Capital Region Transportation Needs Assessment of Seniors and Persons with Disability

2016 Final Report

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Prepared for the Capital Region Board

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AVAILABILITY

An electronic copy of this report is available from www.mard.ualberta.ca or from www.capitalregionboard.ab.ca

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Executive Summary

The Capital Region Board (CRB), established in 2008, is represented by 24 municipalities in and around Alberta's provincial capital. The CRB's four identified priority areas are Land Use, Intermunicipal Transit Services, Non-Market and Market-Affordable Housing, and Geographical Information Systems. In terms of Intermunicipal Transit Services, transportation for persons with disabilities (PWD) was identified as one of the key elements of the Regional Transit Plan. In this same report, the authors also recognized the need to improve the regional delivery of specialized intermunicipal transit services *for seniors* and *PWD.*

Two *Transportation Needs Assessments* of seniors and PWD were conducted by MARD – the first *Transportation Needs Assessment* was conducted in 2015 in a sub-region of the Capital Region (Lamont County and the town of Redwater) and the second *Transportation Needs Assessment* was conducted in 2016 in the remaining sub-regions of the Capital Region. The overall objectives of the two *Transportation Needs Assessments* were to: 1) identify factors associated with unmet transportation needs of seniors (65 years and older) and PWD (18 years and older); 2) identify attributes that make alternate transportation for seniors (ATS) services and specialized transit (ST) services for PWD more 'user-friendly'; and 3) assess the need for ATS and ST services, as well as the need for intermunicipal and regional medical transit services within the Capital Region and the importance of having municipal funding available for transportation services. Data were collected through phone interviews with adults aged 45 to 64, seniors 65 years of age and older, and PWD 18 years of age and older. The samples were generated through Random Digit Dialing and purposive sampling of PWD. The overall sample consisted of 2296 individuals in the general population aged 45 years and older (Adult Children, Senior Drivers, and Senior Non-Drivers) and PWD aged 18 years and older.

There currently is a broad range of transportation services available in the Capital Region, including Light Rail Transit, public transit (bus) services, taxi services, specialized transit services for PWD, as well as a number of for-profit and non-profit service providers providing transportation services to seniors and/or to PWD. Yet, despite the availability of transportation services in the Capital Region, many seniors and PWD have unmet transportation needs.

The research reported herein is unique in its assessment of the effects of predisposing, enabling, and need factors on *different types of transportation needs* (e.g., medical, essential, social, etc.) across *different segments of the population* (seniors and PWD), and *across different settings* (urban and rural). The

research also is unique in that it provides information not only on the factors affecting the transportation mobility of seniors and PWD in urban and rural settings, but also assesses, with the same sample, the attributes needed to make ATS and ST services more user-friendly. The research also provides information on the importance of the availability of ATS and ST services, intermunicipal transit (IMT) services, and regional medical transit (RMT) services in communities in the Capital Region, as well as the importance of municipal funding for these services.

In this report, we have presented the results emanating from three studies, with each of the three studies aligned with the three objectives. For Study 1, results are presented related to the identification of factors associated with unmet transportation needs of seniors (65 years and older) and PWD (18 years and older). For Study 2, results are presented related to the identification of attributes that make ATS and ST services more 'user-friendly'. For Study 3, results are presented related to assessment of the importance of the availability of ATS, ST, IMT, and RMT services within the Capital Region and the importance of having municipal funding available for these transportation services. A summary of the results for each of the studies is presented below.

Study 1

A number of factors have been identified previously in a handful of studies elsewhere as affecting the mobility of seniors and PWD. For seniors and PWD, those factors have included age, sex, marital status, living arrangements, income, place of residency, the availability of transportation services outside of the private vehicle, health status, and disability. In terms of number of unmet needs, our results indicate that, not surprisingly, Senior Drivers have fewer unmet transportation needs than Senior Non-Drivers and PWD. What is surprising is the degree of difference in unmet transportation needs among these three segments of the population. Results from interviews with more than 1000 Senior Drivers, Senior Non-Drivers, and PWD indicated that Senior Non-Drivers have more than a four-fold increase in unmet transportation needs as compared to Senior Drivers, and PWD have more than double the unmet transportation needs as compared to Senior Non-Drivers. Results from this study indicated that increasing age and being female increased the odds of being transportation disadvantaged in the senior population. However, the results also indicated that becoming transportation disadvantaged is not *due to age alone*. Rather, the presence of illness and/or disability were found to be more important predictors of unmet transportation needs in the senior population than age and gender alone or combined. Of interest, in our initial analyses of unmet transportation needs of PWD, only sex was a significant predictor of unmet transportation needs for PWD,

with females with disabilities having greater unmet transportation needs than their male counterparts. However, in an examination of the relationship between predisposing, enabling, and need factors and unmet transportation needs for PWD, none of the factors were predictive of unmet transportation needs for this population. These results are most likely due to the small sample size of PWD. In terms of place of residency, the trend was for greater unmet transportation needs for Senior Non-Drivers and PWD the greater the distance from the metropolitan core, but the differences across the geographic areas studied did not reach statistical significance.

Study 2

In addition to examining the factors associated with unmet transportation needs of seniors and PWD in urban and rural settings in the Capital Region, we also asked Adults aged 45–64, Senior Drivers, Senior Non-Drivers, and PWD about the availability of ATS and ST services for PWD. Although close to two-thirds of Adults 45–64, Senior Drivers, and Senior Non-Drivers and about one-third of PWD indicated that there was some type of ATS and/or ST service in the community (e.g., community buses and/or vans for seniors, handivan services, Driving Miss Daisy/Corinne's Companions, DATS for PWD), more than one-third of Senior Non-Drivers and PWD relied either on family members and/or friends for transportation one or more times per week to 'get to where they wanted to go'. When asked about the features needed to make transportation services for these two segments of the population more user-friendly, the vast majority of Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD identified all 5 A's of user-friendly transportation (Availability, Acceptability, Accessibility, Adaptability, and Affordability) as being important to service provision. Not surprisingly, given the need, the vast majority of respondents rated the availability of ATS and ST services in the community as 'somewhat/very important'.

Study 3

The importance of the availability of IMT and RMT services within the Capital Region also was assessed, with the vast majority (85%–99%) of participants indicating that the availability of IMT service in their community was 'somewhat/very important'. A similar pattern of findings was evident for RMT services, with 95% of participants indicating that having RMT services available in the Capital Region was 'somewhat/very important'. Overall, the vast majority of participants (97% of the Sample as a Whole) indicated that it was 'somewhat/very important' to have *municipal funding* available to offset the costs of providing ATS and ST services in the community. The *need* for municipal funding for IMT and RMT

services also was evident, with 96% of all participants rating the availability of *municipal funding* for both these services as 'somewhat/very important'. In terms of use, more than half (56%) of all participants indicated that they would be 'somewhat/very likely' to use IMT service if it was available.

Summary and Going Forward

The results from the combined 2015 and 2016 *Capital Region Transportation Needs Assessments* presented in this report indicate that seniors and PWD in communities throughout the Capital Region do have unmet transportation needs. First, the high unmet transportation needs of PWD in all regions of the Capital Region indicate that greater availability of these types of services is needed throughout the Capital Region. The results also are informative in that although PWD have, on average, greater unmet transportation needs than seniors, the societal economic burden of having unmet transportation needs is far greater for seniors given the difference in proportion of these two segments of the population in our communities. As such, planning and policy decisions related to the transportation service provision for seniors will be inadequate if those decisions are based simply on population statistics of seniors in the target area. Rather, population statistics on health and disability, and, if available, the percentage of seniors in the community who do not drive, can facilitate planning and policy decisions that can, in turn, facilitate transportation mobility for this growing segment of the population. Overall, the findings have important implications for assessing the need for transportation services for seniors and PWD at local, regional, municipal, and provincial levels.

The results also provide an important step toward understanding which features of transportation services for seniors and PWD are deemed to be most relevant. All 5 A's of user-friendly transportation services were rated as being important by Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD. Implementation of user-friendly forms of ATS and ST services in communities within the Capital Region can and should address the unmet transportation needs of these two segments of the population. To the best of our knowledge, no one has estimated the costs of unmet transportation needs of seniors and PWD. However, it is reasonable to assume that the lack of responsive transportation for both seniors and PWD is costly at both a societal and individual level. An important next step is an assessment of the costs associated with unmet transportation needs and the associated costs and benefits of addressing those needs through enhanced service provision.

Finally, the results also indicate that the availability of ATS, ST, IMT, and RMT services in communities in the Capital Region were seen as important as was the provision of municipal funding for these services. Overall, the advancements in knowledge gained from these studies can be used by service providers, community organizations, and local, regional, and municipal leaders to inform on policy and planning initiatives and funding requests related to the delivery of responsive transportation services for seniors and PWD in the Capital Region.

Contents

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1.0   Introduction

1.1   Overview of the Capital Region Board and Its Priority Areas

The Capital Region Board (CRB), which was established in 2008 by the Government of Alberta, is represented by 24 municipalities in and around Alberta's provincial capital. The Capital Region consists of five cities (Edmonton, Fort Saskatchewan, Leduc, St. Albert, and Spruce Grove), one specialized municipality (Strathcona County), four municipal districts (Lamont County, Leduc County, Parkland County, and Sturgeon County), 11 towns (Beaumont, Bon Accord, Bruderheim, Calmar, Devon, Gibbons, Lamont, Legal, Morinville, Red Water, and Stony Plain), and three villages (Thorsby, Wabamum, and Warburg) (see Figure 1). The Capital Region's one specialized municipality[1] and the four municipal districts include a total of 39 communities that are recognized as hamlets by Alberta Municipal Affairs (1).
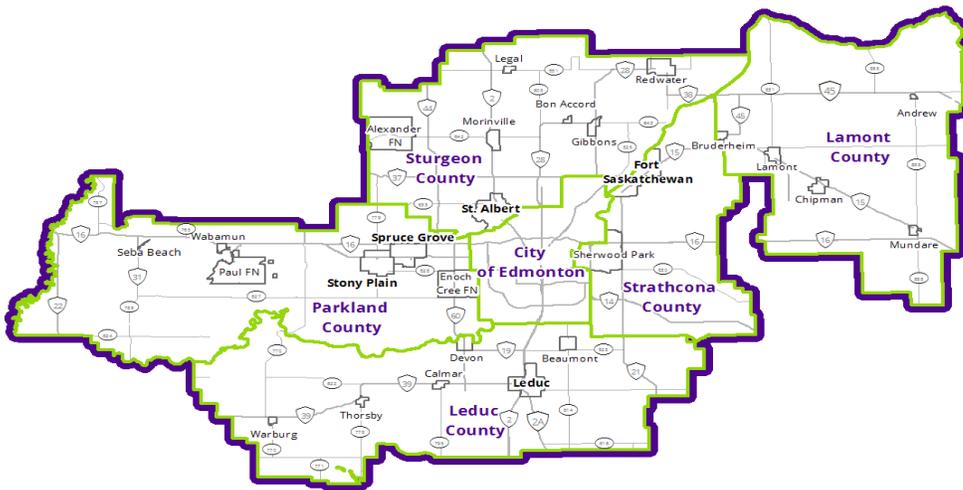
Figure 1. Map of the Capital Region (Source: http://www.makingtracks2015.ca/about.php).

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[1] Sherwood Park is one of two hamlets in Alberta designated an urban service area.

The CRB, which was created to prepare and implement an integrated Capital Region Growth Plan, identified Land Use, Intermunicipal Transit Services, Non-Market and Market-Affordable Housing, and Geographical Information Systems as its four Key Priority Areas. In terms of Intermunicipal Transit Services, regional bus services, commuter services, Park and Ride facilities, Light Rail Transit (LRT) services, and transportation for persons with disabilities (PWD) were identified as key elements of the Regional Transit Plan (2). In this same report, the authors also recognized the need to improve the regional delivery of specialized intermunicipal transit (IMT) services for seniors and PWD (2). Since that time, the CRB Transit Committee has continued its recognition of the importance of transportation service provision to these two segments of the population. In 2015, the CRB funded a pilot *Transportation Needs Assessment of Seniors and Persons with Disabilities* in a sub-region of the Capital Region (3), followed by funding for a similar *Transportation Needs Assessment* in the remaining Capital Region sub-regions (4). The combined results of those two *Capital Region Transportation Needs Assessments* are the focus of this report.

In this report, we present and discuss the factors that are predictive of the unmet transportation needs of seniors and PWD, with the data analyzed by geographic area in the Capital Region. We also present results on which features of alternate transportation for seniors (ATS) services and specialized transit (ST) services for PWD are deemed most important to seniors and PWD. **ATS service** is defined as modes of transportation that exist outside of public transportation programs and include both for-profit and not-for-profit transportation by a service provider (e.g., private vehicles, buses, handivans, minivans) (5). **ST Services** were defined as transportation services that are designed to accommodate individuals with mobility restrictions that make it difficult or impossible to take conventional transit service; this type of service is typically equipped to accommodate PWD (2).

An important backdrop to understanding and interpreting the presented results is knowledge of existing transportation services within the Capital Region. As such, a profile of the current transportation services (LRT and commuter bus service), as well as of ATS and ST services within the Capital Region. It is anticipated that the results reported herein can and will be used to support ongoing policy decision-making and implementation processes related to transportation services for seniors, for PWD, and other target populations within the Capital Region.

1.2   Profile of Current Transportation Services in the Capital Region

There currently is a broad range of transportation services available within the Capital Region. Those services, which include LRT, public transit (bus) service, ST services for PWD, and ATS services are integral to making communities within the Capital Region more livable by providing access to goods and services. The City of Edmonton is the hub of LRT service with a mix of scheduled and commuter bus service connecting people from surrounding municipalities to the metropolitan core (6). The LRT network consists of two major lines (the Metro Line and the Capital Line), with 18 LRT stations, four of which have a Park and Ride. In addition to the LRT, there are 15 transit centres in Edmonton which accommodate several buses at one time. There presently are six other municipalities in the Capital Region providing transit service – the City of Leduc and Leduc County, the City of Fort Saskatchewan, Strathcona County, Sturgeon County, the City of St. Albert, and the City of Spruce Grove. An overview of the transit services in each of these municipalities is provided in Table 1.

In addition to public transit services, there presently are six municipally funded service providers in the Capital Region providing ST services for PWD. The six municipally funded ST service providers for PWD are shown in Table 1, with more detailed information on these services provided in Table 2. As shown, the primary areas of service are the City of Edmonton and the immediate surrounding areas.

There also are a number of for-profit and non-profit service providers in the Capital Region providing transportation services to seniors and/or to PWD. Based on an environmental scan of the cities, towns, villages, and hamlets in the Capital Region, there currently are 10 communities with bus services, 22 communities have access to public and/or private disabled transit services, 12 communities have taxi services, 24 communities have access to non-profit and/or community-run ATS services, and 13 communities have access to for-profit ATS services.

