Exploring the role of the outdoor built environment for aging in place: A look into the False Creek South neighbourhood

by

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Project Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Urban Studies

in the
Urban Studies Program
Faculty of Arts and Social Sciences

SIMON FRASER UNIVERSITY
Spring 2022

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Abstract

Population aging and urbanization calls for urban planners to take a closer look at age-friendly plans and policies to support aging in place. Research shows that most older adults prefer to “age in place”, continuing to live in their own home or neighbourhood for as long as possible. This study explores the outdoor built environment of an urban neighbourhood in the City of Vancouver, identifying aspects perceived as barriers and facilitators for aging in place. Data were collected using semi-structured interviews with 11 older adults and four key informants, supplemented by photographs and journal entries from the older adults. Data were analyzed using inductive and deductive thematic analysis. Findings show that older adults and key informants agree objective features such as smooth sidewalks, curb ramps, the proximity of green spaces, availability of benches, public washrooms, and street lighting facilitate aging in place. Key informants reported distance to amenities and poor transportation service as barriers. Older adults positively reported on the therapeutic and social aspects of the built environment such as forest walks and meeting places for social interaction as important facilitators for aging in place. To address the issues of population aging and urbanization, this thesis suggests that urban planners need to prioritize age-friendly policies that promote mobility and well-being in neighbourhood planning programs, and further develop age-friendly built environments for aging in place.

Keywords: aging in place; built environment; age-friendly city; urban neighbourhoods; person-environment fit; place attachment

Acknowledgements

Foremost, I would like to acknowledge I am an immigrant settler of Asian descent and a student in the Department of Urban Studies at Simon Fraser University. I also humbly acknowledge my privilege to conduct research on the traditional, ancestral, and unceded territories that belong to the Musqueam, Squamish, and Tsleil-Waututh First Nations. I am grateful to live, work and study on their lands.

It takes a village. There was a community of people who helped me complete this research and carried me through to the completion of my Master of Urban Studies degree. Firstly, I would like to thank my patient and supportive supervisor, Atiya Mahmood from the Gerontology department, who took me under her wing. In addition to your invaluable feedback on my progress, I am extremely grateful for our chats at the end of our virtual meetings and your personal support in my academic, professional, and family endeavors. You showed me my input is valuable, kept me motivated, and never let me give up.

For their kindness and assurances throughout this program, I'd like to thank faculty and staff from the Urban Studies and Gerontology Departments, including the Research Commons team. Dr. Tiffany Muller-Myrdahl and Dr. Meg Holden who supported me by believing in the capabilities of working moms.

Thank you to the False Creek South (FCS) residents and key informants who took part in the study. Without you, I would not have the rich content for my thesis.

To my life partner Colin, I am forever grateful for your unwavering belief in my ability to achieve this academic milestone and for being the best dad to Kai and Caleb. To Kai and Caleb, thank you for loving me unconditionally and keeping me on my toes. To Mom and Dad, thank you for instilling the value of education during my early years and for taking care of my boys so I could concentrate on research writing. My brother Sam for being the cool uncle who spent weekends playing video games with the kids. To my work peers for cheering me on. Finally, to my friend groups, Thesis and Kids, Thesis and Beers, #wegotthis, Scott, Rachel, Annie, and Beth, you were my lifeline through this epic academic journey.

Table of Contents

List of Tables

List of Figures

List of Acronyms

AFC	Age-friendly cities
FCS	False Creek South
KI-AR	Key informant – Architect and False Creek South resident
KI-BL	Key informant – Broadway Lodge executive director
KI-CP	Key informant – City of Vancouver planner
KI-UPC	Key informant – Urban planning consultant
SAC	Senior's Advisory Committee
SWAN	Stakeholder's Walkability/ Wheelability Audit in Neighbourhood
WHO	World Health Organization

Glossary

Age-friendly cities	“An age-friendly city encourages active aging by optimizing opportunities for health, participation, and security to enhance the quality of life as people age. An age-friendly city adapts its structures and services to be accessible to and inclusive of older people with varying needs and capacities” (WHO, 2007).
Aging in place	A person’s ability to live in the same home or neighbourhood safely, independently, and comfortably, for as long as possible (Bigonnesse & Chaudhury, 2019; Canada Mortgage and Housing Corporation, 2019).
Built environment	As defined by the Public Health Agency of Canada, the built environment is part of our physical surroundings and includes all buildings, parks, and open spaces, street networks and road systems, transportation systems, and other infrastructure that we encounter in our daily lives. For this study, the built environment consists of physical features outside of the home, including streets, sidewalks, public realm furniture, bus stops, public spaces such as plazas, parks, natural and green spaces.
Mobility	A person’s ability to move around and maintain independence by walking, cycling, driving, or transit services.
Place attachment	The emotional connection that people establish with specific environments that give meaning to these places (Mackenzie et al., 2014; Mahmood et al., 2019; Rowles, 1983).
Population aging	The processes that affect the proportion of the total population who are aged and reflects the increases in their proportion of the population (UN, 2017).
Urban design	Describes the physical features that define the character or image of a street, neighborhood, community, or the city as a whole. Urban design is the visual and sensory relationship between people and the built and natural environment at the macro scale (planning, transport, and infrastructure networks) and micro scale (sidewalk conditions, street furniture, and lighting).

Chapter 1.

Introduction and Overview

1.1. Background

Currently, 55% of the world's population lives in urban areas, and the trend is expected to increase to 68% by 2050 (UN, 2018). The percentage of older adults is expected to double from 11% to 22% by 2050 and to be concentrated in urban areas of developing countries. Canada will experience a significant increase in older people as the "Baby Boomer" generation matures. In 2017, 81% of the total population in Canada lived in urban centres (Canada: Degree of urbanization, 2017).

These trends indicate a need to prioritize urban aging as a point of consideration in urban planning and policy development (Smith, 2009). In British Columbia (BC), the greatest population increase is expected among the oldest adults (see Table 1.1). The population aged 85+ is projected to increase by 75% over 30 years (2011-2041), rising to 6% of the total population by 2041. Growth among seniors ages 75-84 is expected to exceed 60%, with that age group projected to account for 10% of the population in 2041 (BC Statistics, 2017).

Table 1.1. Projected population change by age group in BC, 2011-2041

AGE GROUP	% OF TOTAL POPULATION		30-YEAR GROWTH
	2011	2041	
85+	2%	6%	75%
75-84	5%	10%	62%
65-74	8%	11%	43%
55-64	13%	12%	19%

Research suggests that older adults want to age in place, living comfortably in their own homes, and remaining in familiar, safe, and clean neighbourhoods to which they have become attached over the years (Byrnes et al., 2006; Gardner, 2011; Wiles et

al., 2012). The extent to which this group can continue to live in the neighbourhood of their choice, participate in their community actively, and access needed services can be supported by neighbourhood planning policies that promote livable and age-friendly neighbourhoods, inclusive of their aging population. A neighbourhood's built environment that is beneficial for healthy living for older adults is also good for all ages (Buffel et al., 2012). The population of older adults in the City of Vancouver was the fastest-growing age demographic (19%) between 2011 and 2016. This population is expected to double in the next 30 years, with an increase of more than 93,000 older adults age 65+ by 2036 (BC Statistics, 2017). Based on this demographic shift, neighbourhoods in urban centres will need to accommodate more older adults who wish to remain living in the neighbourhood as they age.

1.2. Study rationale

This study aims to explore facilitators and barriers of urban outdoor built environments that support or deter older adults aged 65 years or older aging in place in urban neighbourhoods. In particular, the objective is to understand older adults' perspectives of the role of outdoor built environments on their ability to age healthily and live in their chosen neighbourhood for as long as they can. In this study, neighbourhood is defined as a bounded area with a cluster of streets and recreational and shopping areas generating social connections. Its public realm becomes the direct living environment of people, the environment where some of their activities take place and where they are exposed to positive and negative environmental influences (Groenewegen et al., 2018; Kallus & Law-Yone, 2000). The area selected for this case study is the urban neighbourhood of False Creek South (FCS). This neighbourhood in the City of Vancouver is a waterfront community located between Cambie Bridge to the east and Burrard Bridge to the west. To the north, FCS is bounded by a seawall along False Creek with iconic views of downtown Vancouver and mountains.

This study assesses perceptions of urban-dwelling older adults on aging in place to gain a better understanding of why they are choosing to remain in their neighbourhood as they age. By taking inventory of FCS's current physical outdoor conditions, this study aims to discover the objective characteristics of neighbourhoods such as the function of pedestrian infrastructure and transportation systems to provide older adults the opportunity to stay in the neighbourhood of their choice for as long as

possible. Aging successfully requires an enabling environment where older adults feel secure and supported (Smith, 2009). According to WHO (2015), encouraging the development of age-friendly places that support healthy lifestyles helps people age actively and thereby enhances their quality of life. WHO's definition of health highlights active aging, or the physical, mental, and social aspects of well-being for the aging population (WHO, 2002). This can be facilitated by identifying key factors that keep these aging residents in such places.

As major urban centres densify and the number of older adults living in these areas increases, urban planning for this demographic shift is important to minimize the health, social and economic challenges. Urban planners need to focus on the physical design of the neighbourhoods that enable residents to grow older actively, with infrastructure and services to support their needs (van Hoof et al., 2018). Most older adults in Canada (93%) do age in place in their own homes within their community (Statistics Canada, 2011). For this reason, urban planners must develop neighbourhood plans that include age-friendly policies to support older adults aging in place. Minimizing barriers to enable older adults' mobility and independence through neighbourhood design, pedestrian safety, access to amenities and transportation, reduces social isolation and inactivity thereby improving well-being.

Conceptualized over 40 years ago as part of an urban reform movement, the FCS neighbourhood model reflects the innovative and progressive spirit of the 1970s. FCS is considered unique because the official development plan was based on land use policies that promoted social inclusivity and environmental goals. FCS neighbourhood planning embodies best practices that brought to life distinctive features such as design guidelines based on a human scale and people-oriented places, an auto-free environment emphasizing pedestrian and bicycle infrastructure, engineering social-mixing and built-form diversity by designing residential low to mid-rise housing enclaves, active public spaces like the seawall, playing fields, dog park, landscaped pedestrian overpass over 6th Avenue, and the unique aesthetics and design of the buildings (Ley, 1987).

Over time the concept of age-friendly communities has been a goal for policy makers and researchers. The intent is to plan communities that support the increasing number of older adults who choose to remain in their homes and neighbourhoods for as

long as possible (Vasunilashorn et al., 2012). The ability to age in place depends on intersecting factors such as a person's mental health and physical abilities, social connections, and a built environment that is planned with safety in mind and to accommodate a person's needs (Burton et al., 2011; Dobner et al., 2014; Mahmood et al., 2019; Phillips et al., 2013). Built environments that are age-friendly, walkable, with accessible transportation services facilitate older adults' independence and mobility, the ability to move around and get to places with relative ease (Clarke & Gallagher, 2013; WHO, 2002). Studies found that active aging is connected to mobility and physical activity which in turn leads to social participation and security (Mahmood et al., 2012; van Hees et al., 2017). A such, opportunities for older adults aged 65+ to age in place with success can be supported when the outdoor built environment is designed to facilitate active aging.

In the case of FCS, outdoor built environment characteristics consists of walkways, roads, benches, public transportation infrastructure, including natural attributes such as gardens, parks, and proximity to the ocean. The quality of these features can affect the extent to which older adults can live, work, and play in their neighbourhoods. Supportive neighbourhood design features include accessible pedestrian pathways, ramps for people who use mobility-assisted devices, streetlights, crosswalks with curb cuts, benches, well-maintained green spaces, and accessible transportation systems (Chaudhury et. al., 2012; Mahmood et. al., 2019). Likewise, neighbourhoods that offer amenities and health services within walking distance enable older adults to meet their daily necessities, such as buying groceries and visiting the doctor (Bigonnesse et al., 2014; Van Dijk et al., 2015; van Hees et al., 2017). Examining how physical environmental aspects such as pedestrian infrastructure and access to transportation act as facilitators to physical activity and mobility might not only inform the design of policy interventions but also influence urban designs that promote physical activity (Dannenberg et al. as cited in Michael et al., 2006). In turn, this enables older adults to live independently and safely as they age in place.

In addition, social networks or established personal relationships and social interactions between people are important aspects to consider. Wiles et al., (2012) suggest that aging in place is more than growing older in one place. They remind us that connections to people and places within a neighbourhood, such as coffee shops, grocery stores, and cultural groups foster feelings of warmth, and a sense of belonging

are also important factors for aging in place. Mackenzie et al. (2014) found aging in place was linked to those who strongly identified with and felt connected to their neighbours. In their study, older adults who reported higher feelings of security in life were the ones with well-developed social capital and a strong sense of cohesion with their neighbours. Knowing neighbours, friends, and family who could be counted on in times of need gave them reassurance, confidence, and security (Mackenzie et al., 2014). Research indicates that as older adults remain socially and culturally connected, their health and well-being also improved (Buffel et al., 2012).

As shown above, research on neighbourhood environments demonstrated that built and social environmental aspects were closely related when older adults were asked about important neighbourhood features for aging in place (Novek & Menec, 2013; Van Dijk et al., 2015; Verma & Huttunen, 2015; Yan et al., 2014). While the role of the social environment is an important factor to consider, this study focuses on clarifying the role of the outdoor built environment in FCS on the desires of older adults. The intent is to provide some new understanding of why older adults choose to remain in the neighbourhood as they grow older.

