OLDER ADULTS' TRAVEL EXPERIENCE WITH PUBLIC TRANSIT AND ITS IMPACTS ON THEIR TRAVEL SATISFACTION AND WELLBEING

by

Xiaohan Gu

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ABSTRACT

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Xiaohan Gu

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The topic of this dissertation focuses on older adults (people who are older than age 65) because this population is projected to surpass the population of people under 18 years old in the U.S. for the first time by 2030.[1] It is important to understand the social and political implications of the changing demographic trends on the built environment for better and in-time accommodations. It is also vital to identify the relationships between accessibility, mobility, quality of life, and the wellbeing of populations with decreased mobility in an automobile-centric country like the United States. Thus, this research explores how public transit services impact older adults' travel satisfaction; and how older adults' travel experience with public transit influences their mental wellbeing and shapes their perceptions of being a transit rider. First, I explored the travel mode choice of older adults using the 2017 NHTS data, especially the circumstances under which older adults would use public transit. Further, I examined the Milwaukee County Transit System's customer satisfaction survey data from 2020 to 2022 to explore older adults' travel satisfaction. Lastly, I explored the detailed barriers and challenges older adults who are transit

[1] U.S. Census Bureau, (2021). *Older people projected to outnumber children for first time in U.S. history*. Census.gov. https://www.census.gov/newsroom/press-releases/2018/cb18-41-population-projections.html

riders face in Milwaukee County and how public transit contributes to their wellbeing and their perceptions of being a transit rider through interviews using the reflexive thematic analysis method. Three key findings emerge from the qualitative sections that encapsulate the core themes of dignity and vulnerability of senior public transit riders, as well as how stigma impact their perceptions. The concept of dignity is underscored when public transit empowers senior riders to maintain their independence. This sense of autonomy allows them to navigate their surroundings and maintain their dignity by not always having to worry about asking others for rides or reduce their out-of-home travels. Public transit can be a crucial means for seniors to feel valued and autonomous, contributing to their overall sense of dignity and mental wellbeing. Senior transit riders' vulnerability is demonstrated through the prevalence of reckless driving, the easiness to walk to the bus stops, and their sense of safety and personal security as transit riders. Reckless driving, bad weather, and poor pedestrian infrastructure would bring additional threats to them when riding public transit, the increased likelihood of accidents and injury would make senior transit riders feel more vulnerable and negatively impact their wellbeing. In the meantime, the stigma around public transit in the US works as a pervasive force affecting the perceptions of less experienced and exposed senior transit riders, shaping a negative perception of themselves as transit riders, which would make riding public transit more difficult for them.

The dissertation is structured as follows: First, in Chapters 1 and 2, I introduce the context of my research and review relevant literature on senior transit riders' travel behavior and its relationship to older adult's travel satisfaction, wellbeing, and transportation justice. Chapter 3 presents the research questions and the mixed research methods used in this research. I then present four chapters of quantitative and qualitative studies designed to answer specific research questions related to the travel behavior of older adults and how that impacts their wellbeing and shapes their

perceptions of being a transit rider. I conclude the dissertation by suggesting potential policy recommendations and a preliminary framework for accommodating new transit riders from my findings, as well as potential future directions for research on older transit riders' travel behavior.

In Chapter 4, I analyzed the 2017 NHTS data to examine elements that impact older adults' travel mode choices at the national level. I found that senior travelers were a diverse group of travelers with varying preferred travel modes. They were mostly in good physical condition, had a valid driver's license, and living in their own homes with access to private cars in less dense areas. Though most of their trips were made by driving, they preferred active travel modes and non-driving modes for social and recreational activities, but they would prefer driving over all other travel modes for shopping trips.

In Chapter 5, I examined the MCTS customer satisfaction survey data through 2020 to 2022 to identify factors that impact senior rider's travel satisfaction with MCTS transit services. In general, older adults cared much more about travel safety with public transit than their younger counterparts, as well as travel information accessed easily through customer services. This may indicate that older adults feel more vulnerable when the drivers do not drive safely and are less tech-savvy and/or have limited access to the Internet so that they rely more on transit provider's customer service for trip related information.

Chapter 6 and 7 used qualitative research methods to explore the barriers and challenges senior transit riders encounter, as well as how public transit contributed to their wellbeing and shaped their perceptions of being a transit rider. I found that travel information accessibility and bus stop accessibility are very important to them. Reckless driving is becoming a serious concern for senior transit riders as it makes being a pedestrian less safe. Moreover, safety and personal

security with public transit is a very gendered experience, female senior transit riders felt more vulnerable than their male counterparts. Public transit can bring both positive and negative contributions to senior transit riders' emotional wellbeing depending on whether it can meet their daily, social, and recreational travel needs. Moreover, there are also vast differences in how experienced transit riders and new transit riders perceive themselves as transit riders. Experienced senior riders perceive themselves as smart, radical, and proud public transit riders while new senior riders' perception is more shaped by the stigma around public transit that public transit is crime-ridden and mainly a travel option for people who cannot afford cars.

In Chapter 8, I concluded this dissertation by summarizing the findings of this research and comparing them with the results from existing literature to inform policymakers and transit agencies to create transportation system that can provide a safe, friendly, and welcoming environment for all travel modes and everyone. I also proposed a preliminary framework based on the findings of the analysis of the interviews for transit agencies to understand what shaped the perceptions of being a transit rider of long-time transit riders and new transit riders. I also suggested future research on incorporating qualitative research methods to include a more diverse sample of interviewees who are transit riders and on rural older adults' travel choices after driving cessation. For example, transit agencies should make public transit information and bus stops more accessible to senior riders as well as establish outreach and educational programs to better help older adults understand and use public transit. Future researchers should also use more up-to-date datasets as well as more qualitative research methods to understand factors that would influence older adults' perceptions of public transit.

Dedicated to my mom, Jianru Gu

And

in loving memory of my grandfather, Yun Gu, who taught me how to read

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LIST OF ABBREVIATIONS

ADA	Americans with Disabilities Act
ASD	Autistic Spectrum Disorder
DOT	Department of Transportation
DRT	Demand Responsive Transportation
EWB	Eudaimonic Wellbeing
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HWB	Hedonic Wellbeing
MPO	Metropolitan Planning Organization
NHTS	National Household Travel Survey
QoL	Quality of Life
RTA	Reflexive Thematic Analysis
SWB	Subjective Wellbeing
TOD	Transit-Oriented Development
MCTS	Milwaukee County Transit System

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1 Introduction

How we move and how our movements impact our surroundings and each other have been topics that gain more and more voice worldwide as we try to battle climate crises and reduce mobility disparities and injustice. A well-designed public transit system, together with mixed-use zoning policies and compact development patterns have always been lauded as promising approaches to create livable and sustainable people-oriented communities in which public transit can be more desirable than the private car, more social capital can be built, job opportunities can be distributed more evenly among disadvantaged community members – such as people who live in poverty, welfare recipients, and older adults (Cervero et al., 2017). However, in most western countries, the stigma around public transit as the primary travel mode for people with lower socioeconomic status has already rendered negative perceptions of public transit, making it difficult to persuade drivers to change their travel modes (Graham et al., 2018; Hagan, 2020; Johnson et al., 2017; Jones et al., 2013; Kersting et al., 2021; LaPlante & Kaye, 2010). In the US, public transit is often related to negative emotions and frequently ranked as the least satisfying travel mode because of incomplete infrastructure, inconsistent and inconvenient services, and unjust transit resource distribution (Verlinghieri & Schwanen, 2020; Zhu & Fan, 2018). For the transit-dependent population, public transit is more about a lifeline to food security, employment, healthcare, and education than an environment-friendly lifestyle or a cure for traffic congestion in an automobile-centric society (Attoh, 2019; Grengs, 2005). Transit-oriented developments in most urban revitalization schemes would increase the livelihood and number of opportunities of a decaying neighborhood (Cervero et al., 2017; Higashide, 2019; Suzuki et al., 2013). However, this type of development often attracts people with higher income levels who could afford the increased living costs in such neighborhoods and brings the risk of gentrification that pushes former low-

income transit-dependent families to the fringe of the city where public transit merely exists (Allen, 2018; Sheller, 2018).

Like most developed countries, the US is witnessing a growing aging population. It is projected that the population of older adults[2] (people aged over 65) would increase from 52 million in 2018 to nearly 95 million by 2060 and the percentage of older adults would increase from 16 percent to 23 percent (US Census Bureau, 2020). In the meantime, US Census Bureau (2017) reports that among the 56.7 million people with disabilities[3], approximately 15.7 million (nearly 28%) are older adults. Though many scholars and policymakers have proposed and promoted bridging mobility gaps for older adults and people with disabilities with public transit and paratransit services, Rosenbloom (2009) has argued that there is little evidence of older adults' preference for using public transit before or after driving cessation. Indeed, private vehicles have rapidly increased their shares over time for everyone while public transit systems struggle with service upkeep and decreasing ridership (Cervero, 1998). Such realities make travel and socializing difficult for people with decreasing and/or restricted mobility in the US and many other automobile-centric countries where satisfying travel modes that can rival driving in private vehicles are hard to find. However, there are cities and regions around the world where public transit systems do not merely survive private vehicles, but also "*have found a harmonious fit*"

[2] This study uses US Census Bureau's definition of the elderly – people who are over 65 years old – as the definition of older adults in the sampling and analyses processes. See Bureau, U. S. C. (2022, September 20). *Older population and aging*. Census.gov. https://www.census.gov/topics/population/older-aging.html. This definition of older adults (people who are over 65 years old) does not apply to papers where the definitions of older adults are either beyond or below the age of 65 years old. For example, Hess (2012) defined older adults as people over 60 years old when studying the perceived walking distances to bus stops of older adults who use public transit in Erie County, New York in the US while Schwanen et al. (2001) defined older adults as people who are over 50 years old when studying the determinants of mode choices for leisure trips in the Netherlands. See Hess, D. B. (2012). Walking to the bus: Perceived versus actual walking distance to bus stops for older adults. *Transportation*, *39*(2), 247–266. https://doi.org/10.1007/s11116-011-9341-1; Schwanen, T., Dijst, M., & Dieleman, F. M. (2001). Leisure trips of senior citizens: Determinants of modal choice. *Tijdschrift Voor Economische En Sociale Geografie*, *92*(3), 347–360. https://doi.org/10.1111/1467-9663.00161.

[3] Unless noted otherwise, this study uses United States' Centers for Disease Control and Prevention's definition of disabilities: a disability is any condition of the body or mind (impairment) that makes it more difficult for the person with the condition to do certain activities (activity limitation) and interact with the world around them (participation restrictions). See Centers for Disease Control and Prevention. (2020, September 16). *Disability and health overview*. Centers for Disease Control and Prevention. https://www.cdc.gov/ncbddd/disabilityandhealth/disability.html#ref

(Cervero, 1998) within the urban environment to provide competitive services for all. It is important to understand the determinants of successful public transit networks and satisfying transit services to create suitable and feasible transit systems in the US that will accommodate the needs of people with decreasing and/or restricted mobility, as well as encourage their use of public transit.

Moreover, scholars like Litman (2003) have suggested that basic mobility, indicating transportation to access goods, services, and activities, is usually considered a merit good or a right. Thus, debates over transportation justice often dwell on equity and rights: how to ensure equitable access to opportunities for different social and demographic groups, the fair and just policymaking for people of all abilities using different transportation modes, and protecting transportation as a right by law to prevent discriminative transportation policies and decisions. In other words, defining transportation justice is important in that it directs transportation policymaking and planning (Karner, 2016). Therefore, one needs to understand and address the inequities in the transportation planning and delivery system (Carleton & Porter, 2018; Sanchez et al., 2018), as well as clarify whose rights and the rights to what that we are protecting (Attoh, 2019).

Thus, this research aims to investigate people's travel experiences with public transit – with a focus on older adults – in Milwaukee County, Wisconsin. Existing research has mostly examined people's travel behavior and satisfaction with public transit using transportation surveys at different levels and smart card data (Allen et al., 2020; Cao, 2013; Deka, 2014; Deka & Gonzales, 2014; Ferrari et al., 2014; He et al., 2020; Moayyed, 2022; Noor & Foo, 2014). Though such studies can help us understand people's travel behavior and satisfaction, they are more focused on the transit system and transit-related policymaking instead of the physical and personal challenges

older adults may face while using public transit. A few studies have used interviews to reveal additional emotional and physical efforts older adults have to make (Ravensbergen et al., 2021, 2022) and the discrimination people with disabilities face (Wayland et al., 2022) while using public transit, none of them is focused on US transit users with decreasing and/or restricted mobility – such as older adults. Moreover, scholars have found gender and geographic differences in public transit riders' travel behavior and satisfaction (Graham et al., 2018; Hagan, 2020; Johnson et al., 2017; Jones et al., 2013; Kersting et al., 2021; LaPlante & Kaye, 2010; Rosenbloom, 2009). Further, when it comes to the relationship between public transit, travel satisfaction, and subjective wellbeing, there are conflicting findings when it comes to older adults in the existing literature (Kim et al., 2020b; Wong et al. 2020).

This dissertation explores the travel behavior and satisfaction of older adults who are transit riders, as well as how public transportation[4] contributes to their wellbeing in Milwaukee County. First, I explored the nationwide travel mode choice of older adults – especially the circumstances under which they would use public transit – using the 2017 NHTS data. Further, I examined the Milwaukee County Transit System's (MCTS) customer satisfaction survey data from 2020 to 2022

[4] Public transit in this study refers to common public transportation systems (such as buses, commuter rails, subway systems, light rails, bus rapid transit (BRT), and subway systems) and paratransit systems unless specified otherwise. In the US, the 49 CFR § 37.121 Requirement requires public entities operating fixed route systems shall provide comparable paratransit or other special services to people with disabilities. Ridehailing services (such as Uber and Lyft) are not considered as public transit in this study in that they are not usually operated by public entities or considered as a right as public transit is by certain scholars and are not entirely regulated by the same regulations that regulate public transit systems. The federal government provides regulations on carpooling and/or vanpooling projects that receive aids or funds from the governments, the available data from the 2017 NHTS does not indicate the types of carpooling or vanpooling modes individuals use, therefore, ridesharing services such as carpooling are not considered as public transportation in this study. In Milwaukee County, FlexRide Milwaukee is an on-demand transit service that provides vanpooling services to and from certain areas (around Milwaukee to an employment zone covering the Menomonee Falls and Butler areas). The service is provided to individuals who are at least 13 years old and working or willing to work within the service areas. As existing literature has suggested, older adults and people with disabilities are less likely in the workforce than able-bodied individuals, this study thus excludes FlexRide Milwaukee from the public transit category. See *49 CFR § 37.121*. Code of Federal Regulation. (2022, November 17). https://www.ecfr.gov/current/title-49/subtitle-A/part-37/subpart-F/section-37.121 for paratransit requirements; *Carpool and vanpool projects (23 CFR 656.5)*. FHWA Operations. (2022, May 3). https://ops.fhwa.DOT.gov/tdm/0656sup/ for carpool and vanpool regulations.See *What is flexride Milwaukee? – flex ride milwaukee*. (n.d.). https://flexridemilwaukee.zendesk.com/hc/en-us/articles/4422177212685-What-is-FlexRide-Milwaukee for detailed information for FlexRide Milwaukee services and requirements. For debates on the right to public transportation, see Attoh, K. A. (2019). *Rights in transit: Public transportation and the right to the city in California's East Bay*. The University of Georgia Press; Litman, T. (2003). *Social inclusion as a transport planning issue in Canada*; Sanchez, T. W., Brenman, M., Ma, J. S., & Stolz, R. H. (2018). *The right to transportation: moving to equity* (1st ed.); Sheller, M. (2018). *Mobility justice: The politics of movement in an age of extremes*. Verso.

to explore older adults' travel satisfaction with public transit. Lastly, I conducted and analyzed 30 interviews to explore the detailed barriers and challenges older adults face with public transit and how public transit contributes to their wellbeing.

2 A Review of Public Transit, Mobility, Age, and Disabilities in the Global Context

2.1 Introduction

In the following sections, I review relevant literature on the travel experience of and satisfaction with public transportation of older adults. Since a significant number of older adults in the US are also persons with disabilities (US Census Bureau, 2020. See introduction for details), I will also include studies on the travel experience and satisfaction with public transit of people with disabilities. I first explore global studies on the travel behavior of older adults and people with disabilities using public transit, summarizing similarities and differences in their demographic backgrounds and trip characteristics. Then, I describe the travel satisfaction of older adults and people with disabilities with respect to public transportation. Subsequently, I review how travel satisfaction is defined and measured by different scholars, the similarities and differences in the travel satisfaction of older adults and people with disabilities when it comes to using public transit, as well as the barriers and challenges these two groups of people need to face while using public transportation. Then, I examine debates on the definition of wellbeing and the roles public transit systems play in the wellbeing of their riders, with a focus on riders who are older adults and people with disabilities. Besides the examination of wellbeing related debates on public transit riders, I also address the burgeoning discourse on transportation justice and what it entails for public transit riders. I end by reviewing and identifying outstanding questions and research gaps regarding the travel experiences of older adults regarding public transportation – especially in the context of the US and how this research aims to contribute to the understanding of the travel experience realities of older adults.

2.2 The travel behavior of public transit riders

Automobile-centric planning policies in most developed countries provide the context in which the existing literature on travel behavior and satisfaction has majorly focused on driving commuters (and what can be done to shift their behavior to use other modes). As most developed countries begin to see growth in their aging populations, some researchers have started to examine the trends and potential changes in older adults' travel experiences to better inform the society to be more accommodating for older adults after driving cessation. In the meantime, researchers have found similarities in the travel experiences of people with disabilities and older adults due to their limited mobility when compared to the able-bodied population. This section reviews existing global studies on the demographic and trip characteristics of older adults and people with disabilities who are public transit riders.

2.2.1 Methods used to gather travel behavior data for older adults and people with disabilities as transit riders

Most researchers around the world have been using surveys and interviews to gather quantitative and qualitative data to examine people's travel behavior. Most countries have been conducting national-level travel surveys to document, examine, and predict people's travel behavior. In the US, for example, scholars have used the National Household Travel Survey (NHTS) to study the roles household members have played in assisting the travel needs of people with disabilities (Deka, 2014), the travel behavior of female older adults in North Dakota (Hough et al., 2008), and the relationship between neighborhood walkability and the use of public transit of people with disabilities in California (Kwon & Akar, 2022). Others in the US have used the Survey of Income and Program Participation and National Health Interview Survey on disability to study the trip characteristics of people who use wheelchairs (LaPlante & Kaye, 2010), the

National Community Livability Survey to examine the relationship between the quality of transportation and life satisfaction (Mattson et al., 2021), and the American Time Use Survey to study the relationship between daily travel behavior and emotional wellbeing (Zhu & Fan, 2018). Nordbakke & Schwanen (2015) have conducted a national transportation survey to examine the impact of access to transportation on older adults' unmet travel needs and wellbeing. In the Netherlands, Schwanen et al. (2001) have investigated the Dutch National Travel Survey to explore elements that affect older adults' travel mode choices for leisure trips. In Japan, scholars used the national Smart Mobility Challenge Survey to examine the relationship between out-of-home activities, access to different travel options, and the mobility of older adults (Tran et al., 2022).

Besides national travel surveys, available local-level transportation surveys have helped researchers understand factors that influence people's travel behavior. In the US, Farber et al. (2014) used the Utah Household Travel Survey to examine social equity issues with distance-based transit fare structure. Schmöcker et al. (2008) examined travel mode choices for shopping trips of older adults and people with disabilities using data from the London Area Transport Survey. In China, Yuan et al. (2022) used the Nanjing Household Travel Survey to study older adults' travel behavior and mode choices while Li et al. (2018) examined the Comprehensive Travel Survey of Shanghai to explore whether proximity to transit is related to wellbeing and life satisfaction. In Japan, Yang (2018) used the 6th Tokyo Metropolitan Area Person Trip Survey to explore factors that impact older adults' mobility choices in smaller cities adjacent to larger transit-oriented cities.

National transportation surveys – such as the NHTS – and some local-level surveys usually aim at collecting and documenting general travel behavior, they do not capture the specific travel

behavior, barriers, and challenges of certain groups of people. Thus, researchers also conduct surveys – sometimes commissioned by departments of transportation (DOT) or private transportation agencies – to examine the travel experiences of certain groups of people. In the US, Bezyak et al. (2017) worked with the Federal Transit Administration (FTA) to establish a survey investigating the barriers people with disabilities face when they use public transit. Buning et al. (2007) surveyed 283 wheelchair-seated bus riders to examine their travel behavior and safety concerns while using public transit. Choice experiment surveys were used in Atascosa, Polk, and Parker Counties in Texas to explore rural older adults' willingness to pay for enhanced public transportation when it comes to improving their quality of life (Israel Schwarzlose et al., 2014). In the Twin Cities, Minnesota, Cao (2013) surveyed residents who live along the light rail to examine the association between light rail transit as well as travel and life satisfaction. Outside the US, researchers have conducted a consumer satisfaction survey in Santiago, Chile to explore factors contributing to rider's satisfaction with the metro system (Allen et al., 2020). Kersting et al. (2021) surveyed people who use Demand Responsive Transportation (DRT) in Germany to study the association between older adults' travel experiences and travel satisfaction. In Asian countries, specialized surveys targeting older adults who are transit riders have been used to analyze the relationship between travel satisfaction, social inclusion, and wellbeing in Hong Kong (He et al., 2020) and Shizuoka City, Japan (Kim et al, 2020b).

As more and more transit agencies begin to adopt smart cards for transit access and fare transaction, researchers are able to use recorded travel data of smart card users to explore transit riders' longitudinal travel behavior. For example, in the US, Deka & Gonzales (2014) studied smart card data of people who used paratransit services in New Jersey for 24 months between October 2010 to September 2012 to investigate the trip motivations of people with disabilities. In

the London Metropolitan Area, transit smart card data has been used to provide insights on how to improve the accessibility levels of public transportation for people with disabilities (Ferrari et al., 2014). In Japan, scholars have used transit smart card data between April 2018 to March 2019 in Shizuoka City to examine the travel trends and patterns of older adults (Liu et al., 2021).

Similar to large- to medium-scale travel surveys, though smart card data could provide long-term travel data for longitudinal travel behavior analyses, most of the quantitative data cannot document detailed travel experiences, especially personal challenges and barriers people meet during their travels. Therefore, scholars have employed interviews or focus groups to collect qualitative data for analyzing the impact of varying transportation options on the mobility of different groups of people. Structured interviews have been used to understand European countries' approaches to meeting older adults' transit needs (Johnson et al., 2017). Scholars in the US have used structured interviews in Pulaski County, Arkansas to report the barriers and challenges preventing the local public transit system from providing satisfying services to transit riders (Jones et al., 2006). In Hong Kong, scholars have interviewed 613 older adults about their travel satisfaction with public transit to inform policymakers on measures that will improve the mobility of older adults (Wong et al., 2017, 2018). Other scholars have used semi-structured interviews to inquire about the travel experiences of 24 older adults who are transit riders in Hamilton, Canada, and how the barriers to accessing public transit have impacted them physically and emotionally (Ravensbergen et al., 2021, 2022). In Northern Ireland, Hagan (2020) used similar methods to interview 11 rural older adults who use community transport buses to explore their trip purposes and how the buses could provide a space for them to socialize with each other. Furthermore, Parahoo et al. (2014) interviewed 20 Dubai metro system passengers at different stations to understand the association between age and the usage of public transit.

2.2.2 Socioeconomic characteristics of older adults and people with disabilities as transit riders

In most countries, transit riders who are older adults are more likely to be female, unemployed, retired, and have less disposable income. In Asian countries like Japan and China, older adults are more likely to be retired, without access to private vehicles or a valid driver's license, and live with their adult children and often rely on them for rides (Tran et al., 2022; Yang, 2018). In Japan, male older adults are engaged in more out-of-home activities than their female counterparts; only about 10% of older adults are frequent public transit riders, and more than 85% of older adults either own at least one personal vehicle or have access to a shared household car (Tran et al., 2022). In Shizuoka City – a medium-sized city in Japan, nearly 60% of senior public transit riders are between 65 to 79, and only 10% of senior public transit riders are over 85 years old (Liu et al., 2021). Like other cities in Japan with growing aging populations, Chiba City is projected to have nearly 40% of its population as older adults by 2050; more than half of older adults who use active travel modes are male, hold a driver's license, and live in households that own at least one car (Yang, 2018). On the contrary, most people in Hong Kong use public transit, less than 15% of households own private vehicles – less than 10% of older adults have access to a car or hold a valid driver's license (Yang, 2018). When it comes to older adults, most of them (over 90%) are either unemployed or retired with very little disposable income; male older adults who use public transit travel more often than their female counterparts (Wong et al., 2018; Yang, 2018). Among older adults who are transit riders in Hong Kong, about a quarter of them have physical mobility issues that require using varying walking aids (crutches or wheelchairs) for everyday travel (Wong et al., 2017, 2020).

In London, people over 60 years old or who have disabilities have access to free public transportation by using the "Freedom Card"; people over 50 years old and people with disabilities also receive varying numbers of subsidized taxi trips so that they only need to pay a fixed amount of money for their taxi rides (Schmöcker et al., 2008). Moreover, public transit accounts for over 50% of commute trips in London; over 25% of older adults transit riders live in neighborhoods that are more accessible to public transit, and more than half of older adults who are transit riders in London are women (Chng et al., 2016). Similarly, female older adults in Sweden are more likely to be transit riders with the majority of them between 75 and 84 years old (Wretstrand et al., 2009). People with disabilities who use paratransit in Norway are more likely to be women; the most common disabilities are physical disabilities (70%) followed by disabilities that are related to mental health issues (about 10%) with less than 10% of cognitive disabilities (Solvoll & Hanssen, 2017).

When it comes to the US, more than half of transit users are females, employed, and from households with less than $40,000 annual income (Bezyak, 2020). For transit riders who are people with disabilities, more than half of them have mobility disabilities, nearly a quarter are visually impaired, nearly one-third are either hearing impaired or have cognitive disabilities, and meanwhile, nearly one-third of public transit riders have chronic health conditions (Bezyak, 2020). For people who travel in wheelchairs, nearly a third of them live in areas without public transit services; for those who live in areas that have the option to use public transit, very few (6.5%) have used them (LaPlante & Kaye, 2010).

The majority of older adults who were not drivers and did not have a valid driver's license in 2001 were women (more than 83%); they were more likely to live alone and less likely to be

married compared to male older adults (Rosenbloom and Herbel, 2009). Moreover, nearly 90% of transit riders in the US live in urban areas (Bezyak, 2020); meanwhile, over three-quarters of older adults in the US live in suburban or rural areas with infrequent and inadequate public transit service (Rosenbloom, 2009; Rosenbloom and Herbel, 2009). In North Dakota, female older adults who live in rural areas who rely heavily on being driven for out-of-home activities may face more travel challenges as the designated household drivers cease to drive and they have very limited public transit services (Hough et al., 2008). Lastly, compared to older adults in San José, California, older adults in Buffalo, New York are more likely to hold valid driver's licenses and live alone in lower-density areas with sparse public transit services though both cities have similar shares of older adults who are able to walk to nearby bus stops (Hess, 2009).

2.2.3 Trip characteristics of older adults and people with disabilities as transit riders

Globally, the most common trips made via public transit and paratransit among older adults and people with disabilities are trips for shopping, social and leisure activities, medical services and hospital visits, as well as social welfare services (Ahern & Hine, 2012; Deka, 2014; Deka & Gonzales, 2014; Kersting et al., 2021; Ryvicker et al., 2012; Tran et al., 2022). Older adults with disabilities in the US and Germany are more likely to use transit systems for leisure and social activities while their younger counterparts tend to commute via public transit to jobs (Deka, 2014; Deka & Gonzales, 2014; Kersting et al., 2021). Most studies confirm that women in both population groups use public transit and paratransit much more frequently than men, and they carry out more shopping and leisure trips than men (Ahern & Hine, 2012; Deka, 2014; Graham et al., 2018; Hagan, 2020; Rosenbloom & Herbel, 2009). Ahern and Hine (2012) have found that in the Republic of Ireland, some older men consider community transport services less useful because

the routes do not go to their preferred activities. Deka and Gonzales (2014) indicated that in New Jersey, US, disabled men are more likely to make trips to healthcare services via public transit than women with disabilities. However, in countries and regions with better public transit networks (e.g., Hong Kong and bigger cities in Japan), older men use public transit more frequently for general out-of-home activities than older women (Tran et al., 2022; Yang, 2018). Except for in Hong Kong (Yang, 2018), older adults and people with disabilities consider car ownership as the most important and preferred way for out-of-home activities even in countries with relatively extensive public transit networks (Ahern & Hine, 2012; Falkmer et al., 2015; Graham et al., 2018; Rosenbloom & Herbel, 2009; Tran et al., 2022).

Sharing rides with other people has varying implications on the comfort levels of using public transit and paratransit for different people. In general, older adults and people with disabilities in Australia and the US tend to avoid peak hours when traveling via public transit (Falkmer et al., 2015; Kostyniuk & D'Souza, 2020); older adults would also feel more comfortable when traveling in groups while using DRT services in Germany (Kersting et al., 2021) and sitting closer to exits in Hamilton, Canada (Ravensbergen et al., 2021). Regardless of age and physical mobility, women feel more comfortable when they travel via public transit and paratransit than men (Ahern & Hine, 2012; Deka, 2014; Rosenbloom & Herbel, 2009). Yet, factors contributing to uncomfortable travel experiences while using public transit are very different for men and women. Women and people who travel in wheelchairs find overcrowding less comfortable on public transit (Falkmer et al., 2015; Soza-Parra et al., 2019). Some older men in the Republic of Ireland – especially those who do not use public transit – feel uncomfortable using public transit or community transport because it is a *"feminine behavior"* to them (Ahern & Hine, 2012). While comfortable travel experience of people in wheelchairs is positively related to mobility and

accessibility (Broome et al., 2013; Deka, 2014; Ferrari et al., 2014; Grisé et al., 2019), Kim et al. (2020b) concluded that improved mobility has little significance on increasing travel comfort levels among senior transit riders. People with Autism Spectrum Disorder (ASD) in Australia find e-ticketing more comfortable and convenient for them when they travel via public transit (Falkmer et al., 2015); people with various disabilities find mobile applications with real-time information very helpful for reducing preplanning and increasing opportunistic trips when riding public transit (Steinfeld et al., 2019). Strickfaden & Devlieger (2011) suggested that people with disabilities can inform better designs to improve comfort levels on public transit and in public spaces when they participate in the design process.

Most existing research has also examined the safety issues of public transit riders of all ages who travel in wheelchairs. People in wheelchairs – compared to other passengers – face more barriers and risks boarding, riding, and exiting buses. Lenker et al. (2016) found that most manual wheelchair riders and some power wheelchair users in the US think the access ramps on buses are too steep and risky to use without assistance. The securement of wheelchairs is crucial to the safety of their users while riding the bus. Though an unsecured wheelchair on a moving bus can have large enough displacements that endanger the user (Turkovich et al., 2011), a significant amount of people who travel in wheelchairs prefer not to ask drivers to tie down their wheelchairs for fear of unsupportive drivers, impatient waiting passengers, and delaying the buses (Buning et al., 2007). Safety issues also arise for older adults when there are fewer pedestrian crossings or high-quality sidewalks for them to get to bus stops (Ravensbergen et al., 2021; Rosenbloom & Herbel, 2009). The perceptions of personal security with public transit are mostly negative when it comes to men and people who do not use public transit. People with disabilities in Australia who have never used public transit consider riding public transit unsafe (Falkmer et al., 2015). Old men consider

themselves vulnerable and uncomfortable when riding public transit or community transport (Ahern & Hine, 2012; Graham et al., 2018; Kersting et al., 2021). Scholars have suggested that the stigmatization of public transit as the primary travel mode for people who are women, less able-bodied, or have lower income levels has contributed to the negative perceptions of public transit and makes it less desirable for people (especially men) to travel with (Graham et al., 2018; Hagan, 2020; Johnson et al., 2017; Jones et al., 2013; Kersting et al., 2021; LaPlante & Kaye, 2010).

2.3 The travel satisfaction of older adults and people with disabilities as public transit riders

This section reviews how researchers define and measure the travel satisfaction of public transit riders. Also, this section provides findings of people's travel satisfaction with public transit – with a focus on older adults and people with disabilities – for their everyday travel observed globally by the transportation research community over time.

2.3.1 Definition, determinants, and measurements of travel satisfaction

Over the years, scholars, transportation policymakers, and transit agencies have mainly used customer satisfaction and travel satisfaction to measure how transit riders are satisfied with transportation service delivery and what elements are associated with satisfactory transportation services. Customer satisfaction regarding transportation mostly represents the degree of transportation agencies' service delivery that meet customers' expectations (Morfoulaki et al., 2007, as cited in Abenoza et al., 2017), which would determine people's impressions and intentions of using certain transportation modes (Diana, 2012, as cited in Abenoza et al., 2017). Travel satisfaction, in the meantime, characterizes the outcome of the entire travel experience (Abenoza et al., 2017) and how well travelers' overall travel needs and expectations have been met (Tyrinopoulos & Antoniou, 2008). Castle & Engberg (2004) have reviewed the existing literature that focuses on measuring older adults' travel satisfaction and identified opened-ended

questions, questions with dichotomous answers (yes or no), the use of the Likert scale, subjective evaluation of travel satisfaction, and general satisfaction as the common types of methods used to guide respondents to reflect on their review of travel satisfaction. Therefore, travel satisfaction and customer satisfaction are usually measured by directly asking respondents their general satisfaction with the transportation services they have received or by asking their satisfaction with the quality of different dimensions of the services they have received through surveys or interviews (Abenoza et al., 2017; Hensher et al., 2003).

The Likert scale – a format of scale in which responses are scored along a measurable range – is the most common measurement used by scholars to ask their respondents to reflect on how satisfied they are with different items related to their trips. The 5-point Likert scale (for example, asking respondents to rate a statement from strongly disagree to strongly agree) has been widely used to ask travelers to rank their subjective overall satisfaction with life and public transportation (Abenoza et al., 2017, 2019; Allen et al., 2020; Broome et al., 2013; Cao, 2013; Mattson et al., 2021; Wong et al., 2017; Wretstrand et al., 2009). Cao (2013) used statements such as *I am completely satisfied with my daily travel, my daily travel makes me feel good, and when I think of my daily travel, the positive aspects outweigh the negative* for respondents to reflect their satisfaction with life and its potential connection to transportation. Due to the generalization of such statements, it is not always clear whether a respondent's satisfaction with travel is positively related to their satisfaction with life. In order to understand what factors contribute to people's travel satisfaction with public transit, researchers have also used the Likert scale to investigate different dimensions of public transit trips. Some scholars have focused on the impacts of the qualities of transit service during the trip on travelers' satisfaction. Access to transit travel information, the affordability of trips, the accessibility of stations and/or stops, the attitude of staff,

drivers and operators, ticketing, service reliability, the comfort level of the trip, transfer experiences, and the boarding and exiting experiences (see Table 2.1 for details) have been examined and regressed to analyze their contribution to public transit users' travel satisfaction (Abenoza et al., 2017, 2019; Allen et al., 2020; Broome et al., 2013; He et al., 2020; Kersting et al., 2021; Soza-Parra et al., 2019; Tyrinopoulos & Antoniou, 2008; Wong et al., 2017; Wretstrand et al., 2009).

Table 2.1. Selected Elements of the Qualities of Transit Service During the Trip That Impact Travelers' Satisfaction from Existing Studies

Category	Variables
Accessibility to transit travel information	Signage and signal visibility (+)
	Easiness of finding and understanding the transit system schedule (+)
	Easiness of accessing to planned and unplanned transit schedule changes (+)
Affordability	Pricing of varying passes (-)
	Whether the transfer is covered by initial transit fares (+ when it is)
Accessibility to stops and/or stations	The density of bus stops (+)
	Walking time to nearest or desired bus stops (-)
	Availability and conditions of sidewalks (+)
	Availability of shelters (+)
Attitudes of staff, drivers, and operators	Friendliness of drivers and operators (+)
	Staff's willingness to help during service disruption (+)
	Level of familiarity with securing assistance devices (+)
Ticketing	Availability of different options to purchase tickets (+)
	Easiness to purchase tickets through these options (+)
	Easiness of ticket validation process (+)
Service reliability	Waiting time at stops and/or stations (-)
	Whether buses or trains are on time (+ when on time)
	Frequency of services (+)
The comfort level of the ride	Perceived personal safety at stops or stations (+)
	Perceived personal security while riding the bus (+)
	Cleanness of buses or train compartments (+)
	Availability of seating (+)
	Ride comfort (whether the ride is bumpy) (+)
	Internal temperature (-)
	Crowdedness (-)
	Travel time (-)
Transfer	Easiness to move within transfer stations (+)
	Distance between transfer stops and/or stations (-)
	Perceived safety within transfer stations (+)
Boarding and exiting	Easiness of boarding and exiting buses and train compartments (+)
	Easiness of boarding with mobility assistance devices (+)
	Easiness of exiting with mobility assistance devices (+)
	Easiness of boarding while having disabilities (+)
	Easiness of exiting while having disabilities (+)

Note: Summarized by the author from existing literature. The "+" sign indicates a positive relationship between the variable and the travel satisfaction of a public transit rider. The "-" sign indicates a negative relationship between the variable and the travel satisfaction of a public transit rider.

Scholars also examined the relationship between the built environment and public transit users' travel satisfaction. Kim et al. (2020b) investigated travel satisfaction of trips with different purposes by examining the perceived travel opportunities, households' proximity to travel opportunities, and the availability of public transit. Others have explored the association between transit quality and social livability (sense of community), neighborhood livability (the availability of and proximity to parks and recreational facilities), as well as affordability (job availability and cost of living) to analyze transit riders' travel satisfaction (Mattson et al., 2021; Pfeiffer et al., 2020). As de Oña & de Oña (2015) have pointed out, studies on subjective and abstract concepts like travel satisfaction should always incorporate objective transportation data from transit companies and agencies for more accurate and in-depth analyses. Moreover, since researchers tend to use the most sophisticated and complex methods to better measure travel satisfaction while policymakers and transit agencies prefer to use the most straightforward methods to improve their services, it is crucial to identify the gaps between the interests of researchers and practitioners for providing reliable and easy-to-use methods for measuring and improving transit riders' travel satisfaction (de Oña & de Oña, 2015).

2.3.2 The travel satisfaction of older adults and people with disabilities as public transit riders

For older adults in cities and countries with better public transit infrastructure, they are more satisfied with well-connected, affordable, reliable, and frequent services that meet their daily and social needs; their major concerns are the comfort levels of the riding experiences (He et al., 2020; Wong et al., 2017, 2018). On the contrary, the elderly in cities and countries with less developed public transit infrastructure – especially those living in rural areas – generally find it

difficult to have access to reliable, frequent, and well-connected services, and thus are less satisfied with public transit (Graham et al., 2018; Hagan, 2020; Hough et al., 2008; Kim et al., 2020; Liu et al., 2021). People – especially men – who are lifetime drivers are reluctant to use public transit and are more likely to be socially excluded after driving cessation (Ahern & Hine, 2012; Jones et al., 2013; Schmöcker et al., 2008). For people with disabilities in general, they are least satisfied with inaccessibility to public transit travel information. They appreciate affordable, reliable, and well-connected public transit services as well as friendly drivers just like senior transit riders (Avery, 2017; Low et al., 2020; Noor & Foo, 2014; Solvoll & Hanssen, 2017; Verbich & El-Geneidy, 2016).

Hong Kong is a dense city with highly developed public transit networks moving nearly half a million passengers daily (He et al., 2020; Wong et al., 2017). In fact, Hong Kong is one of the very few cities where automobile ownership is not significantly related to travel satisfaction (Yang, 2018). Over 90% of people commute to work via public transit in Hong Kong; its reliable and extensive public transit systems also result in very high mobility rates among almost all older adults (over 95% of people over 70 use public transit as their main travel mode) to various out-of-home activities (He et al., 2020). Among the common public transit services, buses and railway networks have the highest level of travel satisfaction among older adults for good connectivity, reliability, frequency, smooth transfers, and affordability (He et al., 2020; Yang, 2018). Older adults in Hong Kong are less satisfied with limited priority seating and unsheltered bus stops; public light buses have the least level of travel satisfaction for relatively uncomfortable riding experiences (Wong et al., 2017, 2018).

However, not every city or region has extensive and effective public transit networks that could accommodate the travel needs of older adults. Japan is famous for its integrated national railway networks, but some local bus networks can be difficult for older adults for out-of-home activities. Travel satisfaction of older adults in Japan is higher in more developed areas (mostly inner cities) where their traveling demands are met with better connectivity and higher frequency (Liu et al., 2021; Tran et al., 2022). Older adults in Japan's inner cities are more likely to travel daily and are the most active due to the wide variety of activities they can access via public transit even after they cease to drive (Liu et al., 2021). Liu et al. (2021) also found that the travel satisfaction of older adults living in smaller cities and rural areas is positively related to automobile ownership rather than public transit usage; public transit ridership of older adults in such areas is very low. Their findings are confirmed by Kim et al.'s 2020b study of the same area that when public transit infrastructure is less extensively developed, making it more accessible and faster does not make public transit more appealing to older adults, nor does it contribute significantly to their travel satisfaction. The majority of people with disabilities are less satisfied with the inaccessibility of public transit travel information in Bangkok, Thailand (Avery, 2017) while people with disabilities in Kota Kinabalu, Malaysia are less satisfied with unreliable and infrequent services (Noor & Foo, 2014).

European policymakers are concerned with the limited travel options and social exclusion for their growing aging populations after driving cessation as researchers have pointed out that a significant number of older adults who are less experienced with public transit would give up out-of-home activities when they cannot drive themselves anymore (Johnson et al., 2017). Older adults living in rural Northern Ireland lack sufficient public transit, and their traveling demands are usually met by community transport (Hagan, 2020). Hagan (2020) also noticed that older adults'

travel satisfaction is positively related to experiences with using community transport as well as being able to socialize with others on the ride. When it comes to the Republic of Ireland, rural older adults are less satisfied with the public transit schedules because they are more accommodating for daily commutes to work in the cities rather than for their traveling needs (Ahern & Hine, 2012). They also found that rural older adults are not satisfied with public transit trips to healthcare providers due to limited accessibility; men are less satisfied with using public transit in general because they consider it as a "feminized travel mode".

People in the UK are satisfied with well-connected railway and bus networks, but such satisfaction does not guarantee loyalty to public transit (Chng et al., 2016). Older adults in the UK consider public transit as an important travel mode for their travel demands; they are more satisfied when the networks could provide more social and leisure opportunities but less satisfied when services are unreliable (Graham et al., 2018). Older adults in a transit-oriented city like London feel recognized by society and satisfied with their public transit trips with reduced fares and higher bus stop density; but those who have been lifetime drivers or are males are less likely to use public transit regardless of the quality of service (Jones et al., 2013; Schmöcker et al., 2008). In Germany and Sweden, older adults are satisfied with the comfortable and reliable services paratransit provides for meeting their daily and emergency travel demands (Kersting et al., 2021; Wretstrand et al., 2009). Older adults are more satisfied when they travel in groups in Germany (Kersting et al., 2021). Swedish older adults are frequent public transit riders, men are more satisfied with public transit than women, but they are less satisfied when the walking distance and waiting times are too long, or the transit system is too complex to understand (Wretstrand et al., 2009). Like public transit riders in other countries, transit riders of all ages in Greece and Norway appreciate

extensive, reliable, and frequent public transit services as well as comfortable experiences throughout their trips (Nordbakke & Schwanen, 2015; Tyrinopoulos & Antoniou, 2008).

Public transit riders with disabilities in London are more satisfied when the service is reliable and fast, and there is available travel information at bus stops (Verbich & El-Geneidy, 2016). For visually impaired public transit riders in London, besides information availability, their satisfaction is positively associated with staff assistance, connectivity, and affordability (Low et al., 2020). In Norway, people with disabilities are more satisfied with paratransit services when the services can reach more areas, the riding experiences are comfortable, and when the service can help them make more trips (Solvoll & Hanssen, 2017).