Table 1. *Public Transit (Bus) Service (Local and Commuter) and Disabled Transit Services within the Capital Region 2016*

Location	Service Provider	Transit Services/Disabled Transit Services
City of Edmonton	City of Edmonton Transit	- LRT (Metro and Capital Lines) - Public transit (bus) service 300 fixed routes within the City of Edmonton 1 route to EIA[1] - Disabled Adult Transit Services (DATS)
City of Leduc and Leduc County City of Leduc	Leduc Transit (Inter-municipal partnership between the City of Leduc and Leduc County) ---	- Public transit (bus) service (local and commuter routes) 2 local routes within the City of Leduc 1 route between Leduc and Nisku areas - EIA stop 1 route to the City of Edmonton Century Park LRT south station - Leduc Assisted Transportation Service (LATS)
City of Fort Saskatchewan	Fort Saskatchewan Transit	- Public transit (bus) service (local and commuter routes) 2 local routes providing service throughout the community 1 commuter route to the City of Edmonton Clareview LRT station[2] - Specialized Transportation Services[3]
Strathcona County	Strathcona County Transit	- Public transit (bus) service (local and commuter routes) 16 fixed routes within Strathcona County[4] 7 commuter routes between the urban service areas of Sherwood Park and the City of Edmonton[5] - Specialized transit services (Transit Mobility Bus)
City of St. Albert	St. Albert Transit	- Public transit (bus)] service (local and commuter routes) 15 fixed routes providing service within the City of St. Albert 7 commuter routes to the City of Edmonton[6] - St. Albert Transit Handibus
City of Spruce Grove	City of Edmonton Transit	- Public (bus) transit service (limited local and commuter routes) 1 commuter route to the City of Edmonton[2,7] with limited local service within Spruce Grove - Spruce Grove Specialized Transit Service
Sturgeon County	City of Edmonton Transit	- Public transit [bus] service (commuter route) 1 commuter route to the City of Edmonton[8]

[1] EIA – Edmonton International Airport
[2] Provided by the City of Edmonton Transit (ETS)
[3] Provided under the auspices of the Specialized Transportation Services Society
[4] 11 routes operating all day with 5 routes operating during peak periods
[5] Current commuter routes to University of Alberta, Edmonton City Centre, City of Edmonton Government Centre, and NAIT
[6] Current commuter routes to Kingsway LRT Station and Royal Alexandra/Glenrose Rehabilitation Hospitals (with all day access to NAIT and the hospitals); Express service to and from the eastern portion of downtown Edmonton including City Hall, Law Courts, Canada Place, Scotia Place, City Centre Mall and Epcor
[7] Current commuter routes to NAIT, MacEwan University, downtown Edmonton; with a new route between NAIT and Westmont Transit Centres to Acheson Industrial Area
[8] Current commuter route is from Sturgeon Road to City of Edmonton Eaux Claires Transit Centre (97 St & 157 Ave)

Table 2. *Specialized Transit (ST) Services for Persons with Disabilities in the Capital Region 2016*

Location	Service Provider	Minivan/Handivan Services	Service Area
City of Edmonton	City of Edmonton	DATS	City of Edmonton
City of Leduc	City of Leduc	LATS[1]	City of Leduc
Fort Saskatchewan	City of Fort Saskatchewan	Fort Saskatchewan Minivan and Handivan Services	Primarily within Fort Saskatchewan
Spruce Grove	City of Spruce Grove	Spruce Grove Specialized Transit Service	Sturgeon County and defined limits of Parkland County
St. Albert	City of St. Albert Transit	St. Albert Handibus[2]	St. Albert and Edmonton (13 locations in Edmonton)
Stony Plain	Town of Stony Plain	Stony Plain Handibus[3]	Stony Plain, Spruce Grove, Edmonton, and Devon
Strathcona County	Strathcona County	Transit Mobility Bus[4]	Sherwood Park and Edmonton (specified regions and locations in Edmonton)

[1]LATS (Leduc Assisted Transportation Service) – Service to locations within the boundaries of the City of Leduc (booked trips and fixed route scheduled service [LATS shuttle]). Businesses that sponsor LATS service are the Medicine Shoppe, Second Glance, City Centre Mall, Leduc Co-op Grocery, Leduc Co-op Hardware, Craig's No Frills, Safeway Grocery, and the Farmer's Market

[2] Service to clients in St. Albert. Door to door service to 13 locations in Edmonton including Alberta Retina Consultants, Chrysalis, Cross Cancer Institute, Edmonton City Centre, First Edmonton Place, Glenrose Rehabilitation Hospital, HYS Medical Clinic, Kaye Edmonton Clinic, Royal Alexandra Hospital, University of Alberta Hospital, University of Alberta – Steadward Centre, Kingsway Mall, and University Transit Centre

[3] Available for use by residents of Spruce Grove, Parkland Village, and defined limits of Parkland County

[4] Service to clients in Sherwood Park and rural areas of Strathcona County (replaces SCAT service). Provides transportation to Royal Alexandra Hospital, Glenrose Rehabilitation Hospital, HYS Medical Centre, Grey Nuns Community Hospital, Cross Cancer Institute, Edmonton General Hospital, and Fort Saskatchewan Community Hospital (from rural areas north of Hwy 16 only)

1.3   The Need for ATS and ST Services in the Capital Region

The availability of transportation services for seniors outside of 'public transit' is important given the aging of the population and the associated increases in dependency on alternate forms of transportation service with age (7). The number of individuals 65 years of age and older within Canada is projected to double, from approximately 6 million in 2015 to more than 10 million by 2035. A similar change in demographics is occurring within the Capital Region. Based on Alberta Treasury Board data, the population 65 years of age and older is projected to increase from 11% in 2014 to 19% by 2041 (8).

Factors Affecting Transportation Mobility

A number of factors have been identified as affecting the transportation of seniors based on a handful of studies conducted elsewhere. Those factors include driving status, age, sex, marital status, living arrangements, income, place of residence, the availability of transportation services outside of the private vehicle, as well as health status and disability. Within the senior population, driver licensing rates decline with age with the percentage of seniors holding a valid driver's license decreasing from 80% for those 65 to 74 years of age to less than 20% for those aged 90 and older (7). Sex is an important factor in terms of transportation mobility with older females more likely to be transportation dependent than are their same-aged male counterparts (7,9,10). Marital status also affects transportation mobility, particularly for older women in that they are more likely to be widowed than their same-aged male counterparts, with many older women relying on their spouses for transportation (7,10,11). Older individuals who live alone and those with lower household incomes have been shown to be transportation disadvantaged (12). Place of residency affects transportation mobility in general, with individuals in rural areas being more transportation dependent than their urban counterparts (13,14). Place of residency particularly affects seniors' transportation mobility as the majority of seniors live in areas with few alternatives to car travel (7). Health status and disability also are important factors influencing transportation mobility, with poor health status and the presence of a disability associated with transportation dependency (15,16,17).

Transportation mobility has long been recognized as an important issue for PWD. In fact, disability has been identified as "the most important individual characteristic influencing travel behavior, mobility, and problems with transportation" (p. 3) (16). Research also has shown that PWD "fare far worse than their non–disabled counterparts across a broad range of health indicators" (p. S201), including delays in or failure to receive health care as well as access to other needed services (18). Finally, survey data indicate that PWD are less likely to drive, are more likely to say that transportation is a limiting factor for trip making

ability, and are less likely to indicate that there are adequate transportation options available in the community (16). Based on a 2006 report, 16% of adult Albertans have a disability, with a significant percentage of this population 65 years of age and older (19).

The rapid aging of the senior population and the need for ST services for many disabled persons have widespread implications in many areas of service delivery, including the need for access to responsive forms of transportation for both of these segments of the population. Within Alberta's Capital Region, the 2009 Intermunicipal Network Plan has identified the provision of "specialized public transit services to seniors and persons with disabilities" (p. 58) as one of its mandates (1). In this same report, the authors note the need to improve the regional delivery of specialized intermunicipal transit services, with guiding principles and service attributes articulated to assist in meeting the mobility needs of seniors and PWD at the present time and in the future (p. 60) (1). The results from the 2015 and 2016 *Capital Region Transportation Needs Assessments* will assist the CRB in achieving those goals.

Using data from the combined *Needs Assessments*, our primary objectives were to:

1) identify factors associated with unmet transportation needs of seniors (65 years and older) and PWD (18 years and older);
2) identify attributes that make ATS and ST services more 'user-friendly'; and
3) assess the need for IMT and RMT services within the Capital Region, as well as the importance of having municipal funding available for transportation services.

2.0 Study Overview and Target Populations

Two *Transportation Needs Assessments* of seniors and PWD were conducted by MARD – the first, a pilot study, which was conducted in 2015 in a sub-region of the Capital Region (Lamont County and the town of Redwater) and a second study which was conducted in 2016 in the remaining sub-regions of the Capital Region (City of Edmonton, Leduc County, Parkland County, Strathcona County, and Sturgeon County) (see Figure 2). A list of the CRB member municipalities represented in the survey is provided in Table A.1.
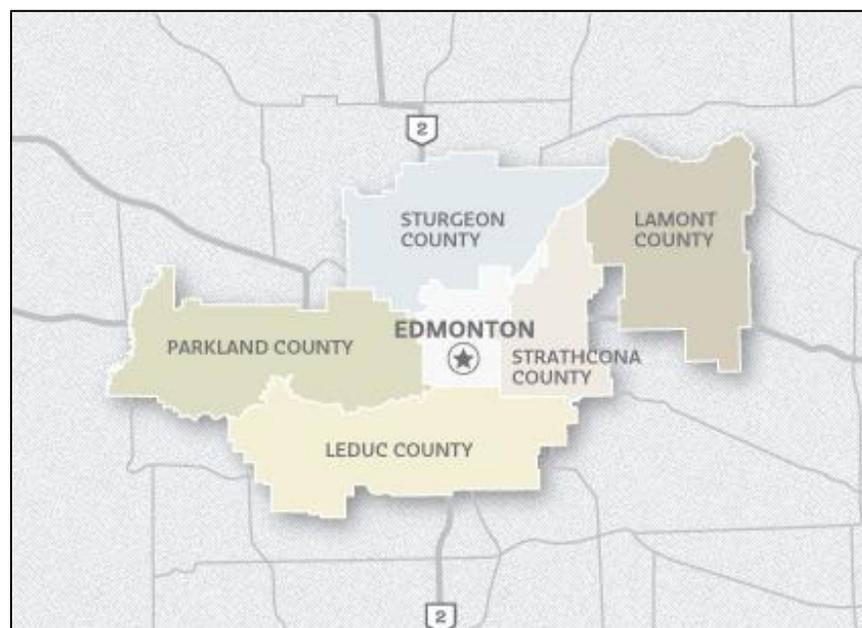
Figure 2. Map of the Capital Region depicting the six sub-regions studied (2015 & 2016).

The target populations in both the 2015 and 2016 *Capital Region Transportation Needs Assessments* consisted of individuals in the general population aged 45 years and older (adult children aged 45 to 64 and seniors over 65) and PWD aged 18 years and older. Random digit dialing (RDD) using telephone landlines (derived from a databank with the last two digits randomly generated by computer)[2] for those residing in the six sub-regions was used to generate the sampling frame. The study involved interviewing residents by telephone using the Computer Assisted Telephone Interviewing system at the University of Alberta's Population Research Laboratory (PRL). Two survey instruments, which were used in both studies, were

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[2] A sample of 1000 cell phone numbers also was used to generate the sampling frame in the 2016 CRB Needs Assessments.

developed by MARD researchers with input from the PRL and CRB personnel. The first survey instrument was used in interviewing adults aged 45 to 64 and seniors aged 65 and older, with the second survey instrument used in interviewing PWD aged 18 years and older. Data were collected by the PRL under contract to MARD, with data from Lamont County and Redwater collected between January 29 and February 25, 2015, with data from the remaining sub-regions collected between January 14 and March 9, 2016. The research received ethics approval from the University of Alberta's Health Research Ethics Board. The overall sample size was 2296 (413 participants interviewed in 2015 and 1883 participants interviewed in 2016). The overall response rate for the 2015 study was 36% and 21% for the 2016 study. These response rates are similar to or exceed recently reported response rates to telephone surveys (20).

Recall that there were three primary objectives to this research. The results related to Objective 1 are presented in Section 3.0 and entitled Study 1: Assessing the Factors Associated with Unmet Transportation Needs of Seniors and PWD. Results related to Objective 2 are presented in Section 4.0 and entitled Study 2: Assessing the 'User-Friendly' Attributes of Transportation Services. Results related to Objective 3 are presented in Sections 5.0 and entitled Study 3: Assessing the Need for Intermunicipal Transit and Regional Medical Transit Services and the Importance of Municipal Funding for Transportation Services.

3.0 Study 1: Assessing the Factors Associated with Unmet Transportation Needs of Seniors and PWD

3.1 Assessing the Factors Associated with Unmet Transportation Needs of Seniors

3.1.1 Methodology

Conceptual Framework

As noted previously, one of our primary objectives was to identify factors associated with unmet transportation needs of seniors (65 years and older) and PWD (18 years and older). The conceptual framework for our examination of factors associated with unmet transportation needs of seniors and PWD is shown in Figure 3. This conceptual framework is based on a model of health care utilization developed by Andersen in 1968 (21) and subsequently refined by Andersen and Newman in 1973 (22) and by Andersen in 1995 (23). The model was initially developed to assist in the understanding of use of health care services, to define and measure equitable access to health care services, and to assist in developing policies to promote equitable access to those services (21). Given its adaptability to other contexts, including assessment of the need for services and service utilization, Anderson's behavioural model frequently is used in research other than health care utilization. As shown in Figure 3, the use of and/or need for services can be explained by three factors: predisposing factors, enabling factors, and need factors. In terms of operational definitions, predisposing factors are factors that affect the propensity to use services, enabling factors are factors that facilitate or impede access to services, with need factors consisting of both perceived and actual need for services. The benefit in our adopting this conceptual framework is that organizing the analyses and discussion of our findings in terms of these three factors facilitates our understanding of the needs and routes to solutions for existing unmet transportation needs of seniors and PWD.

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Predictor Variables                          Outcome Variable

┌─────────────────────┐
│ Predisposing Factors│──────────┐
└─────────────────────┘           ╲
┌─────────────────────┐            ╲    ┌─────────────────────┐
│   Enabling Factors  │────────────────▶│ Unmet Transportation│
└─────────────────────┘            ╱    │        Needs        │
┌─────────────────────┐           ╱     └─────────────────────┘
│    Need Factors     │──────────┘
└─────────────────────┘
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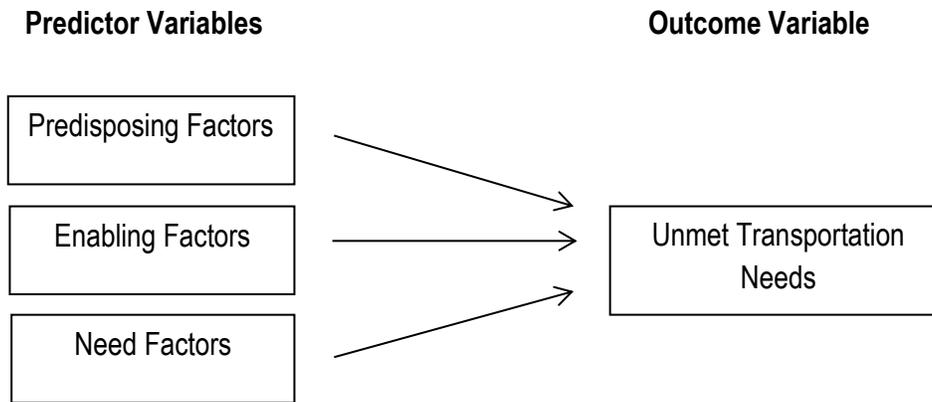
Figure 3. Conceptual framework to assess factors associated with the unmet transportation needs of seniors and PWD.

Measures

Measures of Predisposing, Enabling, and Need Factors

Based on published research, the measures used to assess unmet transportation needs of seniors and PWD in the current study were: age and sex (Predisposing Factors); income, marital status[3], driving status[4], and area of residence (geographic distance to major services) (Enabling Factors); and health status and disability (Need Factors).

Measures of Unmet Transportation Needs

To determine unmet transportation needs, seniors 65 and older (drivers and non-drivers) and PWD were asked "In the last 6 months, how often have you not gone to/been unable to … because you did not have a ride", with the following places/activities identified: gone to a medical appointment in your community; gone to a medical appointment outside your community; been unable to shop for groceries; been unable to get together with family; been unable to attend social functions; been unable to attend religious activities. They were asked to choose one of four categories for their responses: *never*, *sometimes*, *often*, or *not applicable*.

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[3] See page 14 for a description of the re-coding of this variable.
[4] Driving status was not used in the analyses of PWD as all PWD's were non-drivers.