1.3. Research question and purpose

The purpose of this study is to examine the outdoor built environment pedestrian infrastructure and transportation systems that impact the ability of older adults to age in place. The general intent of this research is to provide some understanding as to why older adults choose to remain in a neighbourhood as they grow older. More specifically, the intent is to explore aspects of the outdoor built environment – using FCS neighbourhood as an example – from the perspectives of older adults that live there to identify barriers and facilitators of aging in place. Research questions guiding this study are as follows:

- What are older adult residents' perceptions of FCS as they age in this neighbourhood?
- What are the key informants' professional perceptions on the role of the outdoor built environment in FCS for aging in place?
- What role does the outdoor built environment of the neighbourhood play in older adult residents' decision to age in the FSC neighbourhood?

a) What outdoor built environment features support or hinders older adults' ability to age in place in FCS?

b) What can be improved, enhanced, or changed within the outdoor built environment to facilitate aging in place?

At the time of writing this report, the City of Vancouver and FCS residents continue lease negotiations on residential strata and co-op land leases which are set to expire at various times over the next 25 years. Discussions revolve around lease extensions/renewals and redevelopment opportunities. It is believed that the responses to the research questions could provide guidance and inform the FCS neighbourhood planning process set to begin in 2022.

Organization of chapters

This chapter provides the background, rationale, and purpose of the study. Chapter 2 provides a literature review to explicate the conceptual framework. Chapter 3 provides a rationale for the research methodology and details the research design used at the study site and for participant recruitment. Data collection and analysis strategies are also described in this chapter. Chapter 4 presents older adult and key informant profiles and participant perceptions of aging in place. Chapter 5 discusses findings and interpretations of themes on the functionality of the built environment, land use and supportive features, and safety. Chapter 6 presents findings and interpretations of the therapeutic and social aspects of the built environment. The last chapter presents an overview of the research and its limitations, recommends policy considerations, suggests future research directions, and provides some concluding thoughts.

Chapter 2.

Literature Review

To explore the role of the outdoor built environment on older adults remaining in their neighbourhood as they age, the personal experiences of older adults and physical relationships to the place are considered. Firstly, the literature on aging in place is reviewed to discuss and define the concept as it relates to this study of older adults' decision to remain in FCS as they age. Next, the literature on built environment and mobility, with a focus on outdoor built environment features that shape older adults' physical health and experiences of aging in place is presented. Thirdly, the literature on place attachment is reviewed to discuss the relationship between people and place, and how this relation formulates connections to place. Lastly, two theoretical models on aging in place are reviewed.

2.1. Literature and policies related to aging in place

2.1.1. Definition of aging in place

Literature on aging in place covers a wide range of areas. Research suggests that as people age, they prefer to "age in place". Most adults want to live comfortably in their own homes and in familiar, safe, and clean neighbourhoods for as long as they can feel confident and comfortable to do so (Dobner et al., 2014; Gardner, 2011; Wiles et al., 2012; Yen & Anderson, 2012). The concept has been defined by many disciplines including gerontology, urban planning, geography, health sciences, sociology, and more. The term aging in place has been used to describe people living in a residence or dwelling of their choice. It can also be used to describe the built and social environmental context of the neighbourhood which supports older adults in maintaining independent living for as long as they are able to (Bigonnesse & Chaudhury, 2019). Over time, a sense of "dwelling" or "being in place" tends to develop as an expression

not only of daily routines and awareness of the space surrounding them but also because of a psychological bond between person and place[1] (Rowles, 1983).

Urban neighbourhoods not adapted to older adults' needs can limit the older adults' mobility, well-being, and independence, thereby impacting their ability to age in place. According to ecological gerontologists, aging in place is possible when there is a positive interaction between the demands of the environment and the functional abilities of the person (Lawton & Nahemow, 1973; Greenfield, 2012). As people age, they become attached to the place where they live. At the same time, they become more sensitive and vulnerable to their built and social environment, such as outdoor spaces and buildings, transportation, community, and civic participation (Greenfield, 2012).

Researcher Stephan Golant (2018) argues that aging in place may not make sense for everyone. Aging in place can be limiting for those who choose to stay in environments that do not suit their changing mental and physical abilities (Mahmood and Keating, 2012). While some older adults think their home is the best place for them to live out the rest of their lives, other older adults can end up "stuck in place" because the neighbourhood may not have the features or amenities to meet their changing mental and physical abilities. (Golant, 2018; Mahmood & Keating, 2012; Vasunilashorn et al., 2012, Wiles et al., 2012).

Further, older adults who lack the financial and other resources to relocate from an unsafe, detrimental, or increasingly unaffordable environment also involuntarily end up "stuck in place" (Bigonnesse & Chaudhury, 2020; Golant, 2015). According to Golant (2015) aging in place can "go wrong" if older adults age in neighbourhoods that have unaffordable housing or inadequate dwelling units, if the older adults do not have access to services catered for chronic health conditions, if they experience loneliness and social isolation, and if they live in unsafe neighbourhoods with limited transit services. In a worst-case scenario, older adults living in neighbourhoods with these characteristics may not have the choice of where they age because they are unable to move to another neighbourhood (Golant, 2015).

[1] Early definitions by Rowles and Rubinstein described aging in place by focusing on place as a sense of belonging and security, and providing physiological comfort or social insideness (Weil & Smith, 2016)

For Van Dijk et al. (2015), aging in place means developing neighbourhoods to support independent living by providing resources to accommodate physical and social losses as people age in order to live independently for as long as possible. Neighbourhood characteristics outside the home can impact the older adult's ability to continue living independently, and as such the dynamic exchange between the person's changing abilities and environmental conditions should be considered (Peace, Holland & Kellaher 2006; Wiles et al. 2012). Qualities of the urban neighbourhood built environment that allow older adults to live healthier lives include aspects such as parks, accessible transportation, and recreation programs, access to other local services and amenities, and opportunities to connect with family and friends (Verma & Huttenen, 2015). Aging in place means an older adult has the option to choose their living arrangements, maintain social connections and interaction with locals, feel safe and have a sense of security at home and in the community, and enjoy a sense of independence and autonomy (Wiles et al., 2012).

Taking these insights into account, this study defines aging in place as a person's ability to live in the same home or neighbourhood safely, independently, and comfortably, for as long as possible. Aging in place can be facilitated by supporting the changing needs and capacities of older adults over time as they age, delaying any potential relocation to long-term care residential settings (Bigonnesse & Chaudhury, 2019; Canada Mortgage and Housing Corporation, 2019). Aging in place, therefore, is a balance between older adults' functional abilities to optimize their affective responses and their living environment so that they can aim to age successfully (Golant, 2018; Greenfield, 2012; Wang & Shepley, 2018). Since most older adults prefer to age in place, planners are realizing the need to reassess the built environment of neighbourhoods as the aging population seeks to remain in their existing neighbourhoods (Hodge, 2008; Buffel et al., 2012). The next section covers a discussion on age-friendly cities and highlights the role of mobility and the built environment in allowing an individual to age in place.

2.1.2. Age-Friendly Cities (AFC)

The World Health Organization (WHO) introduced the concept of Age-Friendly Cities (AFC) in 2007 as an approach to advancing "active aging by optimizing opportunities for health, participation, and security to enhance the quality of life as

people age" (WHO, 2007). In 2010, WHO established the Global Network for Age-friendly Cities and Communities to promote equitable and supportive urban communities for older adults. The Global Network connects cities, communities, and organizations across different parts of the world to make each of these communities a "great place to grow old" (WHO, n.d.).

The WHO's AFC guide describes an AFC as one that adapts its structures and services to be accessible to and inclusive of older adults with varying needs and capacities. The guide also provides a policy framework for developing equitable and local responses in the form of AFC checklists with the following domains: outdoor spaces and buildings, transportation, housing, social participation, respect and social inclusion, civic participation and employment, communication and information, and community health services (WHO, 2007).

AFC principles refer to physical and social structures but also encompass the notion of an ongoing process rather than viewing an age-friendly community as a single final option. Cities that adopt AFC policies promote the well-being of older adults by investing in the physical and social neighbourhood attributes to support aging in place (Nieboer & Cramm, 2017; Buffel & Phillipson, 2018). The Public Health Agency of Canada (2012) describes AFC as "the policies, services, and structures related to the built and social environment designed to help seniors age actively". Such a community is set up to help seniors live safely, enjoy good health, and stay involved. According to the AFC concept, multiple elements of the natural, built, and the social urban environment have an impact on older adults by enabling them to stay active, productive, and engaged within their community for as long as possible (Plouffe & Kalache, 2010). A person's knowledge of community resources and local activities makes their everyday life more comfortable, especially in older age (Wiles et al., 2012). Buffel et al. (2012) added to the concept by defining an age-friendly city as a framework that recognizes the diversity of cities and supports the inclusion and participation of older adults in the planning and redevelopment of urban neighbourhoods.

Furthermore, cities that adopt AFC policies deliberately plan to reduce inequalities faced by older adults by recognizing that an older population is a diverse group with intersecting identities that contribute to unique experiences and needs (Public Health Agency of Canada, 2012). Previous research stresses the need for

neighbourhoods to offer culturally familiar and linguistically accessible shops, services, and programs to promote physical activity and mobility among foreign-born older adults (Tong et al., 2020). According to Holman and Walker (2020), intersectionality is a combination of multiple social characteristics such as gender, ethnicity, age, and socio-economic position. They assert that intersectionality can be used to better understand how structural factors shape aging (Holman & Walker, 2020). Equally important, Novek and Menec's (2013) research addressed gaps within AFC characteristics by applying them to different neighbourhood environments. Their results diversified the WHO checklist of essential features of age-friendly cities and identified three addtional contextual factors for aging in place: (1) community history and identity; (2) aging in urban, rural, and remote communities; and (3) environmental conditions. Overall, the research contributes to a more comprehensive understanding of age-friendly communities through an equity lens, recognizing that each neighbourhood has unique qualities and needs requiring different approaches to become age-friendly (Novec & Menec, 2013).

Vancouver Context

The City of Vancouver established its Seniors Advisory Committee (SAC) in 2009. The committee plays a key role in advising staff on neighbourhood planning processes, and mobility improvements, as well as reviewing housing policies and developments. SAC supports staff and Council in pursuing the City's commitment to seek designation by the WHO as a Global Age-Friendly City.

In 2012, the City of Vancouver confirmed its support for age-friendly and aging in place policies by launching the Seniors Dialogue project to increase the profile of SAC and seniors' issues. The project engaged older adults, caregivers, and community agencies on how the City can ensure its facilities and services are age-friendly. Building on the findings from the dialogue series, the city-wide *Age-Friendly Action Plan* was adopted by Council in 2013. The plan's objective was to help make Vancouver a safer and more inclusive place for older adults by adapting facilities to meet their aging needs. The plan describes six focus areas: active and healthy living, human services, built environment, safety & emergency services, training and awareness, and coordination and monitoring. After releasing the *Age-Friendly Action Plan*, Vancouver City Council passed a motion to seek formal recognition as an Age-Friendly City by the Province of

British Columbia and to work toward achieving “Global Age-Friendly City” status with WHO (City of Vancouver, 2013). In 2014, the City received an Age-Friendly City designation from the Province of BC.

Also in 2014, Vancouver City Council adopted the Healthy City Strategy, which contains many policies that align with the WHO social determinants of health. The Healthy City Strategy recognizes the challenges of growing inequality and cites WHO’s four preconditions for change: (1) political commitment where equity and health are core values in a city’s policies and priorities; (2) a comprehensive and systemic approach to urban health; (3) facilitation of inter-sectoral action and active citizen involvement; and (4) partnering with diverse community groups (City of Vancouver, 2014). Building on the Healthy City Strategy, Vancouver approved initiatives that contribute to its livability and progression toward a range of age-friendly interests, particularly those related to dementia and social isolation through the Dementia Friendly City training model in 2015 and the Social Isolation and Loneliness project in 2018. Next, the City’s 2020 Budget Report recommended re-initiating work on the Age-Friendly Action Plan. Furthermore, Vancouver’s Equity Framework, approved by City Council in 2021, prioritizes ways that equity should be integrated into the City’s work with communities with an intersectional, decolonial, racial justice, and systemic equity lens (City of Vancouver, 2021).

While the City of Vancouver’s efforts has helped establish it as an emerging leader in age-friendly planning, it needs to take significant new actions and fast-tracking policies to be recognized by WHO as a “Global Age-Friendly City”. Age-friendly built environments provide opportunities for people regardless of age or ability to enhance their independence, mobility, and well-being (Chau & Jamei, 2021). Urban design must meet the needs of older adults to allow them to be active members of their neighbourhood surroundings (Clarke & Gallagher, 2013). Warburton et al. (2011) assert that real progress can be made towards age-friendly communities when initiatives are aligned with existing policies and are part of a broader government framework. The Government of BC supports the alignment of existing and new policy interventions to increase the profile of age-friendly initiatives. Despite these policy supports at the upper levels of government, the City of Vancouver has yet to increase the profile of the initiative by embedding an age-friendly policy into existing plans and priorities.