Transit quality, service accessibility, and the availability of travel options are significant to travel satisfaction and quality of life (Cao, 2013; Makarewicz & Németh, 2018; Mattson et al., 2021; Pfeiffer et al., 2020). Yet, in most North American cities, automobile-dependent planning policies have crippled the building of robust public transit infrastructures and the ability for people to choose other travel modes other than driving (Cervero et al., 2017; Walker, 2014). Indeed, Zhu & Fan (2018) have found that, in the US, public transit can be related to negative emotions and is the least satisfying travel mode. Similarly, people in the City of Milwaukee indicated that public transit was the least enjoyable travel mode of all travel modes (Schneider & Schinkowsky, 2021). Older adults' travel satisfaction with public transit is negatively related to the walking distance to stops; but the significance level varies geographically (significant in San José, California but not in Buffalo, New York); for older adults in Buffalo and Erie County, New York, their travel satisfaction with public transit is more related to the built environment (Hess, 2009, 2012). Older adults who are transit riders in North America, similarly to those in Ireland, are more likely to be

female (Hess, 2012; Ravensbergen et al., 2021; Rosenbloom & Herbel, 2009). Rural female older adults in North Dakota tend to drive less than males, therefore, finding other travel modes is more challenging for them when public transit services are very limited and inaccessible (Hough et al., 2008). In Hamilton, Canada, Ravensbergen et al. (2021) have found that older adults as transit riders have to make extra efforts to understand the schedules, plan the trip, as well as board and alight the bus than younger and/or able-bodied persons. One of their major barriers to using public transit is a lack of confidence, therefore, the experiences and skills required to use public transit are as important as the quality of the services to their travel satisfaction (Ravensbergen et al., 2022).

Travel behavior research on people with disabilities using public transit is more abundant in the US compared to other countries. In general, the travel demands of people with disabilities are similar to people without disabilities (Yan et al., 2019), they are more satisfied with flexible, accessible, and reliable public transit services; but they do not feel they have the same level of access as people without disabilities do, especially when they cannot use their mobile devices easily onboard (Bezyak et al., 2020; LaPlante & Kaye, 2010). Bearse et al. (2004) have found that the demand for paratransit in mid-sized cities has grown significantly, but accessibility to paratransit is lower for nursing home residents than it is for community residents. In California, access to transit service information (e.g., visual clues and audio announcements) is positively related to travel satisfaction with public transit for visually impaired riders, but such information is hard for them to obtain or understand (Golledge et al., 1996).

Despite the differences between cultures and the development stages of public transit infrastructure, there are four important factors – cultivating the habit of using public transit, trip

planning, trip-chaining experiences, and driver's attitudes and training – that are inseparable from the travel satisfaction of the elderly and/or people with disabilities with public transit.

Cultivating the habit of using public transit for older adults is essential for seniors after driving cessation. Making reliable public transit a crucial alternative for maintaining independence and mobility can promote transit use among seniors to have continued access to essential services, social activities, and healthcare facilities. For the elderly (especially men) who seldom use public transit before driving cessation, it is more likely for them to stay at home than to use any type of public transit (Graham et al., 2018; Hagan, 2020; Rosenbloom, 2009). For people who already have negative attitudes and emotions toward public transit, it would be detrimental to their physical and mental well-being if satisfying public transit or other alternatives are not available for them to use when they cannot drive themselves anymore. Ahern & Hine (2012) have found that older non-driving men's negative perception of public transit is usually debunked once they try to use it; exposure to and experience with using public transit at certain stages of life can form a habit of using it in later life (Rubin, 2011). Thus, fostering the habit of using public transit could help older adults form positive attitudes toward public transit and acquire the skills to use public transit so that public transit can be a viable option for them to participate in social activities after driving cessation.

Trip planning is also a concern for older adults and people with disabilities. They express emotional distress due to how travel information is inaccessible to them, because of their disabilities, print sizes, and access to technologies, they sometimes can get too overwhelmed to travel (Bezyak et al., 2020; Buning et al., 2007; Lubitow et al., 2017; Ravensbergen et al., 2021, 2022; Strickfaden & Devlieger, 2011). Making travel information more accessible to public transit

riders who are elderly and/or with various disabilities can make their travel experiences smoother and more satisfying, which will also encourage them to travel more.

Trip-chaining is a common travel behavior for older adults to manage their daily activities so that they can combine their out-of-home activities more efficiently by reducing the number of trips and conserving energy (Rosenbloom, 2001). However, public transit transfers can make it difficult for the elderly and people with disabilities to connect their trips with public transit. Inaccessible stops or stations and inconsistent services reduce access to jobs, healthcare, and social activities (Buning et al., 2007; Grisé & El-Geneidy, 2018; Kim et al., 2020b). Their trip-chaining behavior using public transit, therefore, should be closely examined to better inform public transit agencies for more accommodating services.

Lastly, the training and the attitude of drivers matters tremendously to the travel satisfaction of the elderly and people with disabilities when they travel by public transit. These passengers often rely on public transit for their mobility needs, making the role of drivers essential in promoting not only accessibility but also confidence and comfort during their journeys. Drivers with friendly, respectful, and patient behavior can make a significant difference in fostering a welcoming environment, encouraging seniors and people with disabilities to use public transit more regularly and independently. When drivers are courteous, these individuals feel more secure and supported, which improves their overall travel satisfaction and allows them to navigate transit systems with greater ease or turn them away from using public transit (Bezyak et al., 2017; Chatterjee et al., 2020; Wong et al., 2017).

2.4 Travel-related wellbeing of older adults and people with disabilities

There is an extensive body of literature that investigates travel-related factors and their associations with an individual's wellbeing. As Mokhtarian (2019) noted, it is important to identify

whether the contribution of an individual's wellbeing comes from the trip itself or the potential mobility it provides. Thus, this section draws on studies that mainly focus on the latter: factors that impact the wellbeing of older adults and people with disabilities who use public transit and paratransit for out-of-home activities.

2.4.1 Definition, determinants, and measurements of travel-related wellbeing

Subjective wellbeing (SWB) is often categorized as hedonic wellbeing (HWB) and eudaimonic wellbeing (EWB): the former describes the presence of enjoyment and/or the absence of discomfort while the latter describes the fulfillment of a higher order of life or purpose (De Vos et al., 2013; Mokhtarian, 2019). In most travel-related wellbeing literature, scholars have mostly explored the HWB aspects of SWB: how the positive aspects of travel contribute to the overall satisfaction of an individual's life and how limited mobility deprives an individual of the ability or opportunity of having higher satisfaction of life. Therefore, terms describing SWB – such as wellbeing, happiness, life satisfaction, and quality of life (QoL) – have been used interchangeably by some scholars when it comes to examining the relationship between travel and SWB (Delbosc, 2012). However, self-reported wellbeing descriptions (wellbeing, happiness, and life satisfaction) are viewed as experiences that depend on and change with behaviors and objective circumstances, QoL is considered a more objective measurement by some scholars for using external and collectible indicators (De Vos et al., 2013; Mokhtarian, 2019). Travel satisfaction should not be confused with travel-related SWB. The former commonly refers to travelers' attitudes toward the overall transportation service delivery and elements that contribute to satisfactory transportation service delivery, whereas the latter could be described as how an individual's satisfaction with life can be affected by travel.

Several conceptual models have been established by different scholars to explore the relationship between travel and SWB. Mokhtarian (2019) reviewed four conceptual models from four previous studies that identify elements concerning travel-related SWB at different scales. Besides the framework by Reardon and Abdallah (2013) that inspects influences from non-transportation factors (economy, environment, social relationships, and the individual), the other three have overlapping factors that question the effects of different elements of travel on SWB ranging from the potential to travel, travel itself, and the out-of-home activities achieved through travel (Ettema et al., 2010; Delbosc, 2012; De Vos et al., 2013, as cited in Mokhtarian, 2019). After reviewing 19 academic articles on SWB and mobility, De Vos et al. (2013) recognized five dimensions of travel that influence SWB: experiences that occurred during travel, activity conducted during travel, engagement in out-of-home activities, travel as an activity, and the potential of travel. Experiences that occurred during travel mainly focused on commute trips, several scholars have confirmed that cycling and walking contribute the most to positive feelings and overall satisfaction with life while public transit is connected to the least positive feelings (De Vos et al., 2013; Schneider & Willman, 2019; Zhu & Fan, 2018). The contribution of activity conducted during travel has mainly focused on travel time's impact (how much time has been spent on travel and what activities have been conducted during the period of travel) on an individual's SWB while scholars who examine the association between travel as an activity and SWB have looked into the intrinsic values of travel itself (De Vos et al., 2013; Mokhtarian, 2019). When it comes to public transit, most studies focused on the level of engagement in out-of-home activities and the potential of travel public transit can provide to its riders in various countries and regions (Adams et al., 2015; Banister & Bowling, 2004; Chatterjee et al., 2020; He et al., 2020; Mattson et al., 2021; Mogaji & Nguyen, 2021; Sun et al., 2021; Zhu & Fan, 2018).

2.4.2 SWB of public transit riders who are older adults and people with disabilities

Most discussions investigate how travel contributes to the wellbeing of older adults and how a lack of mobility impacts social inclusion (Mokhtarian, 2019). Though the concern of social exclusion among older adults generally arises when they cease to drive, the levels of impact and implications have geographic variations and are different between different sexes. In Northern Ireland and the UK, older women feel less socially excluded when they have access to public transit or community transport and are willing to use them for social and leisure activities (Ahern & Hine, 2012; Graham et al., 2018; Hagan, 2020); sometimes the trip itself becomes *the third place* (Oldenburg & Brissett, 1982) that serves as a public space that provides opportunities for communications among older women (Ahern & Hine, 2012). On the contrary, older men in these countries claim that driving contributes more to their SWB because it allows them the freedom of travel and thus they feel more socially included; some of them prefer not to make trips at all if they cease to drive because they do not feel comfortable using public transit or community transport (Ahern & Hine, 2012; Graham et al., 2018; Hagan, 2020). Globally, most older adults in rural areas that do not have accessible public transit networks or paratransit options feel more socially excluded when they cease to drive compared to older adults in urban areas with extensive public transit networks (Ahern & Hine, 2012; Graham et al., 2018; Hagan, 2020; Jones et al., 2013; Kim et al., 2020b; Yang, 2018). Insufficient public transit leads to a significant number of non-driving older women in rural areas relying on spousal lifts for out-of-home activities, they are more likely to face increased social exclusion when spousal lifts become unavailable (Ahern & Hine, 2012; Graham et al., 2018). Little research has been dedicated to the role of travel and social inclusion of people with disabilities, most existing literature has hinted that people with disabilities have limited access to jobs and other out-of-home activities via public transit or paratransit (Deka, 2014;

Falkmer et al., 2015; Grisé et al., 2019). It is less encouraging for them to use public transit to travel when there are barriers to getting accurate travel information, accessing stops and stations, as well as managing transfers (Falkmer et al., 2015; Ferrari et al., 2014; Kim et al., 2020a; Kostyniuk & D'Souza, 2020; Lenker et al., 2016; Steinfeld et al., 2019).

The automobile-centric built environment has made people very car-reliant, car ownership and the ability to drive thus are very important to the independence of an individual. This makes it difficult for most older adults and people with disabilities who either cease to drive or cannot drive themselves to live independently and move freely (Ahern & Hine, 2012; Falkmer et al., 2015; Graham et al., 2018; Rosenbloom & Herbel, 2009; Tran et al., 2022). Regardless of age and physical mobility, women can retain and maintain a certain level of independence due to their willingness to use combined modes of transportation besides driving alone for their out-of-home activities (Ahern & Hine, 2012; Ferrari et al., 2014; Graham et al., 2018; Hagan, 2020; Ravensbergen et al., 2021). In countries like Canada, the US, the UK, and Northern Ireland, older adults and people with disabilities can get lifts from other household members when they cannot drive themselves or cease to drive, but most of them prefer to save the lifts for "necessary trips" (such as hospital visits, grocery shopping, and emergencies) so that they will not be dependent on others as "burdens" (Ahern & Hine, 2012; Deka, 2014; Graham et al., 2018; Hagan, 2020; Ravensbergen et al., 2021). Some of them will give up certain out-of-home social and recreational activities rather than ask for rides from friends for the same reason when their public transit and paratransit options become less reliable and affordable (Ahern & Hine, 2012; Deka, 2014; Graham et al., 2018; Ravensbergen et al., 2021). In the US, a significant number of people with disabilities rely on lifts from household members for daily commutes and essential hospital visits, such reliance sometimes has negative impacts on the emotional wellbeing of household members who

are the designated drivers for these trips (Deka, 2014). It is difficult for most men to appreciate and embrace public transit and paratransit; they feel more dependent and reluctant to travel outside their homes when they cannot drive themselves or give lifts to other people anymore (Deka, 2014; Falkmer et al., 2015; Ferrari et al., 2014; Grisé et al., 2019).

Most studies in western countries have agreed that the mobility of older adults in rural areas is reduced and limited due to less access to public transit, which has negative impacts on their QoL (Ahern & Hine, 2012; Deka, 2014; Ferrari et al., 2014; Graham et al., 2018; Hagan, 2020; Israel Schwarzlose et al., 2014; Kersting et al., 2021; Kim et al., 2020b; Ravensbergen et al., 2021; Tran et al., 2022). In Canada, the US, the UK, Northern Ireland, and Germany, limited access to public transit and expensive paratransit services in rural areas means that non-drivers and older adults who cease to drive need to give up some out-of-home social activities so that they can afford more expensive travel alternatives for essential trips – such as grocery shopping and hospital visits (Ahern & Hine, 2012; Graham et al., 2018; Hagan, 2020; Kersting et al., 2021; Ravensbergen et al., 2021). For people with disabilities, apart from paying for expensive paratransit services, limited access to accessible public transit networks means fewer job opportunities compared to the able-bodied population, more time spent on the commute due to unsmooth transfers, and reduced social activities (Deka, 2014; Deka & Gonzales, 2014; Ferrari et al., 2014; Grisé et al., 2019; Kim et al., 2020b; Steinfeld et al., 2019). Mokhtarian (2019) cautiously pointed out that mobility and out-of-home activities may not always positively relate to the QoL, scholars who studied the contribution of the number of trips taken and the purpose of trips to the QoL of older adults in Japan confirmed that trips to healthcare services sometimes indicate a decreased QoL among older adults (Kim et al., 2020b). Yet, public transit does not only increase the mobility of some older adults and people with disabilities, but it also makes them feel more self-reliant when they can

travel on their own (Ahern & Hine, 2012; Deka, 2014; Graham et al., 2018; Hagan, 2020; Ravensbergen et al., 2021). Moreover, in London, public transit can enhance self-esteem among older adults when they are provided with concessionary rides which they consider as a way of societal recognition for their contribution to society before their retirement (Jones et al., 2013).

2.5 Transportation justice regarding public transit riders

How we move and how our movements impact our surroundings and each other have been topics that gain more and more voice worldwide as we try to battle climate crises and reduce mobility disparities and injustice. Basic mobility, indicating transportation to access goods, services, and activities, as Litman (2003) suggested, is usually considered a merit good or a right. Thus, debates over transportation justice often dwell on equity and rights: how to ensure equitable access to opportunities for different social and demographic groups, the fair and just policymaking for people of all abilities using different transportation modes; and protecting transportation as a right by law to prevent discriminative transportation policies and decisions. In other words, defining transportation justice is important in that it directs transportation policymaking and planning (Karner, 2016). Therefore, one needs to understand and address the inequities in the transportation planning and delivery system (Carleton & Porter, 2018; Sanchez et al., 2018), as well as clarify whose rights and the rights to what that we are protecting (Attoh, 2019).

2.5.1 Discourses on transportation justice in the US

Most discussions on transportation justice in the US are related to environmental justice. Environmental justice advocates and regulatory agencies have been fighting discriminatory planning policies and disinvestments that have led to disproportionate negative environmental impacts on low-income communities and communities of color (Cole & Foster, 2001; McGurty, 2007; Pellow & Brulle, 2005, as cited in Karner, 2016). The US Department of Transportation

(DOT) has implemented environmental justice guidance to require metropolitan planning organizations (MPOs) to not only address traditional environmental injustice practices but also to analyze whether the benefits and burdens of new transportation projects are justly distributed to communities (Karner, 2016; Sanchez et al., 2018). There are three common discussions on transportation justice: transportation equity, the right to transportation, and a broader transportation justice definition that goes beyond the discussion of automobility alone.

Transportation equity, as Verlinghieri & Schwanen (2020) have noted, has focused on examining 1) the impacts of the accessibility to services and places between different social and demographic groups, employment, housing discrimination, and private automobile ownership; 2) inequitable transport subsidies distribution and automobile-centric infrastructure on a large scale; and 3) the uneven mobility realities at the individual level and their everyday travel experiences. Thus, in transportation research, equity relates more to the level of fairness and justice when it comes to accessibility concerns and has been understood as vertical equity and horizontal equity (Carleton & Porter, 2018). Horizontal equity refers to the fair allocation of costs and benefits between similar individuals and communities whereas vertical equity concerns inequitable conditions experienced by disadvantaged individuals and communities (Litman, 2003). Further, Litman (2013) distinguishes vertical equity from income and social class to mobility needs and ability. The former focuses on the allocation of costs and resources between varying income and social classes, especially when it comes to transportation subsidies and price increases; the latter latches on meeting the transportation demands of people with varying abilities, which often relates to accessibility issues for people with disabilities and providing accommodating special transit services. Though transportation equity regarding mobility needs and ability gives important insights into meeting the transportation needs of people with varying abilities, their voices are

largely ignored by public opinion and face greater challenges to be met (Jenks, 2019). Moreover, Attoh (2019) argues that the definition provided by Litman (2003) does not provide enough stress on public transit's roles in securing people's rights or what public transit is for.

In the meantime, legal fights over the transparency of the transportation decision-making process and fair resource distribution have been made to combat transportation injustice and challenge structural and institutional discrimination (Karner et al., 2020). Title VI of the Civil Rights Act of 1964 prohibits discrimination of race, religion, color, and national origin by federal assistance recipients[5]. Not only state departments of transportation and MPOs, but also any other transportation-related programs receiving federal aid are under the regulation of Title VI (Sanchez et al., 2018). Sanchez et al. (2018) also noted that legislation alone could not ensure the enforcement of the law or hold entities accountable when transportation as a civil right is violated. Citing *Darensburg v. Metropolitan Transportation Commission (MTC)*[6], Attoh (2019) argues that transportation is a civil right because it provides access to education, employment, healthcare, and other opportunities; but regarding it only as a civil right, it narrows debates on transportation justice to only *culpability* and the *cost of negligence*. Instead, Attoh (2019) suggests expanding the concept of transportation justice to the right to the city[7], rather than fighting *"as consumers of a*

[5] Title VI of the Civil Rights Act of 1964, 42 USC. § 2000 (d), *et seq*. See https://www.justice.gov/crt/fcs/TitleVI

[6] Sylvia Darensburg of Oakland, California and other two minority local transit bus riders filed a class action lawsuit against the MTC in 2008, accusing the MTC violating Title VI and California Government Code Section 11135 – a state law prohibiting discrimination based on race, color, or national origin. The plaintiffs alleged that the MTC's planning policies and fundings were favoring white railway commuters by heavily subsiding capital projects and railway expansions of the Area Rapid Transit (BART) and Caltrain while overlooking the operational needs of the local bus transit system. Judge Laporte in 2009 of the US District Court for the Northern District of California ruled against the plaintiffs citing MTC's allocation of resources was backed by federal statues to enhance regional connectivity, increase global competitiveness, and move people from single-occupancy vehicles into transit. The plaintiffs appealed to the Ninth Circuit Court of Appeals in 2011, Judge Silverman ruled against the plaintiffs saying plaintiffs' evidence failed to prove racial discrimination. See Attoh, K. A. (2019). *Rights in transit: Public transportation and the right to the city in California's East Bay*. The University of Georgia Press.

[7] Attoh has adapted Henri Lefebvre's critic on how industrialization and capitalism had changed the character of the city and people's ability to participate in the urban life. In his argument the right to transportation is a right to the city and its opportunities. See Attoh, K. A. (2019). *Rights in transit: Public transportation and the right to the city in California's East Bay*. The University of Georgia Press; Lefebvre, H., Kofman, E., & Lebas, E. (1996). *Writings on cities*. Blackwell Publishers.

commodity", Attoh (2019) argues that people should fight for participation in urban life and *"advancing a vision of a society that cares for all communities equally well''*.

Federal transportation policies have long favored automobile travel over other travel modes (Grengs, 2005), creating a level of sprawl and automobile dependence so high that Jane Jacobs in her book *The Death and Life of Great American Cities* (1992) once mocked "*For us, the answer will be clear, established and for all practical purposes indisputable: The purpose of life is to produce and consume automobiles".* Low-density sprawl and automobile-centric planning have devastating tolls on disadvantaged communities whose members not only have limited access to jobs but also suffer disproportionately from pollution and exposure to health hazards (El-Geneidy et al., 2016). Scholars and planners consequently argue that the environmental justice regime not only should serve as the guidance for achieving transportation justice but also should be an integral part of transportation justice when it comes to transportation policymaking (El-Geneidy et al., 2016; Karner, 2016; Sanchez et al., 2018; Verlinghieri & Schwanen, 2020). Others turn to transit metropolises like Hong Kong, London, and Toronto to find solutions in public transit promotion, transit-oriented development (TOD), and mixed-used zoning policies to create walkable and livable communities (Cervero, 1998; Cervero et al., 2017). They believe that transportation justice can be pursued by connecting people with better transit access in a denser and livelier city where opportunities are accessible to all (Higashide, 2019; Suzuki et al., 2013). Grengs (2005) carefully pointed out that by shifting the goals of public transit from achieving equity to efficiency and congestion relief, public transit is being transformed into an element that fits into neoliberal economics that worsens the condition of transit-dependent riders. Sheller (2018) on the other hand, in her book *Mobility Justice: The Politics of Movement in an Age of Extremes,* first criticizes Cervero et al.'s 2017 work *Beyond Mobility: Planning Cities for People and Places* for their

reticence on challenging the social inequalities and environmental damages caused by automobile-dependence lifestyles while arguing for adopting TODs to create more livable communities. Second, Sheller (2018) argues that TODs and walkable communities are more likely to lead to problematic gentrification – as Allen (2018) has observed that the revitalization and transformation of former decaying urban neighborhoods into walkable and green communities with better transit access has pushed transit-dependent inner-city residents to the fringe of the city where public transit barely exists – that does not improve mobility for the mobility poor at all. Lastly, Sheller (2018) argues that scholars have found gendered movement patterns because of the different roles men and women undertake in their households and the society, as well as commute trip differences between races due to racial discrimination; therefore, the concept of mobility justice should be extended beyond transportation and the urban scale to include other perspectives (e.g. feminism, critical race, disabilities, and queer theory) to expand people's understanding of accessibility.

2.5.2 Elements of a just transit system

What, then, entails a transit system that serves the public fairly and justly? As discussed above, the transit system has varying distributions of benefits and burdens on different groups of population and different geographic areas, a one-size-fits-all solution can hardly address the uneven transit realities. However, several scholars have proposed principles that could serve as guidelines to help people make or transform transit systems to be more just. There are five major themes in creating a more just transit system in the US: accessibility, transparency, responsibility, affordability, and quality. Research has shown that access to various opportunities (e.g., jobs, education, and healthcare) of low-income communities, communities of color, people with disabilities, and the elderly are generally low due to low automobile ownership and low-quality public transit services (Casas, 2007; El-Geneidy et al., 2016; Ermagun & Tilahun, 2020;

Jomehpour & Smith-Colin, 2020; Jones et al., 2006; Samuel et al., 2013). Thus, a just-promoting transit system should ensure access to opportunities for all, especially for transit-dependent communities and communities with poor mobility (Sanchez et al., 2018; Sheller, 2018). Transit systems must also work with other travel modes, the built environment, zoning policies, and housing development to ensure good connectivity between people, and opportunities through services (Allen, 2018; Cervero, 1998; Higashide, 2019; Sheller, 2018). Moreover, transit projects and financial decisions should be transparent so that the public could supervise whether the benefits and costs have been equitably distributed among the development of different travel modes, especially in public transit systems (Attoh, 2019; Sanchez et al., 2018; Sheller, 2018). Sanchez et al. (2018) noted that most federal funding recipients get greenlights on transportation projects with a single-page document as their compliance with Title VI requirements without any supporting evidence. Therefore, planners and decision-makers are responsible to ensure public involvement during the processes, and funding agencies should establish clear measures for granting funding to eligible applicants (Sanchez et al., 2018; Sheller, 2018).

Some cities and towns have developed fee structures that charge people with disabilities and the elderly less for using public transit, for example, older adults and people with disabilities have access to free public transit and reduced rates for riding taxis (Schmöcker et al., 2008). Low-income commuters usually are compelled to pay for the full amount of single ride fare because they cannot afford discounted monthly passes and even need to pay extra for transfers due to longer commutes (El-Geneidy et al., 2016; Farber et al., 2014; Litman, 2003; Lubitow et al., 2017). Therefore, the pricing of transit systems must be fair and affordable to the mobility poor so that it does not penalize those with less disposable income or make multiple transfers due to inconsistent connectivity between services (Sheller, 2018; Walker, 2014). As mentioned earlier, the stigma

around transit as an inferior travel mode for people with lower income and social status contributes to the negative perceptions of public transit (Graham et al., 2018; Hagan, 2020; Johnson et al., 2017; Jones et al., 2013; Kersting et al., 2021; LaPlante & Kaye, 2010); people with disabilities sometimes face interpersonal and abusive discrimination while using public transit (Wayland et al., 2022). Thus, people who use public transit deserve high-quality transit services, they should also be protected and respected as dignified riders (Attoh, 2019; Higashide, 2019). This means, as Attoh (2019) argues, every transit rider deserves high-quality services from waiting in sheltered stops, and smooth and comfortable rides regardless of their physical abilities, to the ability to file complaints when satisfying services are not delivered.

2.5.3 Barriers to creating a just transit system in the US

From making more than 250 streetcar trips per rider per year in the 1920s (US National Research Council, 2001) to less than 5% of people in the US commuting via public transit in 2019 (US Census Bureau, 2021), three major reasons can help explain the decreasing ridership and barriers in creating a just public transit system in the US: past and current housing development and zoning policies, transportation policies and governance, and barriers in the efforts that promote sustainable transportation. Since the 1920s, the US government began to introduce and establish new zoning laws to regulate land uses and density; supported by the Supreme Court's decision in *Village of Euclid v. Ambler Realty*[8] in 1926, cities and towns are allowed to establish their zoning ordinances to separate land uses (Spieler, 2018). Further, racial discrimination and the federal

[8] Ambler Realty and the Village of Euclid, Ohio had a dispute over 68 acres of land in 1926. The village, in fear of its characters changed by growing industrialization, tried to introduce a zoning ordinance to prevent further industrialization. The land in dispute was classified into several classes and three different uses thus preventing the landowner from using it for solely industrial purposes. Amber Realty sued the village, arguing that such land classification significantly reduced the value of its land and infringed the liberty of the company. The village of Euclid lost the lawsuit in lower court as the court ruled the zoning ordinance unconstitutional. When brought to the Supreme Court, the court sided with the Village of Euclid, asserting that the zoning ordinance was a reasonable extension of the village's police power and was entirely constitutional. See Village of Euclid v. Ambler Realty, 47 S.Ct. 114 (1926). https://supreme.justia.com/cases/federal/us/272/365/

government's G.I. Bill[9] with low-cost mortgages also fueled urban sprawl, directing jobs and white residents from transit-friendly cities into car-oriented suburbia (Lewyn, 2001; Spieler, 2018). Through almost a century of building low-density residential homes under exclusionary zoning laws, the new urban form makes transit inaccessible to most suburban residents and almost a symbol of the urban poor.

Most European countries have more centralized governance over transportation and urban development, aiming to provide high-quality public transit services and curb private automobile ownership with high taxation and parking fees (Cervero, 1998; US National Research Council, 2001). However, the US federal government and regional MPOs have little control over local land use or transportation development, leaving the fate of major urban transportation planning in the hands of state transportation departments (US National Research Council, 2001). The lack of centralized governance on transportation makes it extremely difficult to supervise and enforce nationwide equitable transportation policies that favor public transit. In the meantime, the federal government has been heavily endorsing and subsidizing highway programs and expansion since last century while providing very small and decreasing budgets for public transit and other travel modes (Lewyn, 2001). When the decreasing financial support for public transit in the US has forced public transportation agencies to cut and reduce services, there is little room for the discussion of providing high-quality services.

Lastly, the very efforts that help promote mobility justice, and sustainable transportation can worsen the creation of a just transit system too. Unfunded mandates like the Americans with

[9] The Servicemen's Readjustment Act of 1944, commonly referred to as the G.I. Bill, was a law established to provide benefits to education, housing, and job training to some returning World War II veterans. See *75 years of the GI bill: How transformative it's been*. US Department of Defense. (2019, January 19). https://www.defense.gov/News/Feature-Stories/story/Article/1727086/75-years-of-the-gi-bill-how-transformative-its-been/

Disabilities Act (ADA) and strict emission regulations from sustainable development place local transit agencies in a legal and financial dilemma when they are already struggling with providing basic services (Jones et al., 2006). Justification for public transit subsidies often catches on improving mobility, reducing congestion, lowering travel time and costs, and connecting different travel modes (Grengs, 2005); but such improvements have often benefitted people and communities that already have better connections and access to various transportation options while leaving people with limited mobility options continue to fight with inconsistent and reduced services (Allen, 2018; Attoh, 2019; Sheller, 2018).

2.6 Research gaps in existing literature

Scholars around the world have extensively examined people's travel behavior, travel satisfaction, as well as how travel can contribute to an individual's wellbeing and quality of life. However, when it comes to the travel experiences of public transit users, especially those who are older adults that may have limited travel alternatives after driving cessation, efforts to understand the relationship between their travel experiences, travel satisfaction, and wellbeing in automobile-centric countries have become scarce. Also, though policymakers are promoting public transit as the travel mode that accommodates the travel needs of the non-driving population, given the stigma around public transit in most western countries, very few studies have examined when and under what circumstances non-driving older adults would use public transit. Thus, this section identifies the research gaps related to the travel experiences of older adults who are public transit riders.

2.6.1 Gaps in research methods

I reviewed 82 papers that examined travel experiences and transportation-related policies globally. Besides those that used census data or are literature reviews of existing studies, most of them (25 in the US and 21 outside the US) relied on national- or local-level surveys and smartcard

data in regression analyses to observe the travel trends and predict future ones (see Appendix A and Appendix C in the Appendices). However, these studies fail to reveal the exact travel experiences of older adults due to the very generalized collectable data from these surveys. Specialized surveys or surveys commissioned by transit agencies or DOTs could help shed light on the travel barriers and challenges specific groups of people face. In the US, Bezyak et al. (2017) worked with the FTA to establish a survey investigating the barriers people with disabilities face when they use public transit. Buning et al. (2007) surveyed 283 wheelchair-seated bus riders to examine their travel behavior and safety concerns while using public transit. In the Milwaukee, WI region, Moayyed (2022) surveyed 178 older adults who live in institutional residencies to examine their travel behavior and travel barriers. She found that driving was the dominant travel mode for older adults living in institutional facilities and they would choose walking instead of public transit to go to places that would take them less than 10 minutes to walk to (Moayyed, 2022). Researchers have conducted a consumer satisfaction survey in Santiago, Chile to explore factors contributing to riders' satisfaction with the metro system (Allen et al., 2020). Kersting et al. (2021) surveyed people who use Demand responsive transportation (DRT) in Germany to study the association between older adults' travel experiences and travel satisfaction.

Insightful and helpful as those studies above are for us to have a more in-depth understanding of travel challenges older adults or people with reduced mobilities face when they use public transit, they are more concentrated on elements within the transit system and transit-related policymaking rather than focusing on the actual travel experiences of older adults. Only a handful of studies have used interviews to capture the entire travel process or the intricacies of the travel experiences of older adults and people with reduced mobilities (see Table A.1). For example, from interviewing 24 older adults who use public transit in Hamilton, Canada, Ravensbergen et al.

(2021, 2022) found that older adults have to make extra efforts in almost every step to prepare themselves for a single ride. These extra efforts include learning to read and understand travel information, walking to the bus stops, getting on and off the buses, and planning their way back home; sometimes when extreme weather conditions make it difficult to ride the bus and they have to ask friends who are drivers for a ride, it can become very stressful and emotional that they would give up some social activities (Ravensbergen et al., 2021, 2022). In Australia, researchers have learned from their interviewees that people whose disabilities are not obvious to other people are more likely to be discriminated against and ignored while asking for priority seats when they use public transit; for people who use mobility-assisted devices, train operators would often refuse to board them even if they know that their behaviors are illegal (Wayland et al., 2022). Yet, among the few studies that used interviews to explore the travel experiences of public transit users, only Jones et al. (2006) have examined public transit in the US, and its focus was mostly on the challenges public transit agencies face rather than the travel experiences of public transit riders. While examining measures that could successfully reduce gender-based violence on public transit in New Mexico City, Mexico, Rivadeneyra et al. (2015) found that even if transit users believe measures suggested by public transit policymakers could reduce the occurrences of gender-based violence on public transit, they are far from the measures and interventions that they prefer to keep them safe from such encounters. As mentioned earlier, de Oña & de Oña (2015) have also pointed out gaps between the interests of researchers and practitioners in measuring and improving transit riders' travel satisfaction. Thus, besides using surveys to understand older adults' travel satisfaction with public transit, it is also crucial to explore the travel experiences of older adults who are public transit riders through in-depth interviews to understand the realities of the subtle and sometimes invisible barriers and challenges they face.

2.6.2 Gaps in research themes relating to older adults' travel experiences

Scholars across the world have suggested that in most western countries, especially in rural areas where different forms of public transit are available, female older adults use public transit more and are more comfortable with using transit, while their male counterparts are neither familiar with nor willing to use public transit (Graham et al., 2018; Hagan, 2020; Johnson et al., 2017; Jones et al., 2013; Kersting et al., 2021; LaPlante & Kaye, 2010). Moreover, Rosenbloom and Herbel (2009) indicated that compared to the past, more women are drivers rather than transit users, it is unclear rather females who are going to be older adults in the coming decade would prefer using public transit like past patterns have indicated. Therefore, it is important to investigate current older adults' travel behavior before promoting and advocating public transit as the ideal alternative for older adults to use after driving cessation.

Further, there are different and even conflicting findings in global public transit satisfaction literature. In Hong Kong and larger Japanese cities, older adults are satisfied with fast, frequent, and well-connected public transit services for their daily travels. (Liu et al., 2021; Tran et al., 2022). Yet, Kim et al. (2020b) have observed that in smaller Japanese cities where public transit networks are not as developed as those in major and bigger cities, making public transit more accessible and faster does not increase the travel satisfaction of older adults. In rural Northern Ireland, older adults' traveling demands are usually met by community transport and their travel satisfaction is positively related to being able to socialize with others on the ride. (Hagan, 2020). Ahern and Hine (2012) have found that in the Republic of Ireland, some older men are less satisfied with community transport because the routes do not go to their preferred activities, and they consider it as a travel mode for women. Thus, we need to examine what factors impact the travel satisfaction of older adults who use public transit when it comes to US cities.

Scholars have examined how the potential of travel and the number of out-of-home activities public transit could provide to older adults impact their wellbeing. Most studies have agreed that the opportunities travel provides for social and recreational activities help them get more engaged socially and connected to their friends and families (Adams et al., 2015; Banister & Bowling, 2004; Chatterjee et al., 2020; He et al., 2020; Mattson et al., 2021; Mogaji & Nguyen, 2021; Sun et al., 2021; Zhu & Fan, 2018). However, the impact from out-of-home activities achieved through public transit does not always have positive contributions to older adults' wellbeing. Kim et al. (2020b) found that trips to healthcare services sometimes indicate a decreased QoL among some Japanese older adults. Thus, an in-depth understanding of their travel needs and patterns using public transit is essential to improve older adults' wellbeing and social inclusion.

Lastly, most researchers have found that compared to drivers and able-bodied population, older adults with reduced mobilities face more difficulties traveling outside their homes and have less access to jobs, healthcare, and social activities (Buning et al., 2007; Deka & Gonzales, 2014; Grisé & El-Geneidy, 2018; Ferrari et al., 201; 2018; Kim et al., 2020b; Nordbakke & Schwanen, 2015). Most studies in the US examined older adults and people with reduced mobilities' travel experiences with public transit in California, New Jersey, New York, Texas, and North Dakota (Deka & Gonzales, 2014; Israel Schwarzlose et al., 2014; Golledge et al., 1996; Hess, 2009; Hough et al., 2008; Kwon & Akar, 2022), only a few studies have examined smaller regions and cities in the Midwest like the Greater Milwaukee area (Moayyed, 2022). Allen's 2018 book *Lost in the Transit Desert: Race, Transit Access, and Suburban Form* has vividly depicted how inner city carless African American families struggle with the unjust and imbalances transit systems to get to their jobs after being forced to live in the fringes of the city by gentrification. Ranked as the most segregated city in 2016 by the Brookings Institution (Reeves & Rodrigue, 2016), the

investigation of the travel experiences of older adults who use public transit in and around the City of Milwaukee will contribute greatly to the understanding of how perceptions of, experiences with, and use of public transit among older adults contribute to their travel satisfaction and wellbeing in the United States.

3 Research Questions and Methods

In this section, I present the research questions and mixed research methods I propose to use in this research, as well as argue why this mixed method is a reasonable and appropriate approach for my research.

3.1 Research questions

This research proposes to fill identified research gaps in the previous chapter by asking: How well does public transit serve the transportation needs of older adults? Specially, I ask the following questions:

1. How do public transit services impact older adults' travel satisfaction?
2. What barriers do older adults face when they use public transit?
3. How do transit experiences relate to the emotional wellbeing of older adults and their perceptions of themselves as transit riders?

I divided the research into four major sections. First, I explored how demographic characteristics, socioeconomic characteristics, the built environment, and transit quality influence older adults' decision on their travel mode choices in the US using the 2017 NHTS data. Then, I zoomed in by investigating how different aspects of the MCTS services influence the travel satisfaction of older adults who are transit riders in Milwaukee County with the 2020-2022 MCTS customer satisfaction survey data. Further, I examined and analyzed the nuances of older adults' travel experiences with public transit by exploring the specific barriers and challenges that older adult transit riders face in Milwaukee County through in-depth interviews. Lastly, through the in-depth interviews, I also examined how public transit contributes to their wellbeing and shapes their perceptions of being a transit rider.

3.2 Research methods

Quantitative research methods usually employ various regression analyses to examine the associations and their significant levels among different travel-related variables such as the relationship between travel modes and older adults' out-of-home activities (Tran et al., 2022), how bus stop amenities could influence public transit ridership (Kim et al., 2020a), as well as the relationship between travel behavior and emotional wellbeing (Zhu & Fan, 2018). As explained in previous sections, surveys that contain a greater amount and more general information are often used by scholars in quantitative analyses, they seldom capture the more detailed and delicate associations between travel behavior and different aspects of the travel experience. However, scholars have found that qualitative research methods – such as in-depth interviews – could bridge the gap and are more appropriate for understanding the intricacies of travel behavior (Clifton & Handy 2001). Thus, this study adopts the mixed methods sequential explanatory design that consists of both quantitative and qualitative research methods to better interpret and investigate their travel behavior of older adults who are transit riders.

3.2.1 The mixed methods sequential explanatory research design

This research used the mixed research method for its strength in method complementarity and expansion that allows researchers to elaborate and enhance research results, inform appropriate methods for further investigation based on the analyses from the previous research stage, as well as to extend the breadth of research inquiry with different research methods (Greene et al., 1989, as cited in Schoonenboom & Johnson, 2017). Specifically, this research used an explanatory sequential research method design to investigate the proposed research questions. The explanatory sequential design consists of two research method strands (see Figure 3.1): the collection and analysis of quantitative data of the quantitative strand, and the collection and analysis of qualitative

data of the qualitative strand, usually informed by the quantitative strand. Then, the researcher clarifies to what level and how the qualitative results explain and shed light on the quantitative results and how they answer the research questions in an integral manner (Creswell & Plano Clark, 2011). The explanatory sequential design can be most useful and appropriate especially when the research aims to assess trends and relationships shown by quantitative analytical results as well as to explain the reasons behind them with in-depth qualitative analyses in order to provide a holistic understanding of the research questions (Creswell & Plano Clark, 2011).

Figure 3.1. Prototypical Versions of the Explanatory Sequential Research Design.
Source: Creswell, J. W., & Plano Clark, V. L. (2011). Designing and conducting mixed methods research (2nd ed). SAGE Publications.

Walker (2014) has identified seven demands from public transit users suggesting that public transit should: take people to places they want to, take people when they want to go, provide good use of a traveler's time, provide good use of a traveler's money, provide respectful and comfortable services, be reliable, and give people the freedom to change their plans (see Figure 3.2). Besides public transit riders' travel demands, Walker (2014) also identifies seven phases of a public transit trip: understanding, accessing at the origin, waiting, paying, riding, connecting (transferring), and accessing at the destination (see Figure 3.3). Most travel surveys (e.g., the NHTS) can provide certain information that responds to public transit riders' demands (e.g., service frequency, service availability, as well as service reliability); but it requires in-depth interviews to inquire about the details of the travel experiences of public transit riders during their trips (e.g., how travelers feel when they wait at sheltered or unsheltered bus stops, how do they plan their trips, and what roles technology has played in their trips).

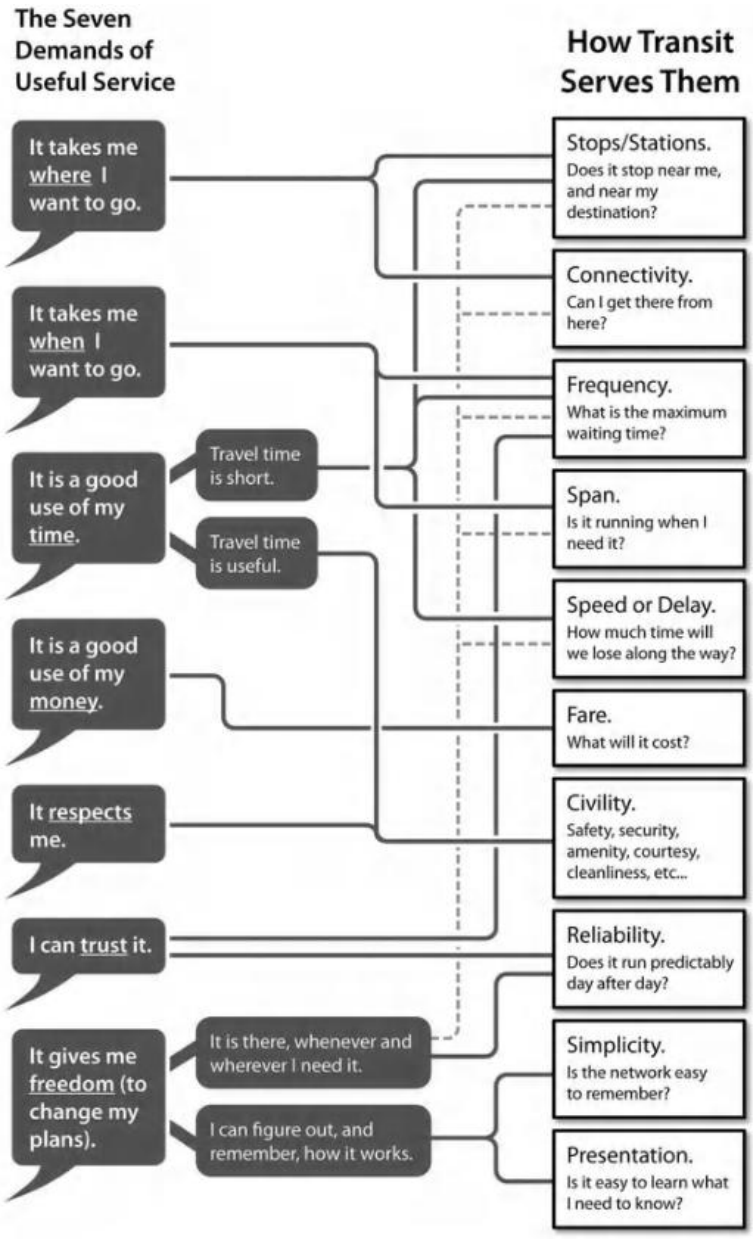

Figure 3.2. Seven Demands of the Useful Transit System and How Transit Should Serve the Riders.
Source: Walker, J. (2014). Human transit: How clearer thinking about public transit can enrich our communities and our lives. (1st ed.). Birkhäuser Boston.