Measure of Geographic Distance from Major Services

Area of residency affects transportation mobility, with alternatives to the car virtually non-existent outside of Census Metropolitan Areas (CMA) and Census Agglomerations (CA) (7). Currently, the Capital Region consists of a large rural area surrounding a concentration of urban areas (6). In terms of service delivery, there are regionally-significant services and amenities such as major health care facilities, educational institutes, retail outlets, and sporting and cultural activities available in the dense metropolitan (central) core of the region (City of Edmonton). Lower levels of service are available at the edges of this metropolitan area, with these services primarily developed to service local and surrounding communities. The rural areas of the Capital Region consist of primarily agricultural areas and smaller rural scale service centres including towns, villages, and hamlets (6). For analytic purposes, we stratified the Capital Region into four geographic areas (City of Edmonton and three 'outer' rings) with geographic areas based on distance from major services. Note that this conceptualization is similar to that portrayed in the CRB 2009 report (p. 35) (2). In our data analyses, the responses on unmet transportation needs were similar from participants residing in locations in the third and fourth rings (see Figure 4). As such, we combined the responses from respondents residing in the third and fourth rings for our data analyses for Study 1. Thus, our geographic areas of analyses became the City of Edmonton, Sherwood Park/St. Albert (Geographic Area 1), and the remaining areas (Geographic Areas 2 & 3).
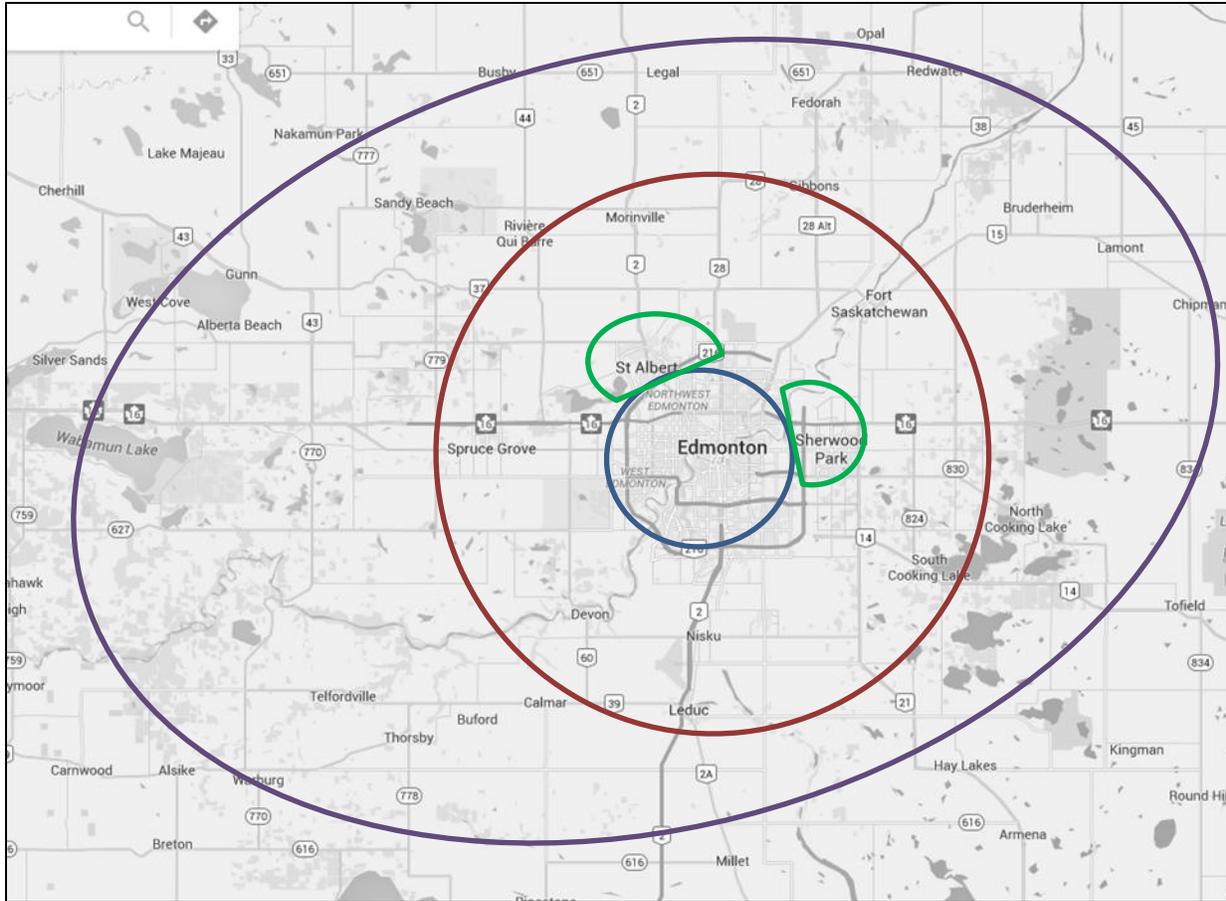
Figure 4. Map of the Capital Region with rings depicting the four geographic areas.

The City of Edmonton is the metropolitan (central) core. The first geographic area outside the central core includes the hamlet of Sherwood Park and the City of St. Albert (Geographic Area 1). The second geographic area outside the central core includes the City of Fort Saskatchewan, Strathcona County (not including Sherwood Park), Town of Beaumont, Town of Devon, City of Leduc, City of Spruce Grove, and Town of Stony Plain (Geographic Area 2). The third geographic area outside the central core includes the Town of Bon Accord, Town of Bruderheim, Town of Calmar, Town of Gibbons, Lamont County, Town of Lamont, Leduc County, Town of Legal, Town of Morinville, Parkland County, Town of Redwater, Sturgeon County, Village of Thorsby, Village of Wabamun, and Village of Warburg (Geographic Area 3).

3.1.2   Data Analyses

Using data from the 2015 and 2016 *Capital Region Transportation Needs Assessments*, we examined the prevalence of self-reported unmet transportation needs and the factors that were predictive of unmet transportation needs in seniors aged 65 and older (drivers and non-drivers) and PWD aged 18 and older. Descriptive statistics (e.g., means, standard deviations, percentages) were used to describe the overall sample, sub-samples, and main variables. Regression analyses were used to identify factors that were predictive of unmet transportation needs. The variables used to predict unmet transportation needs were

age (years), sex (coded as 0 = Males; 1 = Females), total income (coded as 0 = > $85,000; 1 = $50,000 – $84,999; 2 = $20,000 – $49,999; 3 = < $20,000), driving status (coded as 0 = Senior Driver; 1 = Senior Non-Driver), geographic area (coded as 0 = City of Edmonton; 1 = Geographic Area 1; 2 = Geographic Areas 2 and 3 (see Figure 4 for areas associated with coded areas), current physical health (coded as 1 = Poor; 2 = Fair; 3 = Good; and 4 = Excellent), and disability (coded as 0 = No Disability; 1 = Disability). With respect to marital status and living arrangements, because of the strong relationship between the two variables, we created a new variable representing a combination of the two and labelled this variable as 'domestic situation' (coded as 0 = Married/Common-Law and Lives with Family/Friends; 1 = Single and Lives with Family/Friends; and 2 = Single and Lives Alone). The outcome measure for unmet transportation needs was the total score of the ratings of unmet transportation needs across the six trip types with this total score calculated by summing the scores across the six trip types (coded as 0 = Never; 1 = Sometimes; and 2 = Often).

3.1.3   Results

An overview of the results of participant characteristics for Senior Drivers and Senior Non- Drivers[5] is provided in the section below. In the sections that follow, we describe the predictors of unmet transportation needs for these two segments of our sample, the factors that are predictive of unmet transportation needs, and the effect of area of residency on unmet transportation needs.

Demographics

As can be seen in Table A.2 (see Appendix A.2), 884 senior drivers and 203 senior non-drivers participated in the survey. Results related to age, sex, marital status, living arrangements, employment status, household income, current ratings of physical health, use of mobility aids, the degree to which physical health interfered with everyday activities, disability status, driving status, place of residence, and number of participants by geographic area also are provided in Table A.2. A comparison of Senior Drivers and Senior Non-Drivers indicated that Senior Non-Drivers were significantly older, more likely to be female, more likely to be widowed, less likely to be living with a spouse, more likely to be retired, and more likely to have a total household income < $20,000 as compared to Senior Drivers (all *p* values < .05). Senior Non-Drivers were more likely to rate their current physical health as poor or fair; were more likely to use one or more mobility aids; were more likely to say that their current physical health interfered with their ability to carry out

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[5] Demographics related to all of the four sub-samples (Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD) are provided in Appendix A.2.

everyday activities; and were more likely to indicate that they had a disability than were Senior Drivers (all *p* values < .05). In terms of place of residence (city, town, etc.), the trend was for a greater percentage of Senior Non-Drivers to live in cities or towns within the Capital Region (79%) as compared to Senior Drivers (60%). With respect to area of residence within the geographic areas, the pattern was that approximately the same percentage of Senior Drivers (41%) and Senior Non-Drivers (46%) lived either in the City of Edmonton, Sherwood Park, or St. Albert, with the remaining living in the outlying areas.

Unmet Transportation Needs

In order to determine if unmet needs across all of the six types of transportation needs (e.g., medical transportation needs within the community; medical transportation needs outside the community; transportation for essential needs; etc.) could be combined into a single outcome measure, we first performed a principal component analysis. If the measures are related, this type of analysis can be used to reduce a large number of these related variables to a smaller set while still maintaining most of the information present in the larger set. In our analysis, we found that all of the six outcome measures could be combined into a single outcome measure with minimal loss of information (see Appendix A.3. Table A.3 for the results of principal component analysis). All participants were asked about unmet transportation needs. The average unmet transportation needs for Senior Non-Drivers were almost 4.5 times higher (Mean = 1.69; SD = 2.54) than those of Senior Drivers (Mean = .38; SD = 1.20) ($p < .001$).

As shown in Figure 5, the percentage of Senior Non-Drivers with unmet transportation needs (48%) was significantly greater than those of Senior Drivers (14%) ($p < .001$). Of note, a number of Senior Non-Drivers responded *Not Applicable* when asked about their unmet transportation needs across the six trip types. Further exploration of the data indicated that these questions were rated as *Not Applicable* because the respondent did not have unmet needs for this type of transportation (e.g., no medical appointments during the time frame specified; someone other than themselves doing the grocery shopping; did not attend religious activities; etc.).
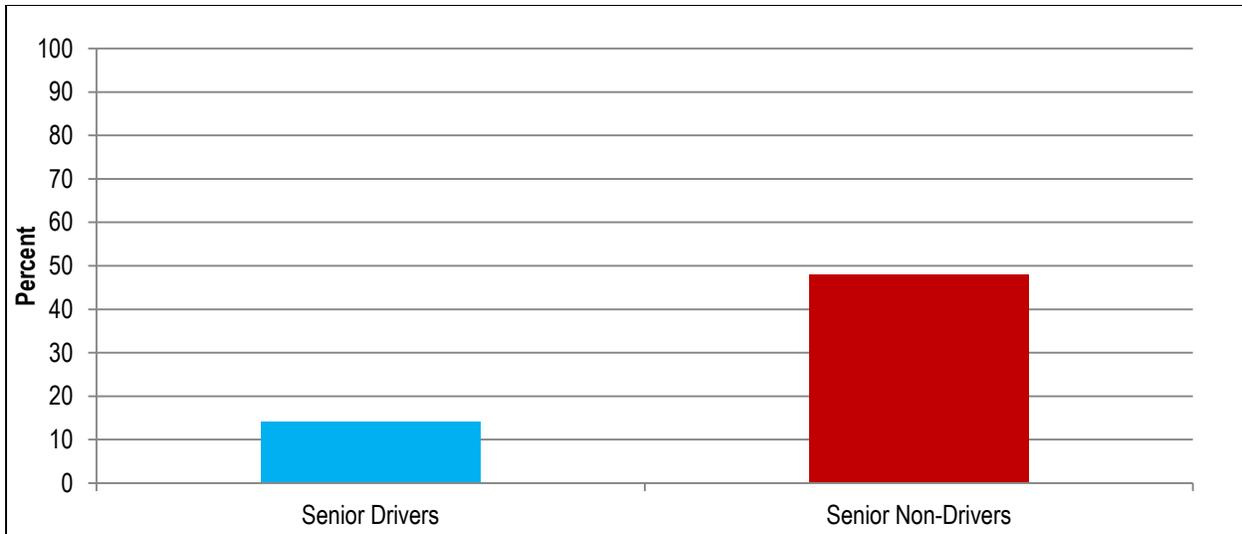
Figure 5. Percentage of Senior Drivers and Senior Non-Drivers with unmet transportation needs.

Factors Associated with Unmet Transportation Needs

We next examined the relationship between predisposing, enabling, and need factors (e.g., age, sex, income, domestic situation, place of residence, current physical health, disability) and unmet transportation needs (total score) for Senior Drivers and Senior Non-Drivers using regression analyses. Regression analysis is one of the most basic and commonly used analyses to explain the relationship between predictor variables (in our case, the variables associated with the predisposing, enabling, and need factors) and the outcome variable (unmet transportation needs).

In the first regression analysis, we examined the relationship between age and sex and unmet transportation needs in our sample of Senior Drivers and Senior Non-Drivers. As shown in Table 3, both age and sex were significant predictors of unmet transportation needs (both p values were statistically significant at $p < .001$). What these results indicate is that individuals who are older and who are female have more unmet transportation needs as compared to individuals who are younger and who are male. In terms of interpreting the numerical value of the unstandardized coefficient, the coefficient of 0.029 for age means that with each increasing 10 years of age, there will be an increase in unmet transportation needs of approximately one-third. The coefficient of 0.318 for sex means that females have three times the unmet transportation needs than their same-aged male counterparts.

Table 3. *Relationship between the Predictor Variables of Age and Sex and Unmet Transportation Needs of Senior Drivers and Senior Non-Drivers*

Type of Factor	Predictors	Unstandardized Co-efficient[+]	Unmet Transportation Needs (*p* value)
Predisposing	Age[1]	**.029**	**.001***
	Sex[2]	**.318**	**.009***

[+] Unstandardized coefficients are used to assess which of the predictor measures have a greater effect on the dependent variable (unmet transportation needs) in a regression analysis when the variables are measured in different units of measurement (e.g., age measured in years and sex measured as female or male)
* Statistically significant
[1] Age – Years
[2] Sex – Female/Male

Next, we examined the relationship between all of the predisposing, enabling, and need factor variables and unmet transportation needs for Senior Drivers and Senior Non-Drivers, with the goal of determining which, if any of the variables, are related. Our rationale was that many of the enabling and need factors are related to the predisposing factors of age and sex (e.g., health status changes with age as does the presence of disabilities; older females are more likely to be economically disadvantaged and have more chronic health conditions than their same-aged male counterparts; etc.). As such, we hypothesized that a number of the enabling and need factors would be strongly associated with age and sex, and as such, would end up being more powerful predictors of unmet transportation needs than age and sex alone. The results from the combined analyses are presented in Table 4.

As shown in Table 4, age and sex, which were significant predictors of unmet transportation needs when used alone now are no longer predictive (that is, the *p* values for both age and sex are now > .05) of the unmet transportation needs of seniors. Income and domestic status also are not predictive of unmet transportation needs (both *p* values > .05). In contrast, driving status, place of residence (geographic area), current physical health, and disability all are significant predictors of the unmet transportation needs (all *p* values < .05) of seniors. What this means is that seniors who are non-drivers have greater unmet transportation needs than senior drivers; seniors who live in areas of the Capital Region outside the City of Edmonton have greater unmet transportation needs than seniors living within the City of Edmonton, seniors in poorer health have greater unmet transportation needs than seniors who are in good health, and seniors with a disability have greater unmet transportation needs than seniors not having a disability.

In looking at the unstandardized coefficients in Table 4, we can see that these values range from .005 to .770. Loosely speaking, these numerical values represent the percentage increase in the unmet transportation needs of seniors with the 'condition' as compared to seniors 'without the condition' (e.g., driving, no physical health problems, etc.). As can be seen, driving status is a significant predictor of unmet transportation needs, with seniors who do not drive experiencing about a 70% increase in unmet transportation needs as compared to seniors who drive. Seniors who live in areas of the Capital Region outside the City of Edmonton have about a 16% increase in unmet transportation needs as compared to seniors living within the City of Edmonton. Seniors in poor health experience about a 34% increase in unmet transportation needs due to health as compared to seniors in good/excellent health, and seniors with a disability have a 77% increase in unmet transportation needs due to their disability as compared to seniors without a disability.