The next section reviews the literature on the role of the outdoor built environment as it relates to the independence, mobility, and safety of older adults as they age in place.

2.2. Outdoor built environment features relevant to aging in place

Certain aspects of urban neighbourhood environments need to be designed appropriately to support older adults as they age. This includes pedestrian infrastructure and transportation systems. This section discusses the significance of mobility in later life and built environment factors found in the literature that support or hinder older adults aging in place.

2.2.1. Mobility

Literature on neighbourhood environments focusing on urban design features and physical activity found that older adults rely on both walking and public transportation for everyday mobility (Buffel & Phillipson, 2019; Chaudhury et al, 2011; Michael et al, 2006; Yen & Anderson, 2012). Webber et al. (2010) define mobility as the older adults' ability to move around in their neighbourhood and maintain their independence. The way older adults navigate their neighbourhood is influenced by their functional abilities and access to transportation, including public transit (Michael et al., 2006; Yen & Anderson, 2012; Wiles et al., 2012). In their review, Rosso et al. (2011) propose that in "order to facilitate aging in place, it is important to understand the role of the built environment on mobility limitations". Their findings suggest that neighbourhoods can support older adults' mobility by adapting the built environment to complement the older adults' changing functions and abilities as they age.

Research based on the ecological model focuses on the impacts of the built environment instead of a person's functional abilities, emphasizing the importance of outdoor built environmental factors influencing mobility (Yen and Anderson, 2012). Older adults who live in neighbourhoods that provide safe pedestrian infrastructure, walkable to and from destinations, and accessible transportation systems are more likely to participate in regular physical activity (Chaudhury et al., 2011; Gomez et al., 2010; Li, 2005; Lockett et al., 2005; Nagel et.al, 2008; Rosso et al., 2011). As a result, the

improved physical health of older adults is linked to walkable neighbourhoods that provide opportunities to remain active (Cauwenberg et al., 2012; Michael et al., 2006). However, as people age, their mobility needs change, so environments may present new challenges as older adults' physical ability declines.

2.2.2. Pedestrian infrastructure

Urban neighbourhood outdoor built environments that are adapted or designed to be accessible and meet the needs of older adults can be a key contributor to aging in place (Dobner et al., 2014; Hwang, 2017; Phillips, 2017; Verma & Huttunen; 2015; Wang & Shepley, 2018; Yen & Anderson, 2012). In her review, Hwang (2017) proposed that more walkable and better adapted pedestrian-friendly environments could support older adults' aging in place. A study of 206 older adults aged 65+ years found that those who reported positive and walkable environments were able to stay in their neighbourhoods 3.53 years longer than older adults who reported negative environments (Wang & Shepley, 2018). Within the outdoor built environment microscale factors, such as benches, curb cuts, surface quality, and width of walking paths, ramps, wayfinding signage, separation of pedestrian and cyclist paths, or overall pedestrian-friendly infrastructure are important factors for facilitating older adults' walking and thus promotes aging in place (Chaudhury et al., 2012; Li, 2005; Lockett et al., 2005; Michael et al., 2006; Verma & Huttunen, 2015; Wang & Shepley, 2018). On the other hand, poorly designed sidewalks, poor quality streets, and the absence of crosswalks and curb ramps were identified as barriers in the neighbourhood environment (Mahmood et al., 2019).

Additionally, the aesthetics of the outdoor built environment may contribute to a perceived risk of crime and feelings of insecurity (Buffel, Phillipson, & Scharf, 2012). Environmental variables such as safety from crime, adequate street lighting, pleasant neighbourhood atmosphere (clean and quiet), sheltered resting places, access to nature (parks, trees, ponds), access to washrooms, and proximity to sea/shoreline were identified as contributors to aging in place (Chaudhury et al., 2012; Gomez et al., 2010; Li, 2005; Lockett et al., 2005; Nagel et al., 2008; Van Dijk et al., 2015; Verma & Huttunen, 2015; Wang & Shepley, 2018). Poor neighbourhood aesthetics (graffiti, vandalism, unkempt greenery, construction); lack of safety from traffic; uneven walking paths; obstructions or snow on sidewalks, pathways, and trails; and absence of

sidewalks, crosswalks, curbs, ramps, and benches were identified as barriers within the neighbourhood built environment (Chaudhury et al., 2011; Gomez et al., 2010; Lockett et al., 2005; Michael et al., 2006; Phillips et al., 2013; Verma & Huttunen, 2015). As has been noted, neighbourhood attractiveness, safety, and overall pedestrian-friendly infrastructure facilitate walking and independent living and link to older adults' improved physical activity and health status (Bigonnesse et al., 2018; Mahmood et al., 2012; Vine et al., 2012; WHO, 2007).

2.2.3. Transportation systems

Mobility and travel opportunities within urban neighbourhoods are important factors for staying socially active and connected. Neighbourhoods that offer accessible public transportation within walking distance to home, good bus connections, and safety measures at bus stops are facilitators of older adults gaining independence and aging in place (Chaudhury et al., 2012; Dobner et al., 2014; Lockett et al., 2005; Van Dijk et al., 2015; Van Hees, 2017). Regular and reliable transportation that offers accessible services, and facilitates connections to various neighbourhood activities, is a major component of successful aging in place (Bigonnesse et al., 2014; Milton et al., 2015). Verma and Huttunen (2015) note that adequate neighbourhood transportation is a key factor for older adults staying socially connected with other people. They also note the importance of providing up-to-date information about transportation options to make travel from home to services more accessible for some older adults, especially for those who do not use or have access to internet technology.

Meanwhile, poor transportation services such as infrequent bus service, inconvenient routes, and infrastructure such as lack of shelters at bus stops negatively affect older adults' daily lives by limiting their opportunities to participate outside their homes (Chaudhury et al., 2012; Mackenzie et al., 2014; Milton et al., 2015; Verma & Huttunen, 2015). Dobner et al. (2014), in their study on older adults living in disadvantaged neighbourhoods, found that limited transportation options (such as canceled bus connections) presented crucial hurdles to aging in place.

The next section reviews the literature on place attachment to understand the subjective experiences of aging in place. The literature is reviewed to understand and contextualize the attachment of older adults to FCS and why they want to age in place.

2.3. Place attachment

Exploring the meaningful bonds that people have to places helps to understand the emotional significance of the place. My investigation brings attention to the meanings attached to specific places, as well as how these meanings help shape an individual's life. Novek and Menec (2013) found that subjective contextual factors such as social and community history associated with certain places shaped older adults' experiences of who they are. Participants in their study described attachments to buildings and community spaces that informed their identity and their sense of independence. Similarly, Mackenzie et al. (2014) showed that as people interact with everyday places, they create connections with, and give meaning to, these places. They found that the older adults who spent their efforts building their own home, raising children in the area, having connections with long-term neighbours, and living close to community activities enriched their experiences of home. As a result of this attention, feelings have been demonstrated as compelling bonds that individuals form with specific places and how the place is understood. It is recognized that feelings shape an older adults' attachment to places (Wiles et al., 2017). Increased feelings of attachment to one's neighbourhood can facilitate aging in place (Gilleard et al., 2007).

Dobner et al. (2014) suggests that emotional attachment to place is reported by older adults who had lived in a neighbourhood for a long time – despite deficiencies in infrastructure. Being familiar with everyday places cultivates familiarity and a sense of continuity leading to feelings of security and stability. Similarly, it has been observed that older adults who felt left behind and priced out of their neighbourhoods due to urban redevelopment, still express strong identification with the place and deep attachment to the area they have bonded with throughout their life (Buffel & Phillipson, 2019). Above all, participants deeply valued their ability to decide where to live as they age (Van Dijk et al., 2015). As such, it is important to support older adults' capabilities of finding ways to maintain daily routines and manage themselves in their own homes (Van Dijk et al., (2015).

The following section discusses two theoretical models guiding this research: the Ecological Model of Aging: Person-Environment fit (Lawton & Nahemow 1973) and the Theory of Insideness (Rowles, 1983).

2.4. Two theoretical models guiding this research

Research questions guiding this study focus on understanding the experience of aging in place and older adults' negotiations with the outdoor built environment. However, it is also important to acknowledge that the choice to stay in a neighbourhood as people age goes beyond the condition of the built environment to include subjective experiences such as attachment to a place and memories created within the place. This section presents the Ecological Model of Aging: Person-Environment fit model developed by Lawton and Nahemow (1973) and Rowles' (1983) Theory of Insideness to frame the experiences of older adults as they age.

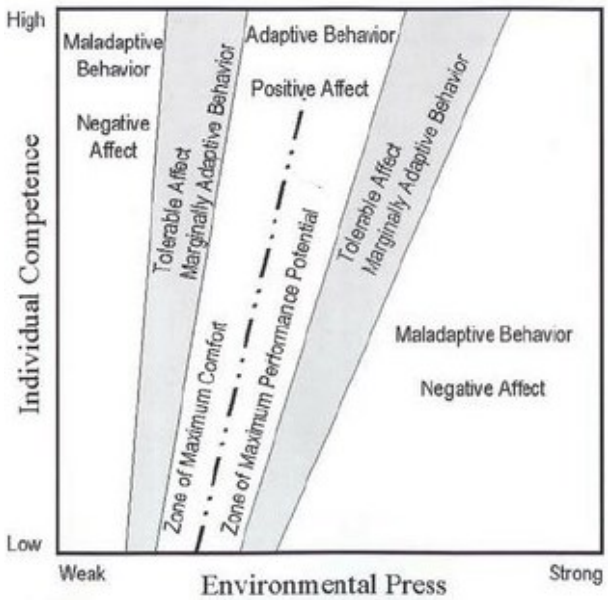
2.4.1. Ecological model of aging: Person-environment fit (Lawton & Nahemow, 1973)

The ecological perspective on aging has been influenced by Lawton and Nahemow's (1973) competence-press model, which articulates the dynamic and interdependent relationships between individual capacity and environmental influences (Kendig, 2003; Wahl et al., 2012). The primary assumption of this interactive model is that the capacity of older adults to adapt to existing built environmental pressures greatly decreases as they age because of an increasing number of functional limitations (Lawton & Nahemow, 1973). According to the model, people with low functional abilities facing high environmental demands are more likely to experience maladaptive behavior, while people who have high functional abilities facing low environmental demands experience positive behavior (Lawton, 1980 as cited in Phillipson, 2011). People with high levels of physical strength and mental abilities in a high-risk crime environment can go out and engage in physical activity (positive behavior). However, for people who are weaker physically, the pressure of the environment is too great for them to leave their home, which subsequently restricts their mobility and increases their feelings of isolation (maladaptive behavior).

Based on the ecological model, a person's ability to age in place is a balance or "fit" between an individual's mental and physical function (competence), and environmental characteristics (press) (see Figure 2.1). It can be said that successful aging in place results from an optimal balance between the person's competencies and the degree of press from the built and social environments (Bigonnesse & Chaudhury,

2020; Lawton & Nahemow, 1973; Wahl et al., 2012). Built environments consist of inanimate objects, spaces, and structures an individual directly or indirectly engages with, while social environments consist of interpersonal relationships, such as relationships between neighbours and families (Greenfield, 2012). When demands from the built and social environments exceed a person's resources – and this may arise due to changes within the environment or the person – the person is less likely to age in place (Greenfield, 2012; van Hees et al., 2017). For example, people with the ability to stay active in neighbourhoods that have made walking to and from places safe and convenient with features such as adequate sidewalk widths, smooth walking surfaces, and proper street lighting are more likely to age in place safely and comfortably even if their bodily functions begin to change. The same cannot be said for those who have safety concerns due to poor and inaccessible pedestrian infrastructure (missing benches, sidewalks, crosswalks, narrow walking paths) or if their physical health deteriorates to the point that they cannot walk. In either case, the likelihood of aging in place safely and comfortably lessens.

Figure 2.1. Competence-press model: Person-environment fit (Lawton & Nahemow, 1973)



2.4.2. Theory of Insideness (Rowles,1983)

Rowles (1983) developed the Theory of Insideness to conceptualize attachment to place. This theory suggests that people who have lived in the same community for a long time maintain different types of attachment. Rowles frames this using the concept of “insideness”, which refers to the processes of place attachment and the designation of meaning to a place. He explains place attachment with three dimensions: (1) physical “insideness” which refers to the attachment of an individual who has developed a sense of environmental control and awareness developed within familiar places by establishing fixed routines and habits in a place that they have lived in for a long time (Novek & Menec, 2014); (2) social “insideness” which is the shared social identity assigned to places and neighbourhoods (Novek & Menec, 2014). These are social relationships that an individual fosters with others; and (3) autobiographical “insideness” which are the personal meanings that older adults attach to places over the course of their life that shape their self identity (Novek & Menec, 2014).

The concepts of physical, social, and autobiographical insideness highlight how a lifelong accumulation of experiences in a place can provide a sense of identity and a positive sense of self. Older adults with strong ties to a place feel more independent, autonomous, and secure because of the time that they have spent living in that same space. Rowles further argues that attachment to place may play a greater role in the maintenance of identity in older age, because over time, these places become ‘a landscape of memories’ (Rowles, 1983). Research suggests that older adults with strong place attachment to their homes and community will demonstrate more confidence aging in place (Ahn et al., 2019).