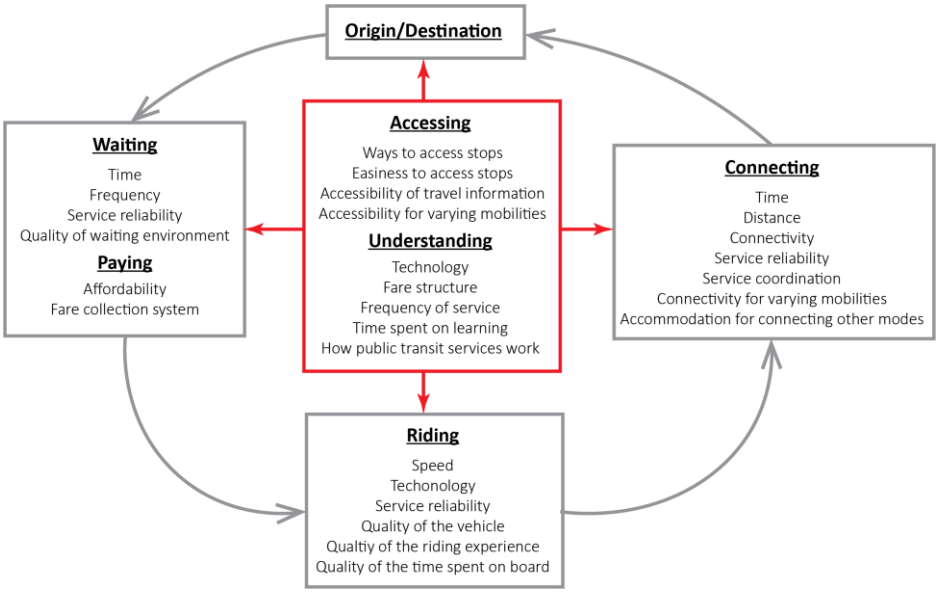

Figure 3.3 Seven Phases of a Public Transit Trip.
Source: Made by the author with concepts adapted from Walker, J. (2014). Human transit: How clearer thinking about public transit can enrich our communities and our lives. (1st ed.). Birkhäuser Boston.

Thus, this study adopts the two-phased sequential explanatory research design as the main research framework to answer the research questions (see Figure 3.4). The first quantitative research method strand consists of the multinomial logit model investigating when and under what circumstances would older adults use public transit at different levels, as well as the binary logistic regression model examining senior public transit riders' travel satisfaction with local public transit services in Milwaukee County. In the second stage, this study employs the qualitative strand of qualitative interviews with questions informed by existing literature and the research results from the first stage.

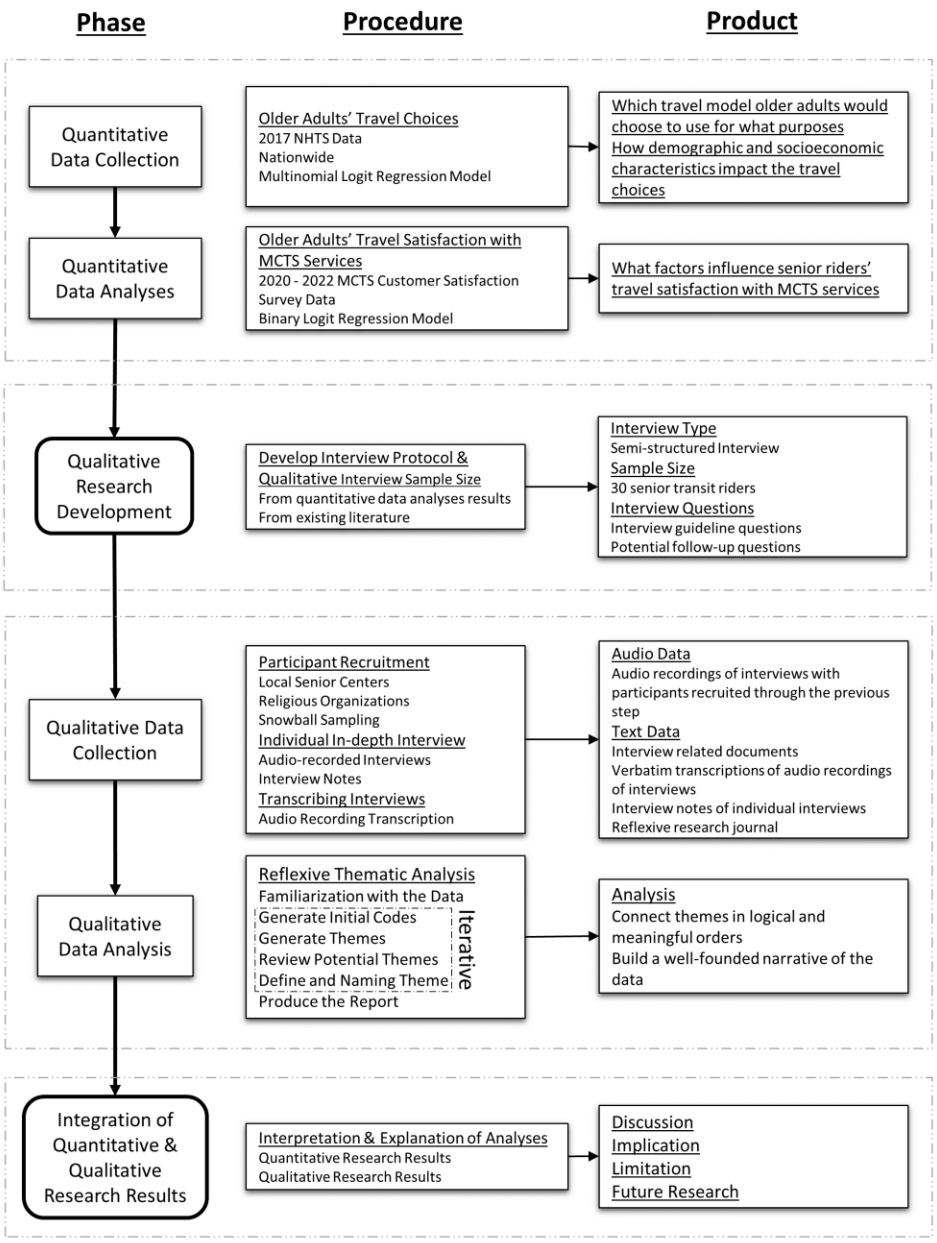

Figure 3.4. Visual Model for Sequential Explanatory Design.
Source: Made by the author with example framework adapted from Ivankova & Stick (2007) from Creswell & Plano Clark (2011). See Creswell, J. W., & Plano Clark, V. L. (2011). Designing and conducting mixed methods research (2nd ed). SAGE Publications; Ivankova, N. V., & Stick, S. L. (2007). Students' Persistence in a Distributed Doctoral Program in Educational Leadership in Higher Education: A Mixed Methods Study. Research in Higher Education, 48(1), 93–135. https://doi.org/10.1007/s11162-006-9025-4

4 What Elements Influence Older Adults' Travel Mode Choices in the US

4.1 Introduction

In this chapter, I analyzed the 2017 NHTS data to examine elements that impact older adults' travel mode choices in the US. Specially, I explore what travel modes senior travelers with different demographic and socioeconomic characteristics choose, what elements from the built environment impact their travel mode choices, and most importantly, what travel modes they choose for different out-of-home activities. Understanding the relationship between their travel needs and travel mode choices is essential for policymakers and DOTs to create a transportation system that is safe, friendly, and encouraging of all travel modes for all travelers. I made suggestions for policy based on the analysis results.

4.2 Literature Review

In most countries, transit riders who are older adults are more likely to be female, unemployed, retired, and have less disposable income. In Asian countries like Japan and China, older adults are more likely to live with their adult children (Tran et al., 2022; Yang, 2018). In Japan, male older adults are engaged in more out-of-home activities than their female counterparts; only about 10% of older adults are frequent public transit riders, and more than 85% of older adults either own at least one personal vehicle or have access to a shared household car (Tran et al., 2022). On the contrary, most people in Hong Kong use public transit, less than 10% of older adults have access to a car or hold a valid driver's license (Yang, 2018). When it comes to older adults, most of them (over 90%) are either unemployed or retired with very little disposable income; male older adults who use public transit travel more often than their female counterparts (Wong et al., 2018; Yang, 2018). Among older adults who are transit riders in Hong Kong, about a quarter of them has

physical mobility issues that require using varying walking aids (crutches or wheelchairs) for everyday travel (Wong et al., 2017, 2020).

In London, people over 60 years old or who have disabilities have access to free public transportation by using the "Freedom Card"; people over 50 years old and people with disabilities also receive varying numbers of subsidized taxi trips so that they only need to pay a fixed amount of money for their taxi rides (Schmöcker et al., 2008). Moreover, public transit accounts for over 50% of commute trips in London; over 25% of older adults transit riders live in neighborhoods that are more accessible to public transit, and more than half of older adults who are transit riders in London are women (Chng et al., 2016). Similarly, female older adults in Sweden are more likely to be transit riders with the majority of them between 75 and 84 years old (Wretstrand et al., 2009).

When it comes to the U.S., most public transit users are white and have higher than high school degrees; more than half of transit users are females, employed, and from households with less than $40,000 annual income (Bezyak, 2020). The majority of older adults who were not drivers and did not have a valid driver's license in 2001 were women (more than 83%); they were more likely to live alone and less likely to be married compared to male older adults (Rosenbloom and Herbel, 2009). Moreover, nearly 90% of transit riders in the U.S. live in urban areas (Bezyak, 2020); meanwhile, over three-quarters of older adults in the U.S. live in suburban or rural areas with infrequent and inadequate public transit service (Rosenbloom, 2009; Rosenbloom and Herbel, 2009).

Globally, the most common trips made via public transit and paratransit among older adults and people with disabilities worldwide are trips for shopping, social and leisure activities, medical services and hospital visits, as well as social welfare services (Ahern & Hine, 2012; Deka, 2014;

Deka & Gonzales, 2014; Kersting et al., 2021; Ryvicker et al., 2012; Tran et al., 2022). Older adults with disabilities in the U.S. and Germany are more likely to use transit systems for leisure and social activities while their younger counterparts tend to commute via public transit to jobs (Deka, 2014; Deka & Gonzales, 2014; Kersting et al., 2021). Most studies confirm that women in both population groups use public transit and paratransit much more frequently than men, and they carry out more shopping and leisure trips than men (Ahern & Hine, 2012; Deka, 2014; Graham et al., 2018; Hagan, 2020; Rosenbloom & Herbel, 2009. However, in countries and regions with better public transit networks (e.g., Hong Kong and bigger cities in Japan), older men use public transit more frequently for general out-of-home activities than older women (Tran et al., 2022; Yang, 2018). Except for in Hong Kong (Yang, 2018), older adults and people with disabilities consider car ownership as the most important and preferred way for out-of-home activities even in countries with relatively extensive public transit networks (Ahern & Hine, 2012; Falkmer et al., 2015; Graham et al., 2018; Rosenbloom & Herbel, 2009; Tran et al., 2022).

4.3 Research Question

This chapter used the 2017 NHTS data to examine factors that influence the travel behavior of older adults in the US. Specifically, I explore the following question: what demographic and socioeconomic characteristics, the built environment, as well as trip purposes are associated with choosing transit over other travel modes for older adults in the US?

4.4 Data and Methodology

4.4.1 2017 NHTS data

The NHTS is a national-level travel survey administered and conducted by the FHWA, documenting the primary data on US household travel information made by all travel modes

including the commute to work, travel to school and recreation, as well as individual and household level trips (NHTS, 2020). The FHWA has been collecting travel data through surveys since 1969, this study used the 2017 NHTS data, which is the eighth in the entire series and the most up-to-date survey from the FHWA to examine how the socioeconomic and demographic factors influence the travel behavior of older adults in the US. Through a stratified random address-based sample, the 2017 NHTS collected travel data between March 2016 and May 2017 from 129,696 US households containing 264,234 records of individual travel information of persons who are 5 years old and over (NHTS, 2020). NHTS data has been widely used by several scholars to describe and analyze general and specific travel trends of US households and individuals (McGuckin, 2018), the environmental concerns relating to energy consumed by private vehicles (Choi & Zhang, 2017), the relationship between safety and different travel modes (Ferenchak & Marshall, 2020), as well as the travel behavior of specific groups of people (Deka, 2014; Hess, 2012).

The 2017 NHTS provides four separate datasets: household-level travel data, personal-level travel data, trip-level travel data, and vehicle-level travel data. All datasets can be linked and merged through several shared identification variables (see Table 4.1 for the relationships between files). For example, each household is assigned a unique identification number (HOUSEID) and so is each household member (PERSONID). Therefore, demographic data from the personal file can be linked to the household file through shared HOUSEID.

Table 4.1. Linking Relationships between 2017 NHTS Datasets

File 1 (From)	File 2 (To)	Linking ID Variables
Household file	Personal file	HOUSEID + PERSONID
Household file	Vehicle file	HOUSEID
Household file	Trip file	HOUSEID
Personal file	Vehicle file	HOUSEID + PERSONID
Personal file	Trip file	HOUSEID + PERSONID
Vehicle file	Trip file	HOUSEID + VEHID

Note: Table adapted from the 2017 NHTS guidebook. See *2017 NHTS Data User Guide*. National Household Travel Survey. (2019, April 23). https://nhts.ornl.gov/assets/NHTS2017_UsersGuide_04232019_1.pdf

4.4.2 Multinomial logit model

This research applied the multinomial logit model (MNL) to the 2017 NHTS data to examine when and under what circumstances would older adults use public transit in the US. Regression modeling has been widely employed by scholars to examine how different elements from demographic characteristics, and transit quality, to the built environment can influence public transit use (Casas, 2007; Chng et al., 2016; Deka, 2014; Hough et al., 2008; Kim et al., 2020a; Kostyniuk & D'Souza, 2020; Kwon & Akar, 2022; Le & Dannenberg, 2020; Mattson et al., 2021; Samuel et al., 2013; Tran et al., 2022; Wong et al., 2017, 2018; Zhu & Fan, 2018). Discrete choice models, in particular, have been employed in transportation research to model travel mode choice, travel behavior, and other types of travel-related decisions. Discrete modes assume that the choice of an alternative by an individual is determined by a set of observable and measurable characteristics, and the outcome of this type of model is a discrete choice from a set of alternatives (Deka, 2014; Deka & Gonzales, 2014; Hough et al., 2008; Kim & Ulfarsson, 2004; Schwanen et al., 2001; Yuan et al., 2022). Three discrete choice models are commonly used in transportation research to understand an individual or a certain group of people's decision of choosing one alternative from a set of alternatives: the logistic regression model (logit model), the probit regression model, and the MNL model. For research that examines how different independent variables influence a dependent variable with binary outcomes (e.g., whether an individual decides to travel with public transit or not), scholars have commonly used the logit regression model (Israel Schwarzlose et al., 2014; Yan et al., 2019) and probit regression model (Deka, 2014; Hough et al.,

2008)[10]. Another common type of discrete choice model is the MNL model when the dependent variable is non-binary (e.g., when an individual is going to choose to drive, walk, bike, or use transit for grocery shopping trips). MNL models have been widely used to examine and understand decision-making behavior (McFadden, 1973, as cited in Yuan et al., 2022). In transportation research, researchers have used MNL models to examine factors that influence the elderly's travel mode choices (Kim & Ulfarsson, 2004; Schwanen et al., 2001; Yuan et al., 2022) and what impacts people with disabilities' use of paratransit (Deka & Gonzales, 2014). As Kim & Ulfarsson (2004) have shown in their study, older adults' travel mode choices vary with different demographic characteristics, socioeconomic characteristics, and trip purposes. Thus, this chapter used the MNL model to examine when and under what circumstances would older adults use public transit in the US with 2017 NHTS data.

4.5 Data Analysis

4.5.1 Descriptive analysis of 2017 NHTS data

The 2017 NHTS indicated that 55,898 (22%) out of 264,234 trips were made through March 2016 to May 2017 by older adults who were over 65 years old (see Table 4.2). Over 40% of them were between 65 and 70 years old; only about 5% of them were over 80 years old. This may indicate that most older adults were relatively active before their physical condition prevented them from traveling comfortably for social and daily activities; as they aged, they might reduce

10 The logit regression model and the probit regression model are both statistical models that can be used for predicting binary outcomes. The logit model and the probit model use different functions, estimation methods, and have different assumptions about the distribution of the errors. The former uses the logistic function to model the probability of the binary outcome, the maximum likelihood estimation to estimate the parameters of the model and assumes that the errors are independently and identically distributed according to a logistic distribution. However, the latter uses the cumulative standard normal distribution (the probit function) to model the probability of the binary outcome, the maximum likelihood estimation to estimate the parameters of the model on the cumulative standard normal distribution, and assumes that the errors are independently and identically distributed according to a standard normal distribution. The logit model is usually used when the predictor variables are continuous or categorical. The probit model is useful when the predictor variables are continuous. See Aldrich, J., & Nelson, F. (1984). *Linear Probability, Logit, and Probit Models*. SAGE Publications, Inc. 10.4135/9781412984744; Liao, T. F. (1994). *Interpreting probability models: Logit, probit, and other generalized linear models*. Sage.

their out-of-home activities when their physical condition made it more difficult to make trips. The number of female (51%) and male (49%) senior travelers was nearly equal, and the majority of them were white (85%), not employed anymore (78%), and had higher than high school degrees (80%). Nearly 60% of older adults in the sample had a median household income level that was over $50,000 a year. Most of them did not have any forms of disabilities (87%) and had a valid driver's license (93%).

Most older adults in the 2017 NHTS owned their homes (85%), lived in smaller households (98% of them lived in households of 1-3 adults), in less urban areas (nearly 60% of them lived in suburban and small towns), and at least had one available vehicle to them (77%). Also, they were more likely to live in places with lower population density and employment density: the minority of them lived in places with more than 10,000 persons (less than 10%) or 10,000 workers (nearly 30%) per square mile. Even though 93% of them had a valid driver's license and only 5% of them did not own any vehicles, driving did not account for over 90% of their traveling needs. Indeed, while nearly 70% of them traveled by car, 28% of them walked for some of their trips. Moreover, less than 1% of older adults used public transit as their travel mode for their out-of-home trips. Besides traveling back to their homes (38%), most other trips were made for shopping (24%), social and/or recreational activities (14%), and meals outside their homes (8%). Very few trips were made for medical purposes (2%), work (4%), or giving lifts to other people (3%). This may indicate that even if they could drive or have access to vehicles, some of them were not confident driving under certain circumstances, or it was easier to use other travel modes (such as walking) for certain activities.

Table 4.2. The Characteristics of Dependent and Explanatory Variables

Variable	Number	Percentage
Dependent Variable (Travel Mode)		

Car	37,720	67.48
Bike	908	1.62
Mopeds	298	0.53
Public transit	552	0.99
Taxi	673	1.20
Walk	15,747	28.17
Explanatory Variables		
Demographic Characteristics		
Age		
Between 65 and 69	22,958	41.07
Between 70 and 74	15,278	27.33
Between 75 and 79	9,196	16.45
Between 80 and 85	5,853	10.47
Over 85	2,613	4.67
Sex		
Female	28,746	51.43
Male	27,152	48.57
Race		
White	47,460	84.90
African American	2,855	5.11
Asian	1,642	2.94
Hispanic	2,697	4.82
Native American	136	0.24
Native Hawaiian or other Pacific Islander	62	0.11
Other	1,046	1.87
Disability Status		
Have a disability	7,001	12.52
Do not have a disability	48,897	87.48
Driver's License Status		
Have a valid driver's license	51,792	92.65
Do not have a valid driver's license	4,106	7.35
Employment Status		
Employed	12,192	21.81
Not employed	43,706	78.19
Educational Attainment		
Less than high school	1,847	3.30
High school	9,755	17.45
College or associate	15,463	27.66
Bachelor's	12,733	22.78
Graduate	16,100	28.80
Socioeconomic Characteristics		
Home Ownership		
Rent	8,259	14.78
Own	47,268	84.56
Other	371	0.66
Household Size		
1 -3 Adults	54,557	97.60
4 -6 Adults	1,257	2.25
7 -9 Adults	84	0.15
Median Household Income		
Less than $25,000	9,595	17.17
$25,000 to $34,999	5,870	10.50

$35,000 to $49,999	7,717	13.81
$50,000 to $74,999	11,022	19.72
$75,000 to $99,999	7,903	14.14
More than $99,999	13,791	24.67
Number of Cars Owned		
0	2,917	5.22
1-2 Cars	42,890	76.73
3-4 Cars	9,090	16.26
Over 5 Cars	1,001	1.79
Built Environment		
Urbanized Level		
City	13,702	24.51
Urban	8,301	14.85
Suburban	15,789	28.25
Small town	18,106	32.39
Population Density[1]		
0-999 persons per square mile	12,069	21.59
1,000-3,999 persons per square mile	23,241	41.58
4,000-9,999 persons per square mile	15,580	27.87
10,000-24,999 persons per square mile	3,553	6.36
25,000-999,999 persons per square mile	1,455	2.60
Employment Density[2]		
0-249 workers per square mile	8,630	15.44
250-999 workers per square mile	17,552	31.40
1,000-1,999 workers per square mile	12,747	22.80
2,000-3,999 workers per square mile	11,228	20.09
4,000-999,999 workers per square mile	5,741	10.27
Trip Information		
Trip Purpose		
Home	21,391	38.27
Medical/Dental	1,356	2.43
Meals	4,295	7.68
Work	2,346	4.20
Shopping	13,474	24.10
School/Religious	1,561	2.79
Social/Recreational	7,905	14.14
Give rides	1,941	3.47
Other	1,629	2.91
Total Trips	55,898	

Note:
1. Population density represents the number of persons per square mile in the census tract of the household's home location.
2. Employment density represents the number of workers per square mile in the census tract of the household's home location.

4.5.2 Multinomial logit model result analyses of 2017 NHTS data

This study used the multinomial logit model to examine what impacted older adult's travel choice in the US with the 2017 NHTS data. The dependent variable is the travel mode they chose for a certain trip purpose. The explanatory variables included for the multinomial logit model were

variables representing 2017 NHTS participants' demographic and socioeconomic characteristics, the built environment, as well as trip information reporting their trip purposes for each trip made with different modes of transportation (see Table 4.2). To avoid multicollinearity in the model, I calculated the variance inflation factors (VIFs) for all potential explanatory variables. Based on the VIFs, age, driver's license status, educational attainment, home ownership, household size, household income, number of cars owned, population density, and employment density were excluded. After removing these variables, all variables included in the final model had VIFs that were less than 5 (see Table 4.3).

Table 4.3. VIF Values Calculated for Potential Explanatory Variables for the MNL Model

Potential Explanatory Variables	VIF Values	Included in MNL Model
Demographic Characteristics		
Age	149.89	No
Sex (Female = 0)	2.20	Yes
Race (white = 0)		Yes
African American	1.12	
Asian	1.10	
Hispanic	1.16	
Native American	1.01	
Native Hawaiian or other Pacific Islander	1.00	
Other	1.03	
Disability Status (Have no disability = 0)	1.29	Yes
Driver's License (Have no license = 0)	17.69	No
Employment Status (Unemployed = 0)	1.60	Yes
Educational Attainment (< High School = 0)		No
High school	6.61	
College or associate	10.30	
Graduate	11.50	
Socioeconomic Characteristics		
Home Ownership (Rent = 0)		No
Own	8.45	
Other	1.05	
Household Size	10.25	No
Household Income	9.12	No
Number of Cars Owned	6.74	No
Built Environment		
Urbanized Level (Small town = 0)		Yes
Suburban	2.65	
City	3.31	
Urban	3.97	
Population Density	21.76	No
Employment Density	22.34	No
Trip Information		
Trip Purpose (Home = 0)		Yes
Medical/Dental	1.07	
Meals	1.20	

Work	1.27
Shopping	1.63
School/Religious	1.08
Social/Recreational	1.38
Give rides	1.10
Other	1.08

In general, the statistical significance of relationships between the odds of choosing a certain mode of transportation and the explanatory variables varied between modes (see Table 4.4). Older adults in the US would usually choose driving over all the other modes of transportation. Female senior travelers have significantly lower odds in choosing biking (73% lower) and mopeds (59% lower) than male senior travelers; but they had slightly higher odds of choosing walking (5%) than male senior travelers. Though female senior travelers had higher odds in choosing public transit (14% higher) and taxis (13% higher) over their male counterparts, the odds ratios were not statistically significant.

When it comes to race and ethnicity, compared to white older adults, the odds of older adults who were African American, Asian, Hispanic, Native American, and Other choosing public transit over driving were all higher and statistically significant. Notedly, compared to white senior travelers, the odds of older adults choosing public transit over driving were the highest for African Americans (nearly 400% higher), followed by Native Americans (nearly 330% higher), Hispanics (nearly 190% higher), and Asians (nearly 120% higher). The odds of senior travelers choosing biking over driving were generally lower except for Native Hawaiian or Other Pacific Islanders (nearly 188% higher), but only these odds of African American senior travelers (51% lower) and Other race senior travelers (68% lower) were statistically significant. The odds of choosing mopeds over driving were only higher for Native American senior travelers (14% higher) compared to white senior travelers, while only these odds of African American senior travelers (35% lower) and Hispanic senior travelers (75% lower) were statistically significant. The odds of

senior travelers choosing taxis over driving were higher for African Americans (24% higher) and Hispanics (1% higher) when compared to white senior travelers, none of the odds were statistically significant in this category. Compared to white senior travelers, the odds of Asian (60% higher) and Other race (13% higher) senior travelers choosing walking over driving were significantly higher; the odds of senior travelers in other race and ethnicity groups were lower, but only the odds of senior travelers who were African Americans (nearly 20% lower) were statistically significant.

For older adults with any forms of disabilities, their odds of choosing biking (40% lower) or walking (7% lower) over driving were lower than older adults without disabilities. However, their odds of choosing public transit (148% higher) and taxis (93% higher) over driving were significantly higher compared to senior travelers without disabilities. Though their odds of choosing mopeds (30%) over driving were also higher than senior travelers without disabilities, the odds ratio was not statistically significant. Older adults who were employed only had higher odds of choosing public transit (13% higher) or taxis (33% higher) over driving than their unemployed counterparts. However, their odds of choosing public transit over driving were not statistically significant. The odds of choosing alternative travel modes over driving were lower for senior travelers who were employed, with mopeds (25% lower) and walking (14% lower) showing statistically significant differences.

The built environment also has an impact on older adults' travel mode choices. Except for choosing mopeds, older adults living in suburban areas, cities, and urban areas had significantly higher odds of choosing active travel modes, using public transit and taxis over driving than older adults living in small towns. In other words, in general, if older adults lived in denser places, the odds of them choosing other travel modes over driving would be higher than older adults who

lived in less dense places. Especially, older adults living in urban areas had the highest odds in choosing biking (336% higher), walking (198% higher), public transit (1048% higher), and taxis (224% higher) when compared to the odds of choosing these travel modes over driving for older adults living in cities and suburban areas. However, older adults in small towns had slightly higher odds of using mopeds over driving than their counterparts living in suburban areas, cities, and urban areas (the odds ratio of choosing mopeds for senior travelers living urban areas was not statistically significant).

Table 4.2 shows that driving remained the most chosen travel mode (over 67% trips were made by driving) compared to other options. However, there were instances where older adults opted for alternative travel modes instead of driving. When it comes to social and recreational activities, older adults had higher odds of choosing taxis (93% higher), mopeds (84% higher), biking (83% higher), walking (49% higher), and public transit (41% higher) over driving, though the odds of choosing public transit over driving were not statistically significant. Also, for older adults, public transit had higher odds over driving when trips were made for hospital visits (136% higher) and work commutes (118% higher). Similarly, older adults had higher odds of choosing taxis over driving when they traveled for hospital visits (51% higher), food (13% higher), and (9% higher); though only the odds of choosing taxis for hospital visits showing statistically significant differences than the odds of choosing driving. However, older adults had statistically significant higher odds of choosing driving over all other travel modes for their shopping trips.

Table 4.4. Results for MNL Model of Older Adults' Travel Mode Choices

Variables	Travel Mode									
Reference category = Car	**Bike**		**Mopeds**		**Public Transit**		**Taxi**		**Walk**	
	Coef. (Sig.)	Odds Ratio	Coef. (Sig.)	Odds Ratio	Coef. (Sig.)	Odds Ratio	Coef. (Sig.)	Odds Ratio	Coef. (Sig.)	Odds Ratio
Demographic Characteristics										
Sex (Female = 0)	-1.297 (***)	0.273	-0.896 (***)	0.408	0.128 (NS)	1.136	0.124 (NS)	1.132	0.049 (**)	1.050
Race (White = 0)										
African American	-0.730 (***)	0.482	-0.433 (***)	0.649	1.608 (***)	4.992	0.212 (NS)	1.236	-0.233 (***)	0.792
Asian	-0.387 (NS)	0.679	-1.137 (NS)	0.321	0.798 (***)	2.222	-0.237 (NS)	0.789	0.470 (***)	1.600
Hispanic	-0.222 (NS)	0.801	-1.372 (*)	0.254	1.069 (***)	2.912	0.013 (NS)	1.013	-0.072 (NS)	0.931
Native American	-0.260 (NS)	0.771	0.127 (NS)	1.136	1.458 (***)	4.296	-5.624 (NS)	0.004	-0.210 (NS)	0.811
Native Hawaiian or Other Pacific Islander	1.055 (NS)	2.871	-2.065 (NS)	0.127	-3.301 (NS)	0.037	-4.061 (NS)	0.017	-0.013 (NS)	0.987
Other	-1.524 (*)	0.316	-0.756 (NS)	0.470	0.909 (***)	2.482	-0.451 (NS)	0.637	0.124 (*)	1.132
Disability Status (No disability = 0)	-0.524 (***)	0.592	0.265 (NS)	1.303	0.906 (***)	2.476	0.658 (***)	1.931	-0.078 (**)	0.925
Employment Status (Unemployed = 0)	-0.023 (NS)	0.977	-0.286 (*)	0.751	0.118 (NS)	1.126	0.284 (***)	1.329	-0.146 (***)	0.864
Built Environment										
Urbanized Level (Small town = 0)										
Suburban	0.459 (***)	1.582	-0.251 (*)	0.778	0.569 (***)	1.767	0.363 (***)	1.437	0.155 (***)	1.168
City	0.901 (***)	2.463	-0.430 (***)	0.650	0.931 (***)	2.536	0.570 (***)	1.769	0.289 (***)	1.335
Urban	1.473 (***)	4.360	-0.239 (NS)	0.787	2.441 (***)	11.484	1.175 (***)	3.239	1.091 (***)	2.977
Trip Information										
Trip Purpose (Home = 0)										
Medical/Dental	-1.470 (***)	0.230	-0.631 (NS)	0.532	0.860 (***)	2.364	0.409 (**)	1.505	-2.430 (***)	0.088
Food	-0.838 (***)	0.433	-0.331 (NS)	0.733	-0.732 (***)	0.481	0.124 (NS)	1.132	-0.790 (***)	0.454
Work	-0.281 (NS)	0.755	-0.509 (NS)	0.601	0.777 (***)	2.175	0.083 (NS)	1.087	-0.733 (***)	0.481
Shopping	-0.651 (***)	0.522	-0.965 (***)	0.381	-0.423 (***)	0.655	-0.791 (***)	0.454	-1.135 (***)	0.322
School/Religious	-1.201 (***)	0.301	-1.454 (**)	0.234	-0.869 (***)	0.419	-0.591 (**)	0.554	-1.229 (***)	0.293
Social/Recreational	0.602 (***)	1.826	0.610 (***)	1.841	0.132 (NS)	1.414	0.657 (***)	1.930	0.398 (***)	1.489
Give Rides	-4.641 (***)	0.010	-1.483 (***)	0.227	-1.581 (***)	0.206	-1.000 (***)	0.368	-2.230 (***)	0.107
Other	0.288 (*)	1.333	0.713 (***)	2.040	0.542 (*)	1.720	1.682 (***)	5.374	-0.087 (***)	0.838
Constant	-3.546 (***)	0.029	-3.906 (***)	0.020	-5.880 (***)	0.003	-4.750 (***)	0.009	-0.177 (***)	0.463
Goodness of Fit										
Log-likelihood	-41706.78 (df=105)									
McFadden's R^2	0.086									
AIC	83623.56									
BIC	84561.35									
Number of Observations	55,898									

Note:
1. *p<0.1; **p<0.05; ***p<0.01, and NS represents not statistically significant.
2. Small-Hsiao Test was performed to test whether the Independence of Irrelevant Alternatives (IIA) assumption is rejected and if the MNL model is suitable for this dataset. Log-Likelihood Ratio Test Statistic: -62938.93, Degrees of Freedom: 2, p-value: 1, and the IIA assumption holds. The MNL model is appropriate for this dataset.

4.6 Discussion

This chapter uses 2017 NHTS data to examine which variables were associated with older adult's travel choice in the US. Many senior travelers were white, not employed anymore, and had higher than high school degrees. They were also most likely homeowners living in small households with access to private cars; and many of them were living in more suburban and rural areas. Many of them were under 70 years old and only a few of them were over 80 years old. Most of them did not have any forms of disabilities and had a valid driver's license. In the meantime, most of them drove for their daily trips, some of them walked, but very few of them used public transit. Most of their trips were made for shopping and social and/or recreational activities; only very few trips were made for medical purposes or work. Existing studies have found that older adults who did not drive and seniors who stopped driving were more likely to face travel challenges when there were not efficient and sufficient alternative travel options to driving. Hough et al. (2008) found that non-driving female older adults who lived in rural areas had very few travel options to spousal lifts for their out-of-home activities. Male older adults who ceased to drive found the limited destinations reached by community transportation services less appealing and were less motivated to travel (Ahern and Hine, 2012).

When compared to white senior travelers, senior travelers of other races and ethnicities had significantly higher odds of riding public transit over driving for their trips, and the odds were higher for African American and Hispanic senior travelers than senior travelers of other races and ethnicities. This could be that race and ethnic minority senior travelers, particularly those who were African Americans, were more reliant on public transit due to their lower car ownership rates and household income; as well as in that their residential locations were often in urban settings where there were some forms of public transit than in less urban areas (Loukaitou-Sideris et al.,

2018; Rosenbloom, 2004). Therefore, it is important for transit agencies to commit and to prioritize improving and maintaining public transit services in communities of color. In doing so, transit agencies need to ensure that their investments across communities are equitable so that communities of color would have access to high-quality public transit services as well as good public transit infrastructure; since researchers have found that certain transit agencies serving low-income populations often receive less state funding per ride, and minority communities usually receive fewer investments and subsidies on their public transit infrastructure (Hudspeth & Wellman, 2018; Sanchez et al., 2004). Local governments could use dedicated tax revenues to support their transit agencies to serve minority communities better (Hudspeth & Wellman, 2018), so that they are able to maintain their service levels and quality in these communities. However, when it comes to active travel modes, white senior travelers had higher odds of choosing active travel modes (biking and walking) than most other races and ethnicities, only Asian senior travelers had higher odds of choosing waking over driving than white senior travelers. It could be that for senior travelers with higher odds of choosing active travel modes over driving, their neighborhoods were able to secure more investments promoting and improving the infrastructure of active travel modes, were safer for senior travelers to bike or walk, or there were more active transportation advocates in their neighborhoods providing opportunities for them to learn more about active transportation. Berke et al. (2007) found that older adults who live in neighborhoods with fewer sidewalks, parks, and bike lanes are less likely to use active travel modes and have higher reliance on cars. Low-income communities and communities of minorities are often found to have poor active transit support or infrastructure (Ogilvie et al., 2008; Sims & Bopp, 2018). Older adults without any disabilities were more likely to choose active transportation modes like biking and

walking over driving; they were also more likely to use public transit or walk when they did not have a valid driver's license.

Therefore, the promotion of active transportation modes and complete streets policies could provide older adults who enjoy biking and walking with a safer and better environment, it may also encourage older adults who are less familiar with active transportation modes to try them for some of their daily trips. This study also confirms the findings of existing studies that like other transit riders (Bezyak, 2020), older adults who prefer to choose active travel modes or use public transit over driving are more likely to live in urban areas. This might be that urban areas and cities have better and more active transportation and public transit infrastructure. And urban areas have higher levels of activity destinations with short travel distances, these are land use patterns that are easier to serve with transit (Schneider, 2013). However, most older adults live in their own homes in suburban or smaller towns with infrequent and inadequate public transit service (Rosenbloom, 2009; Rosenbloom and Herbel, 2009). This means that local governments, DOTs, and transit agencies should establish strategies and policies (e.g., provide education and programs for adapted vehicles that are targeted at assisting senior drivers, provide financial subsidies for needed seniors to purchase or upgrade to vehicles that have better driver assistance technologies) would make it safer for seniors to drive themselves (NHTSA). They can also provide subsidies and educational programs to encourage seniors to use alternative travel modes to driving. For example, subsidies and educational programs for seniors to use on-demand transit services that do not require the use of smartphones (e.g., GoGoGrandparent and SliveRide) would also help them for their trips when public transit is inaccessible to them (Chase, 2011; DeGenova, 2020).

Even if most older adults choose driving for most of their trips, there are some trips older adults would choose other travel modes over driving. Notedly, even though most of them had a valid driver's license and have access to private cars, driving did not account for the same amount of their trips. This may indicate that they were either not comfortable driving themselves anymore or they found other travel modes sufficient or more satisfying than driving for some of their out-of-activities. Older adults in the US are more likely to choose active travel modes and taxi over driving for their social and recreational trips. They also choose public transit over driving for such activities but the odds for this travel mode choice were not statistically significant. Similar to findings of existing studies, they also prefer using public transit for leisure activities (Deka, 2014; Deka & Gonzales, 2014; Kersting et al., 2021). First, this might indicate that for certain recreational trips, active travel modes make traveling the activity itself satisfying, relaxing, and enjoyable (De Vos et al., 2013) for older adults. Second, for certain activities that may involve drinking or usually occur during the evening, they may feel safer and more comfortable when they are not driving themselves. Aside from recommending local governments and transit agencies to adopting complete streets policies that create safe road environments for all road users, they could also provide accessible taxi services and related subsidies to expand the travel mode choices of older adults (Wong et al., 2020). This study also found that older adults choose taxis and public transit (the odds for public transit were not statistically significant) over driving for their hospital visits. However, this does not necessarily mean that the public transit system or using taxis could meet all their medical travel needs, it could be that they choose public transit or taxis for occasional non-emergency hospital visits and checkups. Older adults would choose public transit over driving to work. This, again, does not guarantee that public transit system could satisfy older adults' travel needs for work, it may be that for those older adults who are still employed, public transit might

be their only means of transportation. Researchers found that older adults considered fixed-line transit as an inexpensive alternative to driving due to the high maintenance costs of having a private car; but public transit was not widely used due to its inflexibility in time and places they could travel to (Battista et al., 2015). Therefore, ensuring transportation access for older adults, especially those who do not drive, is crucial for them to access healthcare and other opportunities. Therefore, partnerships between social services, healthcare providers, and transit agencies could help provide older adults with affordable and accessible rideshare services (Bayne et al., 2021; Blodgett & Benjaafar, 2017), as well as prioritize investments in on-demand paratransit services (Rodrigue et al., 2023) so that they could have more travel choices for their healthcare needs. Lastly, older adults would prefer driving over all other travel modes for their shopping trips. This could be that they will have to carry bags of goods after their shopping trips, making using other travel modes more difficult than driving. Indeed, Ravensbergen et al. (2021) analyzed older adults' travel experiences with public transit and found that older adults found using public transit to be difficult for shopping because they either found it exhausting to carry heavy bags after their shopping trips or found it inconvenient and physically taxing to take a cart for shopping with them. Thus, transit agencies should also consider partnering with local businesses, food delivery companies, and volunteer transportation services to either provide travel options that do not require older adults to carry heavy bags after their shopping trips or have groceries they need delivered to their doorsteps.

Most importantly, for automobile-centric countries like the US, it is important for policymakers and transportation advocates to ensure that older adults who are not drivers or will cease to drive will have access to other forms of transportation for their out-of-home activities. To make public transit a viable travel alternative to driving, sufficient and upholding federal, state,

and local support to public transit agencies across the US is essential to help them maintain their services. Unfortunately, many transit agencies had been experiencing budget deficits before the COVID-19 pandemic as federal transportation policies have long favored automobile travel over other travel modes (Grengs, 2005). Their financial struggles have been worsened with lagging ridership recovery and vehicle operator shortages since the COVID-19 pandemic, the struggles are further exacerbated as the federal supports for public transit from the Infrastructure Investment and Jobs Act (IIJA)[11] are running out by 2026 (Dalbey, 2023). As a result, transit agencies across the US had to increase fare prices, make route cuts and cancellations, shorten services schedules, as well as seeking new funding opportunities and coalitions with private and non-profit entities to bridge their fiscal shortfalls (Dalbey, 2023)[12]. However, the measures transit agencies are taking and/or will take would negatively impact travel riders, especially senior transit riders who are retired and/or living on fixed incomes, whose primary and only travel mode is public transit, and use public transit for their regular social and recreational activities. Sufficient supports and investments into public transit can help make public transit remain affordable (e.g., issue discounted transit passes for older adults, cap the prices for daily and monthly rides) and its network and schedules more extensive (e.g., avoid cutting routes, better connections between

[11] The Infrastructure Investment and Jobs Act (IIJA) bill was a $1.2 trillion infrastructure bill is a United States federal statute enacted by the 117th United States Congress (2021-2022) and signed into law by President Joe Biden on November 15, 2021. The initial provisions were mostly related to programs and projects of the USDOT (such as federal highway aid, transit, highway safety, motor carrier, research, hazardous materials and rail programs). Funds for broadband access as well as clean water and electric grid renewal were also added to the bill after Congressional negotiations. Thirty-nine billion dollars were allotted to programs and funding opportunities that were related to transit. Some of the programs were: expand/improve passenger rail service, improve access to financing for rehab and improvement projects, maintain or operate existing service, etc. See Kenny, S. C. (2022, January 25). Transit funding in the infrastructure bill: what can it do for me? *Transportation for America (T4America)*. https://t4america.org/2022/01/25/transit-funding-infrastructure-bill/; The committee on transportation and infrastructure. (2021). (rep.). *H.R.3684 - Infrastructure investment and jobs act*. https://www.congress.gov/bill/117th-congress/house-bill/3684/text; Wikimedia Foundation. (2024, September 5). *Infrastructure investment and jobs act*. Wikipedia. https://en.wikipedia.org/wiki/Infrastructure_Investment_and_Jobs_Act#.

[12] The National Campaign for Transit Justice (NCTJ) and Transportation for America (T4America) conducted a sample survey early 2023 to understand the fiscal conditions of transit agencies around the US after the agencies had gained federal support from the IIJA Bill for 2 years. They surveyed 27 transit agencies across the US to learn about how the funding from the IIJA Bill have contributed to their fiscal health, what new challenges and struggles they had, and what measures they considered taking once the federal funding from the IIJA Bill runs out. See Dalbey, M. (2023, January 31). Transit fiscal cliff or transit fiscal doom? *Transportation for America (T4America)*. https://t4america.org/2023/01/31/transit-fiscal-cliff-or-transit-fiscal-doom/

urban and suburban areas). This can help senior transit riders to be able to afford transit for their out-of-home activities; well-maintained transit services with extensive networks could also provide driving older adults with viable alternatives when they stop driving themselves.

4.7 Conclusion

This chapter explores older adults travel mode choices with the 2017 NHTS data. Many senior travelers were white, not employed anymore, had higher than high school degrees and income levels. Most of them did not have any disabilities and had a valid driver's license; many of them lived in their own homes with access to private cars. Therefore, most of them drove for their out-of-home activities, public transit was in general their least chose travel mode. Female senior travelers and racial minorities tended to choose public transit over driving, while white senior travelers tend to choose active travel modes over driving. This suggests that senior travelers are a diverse group, and their travel mode choices also reflect transportation inequity and disparities. It is important to prioritize transportation investments in disadvantaged communities, as well as promote and adopt planning policies like complete streets policies to create a more equitable and safer environment for all travel modes and all travelers. Senior travelers also chose active travel modes and non-driving modes over driving for social and recreational activities, they chose taxis over driving for their hospital visits, but they would choose driving over all other travel modes for shopping trips. Providing reliable and high-quality travel alternatives to driving is essential to meet senior travelers' different travel needs. Understanding the relationship between their travel needs and travel mode choices is essential for policymakers and DOTs to create a transportation system that is safe, friendly, and encouraging for all travel modes and all travelers.

5 What Contributes to the Travel Satisfaction of Senior Transit Riders

5.1 Introduction

In this chapter, I analyzed the MCTS customer satisfaction survey data collected from 2020 to 2022 to explore how transit service quality impacts customer's satisfaction with public transit in Milwaukee County, especially to identify factors that impact senior rider's travel satisfaction with MCTS transit services. I found that in general, there is little difference between the travel satisfaction of all riders and of riders who are older adults. Public transit riders in Milwaukee County are more satisfied with transit services that have better travel information accessibility, reliable buses that are not always late, well-maintained buses, as well as drivers who are friendly, courteous, and drive the buses safely. For older adults, they care much more about travel safety with public transit, as well as travel information accessed easily through customer services. This may indicate that older adults feel more vulnerable when the drivers do not drive safely and are less tech-savvy and/or have limited access to the Internet so that they rely more on the transit provider's customer service for trip related information.

5.2 Literature Review

This section reviews how researchers define and measure the travel satisfaction of public transit riders. Also, this section provides findings of people's travel satisfaction with public transit – with a focus on older adults and people with disabilities.