Table 4. *Relationship between the Predisposing, Enabling, and Need Variables and Unmet Transportation Needs of Senior Drivers and Senior Non-Drivers*

Type of Factor	Predictors	Unstandardized Co-efficient[+]	Unmet Transportation Needs (*p* value)
Predisposing	Age[1]	.005	.592
	Sex[2]	.178	.133
Enabling	Income[3]	.083	.236
	Domestic status[4]	.022	.741
	Driving Status[5]	**.698**	**.000***
	Geographic area[6]	**.162**	**.027***
Need	Current Physical Health[7]	**-.338**[++]	**.000***
	Disability[8]	**.770**	**.000***

+ See Table 3 for a description of unstandardized coefficients
* Statistically significant
++ Note that this negative value is based on coding of the variable and should be interpreted the same way as the positive values
[1] Age – Years; [2] Sex – Female/Male; [3] Income – <$20,000/> $20,000; [4] Domestic Situation – Single, living alone/Single, living with others/ Married living with others; [5] Driving Status – Driver/Non-Driver; [6] Geographic Area – City of Edmonton/Geographic Area 1/Geographic Areas 2 & 3; [7] Current Physical Health – Poor/Good to Excellence; [8] Disability – Disability/No Disability

Effect of Area of Residency on Unmet Transportation Needs

As discussed in the previous section, geographic area was found to be a significant predictor of unmet transportation needs (*p* = .03). In our final analyses, we compared the unmet transportation needs of

Senior Drivers and Senior Non-Drivers across *each* of the geographic areas. As can be seen in Figure 6, overall, the average number of unmet transportation needs is higher for Senior Non-Drivers than for Senior Drivers irrespective of geographic area (e.g., City of Edmonton, Geographic Area 1 [Sherwood Park/St. Albert], and Geographic Areas 2 & 3 [all remaining CRB locations]) with this difference statistically significant (p = .009). In terms of *Senior Drivers*, although their unmet transportation needs increase across the three geographic areas in the Capital Region (City of Edmonton, Geographic Area 1, and Geographic Areas 2 & 3), these differences are not statistically significant (p's > .05). It also can be seen that the unmet transportation needs for *Senior Non-Drivers* increase across the three geographic areas (City of Edmonton, Geographic Area 1, and Geographic Areas 2 & 3), with approximately a two-fold increase in unmet transportation needs for Senior Non-Drivers living in Geographic Areas 2 and 3 as compared to Senior Non-Drivers living in the City of Edmonton. This difference approached, but did not reach, statistical significance (p > .05). The difference in unmet transportation needs of Senior Drivers in the City of Edmonton and Geographic Area 1 were similar (p > .05).
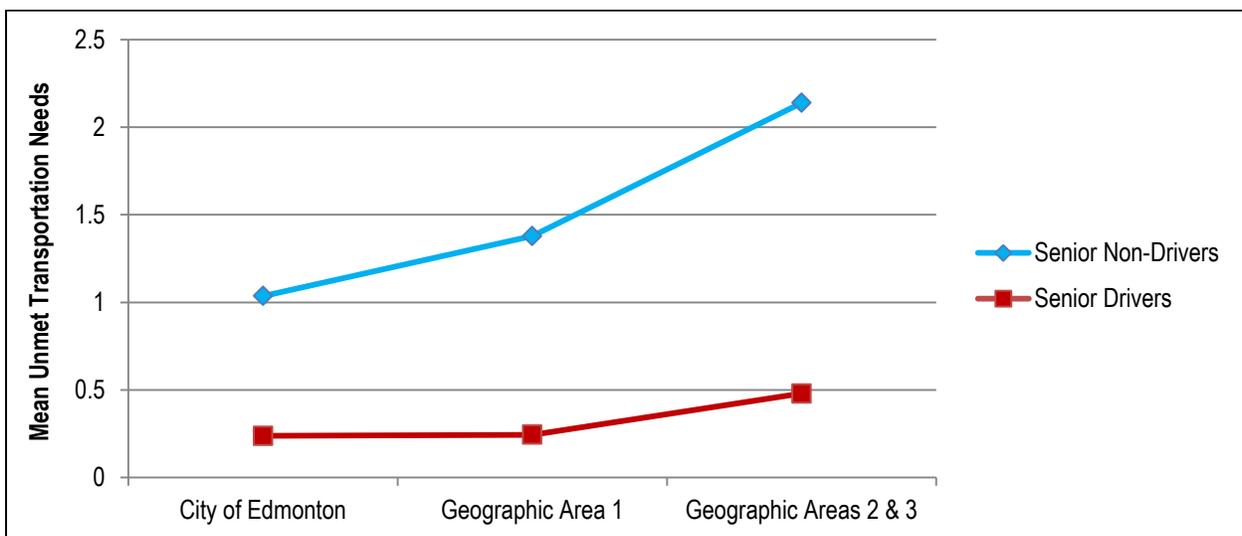

Figure 6. Mean unmet transportation needs of Senior Drivers and Senior Non-Drivers by geographic area in the Capital Region.

3.2   Assessing the Factors Associated with Unmet Transportation Needs of PWD

3.2.1   Methodology

The methodology (e.g., Conceptual Framework, measures) was the same for PWD as it was for Seniors (see Section 3.1.1).

3.2.2   Data Analyses

The data analyses were the same for PWD as for Seniors (see Section 3.1.2).

3.2.3   Results

Demographics

Seventy-eight PWD participated in the survey. Results related to age, sex, marital status, living arrangements, employment status, household income, current ratings of physical health, use of mobility aids, the degree to which physical health interfered with everyday activities, disability status, driving status, place of residence, and number of participants by geographic area are provided in Table A.2 (Appendix A.2). Briefly, the mean age of PWD was 46.9 years, 58% were female, almost 40% were married or living common-law, with the majority (80%) living either with family/friends, in a group setting, or other (e.g., with a caregiver). Forty-one percent indicated that they were on long-term disability and 21% indicated that they were unemployed. The majority (76%) indicated that the total household income was > $20,000. In terms of health status, almost two-thirds (64%) rated their current physical health as poor or fair; with almost one-half (49%) indicating that they used one or more mobility aids. The vast majority (89%) indicated that their current physical health interfered with their ability to carry our everyday activities. By definition, all indicated that they had a disability and none of the participants drove. Almost two-thirds (62%) of PWD resided in a city or town. Forty-one percent lived either in the City of Edmonton, Sherwood Park, or St. Albert, with the remaining PWD living in towns, villages, hamlets or on farms or acreages within the Capital Region.

Unmet Transportation Needs

In terms of unmet transportation needs, the majority (78%) of PWD indicated that they had unmet transportation needs. For those PWD who indicated that they did not have unmet transportation needs, the vast majority indicated that they lived with family (parents, siblings, or children). It is assumed that the presence of family members within the same household and who were available to provide transportation was responsible for these findings.

Factors Associated with Unmet Transportation Needs

In an examination of the relationship between predisposing, enabling, and need factors and unmet transportation needs of PWD, in the initial analyses of age and sex, only sex emerged as a significant predictor of unmet transportation needs of PWD ($p < .049$), with females having greater unmet transportation needs than their males counterparts (see Table 5).

Table 5. *Relationship between the Predictor Variables of Age and Sex and Unmet Transportation Needs of PWD*

Type of Factor	Predictors	Unstandardized Co-efficient[+]	Unmet Transportation Needs (*p* value)
Predisposing	Age[1]	.004	.905
	Sex[2]	**1.887**	**.049***

[+] See Table 3 for a description of unstandardized coefficients
* Statistically significant
[1] Age ‑ Years
[2] Sex – Female/Male

Next, we examined the relationship between all of the predisposing, enabling, and need variables and unmet transportation needs of PWD. The results are presented in Table 6. As shown, none of the variables were statistically significant. The absence of significant results is most likely due to the small sample size of PWD.

Table 6. *Relationship between the Predisposing, Enabling, and Need Variables and Unmet Transportation Needs of PWD*

Type of Factor	Predictors	Unstandardized Co-efficient[+]	Unmet Transportation Needs (*p* value)
Predisposing	Age[1]	-.006[++]	.860
	Sex[2]	1.548	.114
Enabling	Income[3]	.293	.574
	Domestic Status[4]	.577	.465
	Driving Status[5]	—	—
	Geographic Area[6]	-.309	.588
Need	Current Physical Health[7]	-.824[++]	.098
	Disability[8]	—	—

+ See Table 3 for a description of unstandardized coefficients
++ Note that the negative values are based on coding of the variable and should be interpreted the same way as the positive values
[1] Age – Years; [2] Sex – Female/Male; [3] Income – <$20,000/> $20,000; [4] Domestic Situation – Single, living alone/Single, living with others/Married living with others; [5] Driving Status – Not Applicable; [6] Geographic Area – City of Edmonton/Geographic Area 1/Geographic Areas 2 & 3; [7] Current Physical Health – Poor/Good to Excellence; [8] Disability – Not Applicable

Effect of Area of Residency on Unmet Transportation Needs

As with Senior Drivers and Senior Non-Drivers, we examined the relationship between residency in the geographic areas of the Capital Region and unmet transportation needs of PWD. As can be seen in Figure 7 (focusing on the PWD), the pattern of findings is such that the mean unmet transportation needs were higher for PWD living within the City of Edmonton than for PWD living in the remaining geographic areas of the Capital Region. The mean unmet transportation needs of PWD also were higher for PWD living in Geographic Areas 2 and 3 versus those PWD living in Geographic Area 1. However, none of these differences were statistically significant (all *p*'s > .05). We hypothesize that the higher unmet transportation needs of PWD in the City of Edmonton and in Sherwood Park and St. Albert may be due to a greater severity of disability as well as increased demand for ST service. That is, PWD who are more severely disabled are most likely in need of more specialized medical services and/or in need of more frequent treatment for their disabilities. As such, it would be more efficient and less costly to live closer to those services, and most often these specialized medical services are available in larger centres. It also may be the case that given the higher proportion of PWD who live in the City of Edmonton, there may be greater demand for ST services (which may not be easily accommodated), with this increase in demand translating into some PWD having unmet transportation needs. The trend for greater unmet transportation needs of

PWD in Geographic Areas 2 and 3, as compared to the other geographic areas in the Capital Region, is most likely due to an absence or paucity of ST services in the more rural areas.

Finally, in examining the unmet transportation needs of PWD and Senior Non-Drivers and Senior Drivers, we find that, irrespective of geographic area (e.g., City of Edmonton, Geographic Area 1, and Geographic Areas 2 & 3), the mean unmet transportation needs of PWD were greater than for Senior Drivers and Senior Non-Drivers. However, none of these differences were statistically significant (all p's > .05).
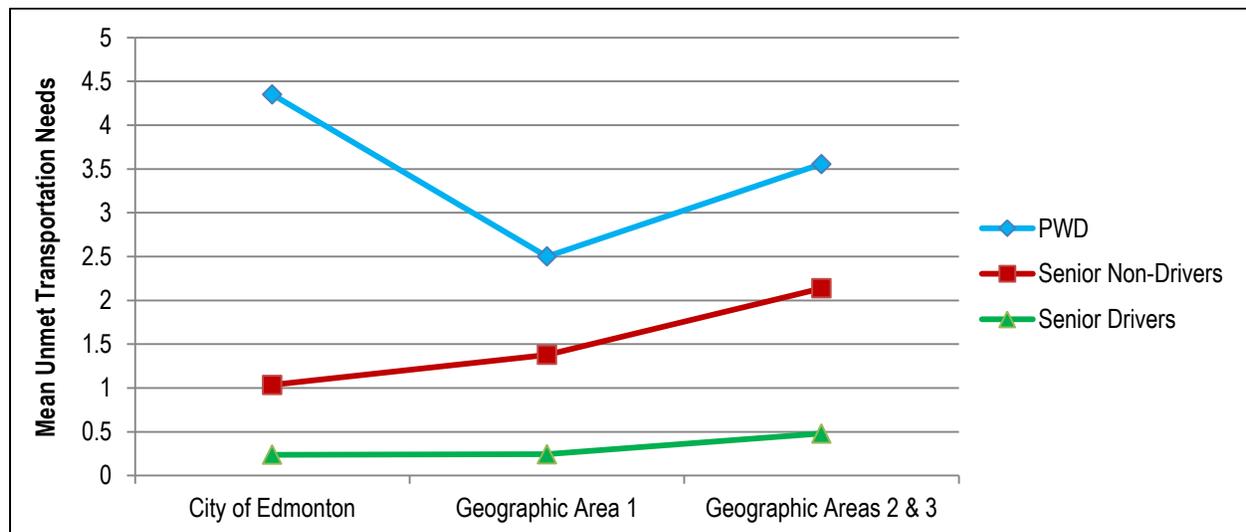

Figure 7. Mean unmet transportation needs of PWD (with Senior Non-Drivers and Senior Drivers included for comparison) by geographic area in the Capital Region.

4.0 STUDY 2: Assessing the User-Friendly Attributes of Transportation Services

In the early 2000s, The Beverly Foundation identified five features of service provision as being important to transportation services for seniors and PWD (24,25). Collectively, these factors came to be known as the 5 A's of senior-friendly and/or user-friendly transportation. Since that time, these features have been used as criteria for assessing the usability of transportation options by seniors and PWD (26,27,28). Definitions of each of the 5 A's of user-friendly transportation are provided in Table A.4 (see Appendix A.4). The results related to each of the 5 A's of user-friendly transportation services for seniors and PWD are presented in Sections 4.1 through 4.5.

4.1 Availability

Getting Around

All participants were asked how they 'get around' in a typical week. Adults aged 45–64 indicated that, on average, they drove 5.4 days per week 'to get to where they wanted to go' whereas Senior Drivers indicated that, on average, they drove 4.5 days per week 'to get to where they wanted to go', with this difference being statistically significant ($p < .001$). When participants were asked about the number of days that they relied on *family members* to 'get to where they wanted to go', not surprisingly, less than 25% of Adults 45–64 and Senior Drivers indicated that they relied on family members for transportation one or more times per week. In comparison, 73% of Senior Non-Drivers and 77% of PWD indicated that they relied on family members for transportation one or more times per week. In terms of reliance on family for transportation, the difference among the groups was statistically significant ($p < .001$).

Similarly, when asked about the number of days that they relied on *friends* to 'get to where they wanted to go', 10% of Adults 45–64 and 15% of Senior Drivers indicated that they relied on friends for transportation one or more times per week. In comparison, 38% of Senior Non-Drivers and 30% of PWD participants indicated that they relied on friends for transportation one or more times per week. Again, the difference among the groups in terms of reliance on family and friends for transportation was statistically significant with Senior Non-Drivers and PWD more likely to rely on family and friends for transportation ($p < .001$).