As people age, they must cope with many scenarios. These scenarios include declining health, neighbourhood change, friends and family moving away, or dealing with the choice to stay in their home for as long as they can. Rowles (1983) uses the concept of place attachment to explain why older adults choose to stay in their home or neighbourhood and to emphasize the importance of place-making and meaning-making skills developed over the course of a life. These skills help older adults cope with environmental change later in their lives. Attachment to place is not only a motivation for aging in place, but also how people can do so in the context of rapid change in their own mental and physical abilities and the environments around them.

The person-environment fit model (Lawton & Nahemow, 1973) and the Theory of Insideness (Rowles, 1983) acknowledge the interactive relationship between older adults and the environment. The theories inform my research by providing the environmental context for aging, helping determine whether the ability to age in place is dependent on the existence of an appropriate match or balance between the person and the environment (Wahl et al., 2012). Place attachment explains the older adults' reasons for aging in place through physical and social bonds developed over time with the environment. Aging in place may be influenced by the objective features in the built environment combined with the older adults' subjective perceptions of their surroundings, including feelings and memories. Many factors influence whether aging in place is an option for older adults, including environmental conditions either impeding or supporting a person's mental and physical abilities. The theories presented above guide this study's approach to issues of aging, inclusive of objective features as well as subjective perceptions and emotions.

2.5. Summary of literature review

This literature review reveals that aging in place is a complex term that can refer to a range of concepts, including the role between personal function or competence and the built environment, and the facilitators or choices available to older adults that allow for a "sense of identity both through independence and autonomy" (Wiles et al., 2012). This study defines aging in place as the ability to live in the same home or neighbourhood safely, independently, and comfortably, for as long as possible (Bigonnesse & Chaudhury, 2019; Canada Mortgage and Housing Corporation, 2019). This definition recognizes the changing needs and capacities of older adults over time as they age, delaying any potential relocation from their current residential setting (Bigonnesse & Chaudhury, 2019).

The importance of older adults' mobility and their ability to move around independently in their neighbourhood, is a major contributor to aging in place. The evidence reviewed showed that multiple factors of the neighbourhood outdoor built environment associated with the absence or presence of certain pedestrian infrastructure (e.g. benches, curb cuts, sidewalk and pavement conditions, traffic, wayfinding signage, street lamps, neighbourhood aesthetics such as graffiti, and unkempt greenery) and transportation systems (e.g. accessible public transit, proximity

to bus stops, shelter, benches, and lighting at bus stops) can influence mobility, and feelings of safety among older adults.

To gain a deeper understanding of what makes a place meaningful for people living there, literature on place attachment was reviewed. Research on place attachment established that lived experiences that create emotions, attitudes, memories, and personal understandings are applied by the meanings that people attach to places (van Hees, et al., 2017). Studies suggest that older adults' preference to age in place can be influenced by the memories and personal histories formed within a neighbourhood's built environment and social character. This suggests that place attachment plays an important role in maintaining a sense of self and sense of place for older adults who are aging in place.

The literature reviewed provides a framework for understanding what factors may be involved for older adults to pursue aging in place. Analysis of qualitative data collected from semi-structured interviews and older adult participant photo-documentation journal entries were framed using themes highlighted from the literature on factors influencing aging in place. The next chapter describes the research design and methods of this study.

Chapter 3.

Research Design and Methods

This chapter provides an overview of the research design of this study. The methods used to recruit participants – including older adult residents of False Creek South (FCS) and key informants – are presented, followed by the outline for data collection methods and analysis. Lastly, the ethical considerations of the study are presented.

3.1. Research design

The purpose of this research is to discover the outdoor built environment factors that support or prevent older adults from aging in place and to gain an understanding of older adults' perspectives on aging in place issues within FCS. This is a qualitative case study in that it investigates the meaning and subjective truths, participants' perception of their environments and interactions rather than numerical and statistical data (Babbie & Benaquisto, 2010; Patton, 2015). Qualitative research is a process of studying natural situations that are not manipulated or controlled, allowing a deeper understanding of the topic(s) and new paths of discovery as these understandings emerge (Patton, 2015). The approach allows for flexibility in answering or exploring the research question. This flexibility is integral for me as the researcher to understand what is happening, seek new insights, listen, ask questions, and be able to analyze the phenomenon in a new light (Yin, 2011). Qualitative findings from this study are based on older adult participants' lived experiences, their interactions, and their interpretation of their environment. They shed light on a specific context – based on detailed understandings of the issue through an inductive process where themes and explanations emerge from the data collected from participant interviews (Patton, 2015).

This cross-sectional study involved looking at data from participants at one point in time, rather than over an extended period (Babbie & Benaquisto, 2010). The data were collected through semi-structured interviews and a modified Photovoice technique with older adult and key informant participants. Data collection started in October 2020 and ended in November 2020. The sample size was small; 11 older adults aged 65 or

older living in the FCS neighborhood, and 4 key informants knowledgeable about the planning history and urban design of the FCS neighbourhood.

This study used multiple methods of data collection resulting in a “triangulation” (Denzin, 2012) of data-collection approaches. For example, before their interview, older adult participants completed a Photovoice activity. The ability to examine the data in numerous ways and thus consider a phenomenon in multiple aspects helped to mitigate any researcher bias (Fusch, Fusch & Ness, 2018).

3.1.1. Study site: False Creek South (FCS)

The study area selected for this research is FCS, an inner urban neighbourhood in Vancouver, which currently has a high proportion of older adults aged 65 and above. Located between the Cambie and Burrard Bridges, and between False Creek and Sixth Avenue to the south, FCS was planned in the 1960s and 1970s as a revitalization project of the city’s run-down industrial waterfront (see Figure 3.1 for a map of FCS and Figure 3.2 situating FCS within the City of Vancouver). The original neighbourhood plan encouraged a range of age groups and income levels through a diversity of housing tenure options – although it was primarily designed to attract young professionals and families with children back into the inner core of the city (City of Vancouver, 2017). Most of these families have raised their children and continue to live in the neighbourhood.

Figure 3.1. Map of False Creek South

Image of the FCS neighbourhood (City of Vancouver, 2021).

Figure 3.2. Vancouver neighbourhood map

Image from Wikimedia Commons (Tschubby, 2008). City of Vancouver map showing the FCS neighbourhood area outlined in yellow.

FCS has a resident population of 5,600 people (2016 Census). Of that, 1,792 – or 32% – are aged 65 and above, compared to only 9% in 1981. From 1996 to 2016, the population aged 0-9 years and 10-19 years have remained lower in FCS compared to Metro Vancouver. Between the years 1996 to 2016, the number of people under 44 years decreased, the middle-aged group (45-64 years) remained stable, while the proportion of older adults (65 years and above) increased significantly. The FCS neighbourhood's aging pattern describes a population that is aging in place. Additional information supports this assessment: Census data show older adults are outnumbering children. The average age in FCS is 54 years, which is much higher than the city's average age of 41 years (Statistics Canada, 2016). During Phase 1 of the FCS neighbourhood planning process (described below), 46% of survey respondents were

between the ages of 50 and 69 years, and 18% were aged 70 years and older (City of Vancouver, 2018). When comparing statistics over time on mover-rates, the census shows a decrease in the number of people in FCS who moved out of the neighbourhood. From 1991 to 1996, 55% of people moved; from 2001 to 2006, 42% of people moved, and from 2011 to 2016, 37% of people moved out of FCS. These statistics suggest that there is a preference among older adults to age in place.

FCS has distinct outdoor environment features that collectively make it unique. First, this area is a waterfront community: the north edge of the neighbourhood is bounded by a seawall that surrounds a small, tidal inlet separating FCS from downtown Vancouver. The seawall's accessible walking and cycling path connects with Granville Island and Kitsilano Beach to the west, and Olympic Village and Science World to the east. Secondly, nearly half of the 55 hectares of land in FCS was intentionally designed to include natural green spaces and public gathering spaces. FCS has many recreation areas including several children's playgrounds, large sports fields, tennis courts, and a popular off-leash dog park in Charleson Park. Surrounded by large trees, gardens, a lagoon, and a waterfall, Charleson Park is a 7.14-hectare urban park and urban forest with skyline views of the city. Thirdly, FCS residential enclaves are threaded by a network of parks, public spaces, cobblestone pathways, gardens, and courtyards, including a bikeway and pedestrian walkway along the seawall. Collectively these neighbourhood urban features are important to the experiences of study participants as they shared their perceptions of which aspects within the outdoor built environment support or prevent their ability and choice to age in place.

In 2018, the City of Vancouver completed Phase 1 of a neighbourhood planning program, working with the community to draft the Provisional Vision Statement and Guiding Planning Principles for FCS. Sections of the planning principles included directions that would support aging in place by:

1) recognizing the role of well-planned community amenities, parks, and facilities
2) planning for street networks for all ages and abilities
3) providing more accessible transit within the community
4) enhancing the public realm by improving walkability and convenience while promoting human health (City of Vancouver, 2018)

In the same year, these principles were published, the neighbourhood planning process was placed on hold due to negotiations of leaseholds on city-owned land in FCS. The City of Vancouver, through its Property Endowment Fund, owns 80% of the land in FCS. Much of the City-owned land was leased to tenants (leasehold strata lots[2], co-operatives, and market and non-market housing) through 60-year ground leases. Most of these leases expire between 2036 and 2046. In October 2021, Council directed staff to resume the neighbourhood planning process for the City's lands in FCS, although lease negotiations are ongoing.

According to a City of Vancouver Council report (2018), residents in FCS placed a high value on the vibrancy of their neighbourhood and want to remain in their community beyond the end of their lease terms. However, leasehold negotiations can leave residents feeling tense and uncertain about their future in the neighbourhood. This study is well-timed to uncover the needs (beyond housing) of older adults living in FCS as they choose to age in place.

3.2. Older adult and key informant recruitment

Eleven older adult participants aged 65 years or older were purposefully selected to participate in the research. Older adults were recruited through word of mouth with the help of my own personal established contacts with residents and business owners in FCS. Outreach was also conducted through seniors' programs at the False Creek Community Centre, Creekside Community Centre, 411 Seniors Centre, and SFU's Gerontology Research Centre. Recruitment flyers were placed at a local bakery and café in the neighbourhood. Snowball sampling methodology was also used, where potential participants were provided with recruitment flyers that they then shared with their contacts (see Appendix A: Recruitment Flyer). They were advised not to provide contact information of third-party individuals to me without obtaining consent from the individual first. I only used publicly available email lists. I screened potential older adult participants

[2] Leasehold means the property is either owned by the government or First Nations. Leasehold property title grants owners the right to use their properties for a specific term.

Strata property title entitles owners exclusive use of the property itself, which can be a condo, townhouse, duplex, or detached home. Owners contribute to the maintenance and upkeep of common areas (gardens, parking garages, elevators, roof)

through a telephone survey when participants called me to find out more about the research study (see discussion in section 3.3.1 and Appendix B: Telephone Survey).

Inclusion criteria: Adults 65 years of age and older living in the False Creek South neighbourhood boundary area; able to walk comfortably and be mobile; who make at least two journeys into their neighbourhood weekly; and are adept at using a digital camera.

Exclusion criteria: People under the age of 64 years of age, and those who were not fluent in verbal and written English (and therefore could not understand the details in the information sheet and consent form) were excluded. People who use mobility-assist devices were also excluded. While consideration of their perspectives could be important for fully understanding factors relevant to aging in place, it was beyond the scope of this study. Criteria and rationale for participation are presented in Appendix C.

In addition, four key informants or professional experts with knowledge about FCS, urban planning, and population aging were recruited through publicly available contact information and recommendations from personal connections who passed my contact information to potentially interested participants. The benefits of interviewing key informants are that they provide an alternative perspective to the outdoor built environment that supports or prevents older adults from aging in place. They were expert sources of information providing more information and deeper insight into the topic (Cossham & Johanson, 2018). Three key informants from the urban planning and architecture profession and one elder-care practitioner were consulted for their opinions and insights on key elements. No compensation was provided to older adults and key informant participants.

3.3. Data collection process

As discussed above, this study relied on two qualitative approaches to data collection: semi-structured interviews as the primary source of data, and Photovoice as a secondary source. Conducting research during the COVID-19 pandemic meant adhering to public health safety protocols. Therefore, semi-structured interviews took place

remotely by phone or using Simon Fraser University's (SFU) Zoom video conference account. Data were collected in the following ways:

- Semi-structured phone or online video conference interviews with adult (65 years or older) participants (n=11) and key informants (n=4). Each phone or online video session adhered to the same methods and procedure.
- Photo-taking and documentation activity by the same group of older adult participants (n=11) using an adapted Photovoice method.

Data collection with older adults was conducted over three sessions via phone interview or online video interview. The three sessions included: (1) an information session (part of recruitment); (2) an instruction session for participant photo-documentation activity; and (3) an interview session. The process for each session is described below.

3.3.1. Information session: Older adult participants only

The information session (15 mins) provided the opportunity to introduce myself, confirm that each older adult participant met the study criteria, explain the objectives of the research, and obtain their consent for participation (see Appendix B: Telephone Survey). I also took this opportunity to review the project information and consent form (see Appendix D) with each older adult. Additionally, they were informed that they could withdraw from the study at any time, without consequences. If the older adult met the study criteria and agreed to participate, I emailed the following documents: the project information and consent form, the participant demographic information, a map of FCS, and the photo-taking and photo documentation activity guide. Paper copies were also mailed via Canada Post with a large stamped self-addressed envelope. Per ethics requirements to follow public health orders that prevent the spread of COVID-19, documents were prepared and sealed in a plastic bag, then placed in a large mailing envelope at least 48 hours before mailing.