Over the years, scholars, transportation policymakers, and transit agencies have mainly used customer satisfaction and travel satisfaction to measure how transit riders are satisfied with transportation service delivery and what elements are associated with satisfactory transportation services. Customer satisfaction measures often represent the degree of transportation agencies' service delivery that meet customers' expectations (Morfoulaki et al., 2007, as cited in Abenoza

et al., 2017), which would determine people's impressions and intentions of using certain transportation modes (Diana, 2012, as cited in Abenoza et al., 2017). Travel satisfaction, in the meantime, characterizes the outcome of the entire travel experience (Abenoza et al., 2017) and how well travelers' overall travel needs and expectations have been met (Tyrinopoulos & Antoniou, 2008). Castle & Engberg (2004) have reviewed the existing literature that focuses on measuring older adults' travel satisfaction and identified opened-ended questions, questions with dichotomous answers (yes or no), the use of the Likert scale, subjective evaluation of travel satisfaction, and general satisfaction as the common types of methods used to guide respondents to reflect on their review of travel satisfaction. Therefore, travel satisfaction and customer satisfaction are usually measured by directly asking respondents their general satisfaction with the transportation services they have received or by asking their satisfaction with the quality of different dimensions of the services they have received through surveys or interviews (Abenoza et al., 2017; Hensher et al., 2003).

When it comes to the impacts of the qualities of transit service during the trip on travelers' satisfaction, scholars focused mostly on: access to transit travel information, the affordability of trips, the accessibility of stations and/or stops, the attitude of staff, drivers and operators, ticketing, service reliability, the comfort level of the trip, transfer experiences, and the boarding and exiting experiences to examine and analyze their contribution to public transit users' travel satisfaction (Abenoza et al., 2017, 2019; Allen et al., 2020; Broome et al., 2013; He et al., 2020; Kersting et al., 2021; Soza-Parra et al., 2019; Tyrinopoulos & Antoniou, 2008; Wong et al., 2017; Wretstrand et al., 2009).

5.2.1 The travel satisfaction of older adults and people with disabilities as public transit riders

For older adults in cities and countries with better public transit infrastructure, they are more satisfied with well-connected, affordable, reliable, and frequent services that meet their daily and social needs; their major concerns are the comfort levels of the riding experiences (He et al., 2020; Wong et al., 2017, 2018). On the contrary, the elderly in cities and countries with less developed public transit infrastructure – especially those living in rural areas – generally find it difficult to have access to reliable, frequent, and well-connected services, and thus are less satisfied with public transit (Graham et al., 2018; Hagan, 2020; Hough et al., 2008; Kim et al., 2020; Liu et al., 2021). People – especially men – who are lifetime drivers are reluctant to use public transit and are more likely to be socially excluded after driving cessation (Ahern & Hine, 2012; Jones et al., 2013; Schmöcker et al., 2008). For people with disabilities in general, they are least satisfied with inaccessibility to public transit travel information. They appreciate affordable, reliable, and well-connected public transit services as well as friendly drivers just like senior transit riders (Avery, 2017; Low et al., 2020; Noor & Foo, 2014; Solvoll & Hanssen, 2017; Verbich & El-Geneidy, 2016).

Travel behavior research on people with disabilities using public transit is more abundant in the US compared to other countries. In general, the travel demands of people with disabilities are similar to people without disabilities (Yan et al., 2019), they are more satisfied with flexible, accessible, and reliable public transit services; but they do not feel they have the same level of access as people without disabilities do, especially when they cannot use their mobile devices easily onboard (Bezyak et al., 2020; LaPlante & Kaye, 2010). Bearse et al. (2004) have found that the demand for paratransit in mid-sized cities has grown significantly, but accessibility to paratransit is lower for nursing home residents than it is for community residents. In California, access to transit service information (e.g., visual clues and audio announcements) is positively

related to travel satisfaction with public transit for visually impaired riders, but such information is hard for them to obtain or understand (Golledge et al., 1996).

5.3 Research Question

This chapter explores how well MCTS transit services meet the needs of older adults who are transit riders in Milwaukee County using data from the 2020-2022 MCTS customer satisfaction surveys. Specifically, I investigate the following research questions:

1. Is there a difference in transit satisfaction among older adult transit riders and younger adult transit riders?
2. What factors are associated with differences in transit satisfaction among older adult transit riders versus younger adult transit riders?

5.4 Data and Methodology

5.4.1 MCTS customer satisfaction survey

This chapter will use the MCTS customer satisfaction survey through 2020 to 2022 for analysis. The MCTS customer satisfaction survey is a local-level travel survey administered and conducted by MCTS, documenting their customers' satisfaction with their services while also asking for improvement suggestions from their customers in Milwaukee County (see Figure 5.1 for MCTS bus routes and service area). MCTS has been conducting annual customer satisfaction surveys since 2016 to inquire about the travel satisfaction of their customers. Qualifying respondents are Milwaukee County residents who have taken an MCTS bus at least once or twice during the last three months before the survey is sent out. Survey invitations are featured in their newsletters, sent out through email to the opt-in customer list kept by MCTS, as well as mailed postcard with instructions for participating in the survey online. The average time for completing the survey is estimated to be 20 minutes and the survey is usually kept open for one month and a half (45 days) during the summer each year. Two screening questions are asked to ensure that the respondent is over 18 years old and is the only respondent from one household. Besides asking the

respondents' satisfaction with personal security and safety, attitudes of drivers, staff, and representatives, transit quality, ease of getting travel information, and overall travel satisfaction with MCTS services, it also asks respondents' demographic and socioeconomic characteristics, as well as their trip purposes (MCTS, 2022).

5.4.2 Binary logistic regression model

This research will apply the binary logistic regression model to MCTS customer survey data from 2020 through 2022 to examine senior public transit riders' travel satisfaction with MCTS services. For scholars who are interested in investigating people's travel satisfaction with varying travel modes, they usually use the binary logistic regression model or ordered logistic regression model. Similar to the logit regression model, the binary logistic regression model analyzes the relationship between a binary dependent variable and selected independent variables. The binary logistic model would be an appropriate research method to examine whether a traveler is satisfied or not satisfied with a certain travel mode or if they are willing or not willing to travel with a certain travel mode (Wong et al., 2017, 2020; Yang et al., 2022). Therefore, this research employs the binary logistic regression model to examine how satisfied senior transit riders are with the MCTS transit services.

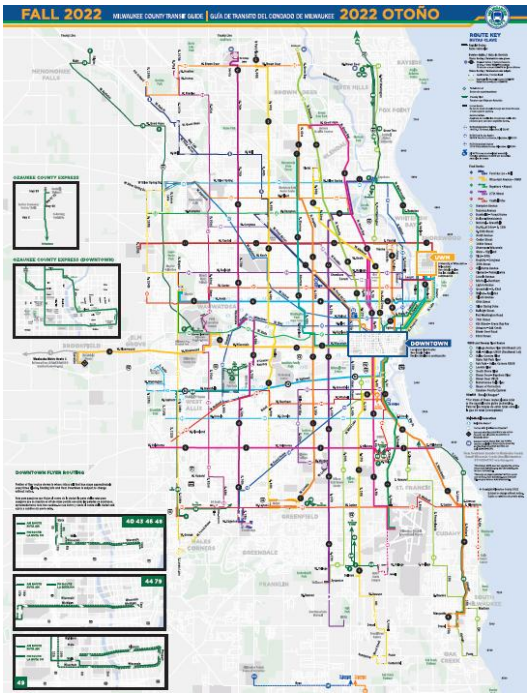

Figure 5.1. Map of MCTS Bus Routes and Service Area as of 2022.
Source: US Census Bureau. *https://www.ridemcts.com/routes-schedules/system-map*

5.5 Data Analysis

5.5.1 *Descriptive analysis of MCTS survey participants*

From 2020 to 2022, 3,802 qualifying individuals in total[13] participated in the MCTS customer survey with 92% (3,492) of the survey participants indicating their sex as either female or male. Among the 3,492 survey participants of all ages, the number of male (1,710, 49%) and female (1,782, 51%) participants was almost equal. Around 84% (1,782 out of 3,492) of survey participants were transit riders that aged between 18 and 64, and there was a nearly equal distribution of male riders (1,424, 50%) and female riders (1,399, 50%) in this age category. Nearly 16% (549 out of 3,492) of survey participants were older adults with a similar distribution of male (286, 52%) and female (263, 48%) participants (see Table 5.1).

13 To protect the privacy of these respondents, I have removed all identity information including name, phone number, email address, and zip code of their home location. MCTS customer satisfaction survey uses two screening questions to ensure their respondents are 1) over 18 years old and 2) the only representative of a household. Therefore, respondents of each year are unique, but the total number of respondents through 2020 to 2022 may not be all unique.

Table 5.1. The Overview of MCTS Customer Survey Participants through 2020 to 2022

	All Participants					Participants between 18-64					Participants over 65				
		Male		Female			Male		Female			Male		Female	
Year		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%
2020	1,322	522	39.49%	680	51.44%	996	436	43.78%	560	56.22%	206	86	41.75%	120	58.25%
2021	1,163	649	55.80%	514	44.20%	956	534	55.86%	422	44.14%	207	115	55.56%	92	44.44%
2022	1,007	539	53.53%	468	46.47%	871	454	52.12%	417	47.88%	136	85	62.50%	51	37.50%
Total	3,492	1,710		1,782		2,823	1,424		1,399		549	286		263	

Note:

1. The total numbers listed above only accounted for survey entries whose answers regarding the respondent's sex were either Male or Female. The total number of respondents (3,802) by year is 1,407 (2020), 1,253 (2021), and 1,142 (2022).
2. Though MCTS's ridership increased after the COVID-19 pandemic, notably nearly 1 million more riders in 2022, survey participants did not reflect the same trends. Thus, the model results may not fully reflect the actual MCTS rider satisfaction or characteristics. See Bentley, D. (2022, June 17). *MCTs ridership increases as new route changes are set to be implemented later this year*. Journal Sentinel. https://www.jsonline.com/story/news/2022/06/17/milwaukee-county-transit-system-implements-new-route-changes-year/7614589001/

When it comes to the demographic and socioeconomic characteristics of MCTS survey participants, riders who were older adults shared many similar characteristics with riders from other age groups (see Table 5.2). Most survey participants were white (nearly 60% of participants that were between 18-64 years old, and over 80% of senior riders), had a valid driver's license (over 80% of participants that were between 18-64 years old, and nearly 75% of senior riders). The majority of MCTS survey participants had higher than High School degrees; senior survey participants had slightly higher educational attainment levels (over 50% of them had degrees that were higher than bachelor's degrees) when compared to participants that were between 18-64 years old (nearly 45% of them had degrees that were higher than bachelor's degrees). It could be that some participants that were aged between 18 and 34 (over 30% of total participants) were still pursuing degrees that are higher than bachelor's degrees. Similarly, over half of participants that were between 18-64 years old and older adult participants had annual household incomes lower than $50,000. The only significant difference between younger participants and older adult participants was their employment status as most senior participants were retired. Milwaukee is historically one of the most segregated cities in the U.S. (Reeves & Rodrigue, 2016), remains deeply divided along racial lines, ranking second in Black-white segregation (Cheng, 2024). Though 2020 census data indicates that while some suburbs have become more integrated, the city

of Milwaukee itself still shows significant segregation, particularly on the near north side, which is predominantly Black (Cheng, 2024). According to the US Census Bureau's estimates, Milwaukee County's total population shrank 2.1% from 938,527 in 2020 to 918,661 in 2022; the number and percentages of total population of people over 65 years old both increased from 14.1% (132,332) in 2020 to 14.9% in 2020 (136,880) the number and percentages of the total population of people between 18-64 years old both decreased from 65.8% (617,550) in 2020 to 65.4% (600,804) in 2022 (US Census Bureau, 2022). In the meantime, the number of white population (decreased from 468,396 to 450,726) and African Americans (decreased from 245,292 to 239,142) decreased from 2020 to 2022, while these of Hispanics (increased from 150,471 to 152,466) and Asians (increased from 45,897 to 47,945) increased from 2020 to 2022. (US Census Bureau, 2022). The estimated median household income in 2022 for Milwaukee County was $59,319 (US Census Bureau).[14] The MCTS survey participants predominantly identified as whites compared to the general Milwaukee County population, where there has been increases in Hispanic and Asian populations and a decrease in white and African American populations. The proportions of people over 65 in the MCTS survey participants nearly mirror that of the county's population in this category. Additionally, a significant proportion of MCTS survey participants had annual household incomes below $50,000, which was below the county's median household income. The overrepresentation of white and lower-income riders in the survey compared to the county's demographic trends suggests potential non-response bias, particularly underrepresenting the increasing Hispanic and Asian populations.

Table 5.2. The Characteristics of MCTS Customer Survey Participants through 2020 to 2022

	All Participants	Participants between 18-64	Participants over 65

[14] The median household income in Milwaukee County was from the American Community Survey's 2088-2012 5-year estimates. See U.S. Census Bureau quick facts: Milwaukee County, Wisconsin. https://www.census.gov/quickfacts/fact/table/milwaukeecountywisconsin/INC910222#INC910222

	No.	%	No.	%	No.	%
Age						
18 to 24	332	9.51%	--	--	--	--
25 to 34	739	21.16%	--	--	--	--
35 to 44	655	18.76%	--	--	--	--
45 to 54	539	15.44%	--	--	--	--
55 to 64	651	18.64%	--	--	--	--
65 or over	549	15.72%	--	--	--	--
Refused	27	0.77%	--	--	--	--
Driver's License						
Yes	2,442	69.93%	2,031	81.47%	411	74.86%
No	1,050	30.07%	912	36.58%	138	25.14%
Race						
White	2,172	62.20%	1,726	58.65%	446	81.09%
African American	666	19.07%	609	20.69%	57	10.36%
Hispanic	233	6.67%	226	7.68%	7	1.27%
Asian	104	2.98%	97	3.30%	7	1.27%
Native American	54	1.55%	51	1.73%	3	0.55%
Pacific Islander	11	0.32%	11	0.37%	0	0.00%
Other	252	7.22%	222	7.54%	30	5.45%
Educational Attainment						
Lower than High School	122	3.49%	116	3.94%	6	1.09%
High School Diploma or Equivalent	542	15.52%	485	16.48%	57	10.38%
Some College or associate's degree	1,206	34.54%	1,018	34.59%	188	34.24%
Bachelor's Degree	1,037	29.70%	872	29.63%	165	30.05%
Postgraduate	543	15.55%	417	14.17%	126	22.95%
Refused	42	1.20%	35	1.19%	7	1.28%
Income						
Less than $25,000	839	24.03%	716	24.33%	123	22.40%
$25,000 to $34,999	444	12.71%	386	13.12%	58	10.56%
$35,000 to $49,999	465	13.32%	404	13.73%	61	11.11%
$50,000 to $74,999	476	13.63%	392	13.32%	84	15.30%
$75,000 to $99,999	302	8.65%	255	8.66%	47	8.56%
More than $99,999	347	9.94%	312	10.60%	35	6.38%
Other	619	17.73%	478	16.24%	141	25.68%
Employment Status						
Working full-time	1,874	53.67%	1,804	61.30%	70	12.75%
Working part-time	522	14.95%	461	15.66%	61	11.11%
Not employed	291	8.33%	279	9.48%	12	2.19%
Student	128	3.67%	127	4.32%	1	0.18%
Retired	563	16.12%	162	5.50%	401	73.04%
Prefer not to respond	114	3.26%	110	3.74%	4	0.73%

Note: The sample size for all participants is 3,492, including 2,943 participants aged between 18-64 and 549 participants aged over 65.

Table 5.3 shows the trip characteristics of all MCTS survey participants. Older adult participants (66%) were more likely to have more than 15 years of experience riding MCTS buses when compared to participants aged between 18-64 (40%). However, this might be that the participants in the younger group were too young to have 15 years of riding experience. When we look at people with 3-5 years of riding experience, there were nearly 18% of participants that were aged between 18-64 and the percentage in this category for senior riders was around 7%. Older

adults were more likely to ride public transit for shopping (18%), medical-related visits (16%), and especially for social and recreational trips (23%) while other participants were more likely to commute for work via public transit (55%), followed by traveling by public transit for social and recreational activities (16%). Again, this could be that most participants who were over 65 years old were retired and they were much less likely to commute to work when compared to people who were between 18-64 years old. Interestingly, over half of participants who were between 18-64 years old (68%) and senior participants (62%) shared that they did have some forms of alternative travel modes to public transit available to them, but they still chose to ride public transit. These findings corroborate some of the findings from Bezyak's 2020 study regarding the demographic and socioeconomic characteristics of most US public transit user (who were white, had higher than high school degrees, and were from households with lower annual income). However, it is also important to note that people who participated in the surveys were more likely to be long time public transit riders so that they would have more interested in how MCTS could improve their service quality. Moreover, since the surveys were conducted online, the opinion of people who had limited or no access to the Internet was not captured or represented in the surveys.

Table 5.3. MCTS Survey Participant's Trip Characteristics

	All Participants		**Participants between 18-64**		**Participants over 65**	
	No.	%	No.	%	No.	%
Years of Riding MCTS Buses						
Less than 1 year	301	8.62%	255	8.67%	46	8.38%
1-2 years	311	8.91%	298	10.13%	13	2.37%
3-5 years	557	15.95%	518	17.61%	39	7.10%
6-9 years	395	11.31%	362	12.30%	33	6.01%
10-14 years	331	9.48%	304	10.33%	27	4.92%
15 or more years	1,520	43.53%	1,157	39.33%	363	66.12%
Don't know	77	2.21%	49	1.67%	28	5.10%
Primary Trip Purpose						
Work	1,725	49.40%	1,619	55.03%	106	19.31%
Child Care	27	0.77%	26	0.88%	1	0.18%
Shopping	293	8.39%	193	6.56%	100	18.21%
School	213	6.10%	210	7.14%	3	0.55%
Medical	256	7.33%	170	5.78%	86	15.66%
Social or Recreational Activities	584	16.72%	456	15.50%	128	23.32%
Other	394	11.28%	269	9.14%	125	22.77%

Primary Reason for Riding the Bus						
Rarely/never have alternate choices to the bus	747	21.39%	637	21.65%	110	20.04%
Have some alternative choices available but choose to use the bus	1,009	28.89%	881	29.95%	128	23.32%
Have alternative choices most of the time but choose the bus for most trips	515	14.75%	444	15.09%	71	12.93%
Have alternative choices for all the trips, but choose to use the bus	817	23.40%	676	22.98%	141	25.68%
Not sure	404	11.57%	305	10.37%	99	18.03%

Note: The sample size for all participants is 3,492, including 2,943 participants aged between 18-64 and 549 participants aged over 65.

5.5.2 Binary logit models of MCTS customers' travel satisfaction

This study used two binary logit models to examine and compare what impacts younger MCTS survey participants' and older adult participants' travel satisfaction through 2020 to 2022. The dependent dummy variable indicates whether a survey participant is satisfied with a specific transit service MCTS provided or not. The explanatory variables included for the binary logit models were dummy variables representing MCTS survey participants' demographic and socioeconomic characteristics, as well as those representing the qualities of MCTS transit services that impact rider's satisfaction. The variables representing the MCTS transit service qualities are in four categories: transit service and information accessibility, service reliability, the comfort level of the ride, and the attitude of drivers (see Table 5.4). To test for multicollinearity in the models, VIFs for the explanatory variables included in the model were calculated, and the VIFs for all explanatory variables in both models were less than five (see Table 5.5). This suggests that the set of explanatory variables did not suffer from multicollinearity.

Table 5.4. The Characteristics of Dependent and Explanatory Variables

	Participants between 18-24				**Participants over 65**			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Dependent Variable								
Satisfaction level with MCTS transit services [2]	0.78	0.42	0.00	1.00	0.77	0.42	0.00	1.00
Demographic and Socioeconomic Characteristics								
Sex (Male: 1, Female: 0)	0.48	0.50	0.00	1.00	0.52	0.50	0.00	1.00
Disability status (Yes: 1, No: 0)	0.16	0.37	0.00	1.00	0.25	0.43	0.00	1.00
Employment status (Employed: 1, Other: 0)	0.80	0.40	0.00	1.00	0.24	0.43	0.00	1.00
Income (More than $50,000: 1, Other: 0)	0.39	0.49	0.00	1.00	0.41	0.49	0.00	1.00
Higher than high school degree (Yes: 1, No:0)	0.79	0.40	0.00	1.00	0.88	0.32	0.00	1.00
Driver's license (Yes: 1, No: 0)	0.69	0.46	0.00	1.00	0.75	0.43	0.00	1.00

Years of riding public transit (More than 5 years: 1, Other: 0)	0.63	0.48	0.00	1.00	0.81	0.39	0.00	1.00
Transit Service and Information Accessibility[3]								
Distance from home to nearest bus stop[4]	0.16	0.36	0.00	1.00	0.14	0.35	0.00	1.00
The ease of understanding information on the website	0.81	0.39	0.00	1.00	0.80	0.40	0.00	1.00
The information provided by MCTS Customer Service by call or email	0.80	0.40	0.00	1.00	0.81	0.40	0.00	1.00
The ease of getting detour/route change information	0.67	0.47	0.00	1.00	0.69	0.46	0.00	1.00
Service Reliability[3]								
The buses not being late	0.69	0.46	0.00	1.00	0.77	0.42	0.00	1.00
The buses not being early	0.71	0.45	0.00	1.00	0.74	0.44	0.00	1.00
The Comfort Level of the Ride[3]								
Seat availability	0.90	0.30	0.00	1.00	0.91	0.29	0.00	1.00
Cleanliness of the bus	0.76	0.43	0.00	1.00	0.80	0.40	0.00	1.00
Cleanliness of the bus shelters	0.55	0.50	0.00	1.00	0.54	0.50	0.00	1.00
The presence of adequate security measures	0.78	0.41	0.00	1.00	0.80	0.40	0.00	1.00
Perception of your own personal safety[4]	0.92	0.27	0.00	1.00	0.93	0.26	0.00	1.00
Attitudes of Drivers[3]								
How safely they drive the bus	0.89	0.32	0.00	1.00	0.91	0.28	0.00	1.00
How friendly drivers are	0.80	0.40	0.00	1.00	0.83	0.37	0.00	1.00
How good the drivers are at accommodating passengers	0.86	0.35	0.00	1.00	0.89	0.31	0.00	1.00
How often the drivers know the answers to people's questions	0.85	0.36	0.00	1.00	0.86	0.34	0.00	1.00

Note:

1. The sample size for all participants is 3,492, including 2,943 participants aged between 18-64 and 549 participants aged over 65.
2. The MCTS survey has a question asking participants to rate their overall services from on a scale of 4 (1 for does not meet my needs, 2 for nearly meets my needs, 3 for meets my needs, and 4 for exceeds my needs. The survey also used the value of 98 for participants to choose from if they did not have an answer for this question. For this study, I used the following coding schemes: 0 for1 and 2 as not satisfied, 1 for 3 and 4 as satisfied. For values that were 98, they were converted to NAs.
3. Unless noted otherwise, the dummy variables representing MCTS transit service qualities are coded as: it meets my needs: 1, it does not meet my needs or other: 0.
4. The coding for the dummy variable representing the distance from rider's home to the near bus stop: more than ½ mile (approximately 4 blocks): 1, less than ½ mile (approximately 4 blocks): 0.
5. The coding for the dummy variable representing the perception of a rider's personal safety: feeling neutral to very safe: 1, feeling not safe at different degrees: 0.

Table 5.5. VIF Values Calculated for Potential Explanatory Variables for the Binary Logit Models

	VIF Values		Status
	Participants between 18-64	Participants over 65	
Demographic and Socioeconomic Characteristics			
Sex (Male: 1, Female: 0)	1.01	1.18	Yes
Disability status (Yes: 1, No: 0)	1.10	1.39	Yes
Employment status (Employed: 1, Other: 0)	1.12	1.32	Yes
Income (More than $50,000: 1, Other: 0)	1.21	1.53	Yes
Higher than high school degree (Yes: 1, No:0)	1.14	1.40	Yes
Driver's license (Yes: 1, No: 0)	1.19	1.68	Yes
Years of riding public transit (More than 5 years: 1, Other: 0)	1.12	1.25	Yes
Transit Service and Information Accessibility[3]			
Distance from home to nearest bus stop[4]	1.03	1.24	Yes
The ease of understanding information on the website	1.22	1.45	Yes
The information provided by MCTS Customer Service by call or email	1.28	1.40	Yes
The ease of getting detour/route change information	1.27	1.61	Yes
Service Reliability[3]			
The buses not being late	1.25	1.88	Yes
The buses not being early	1.24	1.86	Yes
The Comfort Level of the Ride[3]			
Seat availability	1.10	1.31	Yes
Cleanliness of the bus	1.20	1.55	Yes
Cleanliness of the bus shelters	1.22	1.34	Yes
The presence of adequate security measures	1.19	1.48	Yes
Perception of your own personal safety[4]	1.09	1.44	Yes
Attitudes of Drivers[3]			
How safely they drive the bus	1.17	1.33	Yes
How friendly drivers are	1.41	2.06	Yes
How good the drivers are at accommodating passengers	1.54	2.37	Yes
How often the drivers know the answers to people's questions	1.41	2.00	Yes

Note:

1. The sample size for all participants is 3,492, including 2,943 participants aged between 18-64 and 549 participants aged over 65.
2. The MCTS survey has a question asking participants to rate their overall services from on a scale of 4 (1 for does not meet my needs, 2 for nearly meets my needs, 3 for meets my needs, and 4 for exceeds my needs. The survey also used the value of 98 for participants to choose from if they did not have an answer for this question. For this study, I used the following coding schemes: 0 for1 and 2 as not satisfied, 1 for 3 and 4 as satisfied. For values that were 98, they were converted to NAs.

3. Unless noted otherwise, the dummy variables representing MCTS transit service qualities are coded as: it meets my needs: 1, it does not meet my needs or other: 0.
4. The coding for the dummy variable representing the distance from rider's home to the near bus stop: more than ½ mile (approximately 4 blocks): 1, less than ½ mile (approximately 4 blocks): 0.

The coding for the dummy variable representing the perception of a rider's personal safety: feeling neutral to very safe: 1, feeling not safe at different degrees: 0.

In general, there is little difference between the satisfaction level of participants that were aged between 18-64 and senior participants (see Table 5.6). Senior participants were more satisfied with higher comfort level of the ride and better attitudes of the bus drivers (The model results showing the comparison between participants of all ages and these who were over 65 showed similar results, see Appendix F for the details). The satisfaction with MCTS transit services is more negatively associated with riders with the following characteristics regardless of age: being male, having a form of disability, of higher income levels, not employed, having higher than high school degrees, and having a valid driver's license. Moreover, only the impacts of income and educational attainment levels are statistically significant for participants that were aged between 18-64. In other words, all else equal, for participants aged between 18-64, the odds of being satisfied with MCTS transit services of those with higher than high school degree are 42% lower than their counterparts. Similarly, the odds of being more satisfied with MCTS transit services of those whose income is higher than $50,000 are 34% lower than their counterparts. It could be that for younger transit riders with higher educational attainments and income levels, they might have other travel modes (such as access to a private car) available to them that are more reliable and flexible compared to public transit (Abenoza et al., 2017). For senior transit rider's travel satisfaction with MCTS transit services, the impact of having a valid driver's license is the only variable among the demographic and socioeconomic characteristics that is statistically significant. For senior riders with a valid driver's license, their odds of being satisfied with MCTS transit services are 89% lower than their counterparts. This may indicate that public transit was not their only or primary travel option, and they might be more critical about public transit services as drivers. However, the impact of years

of riding public transit is different on participants that were aged between 18-64 and senior participants; the odds of senior participants being satisfied with MCTS transit services were higher as they have more years of experience riding public transit while it is the opposite for participants that were aged between 18-64. This could be that first, people aged between 18-64 were less likely to have very long experiences with public transit when compared to senior riders. Then, it is also possible that when people have more experiences of riding public transit, they are more familiar with how public transit operates and would adjust their expectations accordingly.

When it comes to accessibility, when travel information and bus stops are more accessible, the odds of travelers being satisfied with MCTS transit services are higher. Notedly, while the impacts of explanatory variables in this category are all significantly and positively related to the travel satisfaction of participants that were aged between 18-64, only the impacts of information regarding change of routes and online information accessibility are significant for senior travelers. This could be those participants between 18 and 64 had better access to smartphones and the Internet, which could make accessing such information easier than for senior travelers who might be less tech-savvy. For younger transit riders, as route change information and online travel information became more accessible, their odds of being satisfied were much higher. For senior riders, the easiness of getting travel information had a higher contribution to their satisfaction with public transit. Regardless of age, the odds of being satisfied with MCTS transit services are significantly related to service reliability – especially with on-time arrival of the bus. This is extremely important for senior riders, whose odds of being satisfied are much higher (900% higher) when buses are not late. Compared to buses being late, the impact of buses arriving earlier than the scheduled time was positively associated with the younger riders' satisfaction with public transit but negatively associated with that of senior rides', but neither were statistically significant.

The impacts from the perspective of comfort level of the ride were more statistically significant on a traveler's satisfaction with public transit for participants that were aged between 18-64 than that of senior participants. First, regardless of age, the odds of a traveler being satisfied with MCTS transit services are much higher when they feel safe and secure riding public transit, though the perception of personal security is not statistically significant for senior participants. For participants that were aged between 18-64, clean buses (46% higher) and bus shelters (30% higher) are more significantly related to higher odds of being satisfied with MCTS transit services, while neither were significantly related to higher odds of being satisfied with MCTS transit services for senior participants. For participants of all ages, the odds of them being satisfied with public transit were significantly higher when the drivers were knowledgeable (61% for younger public transit riders and 223% for senior public transit riders). Whether the drivers drove safely, were friendly, and were accommodating's impact were not statistically significant on public transit riders who were between 18-64 years old. However, senior participants were more concerned about the attitude of drivers when it comes to their travel satisfaction with MCTS transit services. For them, the odds of being satisfied with riding the bus were significantly higher for them when the drivers drove the buses safely (over 1,000%) and were friendly (over 300%). As for the friendliness of the drivers, senior public transit riders may rely more on obtaining travel information than their younger counterparts who were more likely to be tech-savvy, friendlier drivers would make it easier for them to ask for travel information, and thus would have positive contributions to their travel satisfaction with public transit.

Table 5.6. Binary Logit Models Results

	Participants between 18-64					Participants over 65				
	Estimate	SE	z value	Sig.	Odds Ratio	Estimate	SE	z value	Sig.	Odds Ratio
Constant	-2.282	0.419	-5.451	***	11.176	3.483	1.984	1.755	*	32.566
Demographic and Socioeconomic										
Sex (Base: Female)										
Male	-0.021	0.141	-0.150		0.979	-0.297	0.501	-0.592		0.743
Disability (Base: Has no disability)										
Has a disability	-0.006	0.183	-0.030		0.994	-0.433	0.561	-0.772		0.649
Income level (Base: Less than $50,000)										
More than $50,000	-0.419	0.159	-2.637	***	0.657	-0.527	0.576	-0.916		0.590
Employment status (Base: Not employed)										
Employed	0.096	0.187	0.514		1.101	0.228	0.574	0.397		1.256
Educational attainment (Base: Lower than high school degree)										
Higher than high school degree	-0.545	0.199	-2.744	***	0.580	-1.062	0.981	-1.083		0.346
Driver's license (Base: Has no driver's license)										
Has a driver's license	-0.077	0.167	-0.458		0.926	-2.187	0.756	-2.893	***	0.112
Year of riding public transit (Base: Less than 5 years)										
More than 5 years	-0.207	0.156	-1.332		0.813	0.137	0.748	0.183		1.147
Transit Service and Information Accessibility										
Distance to nearest bus stop (Base: Less than 1/2 miles)										
More than 1/2 miles	-0.514	0.181	-2.839	***	0.598	-0.538	0.663	-0.812		0.584
The ease of getting detour/route change information (Base: Not accessible)										
Information is accessible	0.517	0.156	3.314	***	1.678	1.519	0.554	2.743	***	4.567
The information provided by MCTS Customer Service by call or email (Base: Not accessible)										
Information is accessible	0.724	0.176	4.103	***	2.063	0.552	0.611	0.904		1.737
The ease of understanding information on the website (Base: Not accessible)										
Information is accessible	0.475	0.179	2.646	***	1.608	1.082	0.602	1.797	*	2.950
Service Reliability										
The buses not being late (Base: The bus is late)										
The buses not being late	1.079	0.158	6.813	***	2.943	2.306	0.676	3.409	***	10.035
The buses not being early (Base: The bus is early)										
The buses not being early	0.274	0.162	1.694		1.315	-0.441	0.717	-0.616		0.643
The Comfort Level of the Ride										
Seat availability (Base: Seats unavailable)										
Seat available	0.279	0.206	1.354		1.322	-0.924	1.024	-0.902		0.397
Cleanliness of the bus (Base: The bus is not clean)										
The bus is clean	0.380	0.164	2.320	**	1.462	-0.497	0.670	-0.742		0.608
Cleanliness of the bus shelters (Base: The bus shelter is not clean)										
The bus shelter is clean	0.283	0.157	1.804	**	1.327	0.581	0.532	1.091		1.788
The presence of adequate security measures (Base: Inadequate security measures)										
Adequate security measures	0.273	0.167	1.633		1.313	1.002	0.604	1.659	*	2.724

Perception of your own personal safety (Base: Do not feel safe)										
Feel safe	0.756	0.224	3.382	***	2.130	1.227	0.926	1.326		3.413
Attitudes of Drivers										
How safely they drive the bus (Base: They do not drive safely)										
They drive safely	0.306	0.200	1.535		1.359	2.468	0.923	2.674	***	11.794
How friendly the drivers are (Base: They are not friendly enough)										
The drivers are friendly	0.223	0.186	1.202		1.250	1.492	0.792	1.884	*	4.447
How good the drivers are at accommodating passengers (Base: The drivers are not accommodating)										
The drivers are accommodating	0.035	0.210	0.168		1.036	-0.923	0.934	-0.988		0.397
How often the drivers know the answers to people's questions (Base: The drivers are not knowledgeable)										
The drivers are knowledgeable	0.478	0.198	2.407	**	1.613	1.173	0.799	1.469		3.232
Model Fit										
AIC	1,346.00					170.88				
No. of observations	1,686					234				

Note: *p<0.1; **p<0.05; ***p<0.01

5.6 Discussion

This chapter examines MCTS bus riders' travel satisfaction with the transit services MCTS provides, especially that of bus riders who are older adults. In general, senior public transit riders mirror certain aspects of the national profile of public transit riders: they are most likely to be white, of lower income levels, employed, and have higher than high school degrees (Bezyak, 2020). However, it is also these transit riders who are less likely to be satisfied with public transit. In the meantime, transit riders who are female, do not have a form of disability, have a job, and do not have a valid driver's license have higher odds of being satisfied with public transit. This may be that female are more likely to ride public transit and have more experience riding public transit (Tran et al., 2022; Yang, 2018), their familiarity with public transit may contribute to a higher level of tolerance of transit services as they use public transit significantly more than male riders for their daily routine (Tran et al., 2022). Policymakers and transit agencies should focus more on accommodating male older adults when they cease driving as they are less familiar with public transit, they may find learning to ride public transit frustrating and have a higher chance of suffering from social isolation. Moreover, any forms of disability would make it difficult for an individual to travel outside their homes; and for people with mobility related disability, they are more likely to consider public transit as the last resort and seldom use it (LaPlante & Kaye, 2010). In other words, they are less familiar with riding public transit and have very limited access to accommodating paratransit services (LaPlante & Kaye, 2010), making it difficult for them to be used to and like riding with public transit. Transit agencies, especially those in areas that are less urban should consider how to establish a transit system that would greatly help people with different forms of disability travel outside their homes easily.

Like most public transit riders, older adults who are transit riders in Milwaukee County also prefer transit services with easy access to bus stops and travel information, reliable buses that follow travel schedules, well-maintained buses, as well as drivers who are friendly, courteous, and with safe driving habits. However, it is important to note that if they still have a valid driver's license, their chances of being satisfied with public transit are much lower than their counterparts. This may be that senior public transit riders who still have a valid driver's license are more likely to be male (Rosenbloom and Herbel, 2009), who have been the designated drivers of their households most of the time (Hough et al., 2008), and thus may not be frequent bus riders as female senior transit riders. For them, the disparity between the experiences of driving a private car to travel at any given time and sharing a public space with other passengers on a set schedule is so distinctively clear that it would reduce their travel satisfaction level with public transit. The nuances of the travel experiences with public transit could hardly be captured by surveys alone, as these tools may overlook the emotional and psychological factors influencing travel satisfaction (Clifton & Handy 2001). Future research should use research methods such as interviews to further investigate the detailed and subjective experiences of transit riders. I addressed these aspects of older adults who were public transit riders using MCTS transit services in greater detail in the following chapters through semi-structured interviews with questions partially informed by this study. Moreover, this would require policymakers and transit agencies to establish outreach programs to educate and encourage older adults to get more familiar with available transportation options around them beside driving themselves, making the potential transition from driving to using different forms of public transit easier for senior drivers. For senior riders, travel information accessibility through contacting transit agency's customer service is more likely to determine how satisfied they are with public transit. It may be that some older adults are less tech-savvy than their

younger counterparts and have limited access to computers and smartphones for travel information. Though transportation providers are creating online access of travel information to make it more accessible and available for everyone, it is also important to ensure that people who access travel information through more traditional medium (such as printed bus schedules at bus stops as well as timely updates) can still have access to it.

Additionally, older adults who are transit riders are more likely to be satisfied with buses that follow travel schedules in Milwaukee County. First, senior riders might spend more time walking to the bus stops than younger riders, especially in winter when the sidewalks are icy and/or snowy. Then, sheltered bus stops would make most transit riders feel more secure and at ease when waiting for the buses (Wong et al., 2017, 2018); but not all bus stops in Milwaukee County are sheltered, which would make it less pleasant for riders to wait for late buses. Thus, it is important for transit agencies to ensure on time and reliable services. At the same time, transit agencies should improve their comfort levels so that all transit riders could be more satisfied with their services. These could be achieved by working together with local governments to fix broken sidewalks, keep the sidewalks dry and safe to walk during winter times, as well as provide more sheltered bus stops (this could also be partnership opportunities with local businesses). Most importantly, senior riders are much more likely to be satisfied with public transit when the drivers are friendly and drive safely. This may be related to the fact that most transit agencies' focus on improving online travel information accessibility, when senior riders have limited access to online travel information, how knowledgeable and friendly the bus drivers are would greatly determine their travel experience and satisfaction as senior transit rides may rely on the drivers for accurate information. Transit agencies should incorporate rider's feedback into developing and improving their training systems for their bus drivers so that they are knowledgeable about the most-up-date

route information as well as related updates. Lastly, driver's safe driving habits has significantly higher influence on senior transit rider's travel satisfactions with public transit. Senior riders might be more aware of their physical conditions than younger public transit riders, safe driving behavior would make them feel more secure and protected (Fellesson & Friman, 2012). Therefore, transit agencies should provide safe driving training programs to their operators, as well as implementing regular evaluations and monitoring on operators' driving patterns to ensure that they are operating safely.

5.7 Conclusion

This chapter highlights the travel satisfaction of MCTS bus riders with a focus on older adults. The study confirms certain aspects of public transit riders' national profile as being predominantly white, lower income, employed, and educated beyond high school; but they are generally less satisfied with public transit. In contrast, female riders, individuals without disabilities, employed persons, and those without a valid driver's license report higher satisfaction. This difference likely stems from greater familiarity and reliance on public transit among these groups. Older adult riders in Milwaukee County prefer services with accessible bus stops, reliable schedules, well-maintained buses, and courteous drivers with safe driving habits. However, senior riders with valid driver's licenses, typically male and former household drivers, are less satisfied. Thus, addressing the needs of male older adults is crucial, as they may find transitioning from driving to public transit challenging, potentially leading to frustration and social isolation. In the meantime, creating an inclusive transit system that accommodates various disabilities, ensuring accessible travel information to all groups of riders through various media, maintaining reliable and safe services, and providing effective and efficient training for drivers are all essential to

enhance their traveling experiences of and overall travel satisfaction with public transit, as well as fostering a more positive perception of public transit.

6 Barriers and Challenges that Older Adults Face while Using Public Transit

6.1 Introduction

In this chapter, I conducted and analyzed 30 semi-structured interviews with senior MCTS transit riders to explore the barriers and challenges they encounter in Milwaukee County. I found that travel information accessibility and bus stop accessibility are very important to them as they have limited access to the Internet. Further, sidewalks in bad condition make walking to the bus stops more difficult for them. Reckless driving is becoming a serious concern for senior transit riders as it makes being a pedestrian less safe. Other than that, safety and personal security with public transit is a very gendered experience for senior transit riders in Milwaukee County: female senior riders are more likely to worry about their personal safety while waiting and riding the bus than male senior riders. Transit agencies should work closely with local governments and DOTs to establish effective measures with transit riders' feedback to provide a safe travel environment for everyone.

6.2 Literature Review

Researchers in European countries have pointed out that a significant number of older adults who are less experienced with public transit would give up out-of-home activities when they cannot drive themselves anymore (Johnson et al., 2017). Older adults living in rural Northern Ireland lack sufficient public transit, and their traveling demands are usually met by community transport (Hagan, 2020). Hagan (2020) also noticed that older adults' travel satisfaction is positively related to experiences with using community transport as well as being able to socialize with others on the ride. Less satisfying public transit for rural elderly transit riders is usually associated with inflexible schedule and limited access to healthcare providers (Ahern & Hine, 2012).

Older adults in the UK consider public transit as an important travel mode for their travel demands; they are more satisfied when the networks could provide more social and leisure opportunities but less satisfied when services are unreliable (Graham et al., 2018). Older adults in a transit-oriented city like London feel recognized by society and satisfied with their public transit trips with reduced fares and higher bus stop density; but those who have been lifetime drivers or are males are less likely to use public transit regardless of the quality of service (Jones et al., 2013; Schmöcker et al., 2008). In Germany and Sweden, older adults are satisfied with comfortable and reliable services that help them meet their daily and emergency travel demands (Kersting et al., 2021; Wretstrand et al., 2009). Swedish older adults are frequent public transit riders, men are more satisfied with public transit than women, but they are less satisfied when the walking distance and waiting times are too long, or the transit system is too complex to understand (Wretstrand et al., 2009). Like public transit riders in other countries, people in Greece and Norway appreciate extensive, reliable, and frequent public transit services as well as comfortable experiences throughout their trips (Nordbakke & Schwanen, 2015; Tyrinopoulos & Antoniou, 2008).

Transit quality, service accessibility, and the availability of travel options are significant to travel satisfaction and quality of life (Cao, 2013; Makarewicz & Németh, 2018; Mattson et al., 2021; Pfeiffer et al., 2020). Yet, in most North American cities, automobile-dependent planning policies have crippled the building of robust public transit infrastructures and the ability for people to choose other travel modes other than driving (Cervero et al., 2017; Walker, 2014). Indeed, Zhu & Fan (2018) have found that, in the US, public transit is always related to negative impressions and is the least satisfying travel mode. Older adults' travel satisfaction with public transit is negatively related to the walking distance to stops; but the significance level varies geographically (Hess, 2009, 2012). Rural female older adults in North Dakota tend to drive less than males,

therefore, finding other travel modes is more challenging for them when public transit services are very limited and inaccessible (Hough et al., 2008). In Hamilton, Canada, Ravensbergen et al. (2021) have found that older adults transit riders require more effort to understand the schedules, plan the trip, as well as board and alight the bus than younger and/or able-bodied persons. One of their major barriers to using public transit is a lack of confidence, therefore, the experiences and skills required to use public transit are as important as the quality of the services to their travel satisfaction (Ravensbergen et al., 2022).

6.3 Research Question

This chapter explores how well MCTS transit services meet the needs of older adults who are transit riders in Milwaukee County. Specifically, through in-depth interviews with questions informed by existing literature and analysis results from the previous chapter, I ask the following question: what are the specific barriers and challenges older adults who are transit riders face in Milwaukee County?

6.4 Data and Methodology

6.4.1 Data

To explore the detailed travel experiences of older adults who are public transit users, older adults (65 years of age or older) who live in Milwaukee County and have used MCTS public transit or paratransit services in the past month before the interview were invited to participate in the study. Participants were recruited between March to May 2023 through senior centers, local public transit providers, as well as community outreach programs that provide free transportation options for qualifying older adults.