Importance of ATS and ST Services in the Community

When asked about the importance of having ATS services available for seniors in their community, the vast majority of Adults 45–64 and Senior Drivers (99% and 98%, respectively) indicated that it was 'somewhat/very important'. Similarly, the vast majority (91%) of Senior Non-Drivers indicated that having ATS services available for them to use was 'somewhat/very important'. In terms of ST services, 97% of PWD participants indicated that it was 'somewhat/very important' to have this type of transportation service available in their community (see Figure 8).
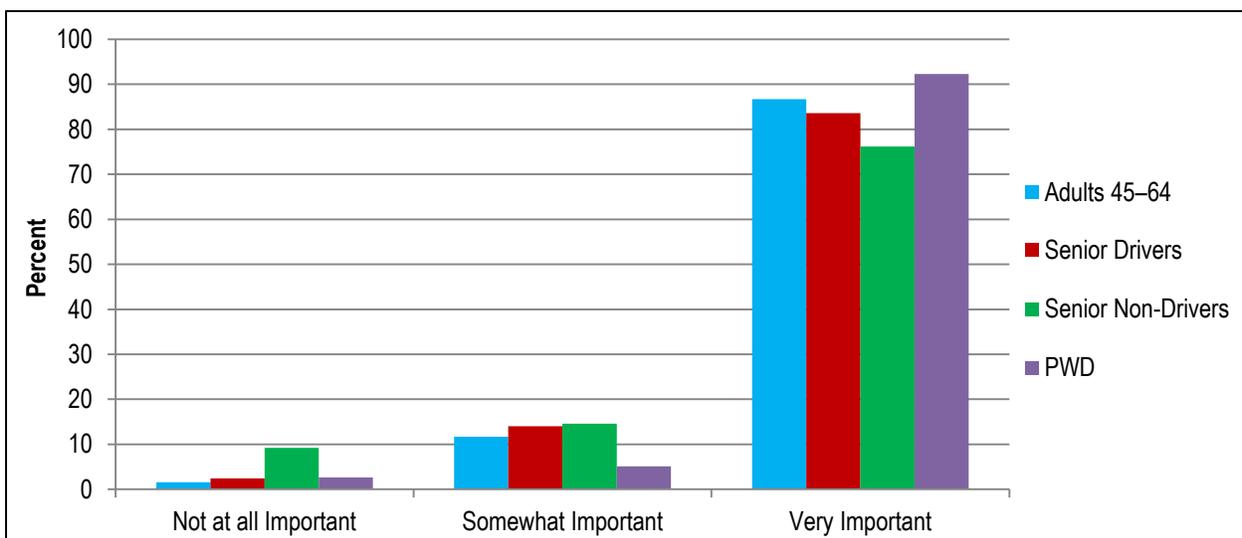
Figure 8. Importance of availability of ATS/ST services in the community.

When asked about how important ATS services were to the quality of life of seniors, the vast majority of Adults 45–64, Senior Drivers, and Senior Non-Drivers indicated that ATS services were 'somewhat/very important' for quality of life (99%, 98%, and 82%, respectively). Ninety-five percent of PWD indicated that ST services were 'somewhat/very important' to their quality of life (see Figure 9).
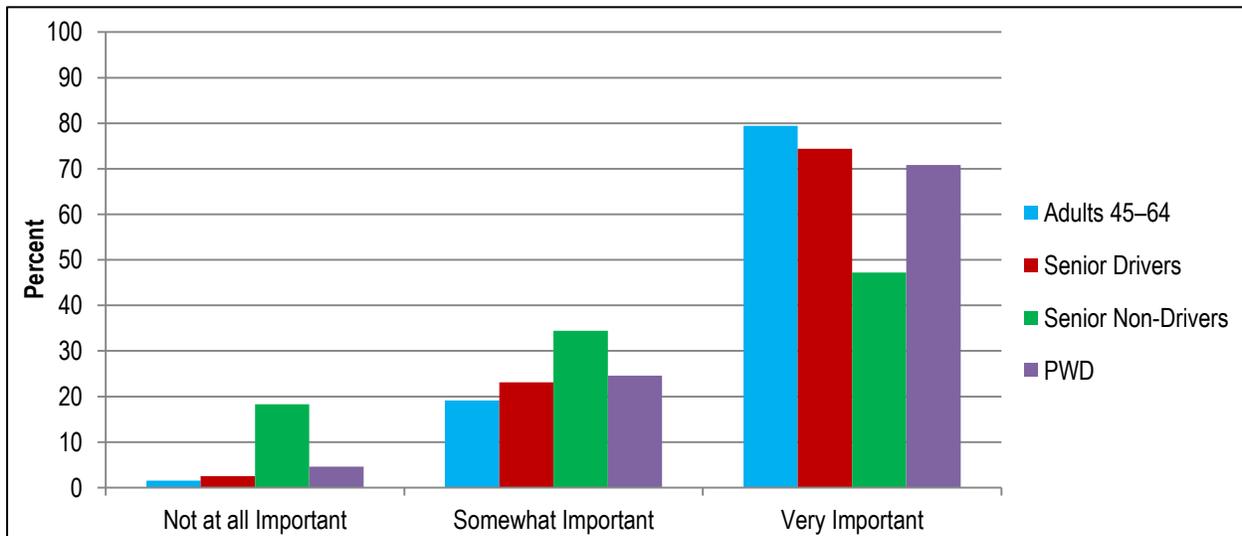
Figure 9. Importance of ATS/ST services for quality of life.

Availability and Use of ATS and ST Services in the Community

All participants completing the ATS services survey (Adults 45–64, Senior Drivers, and Senior Non-Drivers) were asked if there were ATS services available in their community and whether *seniors in their community* or they themselves used those services. **ATS service** was defined as modes of transportation that exist outside of public transportation programs and include both for-profit and not-for-profit transportation by a service provider (e.g., private vehicles, buses, handivans, minivans) (5). PWD participants were asked if there were ST services available in their community and whether they used this type of transportation service. **ST Services** were defined as transportation services that are designed to accommodate individuals with mobility restrictions that make it difficult or impossible to take conventional transit service; this type of service is typically equipped to accommodate PWD (2).

When asked if there were any ATS services provided in the participant's community, close to two-thirds of Adults 45–64, Senior Drivers, and Senior Non-Drivers said 'yes' (data not presented in a graph). Some of the ATS services identified included community buses and/or vans for seniors, volunteer drivers, handivan services, Driving Miss Daisy/Corrine's Companions, and services offered by community organizations such as the Lion's Club and Pioneer Club. In terms of PWD, less than half (37%) indicated that there were ST services available in their community. Some of the ST services identified were Edmonton Transit's Disabled Adult Transit Service, Strathcona Transit's Mobility Bus, as well as for-profit service providers (e.g., Driving Miss Daisy/Corrine's Companions, and handicap taxi service) and handivans.

For Adults 45–64 and Senior Drivers who indicated that there were ATS services available in their community, the vast majority (93% and 91%, respectively) indicated that they thought seniors in their community used the services whereas just over half (53%) of Senior Non-Drivers indicated that they did indeed use the ATS services that were available. The difference among the groups was statistically significant ($p's$ < .001). For PWD participants who indicated that there were ST services available in their community, less than half (46%) indicated that they used these services.

When asked about the *likelihood of use* of ATS services *by seniors in their community* if those services were available, 98% of Adults 45–64 and 97% of Senior Drivers thought that the seniors in their community would be 'somewhat/very likely' to use ATS services if they were available. Similarly, the majority (83%) of Senior Non-Drivers indicated that they would be 'somewhat/very likely' to use ATS services if they were available in the community. For PWD participants, 91% indicated that they would be 'somewhat/very likely' to use ST services if they were available in their community.

Times Most Likely to Use ATS and ST Services

This section of the survey pertained to *times* when *seniors and PWD in the community* would be *most likely* to use ATS and ST services if those services were available. As can be seen in Figure 10, the pattern of responses indicated that the majority of participants responded that the *most likely* time periods for use of ATS or ST services if those services were available would be Weekday mornings (95%, 90%, 78%, and 92%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively) and Weekday afternoons (85%, 83%, 84%, and 86%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively). Fewer participants indicated that ATS or ST services would be used on the weekend, with Weekend mornings (60%, 53%, 43%, and 49%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively) and Weekend afternoons (59%, 56%, 47%, and 43%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively) as the time periods that seniors and PWD would be *most likely* to use these services. A lower percentage of participants indicated that ATS or ST services would be used on Weekday and Weekend evenings with less than 40% of all participants indicating use of services Weekend evenings.
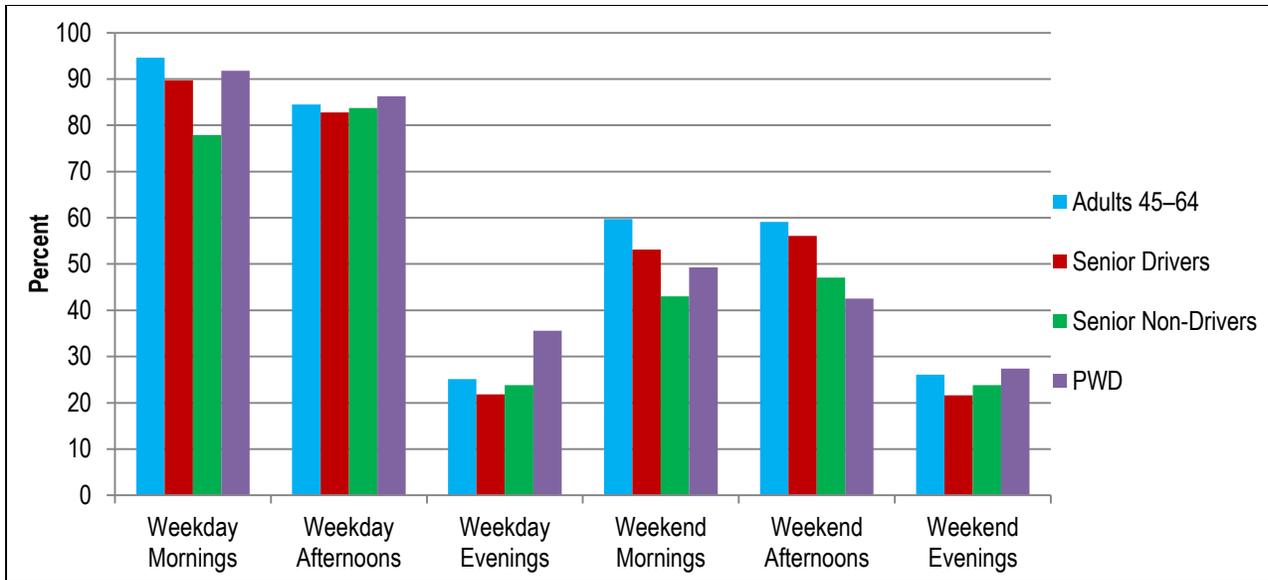
Figure 10. Times most likely to use ATS/ST services.

4.2   Acceptability

Importance of Different Features of ATS Service Provision – Booking Rides and Knowledgeable Drivers

In this section of the survey, participants were asked to rate the importance of different features of ATS and ST services if those services were available in their community. Specifically, participants were asked to provide input on booking rides and the importance of having drivers who are knowledgeable on health issues such as dementia or physical disabilities.

Booking Rides

As can be seen in Figure 11, across the four samples, booking ATS and ST services 24 hours in advance was indicated to be most reasonable by the majority of Adults 45–64 (94%), Senior Drivers (91%), Senior Non-Drivers (87%), and PWD (91%). Not having to book rides in advance (69%, 68%, 77%, and 71%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively) was the second most preferred choice for each of the sub-samples. Having to book ATS and ST services more than 48 hours in advance was deemed to be the least reasonable by all four sub-samples.
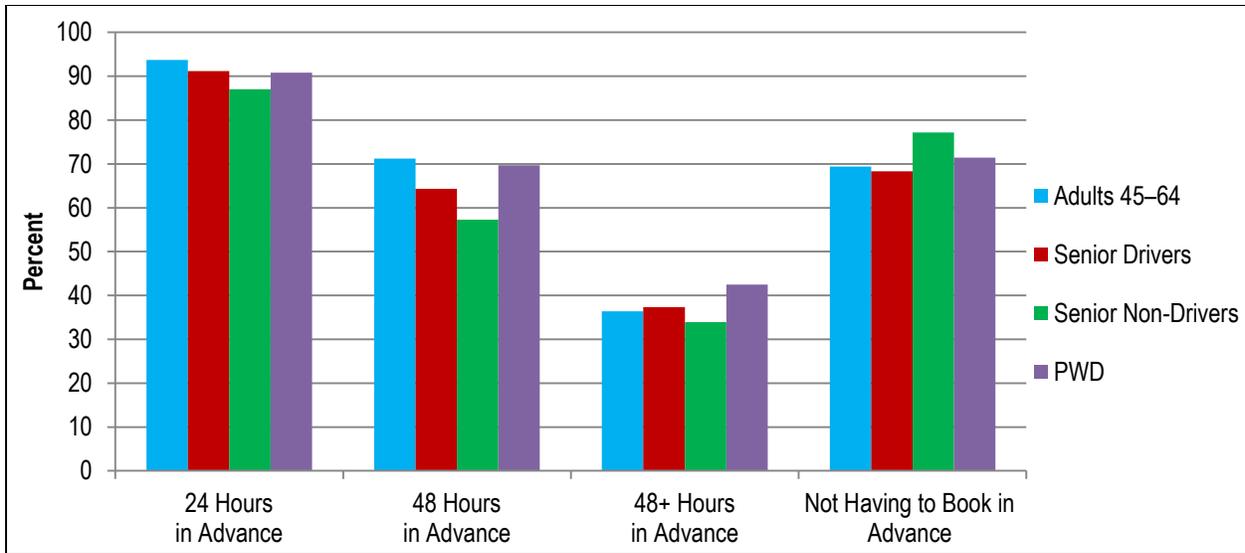
Figure 11. Reasonableness of booking rides with/without advance notice.

Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD participants also were asked how likely they thought *seniors or PWD in their community* would be to book their trips with service providers online. As shown in Figure 12, close to two-thirds of Adults 45–64 and Senior Drivers (60% and 64%, respectively) indicated that they thought seniors in their community would be 'somewhat/very likely' to book rides with service providers online. However, only about half (51%) of Senior Non-Drivers indicated that *they* would be 'somewhat/very likely' to book trips with ATS service providers online. In terms of PWD participants, close to two-thirds (65%) indicated that they would be 'somewhat/very likely' to book rides with ST service providers online.
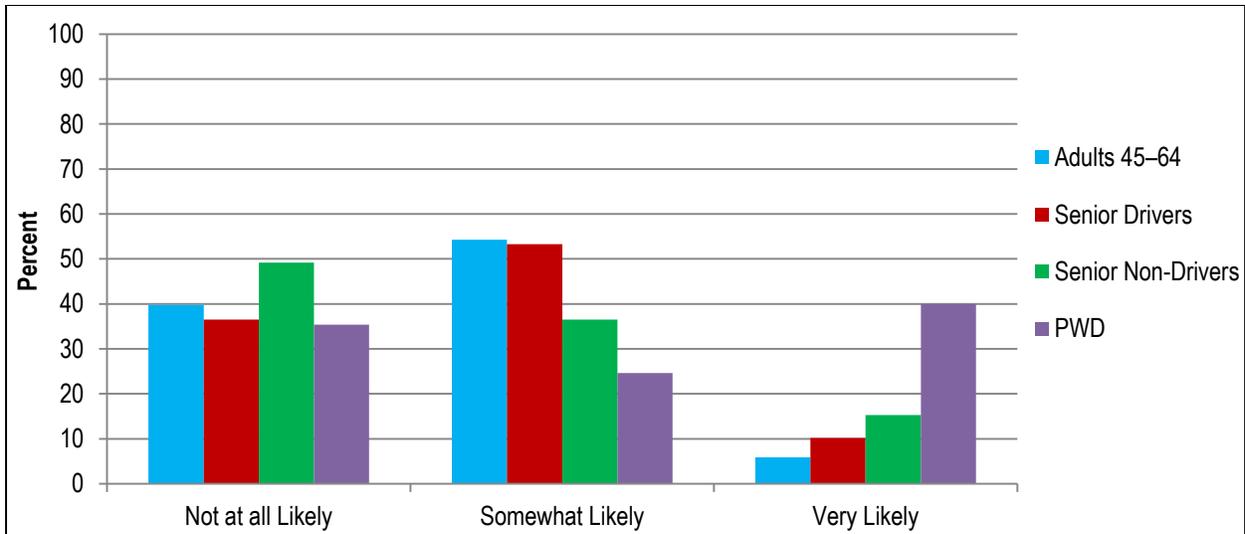
Figure 12. Likelihood of booking trips online.