Participant demographic questionnaire

Each participant completed a short demographic questionnaire to collect data such as gender, age, housing and living arrangements, and socio-economic information, among others (See Appendix E: Participant Demographic Questionnaire). This

information was important for providing the context of older adults participating in this study in comparison to other older adults, as well as to ensure diversity in sampling.

3.3.2. Instruction session

After each older adult participant received their research package, they had a choice to connect either by phone or online (using the SFU Zoom video conference platform) for the instruction session. During this 45-minute session, I reviewed the purpose of the study and described the Photovoice method, as well as their roles and tasks for the photo-documentation activity. They were reminded not to include people in their photos, and to avoid putting themselves in harm's way while taking photos. In the following section, a summary of the Photovoice method is provided, followed by a summary of the activity used for this study.

Photovoice Methodology

Photovoice is an approach combining narrative with photography to explore community issues (Wang & Burris, 1997; Wang et al, 2004). Rather than designing the research around a pre-determined checklist considered relevant by researchers, Photovoice enables community participants to share their perspectives on the subject or topic of the research. The Photovoice method involved specific processes that include training participants on the proper use of cameras, sharing photographs in a group setting facilitated by the researcher, identifying key photographs selected by people in the group, and sharing information with policy makers (Wang, 1999). This method is based on the idea that research designed to advance a certain groups' experiences should include the priorities and perspectives of that group. Specifically, the technique values participants as a key source of expertise and focuses on what the community, rather than the researchers, thinks is important. Photovoice offers a voice for people who may not be heard otherwise (Mahmood et al, 2012).

Photovoice: photo-documentation activity in this study

I chose the Photovoice method to enable participants to share their perspectives of what it means to age in place in their neighbourhood. By focusing on the older adults' selection of aging in place barriers and facilitators – rather than a predetermined checklist – key issues facing older adults in their neighbourhood could be identified

(Novek & Menec, 2013). It was also possible to determine if neighbourhood pedestrian infrastructure characteristics key informants perceived as important surfaced. As described below, the images were used as a resource to provide visual documentation of perceived and objective barriers and facilitators within the outdoor built environment. The photography aspect captured direct observations, including physical characteristics of the environment important to older adults, thus providing insightful context for the needs of older adults aging in urban neighbourhoods. In this study, older adult participants took photos of key physical aspects in their neighbourhood and then journaled their thoughts about each photograph that were guided by four questions. They then discussed their photos one-on-one with me during our phone or online video interview.

Participants were instructed to select a regular or daily walking route within FCS that could be completed within 15 to 30 minutes from their home. They could choose a regular or favourite route or one they did not enjoy. They could also choose a route specifically to share deficiencies (or benefits) with me. Then they were instructed to mark their route on the map provided in the research package described above. A smartphone was used to take 6-8 photos along the route documenting physical features they identified as facilitators or barriers to aging in place, and/or to walking or being mobile in FCS. They were asked to write about each photo in a journal, describing what the photo meant to them and their reason for taking it. Journals included comments on whether the feature captured in each photo represented a barrier to being active or whether it acted as a facilitator for aging in their neighbourhood (See Appendix F: Photo-taking Guide and Photo-documentation Journal and Appendix G: FCS Route Map).

Participants were also instructed to complete the photo-taking and documentation activity within two weeks of receiving the research package. After completing the activity, they had the option to submit the marked map, photo images, and photo-documentation journal via email or by Canada Post mail services. Upon receiving the demographic form, photo-documentation journal, and images, a semi-structured interview was scheduled within 10 to 14 days.

3.3.3. Semi-structured interviews: Older adults and Key Informants

Patton (2002) describes semi-structured interviews as comfortable, and informal interviews using interview guides with open-ended questions. They are used to explore the meaning of a particular phenomenon and are typically conducted one-on-one. In a semi-structured format, questions can be asked in a particular order to probe for interpretation of experience, extra probes could be used to ask for more specific details, or the order of the questions could be changed to deepen communication (Patton, 2002).

In this study, interview questions were guided by a set of pre-determined questions, some of which were adapted from *Stakeholders' Walkability Audit in Neighbourhood (SWAN)* (Mahmood et al., 2019). These questions were used as prompts to solicit information related to my study purpose and objectives. The semi-structured format provided a framework to ensure that the questions stay on topic, but to also provide the flexibility to explore and probe further. This method allowed me to clarify or better understand comments, or to draw out information that did not emerge from their photo-documentation journals during the interviews.

Semi-structured interviews with older adult and key informant participants were held either online via SFU's Zoom video conferencing application or by phone. Before their interview, participants were informed that the interview would be recorded with audio and video. Each participant was informed that the data recorded by Zoom could be accessed by the US according to US Patriot and Cloud Acts. If they didn't want their image to be recorded, they were instructed to turn off their video cameras. Participants also had the option to decline being recorded entirely. Data from the interviews contained basic demographic questions, my notes, transcribed audio recordings, and photo images taken by the participants. Immediately following the transcription of the audio and video recordings, I reviewed the transcripts to ensure accuracy. Pseudonyms were assigned to protect participant identity and to ensure confidentiality.

Semi-structured older adult interviews

During the semi-structured interviews, older adult participants were asked open-ended questions about their experience of living in FCS. The aim was to understand their perceptions on aging in place, and their perceived barriers and facilitators of the

outdoor built environmental factors. An interview guide was used to guide the interview sessions. Prompts were used to encourage older adults to share more detailed information about aging in place in FCS and perceptions of transportation systems in their neighbourhood (See Appendix H: Interview Guides and Prompts). Additional questions were also asked about each photo to solicit information related to the study's purpose and objectives.

Older adults were asked to describe how living in FCS was different from other neighbourhoods they know, and to explain their thoughts about aging in FCS. These questions also probed into the role of public transportation in their lives. They were asked to comment on their use of public transportation, as well as the availability and condition of transit stops (e.g., presence of said stops, benches, lighting, shelter, and signage). Lastly, specific questions were asked on the role of pedestrian infrastructure in their decision to age in place (e.g. absence or presence of curb ramps, slopes, obstacles, marked crosswalks; condition of sidewalks and walkways; availability of places to sit and green spaces; or if they felt safe at night), and to explain why these features were facilitators or barriers for older adults aging in place They were prompted to share their perspectives about negative and positive aspects along the walking route selected such as the quality of pathways and sidewalks, availability of covered and uncovered seating areas, lighting, access to nature, and so on. They were also prompted to share perceptions of safety from crime and traffic, and neighbourhood aesthetics (e.g., absence or presence of litter, graffiti, garbage cans, etc.). With each identified feature in the photos submitted, they were encouraged to explain why and how it impacted their ability to age in FCS.

Semi-structured key informant interviews

Semi-structured interviews were also conducted with four key informants with specific knowledge of urban planning and population aging aspects. They can be categorized into two groups: urban planning professionals (3) and service providers (1). Key informant interviews were guided by a set of questions to obtain expert insights on the role of the outdoor built environment on aging in place in FCS. They were asked to provide their opinion on the characteristics of a neighbourhood that would allow people to stay in a neighbourhood of their choice for as long as possible, the role of the outdoor built environment in FCS for aging in place, features in FCS that help keep people

active, how the original design in FCS supports or presents problems for older adults, and the role of neighbourhood urban design and transportation for aging in place (see Appendix H: Interview Guides and Prompts). Questions were open-ended to allow comments. Interviews were 60 minutes long and conducted over SFU's Zoom video conference platform. Comments were recorded both in audio and video form and summarized for reporting purposes. Their feedback brought a valuable perspective to the discussion.

3.3.4. Researcher-led observation

I conducted personal observations in FCS to gain a better account of barriers and facilitators of the pedestrian-built environment. Observations of FCS built environment characteristics helped with understanding and coding the findings reported by participants. I adapted the Stakeholders Walkability Audit in Neighbourhoods (SWAN) tool (Mahmood et al., 2019, see Appendix H for a short description of SWAN) to complete segment observations along two arterial roads in FCS (Moberly Road and Lamey's Mill Road, see Appendix G: FCS Route Map for locations) on September 26 and 27, 2020. Observations were guided by the SWAN audit tool and SWAN secondary observation form to record street and sidewalk conditions. Using the camera on my phone, I took photographs to record supportive and problematic features on the street segments I had observed. By conducting this researcher-led observation, I hoped to gain a slightly different perspective on the built environment than my participants given my background as a city employee with urban studies training. My observations – combined with the perceptions and lived experience of study participants – provided me with a nuanced understanding of what could be improved or changed within the outdoor built environment to facilitate mobility of older adults in FCS who wish to age in place. Findings from my observations have been summarized in Appendix I and are not included in the data analysis and main findings of this study.

3.4. Data analysis

This section presents the methods used to analyze the interview datasets collected from older adult and key informant participants, and data collected from the participants' photo-documentation activity.

3.4.1. Qualitative data

Analysis of the data followed the five phases of interpretative thematic analysis described by Braun and Clarke (2006). It was important for me to keep in mind that analysis guidelines should allow flexibility with the coding of the data collected and to recognize that analysis is not a linear process. As such, analysis is an iterative process that allows for moving back and forth as needed, throughout the phases. Analysis of data for this study – particularly on identifying patterns of meaning and issues of potential interest – began during data collection, as older adults submitted their photo-documentation journals and images.

In the initial phase of analysis, data was reviewed sentence by sentence, or phrase by phrase, to extract from the transcript quotes corresponding to the various issues raised. Data were also reviewed to identify significant statements and to look for new ideas and issues that emerged from the participant's words. Transcripts were checked against the original audio recordings for accuracy. It was important for me to take the time in this phase to familiarize myself with the data by reading and re-reading it actively – documenting ideas, meanings, patterns, issues, and themes. The product was an initial list of ideas about what was in the data and what was interesting about these ideas.

Fereday and Muir-Cochrane's (2006) hybrid approach of qualitative thematic analysis of deductive coding (derived from the literature reviewed in this study) and inductive coding (emerging from participant discussions) was used to develop themes and interpret raw data. As noted, interview questions were formed by SWAN domains and concepts, which were subsequently used to guide data analysis. A template of codes emerged from SWAN domains and existing literature (deductive). New coding – that wasn't part of SWAN – was added to this (inductive). I also used the successive approximation strategy, which involved an iterative process by moving forward and backward between abstract concepts, theories, or models and observed data. This included constant refining of the data assembled (Neuman, 2014).

The second phase of analysis involved producing a list of initial codes from the data. Coding involved tagging and naming selections of text within each data set related to the research questions. I used the NVivo Qualitative Data Analysis software for this

round of review to code high-level groups of ideas, themes, or patterns. These codes identified and organized the data into meaningful segments that could be further assessed in the next phase. Descriptive codes were generated by going over the material multiple times, listening to the audio and video recordings, reading the transcripts and my interview notes, and examining the photographs.

The third phase involved searching and generating themes by sorting all the identifiable codes pertinent to the research questions into themes. The process of analysis was worked out by considering how the different codes could be linked to form an overarching theme. Through the process of arranging and re-arranging codes, relationships between codes emerged to form main themes or sub-themes. Each category was indexed under a set of headings or overarching themes (Hammersley et al., 2007) that highlighted participants' neighbourhood perceptions and experiences.

The codes were reworked further by looking for themes, patterns, contrasts, similarities, and differences across and within all the data sources. Photographs taken during the photo-documentation activity were used to complement the thematic analysis of the interview data. In her study, Gardner (2011) noted that during analysis, photographs were an important part of the analysis process. I employed a similar technique by using the photos as prompts and reminders to clarify ideas, provide insights, and help organize the data as themes emerged.

Phase four involved reviewing and refining themes to ensure each theme formed a pattern that made sense of the coded data. It was important during the process to determine whether the themes were aligned to the data set and reflected the meanings within the data. This phase also allowed the coding of additional data missed in earlier coding stages. The outcome of this phase was a clear set of themes that fit together to tell a story about the data.

The final and fifth phase involved iterative refinements to define and name themes. It was important to consider how each theme fits into the research question. Each theme was considered with others, and further analysis identified sub-themes within each theme. By the end of this phase, I could easily describe the scope and content of each theme.

3.4.2. Establishing trustworthiness

This study followed Lincoln and Guba's (1985) framework of trustworthiness to establish reliability, validity, or rigor in this study's qualitative data analysis process. They outline four criteria required to establish trustworthiness: credibility (confidence in the "truth" of the findings), dependability (demonstrating findings are consistent and could be repeated), confirmability (researcher objectivity or neutrality), and transferability (findings can be applied in another context). Lincoln and Guba (1985) describe several techniques that can be used to conduct qualitative research to achieve rigor and reliability. I will describe the techniques I used for three out of the four trustworthiness criteria as presented by Lincoln and Guba (1985).