Table 6.1 The Profiles of Interview Participants

Age	Race	Gender	Employment Status	Zip	Years of Riding Transit
65	African American	Male	Retired	53218	1-4 years
65	African American	Male	Unemployed	53206	1-4 years

65	African American	Female	Employed	53211	5-10 years
71	African American	Female	Retired	53206	over 10 years
71	African American	Female	Retired	53209	1-4 years
73	African American	Female	Employed	53206	Under 1 year
73	African American	Female	Retired	53206	1-4 years
77	African American	Male	Prefer not to answer	53212	over 10 years
82	African American	Female	Retired	53206	1-4 years
65	Asian	Male	Retired	53202	over 10 years
66	White	Female	Employed	53219	over 10 years
69	African American	Female	Retired	53211	over 10 years
70	Prefer not to answer	Male	Retired	53202	over 10 years
71	White	Female	Prefer not to answer	53211	over 10 years
72	White	Female	Retired	53211	over 10 years
72	African American	Female	Retired	53212	over 10 years
74	White	Female	Retired	53211	5-10 years
75	White	Female	Retired	53211	over 10 years
76	White	Female	Retired	53211	over 10 years
78	White	Female	Retired	53202	5-10 years
65	African American	Female	Unemployed	53216	1-4 years
69	White	Female	Retired	53202	5-10 years
71	African American	Male	Employed	53216	over 10 years
72	African American	Female	Prefer not to answer	53205	over 10 years
74	African American	Female	Retired	53216	1-4 years
67	African American	Male	Retired	53212	5-10 years
71	Asian	Female	Retired	53222	over 10 years
74	African American	Female	Retired	53212	1-4 years
75	African American	Female	Retired	53216	over 10 years
86	White	Female	Employed	53202	over 10 years

Overall, thirty qualifying older adults were recruited and interviewed for this study (See Table 6.1 for participant profiles, and Table 6.2 for the descriptive characteristics of participants). Participants participated in semi-structured interviews during May and June 2023. The interviews covered their detailed trip experiences with public transit from planning to returning home, barriers and challenges experiences at different stages of their trips and public transit's contribution to their wellbeing.

Table 6.2. Research Participant Characteristics

	Number	Percentage
Age		

	Between 65 and 69	9	30%
	Between 70 and 74	14	47%
	Between 75 and 79	5	17%
	Between 80 and 85	1	3%
	Over 85	1	3%
Gender			
	Female	23	77%
	Male	7	23%
Race			0%
	White	9	30%
	Black[1]	18	60%
	Asian	2	7%
	No answer	1	3%
Employment Status			
	Employed	5	17%
	Retired	20	67%
	Unemployed	2	6%
	No answer	3	10%

Note:

1. To address the potential non-response bias associated with Black participants in the surveys analyzed in previous chapters, the increased representation of Black individuals in the interview sample in this chapter could be beneficial better reflect their experiences and perspectives.

6.4.2 Semi-structured interviews

Several studies that focused on the travel experiences of older adults using interviews have recruited interviewees through paratransit providers (Hagan, 2020), community and charitable organizations (Cochran, 2020; Jones et al., 2013; Ravensbergen et al., 2021, 2022), clinical centers and public transit stations (Wong et al., 2017). Thus, this research recruited research participants through organizations such as senior centers serving older adults in Milwaukee County as well as religious institutions. Further, Research solicitations were first sent out through email contacting organizations and institutions for inquiries on whether they have senior members that use public transit or varying types of paratransit to attend their events and participate in their services. Meanwhile, follow-up emails were sent for approvals from directors of responding organizations and institutions to interview their participants on their travel experiences with the MCTS public

transit services. For organizations and institutions that permitted the research, detailed messages of recruitment were distributed through their' communication channels, social media, and printed flyers from January to March 2023. Moreover, I asked responding directors of organizations and institutions whether I could attend their events to explain my research to their members and answer possible questions they may have regarding the research. By doing so, I recruited 30 qualifying research participants for this study.

The scope of the semi-structured interview covered detailed trip experiences via public transit from planning to returning home, barriers and challenges experienced at different stages of using public transit, public transit's contribution to their wellbeing, expectations of services that public transit should provide, and their perceptions of being a transit rider. The interview questions used to explore senior transit riders' experiences with MCTS services in Milwaukee County are displayed in Table 6.3.

Table 6.3. Semi-structured Interview Guide Questions

Topic	Questions
Travel experiences with public transit	• To start with, I'd like to know your travel experiences with the MCTS services. Can you tell me: How often do you use the buses? How do you usually use the buses?
Barriers and challenges faced while using public transit	• Can you tell me when and where do you find it difficult for you to use transit?
Public transit's contribution to wellbeing	• So can you tell me how public transit helps you with your life? And how do you feel when it cannot?
Expectations of public transit	• What improvements would really make transit more convenient for you?
Perceptions of being a transit rider	• How do you feel as a transit rider in general?

Note: the interview guide questions are structured based on guidelines from Braun & Clarke's 2013 book: *Successful Qualitative Research: A Practical Guide for Beginners* and examples provided by Creswell & Plano Clark (2011). See Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners*. SAGE. Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed). SAGE Publications.

Follow-up questions were asked when a participant mentioned certain subjects that fit into the findings from the existing literature (see Table 6.3 for potential follow-up questions that may be asked of interviewees regarding their responses). The follow-up questions were summarized

and generated based on findings from existing literature, they may not cover every aspect of the travel experiences of older adults who are public transit riders or specific aspects that are unique to Milwaukee County. Thus, when uncommon themes and subjects that were not included in the guiding question framework were mentioned during the interviews by the interviewees, I asked specific probing questions regarding the themes that have been brought up. Given the importance and frequency of the uncommon and unique themes, as well as how they impact and contribute to the understanding of senior transit riders' detailed travel experiences in Milwaukee County, I added certain themes to the guiding question framework for later interviews as well as for theory-building in my analyses (note that since these themes evolved as the interviews went, they were not consistently asked of or answered by all participants). Though this research did not study specifically how the COVID-19 pandemic impacted older adults' travel-related wellbeing, interviewees were likely to mention barriers and challenges brought by the pandemic in that its impacts were more recent to them. In order to better understand and distinguish the barriers and challenges older adults faced while using public transit and the contribution of the public health emergency to such barriers and challenges, I asked the interviewees not only how the COVID-19 pandemic influenced their travel with public transit, but also how they compared the barriers and challenges they faced using public transit before and after the pandemic (see Table 6.4 for potential questions regarding the COVID-19 pandemic). Interviews were recorded with the interviewees' consent and interviewees could pause or stop the interview whenever they felt like it.

Table 6.4. Potential Follow-up Questions for Interviewing Older Adults Who are Public Transit Riders

Category	Questions
Mention of technology or other ways to find travel information	• Do you have a smartphone? Do you know and use the transit app to plan for your trip? • Do you often plan your trip back home when you prepare and plan for the trip to go out?

Mention of using different modes for different trips	• Do you feel taking the buses would help you meet your daily needs? • Other than riding the buses, what other ways do you use for out-of-home activities and what are these activities?
Mention difficulties experienced at different stages of using public transit	• What are the things that are challenging for you during your walk to the bus stops? • What do you consider difficult for you to board and get off the bus? • While riding the bus, are there things that worry you?
Mention giving up certain activities because transit is not available or accessible	• Do you have to give up certain activities because of not being able to ride the bus? What kind of activities are they? • Do you have to rely on lifts from other people because you cannot ride the bus? • How do you feel when you have to rely on others for rides?
Mention expectations of services that public transit should provide	• What services do you expect the transit system provides that would make your trips easier? • For services that exist but you are less familiar with, which ones would you want to learn more first?
Mention feelings of being a transit rider	• How do you feel when you wait for the buses at the bus stops? • Compared to drivers, how do you feel as a non-driver while riding buses?
Mention the COVID-19 pandemic or the barriers and challenges they mention seem to be more recent than persistent ones	• Could you show me some examples of how Covid changed your experiences with public transit? • Compared to your experiences riding the buses before Covid, what are some of the biggest changes?

Note: the questions are based on interview questions and findings from existing literature that used interviews to inquire about the travel experiences of older adults or people with disabilities. See Hagan, R. J. (2020). Getting out of the house: The use of community transport as a third place for rural-dwelling older adults. *Ageing and Society*, *40*(11), 2519–2539. https://doi.org/10.1017/S0144686X19000722; Ravensbergen, L., Newbold, K. B., & Ganann, R. (2022). 'It's overwhelming at the start': Transitioning to public transit use as an older adult. *Ageing and Society*, 1–18. https://doi.org/10.1017/S0144686X22000010; Ravensbergen, L., Newbold, K. B., Ganann, R., & Sinding, C. (2021). 'Mobility work': Older adults' experiences using public transportation. *Journal of Transport Geography*, *97*, 103221. https://doi.org/10.1016/j.jtrangeo.2021.103221

6.4.3 Reflexive Thematic Analysis

The interviews were recorded and then transcribed verbatim and analyzed using the MAXQDA software. This study uses Reflexive Thematic Analysis (RTA) to analyze the interview transcripts. RTA is an accessible and flexible approach for researchers to interpret, identify, and analyze themes and patterns from qualitative data (Braun & Clarke, 2012, as cited in Byrne, 2022). Though thematic analysis has been widely used by researchers and scholars in psychology, sociology, public health, communication, psychotherapy, and gender studies (Braun & Clarke, 2022), only a few researchers recently have used it to explore travel behavior and transportation-related research. For example, different thematic analysis methodologies have been used to: explore the hidden motives behind people's travel mode choices (Ashmore et al., 2020);

investigate driver's views and opinions in two cities in Poland and Iran about driver's high-risk behaviors (Shayganmehr et al., 2021); understand consumer's perception of electric vehicles and the barriers to wider adoption of electric vehicles (Krishna, 2021); study the perceptions of parents adopting a new way – escorting their children in groups walking to school – in Bradford, UK (Nikitas et al., 2019); as well as examine commute satisfaction among the University of Wisconsin – Milwaukee campus community (Schneider & Willman, 2019). Thematic analysis provides researchers insights – especially the emotional aspect – of traveler's travel behavior (Krishna, 2021) through the qualitative data collection process and the meaning of the collected data through an active and analytical lens, as well as reflecting on the dominant assumptions while embracing the nuance and complexity of the data (Braun & Clarke, 2022). The transcribed interview data was analyzed through the six iterative phases proposed by Braun & Clarke (2022): the familiarization with data, generation of initial codes, generation of themes, the review of potential themes, define and name themes, and the production of the report.

The entire dataset was coded and labeled interpretively for information interviewees revealed that is related to the research questions. Due to the iterative and nonlinear nature of this process, multiple versions of coding and coding progression were conducted. After the coding process, the codes were interpreted inductively to establish themes that lead to potential answers to the barriers and challenges that senior transit riders in Milwaukee County may face as well as how MCTS contributes to their wellbeing.

6.5 Data Analysis

Older adults who are transit riders in Milwaukee County face a variety of barriers and challenges when they use public transit. Depending on who they are, how long they have been

using transit, and what types of public transit they usually use, their experiences with public transit also contribute differently to their wellbeing.

6.5.1 Barriers and Challenges

Any public transit trip involves more than boarding, riding and alighting the bus. Walker (2014) identifies seven phases of a public transit trip: understanding, accessing at the origin, waiting, paying, riding, connecting (transferring), and accessing at the destination. Participants discussed barriers and challenges they face in four major areas: unavailable and unreachable, safety and peace of mind, passenger care of bus drivers, and shrinking service time and area.

6.5.1.1 Unavailable and Unreachable

Information inaccessibility

As most transit service providers try to improve their information and communication accessibility by integrating online access of their schedule and service change information, it can be less accessible for most senior transit riders. Fewer than 5 interviewees shared that they knew about and used the phone applications to access bus schedules and to check what buses to take when they wanted to go to places that were not on their regular routines. For most of the interviewees who took the buses that were less technology-savvy, they not only needed to memorize the schedules of the buses they frequently took, but they also had to call the bus company's customer service line if they suspected service changes when they were already at the bus stops. One interviewee shared that because the information was mostly available online, people who worked at customer service did not always know answers to their questions and they were sometimes asked to check the website for detailed information. It can get worse for people who were paratransit riders. Though paratransit services rely less on online access for information, it is not easy to call to schedule a non-routine ride or to cancel any rides either. As most paratransit

riders noted, the customer service line was always busy, and they were hardly given enough time to get their requests through. Some paratransit riders shared that it became very stressful when they wanted to schedule a non-routine ride because such requests were most likely not documented. One interviewee shared: *"I called [the paratransit provider] to schedule a ride for the Mother's Day event and they didn't pick me up that morning. I called to ask them why no one came to get me, and they told me I didn't schedule a ride on that day. I definitely did because I really wanted to go [to that event] and I called in advance and they told me they will come and pick me up."* (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week)[15]. Interviewees expressed emotional distress when they encountered barriers to transit information, some also shared that they felt they were forgotten by society, or they became invisible as they age because people *"do not seem to care about us anymore"* (Female, Black, age 70-74, buses and car, over 10 years, 3-5 times a week).

Bus stop inaccessibility

Another common barrier for senior transit riders was inaccessible bus stops caused by winter weather and drivers blocking bus stops. Most senior transit riders shared that bus stops were less accessible in the winter due to snow covered sidewalks and bus stops not being shoveled. Snowy and icy sidewalks can make walking to and from the bus stops very dangerous for senior transit riders, especially those who needed canes or walkers for walking. Some interviewees revealed that they had to leave their homes earlier in the winter because they needed extra time to try to get to the bus stops safely. Unshoveled bus stops were another weather-related barrier for senior transit riders in the winter. Most interviewees shared that the ramps could not reach the sidewalks due to

[15] The description in the parenthesis denotes the characteristics of the respondent where the quote was taken. It describes the sex, race and ethnicity, age range, means of transportation they used at the time of the interview, their years of experiences riding public transit at the time of the interview, as well as how often they use public transit each week unless noted otherwise.

unshoveled snow: *"Well, sometimes the bus stops are not shoveled … So it can be very difficult to board and get off the buses. Yeah, [during the] winter time with, you know, 2 foot of snow there [at the bus stop that was not shoveled]"* (Female, white, age 70-74, buses and car, over 10 years, more than 5 times a week). And they sometimes needed to walk on the streets because the buses were blocked by the snow: *"[Unshoveled bus stops] is a big, that is, a large hindrance for the elderly, because the snow is here [at the bus stop], and the street is over there, and the bus [stopped] on the street [instead of at the bus stop]. So you have to, like walk around [the sidewalk] to the end, you know, get off the sidewalk, and then you walk down [on the street], you know, to the, to the side of the bus, and then you get on the bus."* (Male, Black, age 75-79, buses and car, over 10 years, 3-5 times a week). Bus stops can be challenging to get to for senior riders when cars parked at and/or near bus stops. Some interviewees shared that there were times when they had to walk on the streets to get on the bus because of that. Inaccessible bus stops can be extremely difficult to get to for senior riders who needed assistance walking or were in wheelchairs as the buses could not lower the ramp for them to board or alight the buses: *"She's (interviewee's mother) as a roller (meaning people who use wheelchairs or walkers) ... The buses are really well set up for them. They, they'll put the ramp down. Even if you're not in a wheelchair, though, you know, if you want the ramp and they would put it down. But often the bus stops are parked with cars and trucks. This is a real problem in Milwaukee. It's like, [the drivers would think], well, it's just a bus [stop], I can park here, with my flashers on. You know the delivery [truck drivers, they always do that]. I hate those, so much. So the point is, [because of these], the bus has to stop in the middle of the*

street [without a way to lower the ramp].” (Male, NA, age 75-79, buses and car, over 10 years, more than 5 times a week)[16].

Constrained destinations

The majority of interviewees mentioned that they did not think they were able to ride public transit for some of their travel needs, most social and recreational activities were not accessible to them because their primary transportation mode was public transit. As one interviewee shared when asked about how they saw themselves as transit riders: “*I am limited, the bus can only take you to certain destination points. The bus can take you [to some places you need to go to], or downtown, or the hospital, or the stadium. But you are somewhat confined. I would say that we have mobility, but it is constrained mobility.” (*Male, Black, age 75-79, buses and car, over 10 years, 3-5 times a week). Over half of the interviewees mentioned that they expected to visit friends and family members living outside the public transit network and participate in more social and recreational activities that happen in places other than just at senior centers. They felt lonely and expressed frustration when their travel options with public transit were mostly limited to certain areas: “*I mean, we're trapped in here. There's like 3 buses in the morning, going south and 3 going north at night, or something. You know, if you want to travel further, taking [the bus] wouldn’t do it. And [going to the] south [on the bus]? Forget it.”* (Male, NA, age 75-79, buses and car, over 10 years, more than 5 times a week).

6.5.1.2 Safety and Peace of Mind

Besides inaccessibility, safety issues are also another barrier that older adults face when riding public transit. In general, there are two main safety and security themes: reckless driving in

[16] This interviewee declined to disclose this information at the time of the interview during the process of completing the demographic information survey.

the City of Milwaukee and unsafe and uncomfortable experiences and encounters while using public transit. Because most of the participants rode public transit during the COVID-19 pandemic, participants were also asked about the pandemic's impact on how they perceive travel safety with public transit. Unexpectedly, only 2 people indicated that they rode less or stopped riding public transit out of safety concerns about the pandemic, most participants did not consider the COVID-19 pandemic as one of their safety concerns when riding public transit.

Reckless driving

The City of Milwaukee has seen rampant increases in reckless driving in recent years (Wisconsin Public Radio, 2024), which makes it a safety concern of all citizens. For older adults who ride the buses, most directly, reckless driving makes bus riding more difficult and dangerous. Some participants shared that when they needed to cross the streets to catch the buses that were operating on the other side of the roads, sometimes it can be a struggle and dangerous for them because they've heard and/or experienced drivers speeding and running red lights while people were crossing the streets. For some of them, their traumatic experiences came from news about terrible accidents when speeding drivers or drunk drivers ran into bus stops or killed pedestrians who were crossing the streets in the city. For the others, they have experienced drivers running red lights or speeding when they were crossing the streets.

Nearly two-thirds of the participants (18 out of 30) expressed that reckless driving behaviors made traveling by public transit very stressful and dangerous, they needed to be more cautious about their surroundings when crossing the streets. One participant shared that: "*I see some of these people (drivers) that like, when I get off a bus, you know, they have no regard for anybody… So you gotta kind of be on the defensive when you get off of the bus, you need to be defensive until you get to where you're going, because you don't know who's going to run a red*

light." (Female, white, age 70-74, buses, over 10 years, more than 5 times a week). Older adults who are transit riders, even if they do not need walk-assisting devices, it usually takes them longer to cross the streets than their counterparts to catch the buses. Some of the participants expressed feeling stressful when the pedestrian signal time was not long enough for them to cross the street at the pace they were comfortable with. Besides that, reckless driving increases their stress levels with potential risks of getting severely injured. Participants indicated that the increased reckless driving in the city was making crossing the streets become *"scary"* (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week) and would *"put fear in your heart"* (Female, Black, age 70-74, buses and car, over 10 years, 3-5 times a week). They were less comfortable and confident to travel by public transit, and sometimes would give up certain recreational trips due to mental distress. Thus, for older adults who are transit riders, especially those who are relatively new to riding public transit, reckless driving can act as a great deterrent against using public transit for their out-of-home activities and worsen their mental health.

Some participants also shared that reckless driving made the bus and paratransit rides more dangerous. For most of them, they felt unsafe when other drivers cut off buses. Several participants shared that they have experienced other drivers cutting off the buses or vans they were on, forcing the bus and van drivers to suddenly slow down or change lanes. It frustrated the riders as they knew this was illegal, but it was also not in their control: *"Yeah, the law says that no turn in front of the bus, they still turn in front of the bus and the bus has to stop [suddenly] that you feel the jerk… And you do not feel safe riding [it]"* (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week). For older adults who were paratransit riders, some of them shared that new and inexperienced drivers sometimes would drive at higher speeds to be able to get to the next stop on schedule; or they would stop abruptly at traffic lights. These driving behaviors made them feel

their riding experience unsafe and they felt anxious about their safety recently: *"The young people (paratransit drivers) are driving, going that fast, I thought I could have been in danger."* (Female, Black, age 70-74, paratransit, under 1 year, less than 3 times a week). Even though a lot of participants ceased driving and used public transit as their primary travel modes, it is surprising to see that reckless driving has an enormous effect on how they went about their out-of-home activities. For them, increasing reckless driving behaviors in the city made them feel additional stress when they needed to cross the streets, feel anxious when the buses they were riding were cut off by other drivers, and made them consider giving up some out-of-home trips if they felt very unconfident riding public transit.

Concerns about personal security and vulnerability

Nearly all participants (22 out of 30) who rode the buses expressed feeling vulnerable and unsafe at different points in time when they traveled by public transit. Since most paratransit services provide door to door services, participants who were exclusively paratransit riders did not share any significant concerns about safety and personal security. In the meantime, nearly all bus riders preferred to ride the bus during the day and avoided travelling by buses when it was dark outside. They shared that the buses at night were less frequent and there was less foot traffic – especially in the winter – which made them feel very vulnerable as an older adult. One participant shared that: *"I don't go anywhere after dark. [I will if] I'm with someone in a car, but you don't go alone. Right? And this is a reasonably safe neighborhood, but being an older person with a walker. It was like wearing the signs, saying. I'm weak and vulnerable."* (Female, white, age 70-74, buses and paratransit, over 10 years, 3-5 times a week). If they had to travel outside their homes by public transit when it was dark, they would scout the surroundings for public places (e.g., restaurants, hotels, or bars) as shelters in case they had any unexpected encounters. However, if there were

sheltered bus stops, they would feel safer and more secure when waiting for the buses at night. For them, the shelters acted as *"more of an enclosure"* (Female, white, age 70-74, buses, over 10 years, more than 5 times a week) so that they were not quite exposed when they felt vulnerable.

Most bus riders shared that they preferred to travel during off-peak times during the day. They usually felt nervous and unsafe when they had to travel during peak hours when the buses were more crowded. They were very conscious about their age and physical condition, they felt anxious about boarding and alighting the buses as knew they'd be slower compared to many other riders with relatively better physical conditions: *"…you've got people standing behind you looking out, you know, make you feel like you're dragging this thing down."* (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week). Some of them expressed that they'd feel unsafe and even embarrassed when the other riders behind were verbally impatient or trying to tell them to be faster: *"I felt frustrated and upset, it was stressful … Then the riders behind you get at you because they say you are holding up the bus."* (Female, white, age 75-79, buses, over 10 years, used to be more than 5 times a week, became less than 3 times a week due to traumatic experience). It could get more difficult when they needed to get off a crowded bus. Some participants shared that even though they mostly sat in the front of the buses, the crowdedness and their physical condition still made getting off the bus during rush hours stressful. Notedly, these were feelings shared by most participants who rode the buses regardless of gender. In other words, senior transit riders were sensitive to their age and physical condition and would prefer to travel at times that made them feel safer, less vulnerable, and most importantly, more at ease: *"I don't use to ride the bus when it's crowded… or something like that, I try to avoid the people… So I've gotten that down to a pattern. I don't get on the bus when there's a lot of people. Sometime during the day, like noon, that's a good time. They're empty because everybody is at work and the kids are at school. You*

never, never ride a bus at 3 to 4 o'clock, that's the kids are getting off then people are getting off work. So it's really bad because they will run over you, knock you down, push your aside, they do not say excuse me and nothing." (Female, Black, age 70-74, buses and car, over 10 years, 3-5 times a week).

Gendered riding experiences on the buses

However, when it comes to their perceptions of unsafe and insecure experiences while they were riding the buses, though there were many overlaps of the perceptions of feeling safe and secure while waiting for the buses, some of the safety and personal security perceptions became extremely gendered when it comes to how they felt while riding the buses. Most female participants who were bus riders shared similar experiences while nearly all male participants who were bus riders expressed that they did not feel unsafe or insecure when they were on the bus. For senior female bus riders, they always preferred seating in the front of the buses. The priority seats were usually between the doors on a bus, so it was easier for them to settle down or get off the buses. Most importantly, sitting in the front allowed them to observe their surroundings more closely so that they could be alert about their surroundings and act accordingly. They revealed that they felt safer when sitting in the front because they were closer to the bus driver and the doors. Most of the senior female bus riders believed that they were perceived as easy targets for crimes because of their gender and age: *"As an older woman. I'm more of a prey. Even I got my purse like this or whatever [holding their purse tightly in their arms and in front of their chest]. It's just, you know, you just, you're looking at everybody that gets up to where I am. Yeah. And I was looking at everybody [to observe their movements]."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week). This made them anxious about their safety especially when they traveled by themselves, none of the male bus riders shared that experience or feeling. Three of

them were mugged on the bus in the past, they shared that these horrible events deeply traumatized them to an extent that they sometimes felt they were *"a bit paranoid"* (Female, white, age 70-74, buses and paratransit, over 10 years, 3-5 times a week). One interviewee described it happened when she got off the bus: *"I've been mugged at my bus stop. I was getting home, he just came, we were near a parking structure, and he asked me when the bus was coming, and I brought up my phone and he grabbed my purse. He ripped it right off me."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, more than 5 times a week). Most of them shared that even if they felt relaxed and safe, they still paid close attention to what was happening around them.

Another factor contributing to senior women bus riders' perception of uncomfortable experiences was their uncomfortable encounters with other passengers. Their most shared and common uncomfortable riding experiences were when strangers came up and tried to talk to them on an empty bus. Nearly half of the senior women reported feeling uneasy when other passengers interacted with them on a relatively empty bus, especially when these interactions were unsolicited. This sense of uneasiness stemmed from their own perceived vulnerability and the unpredictability of such encounters. They were also sensitive to incidents that happened on the buses even if they were not involved in these incidents directly: *"I tried to stay to myself and I don't get involved. Just stay out of it. Stay out of it. I'm sitting there and if there are seats [available] on the bus, I will sit closer to the door."* (Female, Black, age 70-74, bus and paratransit, over 10 years, more than 5 times a week). Besides paying close attention to what was happening around them, they would choose to get off the bus when there was an incident (e.g., there was a passenger that might be mentally ill or there was a dispute between other passengers) even if it was not their stop. For senior female bus riders, riding the bus meant always having a pervasive sense of insecurity that

sometimes would make them take proactive measures to avoid potential threats, even at the cost of inconvenience.

6.5.1.3 Passenger Care of Bus Drivers

For most senior bus riders and paratransit riders, the most common barrier they faced while using public transit was when the drivers had unsupportive and disrespectful attitudes. Specifically, participants mentioned that it was hard for them to use public transit freely and confidently when the drivers were inefficiently trained or were disrespectful to riders.

Inefficient training

Like other public transit providers in the US, MCTS also faced bus driver shortages during the COVID-19 pandemic. Indeed, many transit agencies had to reduce or eliminate in-person training programs due to financial and health-related constraints (APTA, 2021; Lee & Smith, 2021). Consequently, there were usually gaps in driver's knowledges on health and safety protocols (e.g., sanitization and managing mask mandates), and more importantly, in their knowledge on travel information (APTA, 2021; Brown & Gilmore, 2022; Lee & Smith, 2021). Therefore, it is not surprising that many participants who were bus riders have complained about how bus drivers lacked knowledge of route information. Several of them shared that in recent years since the COVID-19 pandemic, they have encountered more and more new drivers who could not help them with bus transfers or schedule information. One of them shared that the experienced drivers would use signals such as honking at another bus to indicate that there were people who needed to transfer; but the new drivers sometimes would drive away even if they saw someone walking to the bus stop to board the bus. Interviewees who were paratransit riders shared bus riders' concerns that they did not think bus operators were sufficiently trained to drive properly and safely:

"[We need] more safe drivers, like professional, well-trained [ones] because sometimes the buses

they be going so fast and know that they stop and you fall. I mean, they stop and after that you go forward. I mean, everybody can't take that, you know. So I think they need to improve on the drivers being more, a little more concerned about the people who ride the bus." (Female, Black, age 70-74, buses and car, over 10 years, 3-5 times a week). Several paratransit riders shared that the drivers were driving too fast and recklessly and they did not feel safe while sitting in the vans. For bus riders, riding the bus became very challenging when drivers started the buses before they properly sat down. One interviewee shared that she got severely injured and could not walk for several weeks because the driver started the bus before she could sit down: *"... so I got on the Gold line. Paid my fare, and before I had a chance to sit down the bus lurched forward about 2 foot, knocked me on my back so I was bruised on all my left side. Well, on my knee and both knees and my, my elbow was the worst."* (Female, white, age over 85, buses, over 10 years, more than 5 times a week). Insufficiently trained drivers mean more stress and further discouragement for traveling outside of their homes because in addition to making trips, they had to worry about their safety during those trips.

Disrespectful and discourteous drivers

Another big challenge and discouragement for senior transit riders was when they met disrespectful and discourteous drivers. They considered disrespectful and discourteous behaviors that would make it difficult to use the transit services as when drivers did not accommodate riders who had difficulties getting on and off the vehicles and who were rude when picking up and dropping off riders. Senior transit riders found it extremely difficult for them to continue to use public transit services when the drivers ignore their need for helping with the ramp or carrying things on and off the buses. One bus rider shared that after four years of traumatizing experiences she had with public transit when bus drivers repeatedly refused to lower the ramp for her, she just

gave up going out if she could not walk to places that she wanted to go to: *"According to the American Disabilities Act, they have to accommodate upon request. They don't. They want to make you say why you need it, or they refuse it, or they say, I know the law, and you're not handicapped. I know the law, and you must be in a wheelchair, and I even had a letter from the doctor for me [to use] at the bus station saying that you know they have to do it and they still won't."* (Female, white, age 75-79, buses, over 10 years, used to be more than 5 times a week, became less than 3 times a week due to traumatic experience). Though this is one extreme case and does not represent all senior bus riders' travel experience with public transit, it shows that negative experiences with public transit could discourage seniors from traveling outside their homes. For senior bus riders, disrespectful drivers usually meant drivers who did not answer their questions or ignored their greetings: *"Sometimes, just sometimes the bus drivers are cranky. [The new bus drivers], they are not as well trained as the other ones… And when you talk to them, and they look at you like you're crazy. I always try to say thank you, you have a nice day. They look at you [like you are crazy], you know the older ones are good, [but for] the younger ones, I don't know if I should be talking to them at all."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, more than 5 times a week). For paratransit riders, it meant drivers who were usually rude when picking them up from places. One interviewee shared that one time the driver who was supposed to pick her up arrived very early, knocked at her door violently, and even threatened to leave without her if she could not get ready for the ride in 5 minutes: *"So my point, it was for 10. So at 9 o'clock they were going to pick me up. I'm waiting, and at 8:35, I get a ding-dong, ding-dong, ding-dong! ding-dong! [And I was thinking] what's going on? And then I heard bam! Bam! They were like the police! That scared me and when I walked to the front [door] and this driver was standing there. And so, then I said it is 8:35, my appointment is at 9:00 (she meant her pickup window should be starting at 9:00am*

and the window should be around half an hour. In this case, the driver should pick her up from 9:00am to 9:30am). She said, well, come now, or I'm going to leave … She was standing there, and I said I'm not ready, and it (the van) wasn't supposed to be here till 9 o'clock. She said, well, if you don't come out in 5 mins I'm leaving." (Female, Black, age 70-74, paratransit, 5-10 years, more than 5 times a week). Others shared that some paratransit drivers would arrive half an hour early at the senior centers and ask them to get ready to leave when they were in the middle of certain activities. Several participants shared that they felt very upset and embarrassed when that happened because they did not think the drivers respected their time; and they also felt embarrassed when they were called to leave that way in front of their friends: *"She picked us up about 5 to 2:00. My pickup time down here is 2:30. She's, she [was] going rush us home. And she's going to go home and get her kids and take them to the doctor, I heard her on the phone when I came out. And then one day, I like, I like sewing, and I like sewing things. [And that time] I was right in the middle of something. [If you are] late [for your pickup rides], they would announce your name saying someone's over the with the First Transit [on the speaker]. I was, I was so upset. I ain't know what to do. I was mad."* (Female, Black, age 80-84, paratransit, 1-4 years, less than 3 times a week).

6.5.1.4 Shrinking Service Time and Area

Service changes became a major concern for some senior transit riders in Milwaukee County as MCTS was planning to launch the Connect One Bus Rapid Transit (BRT), which will replace an existing bus line that travels directly to a local hospital. Participants discussed how this change would add extra travel time and discourage them from travelling outside their homes.

Extra travel time

Though public transit was not considered an ideal option for most interviewees for hospital visits, eight interviewees shared that they rode the bus to the hospital for regular checkups and

non-emergency visits. Five of them revealed that they had chosen their current residential locations because they only needed to ride one bus to go to the hospital. Some of them shared that they lived no more than 2 blocks away from the bus stop and it was relatively convenient for them to ride the bus to go to the hospital. They did not consider the BRT line to be very helpful for them because they will have to spend more time transferring between buses: "*now consolidate them into a single route which everybody will have to transfer."* (Male, NA, age 75-79, buses and car, over 10 years, more than 5 times a week). In addition to more bus transfers, some interviewees shared that they would have to walk more in order to get to the nearest new bus stations. This service change negatively impacts nearly participants that were aged between 18-64 who used the bus route that will be replaced by the BRT line in the future. One interviewee was not aware of the service change at the time of the interview and was devastated when they learned about the service change: *"I moved to Milwaukee from another city, and I never rode the bus before I moved here. It took me a long time to learn and confidently ride [this route to the hospital], and now they are going to cancel [the name of the route]. I feel like the air has been sucked out of my body, that is my lifeline, and I don't know how I can go to the hospital anymore…"* (Female, white, age 75-79, buses, 5-10 years, less than 3 times a week).

Reduced out-of-home activities

Some interviewees also expressed that they may need to involuntarily reduce their out-of-home activities due to the service change. Besides traveling to the hospital, the bus route that was going to be replaced by the BRT bus line also provided access to places with several social and recreational opportunities that several participants were interested in. Four interviewees shared that they did not think they would continue to participate in those activities because of this service change. Instead of a lack of other available travel alternatives, those senior riders shared that it was

rather the physical and emotional burden they would have to bear in order to venture out of their homes for such activities: *"Absolutely. I don't know what I would do without the bus, I don't like depending on people to give me a ride. I want to be independent. So yeah, I mean, I don't know what I would have done.* (Female, Black, age 65-69, buses and paratransit, 1-4 years, more than 5 times a week). For some participants, losing access to social and recreational activities means losing motives to get out of their homes besides necessary travel needs (e.g., grocery shopping and going to the hospital). One interviewee shared that: *"I will try to walk the extra 1 block for as long as I can [to catch a different bus] for the symphony, after that I will just have to stay at home."* (Female, white, age 75-79, buses, 5-10 years, more than 5 times a week). Several participants also expressed that they felt abandoned by society once they became seniors when they talked about the negative impacts such service change had on their daily lives: *"I always, you know, pay my taxes, did what I was supposed to, and then, you know, you get old. and you know they tend to forget about us."* (Female, Black, age 80-84, paratransit, 1-4 years, less than 3 times a week).

6.6 Discussion

The findings of this chapter contribute to older adults' travel experiences with public transit literature by examining the nuanced and detailed barriers and challenges senior public transit riders face in Milwaukee County and how public transit contributes to their wellbeing. This study finds four major themes revolving around the specific barriers senior public transit riders face with both buses and paratransit vans: unavailable and unreachable, safety and peace of mind, passenger care of bus drivers, and shrinking service time and area. Riding public transport is not only about boarding and alighting the buses (Walker, 2014), and for senior public transit riders, they have a difficult time to find public transit travel information as public transit agencies gradually move travel information online, which also confirms the findings from the previous chapter. Transit

agencies should keep updated hardcopy bus schedules on the buses as well as ensure access to travel information through phones available so that older adults or people who are not tech-savvy can access the most up-to-date travel information. Bus stop accessibility is related to weather, the condition of sidewalks, and whether private car drivers respect parking restrictions around bus stops. When bus stops are blocked by unshoveled snow or illegally parked cars, senior public transit riders usually need to get down on the street in order to board the buses. It becomes almost impossible for senior public transit riders who need the ramp to board the buses because the ramp cannot be lowered when the bus is away from the sidewalk. When the conditions of the sidewalk are bad (e.g., broken or icy sidewalks), they become more dangerous for senior public transit riders, especially those who use walking assistance devices. Thus, it is crucial to provide safe access to bus stops at all times by fixing broken sidewalks, as well as keeping sidewalks and curbs ice- and snow-free in the winter. It is also important to understand that this is not the sole responsibility of transit agencies, local governments should also work with transit agencies to ensure safe and good sidewalks for all groups of people to walk on; and enhance enforcement against illegal parking at bus stops so that transit riders can access the bus stops at all times.

When it comes to the safety and personal security of senior transit riders, many of them mentioned that even if they do not drive anymore, they were still haunted by increasing reckless driving behavior in Milwaukee County. Drivers who drive recklessly (e.g., speeding, running red lights, or cutting buses off) make it difficult for senior transit riders to cross the streets and feel unsafe when they are traveling on the buses. Some senior transit riders would give up out-of-home activities if they are less comfortable and confident to travel by public transit. Because reckless driving can act as a great deterrent against using public transit and worsen their mental health, local governments, DOTs, as well as transit agencies should work together to create a safe

transportation system that encourages slower driving speeds and safer driving habits to create a friendly environment for everyone. Cities and municipalities could adopt automated speed enforcement systems (e.g., speeding cameras) to deter speeding and to encourage safer driving habits (Retting et al., 2003); DOTs could also implement different traffic calming measures (e.g., speed bumps, curb extensions) to slow down drivers (Loukaitou-Sideris, 2006); transit agencies could also adopt Complete Streets policies to promote road designs that help slow vehicular traffic and accommodate other road users like pedestrians, cyclists, and public transit riders (Anderson et al., 2015). Similar to the findings of Falkmer et al. (2015) and Kostyniuk & D'Souza (2020), senior riders prefer to ride the bus during the day, avoid peak hours, and avoid travelling by bus when it was dark outside or when buses are less frequent. However, this does not necessarily mean that they do not prefer to participate in out-of-home activities in the evening, it could very likely indicate that lacking a safe means of transportation for evening out-of-home activities prevents senior transit riders from such activities. Thus, it is crucial for transit agencies, related organizations, and local governments to provide better transit options (e.g., extended service hours and frequencies) and more diverse activities around the city so that seniors are more socially engaged as they age.

One of the most important findings is that personal security and safety is a very gendered perception as most female senior riders shared what would make them feel insecure and unsafe while male senior riders did not have the same experiences. Compared to male senior riders, female senor riders are more likely to be the target of being mugged. For senior female bus riders, sitting in the front of the bus would help them observe their surroundings and react quickly. They feel very vulnerable when approached by other passengers, especially when the buses are empty. Other studies had similar findings that female transit riders usually have and perceive a higher risk of

being victims of crimes that are related to public transit and are more likely to change their travel behavior based on safety concerns (Delbosc & Currie, 2012; Loukaitou-Sideris & Fink, 2009; Yavuz & Welch, 2010). Previous research shows that the safety measures transit users prefer are not always the ones transit agencies suggested when it concerns gender-based safety issues (Rivadeneyra et al., 2015). Even if some transit agencies believe women have specific safety and security needs, many of them do not consider establishing programs that target at addressing their needs and concerns as necessary (Loukaitou-Sideris & Fink, 2009). Thus, transit agencies should focus on gender-based safety measures based on the experiences and expectations from female riders to create effective measures that would make female riders feel safe and secure while riding public transit. Some transit agencies have found that enhanced lighting and surveillance either at the bus stops and/or on the buses, well-lit and open public space designs, female-only buses, as well as better staff and operator training in dealing with harassment and crimes against female riders could help increase female riders' perceive personal security and protect their safety while using public transit (Ceccato & Paz, 2017; Loukaitou-Sideris, 2014; Yavuz & Welch, 2010). Moreover, it is more important for transit agencies to prioritize these issues and commit to address them using gender-sensitive interventions (ITF, 2018; Yavuz & Welch, 2010). Having female representatives from transit agencies to lead and organize community meetings, events, and focus groups on women's safety and security with public transit, establish and improve programs that could effectively and properly handle gender-sensitive complains, as well as organize such events at times and places that are easily accessible to female senior transit riders could be measures that help transit agencies better understand what will and how to make female transit riders feel safer riding transit.

The attitude of drivers is essential to the quality of senior public transit riders' travel experiences. Senior public transit riders will be discouraged from using public transit for out-of-home activities when they have negative experiences with insufficiently trained public transit operators. To them, proper training means that the operators know the general bus schedules and transfer information, as well as being respectful and courteous when they need help (e.g., do not ignore their questions and greetings, help them with heavy bags, and will not start driving before they securely sit down on the buses or in the vans). It is important for transit agencies to establish sufficient and efficient training programs for the drivers with good evaluation and reeducation elements so that the transit services provided can meet transit riders' needs. Some senior public transit riders' residential location choices are based on the proximity to bus stops and certain bus routes. Hence, service changes may negatively impact their travel experiences with public transit when their *"lifelines"* are removed or changed. This could be detrimental to the mental health of seniors who stopped driving and only started learning to ride public transit. To them, the learning curve of riding public transit is steep and intimidating, they are more likely to stay at home and stop going out of their homes. As senior transit riders have mentioned, community-involved meetings usually take place in the evening when they feel less comfortable to travel, transit agencies should better coordinate their community outreach programs to make it possible for senior riders to participate and have their voices heard.

6.7 Conclusion

This chapter examines the barriers and challenges older adults who are public transit riders in Milwaukee County encounter. Firstly, the findings highlight the importance of ensuring travel information accessibility to older adults, especially those who do not use the internet to access travel information. Second, policymakers and planners can make the bus stops safe to walk to and

accessible in all seasons by fixing broken sidewalks, removing snow from sidewalks and curbsides, as well as regulating illegal parking near bus stops. In doing so, senior transit riders can use public transit safely and confidently. Moreover, proximity to bus stops and accessibility through public transit are essential considerations of certain senior transit riders' residential location choices, it is important for policymakers and transit agencies to organize sufficient community outreach programs for thorough feedback from senior community members. When it comes to safety and personal security, senior transit riders are concerned about the increased number of reckless drivers and their reckless driving behavior; female senior riders are more likely to worry about their personal safety while waiting and riding the bus. Transit agencies should work closely with local governments and DOTs to establish effective measures with transit riders' feedback to provide an more accessible travel environment for everyone.

7 The Relationship Between Public Transit Use and the Wellbeing of Older Adults

7.1 Introduction

In this chapter, I continued to analyze the 30 semi-structured interviews conducted with senior MCTS transit riders to explore how riding public transit contributes to their wellbeing and shapes their perceptions of being a transit rider. I found that public transit can bring both positive and negative contributions to senior transit riders' emotional wellbeing depending on whether it can meet their daily, social, and recreational travel needs. Moreover, there are also vast differences in how experienced transit riders and relatively new transit riders perceive themselves as transit riders. While experienced senior riders perceive themselves as smart, radical, and proud public transit riders with a higher level of travel freedom; new senior riders' perception is more shaped by the stigma around public transit and see themselves as people of lower socioeconomic status with very little travel freedom. It is vital for policymakers and transit agencies to establish and improve public transit infrastructure and help the public foster the habit of using public transit. Having a reliable means of transportation would also contribute positively to older adults' mental wellbeing after driving cessation.

7.2 Literature Review

There is an extensive body of literature that investigates travel-related factors and their associations with an individual's wellbeing. As Mokhtarian (2019) noted, it is important to identify whether the contribution of an individual's wellbeing comes from the trip itself or the potential mobility it provides. In most travel-related wellbeing literature, scholars have mostly explored the HWB aspects of SWB: how the positive aspects of travel contribute to the overall satisfaction of an individual's life and how limited mobility deprives an individual of the ability or opportunity of having higher satisfaction of life. Therefore, terms describing SWB – such as wellbeing,

happiness, life satisfaction, and QoL – have been used interchangeably by some scholars when it comes to examining the relationship between travel and SWB (Delbosc, 2012). However, travel satisfaction should not be confused with travel-related SWB. The former commonly refers to travelers' attitudes toward the overall transportation service delivery and elements that contribute to satisfactory transportation service delivery, whereas the latter could be described as how an individual's satisfaction with life can be affected by travel.

Besides the framework by Reardon and Abdallah (2013) that inspects influences from non-transportation factors (economy, environment, social relationships, and the individual), the other three have overlapping factors that question the effects of different elements of travel on SWB ranging from the potential to travel, travel itself, and the out-of-home activities achieved through travel (Ettema et al., 2010; Delbosc, 2012; De Vos et al., 2013, as cited in Mokhtarian, 2019). After reviewing 19 academic articles on SWB and mobility, De Vos et al. (2013) recognized five dimensions of travel that influence SWB: experiences that occurred during travel, activity conducted during travel, engagement in out-of-home activities, travel as an activity, and the potential of travel. When it comes to public transit, most studies focused on the level of engagement in out-of-home activities and the potential of travel public transit can provide to its riders in various countries and regions (Adams et al., 2015; Banister & Bowling, 2004; Chatterjee et al., 2020; He et al., 2020; Mattson et al., 2021; Mogaji & Nguyen, 2021; Sun et al., 2021; Zhu & Fan, 2018).