Knowledgeable Drivers

All participants also were asked about *how important it was that ATS or ST services* have drivers who were knowledgeable about health issues (e.g., disabilities, illnesses that affect mental functioning such as dementia). The vast majority of Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD (95%, 94%, 94%, and 90%, respectively) indicated that having drivers who were knowledgeable on these issues was a 'somewhat/very important' feature of ATS and ST service provision (see Figure 13).
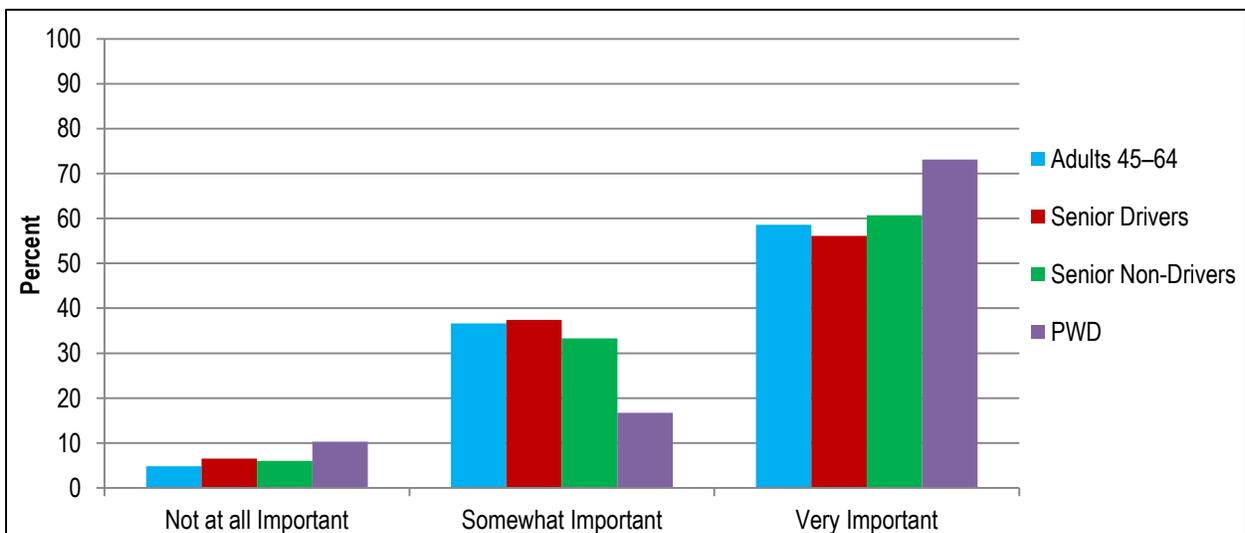
Figure 13. Importance of knowledgeable drivers for ATS/ST services.

4.3   Accessibility

Importance of ATS and ST Services for Different Types of Transportation Needs

Participants next were asked about the *importance* of ATS and ST services for different types of transportation needs (e.g., health-related trips such as medical appointments, essential services, visiting with family and friends, social activities, and for religious activities). All types of transportation needs were rated as being important, with a trend for higher ratings for health-related and essential trips. As can be seen in Figure 14, the vast majority of participants indicated that having transportation (ATS or ST) services that provide rides for health-related services (99%, 99%, 99%, and 96%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD respectively) and essential services (e.g., grocery shopping, banking) (97%, 95%, 93%, and 94%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively) was 'somewhat/very important'.
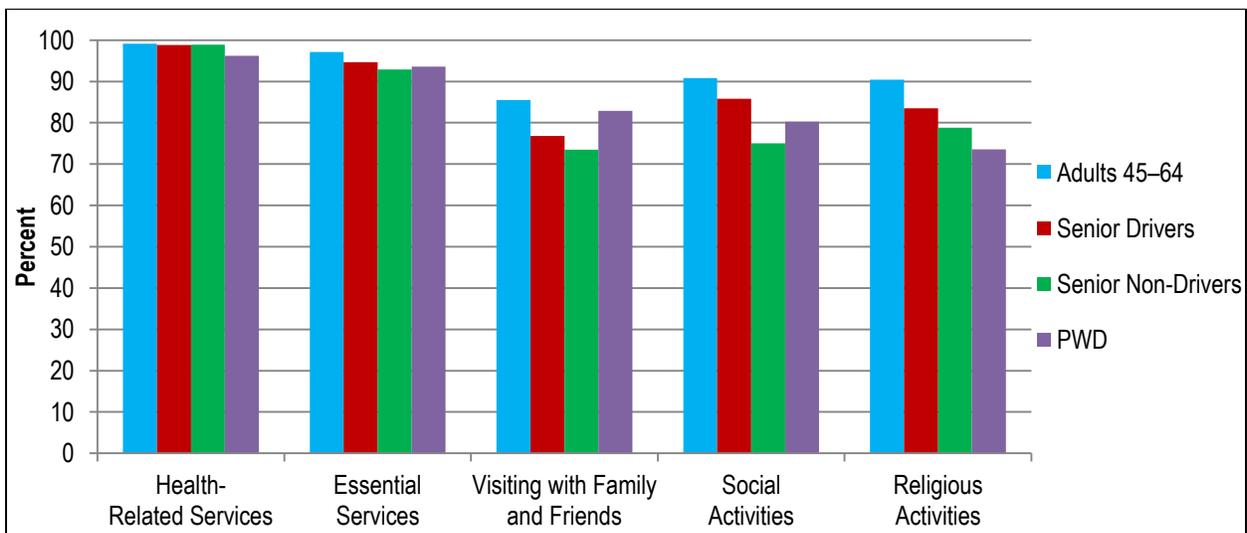

Figure 14. Importance of ATS/ST services for different appointments/activities.

4.4 Adaptability

Importance of ATS and ST Services that can Accommodate Multiple Stops and Wheelchairs

Importance of ATS and ST Services that can Accommodate Multiple Stops

Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD were asked about how important it was to have ATS or ST services that allow for multiple stops (trip chaining) during the trip (e.g., stopping at the bank and then the grocery store on the way home from doctor's office). They also were asked about the importance of having transportation (ATS or ST) services that could accommodate wheelchairs. The majority of Adults 45–64, Senior Drivers, and Senior Non-Drivers (90%, 84%, and 80%, respectively) who answered the ATS survey questions indicated that it was 'somewhat/very important' to have a transportation service that would allow for multiple stops during the trip. Similarly, the vast majority (90%) of PWD participants indicated that having ST services that could accommodate trip chaining was 'somewhat/very important' (see Figure 15).

Importance of ATS and ST Services that can Accommodate Wheelchairs

When asked about the importance of having transportation services that could accommodate wheelchairs, the majority of Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD indicated that this was a 'somewhat/very important' feature of transportation service provision (99%, 99%, 91%, and 82%, respectively) (Data not shown in a graph).
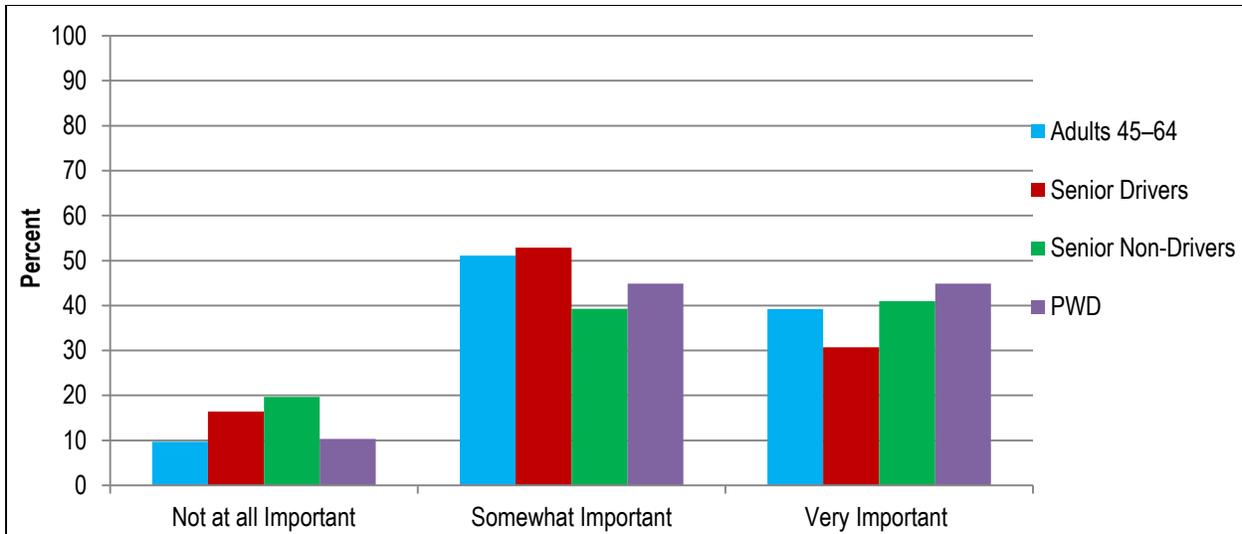
Figure 15. Importance of multiple stops for ATS/ST services.

4.5 Affordability

Paying for Services and Finding out about Transportation Services

Paying for ATS and ST Services

Adults 45–64 years of age and Senior Drivers were asked how much they thought *seniors* in their community could *afford* to pay and how much *seniors* in the community were *willing to pay* for a one-way ride of approximately 10 km. In comparison, Senior Non-Drivers and PWD were asked how much *they* could *afford to pay* and how much they were *willing* to pay for a ride of approximately 10 km. As can be seen in Table 7, the results on responses for *afford to pay* were similar across the four sub-samples, with $7.44 as the average response. A similar pattern was evident on responses for *willing to pay* with PWD participants indicating that they were *willing to pay* a slightly higher amount for a ride of approximately 10 km. However, this difference among the four sub-samples was not statistically significant (p = .58). The average amount that respondents were *willing to pay* was $7.04. Of interest, the amount that PWD participants could *afford to pay* was larger than for the other three sub-samples. However, this difference was not statistically significant (p > .05).

Table 7. *Payment of ATS/ST Services*

Sub-Samples	Afford to Pay (Mean and SD)	Willing to Pay (Mean and SD)
Adults aged 45–64	$7.48 ($5.92)	$6.80 ($5.76)
Senior Drivers	$7.25 ($5.58)	$7.02 ($5.62)
Senior Non-Drivers	$7.92 ($6.12)	$7.81 ($6.27)
PWD	$7.84 ($6.21)	$9.03 ($6.93)

In terms of method of payment, the top choices selected among all four sub-samples were: 'pay per ride' (32%, 41%, 41%, and 25%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively) and 'purchase a book of passes in advance' (42%, 38%, 39%, and 42%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively). Fewer participants across the four sub-samples indicated that they would prefer to 'be invoiced' (3%, 3%, 2%, and 9%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively) or 'set up an account with the provider so that the payment for each ride gets automatically deducted from an account' (23%, 17%, 19%, and 24%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively) (see Figure 16).
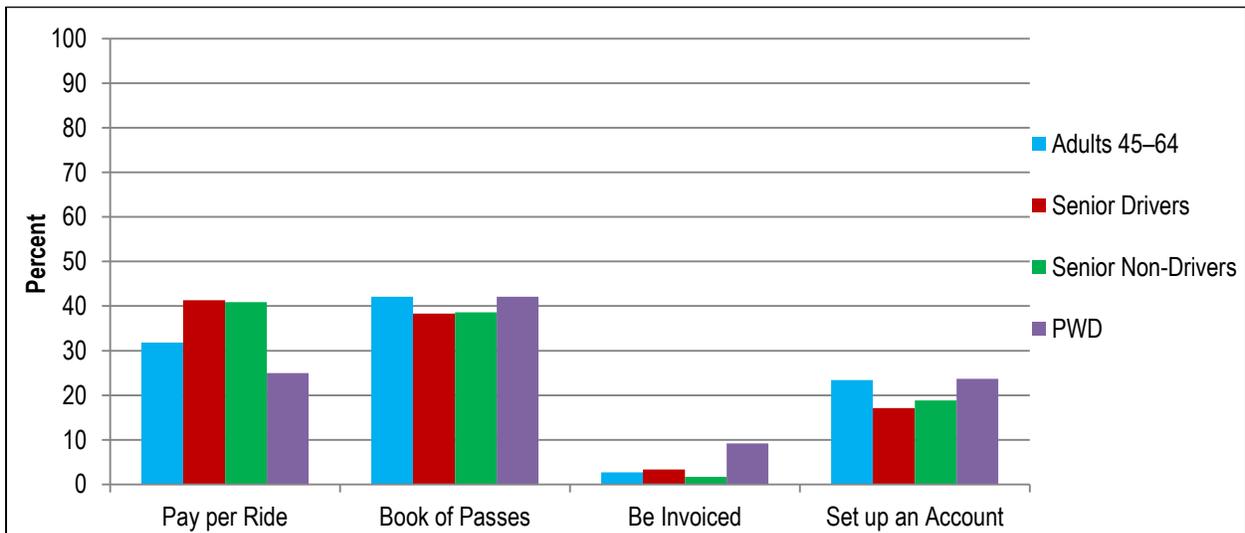
Figure 16. Preferred method of payment for ATS/ST services.

Finding Out About Transportation Services

All participants also were asked how they would prefer to find out about transportation services in their community. The top two preferences in which to find out about transportation services in their community among Adults 45–64 and Senior Drivers was by internet (32% and 19%, respectively) and by community newspaper (42% and 50%; Adults 45–64, Senior Drivers, respectively). Among Senior Non-Drivers, the top two preferences for finding out about transportation services in their community were by community newspaper (41%) and through the senior's centre (15%). Similar to Adults 45–64 years and Senior Drivers, PWD participants indicated that they would prefer to find out about transportation services in their community by community newspaper (33%) and by internet (30%).

5.0 Study 3: Assessing the Importance of Intermunicipal Transit and Regional Medical Transit (IMT and RMT) Services and Municipal Funding for Transportation Services

The results related to the importance of Intermunicipal Transit (IMT) and Regional Medical Transit (RMT) services are presented in Sections 5.1 and 5.2. The results related to the importance of having municipal funding available for transportation services in the Capital Region are presented in 5.3.

5.1 Importance of IMT and RMT Services

All 2296 participants were asked questions about the importance of having IMT and RMT services available in their community. **IMT service** was defined as a transit service that operates between municipalities or across municipal boundaries (e.g., transit service between the participant's community to a major centre such as Edmonton) (2). **RMT service** was defined as a transit service that operates between municipalities or across municipal boundaries (e.g., service available between respondent's town to Edmonton) with its purpose to provide transportation for medical appointments outside of ambulance services.

Overall, 91% of the Sample as a Whole indicated that having IMT service available in the Capital Region was 'somewhat/very important'. The results in Figure 17 are presented for each of the sub-samples (Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD). The majority of participants indicated that having IMT service available in the community was 'somewhat/very important' (92%, 91%, 85%, and 99%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively).