To establish credibility, I applied triangulation and peer debriefing. To ensure triangulation, I used multiple data sources to interpret the data. As described in Section 3.3, these sources included interviews, photo-documentation, journaling, and a modified SWAN survey and observation. Although data from the latter was not used directly for analysis, it helped me identify relationships between the data sets. Using multiple methods helped me to delve deeper into understanding the themes.

Peer debriefing involved regular meetings with my senior supervisor throughout the research process to evaluate my progress, and to discuss data collection and analysis. Additionally, I met with my second supervisor to review research design and data collection amendments due to the COVID-19 pandemic. I also reviewed my progress and findings with peers in the Urban Studies program.

To establish confirmability, I applied the audit trail and reflexivity techniques. Audit trails are recorded descriptions of the research steps from the start of the project. According to Lincoln and Guba (1985), audit trails include written field notes, all raw data (audio recording, transcripts, maps, and photographs), condensed notes from data analysis (codes, themes), process notes related to process and methods, personal memos, interview guidelines, environmental observations, and audit. To maintain reflexivity, I kept a memo reflecting on how my role as an immigrant, educated woman, working for the City of Vancouver might affect my research process, through every step of the process. I recorded preconceptions or biases that I might bring to the research.

Transferability refers to the generalizability of a research study (Nowell et al., 2017). To achieve external validity, Lincoln and Guba (1985) suggest thick descriptions of research objectives, context, and processes so the reader can draw their conclusions and be transferable to other times, settings, situations, and people (Cohen, D. & Crabtree, B., 2006).

3.5. Research ethics and considerations

This study received approval from the Office of Research Ethics at SFU. At the time of the ethics review and approval, the only known risk to older adult participants was safety while taking photos in their neighbourhood. To mitigate unsafe practices while taking photos, older adults were advised to take care when snapping photos and not to do so in traffic or in conditions that may cause them discomfort. Otherwise, the risks for physical or emotional harm to the older adults associated with the proposed research were minimal. To minimize the discomfort of older adults completing the demographic questionnaire, they had the option to not answer the question or to complete it later.

Factors such as the weather (heavy rain, strong winds, and icy conditions) could interrupt the photo-taking activity (Carpiano, 2009). In the event of inclement weather, the older adults were advised to conduct the activity only during suitable weather conditions. To minimize risk, the physical capacity of each participant for the photo-taking activity along their identified route was assessed by asking questions about their physical health and walking ability through pre-screening during the information session.

Older adults were advised to follow the Provincial Public Health Officer's orders as they completed the photo-documentation activity. Those measures were: physical distancing of at least 2 meters, staying home if sick, avoiding crowded places, coughing, or sneezing into elbow or sleeve, and wearing a non-surgical mask. They were advised to end the activity at their discretion if they felt uncomfortable during the photo-documentation activity.

The use of photography raised ethical issues such as anonymity, privacy, and ownership. To address these issues, researchers Castleden et al. (2008), Novek et al. (2011), and Wang and Redwood-Jones (2001) recommended written consent that

included: permission to reproduce images for dissemination purposes (publications, conferences, etc.) and changing participants' names to protect identity. Since the focus of my study was on identifying specific negative and positive outdoor built environment factors that impact successful aging in place, it is unlikely that photos of people would be captured. To alleviate any potential issues, older adults were instructed to avoid taking photographs of identifiable people, including photographs of themselves during the photo-documentation activity.

All identifying information, including any audio or video recordings of interviews conducted in Zoom, was uploaded to a password-protected laptop computer in password-protected files. All written notes of the phone or online video questionnaires were typed into Microsoft Word and/or Excel documents that were password protected. Once notes were digitized, paper copies were destroyed to ensure no paper documents exist that contain confidential information. Because interviews were not fully transcribed verbatim, the recordings will be retained on my password-protected laptop until the completion of the project. Participants had the right to refuse to be digitally recorded (which includes Zoom audio and video recordings).

The purpose of this research is to discover outdoor built environment factors that support or prevent older adults from aging in place. Research methods were selected to gain an understanding of older adults' perspectives on aging in place, enhanced by the perspectives of key informants with relevant experience. Findings and analysis of the data that was obtained are presented in the next three chapters.

Chapter 4.

Findings and Interpretations: Aging in place

As described in the preceding chapter, data was gathered from 11 older adults and four key informants through interviews and other means. Chapter 3 provided information on the participant selection process and the types of questions asked. Appendix H provides participants semi-structured interview guides and prompts. Findings on the role of the outdoor built environment on aging in place in the False Creek South (FCS) neighbourhood are presented in this, and the two subsequent chapters according to themes taken from the literature. A table listing themes and sub-themes and the associated finding can be found in Appendix J.

Chapters 4, 5 and 6 presents findings from older adult participants and, where applicable, findings from key informants. Discussion and interpretation of the findings is also presented, including how results overlap or vary between older adults and key informants. Analysis was guided by the following research questions: (1) *'What are older adult residents' perceptions of FCS as they age in this neighbourhood?*; (2) *What are key informants' perceptions on the role of the outdoor built environment for aging in place?*; and (3) *What role does the outdoor built environment of a neighbourhood play in older adults' decision to age in FCS?* In discussing the themes that emerged, links are made to the existing literature and concepts reviewed in Chapter 2 above.

This chapter begins with an overview of older adults and key informant demographic profiles in section 4.1. In section 4.2, general comments from participants on aging in place are presented. It is established that the older adult participants had unanimously indicated that they wanted to age in place in FCS although some concerns were identified. Two subsequent chapters present findings related to functional (Chapter 5) and therapeutic and social (Chapter 6) aspects of the built environment and how they act as barriers or facilitators of aging in place.

4.1. Participant demographics

Older adult participant profiles

Eleven older adults living in FCS participated in this study. Older adults comprised of six women and five men ranging in age from 70 to 89 years. About half of the older adults were retired and the others worked part-time. Annual household income ranged from $10,000 to more than $50,000. Two older adults opted not to disclose this information. Almost all older adults completed post-secondary education (college, technical school, university). Eight of the 11 older adults live with their spouses, while the other three live alone. One participant resides in co-operative housing and the rest live in strata units, some freehold, and some leasehold. These participants have been living in FCS for anywhere between 7 to 41 years.

As stipulated in the selection process described above, none of the older adults used mobility assistive devices and all walked outside regularly. When asked if they used public transit, nine out of 11 older adults reported yes. Of the nine who used public transit, two said they did not use it during the COVID-19 pandemic. Appendix K provides detailed demographic information about these older adult participants.

Key informant profiles

Four key informant representatives from the urban planning profession and elder care service industry – were interviewed to gain an understanding of their perceptions of FCS and determine what they thought of as being potential barriers and facilitators of aging in place. Three key informants were urban planning or design professionals with experience in neighbourhood planning processes, expertise in urban design, and knowledge of creating neighbourhood policies influencing land use and urban design. Among these three key informants, one was a City of Vancouver planner who led the first phase of the False Creek South neighbourhood planning process from June 2017 to April 2018 (KI-CP); another was an urban planning consultant who specializes in equitable and walkable places and spaces (KI-UPC); the third among these three was an architect with over 30 years of urban planning experience who has also lived in FCS for over 40 years (KI-AR). The fourth key informant works with older adults as the Executive Director at Broadway Lodge and has direct knowledge of the environmental barriers and facilitators in the neighbourhood for tenants of the lodge (KI-BL). Broadway

Lodge is a long-term care residential facility for older adults located in the heart of FCS. KI-BL was interviewed because their expertise on older adults and older adult care in FCS provided deeper insights into the aging process, including the different functional capacities among older adults, and how these considerations might enhance the potential for aging in place. Findings reported by KI-BL revealed similar aging in place themes as other key informants, with added attention to factors relevant for people living with dementia.

4.2. Aging in place

Findings in this section shed light on older adults' perception of aging in FCS as it relates to the supportiveness of the outdoor built environment in all its aspects. Key informants also provided their perspectives on planning for population aging in FCS by identifying facilitators and barriers within the neighbourhood that impact older adults aging in place. Two themes emerged through my interactions with the participants: (1) the older adults participants' wanting to stay in FCS for as long as possible; and (2) resident anxiety and concerns about displacement scenarios vis-à-vis the end of lease renewal negotiations with the City of Vancouver.

4.2.1. I do want to stay here for as long as I can

All the older adults in this study unanimously expressed wanting to remain in this neighbourhood for as long as they could. The desire to stay in FCS is related to the easy access to well-connected pedestrian networks, lively public street life, amenities such as restaurants and green spaces nearby, pedestrian safety from traffic, and generally feeling safe from crime in FCS. In response to the question "do you want to age in your neighbourhood?", Ann an 18-year FCS resident answered confidently with two words, "Yes, absolutely!". Ava, who lived in a strata building close to Granville Island for over 40 years said she wanted to "stay here for many years to come as long as we can continue to go up and down three levels of stairs". Ben, a retired university professor, and seven-year FCS resident echoed Ava's comments:

> Yes, I do want to stay here for as long as I can. I'm 82 and I have the good fortune of having relatively good health and no major problems (Ben).

For Ben, aging in place meant being able to safely move around in the neighbourhood, especially having people nearby that he saw regularly. He especially values the sense of belonging and community FCS offers. Like Ben, Ken, who downsized from a single detached house in the suburbs to apartment living in Vancouver 25 years ago, expressed a preference for living in FCS because of the walkable environment and friendly neighbourhood.

> We decided [we will] stay here until we get carried away. We've [lived in] the north side and the south side [of False Creek] and we like this neighbourhood [FCS] (Ken).

Dee purchased her home in her mid-fifties with the intent that when she retired, it would be a place she wouldn't have to move away from. She mentioned the walkability of FCS and nearby amenities and services that made it very convenient to consider aging in place in FCS.

> When I bought here it was with the intent that when I did retire it would be a place I wouldn't have to move from. When I moved here, the shopping wasn't immediately close by. But with the [new] Canada Line Olympic Village and Broadway/City Hall [Stations, new development] brought all the shopping [amenities] here. It's easy to walk. I never drive my car to get my groceries now, which I had to do when I first moved here. Also just being in this location with the views and the water right at our doorstep just makes it such a beautiful area to go walking in any time of the day (Dee).

Reasons for aging in FCS included incentives for walking such as proximity to shops and services, accessible seawall to enjoy views of the city, water, and mountains, and 'bumping' into people on the street; all of which keeps them in good health. Additionally, older adults stated that they felt safe walking around the neighbourhood, primarily due to FCS's car-free environment. Their independence in getting around to stay healthy, both mentally and physically, was an important aspect of aging in place.

> [I walk to] an open area where the sun comes in [and] it's quiet. There's no road, no cars coming through. There's co-op housing, there's subsidized housing, and three condominiums so you have a wide variety of age groups and people lots of kids playing in the area. So, you'll see some elders out there playing badminton, they are out getting their exercise. You see the kids swing on one of the trees. It's just a very nice friendly neighbourhood (Lyn).

Key informant perspectives on aging in place in FCS

Key informants were asked to identify the characteristics of urban design that support people to age in a neighbourhood of their choice for as long as possible, and if the outdoor built environment in FCS supports aging in place. Key informants mentioned that the original FCS plan did not consider the types of facilities and services that are required to address the needs of people as they age. According to them, this resulted in the challenge of providing people the infrastructure to age in place, while balancing City priorities such as housing for families to move into.

> In terms of the built environment, there is little ability for seniors to downsize. So, if a senior wants to age in place in FCS, there are very limited options to move into more accessible (accessible for wheelchairs, walkers, etc.) or [smaller space] housing. What you have is a large proportion of seniors represented in FCS than the rest of the city. We need their spare bedrooms, and they have to move out of their neighbourhood to have the right size for them (KI-BL).

Key informants noted that FCS lacked amenities such as grocery stores and health services for older adults. Also of concern was the restricted vehicle access within FCS, which may be a charming design feature for some, but a barrier for frail older adults who depend on vehicle transportation for personal and mobility reasons.

> There aren't many services for [seniors] in the area. If they want to buy a loaf of bread, there are very limited options within FCS. To do so it's a long walk. A lot of seniors don't drive, it's difficult for them to access various services such as doctors, physio, and other senior services (KI-BL).

While most key informants spoke highly of the walkability in FCS facilitating aging in place, one key informant felt the pedestrian realm in FCS could be improved by incorporating aging-friendly universal design features.

4.2.2. Living under a cloud of uncertainty: FCS lease negotiations

When older adults were asked if there were other ideas or perspectives on aging in place that they would like to share, many brought up lease negotiations with the City of Vancouver as a factor that may impact their decision to stay in FCS. The City of Vancouver owns 80% of the land in FCS. The remaining 20% is owned by the Squamish First Nation, private owners, and other levels of government. Leases on City-owned land expire between 2036 and 2046 and include market residential units (leasehold strata

and rental units), non-market units (co-ops, non-profit and rental units), and community care facilities (City of Vancouver, 2021).

The older adults mentioned that they felt anxious about the lack of engagement and clarity from the City of Vancouver regarding development plans for the future of FCS. As a co-op housing member, Mia feared the displacement of young families residing in FCS the most, including her daughter and granddaughter who live in the unit next to her. Eve echoed Mia's concern, stating that the "uncertainty of the lease situation makes it difficult to know whether or not we would be able to age in place". Guy, who moved into FCS with his young family over 40 years ago in 1979, said he would stay in FCS until his lease ends in September 2040, when he's in his 100s. As an active member of the FCS neighbourhood association, Jax viewed the lease negotiations as a dilemma for current residents who have nowhere to move into within FCS.