Most discussions investigate how travel contributes to the wellbeing of older adults and how a lack of mobility impacts social inclusion (Mokhtarian, 2019). Though the concern of social exclusion among older adults generally arises when they cease to drive, the levels of impact and

implications have geographic variations and are different between different sexes. In Northern Ireland and the UK, older women feel less socially excluded when they have access to public transit or community transport and are willing to use them for social and leisure activities (Ahern & Hine, 2012; Graham et al., 2018; Hagan, 2020); sometimes the trip itself becomes the third place (Oldenburg & Brissett, 1982) that serves as a public space that provides opportunities for communications among older women (Ahern & Hine, 2012). On the contrary, older men in these countries claim that driving contributes more to their SWB because it allows them the freedom of travel and thus they feel more socially included; some of them prefer not to make trips at all if they cease to drive because they do not feel comfortable using public transit or community transport (Ahern & Hine, 2012; Graham et al., 2018; Hagan, 2020). Most older adults in rural areas that do not have accessible public transit networks or paratransit options feel more socially excluded when they cease to drive compared to older adults in urban areas with extensive public transit networks (Ahern & Hine, 2012; Graham et al., 2018; Hagan, 2020; Jones et al., 2013; Kim et al., 2020b; Yang, 2018). Insufficient public transit leads to a significant number of non-driving older women in rural areas relying on spousal lifts for out-of-home activities, they are more likely to face increased social exclusion when spousal lifts become unavailable (Ahern & Hine, 2012; Graham et al., 2018).

Regardless of age and physical mobility, women often retain and maintain a certain level of independence due to their willingness to use combined modes of transportation besides driving alone for their out-of-home activities (Ahern & Hine, 2012; Ferrari et al., 2014; Graham et al., 2018; Hagan, 2020; Ravensbergen et al., 2021). In countries like Canada, the US., the UK, and Northern Ireland, older adults and people with disabilities can get lifts from other household members when they cannot drive themselves or cease to drive, but most of them prefer to save the

lifts for “necessary trips” (such as hospital visits, grocery shopping, and emergencies) so that they will not be dependent on others as “burdens” (Ahern & Hine, 2012; Deka, 2014; Graham et al., 2018; Hagan, 2020; Ravensbergen et al., 2021). Some of them will give up certain out-of-home social and recreational activities rather than ask for rides from friends for the same reason when their public transit and paratransit options become less reliable and affordable (Ahern & Hine, 2012; Deka, 2014; Graham et al., 2018; Ravensbergen et al., 2021). It is difficult for most men to appreciate and embrace public transit and paratransit; these travel modes make them feel dependent, so they have higher chances of feeling reluctant to travel outside their homes when they cannot drive themselves or give lifts to other people anymore (Deka, 2014; Falkmer et al., 2015; Ferrari et al., 2014; Grisé et al., 2019). Researchers have argued that public transit has been considered as feminized space in society due to the gender-structured social networks and relations, which create symbolic codes that organize many aspects of our daily life and contribute to the differences in male and female mobility (Hanson & Pratt, 2003; Law, 1999). Law (1999) also argued that the symbolic gender codes of the male/female pairing were connected to other social and cultural hierarchical binaries (e.g., mind/body, nature/culture, work/home, city/suburb, and public/private) (Bondi, 1992; Vaiou, 1992, as cited in Law, 1999). Specifically, when men were expected to be able to move more freely between spheres while women’s mobility was often perceived as a deviation from traditional norms, therefore, driving (higher level of travel freedom and mobility) was more associated with men while public transit (lower level of travel freedom and mobility) was more associated with women (Law, 1999; Steg, 2005). Moreover, for many men, the association between car ownership and perceptions of masculinity would influence their perception of different travel modes: driving means more independence and control, as well as better social and financial status; while public transit provides less “freedom of the road” and is

inflexible, inconvenient, and makes them feel independent (Urry, 2004). Also, compared to female drivers, male drivers compared their travel modes with others more often and were more likely to consider the car as an important way of self-expression than female drivers did (Steg, 2005).Most studies in western countries have agreed that the mobility of older adults in rural areas is reduced and limited due to less access to public transit, which has negative impacts on their QoL (Ahern & Hine, 2012; Deka, 2014; Ferrari et al., 2014; Graham et al., 2018; Hagan, 2020; Israel Schwarzlose et al., 2014; Kersting et al., 2021; Kim et al., 2020b; Ravensbergen et al., 2021; Tran et al., 2022). In Canada, the US., the UK, Northern Ireland, and Germany, limited access to public transit and expensive paratransit services in rural areas means that non-drivers and older adults who cease to drive need to give up some out-of-home social activities so that they can afford more expensive travel alternatives for essential trips – such as grocery shopping and hospital visits (Ahern & Hine, 2012; Graham et al., 2018; Hagan, 2020; Kersting et al., 2021; Ravensbergen et al., 2021). Still, public transit is important for non-driving older adults for making them feel more self-reliant when they can travel on their own (Ahern & Hine, 2012; Deka, 2014; Graham et al., 2018; Hagan, 2020; Ravensbergen et al., 2021). Moreover, public transit can enhance self-esteem among older adults when they are provided with concessionary rides which they consider as a way of societal recognition for their contribution to society before their retirement (Jones et al., 2013).

7.3 Research Question

This chapter explores how well MCTS transit services meet the needs of older adults who are transit riders in Milwaukee County. Specifically, through in-depth interviews with questions informed by existing literature and analysis results from the previous chapter, I ask the following questions:

1. How did riding public transit contribute to their wellbeing?

2. How did riding public transit shape their perceptions of being a transit rider?

7.4 Data and Methodology

Please see the previous chapter for the details of data collection and methods used for analyzing the data.

7.5 Data Analysis

7.5.1 More Than Just a Ride – It's an Emotional Journey

When it comes to public transit's contribution to their wellbeing, most participants did not consider public transit having much positive contribution to their physical wellbeing. Only 2 participants shared that walking to the bus stops was a beneficial physical exercise, the rest of the participants who rode buses found the walking distance negatively related to their satisfaction with public transit because most of them needed assistance devices when walking. Thus, this study's interviewees shared more on how public transit contributed to their emotional wellbeing.

7.5.1.1 Positive Contribution: Good Rides, Good Moods

Nearly all participants expressed their appreciation of public transit and paratransit services as a means of transportation for them to travel outside their homes and participate in various social activities. Two common themes came up when they discussed how public transit positively contributed to their wellbeing: being able to travel by themselves made them feel they were independent and dignified individuals; and they were motivated to use public transit to socialize with other people.

Empowered travel: being independent and dignified

Most participants have stopped driving themselves (only 3 participants indicated they used public transit and also drove), their friends or family members offered to give them lifts but they still preferred to use public transit as much as they could unless the places they went to were hard

to get to and/or inaccessible by public transit or they had emergency trips to make. They valued the ability to be independent and go to places by themselves without having others to drive them, even if their friends or family members were willing to give them lifts or run errands for them: *"When I was riding the bus doing my thing, I didn't depend on other people. I came and went as I please, being independent, right? And I'm an independent person. I'm an only child. So, I don't know anything to do but be independent. So, you know, we like our independence."* (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week). To them, access to public transit and a good public transit network was not only about being able to travel outside their homes for errands and hospital visits as well as participate in different social activities, but public transit also made them feel they still had some level of travel freedom and could still enjoy the activities without worrying about their travel options. As one of the interviewees put: *"You can go in the store, you can, you know, take your time. You can decide whether you want this, whether you want that, you can read the labels when you're alone. But when you've got somebody waiting, even though they say, that's okay, you're, I feel [like I am] inconveniencing people [for taking longer than necessary to get things done]."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week). Also, for them, having public transit as their means of transportation when they ceased driving also meant the ability to be independent rather than other people's "burden". One interviewee shared that: *"But it does really help if you don't have to, you know, worry about, you know, asking some of your family [members] because they got their own life, and some of them got they own problems, you know."* (Female, white, age 75-79, buses, 5-10 years, less than 3 times a week).

Moreover, public transit was extremely important for people who were childless and lived alone in that compared to their counterparts, they had even fewer travel options and might be more

likely to experience social isolation. A few interviewees (4 out of 30) shared that they decided to move from the suburbs or other cities to the City of Milwaukee when they stopped driving or lost access to vehicles so that they could use public transit for their daily out-of-home activities and needs. When they relocated, they also shared that proximity to bus stops, especially to bus routes that could get them to the places that they frequently went (e.g., grocery stores, hospitals, and places with social and recreational activities that they liked) was often one of the first considerations: *"I no longer had a car at that time when I moved to this building and the location was perfect, because there were 2 bus stops across the street and one [of them was] easily located a block away to get to the Upper East Side. So yes, that is one of the major concerns."* (Female, white, age over 85, buses, over 10 years, more than 5 times a week). For them, public transit assures them that they can still go about their daily lives without worrying about relying on others for rides, preserving their dignity and independence. *"It helps me get to where I'm going, and just that, it makes me feel better that I'm able to get out there and catch the bus and do stuff by myself."* (Female, Black, age 65-69, buses, 1-4 years, less than 3 times a week).

On the move, connecting with others

As one of the participants said: "*All people need people. But when you get older, you somewhat [are more in] need [of] people, you know, to communicate with you.*" (Male, Black, age 75-79, buses and car, over 10 years, 3-5 times a week). Public transit played a great role in helping older adults socialize and connect with other people so that they feel less lonely and isolated. Five participants specifically emphasized meeting and interacting with other people in-person had contributed positively to their mental wellbeing. A lot of paratransit riders (9 interviewees who were riding paratransit, some of them also rode the buses) shared that attending events and meeting friends at senior centers motivated them to get up and get ready for the day: *"This morning. I just*

didn't feel great, not physically sick. There was construction work outside, we're going to have to be without water, because they change the pipes, you know, in the street … So I was at home, and I said, I just don't want to go today. And then I said. you know what? There's nothing you can do sitting here … you can't do nothing. So I said, let me get up, I said, I got time. So, I jumped in the shower, you know, before 8 o'clock, before they turned the water off. And I like, I did come, So, it really motivates me to come to be with my friends and that. And to have a safe way to get here. So, I really appreciate the transit system that we have." (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week). Some of them expressed that they cherished being able to get to senior centers for the activities, and the friends they made at senior centers were also invaluable to them. They would call each other to see if they were planning on going to the same events at senior centers, and they also would check in on each other when they occasionally did not see their friends when they were absent from their favorite programs and activities: *"And at some time. a friend from here would call me and say, where are you? I'm at my house. I said, I'm still waiting on the van. Because we have worship service on Tuesday, we have Bingo on Wednesday … I got the activities that I would like to participate. Yeah, and meet my friends."* (Female, Black, age 70-74, paratransit, under 1 year, less than 3 times a week).

A few of them (2 participants) shared that even if they sometimes suffer from physical pain resulting from aging and illness, they still will try their best to ride public transit to go out of their homes because they felt happy when they can meet with other people: "*It absolutely 100% [has] positive contribution to my wellbeing. It helps me just know that, that I have a place to come to, and a safe way to get here.*" (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week), They also expressed a stronger need for human connection and in-person interaction after the COVID-19 pandemic. Participants who lived by themselves (4 of them

mentioned that they lived alone) and these who lived in nursing homes (2 participants) shared that they felt extremely lonely and depressed during the pandemic lockdowns due to a lack of "true" human interaction: "*We grew up socializing with people. So, it's really hard when you are isolated.*" (Female, white, age 75-79, buses, over 10 years, used to be more than 5 times a week, became less than 3 times a week due to traumatic experience). They appreciated to be able to use public transit to travel out of their homes for in-person experiences again greatly and consider that a great contribution to make them connected to society.

7.5.1.2 Negative Contribution: Rough Rides, Constrained Journeys

Though public transit makes most senor riders feel independent and dignified by enabling them to travel by themselves, public transit also has negative impacts on their emotional wellbeing. Participants – especially new public transit riders – shared that when public transit serves as their primary transportation mode, they sometimes experienced a sense of loss of freedom and felt dependent on others.

Loss of freedom

Some public transit riders who participated in this study were seniors who used to be drivers but stopped driving themselves permanently due to medical conditions, age, or currently had no access to vehicles. They shared that they felt vulnerable when they started to ride public transit; it was also frustrating for them to find that they could not go anywhere they wanted to go at any time with public transit compared to driving themselves. To some of them, this loss of freedom meant involuntarily giving up certain social activities and reducing the number of times to travel outside their homes: *"[Not being able to drive] is a terrible loss of independence and lack of flexibility. And like I was saying earlier, I've always been impulsive. I would love to call up my friend in Madison and say, I'm going to come visit you this afternoon. What's for dinner? But then,*

now you have to depend on a different kind of transport and can't really go." (Female, white, age 70-74, buses and paratransit, over 10 years, 3-5 times a week). Another factor contributing to this feeling of loss of freedom was the financial constraint. Only four participants were employed at the time of interviews, meaning that most of them were living on fixed incomes or had limited disposable income. This financial constraint worsened their feeling of loss of freedom because some of them knew that it was not because they did not have any other travel options as non-drivers, it was more because other than the limited destinations that public transit could offer, they could not afford other available but pricier travel alternatives for their out-of-home activities: *"So if I had more money I would call an Uber and go somewhere every day. Some places that I used to go very frequently, but hardly ever get to anymore because I cannot get there [by bus]."* (Female, white, age 70-74, buses and paratransit, over 10 years, 3-5 times a week).

Moreover, the service change mentioned and discussed in the previous chapter was very discouraging and could lead to further isolation and emotional distress. When asked about how the service change could impact their travel routines, even participants who had been life-long bus riders in the City of Milwaukee, riding the buses shared that navigating new bus routes had a steep learning curve: *"No, [I do not have the same level of freedom as drivers have because] driving can go anywhere, anywhere. You know. And the buses are taking you to certain places. You know, [you] have to transfer and everything like that. But when they cut the bus out, it's hard for us, the people that, that don't drive, right? ... [For] a lot of people, [learning to get used to a new route] is a long learning curve, sometimes for seniors to get to ... figure out [by] yourselves*." (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week). As a result, they might be hesitant to try the new bus route that was going to replace old bus route that they were more familiar with; they would be also less motivated to travel for out-of-home activities as the new route would

require them transfer between buses: *"No, actually, instead of that (they were asked if they'd reduce their weekly travels for a certain activity by public transit from at least twice a week to once a week), it would probably be none times a week because of this change."* (Female, white, age over 85, buses, over 10 years, more than 5 times a week). So they were more likely to just stay at home instead of trying to adapt to the new bus route. Another participant who had been riding the buses in the City of Milwaukee for hospital visits for about 6 years shared that *"It took me a long time to learn and confidently ride [this route to the hospital], and now they are going to cancel the Gold line. … and I don't know how I can go to the hospital anymore…"* (Female, white, age 75-79, buses, 5-10 years, less than 3 times a week). For senior transit rider, service change and route cuts first would negatively impact on their feeling of travel freedom (they no long had their independent means of transportation), they further gave them more emotional distress as they knew from their own experiences that how difficult it would be for them to learn to ride new routes and how insecure they had felt during the learning process.

Dependence on others

While most public transit riders did appreciate how public transit made them feel independent and dignified by having their own means of transportation; in the meantime, public transit's inflexible schedule and limited network made them feel they were dependent on other people. People who were relatively new to using public transit as their primary travel option have a harder time adapting to this new way of living, and they felt uncomfortable and frustrated when they needed to ask friends or family members for lifts. One concern was that for trips that were difficult for them to make with public transit, they feared for their safety while riding with people who gave the lifts: *"I have a friend who takes me to the grocery store. so I've been spared having to go grocery shopping on the bus. To me, I think, [it] would be one of the hardest things [if I have*

to use the bus for grocery shopping] … especially when you are old, you carry even less. But anyway, myself. I don't even like being a passenger of her. I watch how people drive and nobody pays attention." (Female, white, age 75-79, buses, 5-10 years, more than 5 times a week). Feeling dependent on other people for lifts and not feeling comfortable riding with lift-providers would potentially make these senior transit riders reduce their out-of-home activities that could not be made by public transit or by themselves to the absolute necessary ones and experience isolation.

Other participants shared that they felt dreadful when they have trips that could not be made and destinations that cannot be reached by public transit easily for them. They felt they have interrupted other people's lives even if their friends or family members offered these rides willingly: " *I usually drive with my son. You know, he takes me where I gotta go, picks me up wait for me. Well, I feel like I have less freedom from the standpoint that I'm depending on [my son]. When I was riding the bus doing my thing I didn't depend on other people … I like, well, my son is great about it. If I have an appointment, I let him know he and he comes to my home and take me there, he'll take me where I got to go. Wait for me and bring me back home. Yes, he is a good son, but, see, when I was doing it on my own, say, I was going to a doctor's, or to the mall, or whatever I could take my time, and then do what I got to do."* (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week). As a result, they often carried with them the burden of psychological strain when they needed others for rides and could not make the trips by themselves, those were usually manifested through anxiety, stress, even anger: *"It's not comfortable. Yeah, I feel like you're bugging it and intruding all different people's spaces. Yeah. And this asking can be something that's kind of this hard … I just can't do it. So, I don't ask them. So, it's really hard for me to get around."* (Female, Black, age 80-84, paratransit, under 1 year, less than 3 times a week). Several participants shared that sometimes the sense of powerlessness over limited travel options

made them angry at themselves. Moreover, the thought of being reliant on other people made them overcompensate people who gave them rides. Some shared that they offered to buy the drivers meals or pay for a full tank of gas even if these actions cost more than ridehailing. To them, overcompensation meant they wanted to show gratitude in a way that's sincere and dignified: *"Right. Well, I'll make sure I have to give them some gas money and stuff like that … I like that so that way, I'm not, you know, getting something from them [for free], I'm not just riding for free and not giving them anything. I give them $20 or $30 for the gas there … then you feel like I know I have to let you know. I'm thanking you for driving me, and then for picking me up and sending me to places."* (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week). This often led them to go beyond the usual thank-yous, making extra efforts or gestures to really drive home how much they valued someone's kindness and time. It was their way of making sure the other person truly understood how important their actions were and how much they were appreciated.

7.5.2 Perceptions of Being a Public Transit Rider

The perceptions of being a public transit rider were very different for experienced riders and people who started to use public transit when driving was less or not accessible to them. Such perceptions were not only rooted in the older adults' travel experiences with public transit, but they were also deeply affected by how the general public perceived public transit and its riders. The experiences participants shared were mostly around two major themes when asked about how they saw themselves as public transit riders: the assumption about their social status, as well as how much freedom they had when traveling as a public transit rider.

7.5.2.1 What Being a Transit Rider Says About You

The stigma surrounding public transit in the US often depicts its riders as individuals of lower social status in the eyes of the general public. As one of the interviewees shared: *"Wisconsin*

has this, in Milwaukee especially has this thing about cars, you know, if you don't have an automobile, my goodness, you are deprived." (Female, white, age over 85, buses, over 10 years, more than 5 times a week). This perception is deeply ingrained and stems from socio-economic biases and cultural stereotypes; and does not represent who all public transit riders are: *"The words don't even make sense [whey I say I take the buses], like, he doesn't understand a word I'm saying, he said, well, I can give you a ride. That's all he hears, it's like a poor person's thing [to ride buses], and I've had 20 people offered, and after that I feel stupid. They look at you like: what's wrong with you?"* (Male, NA, age 75-79, buses and car, over 10 years, more than 5 times a week). Even though these narrow views fail to acknowledge the diverse reality of public transit users, they have distinctively different impacts on how experienced riders and relatively new riders[17] see themselves as public transit riders.

The Smart and radical explorers

For most participants who were experienced riders, they were well aware of the stigma around public transit, but it was not the factor that shaped their perception of being public transit riders. In fact, they felt that it was extremely unfair that public transit received such untrue and negative media rendering from their driving friends – frequent horrible crimes on the buses – in suburban or rural areas where public transit was mostly non-existent. One participant shared that: *"Creepy subway stations so I heard [from the news], but you never, they don't hear any cool stuff [about public transit]. It's not always like that [public transit is bad or crime-ridden]."* (Male, NA, age 75-79, buses and car, over 10 years, more than 5 times a week) When asked about how many

[17] Experienced transit riders in the context refer to senior transit riders who have either being using public transit all their lives or have been using it multiple times a week for multiple out-of-home activities and they are now comfortable riding public transit (no less than 3 times a week). Relatively new riders refer to those participants who either have been riding public transit for less than 4 years or have not been using public transit very frequently even if they are public transit riders and have been riding public transit for a relatively long time (for example, there are participants who have been using public transit for 5-10 years, but they nearly only ride one specific bus for one destination.

times they had personally experienced or witnessed crimes happening on the buses, a few had experienced robberies at bus stops or on the bus while most of them did not encounter such incidents. To them, they rode the buses very frequently, and even if they did hear about or experience some unpleasant experiences, they were more like encounters with occasional emotionally unstable passengers that made them feel insecure, those were never as horrendous as what was depicted in the news, nor were they the daily life of public transit riders. Most of them also shared that when they revealed that they traveled or sometimes traveled by buses, they always received pitiful speculations of their socioeconomic status: *"You so often feel like you're a second-class citizen, because you are using public transit versus having your car. When people asked me [on purpose] when I got into a social event, how did you get here? And this was over on the west side of town. I walked here [I said], and I thought to myself, dummy, you know I take the bus. So, sometimes you feel like people are looking down upon you."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, more than 5 times a week). When they mentioned that they took the bus as their means of transportation during conversations with friends, the most common reaction was friendly but sympathetic offers of rides, assuming that they were too poor to afford cars. When some of them mentioned that they had access to private cars and they chose to ride the bus, their driving friends were simply baffled by their choice of means of transportation: *"I can't tell you how many times. I've told people, you know hey, you can just take the bus down to come here, and they would say: I could give you a ride. They like, pity you. You get to sort of like, totally disbelieving look, like, you must really be poor. Don't have a car. I mean, I've had people say, oh, you have a car [when I tell them I have a car], and they'd ask, why do you ride the bus? But I like taking the bus. It's kind of a free feeling".* (Male, NA, age 75-79, buses and car, over 10 years, more than 5 times a week).

Contrary to the general public's perception of public transit riders, experienced riders felt that they were radical and smart when asked to describe how they felt as public transit riders. According to some participants, riding the bus sometimes was a smarter choice than driving a car as an older adult. Public transit to them was a cost-effective way to travel outside their homes compared to driving and maintaining a car: *"One of my coworkers, her car just died. So, she's looking at buying a used car. But she can't find anything for under $7,000 or $8,000. That's a lot of money for a used car … I can't afford it, I just simply could not afford car payments plus the maintenance and the insurance and all the other costs. My transportation costs right now, it's because of work [that I ride the buses] and using the transit plus, it's more like $180 a month. But normally it would be about $30 a week, that would be my transportation, it's much cheaper."* (Female, white, age over 85, buses, over 10 years, more than 5 times a week). Most of them have already retired and currently lived on limited income, public transit provided them with a much more affordable way to run their household errands and participate in social activities than driving a car themselves. They also preferred not to drive with increased reckless driving in the city, and felt relieved that they did not have to worry about their safety as a driver on Milwaukee streets. Moreover, some of them felt smart as a bus rider because they did not have to worry about car issues: *"[I think I am] much smarter [as a transit rider compared to drivers]! Because I can get to places, [even if] they get there faster, but if something happened to their car, they break down, they wouldn't know [what to do]. They'd be lost. And you know so many things [from riding public transit], you know [and understand things like] where to transfer. And then, if this bus is not going to work well, there's a different one I can use."* (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week).

More importantly, instead of being affected by the stigma around public transit, it was their experiences with riding public transit that helped shape their perception of being a public transit rider. Besides considering themselves as smart travelers, some of them – especially those who had lived in cities or countries with relatively developed public transit systems, they also regarded themselves as radical travelers: *"I always thought it was kind of a radical or something [to be a transit rider] … I moved to LA (they described that they had lived in multiple cities and had always used public transit to some degree even if they also drove), I wanted to keep doing it (referring to riding public transit). And, boy, you have to be a real rebel in LA and not drive. I found out ways to do it, it's sort of fun, you know, like fitting into the cracks … So when I moved back here on the East side, of course, it was a lot easier [to ride the buses]. I was thought of myself as kind of a rebel or an exception, or some kind of advocate."* (Male, NA, age 75-79, buses and car, over 15 years, more than 5 times a week). They took pride in their ability to challenge mainstream misperceptions and debunk the inaccurate portrayal of public transit and its riders. Their experiences of riding public transit in places with better transit systems helped them realize that public transit was beneficial to everyone as a mode of transportation instead of being the *"last resort"* or any type of *"social welfare*" for people who could not afford cars. In their opinion, it was the inequitable distribution of resources, as well as a lack of development and support for building robust public transit systems in the US that stigmatized public transit. In fact, they were proud public transit advocates who would encourage their family members and friends to try to ride public transit.

Feeling the weight of lower social status

Most relatively new bus riders who participated in this study shared that they started to ride the bus because they did not feel safe to drive by themselves anymore or they currently did not

have access to private vehicles. Most of them had never used any type of public transit before, and only a few of them had used public transit very shortly decades ago. Their perceptions of public transit were mostly shaped by the common negative media renderings and their impressions of what public transit used to be, so they felt extremely insecure and vulnerable when they started to ride the buses: *"I'm afraid, I'm afraid of the transit bus, I just am. I just with all that goes on [on the news about crimes happened on the buses], with the bus and everything."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week). Some of them experienced had some unpleasant encounters before, compounded by the negative media rendering of public transit, it became very difficult for them to go back to using the buses. One participant shared that: *"Well, I just don't feel safe on the bus. [I am afraid of] assaults, I think those are the ones I am concerned about [and I don't ride it anymore]."* (Male, Black, age 65-69, paratransit, 1-4 years, less than 3 times a week). One of the participants shared that they witnessed someone firing a gun through the roof of the bus nearly two decades ago while they were on the bus, and they were never able to ride the bus again (Female, Black, age 70-74, paratransit, 1-4 years, less than 3 times a week). Just like what experienced riders knew and experienced, these were extreme incidents that rarely happened, but for seniors who just transitioned or were transitioning from driving to using public transit, what they saw on the news and what they had experienced were more likely to define what public transit was to them, and they were more likely to be discouraged from riding public transit.

As previous drivers, they shared and agreed with the common public opinion that transit riders were of lower social status who could not afford cars, it was difficult for them to transfer to a transportation mode that was inferior to what they had before. Losing the sense of privacy and control over their travel modes when they started to use transit would further reinforce their presumptions that they were inferior to drivers: *"I used to drive myself until I had a bad car*

accident. That's why I'm on this this service now. And I think is, that is really frustrating and upsetting. But for the most part I have not been to get to what I want to do in a long time. [Because I am] not driving [anymore]. (Female, Black, age 80-84, paratransit, under 1 year, less than 3 times a week). To those who had tried public transit decades ago, they never cared for public transit once they started to drive, therefore had no idea what buses were like in the present day when they needed to ride them again. Some of them shared that they thought the buses were still like what they were decades ago and therefore dreaded riding the buses again: *"You know, it's uncomfortable [riding the bus]. When you have a car and you put it in for repair and then you take the bus to work. So, [back then] I was working downtown. So, I'll just catch the bus. Oh, man, it was a hot day, you know. I had to walk to the bus stop [to take the bus and there was no air conditioning on the bus]. And so, you know, I'd say, by the time I got home I was sagging, my back was all wet."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week). The learning curve of riding the buses was steep for them because there were not enough good community outreach programs to teach them about public transit and how to ride the bus confidently. Their presumptions of public transit being unsafe as previous drivers also contributed to their unacceptance of using public transit: *"The County, Milwaukee County every year would come to the [senior] center, picked us up, gave us a demonstration on how you ride the bus, how you let the driver know that you want to get off. And they showed us [how good the buses are now], it is air-conditioned now, so it was very helpful, but not enough to [convince me to] really venture out there … Still, you have all the other concerns, it's not only about knowing how to use it, and you have to be sure that I am safe while I'm on the bus."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week). From gathering travel information, losing the convenience of door-to-door travel, to sharing space with other passengers on the bus, some of

them would felt certain degradation in their travel experience, especially when they had unpleasant experiences with public transit: *"When these kinds of things happen (their encounters with disrespectful drivers and late pickups), and when they just couldn't be there when you need them. And you also got the things scheduled and you have to cancel things (in advance). It doesn't make you feel good at all."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week). One of the participants shared that they could not get used to riding the bus and they sometimes felt frustrated when the buses could not take them to where they wanted to go to and they felt uncomfortable receiving lifts from family members and friends: *"I cannot wait to get my car[back from the shop and to drive again]."* (Female, Black, age 80-84, paratransit, 1-4 years, less than 3 times a week). The stigma surrounding public transit impacted the wellbeing of participants who were not confident in driving themselves anymore the most as they shared that they had reduced their out-of-home activities significantly and only rode the bus unless they absolutely had to.

7.5.3 How Far Can I Go

Like most cities in the US, the City of Milwaukee does not have a very extensive public transit network that allows people to travel easily throughout the city. Long time riders' familiarity with riding public transit equipped them with the ability to learn and try new routes more confidently; while new bus riders needed to start with learning how to ride public transit and getting used to ride the buses before they could consider public transit as a viable transportation mode. Therefore, experienced riders and new bus riders had different views on how much freedom they had when they traveled with public transit.

7.5.3.1 I Can Go Anywhere

For most experienced bus riders, their experiences with public transit made the learning curve of trying new routes or new forms of public transit less steep. Over half of them (16 out of 30) shared that they lived in Milwaukee County or the City of Milwaukee for a very long time so that they were very familiar with riding the local buses and finding out how to get to new places by bus: *"There are some buses that go all the way out in the suburbs that I can take, but everything within the city, [I can go to those places that I want to go to]. I can go all over the Bayshore. I can go all the way to Brookfield Square. I can go anywhere, and I have no problem."* (Female, white, age over 85, buses, over 10 years, more than 5 times a week). The experiences they gained while riding public transit through the years helped build their trust and confidence in riding public transit. They were also more tolerant of buses not being on time or less frequent during the weekends in that they considered these less of barriers but more of routine adjustments as public transit riders: *"You're never going to be precisely [on time with the bus], you know, like, but basically you can assume that you will be there for 15, 14, 15 mins, yeah, and then a bus will be coming."* (Male, Black, age 75-79, buses and car, over 15 years). Even for a few participants (one of them recently relocated from New York City to the City of Milwaukee, and the other moved from Hong Kong to the City of Milwaukee about 3 decades ago) who moved to the City of Milwaukee from other cities or even another country with better public transit systems, if they had experiences riding public transit before moving here, they were more likely to try to ride public transit than relatively newer public transit riders who had been living in the city for a long time: *"I started to ride the buses right away, actually, it is surprising how good it is (buses in the City of Milwaukee), I like it more than [the buses in] New York."* (Male, Asian, age 65-69, buses, over 10 years, more than 4 times a week). And for some of the experienced bus riders, they were more motivated to go out of their homes because they had access to public transit: *"In the morning, some ideas may pop in my*

head and say, let's go to the park, let's go to the lake, you know. And I get myself and my little dog ready, and we just get on the bus and travel." (Female, Black, age 70-74, buses, 5-10 years, more than 5 times a week).

However, it is important to note that when experienced bus riders expressed that they could go anywhere, it was not always an indicator of having higher levels of travel freedom with public transit. Some of the participants shared that their residential location choices were based on bus routes that could connect their homes and places they frequent: *"I usually go, I go to my bank, I go to my pediatrist, I go to my hairdresser, I go to my dentist; I go to the symphony, I go to the Public Library on Wisconsin Ave. Those are my primary things that all happen on the 14th line."* (Female, white, age 75-79, buses, 5-10 years, more than 5 times a week). To them, they nearly only traveled to those places on the same bus routes and rarely ventured to try other bus routes. There were participants who nearly rode the buses daily and would try different bus routes for sightseeing, they still shared that they depended on lifts from spouses, friends, or adult children when they need to go to places that were difficult to get to by public transit: *"[For groceries I don't ride the bus], because I have a car [it is] very helpful [to get groceries with a car]."* (Male, NA, age 75-79, buses and car, over 10 years, more than 5 times a week). Another interviewee said that they only took the buses for work commute and grocery shopping, for most of their recreational activities, they shared that: *"I usually just walk around the block of where I live (as my major recreational activity), I ride the bus for the monthly Asian American community get-together, if I want to go to other places, my son will drive me."* (Female, Asian, age 70-74, buses, over 10 years, 3-5 times a week, translated and transcribed from Mandarin Chinese). Generally speaking, experienced bus riders were less likely to consider public transit as a limiting travel

mode, but they also acknowledged that they could not travel to most of the places they needed to go solely by public transit.

7.5.3.2 Less Freedom, More Stops

Compared to experienced bus riders, new bus riders had to start from learning how to ride public transit and get used to the experiences of riding public transit (e.g., losing door-to-door travel options and starting to share a space with more people when they traveled) before they could ride public transit with confidence. To a lot of them, learning a new skill as an older adult was already an implication of having limited options. When combined with having to share a space with more people and having less control over their schedule when they wanted to travel to somewhere, the disparity between riding public transit and driving themselves became more and more evident that their quality of life was degrading: *"There are somethings that are different, because I can drive anywhere, I'm going and be on time. I wouldn't have to depend on them, I just go. That's what it is now, I had to give up driving my car (due to physical conditions prohibiting them to drive safely) and come here [by transit]."* (Female, Black, age 70-74, paratransit, under 1 year, less than 3 times a week). They shared that they felt frustrated, less independent, and not as dignified as drivers as they now had limited options and destinations when they wanted to go outside their homes: *"No, I don't feel as independent as the people with cars. During COVID, they were able to go wherever they wanted to go, because they were in their self-contained little protective car. I was nervous being with other people on the bus. So I wasn't going anywhere*." (Female, Black, age 65-69, buses, 1-4 years, less than 3 times a week).

For some new bus riders, the impact of losing freedom of travel when they had to switch from driving to riding public transit was twofold. First, when they switched from driving to riding the buses, their insecurity as previous drivers and the disparity between the two travel modes made

them dread the idea of travel and therefore would sometimes reduce their out-of-home activities. If places they used to go to by driving took them more time and effort to reach by public transit now, the mental strain they had would discourage them from getting out of their homes in the first place: *"There are just so many things you want to consider [before riding the buses]. Imagine, a lady, probably in her late 60s. and she said someone grabbed her while on the bus. She felt really uncomfortable because she was just really vulnerable there and then you're embarrassed. Nobody wants to be a spectacle, so do you scream? You know. What do you do? [What] do you say? Let me be alone or get off? And you just think about so many things you get so paranoid. And then you just either stay at home or use something else. I just do not ride."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week). Then, when it comes to the traveling itself, the uncertainty and unfamiliarity with riding public transit would also remind them constantly the disparity between these two travel modes and how unfree and restricted they were currently when they had to ride public transit. Therefore, older adults' age, physical condition, the skills they needed to acquire to ride public transit all contributed to the vicious cycle of constantly feeling having less freedom as public transit riders: *"I'd like to use it (public transit) more, but I got comfortable driving, I think. it felt more comfortable, just driving the car, less people and (more) privacy."* (Male, Black, age 65-69, buses and car, 1-4 years, less than 3 times a week). However, some (1 new transit rider and 3 experienced riders) of them shared that the help from people who rode public transit made the transition much easier. When they first started to ride public transit in the City of Milwaukee, the company of friends or family members who were bus riders brought them great relief and reduced their anxiety levels, and they were more likely to trust riding public transit. *"When I first started, there was a woman from Taiwan who showed me what buses I needed to take and where to transfer to get to my job, she rode with me for a couple times, and then I felt*

comfortable riding the buses on my own." (Female, Asian, age 70-74, buses, over 10 years, 3-5 times a week, translated and transcribed from Mandarin Chinese).

7.6 Discussion

This chapter examines how riding public transit contributed to senior transit riders' wellbeing and shaped their perceptions of being a transit rider through semi-structured interviews. Depending on senior public transit riders' experiences with public transit, public transit contributes differently to their emotional wellbeing. Most (over 20 out of 30) currently non-driving senior public transit riders consider public transit as a means of transportation that makes them as independent and dignified individuals as they age; and they prefer traveling out of their homes on their own instead of relying on lifts from friends or family members. Public transit makes it possible by providing a travel option so that they can travel by themselves, plan their travels at their own paces, and go about their lives at ease. They feel they are independent individuals that do not need to rely on their family members and friends for even the basic daily errands, and they would sometimes give up some non-essential out-of-home activities when they find it difficult to make them by themselves. When they do need lifts from their family members and friends, they often overcompensate (e.g., give them gas money that is worth more than what the ride actually would cost) their lift-givers (usually when they are their friends). They want to feel dignified themselves and to ensure the lift-givers know they genuinely appreciate their kindness, time, and help instead of taking the rides for granted.

These findings corroborate the findings of existing literature that some seniors will give up certain out-of-home social and recreational activities rather than ask for rides from friends when they find it difficult to travel on public transit on their own (Ahern & Hine, 2012; Deka, 2014; Graham et al., 2018; Ravensbergen et al., 2021). Even though senior transit riders are not always

satisfied with public transit services, they value feeling independent because they are able to travel by themselves instead of considering themselves, or worse, being considered as someone's *"burden"*. Indeed, Bryanton et al. (2010) found that older adults may often choose to give up their wishes to stay socially active and engaged when they have to rely on others for transportation, as they fear becoming a burden on family or friends who would need to drive them. Therefore, it is important for governments at all levels to prevent public transit budget deficits, and for transit agencies to creatively extend public transit service network and times based on rider's needs because for some people, public transit is their *"lifeline"*. Cvitkovich & Wister (2001) addressed how federal funding allocation on transportation needed to be revisited as transportation services targeting and prioritizing seniors has not been funded at the same level as other transportation services. In addition to a more equitable federal funds allocation, local government could also support funding transit through increased sales or property taxes can help supplement fare revenues from ticket cover operational costs. Public-private partnerships can further supplement maintaining and sustaining transit services with additional resources. These strategies could help transit services prevent service and route cuts, increase the frequencies of evening and night buses, have more frequent services on the weekend, and expand paratransit service destinations at a relatively affordable price. For transit agencies, measures such as expanding sidewalks and improving lighting, can make public transportation more accessible and safer for seniors to comfortably use public transit (Feng et al., 2017). In this way, seniors could have more travel options not only for their necessary out-of-home activities, but also for their social and recreational activities. Further, local governments should collaborate with seniors, policymakers, transit agencies, and social service agencies to build aging-friendly communities (e.g., accessible healthcare and social services in their communities or by public transit) that could better

accommodate the social and recreational needs of seniors that are easier for them to access (Feng et al., 2017).

Moreover, on the one hand, public transit plays important roles in the psychological aspects of transit use among seniors, highlighting factors like joy, reduced loneliness, and increased motivation to socialize and connect with others when they can participate in social and recreational activities via public transit easily. On the other hand, they feel anxious, frustrated, and are even angry at themselves when they cannot use public transit for certain activities and have to rely on other people for rides. For senior public transit riders (9 out of 30) who stopped driving themselves and are relatively new to riding public transit, the disparity between driving themselves and riding public transit makes some of them feel they have much less freedom to travel anywhere with the latter. Some researchers found that having travel options for their out-of-home activities is often positively related to older adults' mental wellbeing (Kotval-K et al., 2023; Thaithatkul et al., 2022); access to public transit would enable them to be able to still participate in and maintain social networks when they do not drive or cease to drive (Rambaldini-Gooding et al., 2021). Other existing studies have pointed out that older adults are more likely to suffer from social isolation because of limited access to public transit (Ahern & Hine, 2012; Ferrari et al., 2014; Graham et al., 2018; Hagan, 2020; Kersting et al., 2021; Kim et al., 2020b; Ravensbergen et al., 2021). For public transit to work better for seniors, it needs to be more accessible and affordable, it also needs to be more visible so that seniors would be aware of their existences, know how to use them (National Center for Mobility Management (NCMM), 2020). Therefore, DOTs at different levels and transit agencies should examine the demographic and socioeconomic characteristics of different communities to ensure that public transit is easily accessible for older adults (e.g., higher density of bus stops and bus routes) in communities with more older adults. The fare prices should

also be more reasonable and affordable for seniors (e.g., offer discounted prices and passes for senior and cap public transit prices based on use, cheaper paratransit rides and subscriptions) so that traveling through public transit does not become a financial strain as they often live on fixed incomes. Moreover, planner and transit agencies should establish and improve outreach programs to help seniors know and understand travel alternatives to driving (e.g., hold community meetings at senior centers to advertise available travel options in their communities, campaign public transit and its improvements through traditional media – radios and newspapers) so that seniors could be more aware of these alternatives surrounding them in their communities. In this way, public transportation can help enable older adults to maintain connections with family, friends, and their communities, reducing social isolation and supporting mental health through greater access to social activities and essential services.

The stigmatized perception of public transit riders as lower socioeconomic status in the US is deeply ingrained and still stems from systemic racism and unequal distribution in economic, social, and especially transportation resources. Such stereotypes fail to acknowledge the diverse reality of senior public transit riders and greatly impact how experienced riders and relatively new transit riders perceive themselves as transit riders. For older adults who are experienced transit riders, they see themselves as smart and radical travelers who are proud of challenging mainstream misperceptions and debunking the inaccurate portrayal of public transit and its riders. They are aware of the stigma around public transit but consider that to be an unfair and far from true depiction of what public transit really is. They use public transit very frequently themselves and take pride in encouraging their friends and family members to use public transit successfully. On the contrary, for older adults who are relatively new public transit riders, they start to ride public transit when they cease to drive temporarily or permanently. Their feelings of insecurity and

vulnerability when they ride public transit are mostly shaped by the common negative media renderings of public transit riders as a group of people who are of lower social status and cannot afford cars. Thus, they sometimes see themselves as someone *"inferior"* to people who can drive themselves, and it makes a change of travel mode much more difficult for them. Indeed, people who are not public transit riders' perceptions of public transit are often from the stigma around it (public transit is not safe and it is for *"other people"* who are poor) and their unfamiliarity with it (people who drive often pay very little attention to public transit operations and development surrounding them) (NCMM, 2020). However, addressing this issue is particularly challenging in automobile-centric countries like the US. First of all, the stigma around public transit does not only exist in the eyes of the general public, but it is also reinforced by elite transportation policymakers and administrators through focusing on short-term political goals and downplaying the importance of public transit in society (Hazelton-Boyle & Wellman, 2022). In the meantime, public transit infrastructure do not often receives adequate positive attention or sufficient funding, making it difficult to maintain even the already subpar service standards in most American cities (Sanchez et al., 2018; Sheller, 2018). Therefore, efforts to perpetuate the stigma around public transit in US would require transit agencies and related entities to focus on long-term goals of maintaining and improving public transit infrastructure and services for transit riders. And such efforts would be more effective when transit agencies and administrators commit to gain transit rider's trust and learn from their nuanced and true experiences. Other than long-term goals and agendas, implementing public transit related educational programs in schools and promoting public transit use via social media could establish more exposure to public transit at an early age as well as to a broader public (Ruiz, 2022). For senior transit riders, it is crucial to establish such educational programs in their communities that are tailored to their needs and concerns (e.g., who usually ride

public transit, how to easily get travel information, when and under what circumstances would they feel more comfortable of riding) to help them understand the reality of public transit and how to use it to their benefits. Last but not least, promote public transit through channels – such as newspapers and radios – that are more accessible to them as many seniors may not be very tech-savvy and some of them have limited access to computers and smartphones.

Experienced riders and relatively new riders have vastly different views on their level of travel freedom with public transit. For experienced riders, when they compare riding public transit to driving for their travel needs, they do not consider themselves to have a lower level of freedom. Note that it does not mean public transit satisfies all of their traveling needs and they can go to anywhere they need to travel to, it does indicate that positive perceptions of being a transit rider can be associated with positive emotions and contributes positively to public transit riders' mental wellbeing. For older adults who are relatively new to public transit, the disparity between the two travel modes makes them dread the idea of traveling by public transit due to less travel freedom public transit could provide compared to driving. If it serves only as a temporary means of transportation, they might be eager to return to driving as soon as it becomes feasible. On the one hand, this would mean that they might still choose to drive even if their physical condition does not allow them to do so, and with increased risks of accidents and getting serious injuries from them (McGwin & Brown, 1999; Rosenbloom, 2003). On the other hand, if they stop driving and must rely on public transit as their main mode of transportation for the rest of their lives, the stress from learning to navigate public transit confidently could make leaving their homes even more overwhelming for them. Indeed, Ravensbergen et al. (2021) found that for older adults who are transit riders, there are "emotional work" (e.g., worry about being a "crazy old lady" for asking for the priority seats, feel nervous about whether the driver is going to lower the bus for them) that

normative and able-bodied public transit riders. However, the familiarity of riding public transit can help reduce the level of stress and insecurity of new senior transit riders. With the help from their family members or friends who have more experience riding the bus, new senior transit riders find it easier to learn to ride public transit. In fact, Ravensbergen et al. (2022) identified that one of the primary challenges older adults faces with public transit is a lack of confidence. However, their study also revealed that increased familiarity with public transit systems helps senior transit riders boost their confidence and is associated with higher levels of travel satisfaction among them (Ravensbergen et al., 2022). Furthermore, exposure to and experience with public transit at various stages of life can establish a habit of using it in later years (Rubin, 2011). Transit agencies could help by offering "buddy services" to potential senior riders who have lower levels of trust and comfort with riding public transit by pairing them with experienced volunteers to increase their comfort public transit (NCMM, 2020). By helping seniors foster the habit of using public transit could help older adults develop positive attitudes toward it and acquire the necessary skills, their experiences with public transit enable them to see true experience of riding public transit, making them more likely to consider it a viable option for participating in social activities after ceasing to drive.

