ Source: ODSP (Hyland and Mossa, More barriers than opportunity) and PWD (Disability Without Poverty Network, 2012)

Assumptions:

- 1 All individuals within working age group are considered to be looking for employment
- 2 It should be noted that other pertinent factors beyond accessible transit are also required to produce this output

EDUCATION ECONOMIC IMPACT					
Level of Education ¹	People with Disabilities	People without Disabilities	Summary if Two Groups Matched (No. of Disabled People)	Change in Proportion	Change in Income (\$)²
Total	2,243,430	14,830,000		-2,243,430	
No Certificate	569,610	2,002,340	302,907	-266,703	-\$6,053,626,000
High School Diploma	545,720	3,545,970	536,422	-9,298	-\$267,379,000
Trades or registered apprenticeship certificate	329,590	1,785,910	270,166	-59,424	-\$2,090,531,000
College, CEGEP, university certificate below bachelor's	488,730	3,933,010	594,972	106,242	\$3,737,588,000
Bachelor's degree	187,300	2,274,630	344,098	156,798	\$7,180,250,000
Graduate degree	122,480	1,289,890	195,130	72,650	\$4,111,046,000
Net Total Change					\$6,617,348,000
<i>Mobility Restricted = 37.7% of disabled population</i>					

EDUCATION ECONOMIC IMPACT					
Level of Education ¹	People with Disabilities	People without Disabilities	Summary if Two Groups Matched (No. of Disabled People)	Change in Proportion	Change in Income (\$)²
Total Potential Annual Increase (\$)					\$2,494,740,000
Normalized, 2011					\$2,544,600,000

Sensitivity Analysis	% Increase	(\$) Increase	Normalized (\$) Increase
Increase of	1.00%	\$24,947,400	\$25,446,000
Increase of	5.00%	\$124,737,000	\$127,230,000
Increase of	10.00%	\$249,474,000	\$254,460,000
Increase of	15.00%	\$374,211,000	\$381,690,000
Increase of	20.00%	\$498,948,000	\$508,920,000
Increase of	25.00%	\$623,685,000	\$636,150,000
Increase of	30.00%	\$748,422,000	\$763,380,000
Increase of	35.00%	\$873,159,000	\$890,610,000
Increase of	40.00%	\$997,896,000	\$1,017,840,000
Increase of	45.00%	\$1,122,633,000	\$1,145,070,000
Increase of	50.00%	\$1,247,370,000	\$1,272,300,000
Increase of	55.00%	\$1,372,107,000	\$1,399,530,000
Increase of	60.00%	\$1,496,844,000	\$1,526,760,000
Increase of	65.00%	\$1,621,581,000	\$1,653,990,000
Increase of	70.00%	\$1,746,318,000	\$1,781,220,000
Increase of	75.00%	\$1,871,055,000	\$1,908,450,000
Increase of	80.00%	\$1,995,792,000	\$2,035,680,000
Increase of	85.00%	\$2,120,529,000	\$2,162,910,000
Increase of	90.00%	\$2,245,266,000	\$2,290,140,000
Increase of	95.00%	\$2,370,003,000	\$2,417,370,000
Increase of	100.00%	\$2,494,740,000	\$2,544,600,000

Sources:

¹ Human Resource and Skills Development Canada, 2009 Federal Disability Report: Advancing the Inclusion of People with Disabilities, 2009.

² Rotman School of Management, University of Toronto, Martin Prosperity Institute

Assumptions:

- 1 It should be noted that other pertinent factors are also required to produce this output.
- 2 It should be noted that people with mental/learning disabilities would be expected to account for a larger proportion of the groups with lower levels of education, and are potentially less likely to achieve higher levels with more accessible transit.

HOME CARE COSTS MOBILITY RESTRICTED 65+ GROUP, 2011

Year	No. of Recipients	No. of Visits/Hour	Average Cost (\$)/Hour	Total Home Care Employee Cost (\$)
2011	309,188	15,664,000	\$25.00	\$391,600,000
Normalized, 2011				\$391,600,000

Sensitivity Analysis	Cost Savings (Increase %)	(\$) Savings	Normalized (\$) Savings
Decrease of	1.00%	\$3,916,000	\$3,916,000
Decrease of	5.00%	\$19,580,000	\$19,580,000
Decrease of	10.00%	\$39,160,000	\$39,160,000
Decrease of	15.00%	\$58,740,000	\$58,740,000
Decrease of	20.00%	\$78,320,000	\$78,320,000
Decrease of	25.00%	\$97,900,000	\$97,900,000
Decrease of	30.00%	\$117,480,000	\$117,480,000
Decrease of	35.00%	\$137,060,000	\$137,060,000
Decrease of	40.00%	\$156,640,000	\$156,640,000
Decrease of	45.00%	\$176,220,000	\$176,220,000
Decrease of	50.00%	\$195,800,000	\$195,800,000
Decrease of	55.00%	\$215,380,000	\$215,380,000
Decrease of	60.00%	\$234,960,000	\$234,960,000
Decrease of	65.00%	\$254,540,000	\$254,540,000
Decrease of	70.00%	\$274,120,000	\$274,120,000
Decrease of	75.00%	\$293,700,000	\$293,700,000
Decrease of	80.00%	\$313,280,000	\$313,280,000
Decrease of	85.00%	\$332,860,000	\$332,860,000
Decrease of	90.00%	\$352,440,000	\$352,440,000
Decrease of	95.00%	\$372,020,000	\$372,020,000
Decrease of	100.00%	\$391,600,000	\$391,600,000

Source:

¹ Comfort Life, Home Care Costs

Home Care Costs – Costs related to all publically funded home care related services



VALUE CASE FOR ACCESSIBLE TRANSIT IN CANADA