> I would love to age in place in this community. If we could solve the problem with the city leases, then yes in my current situation, I would age in place (Jax).

Other older adults feared the future development of FCS would look like Yaletown, a neighbourhood that is densely built with multiple high-rise towers on the north side of False Creek in the Vancouver downtown peninsula. Older adults expressed the following issues as concerns: increased density, taller buildings leading to the loss of accessible green space and views, and an unequal mix of housing tenures leading to the loss of affordable housing options in FCS (Figure 4.1). The original FCS plan intentionally built affordable housing into the mix, comprised of one-third co-op, one-third non-market rental for families and seniors, and one-third ownership strata buildings. This feature was noted by Jax as "the greatest asset of FCS that has been a beacon for 40 years of a best practice in neighbourhood integration". He further stated that "this mixing has led to a wonderful stable environment that is very friendly to seniors".

Figure 4.1. Lease negotiations: Housing tenures

"The housing on the left is a non-profit co-op that makes up part of the planned housing mix of 1/3 co-ops, 1/3 non-profit rental for both families and seniors, and 1/3 ownership stratas" (Jax).

Older adults reported that their ability to age in place may be impacted by the future outcomes from lease negotiations with the City of Vancouver. Some mentioned that the uncertainty of their housing status was stressful. The situation made it challenging to plan for their future to age in place in FCS.

4.2.3. Discussion and interpretation

The findings in this section indicate that the neighbourhood's outdoor built environment plays a key role in the aging experience of older adult participants living in FCS. Older adults in this study expressed a desire to live in FCS for as long as possible. The presence of certain features provided them the security to be independently active, which made it easier for them to enjoy nature, complete daily errands, exercise, and generally be physically active. According to WHO (2015), most older adults want to age in place because they feel secure in familiar surroundings, and they want to keep their connections. Previous research further corroborates this study's findings that older adults have a strong desire to age in place, or to live comfortably in their homes, in

familiar and safe neighbourhoods (Byrnes et al., 2006; Gardner, 2011; Wiles et al., 2012).

The next chapter presents findings on functional aspects of the built environment, including pedestrian and transit infrastructure. The presence, or the lack thereof, of outdoor built environment aspects and transit options that impact walkability and mobility, in general, are presented.

Chapter 5.

Findings and Interpretations: Functional Aspects of the Built Environment

In this chapter, findings on the role of the outdoor built environment on aging in place in the False Creek South (FCS) neighbourhood are presented. Analysis, which is also presented, was guided by the following research questions: *'What are older adults residents' perceptions of FCS as they age in this neighbourhood? What are key informants' perceptions on the role of the outdoor built environment for aging in place? What role does the outdoor built environment of a neighbourhood play in older adults' decision to age in FCS?*

Literature on the built environment, mobility, and walkability was reviewed in Chapter 2. Key themes were identified that link to older adults' mobility and participation (Chaudhury et al., 2011; Mahmood et al., 2020; Routhier et al., 2019). Sections in this and the next chapter are arranged according to these key themes. Section 5.1 covers the functionality of the built environment, focusing on micro-scale pedestrian infrastructure as well as transportation services and transit infrastructure. The role of land use and environmental supportive features is presented in Section 5.2, and safety information in Section 5.3.

5.1. Functionality of the built environment

5.1.1. Pedestrian infrastructure

This section covers findings related to the functionality of the outdoor built environment in FCS based on participant photo documentation journals and semi-structured interviews with older adults and key informants. The functionality of the outdoor built environment is characterized by the condition of street crossings and sidewalks as well as the presence or absence of structured physical elements that impact walkability (Mahmood et al., 2019). These include the quality and characteristics of sidewalks, walkways, and pedestrian crossings, as well as the absence or presence of signage, wayfinding cues, curbs cuts, ramps, and obstacles. In this study, walking was

highlighted as a priority by all older adults. They asserted that living in a walkable neighbourhood with restricted vehicle access supported their ability to age in place for as long as possible.

During the semi-structured interview, both older adult and key informant participants were asked to identify positive and negative pedestrian infrastructure features in FCS that support or deter mobility. They were also asked to explain why these features were supportive or not supportive for older adults aging in place. First, older adult participant findings on pedestrian infrastructure and characteristics of sidewalks and pathways in FCS are presented. To demonstrate specific points, participant photographs and journal excerpts are also presented. Then a synopsis of the key informant's perspectives on the function of the built environment in FCS is covered.

Where does the sidewalk end? Design of sidewalks and crosswalks as barriers or facilitators

When older adults were asked to identify positive or negative aspects of sidewalks or pathways, many indicated that the absence of sidewalks on arterial roads was a barrier. They reported needing to walk on the road alongside vehicles or having to cross the street to use the sidewalk. Older adults also reported that missing curb ramp installations[3] at sidewalk corners or midway along blocks impacted pedestrian mobility throughout FCS. One exception was the curb ramps at Moberly Street cul-de-sac that was part of seawall improvements, which was mentioned as a positive feature by one participant. Other barriers mentioned were obstacles taking up space on sidewalks such as lamp posts, overgrown bushes or trees, signposts, and parking meters (Figure 5.1).

Older adults also noted that narrow sidewalks were not practical for people using mobility assistive devices and for walking side-by-side. For instance, Jax mentioned that his partner suffered a concussion walking into a signpost while avoiding encroaching bushes on the sidewalk.

[3] lowering the sidewalk at the point where it meets the road to provide a smooth connection between the sidewalk and the road surface

Figure 5.1. Obstacles on the sidewalk

"These barriers are difficult to maneuver around, especially with a walker or a wheelchair. Not being able to travel around easily on the sidewalk with walking or riding aids could be a [reason] to not live in the area as we age" (Dee).

Many older adults mentioned uneven sidewalks as detractors for walking and aging in place. Sidewalk cracks and buckling caused by tree roots were noted as tripping hazards (Figure 5.2). Interestingly, some older adults felt it was the personal responsibility of the pedestrian to watch out for sidewalk changes and be cautious around known barriers when walking.

> There is one area where there's potential for tripping if you're not watching where you're going or lifting your feet. I don't see that [area] being improved because of the lay of the land. People need to be more cognizant when they're walking there. If you have a walker, you might be safer. Someone with a cane might have more trouble navigating the

area. If there's a big puddle, you can manage around – we're used to water here (Mia).

Figure 5.2. Sidewalk obstacles

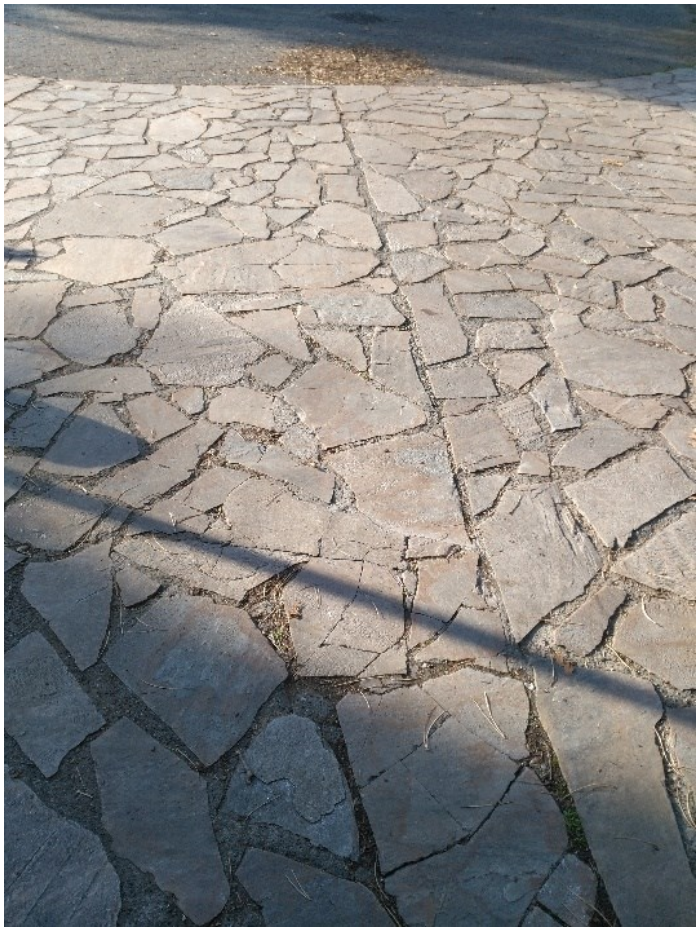
"This is an example of a frequently occurring obstacle for seniors in walking safely outside. Sudden changes in elevation or even small ledges can punish inattention with stumbling or tripping. This is a frequent risk in Vancouver's tree-lined streets, where root growth often distorts or breaks through concrete or macadam" (Ben).

Older adults reported using Fountain Way or the "inner pathway" more frequently during the COVID-19 pandemic to avoid crowds on the popular seawall pathway. Situated in the southwestern area of FCS, between Granville Bridge and Alder Crossing, Fountain Way parallels the seawall and Lamey's Mill Road, connecting neighbourhood enclaves (see Appendix G: FCS Route Map for location). While acknowledging the benefit of a safe alternative for getting around during the pandemic, many expressed concerns that the uneven terrain and "gradual slopes on either side" (Guy) of Fountain Way were detractors for pedestrian mobility and aging in place.

Pavement materials such as flagstone pavers, cobblestones, and brick in-lays were appreciated as features adding character to the environment, making walking experiences more interesting. Although these types of pavements are "interesting architectural features in the neighbourhood" (Ken), older adults identified them as detractors for aging in place because cracks between stones presented tripping hazards, bumpy terrain was difficult to navigate, and uneven surfaces were slippery when wet.

Mia took a photo of Leg-in-Boot Square, a mixed commercial and residential enclave in FCS (Figure 5.3) to draw attention to the flagstone pavers as potential hazards contributing to falls.

Figure 5.3. Flagstone pavers: Fall hazard



"Paving stones are attractive and easy to walk on in dry weather. When wet, these can present a barrier as slippery and potential fall hazard" (Mia).

Generally, older adults perceived the flat terrain of FCS supported pedestrian mobility and aging in place. However, a few older adults reported that the hilly terrain and steep slopes along the southern edge of the neighbourhood – by Charleson Park – made it difficult for more vulnerable pedestrians to walk up and down the sloping paths. In his 80s, Ken reported no problems walking up the hill to get onto the Laurel Steet land bridge, but did note:

> some people don't use the area from the Laurel overpass… from there it's uphill and downhill. You obviously can't walk over there with a walker or in a wheelchair (Ken).

Like Ken, most of the older adults reported that they were not concerned about navigating slopes because they could still walk without the aid of mobility assistive devices. They felt comfortable walking up the hill to shop in the adjacent South Cambie neighbourhood business area. At the time of the interview, Eve remarked that she was able to walk up and down hills to run errands. However, she noted that when her physical health changes in the future, she might have to come up with strategies to overcome street slopes or move out of FCS into a senior care environment.

> If you want to go to VGH for an appointment, you take the #50 bus that goes up Cambie Street, then transfer busses on Broadway. After a few stops, you would still have to walk up a hill to get to VGH. I'm at this point in my life that isn't a problem, but I suspect that if I had mobility issues, I might leave for a place that was more seniors specific (Eve).

Local infrastructure features such as warning strips on sidewalks and marked crosswalks with painted lines for pedestrian crossings on shared foot and cycle paths and at street intersections were mentioned as important pedestrian mobility elements. Older adults reported clearly marked crosswalks increased their confidence in walking and facilitated aging in place. Clearly marked crosswalks guide pedestrians safely across a bike path or roadway. It is equally important for cyclists, drivers, and pedestrians to clearly see the crossings (Figure 5.4).

Figure 5.4. Well marked crosswalks in the surrounding area

"Well-marked crosswalk and pedestrian routes beyond make walking to shopping and transit very easy for those who retain sufficient mobility, including those needing wheelchairs" (Ben).

Participants found that the wider walking pathways provided a safe pedestrian experience for physical distancing during the COVID-19 pandemic. Additionally, older adults identified canopy covers along pedestrian pathways for weather protection from the sun, rain, and snow as an important pedestrian feature for aging in place.

Key informant perceptions on pedestrian infrastructure barriers and facilitators

Key informants identified similar pedestrian infrastructure barriers and facilitators for aging in place as the older adult participants. In their professional opinion, applying human-scaled urban design principles for all ages to guide future re-design in FCS is important for aging in place. Pedestrian barriers mentioned during their interview include narrow sidewalks, missing sidewalks, inadequate curb cuts or curb ramps, and uneven pavement surfaces. They felt that these conditions deterred pedestrian mobility, especially for frail older adults and people who use mobility-assisted devices. One of the key informants – the urban planning consultant (KI-UPC) – suggested replacing trip hazards such as cobblestones and flagstone pavers used for pathways with even and textured surfaces.