7.7 Conclusion

Through in-depth interviews, this chapter finds that public transit can contribute positively to senior transit riders' emotional wellbeing by making them feel independent and dignified individuals, when it enables them to travel for their daily, social, and recreational travel needs. However, they would feel a loss of freedom and being dependent on others when public transit fails to meet them. Transit agencies and governments at all levels should extend public transit service networks in space and time so that senior transit riders could be dependent and dignified

travelers with a reliable means of transportation. Even though new senior riders' perception of themselves as transit riders is still shaped by the stigma around public transit in the US: transit riders are of lower socioeconomic status with very little travel freedom; experienced senior riders perceive themselves as smart, radical, and proud public transit riders who would advocate for public transit as a travel mode with a great level of travel freedom. It is vital for transit agencies and governments at all levels to establish and improve public transit infrastructure and help the public foster the habit of using public transit. It is beneficial to develop positive attitudes toward public transit and encourage people – especially older adults – to consider it a viable travel option after driving cessation.

8 Policy Suggestions, Limitations, Future research, and Limitations

Like Japan and some European countries, the graying of the US is posing new challenges for society and policymakers to accommodate this changing demographic. This dissertation contributes to the understanding older adults' transit mobility, accessibility, and travel satisfaction in the US. Findings of this dissertation describe the nationwide travel mode choices of older adults and factors that impact older adults' travel satisfaction with public transit in Milwaukee County, Wisconsin. Most importantly, this dissertation sheds light on the nuanced and detailed travel experiences of older adults who are public transit riders, providing valuable insights into how public transit contributes to their wellbeing and impacts how they see themselves as transit riders from their own perspectives. The findings of this dissertation can help policymakers and transit agencies better understand senior transit riders' travel mode choices, how to make public transit a more satisfying travel mode for senior transit riders. Certain findings from this research on senior transit riders resonate with the characteristics of transit riders in existing studies: most public transit users are white, have higher than high school degrees, more likely to be females, employed, and from households with relatively lower income (Bezyak, 2020). This research also finds that senior transit riders are not a homogeneous group, their preferences, expectations, and perceptions of public transit are also very likely to vary.

8.1 Older adult's travel mode choice and satisfaction with public transit

Chapter 4 shows findings from analyzing the 2017 NHTS data. Many senior travelers in the US are white, not employed anymore, and have higher than high school degrees. They are also most likely homeowners living in small households with access to private cars; and many of them are living in more suburban and rural areas. Most of them do not have any forms of disabilities and have a valid driver's license. In the meantime, most of them drive for their daily trips, some

of them walk, but very few of them use public transit. Most of their trips are made for shopping and social and/or recreational activities; only very few trips are made for medical purposes or work. Compared to white senior travelers, senior travelers of other races and ethnicities have significantly higher chances of choosing public transit over driving for their trips, and the chances are the highest for African American senior travelers. However, white senior travelers have higher chances of choosing active travel modes (biking and walking) than most other races and ethnicities except for Asian senior travelers, who have higher chances of choosing waking over driving than white senior travelers. Older adults without any disabilities are more likely to choose active transportation modes like biking and walking over driving; they are also more likely to use public transit or walk when they do not have a valid driver's license. Even if most older adults choose driving for most of their trips, there are some trips older adults would choose other travel modes over driving. Older adults in the US are more likely to choose active travel modes and taxi over driving for their social and recreational trips. This study also finds that older adults chose taxis over driving for their hospital visits. However, this does not necessarily mean using taxis could meet all of their medical travel needs, it could be that they choose public transit or taxis for occasional non-emergency hospital visits and checkups. Older adults would choose public transit over driving to work. This also does not guarantee that the public transit system could satisfy older adults' travel needs for work, it may be that for those older adults who are still employed, public transit might be their only means of transportation. Lastly, older adults would choose driving over all other travel modes for their shopping trips.

Chapter 5 examines the MCTS customer satisfaction survey data through 2020 to 2022 to identify factors that impact senior rider's travel satisfaction with MCTS transit services. In general, there is little difference between the travel satisfaction of younger riders and of riders who are

older adults. Female riders, individuals without disabilities, employed persons, and those without a valid driver's license report higher satisfaction with MCTS transit services. Older adults who are transit riders in Milwaukee County find transit services with easy access to bus stops and travel information, reliable buses that follow travel schedules, well-maintained buses, as well as drivers who are friendly, courteous, and with safe driving habits more satisfying. However, if they still have a valid driver's license, their chances of being satisfied with public transit are much lower than their counterparts. For senior riders, travel information accessibility through contacting transit agency's customer service is more likely to determine how satisfied they are with public transit. It may be that some older adults are less tech-savvy than their younger counterparts and have limited access to computers and smartphones for travel information. Most importantly, senior riders are much more likely to be satisfied with public transit when the drivers are friendly and drive safely. This may be related to the fact that most transit agencies' focus on improving online travel information accessibility, when senior riders have limited access to online travel information, knowledgeable and friendly bus drivers would be essential for senior riders to feel comfortable to inquire about travel information. Driver's safe driving habits and has significantly higher influence on senior transit rider's travel satisfactions with public transit as it would give senior riders a sense of security and reduce their stress during their travels.

Senior travelers are less tech-savvy and have limited access to computers and smartphones, they rely more on calling transit agency's customer services for bus schedules and up-to-date travel information. However, in recent years, more and more transit agencies – including MCTS – have started to improve their online travel information accessibility. Transportation providers should also ensure that people who access travel information through more traditional mediums (e.g.,

printed bus schedules and getting travel information through phone calls) can still have access to the most up-to-date information.

Moreover, older adults who are transit riders are more satisfied with buses that follow travel schedules in Milwaukee County. Some of them may have physical conditions that prevent them from walking fast, and it is going to take them more time to walk to the bus stops during the winter. Thus, timely and reliable services will greatly improve the travel satisfaction level of senior transit riders and make them feel more relaxed when they plan their trips by buses. Most importantly, senior riders are satisfied with public transit when the drivers are friendly and drive safely. When accessing online travel information is difficult for them, they rely more on knowledgeable and friendly bus drivers for such information. Transit agencies should incorporate rider's feedback into developing and improving their training systems for their bus drivers to achieve higher travel satisfaction for their riders.

8.2 Barriers and challenges senior transit riders face from their own voices

Chapter 6 strengthens the literature by analyzing 30 semi-structured interviews conducted with senior MCTS transit riders to explore the barriers and challenges they encounter in Milwaukee County. Some of the findings confirm results from Chapter 4 and 5, as well as from existing studies on who senior transit riders are and what positively contributes to their travel satisfaction with public transit. However, the detailed travel experiences from senior transit riders' own voices shed light on new themes with qualitative research methods. This study finds four major themes revolving around the specific barriers senior public transit riders face with both buses and paratransit vans: unavailable and unreachable (inaccessibility), safety and peace of mind, passenger care of bus drivers, and shrinking service time and area.

Inaccessibility represents information inaccessibility, bus stop inaccessibility, and constrained destinations. Riding public transport is not only about boarding and alighting the buses (Walker, 2014), and for senior public transit riders, they have a difficult time finding public transit travel information in ways that are accessible to them. They expressed that as more travel-related information is accessible online, when they call customer service for bus schedules and route update information, they sometimes would be asked to check the website for this information. This also confirms the findings from the previous chapter. Bus stop accessibility is related to weather, the condition of sidewalks, and whether private car drivers respect parking restrictions around bus stops. When bus stops are blocked by unshoveled snow or illegally parked cars, senior public transit riders usually need to get down on the street in order to board the buses. It becomes almost impossible for senior public transit riders who need the ramp to board the buses because the ramp cannot be lowered when the bus is away from the sidewalk. When the conditions of the sidewalk are bad (e.g., broken or icy sidewalks), they become more dangerous for senior public transit riders, especially those who use walking assistance devices. Participants mentioned that they have public transit as a travel mode for their out-of-home activities, but the destinations they could reach by public transit are constrained and limited. They often do not have a lot of travel freedom with public transit to go to many places that they wish to go to. They feel lonely and frustrated with limited travel options and not being able to visit their friends and family members, or participate in social and recreational activities they are interested in.

There are two major themes on senior transit riders' perceptions of safety and personal security: reckless driving in the City of Milwaukee and unsafe and uncomfortable experiences and encounters while using public transit. First, reckless driving is becoming a serious concern for senior transit riders as it makes being a pedestrian less safe. Older adults who are transit riders,

even for those that do not need walk-assisting devices, it usually takes them longer to cross the streets than their younger and more able-bodied counterparts to catch the buses. Some of the participants expressed feeling stressful when the pedestrian signal time was not long enough for them to cross the street at the pace they were comfortable with. Besides that, reckless driving increases their stress levels with potential risks of getting severely injured. Speeding, running red lights, and cutting buses off are dangerous driving behaviors that would make senior transit riders find crossing the streets and riding the bus difficult. If they have had bad experiences or heard about bad traffic accidents involving public transit or reckless driving, they may get scared and are less comfortable or confident to ride public transit for their out-of-home activities. Second, senior riders prefer to ride the bus off-peak hours during the day to avoid crowds, and they avoid travelling by bus at night due to less frequent services and foot traffic, making them feel very vulnerable as an older adult. They would feel safer and more secure when waiting for the buses at night at sheltered bus stops. However, perceptions of personal security and safety on the bus are very gendered perceptions. Male senior transit riders have very few safety or personal security concerns while they are on the bus, while most female senior riders shared many encounters that made them feel insecure and unsafe. They sometimes consider themselves as easy prey of crimes and they often do not feel safe when waiting for the buses. They always prefer seating in the front of the buses for easy and quick exits. This would also allow them to observe their surroundings more closely so that they could be alert about their surroundings and act accordingly. Their self-perceptions of vulnerability and the unpredictability of unpredictable encounters on the bus would make them feel uneasy, and sometimes they'd rather get off the bus before reaching their destinations.

The attitudes of the drivers could be barriers to some senior public transit riders. When the drivers have unsupportive and disrespectful attitudes, it becomes hard for senior riders to use public transit freely and confidently. When drivers do not accommodate riders who have difficulties getting on and off the vehicles, senior riders would feel very discouraged from riding the bus, especially for these who do not have apparent disabilities but have difficulties walking or lifting their legs to board the bus. For drivers who are rude when picking up and dropping off paratransit riders, or when they arrive outside the pickup window or forget to pick up riders, senior riders would feel frustrated and sometimes would reduce their out-of-home activities. Many participants have complained about how bus drivers lacked knowledge of route information in recent years. Since the COVID-19 pandemic, they have encountered more and more new drivers who could not help them with bus transfers or schedule information. This, again, makes accessing travel information more difficult for senior travelers who have limited access to the Internet.

The last theme on the barriers and challenges senior public transit riders face is the service change in Milwaukee County as MCTS will replace an existing bus line that travels directly to a local hospital with a new BRT line. To riders who use the existing bus line to the hospital, some of them have chosen their current residential locations because they only need to ride this one bus to go to the hospital without any transfers. They do not consider the BRT line to be very helpful for them because they will have to spend more time transferring between buses as they need to take at least one bus to the nearest BRT station and then take the new bus line to the hospital. Sometimes it also means that they need to walk more than they physically can to be able to get to bus stops that are now further away from where they live as bus stops for the existing bus line would be removed. Another barrier created for senior transit riders by this service change is that some of them may need to reduce their out-of-home activities. Some participants shared that they

do not think they would continue to participate in some activities because of this service change. Instead of a lack of other available travel alternatives, those senior riders shared that it is also the physical constrain and the emotional burden (e.g., they need to learn to ride new routes or how to transfer, they may have to ask friends and family members for rides) they would have to bear in order to venture out of their homes for such activities.

8.3 Wellbeing and perceptions of being a transit rider

The barriers and challenges discussed in Chapter 6 have both positive and negative contributions to senior transit rider's wellbeing. When they can travel by themselves using public transit, they feel they are independent and dignified individuals, and they are motivated to use public transit to socialize with other people and participate more in society. To them, access to public transit and a good public transit network is more than being able to travel outside their homes for errands and hospital visits, as well as participate in different social activities, it makes them feel they have some level of travel freedom, can go out to enjoy activities by public transit while do not have to always worry about their travel options. Public transit can play important roles helping older adults socialize and connect with other people so that they feel less lonely and isolated as they indicate they prefer in-person socializing activities, and some of them suffered from depression and felt isolated during the COVID-19 pandemic. Access to public transit could help create a virtuous cycle for older adults to be motivated to travel for out-of-home activities, participate in more socializing events, and make new friends.

Public transit can also have negative contributions to senior public transit riders' wellbeing when they cannot go to places or participate in activities by public transit, they sometimes experience a sense of loss of freedom and feel dependent on others. This is more common among senior riders who recently stopped driving or have to use public transit while their cars are currently

not available to them. To them, they feel vulnerable when they start to ride public transit; they feel frustrated when they find that public transit could not go anywhere they want to go at any time when compared to driving themselves. To some of them, this loss of freedom means involuntarily giving up certain social activities and reducing the number of times to travel outside their homes. As many of them are retired and live on fixed incomes, even if they would like to try travel alternatives like rideshare services for their out-of-home activities, the financial constraints do not allow them to try them as frequently as they wish to and would worsen their feelings of the loss of travel freedom. Moreover, the aforementioned service change has a negative impact on senior transit riders' wellbeing too. Participants shared that the learning curve for getting used to new routes can be steep, and for some of them, the services change also means that they will lose access to the bus stops that their physical conditions would allow them walking to. Another negative contribution to senior transit rider's wellbeing from public transit is due to its inflexible schedule and limited network. Some senior transit riders shared that they feel uncomfortable and dependent on other people for lifts even if the lifts are offered willingly from their family members and friends. This would potentially make these senior transit riders reduce their out-of-home activities that could not be done by public transit or by themselves to the absolutely necessary ones. As a consequence, the thought of being reliant on other people makes some senior riders overcompensate people who give them rides. To them, overcompensation means they want lift-givers to know that they genuinely appreciate their kindness and time, and by doing so, they also feel like they protected their dignity.

The perceptions of being a public transit rider vary from experienced riders to people who start to use public transit when they currently are not driving or stopped driving recently. Two common themes come up when people discussed this topic: the assumption about their social status,

the level of travel freedom they have when traveling as a public transit rider. For experienced transit riders, while they are well aware of the stigma around public transit (e.g., public transit is for people who cannot afford cars, public transit is crime-ridden), but it does not shape their perception of being public transit riders. In fact, they consider it unfair that public transit receives untrue and negative media rendering and people who do not use public transit think that is the reality of public transit. In fact, instead of thinking themselves as someone who cannot afford cars, experienced riders think they are radical and smart people who are proud of challenging mainstream misperceptions and debunking the inaccurate portrayal of public transit and its riders. They also consider themselves smart people who know cost-effective travel alternatives to driving. They sometimes act as public transit advocates and encourage their friends, family members, and people around them to try public transit. In the meantime, the experiences they gained while riding public transit through the years help build their trust and confidence in riding public transit. They are also more tolerant of buses not being on time or less frequent during the weekends and are more likely to try new bus routes and use public transit compared riders who are less familiar or have less experience with public transit. Even if some of them do not think they have less travel freedom when compared to people who drive, it is important to note that they acknowledge that public transit cannot meet all of their travel needs, and they also rely on driving or lifts from others for trips that are difficult to make by public transit.

On the contrary, most relatively new bus riders shared that they start to ride the bus because they do not feel safe to drive by themselves anymore or they currently do not have access to private vehicles. Most of them have never used any type of public transit before, and only a few of them have used public transit very shortly decades ago. As previous drivers, they share and agree with the common public opinion that transit riders are of lower social status who could not afford cars,

it is difficult for them to transfer to a transportation mode that is inferior to what they had before. Losing the sense of privacy and control over their travel modes when they start to use transit would further reinforce their presumptions that they are now inferior to drivers, which would discourage them from using public transit. Also, their presumptions of public transit being unsafe contribute to their unacceptance of using public transit. Therefore, they do feel they have less travel freedom now as public transit riders when compared to drivers. To some of them, the stress from learning a new skill as an older adult, combined with having to share a space with more people and having less control over their schedule and time on travel, the disparity between riding public transit and driving themselves become more and more evident. However, some participants shared that when they get help from their friends or family members who are more familiar with riding public transit, riding public transit becomes less stressful and make the transition from driving to riding public transit smoother.

8.4 Policy suggestions and recommendations

To make public transit a viable and a satisfying travel option for older adults, this dissertation suggests the following four major recommendations for DOTs, transit agencies, as well as decision makers at different levels to consider.

8.4.1 Sufficient and upholding supports to public transit

To make public transit a viable travel alternative to driving, sufficient and upholding federal, state, and local support to public transit agencies is essential to help them maintain their services. Unfortunately, many transit agencies had been experiencing budget deficits before the COVID-19 pandemic as federal transportation policies have long favored automobile travel over other travel modes (Grengs, 2005). They face more financial struggles with slow ridership recovery and vehicle operator shortages since the COVID-19 pandemic. As a result, transit

agencies across the US had to increase fare prices, make route cuts and cancellations, shorten services schedules, as well as seeking new funding opportunities and coalitions with private and non-profit entities to bridge their fiscal shortfalls (Dalbey, 2023). First, it is important to ensure adequate and fair funding from the federal government to support public transit infrastructure building and development. In addition to a more equitable federal funds allocation, local government could also support funding public transit through increased sales or property taxes to help supplement fare revenues to cover operational costs. Public-private partnerships can further supplement maintaining and sustaining transit services with additional resources. Working with communities to better understand their needs would make public transit services more efficient and better meet people's needs. These strategies could help transit services prevent service and route cuts, increase the frequencies of evening and night buses, have more frequent services on the weekend, and expand paratransit service destinations at a relatively affordable price.

8.4.2 Better transit services to reduce the barriers for older adults and improve the satisfaction of older adults

For transit agencies, there are several policies and improvements they can make to reduce the barriers older adults face as transit riders and will make travel experience more satisfying. First of all, transit agencies can make travel information more accessible to older adults. Keeping printed bus schedules and making timely updates would allow older adults who are less tech-savvy to know what bus they can take to go to different places as well as when there are services changes. Transit agencies should also work with other municipalities to ensure that broken sidewalks are fixed in time so that walking to bus stops would not be a risk to senior transit riders. Moreover, they should also collaborate to make sure that during winter times, the sidewalks and bus stops are shoveled timely and the bus stops are always accessible for transit riders. Transit agencies should

also work with local law enforcement to reduce and eliminate illegal parking at bus stops so that the bus can always lower the ramp for people who are in need of it. Further, transit agencies should provide better training programs to their operators on safe driving and assisting senior transit riders will boarding and alighting the buses so that senior riders would be more comfortable using public transit.

8.4.3 Community engagement and outreach programs

Transit agencies should actively collaborate with community-level organizations and entities to develop comprehensive educational and training programs tailored for older adults. These programs could help inform them about the various driving alternatives that are available them. One effective strategy is to conduct public transit awareness campaigns through senior centers located at the neighborhoods level with detailed instructions on how to use public transit, making it more accessible and less intimidating for older adults. Additionally, organizing outreach events and programs specifically designed to teach older adults how to navigate public transit systems can be beneficial. These events could include hands-on workshops, informational sessions, and interactive demonstrations. To further enhance their learning experience, transit agencies could organize group trips to popular destinations using public transit. This not only increases their exposure to the transit system but also helps them gain practical knowledge and confidence in using it. Another approach is to establish buddy programs. Transit agencies can recruit experienced senior transit riders as volunteers to mentor new riders. These volunteers can provide personalized guidance, answer questions, and offer support, ensuring a smoother transition for those new to public transit. Moreover, transit agencies should consider leveraging traditional media channels that older adults are more likely to engage with, such as newspapers, radio, and television. By promoting positive stories about public transit in these media, agencies can help mitigate the

negative stigma often associated with public transit. This exposure can play a crucial role in changing perceptions and encouraging more older adults to consider public transit as a viable and convenient option for their transportation needs.

8.4.4 Adopting complete streets policies and create a safer environment for all road users

Lastly, it is crucial for municipalities, DOTs, and transit agencies to create a safe, inclusive, and welcoming environment for all road users. This means addressing the needs of everyone, including pedestrians, cyclists, public transit riders, drivers, and vulnerable groups such as older adults. Adopting complete streets policies can be a viable approach to achieving these goals by designing roadways that prioritize safety, comfort, and accessibility for everyone. One of the most safety concerns senior transit riders mentioned is reckless driving. Implementing traffic-calming measures, such as reduced speed limits and pedestrian-friendly crossings can help reduce the risk of accidents and make streets safer for everyone. Targeted enforcement and public awareness campaigns can also help to combat dangerous driving behaviors that threaten the safety of other vulnerable road users like older adults. In addition to improving safety, complete streets policies can help improve public transit accessibility by providing more and easy-to-access bus stops so that seniors can remain connected to their communities by using public transit.

8.5 Future research and limitations

Though this dissertation investigated the nuances in senior public transit riders' travel behavior, there are several limitations that should be considered when interpreting the findings of this study. First of all, this study examined older adults' travel mode choices with the 2017 NHTS datasets at a time when the 2022 NHTS datasets were not available. The 2017 NHTS datasets are now several years old, older adults' travel patterns, preferences, and socioeconomic characteristics may have changed since then. This is particularly relevant in light of events like the COVID-19

pandemic, which had significant impacts on people's travel patterns (e.g., declined transit ridership, more remote workers). As the 2022 NHTS datasets become available to the public, it is important for researchers to use the most-up-date datasets that would reflect older adults' current travel behavior and mode choices. Further, the data used to understand older adult's travel satisfaction was 2020-2022 MCTS survey data from Milwaukee County, WI. However, most survey takers lived in the City of Milwaukee, only a few of them lived outside the city and even fewer of them were older adults. Future research should investigate the travel behavior of older adults who live in less dense areas, especially in places without extensive public transit networks (rural and suburban areas) to examine what driving alternative travel modes are available for them once they stop driving, as well as their willingness to use different modes. Moreover, the MCTS surveys were conducted online (though postcard invitations were sent to physical addresses, they only provided the link to online survey), the opinion of people who had limited or no access to the Internet was not captured or represented in the surveys. Using the survey data may introduce potential non-response bias into the models and their results. Future research should consider approaches (e.g., analyzing subgroup differences) to mitigate this bias and enhance the validity of study results.

For the qualitative section, this dissertation recruited 30 senior transit riders for the qualitative sections of the study, future research should expand the sample size to better understand senior transit riders' travel experiences. Though this study tried to recruit a diverse group of participants, most participants in this study were female. Other studies have pointed out similar limitations when studies used qualitative research methods to understand senior transit riders' travel experiences with public transit (Hess, 2012; Ravensbergen et al., 2021; Rosenbloom & Herbel, 2009). Older adults who are men are less likely to use public transit and are more likely to

be isolated (Ahern & Hine, 2012; Graham et al., 2018; Hagan, 2020), future research should focus on the elements of public transit design and campaign that would encourage senior men to use public transit for participating more social activities after driving cessation. Also, there was not a huge difference between the number of 2017 NHTS senior female and male survey participants, the number of female MCTS survey respondents was also close to that of male MCTS respondents, researchers should also explore qualitative research methods and recruiting processes that are more approachable to senior male. As Ravensbergen et al. (2021) noted, participants of such studies were already active public transit riders, there might be barriers and challenges preventing potential senior transit riders from using public transit in the first place. future research should also focus on using qualitative methods to investigate the specific barriers and concerns that deter potential senior transit riders from using public transit, what programs or improvements would they prefer and make them feel comfortable riding public transit, as well as interventions or incentives that could attract potential senior riders to use public transit. This research found that respondents considered MCTS service change (adding a new BRT line while cutting certain existing routes) as a barrier that would prevent them from using public transit. Follow-up studies should examine whether these participants would try to use the new bus route or if the service change makes them reduce their travels for better recommendations for transit agencies.

Moreover, though most interviewees did not drive anymore, they mentioned how reckless driving impacted their travels because sometimes they did not feel safe crossing the streets or sitting on the bus. Future research should also look into how reckless driving impacts other road users (e.g., older adults and people with disabilities) and effective measures to make the road safe for all road users. When it comes to how public transit contributes to senior public transit riders' wellbeing, qualitative research methods (e.g., focus groups, in-depth interviews) could capture

detailed, nuanced information about seniors' experiences, feelings, and perceptions. More research should use such methods with larger sample sizes to better understand transit's impact on older adults' wellbeing. and quality of life. This study examined mostly public transit's impact on older adults' mental wellbeing, future research should also look into the relationship between using public transit and its contribution to senior riders' physical wellbeing. This study found gender differences in how senior transit riders perceive their safety and personal security (senior female riders feel more insecure and less safe at different stages of riding the buses), future research should look into how senior female riders' perceptions of public transit safety differs from younger female riders', if there are geographic differences in how female and male perceive public transit safety (e.g., urban versus rural), as well as how does different transit modes (bus transit versus rail transit) contribute to the gendered perceptions on transit safety. This dissertation also found how the stigma around public transit (e.g., public transit is dangerous, public transit is for poor people who could not afford cars) contributes differently to how experienced riders and relatively new riders see themselves as transit riders. Future research should further investigate the relationship between experience with riding public transit and perceptions of public transit with larger sample sizes to see how stigma impacts transit riders' perceptions of themselves, as well as what can be done to mitigate the stigma around public transit.

Lastly, most interview participants in this study showed great distrust during the outreach and recruiting stages. They voiced concerns that most transit agencies and policymakers drive rather than use buses, leading to doubts about whether their expectations of public transit and the challenges they encounter will be understood and addressed. They also mentioned that transit agencies had tried outreach programs to understand their needs and expectations, but these were not always addressed or followed-up. During the outreach stage, several potential participants

became relatively suspicious about the agencies behind the research. Their distrust and suspicion were not lifted even after I emphasized what the research was about, and it was an independent study with no sponsorship from or association with any transit agencies. However, some of them began to put their guard down and showed more trust in me once they knew I was also a transit rider and took the bus to our interviews. They would ask me about what bus route I took to the senior center and how I liked the public transit system. I also encountered one of my participants on the bus on my way to the senior center for interviews. This shared experience was essential for them to believe that I was able to understand their expectations and frustrations with public transit, and therefore they could open up to me and tell me about their true experiences with public transit. It may be helpful for future researchers investigating senior transit riders' experiences with public transit to get familiar with public transit themselves so that they create the connection with senior transit riders and understand their experiences with public transit.

8.6 Conclusion

This dissertation explores and investigates factors that impacts older adults who are public transit riders' travel satisfaction with public transit, how public transit contributes to their mental wellbeing, as well as how they perceive themselves as transit riders. Older adults who are transit riders prefer extensive and affordable transit services with easy access to bus stops and travel information, reliable buses that follow travel schedules, well-maintained buses, as well as drivers who are friendly and with safe driving habits. Public transit can bring positive contribution to their mental wellbeing when public transit could take them to most places they are interested in visiting and help them participate in society. They feel dependent and have less travel freedom when public transit as their primary travel modes cannot reach their desired destinations, and have higher chance to feel lonely and suffer social exclusion. Moreover, the stigma around public transit has

varying impact on how experience transit riders and new transit riders see themselves as transit riders. While experienced senior riders see themselves as radical and smart travel advocates debunking the unrealistic rendering of public transit, new transit riders are more influenced by the stigma and see public transit as a travel mode that is inferior to driving, and thus are less willing to try public transit. By exploring the overall and nuanced barriers and challenges of senior transit riders, examining how their travel experiences contribute to their wellbeing and shape their perceptions of being transit riders through qualitative research methods. This dissertation suggests that the federal government should provide strong support for public transit development so that public transit can become a viable alternative for seniors to use. Transit agencies should also work with local governments and entities to make public transit more accessible and safer for seniors to use. Lastly, municipalities should work with their local DOTs and transit agencies to adopt complete streets policies to create a safe, accessible, and welcoming travel environment for all modes and road users. In conclusion, this dissertation finds that senior transit riders are not a homogenous group, their preferences and expectations of public transit are also likely to vary depending on their exposure to and experiences with public transit. This study also suggests more qualitative research on older adults' travel behavior to help policymakers and transportation agencies to better accommodate a graying America.

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10. Appendices

APPENDIX A

Table of Selected Global Studies Using Interviews to Examine the Travel Behavior and Satisfaction of Older Adults and/or People with Disabilities

Paper	Journal	Setting	Themes	Data source & Scale	Methodology
Avery, L. J. (2017). Mobilization and the Disability Rights Movement: The Realities of Public Transport in Bangkok.	N/A (Dissertation)	Bangkok	People with disabilities Activists Scholars Government officials	11 interviews with activists, scholars, and government officials (most of the interviewees have physical disabilities 2 focus group interviews with people with disabilities and caregivers	Focus group interviews with people with disabilities and caregivers In-depth interviews with activists, scholars, and government officials
Banister, D., & Bowling, A. (2004). Quality of life for the elderly: The transport dimension.	Transport Policy	United Kingdom	Older adults (65 and over) Overall quality of life	1,000 nationwide interviews	Open-end questions in a survey on respondents' opinions on factors affecting their quality of lives
Hagan, R. J. (2020). Getting out of the house: The use of community transport as a third place for rural-dwelling older adults.	Ageing and Society	Derry, Londonderry, and Tyrone County, Northern Ireland	Older adults (age range 62 - 87) Rural transport and community bus service Social capital	11 users of community transport bus service Experience of using community bus range: 1 month to 14 years At bus operational bases	Semi-structured interviews
Johnson, R., Shaw, J., Berding, J., Gather, M., & Rebstock, M. (2017). European national	Transport Policy	European Countries	Older adults Mobility barrier Priorities	Government officials from 20 European countries	Face-to-face interviews

government approaches to older people's transport system needs.					
Jones, A., Goodman, A., Roberts, H., Steinbach, R., & Green, J. (2013). Entitlement to concessionary public transport and wellbeing: A qualitative study of young people and older citizens in London, UK.	Social Science & Medicine	London, United Kingdom	Young adults (12 - 18) Older adults (60 and over) Concessionary bus travel	118 young people 46 older adults	Individual, pair and group interviews (general topics) In-depth interviews (sensitive topics)
Jones, K., Mock, R., & Cearley, S. (2006). Report from an Interdisciplinary Case Study on a Public Transit System in Crisis.	Journal of Public Transportation	Pulaski County, Arkansas, United States	Funding and structural factors Governance Operational conditions	6 bus riders 53 stakeholders	Structured interviews
Low, W.-Y., Cao, M., De Vos, J., & Hickman, R. (2020). The journey experience of visually impaired people on public transport in London.	Transport Policy	London, United Kingdom	Travel experiences public transit visually impaired	23 visually impaired interviewees	Semi-structured interviews
Parahoo, S., Harvey, H., & Radi, G. (2014). Changing Consumer Behavior Paradigms: Does Passenger Age Impact Factors Influencing MRT Usage?	Corporate Reputation Review	Dubai	Age Metro usage	20 passengers at four different metro stations Station managers	Open-ended interviews (passengers) In-depth interviews (station managers)
Ravensbergen, L., Newbold, K. B., & Ganann, R. (2022). 'It's overwhelming at the start': Transitioning to public transit use as an older adult.	Ageing and Society	Hamilton, Canada	Older adults (65 and over) Public transit Travel experience	24 older adults	Semi-structured interviews

Ravensbergen, L., Newbold, K. B., Ganann, R., & Sinding, C. (2021). 'Mobility work': Older adults' experiences using public transportation.	Journal of Transport Geography	Hamilton, Canada	Older adults Mobility Public transport accessibility Disabling spaces	24 older adults	Semi-structured interviews
Wayland, S., Newland, J., Gill-Atkinson, L., Vaughan, C., Emerson, E., & Llewellyn, G. (2022). I had every right to be there: Discriminatory acts towards young people with disabilities on public transport.	Disability & Society	New South Wales and Victoria, Australia	Travel experiences Disability Young people Public transit	26 young people with disabilities	Semi-structured face-to-face interviews
Wong, R. C. P., Szeto, W. Y., Yang, L., Li, Y. C., & Wong, S. C. (2017). Elderly users' level of satisfaction with public transport services in a high-density and transit-oriented city.	Journal of Transport & Health	Hong Kong	Older adults (60 and over) Service quality of public transport modes	613 older adults	Face-to-face interviews
Wong, R. C. P., Szeto, W. Y., Yang, L., Li, Y. C., & Wong, S. C. (2018). Public transport policy measures for improving elderly mobility.	Transport Policy	Hong Kong	Older adults (60 and over) Travel decisions using different public transport modes Participating social activities	613 older adults	Face-to-face interviews

APPENDIX B

Table of Selected Global Studies Using Surveys to Examine the Travel Behavior and Satisfaction of Older Adults and/or People with Disabilities

Source	Setting	Survey Name	Type	Scale	Time period	Method
Adams et al., 2015	Metropolitan Seattle/King County, WA and Baltimore, MD/Washington DC regions, United States	Neighborhood Quality of Life Study (NQLS)	Self-reported	2,199 responses	2001-2005	Multilevel regression models
Allen et al., 2020	Santiago, Chile	A multiannual consumer satisfaction survey for the Santiago de Chile Metro system	Questionnaire	41,993 responses	01/2013-06/2016	Structural equation models (SEM), SEM-Multigroup, and SEMM (finite mixture) models
Banister & Bowling, 2004	United Kingdom	The Quality-of-Life Survey	Self-reported	999 responses from older adults (65 and over)	07,09,11,12/2001	Chi-square
Bezyak et al., 2017	United States	A survey on barriers of people with disabilities using public transit and paratransit services	Web-based survey	4,161 responses from contacts of the National Network of ADA Centers	03/11/2009-03/31/2009	Pearson's chi-square compare with expected
Bezyak et al., 2020	United States	A national survey with people with disabilities	Web-based survey	1,748 respondents with disabilities	10/2015-02/2017	Pearson's chi-square technique and Mann–Whitney U tests
Buning et al., 2007	United States	Survey on wheelchair user's experiences on public, fixed-route buses	Web-based survey	283 respondents	N/A	Chi-square tests to determine variations from the expected frequencies
Cao, 2013	The Twin-cities, Minnesota, United States	A survey on light rail travel satisfaction and quality of life	Mailed-in survey	1,303 responses	05/2011	The structure equations model (SEM)

Casas, 2007	The Greater Buffalo-Niagara Region (GBNR), New York, United States	One-day travel diary survey	Self-reported	1.876 households	09/03/2002-12/12/2002	Poisson and negative binomial regression models
Chng et al., 2016	London, United Kingdom	Wave two of Understandin g Society	Self-reported	3,630 responses	11/2010	Multivariate linear regression
Deka, 2014	United States	2009 National Household Travel Survey (NHTS)	Self-reported	37,209 automobile trips of households with people with disabilities	03/2008-05/2009	Probit models
El-Geneidy et al., 2016	Montreal, Canada	2011 Statistics Canada National Household Survey (NHS) 2014 General Transit Feed Specification	Self-reported	14 census tracts	05/2014-06/2014	Self-established method to account for monetary and time cost
Farber et al., 2014	Utah, United States	Utah Household Travel Survey (UHTS)	Self-reported	6,238 households and 16,071 individuals	Spring 2012	A joint ordinal/continuou s model
Feeley, 2010	New Jersey, United States	A state-wide convenience survey on Autistic Spectrum Disorder	Web-based survey	1,077 responses from individuals with Autistic Spectrum Disorder and/or their caretakers	12/2008-05/2009	Descriptive stats
Golledge et al., 1996	Santa Barbara-Goleta, Lompoc, and Santa Maria, California, United States	A survey on characteristics of the activity patterns of blind and vision impaired non-drivers	Mailed-in survey, telephone survey, and in-person interview	55 visually impaired and blind respondents	N/A	Descriptive stats
Haywood et al., 2017	Paris, France	Show-card with different scenarios of crowdedness	On metro line platforms	Around 1,000 respondents	Late 2010	Ordered probit estimations

He et al., 2020	Hong Kong	A survey on travel satisfaction, social inclusion, and wellbeing	Questionnaire at senior centers	271 participants (age not specified)	2018	SEM (structure equation model)
Hess, 2009	The City of Buffalo, New York; San José, California, United States	A survey on older adult's perceived barriers using public transit	Mail survey with a questionnaire	Buffalo: 171 responses; San José: 286 responses	Late 2005-Early 2006	Multivariate regression analysis
Hess, 2012	Erie county, New York, United States	A survey on older adult's perceived barriers using public transit	Mailed-in survey with a questionnaire	451 responses from older adults (60 and over)	Late 2005-Early 2006	Descriptive analyses
Hough et al., 2008	North Dakota, Untied States	Individual-level social environment and physical environment factors survey	Questionnaire	1,021 female respondents (65 and over)	08/2006	Regression models
Israel Schwarzlose et al., 2014	Atascosa, Polk, and Parker Counties, Texas, United States	A choice experiment survey	Mailed-in survey with a questionnaire	558 respondents	Fall 2011 Spring 2012	Random utility model, mixed logit model
Kersting et al., 2021	Germany	EcoBus project customer survey	Questionnaire on bus	102 responses	06/10/2018-08/05/2018	Pearson correlation analysis
Kim & Ulfarsson, 2004	Washington State, United States	2000 Puget Sound Transportation Panel (PSTP), Puget Sound Regional Council (PSRC)	Self-reported	421 older adults (65 and over)	2000	Discrete choice model: multinomial logit model
Kim et al., 2020	Shizuoka city, Japan	Rider's satisfaction and quality of life survey	Smart card users	386 older adults (65 and over)	01/12/2016-01/22/2016	Flece and Perry (2008) and Doi et. Al (2008) conceptual model for generalized satisfaction

LaPlante & Kaye, 2010	United States	The Survey of Income and Program Participation (SIPP) The National Health Interview Survey on Disability (NHIS-D)	Self-reported	70, 311 adults	06/2005-09/2005	Logistic regression model
Le & Dannenberg, 2020	United States	2001, 2009, and 2017 National Household Transportation Survey	Telephone-based recruitment interview	3,435 transit walkers in 2001, 4,115 in 2009, and 4,601 in 2017	2001, 2009, 2017	Linear and logistic model
Li et al., 2018	Shanghai, China	A micro survey dataset of Shanghai	Self-reported	2,368 respondents	2013	Ordered logit regression
Makarewicz & Németh, 2018	Denver, United States	A survey on multiple transportation options and subjective wellbeing	Self-reported	232 responses	04/2015-12/2015	Kruskal-Wallis one-way ANOVA test
Mattson et al., 2021	United States	National Community Livability Survey	Self-reported	1,000 responses	04/2017-12/2017	Ordered probit models
Moayyed, 2022	United States	A survey on older adults' travel behavior and choices	Survey	178 respondents	02/2019-03/2020	Random forest, Multinomial Logit Regression
Noor & Foo, 2014	Kota Kinabalu, Malaysia	A survey on customer's satisfaction with public transit	Self-reported	987 respondents randomly selected at bus stops, on buses, at shopping centers, as well as at government and private institutions	N/A	Descriptive and factor analysis
Nordbakke & Schwanen, 2015	Norway	A survey on transport and activity participation	Through third party survey company	4,723 older adults (67 and over)	10/2011-11/2011	Ordinal regression model

Pfeiffer et al., 2020	Phoenix, Arizona, United States	A survey on residents and their local environment	Questionnaire	496 participants	2017	OLS regression
Ryvicker et al., 2012	New York City, United States	Survey on access to primary care	Senior centers	1,260 community-dwelling older adults	2008	Stratified multivariate models
Samuel et al., 2013	Baraga, Jackson, Newaygo, and Wayne counties, Michigan, United States	Cross-sectional survey	Mailed-in Survey	73 participants of Michigan's transportation voucher program	N/A	Multivariate regression analysis
Schmöcker et al., 2008	London, United Kingdom	2001 London Area Transport Survey	Self-reported	10,439 individuals: older adults age 65 and over (8,012), people with disabilities (2,427)	N/A	Multi-nominal logit (MNL) model
Schwanen et al., 2001	The Netherlands	Dutch National Travel Survey	Self-reported	28,419 older adults (50 and over)	1996	Multinomial logistic regression model
Solvoll & Hanssen, 2017	Norway	User satisfaction survey	Questionnaire	210 questionnaires	N/A	Regression analysis
Soza-Parra et al., 2019	Santiago, Chile	Rider's satisfaction survey	Outside of four selected metro stations	1,150 responses	07/17/2018-07/20/2018	Ordered logit models
Tran et al., 2022	Japan	National Smart Mobility Challenge Survey	Web-based survey	1,333 older adults (65 and over)	01/23/2021-02/01/2021	Generalized linear models (linear regression models)
Verbich & El-Geneidy, 2016	London, United Kingdom	A five-year customer satisfaction survey	Interviewed passengers alighting at bus stops	22,569 responses	2010 to 2015	Principle component analysis
Wretstrand et al., 2009	Helsingborg, Borås, and Karlskrona, Sweden	Travel experiences using public transit	Questionnaire	322 older adults (75 and over)	N/A	Chi-square, one-way ANOVA
Yan et al., 2019	The City of Detroit and the Ypsilanti area, Michigan, United States	Stated-preference survey	Web-based survey	170 responses	07/2018-11/2018	Ordered logit model

Yang et al., 2022	Chiba city, Japan	The 6th Tokyo Metropolitan Area Person Trip Survey	Travel diary	2,003 older adults (65 and over)	2018	Ordered logistic model and the Cox Proportional Hazards (Cox PH) model
Yang, 2018	Hong Kong	2011 Travel Characteristic Survey (Government)	Self-reported	19,703 older adults	Weekdays between 09/2011-01/2012	A mixed binary logit model and a conditional logit model
Yuan et al., 2022	Nanjing, China	2015 Nanjing household travel survey	Self-reported	11,146 older adults (60 and over)	N/A	Multinomial logit model
Zhu & Fan, 2018	United States	2012–2013 American Time Use Survey (ATUS)	Computer-assisted telephone interview	13,532 trips	2012-2013	Regression models

APPENDIX C

Table of the Summary of Research Methods Used in Global Studies Examining the Travel Behavior and Satisfaction of Older Adults or People with Disabilities

	No. of analytical papers	**No. of papers using surveys**	**No. of papers using interviews**	**No. of papers using focus groups**[1]	**No. of papers using other methods**[2]
US: Older adults	6	6	0	0	0
US: People with disabilities	12	9	0	0	3
US: General travel behavior and satisfaction	21	9	1	1	10
US Total	**39**	**24**	**1**	**1**	**13**
Outside US: Older adults	23	11	8	2	2
Outside US: People with disabilities	11	3	2	1	4
Outside US: General travel behavior and satisfaction	8	7	1	0	1
Outside US: Total	**42**	**21**	**11**	**3**	**7**
Total	**81**	**45**	**12**	**4**	**20**

Note:
1. To simplify the tabulation process, studies that use focus groups is only categorized in the focus group category rather than in both focus group category and interview category.
2. Other methods refer to papers that did not use any form of transportation surveys in their studies. For example, papers that reviewed existing literature or only used census data are included in this category.