Similarly, overall, 95% of the Sample as a Whole indicated that having RMT services available in the Capital Region was 'somewhat/very important'. The results in Figure 18 are presented for Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD. The vast majority of participants (96%, 94%, 93%, and 99%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively) indicated that it was 'somewhat/very important' to have RMT services available within the Capital Region.
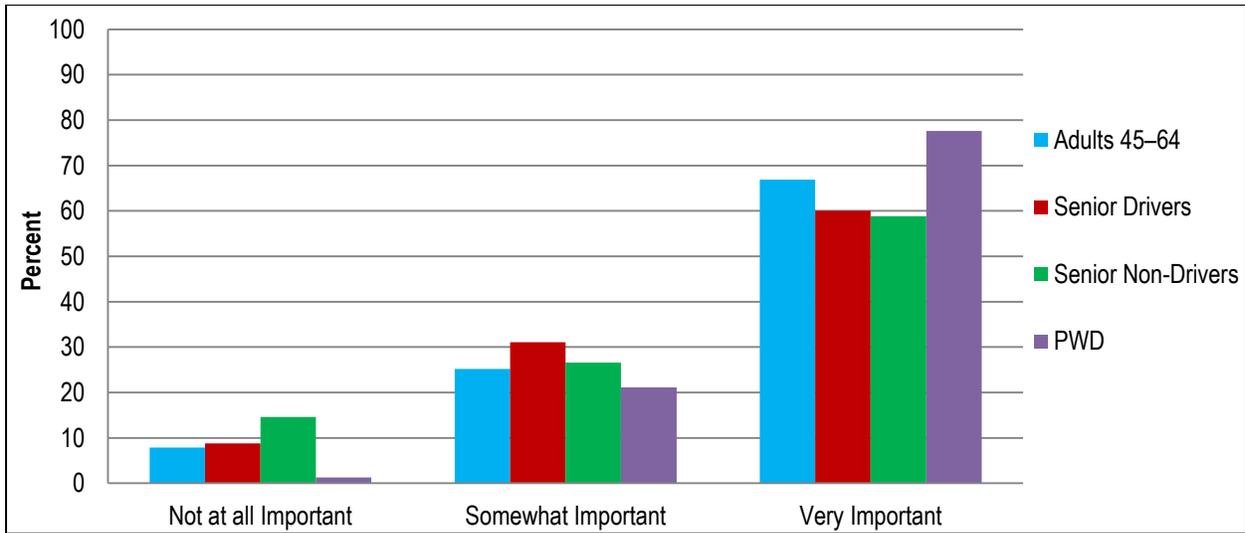
Figure 17. Importance of IMT service.
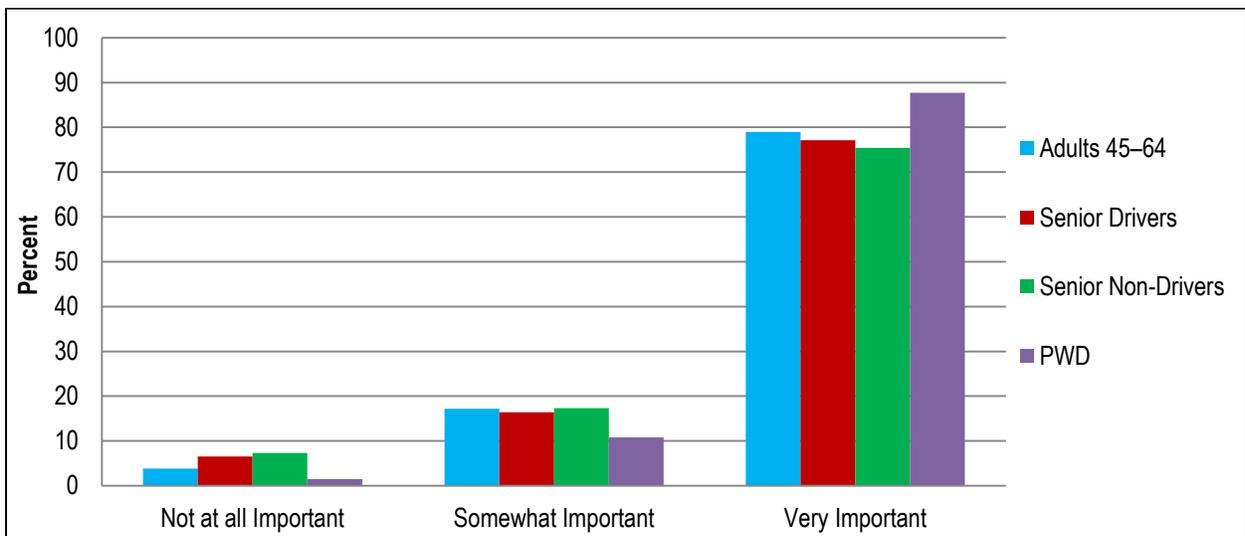
Figure 18. Importance of RMT services.

5.2   Likelihood and Times of Use of IMT Service

Likelihood of Use of IMT Service

Participants also were asked about their *likelihood of using* IMT service if that service was in place in their community. More than half (56%) of the Sample as a Whole indicated that they would be 'somewhat/very likely' to use IMT service if it was available. When looking at the sub-samples, over half of Adults 45–64 and Senior Drivers (52% and 55%, respectively) indicated that they would be 'somewhat/very likely' to use IMT service if it was available in the community. Not surprisingly, a greater percentage of Senior Non-Drivers (75%) and PWD (87%) indicated that they would be 'somewhat/very likely' to use IMT service if it was available, with these differences being statistically significant (all *p* values < .001) (see Figure 19).
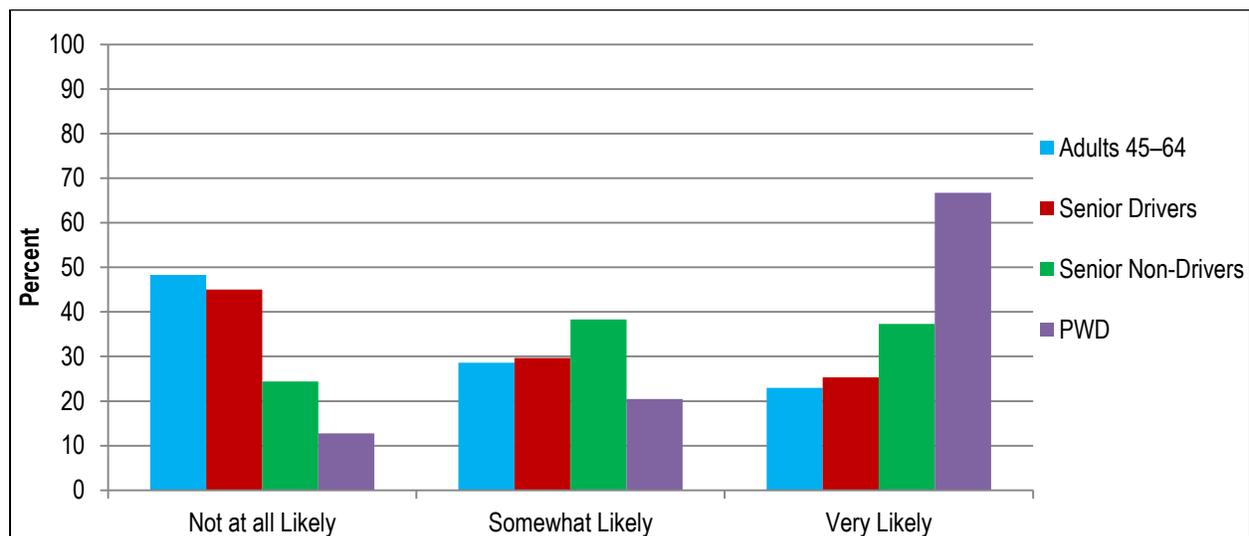
Figure 19. Likelihood of IMT service use.

Times Most Likely to Use IMT Service

The final question in this section pertained to participants' feedback on *times* when they would be *most likely* to use IMT service if that service was available in the community. As can be seen in Figure 20, the pattern of responses shows that a majority of participants across the four sub-samples indicated that the *most likely* time periods of use for IMT service if this service was available would be Weekday mornings (86%, 85%, 80%, and 89%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively) and Weekday afternoons (76%, 76%, 85%, and 82%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively). Fewer participants in each of the sub-samples indicated that they would be likely to

use IMT service on the weekend, with Weekend mornings (47%, 44%, 37%, and 53%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively) and Weekend afternoons (50%, 47%, 45%, and 50%; Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD, respectively) identified as the time periods each of the sub-samples would be *most likely* to use this service. A smaller proportion of participants across all four sub-samples indicated that they would be likely to use IMT service on both Weekday and Weekend evenings. Participants were not asked about the likelihood of use of RMT services and most likely times of use given the nature of this service.
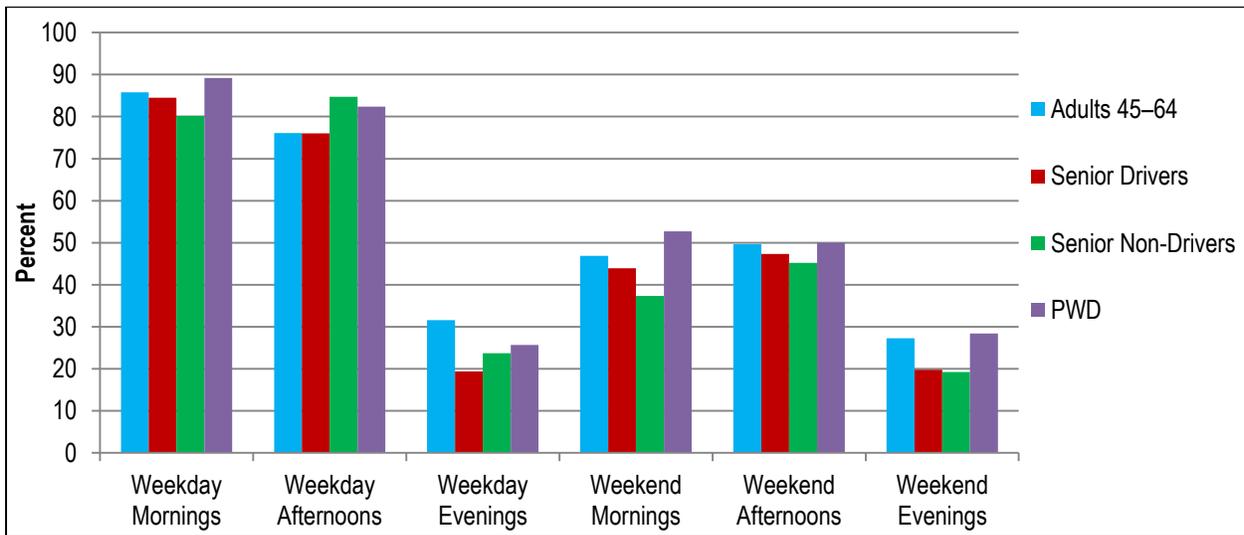

Figure 20. Times of IMT service use.

5.3 Importance of Municipal Funding for Transportation Services

5.3.1 Importance of Municipal Funding for ATS and ST Services

All participants were asked about how important it was to have municipal funding available for ATS or ST services in their community. Overall, the vast majority of participants interviewed (97% of the Sample as a Whole) indicated that having municipal funding available for ATS services was 'somewhat/very important'. The vast majority of Adults 45–64, Senior Drivers, and Senior Non-Drivers (97%, 98%, and 98%, respectively) indicated that it was 'somewhat/very important' to have this type of funding available to offset the cost of providing ATS services in the community. All PWD participants (100%) indicated that it was 'somewhat/very important' to have municipal funding made available to offset the cost of providing ST services in the community (see Figure 21).
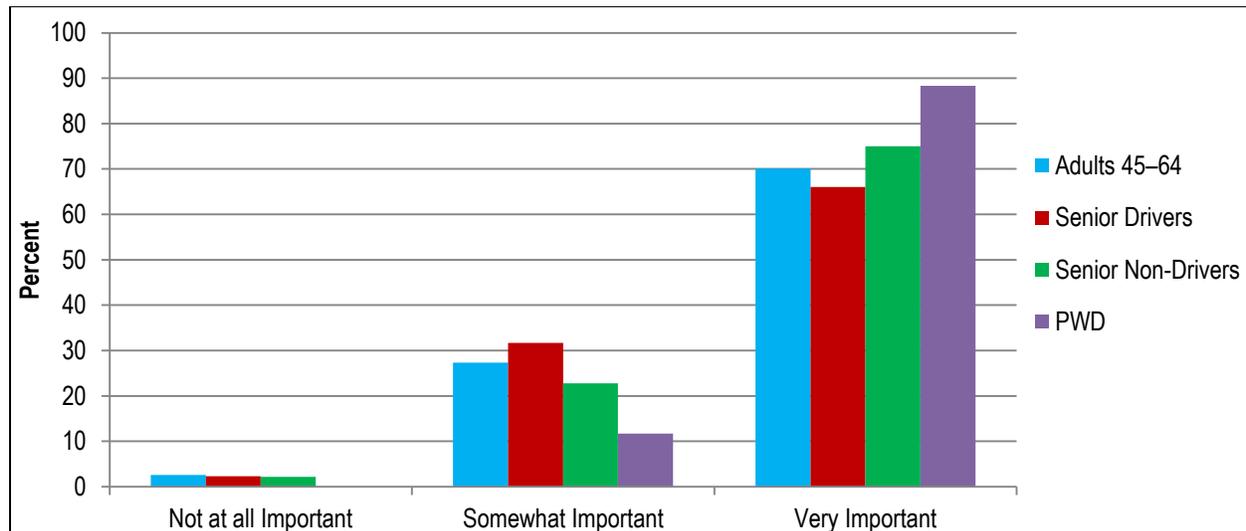
Figure 21. Importance of municipal funding for ATS/ST services.

5.3.2 Importance of Municipal Funding for IMT and RMT Services

All participants were asked about how important it was to have municipal funding available for IMT service in their community. Overall, the vast majority of participants interviewed (96% of the Sample as a Whole) indicated that having municipal funding available for IMT service was 'somewhat/very important'. As shown in Figure 22, the vast majority of Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD (95%, 96%, 95%, and 97%, respectively) indicated that it was 'somewhat/very important' to have municipal funding made available to allow for IMT service provision in the community.
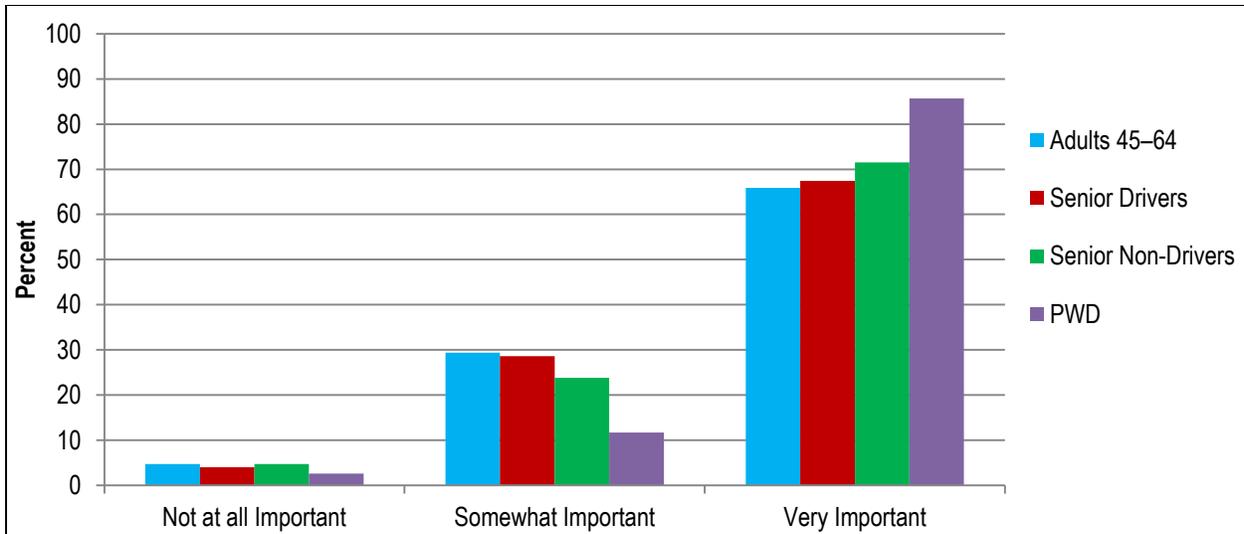
Figure 22. Importance of municipal funding for IMT service.