APPENDIX D

Table of the Overview of Available 2017 NHTS Data for Descriptive and Regression Analyses

Geographic level	Household level[1]	Personal level	Trip level[2]	Vehicle level[3]
US				
Total	129,696	264,234	923,572	256,115
In urban area[4]	100,465	202,907	724,475	186,474
In rural area	29,231	61,327	199,097	69,641
Older adults (over 65)	**48,668**	**67,527**	**224,590**	**88,933**
In urban area: older adults (over 65)	35,821	48,958	166,528	61,035
In rural area: older adults (over 65)	12,847	18,569	58,062	27,898
Older adults (over 65) with disabilities[5]	12,335	13,302	28,936	22,481
In urban area: older adults (over 65) with disabilities	9,272	9,996	22,096	15,655
In rural area: older adults (over 65) with disabilities	3,063	3,306	6,840	6,826
In urban area: older adults (over 65) with disabilities	220	241	544	337
In rural area: older adults (over 65) with disabilities	26	28	80	49

Note:
1. The 2017 NHTS dataset does not provide detailed demographic information for each household member at the household level. The number of older adults and whether there is at least one household member has any type of disabilities are from the personal level. The two datasets are linked with the household identifier to tabulate the number of household with at least one older adult and/or at least one household member with disabilities.
2. The 2017 NHTS dataset does not provide detailed demographic information for each household member at the trip level. Personal and trip level datasets are linked with the household identifier to tabulate the number and characteristics of trips made by households with at least one older adult and/or at least one household member with disabilities.
3. The 2017 NHTS dataset does not provide detailed demographic information for each household member at the vehicle level. Personal and vehicle level datasets are linked with the household identifier to tabulate the number and characteristics of vehicles owned by households with at least one older adult and/or at least one household member with disabilities.
4. The 2017 NHTS geocoded the location of homes using home addresses provided by survey respondents and classified surveyed households into different geographic categories. There are several variables in the 2017 NHTS dataset representing different categorizations: HBHUR (urban or rural indicator at block group level), URBAN (household's urban area classification based on home address and 2014 TIGER/Line Shapefile), URBANSIZE (urban area size where home address is located), and URBRUR (households in urban or rural areas). US Census Bureau defines urban areas as densely developed territory with residential, commercial, and other nonresidential urban land uses. The 2017 NHTS urban-rural classification uses the number of homes per geographic unit and is represented by URBANSIZE: 01 (50,000 – 199,999), 02 (200,000 – 499,999), 03 (500,000 – 999,999), 04 (1 million or more without heavy rail), 05 (1 million or more with heavy rail), and 06 (not in an urbanized area). This table uses the URBRUR variable (01 for urban and 02 for rural) to filter, select, and tabulate data.
5. The 2017 NHTS did not directly ask respondents about their disability status, they asked respondents whether they have medical conditions (MEDCOND), how long they have been having the condition (MEDCOND6), and how their medical conditions impact their travel abilities and options (CONDNIGH,CONDPUB,CONDRIDE,CONDRIVE,CONDSPEC,CONDTAX, and CONDTRAV). This table uses the MEDCOND variable (01 for medical conditions and other numbers for either not having medical conditions or uncertain answers for this survey questions) to filter, select, and tabulate data.
Source: US Department of Transportation, Federal Highway Administration. (2020). *2017 National Household Travel Survey.* http://nhts.ornl.gov; National Household Travel Survey. (2020, August). *2017 NHTS Codebook*. US Department of Transportation Federal Highway Administration. https://nhts.ornl.gov/assets/codebook_v1.2.pdf; Census Bureau, U. S. (2022, October 3). *Urban and rural*. Census.gov. https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html.

APPENDIX E

Table of the Characteristics of Dependent and Explanatory Variables for All Participants and Participants over 65 from MCTS Survey (2020-2022)

	All Participants				Participants over 65			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Dependent Variable								
Satisfaction level with MCTS transit services	0.78	0.42	0.00	1.00	0.77	0.42	0.00	1.00
Demographic and Socioeconomic Characteristics								
Sex (Male: 1, Female: 0)	0.49	0.50	0.00	1.00	0.52	0.50	0.00	1.00
Disability status (Yes: 1, No: 0)	0.17	0.38	0.00	1.00	0.25	0.43	0.00	1.00
Employment status (Employed: 1, Other: 0)	0.71	0.45	0.00	1.00	0.24	0.43	0.00	1.00
Income (More than $50,000: 1, Other: 0)	0.39	0.49	0.00	1.00	0.41	0.49	0.00	1.00
Higher than high school degree (Yes: 1, No:0)	0.81	0.39	0.00	1.00	0.88	0.32	0.00	1.00
Driver's license (Yes: 1, No: 0)	0.70	0.46	0.00	1.00	0.75	0.43	0.00	1.00
Years of riding public transit (More than 5 years: 1, Other: 0)	0.66	0.47	0.00	1.00	0.81	0.39	0.00	1.00
Transit Service and Information Accessibility[2]								
Distance from home to nearest bus stop[3]	0.16	0.36	0.00	1.00	0.14	0.35	0.00	1.00
The ease of understanding information on the website	0.81	0.39	0.00	1.00	0.80	0.40	0.00	1.00
The information provided by MCTS Customer Service by call or email	0.80	0.40	0.00	1.00	0.81	0.40	0.00	1.00
The ease of getting detour/route change information	0.67	0.47	0.00	1.00	0.69	0.46	0.00	1.00
Service Reliability[2]								
The buses not being late	0.70	0.46	0.00	1.00	0.77	0.42	0.00	1.00
The buses not being early	0.72	0.45	0.00	1.00	0.74	0.44	0.00	1.00
The Comfort Level of the Ride[2]								
Seat availability	0.90	0.30	0.00	1.00	0.91	0.29	0.00	1.00
Cleanliness of the bus	0.76	0.42	0.00	1.00	0.80	0.40	0.00	1.00
Cleanliness of the bus shelters	0.55	0.50	0.00	1.00	0.54	0.50	0.00	1.00
The presence of adequate security measures	0.78	0.41	0.00	1.00	0.80	0.40	0.00	1.00
Perception of your own personal safety[4]	0.92	0.27	0.00	1.00	0.93	0.26	0.00	1.00
Attitudes of Drivers[2]								
How safely they drive the bus	0.89	0.31	0.00	1.00	0.91	0.28	0.00	1.00
How friendly drivers are	0.80	0.40	0.00	1.00	0.83	0.37	0.00	1.00
How good the drivers are at accommodating passengers	0.86	0.35	0.00	1.00	0.89	0.31	0.00	1.00
How often the drivers know the answers to people's questions	0.85	0.35	0.00	1.00	0.86	0.34	0.00	1.00

Note:

1. The sample size for participants that were aged between 18-64 is 3,492, and the sample size for older adults is 549.
2. Unless noted otherwise, the dummy variables representing MCTS transit service qualities are coded as: it meets my needs: 1, it does not meet my needs or other: 0.
3. The coding for the dummy variable representing the distance from rider's home to the near bus stop: more than ½ mile (approximately 4 blocks): 1, less than ½ mile (approximately 4 blocks):0.
4. The coding for the dummy variable representing the perception of a rider's personal safety: feeling neutral to very safe: 1, feeling not safe at different degrees:0.

APPENDIX F

Table of the Binary Logit Models Results of All Participants and Participants over 65 with MCTS Survey Data (2020-2022)

	All Participants					Older Adults				
	Estimate	SE	z value	Sig.	Odds Ratio	Estimate	SE	z value	Sig.	Odds Ratio
Constant	2.414	0.401	6.018	***	11.176	3.483	1.984	1.755	*	32.566
Demographic and Socioeconomic										
Sex (Base: Female)										
Male	-0.028	0.134	-0.206		0.973	-0.297	0.501	-0.592		0.743
Disability (Base: Has no disability)										
Has a disability	-0.018	0.169	-0.106		0.982	-0.433	0.561	-0.772		0.649
Income level (Base: Less than $50,000)										
More than $50,000	-0.420	0.149	-2.819	***	0.657	-0.527	0.576	-0.916		0.590
Employment status (Base: Not employed)										
Employed	0.176	0.160	1.096		1.192	0.228	0.574	0.397		1.256
Educational attainment (Base: Lower than high school degree)										
Higher than high school degree	-0.554	0.191	-2.897	***	0.574	-1.062	0.981	-1.083		0.346
Driver's license (Base: Has no driver's license)										
Has a driver's license	-0.207	0.159	-1.301		0.813	-2.187	0.756	-2.893	***	0.112
Year of riding public transit (Base: Less than 5 years)										
More than 5 years	-0.200	0.150	-1.337		0.819	0.137	0.748	0.183		1.147
Transit Service and Information Accessibility										
Distance to nearest bus stop (Base: Less than 1/2 miles)										
More than 1/2 miles	-0.521	0.172	-3.033	***	0.594	-0.538	0.663	-0.812		0.584
The ease of getting detour/route change information (Base: Not accessible)										
Information is accessible	0.584	0.146	3.991	***	1.794	1.519	0.554	2.743	***	4.567
The information provided by MCTS Customer Service by call or email (Base: Not accessible)										
Information is accessible	0.692	0.166	4.184	***	1.999	0.552	0.611	0.904		1.737
The ease of understanding information on the website (Base: Not accessible)										
Information is accessible	0.544	0.165	3.286	***	1.722	1.082	0.602	1.797	*	2.950
Service Reliability										
The buses not being late (Base: The bus is late)										
The buses not being late	1.131	0.151	7.497	***	3.097	2.306	0.676	3.409	***	10.035
The buses not being early (Base: The bus is early)										
The buses not being early	0.254	0.155	1.640		1.289	-0.441	0.717	-0.616		0.643

The Comfort Level of the Ride										
Seat availability (Base: Seats unavailable)										
Seat available	0.224	0.201	1.116		1.251	-0.924	1.024	-0.902		0.397
Cleanliness of the bus (Base: The bus is not clean)										
The bus is clean	0.319	0.157	2.030	**	1.375	-0.497	0.670	-0.742		0.608
Cleanliness of the bus shelters (Base: The bus shelter is not clean)										
The bus shelter is clean	0.296	0.148	2.006	**	1.344	0.581	0.532	1.091		1.788
The presence of adequate security measures (Base: Inadequate security measures)										
Adequate security measures	0.308	0.158	1.943	*	1.360	1.002	0.604	1.659	*	2.724
Perception of your own personal safety (Base: Do not feel safe)										
Feel safe	0.773	0.213	3.620	***	2.166	1.227	0.926	1.326		3.413
Attitudes of Drivers										
How safely they drive the bus (Base: They do not drive safely)										
They drive safely	0.391	0.192	2.036	**	1.479	2.468	0.923	2.674	***	11.794
How friendly the drivers are (Base: They are not friendly enough)										
The drivers are friendly	0.311	0.177	1.759	*	1.365	1.492	0.792	1.884	*	4.447
How good the drivers are at accommodating passengers (Base: The drivers are not accommodating)										
The drivers are accommodating	0.013	0.202	0.066		1.013	-0.923	0.934	-0.988		0.397
How often the drivers know the answers to people's questions (Base: The drivers are not knowledgeable)										
The drivers are knowledgeable	0.476	0.190	2.508	**	1.610	1.173	0.799	1.469		3.232
Model Fit										
AIC			1,502.1					170.9		
No. of observations			1,920					234		

Note: *p<0.1; **p<0.05;
***p<0.01

APPENDIX G

Certificate for Institutional Review Board's (IRB) Required Training on Conducting Social & Behavior Research (for semi-structured interviews)

CITI PROGRAM

Completion Date 15-Mar-2023
Expiration Date 15-Mar-2026
Record ID 51215243

This is to certify that:

Xiaohan Gu

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

IRB-Social & Behavioral Researchers
(Curriculum Group)
IRB-Social & Behavioral Researchers
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

University of Wisconsin - Milwaukee

CITI
Collaborative Institutional Training Initiative

101 NE 3rd Avenue, Suite 320
Fort Lauderdale, FL 33301 US
www.citiprogram.org

Verify at www.citiprogram.org/verify/?w13af6eca-4ae6-4196-a809-0791a2c20f63-51215243

APPENDIX H

IRB Approved Consent form for Research Participation

UNIVERSITY of WISCONSIN
UWMILWAUKEE

Informed Consent for Research Participation
IRB #: 23.242
IRB Approval Date: 05/10/2023

Study title	Travel Experience on and Satisfaction with Public Transit among Older Adults in Milwaukee County
Researcher	Xiaohan Gu, Ph.D. candidate (Urban Studies Program, College of Letters and Science, University of Wisconsin – Milwaukee)

I am inviting you to participate in a research study. Participation is completely voluntary. If you agree to participate now, you can always change your mind later. There are no negative consequences, whatever you decide.

What is the purpose of this study?

I want to understand why and when do older adults choose to use public transit, and how well does the local public transit system serve your needs in Milwaukee County.

What will I do?

I will ask you questions about your detailed travel experiences via public transit:

1. How you usually use public transit
2. The barriers and challenges you have experienced at different stages of using public transit
3. How public transit impacts your wellbeing
4. The services that you think public transit should provide or do better
5. And how do you feel as a transit rider.

The total time will be about 30-45 minutes.

Risks

Possible risks	How I'm minimizing these risks
The facilities where the interview takes place may make you feel insecure or less comfortable to talk about your experiences	We will discuss about your concerns and preferred locations to be interviewed during and after the recruitment to make sure that the chosen location makes you feel comfortable and secure to talk about your travel experiences.
The interview may be too long for you to finish	You can pause or stop the interview to rest whenever you are feeling tired or fatigued. It is also up to you to decide if you want to continue or to stop the interview after your rest.
Some questions may be personal or make you feel emotional	You can skip any questions you don't want to answer.

Other Study Information

Possible benefits	• Help inform public transit agencies what senior transit riders need and how they can provide better services to older adults in the U.S. • Help local policymakers and urban planners understand the challenges and barriers senior transit riders face for more suitable policymaking
Estimated number of participants	30 – 40 older adults (65 and over) who use Milwaukee County public transit services
How long will it take?	30 – 45 minutes

Costs	None
Compensation	A $15 Pick N' Save gift card
Future research	De-identified (all identifying information removed) interview transcripts (not interview audio recordings) may be shared with other researchers. You won't be told specific details about these future research studies.
Recordings / Photographs	I will audio record our conversation. The audio recordings will be transcribed by me and used for exploring and understanding older adults' travel experiences in Milwaukee County. The recording is necessary to this research. If you do not want to be recorded, you should not participate in this study.
Funding source	The Urban Studies Program at University of Wisconsin – Milwaukee

Data Security

What identifying information will be collected and why?	I will collect your: • demographic information (gender, age, race and ethnicity, zip code, and employment status) in order to understand their influences on older adults travel experiences with public transit. • contact information (phone number and/or email) in order to contact you and arrange the interview.
How long will my data be kept?	4 – 5 years. Your contact information will be deleted once the interview is completed.
How is data kept secure?	• All identifying information is removed and replaced with a study ID. • I'll store all electronic data on a password-protected, encrypted computer. • I'll store all paper data in a locked filing cabinet in a locked office. • I'll keep your identifying information separate from your research data, but I'll be able to link it to you by using a study ID. I will destroy this link after I finish collecting and analyzing the data.

Who might see my data and why?

The researchers	To conduct the study and analyze the data
The IRB (Institutional Review Board) at UWM The Office for Human Research Protections (OHRP) or other federal agencies	To ensure we're following laws and ethical guidelines
Anyone (public)	We plan to share our findings in publications or presentations. You will not be identified by name. If we quote you, we will use a pseudonym.

Contact information:

For questions about the research, problems, or complaints	Xiaohan Gu Robert J. Schneider	612-443-8065 / gux@uwm.edu 414-977-7740 / rjschnei@uwm.edu
For questions about your rights as a research participant, problems, or complaints	IRB (Institutional Review Board; provides ethics oversight)	414-662-3544 / irbinfo@uwm.edu

Signatures

If you have had all your questions answered and would like to participate in this study, sign on the lines below. Remember, your participation is completely voluntary, and you're free to withdraw from the study at any time.

Name of Participant (print)

Signature of Participant Date

Name of Researcher obtaining consent (print)

Signature of Researcher obtaining consent Date

APPENDIX I

Demographic Information Collection Form for Interview Participants

UNIVERSITY of WISCONSIN
UWMILWAUKEE

Demographic Information Form
IRB #: 23.242
IRB Approval Date: 05/08/2023

Demographic Information Form

Study title	Travel Experience on and Satisfaction with Public Transit among Older Adults in Milwaukee County
Researcher	Xiaohan Gu, Ph.D. candidate (Urban Studies Program, College of Letters and Science, University of Wisconsin – Milwaukee)

Date: _____

1. Please write down your age: _____
2. Please write down the zip code of your address: _____

3. Please select the option below that best describes your ethnicity.
☐ I identify as Chicano/Chicana/Chicanx, Hispanic, or Latino/Latina/Latinx.
☐ I do not identify as Chicano/Chicana/Chicanx, Hispanic, or Latino/Latina/Latinx.
☐ I prefer not to respond.

4. Please select the option(s) below that best describe your race. Select all that apply.
☐ Alaska Native, American Indian, Indigenous, or Native American
☐ Asian
☐ Black or African American
☐ Native Hawaiian or Other Pacific Islander
☐ White
☐ One or more races that are not listed above
☐ I prefer not to respond.

5. Please select the option below that best describes how you identify.
☐ Female
☐ Male
☐ Non-binary
☐ I prefer not to respond.

6. Please select the option below that best describes your employment status.
☐ Employed
☐ Unemployed
☐ Retired
☐ I prefer not to respond.

Page 1 of 1

APPENDIX J

Interviewee Recruitment Flyer Template 1 (made by author)

ARE YOU A TRANSIT RIDER?

Looking for senior citizens who are 65 and older interested in participating in interviews about their travel experiences with public transit or paratransit.

What is this study about?

This study seeks to understand senior citizens' travel satisfaction and experiences with public transit or paratransit in Milwaukee County

Who can participate?

- **Adults who are 65 and older living in Milwaukee County**
- **Have used the MCTS buses or paratransit services in the past 30 days**

How to participate?

- **If you are eligible and interested in participating in this study, please sign up for participation**
- **I will interview you at the NAME OF Senior Center at times that are convenient for you**
- **Each interview will take about 30 minutes**
- **You will receive a $15 Pick 'N Save gift card for participating in this study**

Contact:
612-443-8065
gux@uwm.edu

UNIVERSITY of WISCONSIN
UWMILWAUKEE

APPENDIX K

Interviewee Recruitment Flyer Template 2 (made by author)

ARE YOU A TRANSIT RIDER?

Looking for senior citizens who are 65 and older interested in participating in interviews about their travel experiences with public transit or paratransit.

What is this study about?

This study seeks to understand senior citizens' travel satisfaction and experiences with public transit or paratransit in Milwaukee County

Who can participate?

- **Adults who are 65 and older living in Milwaukee County**
- **Have used the MCTS buses or paratransit services in the past 30 days**

How to participate?

- **If you are eligible and interested in participating in this study, please sign up for participation**
- **I will interview you at the Senior Center at times that are convenient for you**
- **Each interview will take about 30 minutes**
- **You will receive a $15 Pick 'N Save gift card for participating in this study**

Contact

612-443-8065
gux@uwm.edu

UNIVERSITY of WISCONSIN
UWMILWAUKEE

APPENDIX L

Table of the Theme Summary for Chapter 6

Themes	Quotes
Unavailable and Unreachable	
Information inaccessibility	• *"I called [the paratransit provider] to schedule a ride for the Mother's Day event and they didn't pick me up that morning. I called to ask them why no one came to get me, and they told me I didn't schedule a ride on that day. I definitely did because I really wanted to go [to that event] and I called in advance and they told me they will come and pick me up."* (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week) • *"[They] do not seem to care about us anymore."* (Female, Black, age 70-74, buses and car, over 10 years, 3-5 times a week)
Bus stop inaccessibility	• *"Well, sometimes the bus stops are not shoveled … So it can be very difficult to board and get off the buses. Yeah, [during the] winter time with, you know, 2 foot of snow there [at the bus stop that was not shoveled]."* (Female, white, age 70-74, buses and car, over 10 years, more than 5 times a week) • *"[Unshoveled bus stops] is a big, that is, a large hindrance for the elderly, because the snow is here [at the bus stop], and the street is over there, and the bus [stopped] on the street [instead of at the bus stop]. So you have to, like walk around [the sidewalk] to the end, you know, get off the sidewalk, and then you walk down [on the street], you know, to the, to the side of the bus, and then you get on the bus* (Male, Black, age 75-79, buses and car, over 10 years, 3-5 times a week) • *"She's (interviewee's mother) as a roller (meaning people who use wheelchairs or walkers) ... The buses are really well set up for them. They, they'll put the ramp down. Even if you're not in a wheelchair, though, you know, if you want the ramp and they would put it down. But often the bus stops are parked with cars and trucks. This is a real problem in Milwaukee. It's like, [the drivers would think], well, it's just a bus [stop], I can park here, with my flashers on. You know the delivery [truck drivers, they always do that]. I hate those, so much. So the point is, [because of these], the bus has to stop in the middle of the street [without a way to lower the ramp]."* (Male, NA, age 75-79, buses and car, over 10 years, more than 5 times a week)
Constrained destinations	• *"I am limited, the bus can only take you to certain destination points. The bus can take you [to some places you need to go to], or downtown, or the hospital, or the stadium. But you are somewhat confined. I would say that we have mobility, but it is constrained mobility."* (Male, Black, age 75-79, buses and car, over 10 years, 3-5 times a week) • *"I mean, we're trapped in here. There's like 3 buses in the morning, going south and 3 going north at night, or something. You know, if you want to travel further, taking [the bus] wouldn't do it. And [going to the] south [on the bus]? Forget it."* (Male, NA, age 75-79, buses and car, over 10 years, more than 5 times a week).
Safety and Peace of Mind	

Reckless driving	• *"I see some of these people (drivers) that like, when I get off a bus, you know, they have no regard for anybody… So you gotta kind of be on the defensive when you get off of the bus, you need to be defensive until you get to where you're going, because you don't know who's going to run a red light." (Female, white, age 70-74, buses, over 10 years, more than 5 times a week)* • *"scary"* (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week) • *"put fear in your heart"* (Female, Black, age 70-74, buses and car, over 10 years, 3-5 times a week) • *"Yeah, the law says that no turn in front of the bus, they still turn in front of the bus and the bus has to stop [suddenly] that you feel the jerk… And you do not feel safe riding [it]"* (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week) • *"The young people (paratransit drivers) are driving, going that fast, I thought I could have been in danger."* (Female, Black, age 70-74, paratransit, under 1 year, less than 3 times a week)
Concerns about personal security and vulnerability	• *"I don't go anywhere after dark. [I will if] I'm with someone in a car, but you don't go alone. Right? And this is a reasonably safe neighborhood, but being an older person with a walker. It was like wearing the signs, saying. I'm weak and vulnerable."* (Female, white, age 70-74, buses and paratransit, over 10 years, 3-5 times a week) • The shelters acted as *"more of an enclosure"* (Female, white, age 70-74, buses, over 10 years, more than 5 times a week) • *"…you've got people standing behind you looking out, you know, make you feel like you're dragging this thing down."* (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week) • *"I felt frustrated and upset, it was stressful ... Then the riders behind you get at you because they say you are holding up the bus."* (Female, white, age 75-79, buses, over 10 years, used to be more than 5 times a week, became less than 3 times a week due to traumatic experience) • *"I don't use to ride the bus when it's crowded… or something like that, I try to avoid the people… So I've gotten that down to a pattern. I don't get on the bus when there's a lot of people. Sometime during the day, like noon, that's a good time. They're empty because everybody is at work and the kids are at school. You never, never ride a bus at 3 to 4 o'clock, that's the kids are getting off then people are getting off work. So it's really bad because they will run over you, knock you down, push your aside, they do not say excuse me and nothing."* (Female, Black, age 70-74, buses and car, over 10 years, 3-5 times a week)
Gendered riding experiences on the buses	• *"As an older woman. I'm more of a prey. Even I got my purse like this or whatever [holding their purse tightly in their arms and in front of their chest]. It's just, you know, you just, you're looking at everybody that gets up to where I am. Yeah. And I was looking at everybody [to observe their movements]."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week) • Because of traumatizing experiences (being mugged), they sometimes felt they were *"a bit paranoid"* (Female, white, age 70-74, buses and paratransit, over 10 years, 3-5 times a week) • *"I've been mugged at my bus stop. I was getting home, he just came, we were near a parking structure, and he asked me when the bus was coming, and I brought up my phone and he grabbed my purse. He ripped it right off me."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, more than 5 times a week).

- *"I tried to stay to myself and I don't get involved. Just stay out of it. Stay out of it. I'm sitting there and if there are seats [available] on the bus, I will sit closer to the door."* (Female, Black, age 70-74, bus and paratransit, over 10 years, more than 5 times a week)

Passenger Care of Bus Drivers

Inefficient training

- *"[We need] more safe drivers, like professional, well-trained [ones] because sometimes the buses they be going so fast and know that they stop and you fall. I mean, they stop and after that you go forward. I mean, everybody can't take that, you know. So I think they need to improve on the drivers being more, a little more concerned about the people who ride the bus."* (Female, Black, age 70-74, buses and car, over 10 years, 3-5 times a week)
- *"… so I got on the Gold line. Paid my fare, and before I had a chance to sit down the bus lurched forward about 2 foot, knocked me on my back so I was bruised on all my left side. Well, on my knee and both knees and my, my elbow was the worst."* (Female, white, age over 85, buses, over 10 years, more than 5 times a week)

Disrespectful and discourteous drivers

- *"According to the American Disabilities Act, they have to accommodate upon request. They don't. They want to make you say why you need it, or they refuse it, or they say, I know the law, and you're not handicapped. I know the law, and you must be in a wheelchair, and I even had a letter from the doctor for me [to use] at the bus station saying that you know they have to do it and they still won't."* (Female, white, age 75-79, buses, over 10 years, used to be more than 5 times a week, became less than 3 times a week due to traumatic experience)
- *Sometimes, just sometimes the bus drivers are cranky. [The new bus drivers], they are not as well trained as the other ones… And when you talk to them, and they look at you like you're crazy. I always try to say thank you, you have a nice day. They look at you [like you are crazy], you know the older ones are good, [but for] the younger ones, I don't know if I should be talking to them at all."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, more than 5 times a week)
- *"So my point, it was for 10. So at 9 o'clock they were going to pick me up. I'm waiting, and at 8:35, I get a ding-dong, ding-dong, ding-dong! ding-dong! [And I was thinking] what's going on? And then I heard bam! Bam! They were like the police! That scared me and when I walked to the front [door] and this driver was standing there. And so, then I said it is 8:35, my appointment is at 9:00 (she meant her pickup window should be starting at 9:00am and the window should be around half an hour. In this case, the driver should pick her up from 9:00am to 9:30am). She said, well, come now, or I'm going to leave … She was standing there, and I said I'm not ready, and it (the van) wasn't supposed to be here till 9 o'clock. She said, well, if you don't come out in 5 mins I'm leaving."* (Female, Black, age 70-74, paratransit, 5-10 years, more than 5 times a week)
- *"She picked us up about 5 to 2:00. My pickup time down here is 2:30. She's, she [was] going rush us home. And she's going to go home and get her kids and take them to the doctor, I heard her on the phone when I came out. And then one day, I like, I like sewing, and I like sewing things. [And that time] I was right in the middle of something. [If you are] late [for your pickup rides], they would announce your name saying someone's over the with the First Transit [on the speaker]. I was, I was so*

	upset. I ain't know what to do. I was mad." (Female, Black, age 80-84, paratransit, 1-4 years, less than 3 times a week)
Shrinking Service Time and Area	
Extra travel time	• "*now consolidate them into a single route which everybody will have to transfer."* (Male, NA, age 75-79, buses and car, over 10 years, more than 5 times a week) • *"I moved to Milwaukee from another city, and I never rode the bus before I moved here. It took me a long time to learn and confidently ride [this route to the hospital], and now they are going to cancel [the name of the route]. I feel like the air has been sucked out of my body, that is my lifeline, and I don't know how I can go to the hospital anymore…"* (Female, white, age 75-79, buses, 5-10 years, less than 3 times a week)
Reduced out-of-home activities	• *"Absolutely. I don't know what I would do without the bus, I don't like depending on people to give me a ride. I want to be independent. So yeah, I mean, I don't know what I would have done. (Female, Black, age 65-69, buses and paratransit, 1-4 years, more than 5 times a week)* • *"I will try to walk the extra 1 block for as long as I can [to catch a different bus] for the symphony, after that I will just have to stay at home."* (Female, white, age 75-79, buses, 5-10 years, more than 5 times a week) • *"I always, you know, pay my taxes, did what I was supposed to, and then, you know, you get old. and you know they tend to forget about us."* (Female, Black, age 80-84, paratransit, 1-4 years, less than 3 times a week)

APPENDIX M

Table of the Theme Summary for Chapter 7

Themes	Quotes
More than Just a Ride – It's an Emotional Journey	
Positive Contribution: Good Rides, Good Moods	
Empowered travel: Being independent and dignified	• *"When I was riding the bus doing my thing, I didn't depend on other people. I came and went as I please, being independent, right? And I'm an independent person. I'm an only child. So, I don't know anything to do but be independent. So, you know, we like our independence."* (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week) • *"You can go in the store, you can, you know, take your time. You can decide whether you want this, whether you want that, you can read the labels when you're alone. But when you've got somebody waiting, even though they say, that's okay, you're, I feel [like I am] inconveniencing people [for taking longer than necessary to get things done]."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week) • *"But it does really help if you don't have to, you know, worry about, you know, asking some of your family [members] because they got their own life, and some of them got they own problems, you know."* (Female, white, age 75-79, buses, 5-10 years, less than 3 times a week) • *"I no longer had a car at that time when I moved to this building and the location was perfect, because there were 2 bus stops across the street and one [of them was] easily located a block away to get to the Upper East Side. So yes, that is one of the major concerns."* (Female, white, age over 85, buses, over 10 years, more than 5 times a week) • *"It helps me get to where I'm going, and just that, it makes me feel better that I'm able to get out there and catch the bus and do stuff by myself."* (Female, Black, age 65-69, buses, 1-4 years, less than 3 times a week)
On the move, connecting with others	• *"All people need people. But when you get older, you somewhat [are more in] need [of] people, you know, to communicate with you."* (Male, Black, age 75-79, buses and car, over 10 years, 3-5 times a week) • *"This morning. I just didn't feel great, not physically sick. There was construction work outside, we're going to have to be without water, because they change the pipes, you know, in the street … So I was at home, and I said, I just don't want to go today. And then I said. you know what? There's nothing you can do sitting here … you can't do nothing. So I said, let me get up, I said, I got time. So, I jumped in the shower, you know, before 8 o'clock, before they turned the water off. And I like, I did come, So, it really motivates me to come to be with my friends and that. And to have a safe way to get here. So, I really appreciate the transit system that we have."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week) • *"And at some time. a friend from here would call me and say, where are you? I'm at my house. I said, I'm still waiting on the van. Because we have worship service on Tuesday, we have Bingo on Wednesday … I got the activities that I would like to participate. Yeah, and meet my friends."* (Female, Black, age 70-74, paratransit, under 1 year, less than 3 times a week) • "*It absolutely 100% [has] positive contribution to my wellbeing. It helps me just know that, that I have a place to come to, and a*

safe way to get here." (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week)

- "*We grew up socializing with people. So, it's really hard when you are isolated.*" (Female, white, age 75-79, buses, over 10 years, used to be more than 5 times a week, became less than 3 times a week due to traumatic experience)

Negative Contribution: Rough Rides, Constrained Journeys

Loss of freedom

- *"[Not being able to drive] is a terrible loss of independence and lack of flexibility. And like I was saying earlier, I've always been impulsive. I would love to call up my friend in Madison and say, I'm going to come visit you this afternoon. What's for dinner? But then, now you have to depend on a different kind of transport and can't really go."* (Female, white, age 70-74, buses and paratransit, over 10 years, 3-5 times a week)
- *"So if I had more money I would call an Uber and go somewhere every day. Some places that I used to go very frequently, but hardly ever get to anymore because I cannot get there [by bus]."* (Female, white, age 70-74, buses and paratransit, over 10 years, 3-5 times a week)
- *"No, [I do not have the same level of freedom as drivers have because] driving can go anywhere, anywhere. You know. And the buses are taking you to certain places. You know, [you] have to transfer and everything like that. But when they cut the bus out, it's hard for us, the people that, that don't drive, right? … [For] a lot of people, [learning to get used to a new route] is a long learning curve, sometimes for seniors to get to … figure out [by] yourselves*." (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week)
- *"No, actually, instead of that (they were asked if they'd reduce their weekly travels by public transit from at least twice a week to once a week), it would probably be none times a week because of this change."* (Female, white, age over 85, buses, over 10 years, more than 5 times a week)
- *"It took me a long time to learn and confidently ride [this route to the hospital], and now they are going to cancel the Gold line. … and I don't know how I can go to the hospital anymore…"* (Female, white, age 75-79, buses, 5-10 years, less than 3 times a week)

Dependence on others

- *"I have a friend who takes me to the grocery store. so I've been spared having to go grocery shopping on the bus. To me, I think, [it] would be one of the hardest things [if I have to use the bus for grocery shopping] … especially when you are old, you carry even less. But anyway, myself. I don't even like being a passenger of her. I watch how people drive and nobody pays attention."* (Female, white, age 75-79, buses, 5-10 years, more than 5 times a week)
- *"I usually drive with my son. You know, he takes me where I gotta go, picks me up wait for me. Well, I feel like I have less freedom from the standpoint that I'm depending on [my son]. When I was riding the bus doing my thing I didn't depend on other people … I like, well, my son is great about it. If I have an appointment, I let him know he and he comes to my home and take me there, he'll take me where I got to go. Wait for me and bring me back home. Yes, he is a good son, but, see, when I was doing it on my own, say, I was going to a doctor's, or to the mall, or whatever I could take my time, and then do what I got to do." (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week)*

- *"It's not comfortable. Yeah, I feel like you're bugging it and intruding all different people's spaces. Yeah. And this asking can be something that's kind of this hard … I just can't do it. So, I don't ask them. So, it's really hard for me to get around."* (Female, Black, age 80-84, paratransit, under 1 year, less than 3 times a week)
- *"Right. Well, I'll make sure I have to give them some gas money and stuff like that … I like that so that way, I'm not, you know, getting something from them [for free], I'm not just riding for free and not giving them anything. I give them $20 or $30 for the gas there … then you feel like I know I have to let you know. I'm thanking you for driving me, and then for picking me up and sending me to places."* (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week)

Perceptions of Being a Public Transit Rider

What Being a Transit Rider Says About You

- *"Wisconsin has this, in Milwaukee especially has this thing about cars, you know, if you don't have an automobile, my goodness, you are deprived."* (Female, white, age over 85, buses, over 10 years, more than 5 times a week)
- *"The words don't even make sense [whey I say I take the buses], like, he doesn't understand a word I'm saying, he said, well, I can give you a ride. That's all he hears, it's like a poor person's thing [to ride buses], and I've had 20 people offered, and after that I feel stupid. They look at you like: what's wrong with you?"* (Male, NA, age 75-79, buses and car, over 10 years, more than 5 times a week)

The smart and radical explorers (experienced riders)

- *"Creepy subway stations so I heard [from the news], but you never, they don't hear any cool stuff [about public transit]. It's not always like that [public transit is bad or crime-ridden]."* (Male, NA, age 75-79, buses and car, over 10 years, more than 5 times a week)
- *"You so often feel like you're a second-class citizen, because you are using public transit versus having your car. When people asked me [on purpose] when I got into a social event, how did you get here? And this was over on the west side of town. I walked here [I said], and I thought to myself, dummy, you know I take the bus. So, sometimes you feel like people are looking down upon you."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, more than 5 times a week)
- *"I can't tell you how many times. I've told people, you know hey, you can just take the bus down to come here, and they would say: I could give you a ride. They like, pity you. You get to sort of like, totally disbelieving look, like, you must really be poor. Don't have a car. I mean, I've had people say, oh, you have a car [when I tell them I have a car], and they'd ask, why do you ride the bus? But I like taking the bus. It's kind of a free feeling".*(Male, NA, age 75-79, buses and car, over 10 years, more than 5 times a week)
- *"One of my coworkers, her car just died. So, she's looking at buying a used car. But she can't find anything for under $7,000 or $8,000. That's a lot of money for a used car … I can't afford it, I just simply could not afford car payments plus the maintenance and the insurance and all the other costs. My transportation costs right now, it's because of work [that I ride the buses] and using the transit plus, it's more like $180 a month. But normally it would be about $30 a week, that would be my transportation, it's much cheaper."* (Female, white, age over 85, buses, over 10 years, more than 5 times a week)
- *"[I think I am] much smarter [as a transit rider compared to drivers]! Because I can get to places, [even if] they get there*

	faster, but if something happened to their car, they break down, they wouldn't know [what to do]. They'd be lost. And you know so many things [from riding public transit], you know [and understand things like] where to transfer. And then, if this bus is not going to work well, there's a different one I can use." (Female, Black, age 70-74, paratransit, over 10 years, 3-5 times a week) • *"I always thought it was kind of a radical or something [to be a transit rider] … I moved to LA (they described that they had lived in multiple cities and had always used public transit to some degree even if they also drove), I wanted to keep doing it (referring to riding public transit). And, boy, you have to be a real rebel in LA and not drive. I found out ways to do it, it's sort of fun, you know, like fitting into the cracks … So when I moved back here on the East side, of course, it was a lot easier [to ride the buses]. I was thought of myself as kind of a rebel or an exception, or some kind of advocate."* (Male, NA, age 75-79, buses and car, over 15 years, more than 5 times a week)
Feeling the weight of lower social status (relatively new riders)	• *"I'm afraid, I'm afraid of the transit bus, I just am. I just with all that goes on [on the news about crimes happened on the buses], with the bus and everything."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week) • *"Well, I just don't feel safe on the bus. [I am afraid of] assaults, I think those are the ones I am concerned about [and I don't ride it anymore]."* (Male, Black, age 65-69, paratransit, 1-4 years, less than 3 times a week) • *"I used to drive myself until I had a bad car accident. That's why I'm on this this service now. And I think is, that is really frustrating and upsetting. But for the most part I have not been to get to what I want to do in a long time. [Because I am] not driving [anymore].* (Female, Black, age 80-84, paratransit, under 1 year, less than 3 times a week) • *"You know, it's uncomfortable [riding the bus]. When you have a car and you put it in for repair and then you take the bus to work. So, [back then] I was working downtown. So, I'll just catch the bus. Oh, man, it was a hot day, you know. I had to walk to the bus stop [to take the bus and there was no air conditioning on the bus]. And so, you know, I'd say, by the time I got home I was sagging, my back was all wet."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week) • *"The County, Milwaukee County every year would come to the [senior] center, picked us up, gave us a demonstration on how you ride the bus, how you let the driver know that you want to get off. And they showed us [how good the buses are now], it is air-conditioned now, so it was very helpful, but not enough to [convince me to] really venture out there … Still, you have all the other concerns, it's not only about knowing how to use it, and you have to be sure that I am safe while I'm on the bus."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week) • *"When these kinds of things happen (their encounters with disrespectful drivers and late pickups), and when they just couldn't be there when you need them. And you also got the things scheduled and you have to cancel things (in advance). It doesn't make you feel good at all."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week) • *"I cannot wait to get my car[back from the shop and to drive again]."* (Female, Black, age 80-84, paratransit, 1-4 years, less than 3 times a week)

How Far Can I Go

I Can Go Anywhere (experienced riders)

- *"There are some buses that go all the way out in the suburbs that I can take, but everything within the city, [I can go to those places that I want to go to]. I can go all over the Bayshore. I can go all the way to Brookfield Square. I can go anywhere, and I have no problem."* (Female, white, age over 85, buses, over 10 years, more than 5 times a week)
- *"You're never going to be precisely [on time with the bus], you know, like, but basically you can assume that you will be there for 15, 14, 15 mins, yeah, and then a bus will be coming."* (Male, Black, age 75-79, buses and car, over 15 years)
- "" I started to ride the buses right away, actually, it is surprising how good it is (buses in the City of Milwaukee), I like it more than [the buses in] New York." (Male, Asian, age 65-69, buses, over 10 years, more than 5 times a week)
- *"In the morning, some ideas may pop in my head and say, let's go to the park, let's go to the lake, you know. And I get myself and my little dog ready, and we just get on the bus and travel."* (Female, Black, age 70-74, buses, 5-10 years, more than 5 times a week)
- *"I usually go, I go to my bank, I go to my pediatrist, I go to my hairdresser, I go to my dentist; I go to the symphony, I go to the Public Library on Wisconsin Ave. Those are my primary things that all happen on the 14th line."* (Female, white, age 75-79, buses, 5-10 years, more than 5 times a week)
- *"[For groceries I don't ride the bus], because I have a car [it is] very helpful [to get groceries with a car]."* (Male, NA, age 75-79, buses and car, over 10 years, more than 5 times a week)
- *"I usually just walk around the block of where I live (as my major recreational activity), I ride the bus for the monthly Asian American community get-together, if I want to go to other places, my son will drive me."* (Female, Asian, age 70-74, buses, over 10 years, 3-5 times a week, translated and transcribed from Mandarin Chinese

Less freedom, more stops (relatively new riders)

- *"There are somethings that are different, because I can drive anywhere, I'm going and be on time. I wouldn't have to depend on them, I just go. That's what it is now, I had to give up driving my car (due to physical conditions prohibiting them to drive safely) and come here [by transit]."* (Female, Black, age 70-74, paratransit, under 1 year, less than 3 times a week)
- *"No, I don't feel as independent as the people with cars. During COVID, they were able to go wherever they wanted to go, because they were in their self-contained little protective car. I was nervous being with other people on the bus. So I wasn't going anywhere*." (Female, Black, age 65-69, buses, 1-4 years, less than 3 times a week)
- *"There are just so many things you want to consider [before riding the buses]. Imagine, a lady, probably in her late 60s. and she said someone grabbed her while on the bus. She felt really uncomfortable because she was just really vulnerable there and then you're embarrassed. Nobody wants to be a spectacle, so do you scream? You know. What do you do? [What] do you say? Let me be alone or get off? And you just think about so many things you get so paranoid. And then you just either stay at home or use something else. I just do not ride."* (Female, Black, age 65-69, buses and paratransit, 1-4 years, less than 3 times a week)
- *"I'd like to use it (public transit) more, but I got comfortable driving, I think. it felt more comfortable, just driving the car,*

less people and (more) privacy." (Male, Black, age 65-69, buses and car, 1-4 years, less than 3 times a week)

- *"When I first started, there was a woman from Taiwan who showed me what buses I needed to take and where to transfer to get to my job, she rode with me for a couple times, and then I felt comfortable riding the buses on my own."* (Female, Asian, age 70-74, buses, over 10 years, 3-5 times a week, translated and transcribed from Mandarin Chinese)

APPENDIX N

Perceptions of being a Paratransit Rider

The way paratransit riders perceived themselves as transit riders rooted in the differences in the transit services, their physical conditions, and the discrepancies in their expectations and the reality of paratransit services. Therefore, even if they shared some of relatively new bus riders' views, they had their unique views of how they felt being transit riders. In general, paratransit riders considered themselves as travelers with less autonomy and freedom when they used paratransit services. Unlike buses, paratransit services are still a door-to-door transportation service that would allow riders to wait inside for the paratransit vans to transport them to and from their homes and destinations. To most paratransit riders, they did not feel that they were of lower social status like new bus riders did as they did not have to wait outside, feeling they were being judged by drivers. However, they experienced the highest level of loss of freedom among participants that were aged between 18-64. Like new bus riders, most of them were drivers before they ceased driving and needed to use public transit for out-of-home activities. Learning to travel with paratransit vans was not difficult for them, while getting used to traveling in paratransit vans was extremely challenging. Like new bus riders, switching travel modes – especially from one with a higher level of freedom of travel to one with a much lower level of freedom – meant a great decrease in their quality of life. From driving themselves at any time to anywhere they wanted to go to limited destinations and travel in a shared space, most paratransit riders shared that*: "There are some things that are different, because I can drive anywhere, I'm going and be on time. I wouldn't have to depend on them, I just go … That's [paratransit vans] what it is for me now."* (Female, Black, age 70-74, paratransit, under 1 year, less than 3 times a week). As a result, the feeling of being stuck and dependent on transit services always reminded them that they have lost

their previous freedom to travel. A lot of paratransit riders expressed their loss of autonomy when they started to travel with paratransit. First, for most paratransit services in Milwaukee County, eligible applicants are only allowed to subscribe to one of them. Unlike new bus riders who at least had the choice to choose from different bus routes, paratransit riders could only go to the limited destinations that the transit service they subscribed to offered. Thus, compared to new bus riders, new paratransit riders experienced more disparity between the travel modes and felt they had lost the ability to make travel decisions and choices based on their own preferences. Moreover, their misunderstanding of paratransit worsened their feeling of losing travel autonomy. The paratransit service MCTS offers charges riders $4 each way if they travel to hospitals or grocery stores, which is more expensive than riding the bus. Instead of considering paratransit as a form of public transit, many new paratransit riders had the expectation that what paratransit offered would be equivalent to taxicabs. Many of them felt frustrated, anxious, helpless, and even anger when the vans were not *"on time"* or sometimes would prioritize other passengers' destinations over theirs. Therefore, paratransit riders were more likely to reduce their *"unnecessary"* out-of-home activities and had a greater chance of feeling isolated after they stopped driving.