All participants were asked about how important it was to have municipal funding available for RMT services in the Capital Region. Overall, the vast majority of participants interviewed (96% of the Sample as a Whole) indicated that having municipal funding available for RMT services was 'somewhat/very important'. As shown in Figure 23, across the four sub-samples, the vast majority of Adults 45–64 years of age, Senior Drivers, Senior Non-Drivers, and PWD (96%, 96%, 97%, and 100%, respectively) indicated that having municipal funding made available for RMT services in the Capital Region was 'somewhat/very important'.
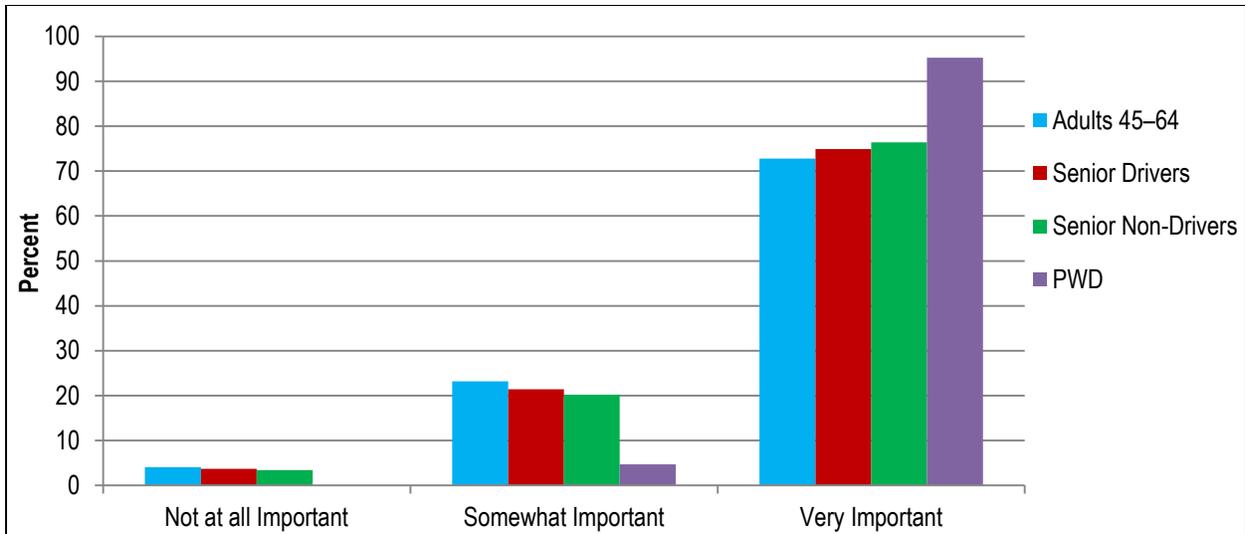
Figure 23. Importance of municipal funding for RMT services.

6.0   SUMMARY AND GOING FORWARD

Overall, the results from the combined 2015 and 2016 *Capital Region Transportation Needs Assessments* provide an important step toward understanding the unmet transportation needs of senior drivers, non-drivers, and PWD, as well as the adequacy and needs of relevant transportation services for seniors and PWD. First, the results presented in this report indicate that seniors and PWD in communities throughout the Capital Region do have unmet transportation needs. Not surprisingly, senior drivers have fewer unmet transportation needs than senior non-drivers and PWD. What is surprising is the degree of difference in unmet transportation needs among these three segments of the population. That is, results from interviews with more than 1000 seniors (driving and non-driving) and PWD indicate that non-driving seniors have more than a four-fold increase in unmet transportation needs as compared to senior drivers, and PWD have more than double the unmet transportation needs as do senior drivers.

An important area of investigation in this study was the identification of factors affecting transportation mobility. The pattern of findings from our analyses of the unmet transportation needs of seniors indicate that increasing age and being female increases the odds of becoming transportation disadvantaged. The finding that older females are more transportation disadvantaged than are older males also is notable in that females tend to outlive their male counterparts. Notably, the results from this research indicate that becoming transportation disadvantaged is not due to *age alone* but rather due to the *strong associations between age, illness, and disability.* That is, when physical health and disability are taken into consideration when assessing unmet transportation needs in seniors, these two factors become more important predictors of unmet transportation needs than do age and sex alone or combined. These findings have important implications for assessing the need for ATS services at local, regional, municipal, and provincial levels. Specifically, these results indicate that planning and policy decisions related to transportation service provision for seniors will be inadequate if those decisions are based simply on population statistics of seniors in the population in the target area. Rather, population statistics on health and disability, and, if available, the percentage of seniors in the community who do not drive, will facilitate planning and policy decisions which will, in turn, facilitate transportation mobility for this growing segment of the population.

Despite the availability of many ST services for PWD in the Capital Region, results from interviews with 78 PWD indicate that more than half (78%) of those interviewed said that they had unmet transportation

needs. To our knowledge, no one has estimated the costs of unmet transportation needs of seniors and PWD. However, it is reasonable to assume that the lack of responsive transportation for seniors and PWD is costly from both a societal and individual perspective. An important next step is an assessment of the costs associated with unmet transportation needs and the associated costs and benefits of addressing those needs through enhanced service provision.

The primary objective of Study 2 was to obtain feedback on features of specialized transportation service delivery for seniors and PWD if those services were to be made available in communities in the Capital Region. The features of ATS services and ST services for PWD examined in this study fall under the umbrella of what has come to be known as the 5 A's of user-friendly transportation (Availability, Acceptability, Accessibility, Adaptability, and Affordability). That is, to be considered as 'user friendly', the transportation service must be available when needed (e.g., days, evenings; weekdays, weekends), be acceptable (e.g., acceptable scheduling times, drivers that are knowledgeable on senior's issues or health issues), be accessible (e.g., provide rides to essential and non-essential services), be adaptable (e.g., accommodate multiple stops), and be affordable (e.g., options for payment methods; fares that are acceptable to seniors and PWD). The results indicated that all five features of transportation services for seniors and PWD were rated as being important by Adults 45–64 years of age, Senior Drivers, Senior Non-Drivers, and PWD. These results are consistent with previous findings (4,27). For example, in the current study, the majority of participants indicated that 'Weekday mornings' and 'Weekday afternoons' were the times that seniors and PWD would be most likely to use the identified transportation services (e.g., ATS and ST services) if those services were available in the communities (Availability). With respect to Acceptability, the majority of participants across the four sub-samples indicated that having to book rides at least 48 hours or less in advance was deemed to be more reasonable, with having to book more than 48 hours in advance less reasonable. Participants also were asked about the importance of multiple stops during the trip (e.g., stopping at the grocery store and bank on the way home from doctor's office) and this feature of service provision (Adaptability) also was rated as 'somewhat/very important' by the majority of participants across the four sub-samples.

One of the features of transportation service for seniors and PWD that is consistently rated as being very high in importance to both seniors and PWD is having drivers who are knowledgeable about health issues (e.g., disabilities, illnesses that affect mental health functioning such as dementia). Yet, based on our work with transportation service providers, few organizations formally train their drivers on these and related

issues. Given the aging of the population and the anticipated increases in the number of seniors and PWD in need of transportation services outside of the public transportation system, broad-based community efforts are needed to make these types of transportation services not only more available but also more acceptable to both seniors and PWD. This can only be accomplished through the implementation of standardized training programs with regular refresher training. Thus, there are opportunities for collaboration between individuals with expertise in this area, service organizations, and transportation services providers, with the goal of developing standardized training materials and creating the infrastructure for delivering the training materials to the appropriate stakeholders on a regular basis.

In terms of Affordability, few participants (Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD) in this survey had the expectation that these types of transportation services should be 'free'. Rather, the vast majority of participants across the four sub-samples indicated that they thought that seniors and PWD could afford and would be willing to pay for the services, with respondents indicating that about $7.50 was what seniors and PWD could afford to pay for a ride of approximately 10 km, with approximately $7 identified as the amount that seniors and PWD would be willing to pay for a ride over this same distance. These results are consistent with the results from our previous provincial Transportation Needs Assessment (27) indicating that, in general, there is support for charging a modest price for the services. The findings have important implications for the design and delivery of transportation services for seniors and PWD in that, often, the prevailing belief is that these transportation services should be available at no charge. Importantly, having users pay at least some of the cost of these transportation services facilitates both the availability and sustainability of transportation services for seniors and PWD in the community.

The primary objectives of Study 3 were to assess the importance of the availability of IMT and RMT services within the Capital Region and to assess the importance of having municipal funding available for transportation services in the Capital Region. The importance of the availability of IMT and RMT services within the Capital Region was striking. The vast majority of respondents (> 90%) indicated that having both IMT and RMT services available in the Capital Region was 'very important'. The *need* for both IMT and RMT services also was evident, with more than 90% of all participants rating the *availability of municipal funding* for IMT and RMT services as 'very important'. A similar pattern of results was found for the *availability of municipal funding* for ATS and ST services. In terms of use, more than half (56%) of all participants indicated that they would 'somewhat/very likely' use IMT service if it was available.

To our knowledge, this research is unique in its assessment of the effects of predisposing, enabling, and need factors on different types of transportation needs (e.g., medical, essential, social, etc.), across different segments of the population (seniors and PWD), and across different settings (urban and rural). The research also is unique in that it provides information not only on the factors affecting the transportation mobility of seniors and PWD in urban and rural settings, but also assesses the attributes needed to make transportation services (alternate transportation for seniors and specialized transit for PWD) more user-friendly. We also assessed the importance of intermunicipal and regional medical transit services as well as funding for the different types of transportation services. Not surprisingly, given the identified needs, the vast majority of participants rated all types of service as well as funding for these services as 'somewhat/very important'.

Overall, the results from the combined 2015 and 2016 *Capital Region Transportation Needs Assessments* provide an important step toward understanding the unmet transportation needs of seniors and PWD, as well as the features of transportation service delivery that would make these types of services attractive and responsive to both seniors and PWD. The advancements in knowledge gained from these studies can be used by service providers, community organizations, and local, regional, and municipal leaders to inform on policy and planning initiatives related to the delivery of responsive transportation services for seniors and PWD in the Capital Region.

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8.0   Appendices

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Appendix A

Appendix A.1   Capital Region Board Member Municipalities

Table A.1. *Capital Region Board Member Municipalities*

Capital Region Board Member Municipalities
Town of Beaumont Town of Bon Accord Town of Bruderheim Town of Calmar Town of Devon City of Edmonton City of Fort Saskatchewan Town of Gibbons Lamont County Town of Lamont City of Leduc Leduc County Town of Legal Town of Morinville Parkland County Town of Redwater City of St. Albert City of Spruce Grove Town of Stony Plain Strathcona County Sturgeon County Village of Thorsby Village of Wabamun Village of Warburg

Appendix A.2   Demographics of Sample

Table A.2. *Demographics of the Adults 45–64, Senior Drivers, Senior Non-Drivers, and PWD*

		Adults 45–64 Years (n = 1131)	Senior Drivers (n = 884)	Senior Non-Drivers (n = 203)	PWD (n = 78)
Age		Mean (SD) 55.6 (5.6)	Mean (SD) 72.5 (5.9)	Mean (SD) 77.2 (7.7)	Mean (SD) 46.9 (14.1)
		n (%)	n (%)	n (%)	n (%)
Sex	Male	397 (35.1)	338 (38.2)	47 (23.2)	33 (42.3)
	Female	734 (64.9)	546 (61.8)	156 (76.8)	45 (57.7)
Marital Status	Married/Common Law	887 (78.9)	555 (63.2)	84 (41.4)	31 (39.7)
	Separated/Divorced	116 (10.3)	85 (9.7)	26 (12.8)	10 (12.8)
	Widowed	44 (3.9)	210 (23.9)	81 (39.9)	4 (5.1)
	Never Married	76 (6.9)	28 (3.2)	12 (5.9)	33 (42.3)
Living Arrangements	Lives Alone	163 (14.5)	281 (32.0)	82 (40.6)	16 (20.5)
	Lives with Family/Friends	955 (85.0)	587 (66.8)	103 (51.0)	57 (73.1)
	Lives in Group Setting	4 (0.4)	11 (1.3)	17 (8.4)	4 (5.1)
	Other	2 (0.2)	--	--	1 (1.3)
Employment Status	Retired	200 (17.8)	718 (81.8)	189 (93.1)	7 (9.0)
	Employed Full Time	503 (44.8)	52 (5.9)	2 (1.0)	11 (14.1)
	Employed Part Time	183 (16.3)	73 (8.3)	2 (1.0)	6 (7.7)
	Self-Employed	44 (3.9)	8 (0.9)	--	--
	Homemaker	54 (4.8)	9 (1.0)	6 (3.0)	3 (3.8)
	Long-Term Disability	68 (6.0)	2 (0.2)	3 (1.5)	32 (41.0)
	Unemployed	61 (5.4)	6 (0.7)	1 (0.5)	16 (20.5)
	Other	11 (1.0)	10 (1.1)	--	3 (3.8)
Household Income	< $20,000	42 (4.7)	58 (8.7)	25 (18.2)	14 (23.7)
	≥ $20,000	860 (95.3)	610 (91.3)	112 (81.8)	45 (76.3)
Current Rating of Physical Health	Poor	50 (4.4)	31 (3.5)	26 (12.9)	22 (28.6)
	Fair	178 (15.8)	180 (20.4)	70 (34.7)	27 (35.1)
	Good	561 (49.7)	432 (49.0)	85 (42.1)	22 (28.6)
	Excellent	339 (30.1)	239 (27.1)	21 (10.4)	6 (7.8)
Use of Mobility Aids	No Mobility Aids	1022 (90.4)	708 (80.1)	82 (40.4)	40 (51.3)
	One or More Mobility Aids	109 (9.6)	176 (19.9)	121 (59.6)	38 (48.7)
Physical Health Interferes	Never	679 (60.1)	475 (53.8)	52 (26.0)	9 (11.5)
	Sometimes	366 (32.4)	345 (39.1)	96 (48.0)	25 (32.1)
	Often	85 (7.5)	63 (7.1)	52 (26.0)	44 (56.4)
Disability Status	No	1048 (92.7)	779 (88.1)	63 (31.0)	--
	Yes	83 (7.3)	105 (11.9)	140 (69.0)	78 (100)
Driving Status	Yes	1096 (96.9)	884 (100)	--	--
	No/Never Drove	35 (3.1)	--	203 (100)	78 (100)
Place of Residence	City	451 (39.9)	344 (38.9)	114 (56.2)	28 (35.9)
	Town	242 (21.5)	185 (20.9)	46 (22.7)	20 (25.6)
	Village	32 (2.8)	33 (3.7)	6 (3.0)	3 (3.8)
	Hamlet	104 (9.1)	107 (12.1)	21 (10.3)	12 (15.4)
	Acreage	161 (14.2)	92 (10.4)	8 (3.9)	8 (10.3)
	Farm	78 (6.9)	93 (10.5)	6 (3.0)	3 (3.8)
	Rural Municipal District	63 (5.6)	30 (3.4)	2 (1.0)	4 (5.1)
Geographic Area	City of Edmonton	175 (15.5)	130 (14.7)	57 (28.1)	20 (25.6)
	Geographic Area 1	249 (22.0)	228 (25.8)	37 (18.2)	12 (15.4)
	Geographic Area 2	395 (34.9)	246 (27.8)	69 (34.5)	26 (33.3)
	Geographic Area 3	312 (27.6)	280 (31.7)	40 (19.2)	20 (25.6)

Appendix A.3   Results of Principal Components Analysis

Table A.3. *Results of Principal Components Analysis*

Item	Loading
1. In the last six months, how often have you not gone to a *medical appointment in your community* because you did not have a ride?	.633
2. In the last six months, how often have you not gone to a *medical appointment outside of your community* because you did not have a ride?	.581
3. In the last six months, how often have you been unable to *shop for groceries* because you did not have a ride?	.701
4. In the last six months, how often have you been unable to *get together with family* because you did not have a ride?	.705
5. In the last six months, how often have you been unable to *attend social functions* because you did not have a ride?	.738
6. In the last six months, how often have you been unable to *go to religious activities* because you did not have a ride?	.535

Appendix A.4　The 5 A's of Senior Friendly Transportation

Table A.4. *The 5 A's of Senior Friendly Transportation*

The 5 A's	Description
Availability	Refers to transportation services that are provided and those services are available when needed (e.g., days, evenings; weekdays, weekends).
Acceptability	Refers to transportation in which service quality is acceptable in terms of advance scheduling; vehicles are clean and well-maintained; service providers provide driver 'sensitivity to seniors' training.
Accessibility	Refers to transportation in which the service provider provides 'door-to-door' and 'door-through-door' transportation; provides transportation to essential and non-essential activities.
Adaptability	Refers to transportation that can accommodate riders wanting to make multiple stops (trip chaining); service providers allow for different types of routes (fixed vs. user response) and passenger service (single vs. group); service providers can accommodate wheelchairs and walkers; escorts can be provided.
Affordability	Relates to the cost of transportation and transportation that is affordable (e.g., uses volunteer drivers to reduce costs, vouchers, or coupons available, etc.).