All the key informants acknowledged that flat terrain enhanced pedestrian movements for older adults, while slopes and hilly terrain were barriers to aging in place. Fountain Way, described above, was referenced as an important east-west pedestrian connector route for FCS residents. Poor surface conditions and bumpy terrain of Fountain Way were noted as barriers to mobility and aging in place because the "pathways are winding and unfortunately are not kept in good repair so they're quite undulating" (KI-UPC). As explained by another key informant – retired architect and FCS resident (KI-AR) – the asphalt on Fountain Way was "poured on the soil, and over 30 years it sags down so you get these crazy little Mount Everests on either side" is an unsafe walking route for residents (Figure 5.5).

Figure 5.5. Fountain Way uneven road

Pedestrian crosswalks and intersections were mentioned by a key informant – a City of Vancouver planner (KI-CP) – as having the "potential to enhance safety by

providing more certainty about when one is supposed to cross and providing that formal instruction and visual for cars to stop". Other positive features mentioned were bright visual cues for cars to stop, unobstructed pedestrian crossing signs, and painted crosswalk lines that pop so when someone "gets onto this walkway system, they're clear about where the curb cuts are going in the right direction into the marked crosswalk, instead of [walking into traffic]" (KI-UPC).

Two key informants suggested that additional wayfinding features would improve aging in place for older adults experiencing dementia and visual impairments. According to one key informant, visual signs that could cue older adults into informing them that they were on the right path were an example of how a built environment can be friendly to aging. Building on this concept, another key informant suggested implementing "wellness walkways" or sections of pedestrian routes designed to support older adults facing declining mental and physical abilities. Design features of "wellness walkways" include no joints on sidewalks so one could easily walk or wheel, reducing glare on pathways, planting scented bushes, introducing pops of colour for visual cues such as painting the sidewalk a different colour, clearly marked curb cuts leading into a pedestrian crosswalk, and a pathway that is well lit for safety. Also important were canopy covers for weather protection in public spaces.

5.1.2. Discussion and Interpretation

Findings from this study confirm previous research about how the outdoor built environment influences older adults' decision to age in place (Bigonesse, 2017; Wang & Shepley, 2018). Older adult and key informant participants mostly agreed on built environment features that facilitate aging in place. Positive associations were highlighted by both groups for micro-scale urban features (absence and presence of sidewalk obstacles, curb cuts, canopies, crosswalks).

Previous research indicates that since older adults spend more time in their neighbourhood compared to other age demographics, the built environment may significantly impact them on a physical level, thereby affecting their ability to age in place (Clarke & Nieuwenhuijsen, 2009; Garin et al., 2014). A study by Clarke and Gallagher (2013) found that older adults who had access to sidewalks, including wider and smooth pavements, were significantly more mobile. Consistent with both participant groups,

research suggested broken sidewalks, clutter on sidewalks, absence of curb ramps, and poorly designed and maintained streets were barriers, making it challenging for older adults to be mobile in their neighbourhood (Chaudhury et al., 2011; Clarke & Gallagher, 2013; Chippendale & Boltz, 2015; Mahmood et al., 2019; Phillips et al., 2013; Verma & Huttunen, 2015). Sidewalk improvements were found to be a practical and effective policy for encouraging physical activity (Chaudhury et al., 2012; Li et al., 2005; Verma & Huttunen). As reported by Dommes and Cavallo (2011), features such as legible and easy-to-understand crossings also led to an increase in activity levels among older adults aging in place.

According to Lawton and Nahemow's person-environment fit theory (1973) – discussed in section 2.4.1 above – these types of conditions result in the higher environmental press on older adult individuals and often prevent them from being independent and having control over their environments. This then reduces the likelihood that they would choose to age in place for safety or comfort considerations (Greenfield, 2012; Lawton & Nahemow, 1973).

To improve FCS for aging residents, key informants stressed designing accessible environments suitable for people of all ages and abilities. This includes adding visual, auditory, and sense wayfinding cues for people facing changing physical and mental abilities. WHO (2002) emphasizes that age-friendly physical environments can make a difference between independence and dependence for all individuals, especially for those growing older. An age-friendly built environment that includes accessible and inclusive infrastructure such as clear signage encourages older adults to spend more time outdoors (Chau & Jamei, 2021; Menec et al., 2011). It is important to prepare the built environment to foster the utmost independence of older adults.

Interestingly, older adult participants did not appear to share the same views even though some of them underwent knee and hip replacement surgeries and suffered strokes that impacted their mobility. For the most part, they chose to report on facilitators rather than barriers in their neighbourhood. In some cases, perceived objective barriers such as uneven surfaces, loose gravel, and rocks were recorded and captured in their photo-documentation journals. However, when probed further during the interview, older adults reported it was their responsibility to pick up their feet over such barriers or move around obstacles on the sidewalks rather than repair or retrofit the built environment.

Literature on person-environment fit suggests that over their life span, older adults adapt to their environments by utilizing assimilation coping strategies to feel competent and gain control of their environment (Golant, 2020; Lawton & Nahemow, 1973). According to Golant (2015), when older adults find themselves out of their comfort zone in an environment, they start to apply assimilative forms of coping to deal with the negative scenarios by lowering their expectations of the environment even though it presents barriers (Golant, 2015; Hyer, 2020). As the older adult's cognitive and physical abilities decline or change, they internally justify barriers in the built environment to maintain their independence (Golant, 2020; Lawton & Nahemow, 1973). Therefore, it is important for older adults who choose to age in place, that they have the option to live with some level of independence, in a safe neighbourhood environment with age-friendly features.

The next section presents findings on functional aspects of transit infrastructure. The presence or absence of transit options that impact walkability and mobility, in general, are presented.

5.1.3. Transportation services and transit infrastructure

Access to reliable public transportation supports active living and facilitates aging in place (Chaudhury et al., 2012; Dobner et al., 2014; Lockett et al., 2005; Van Dijk et al., 2015; Van Hees, 2017). FCS is well served by several public transportation systems, such as bus lines and the Canada Line rapid transit system which connects to the SkyTrain and Sea Bus services. In addition, privately operated water-based passenger ferry systems with scheduled stops at designated docks move people around False Creek. In this section, findings on transportation options and transit infrastructure in FCS is covered. Older adults' perceptions and their use of public transportation, both pre and during the COVID-19 pandemic, are also highlighted here along with key informants' responses on public transportation services.

Transportation in FCS: Supportive or unserviceable

All the older adult participants mentioned they used public transportation pre-pandemic and appreciated the freedom to choose from multiple modes of transportation in FCS. They felt transit stops were conveniently located within walking distance. Most

older adults expressed that easy access to multiple forms of transportation expanded their range of travel. They can travel anywhere within FCS and outside the neighbourhood knowing they had the option to hop on a ferry or ride a bus or take the Canada Line rapid transit system home. For older adults who used public transportation, they found the service handy for grocery shopping, getting a haircut, attending seniors' programs in other parts of the city, or picking up visitors from the airport.

> My wife and I often walk down to Granville Island and do some shopping and then if we have too much to carry, we will take the ferry back in normal times, much less so in COVID times (Ben).

In his 80s, Guy said he could manage the walk up the hill to see his barber and run errands in the adjacent South Cambie neighbourhood. If he felt tired afterward, he could catch a bus that would drop him off in front of his building.

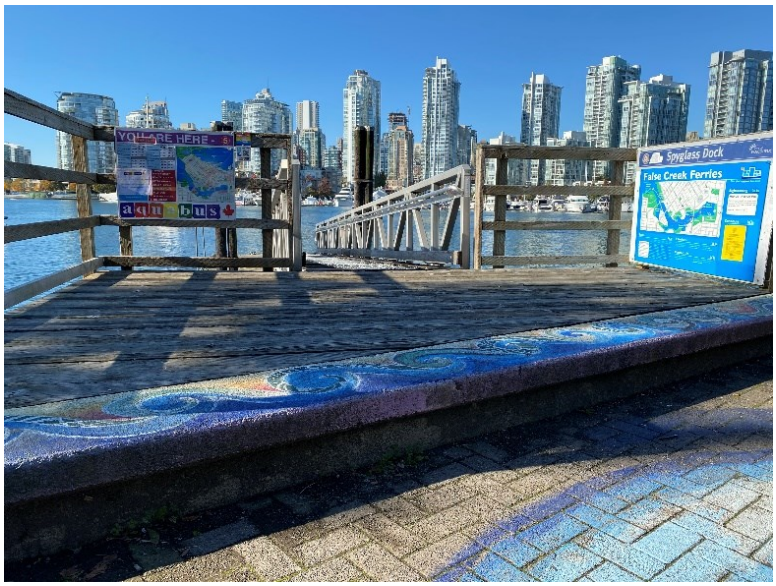
All but one participant owned a vehicle and those who owned a vehicle preferred to walk, bike, or use public transportation. Even though Guy owned a car, he admitted he didn't drive often because he found it very easy and convenient to use public transportation citing, "BC transit's [TransLink] services can take us anywhere. I can walk when I don't want to drive". Ben, also in his 80s, understood that he may not be driving for much longer, so having multiple transportation options available to age in place was extremely important to him. He stressed that transportation services within walking distance supported his ability to conduct daily activities within and outside of FCS, and to stay connected with his family.

> Public transit here is abundant in both directions, and the walkability is also super. The ferry takes me all over False Creek. I don't take the #50 [bus] because two blocks away, there is the Canada Line that takes me straight downtown to have lunch with my son and go to meetings at the SFU downtown campus. [I] can take the sea bus to North Vancouver. When my kids come to visit, I don't pick them up [from the airport] anymore (Ben).

While most older adults agreed that transportation services were reliable in FCS, a few older adults noted that the bus service was unpredictable and infrequent compared to the Canada Line rapid transit system and water ferry system. As Ann noted: "I find the bus less convenient, harder to know when it's coming. Whereas the Canada Line [rapid transit] comes every three minutes and the ferry, you can see it coming." Water ferries providing service around Granville Island and False Creek are

privately owned and operated. Even though it costs more to take the ferry service, many older adults appreciated the additional waterway mode of transportation. The water ferry service was particularly appreciated by Ben who lives in the eastern area of FCS, close to the Spyglass Ferry Dock (Figure 5.6).

Figure 5.6. Water-based transportation



"To me, there are two important aspects to mobility for aging in place in a neighbourhood: one is getting around within the community; the second is easy ways to get out of it for other shopping, dining, cultural and walking opportunities" (Ben).

Ann thought that the water ferry service was a handy mode of transportation that took her to destinations within the FCS neighbourhood and beyond. She was also one of three older adults who felt that there was a need to improve accessibility at the ferry dock stations because ramps are steep at low tide, and the high curb steps onto the dock are problematic for people with mobility limitations (Figure 5.7).

Figure 5.7. Transit infrastructure: False Creek ferry docks inaccessible

"Barrier for mobility-impaired people. Ramp is often very steep. Hard to go up and down" (Ann).

About half of the older adults indicated that they would like to see the restoration of the historic streetcar service as an additional accessible transit connection to Granville Island, Olympic Village, and Science World. The original route spanned from Granville Island to the Leg-in-Boot stop, continuing under the Cambie Street Bridge and ending near the Main Street Science World Skytrain Station.

> We used to have a little train that went from here down to Granville Island… it was an old coach, and it was beautiful, had lots of history and the drivers were very informed and they would let my grandchildren wear the hats and it was great. It was a $2 return. We all miss that (Ann).

Most older adults felt the proximity between bus stops was well placed. They added that the bus stop infrastructure provided sufficient lighting, adequate cover for

protection from rain and snow, benches for older adults to rest, and garbage receptacles nearby.

> I have absolutely no complaints. I literally am maybe 200 yards away from a sheltered stop that has lots of seating, and good lighting. They are placed quite close to the Creek so that people don't have to go a long distance. There are garbage pails there to throw out your paper wrappings (Mia).

Only one participant pointed out that most of the bus shelters were old and in poor condition. Figure 5.8 shows an example of a functional, yet run-down bus shelter on Lamey's Mill Road.

Figure 5.8. Transit infrastructure: Bus stop #50

"The bus stop roof has weeds growing for years, and the graffiti needs removing. Often it stays there for weeks" (Ava).

Many appreciated recent infrastructure updates to add more lighting, a new canopy over the passenger hub and replacing pavement to improve accessibility at the Heather Square Bus Loop in FCS. However, they felt the upgrades were incomplete because old decrepit shelters were still left onsite.

Key informant perspectives on transportation service and transit infrastructure

Two of the four key informants critiqued the design and layout of the Heather Square Bus Loop, noting it was less than desirable for older adults taking public transit.

They suggested redesigning the bus loop to face the street; adding more benches, signage, and greenery; improving pedestrian pathways and sidewalks with new surface treatments; and activating the area by offering rotating businesses such as coffee or food truck or florist.

One key informant felt limited transit service and fewer transit options in FCS impacted older adults' ability to get around within and outside the neighbourhood citing, that "in terms of accessibility, there's not a lot of transit options within the community that could bring a senior citizen to those services. So, I think those are limitations to aging in place" (KI-CP).

KI-AR – retired architect and FCS resident – recognized that transportation services were essential for aging in place. As a double knee surgery recoveree, KI-AR uses the False Creek water ferry service to get to and from shopping destinations such as Granville Island. KI-AR was also in favour of reviving the streetcar service, and mentioned, further, that the cancellation of the FCS local bus route serviced by a community shuttle was missed by residents. Another key informant reported that the location of transit stops was within a reasonable distance from any home in FCS.

Certainly, some key informants had their unique ideas to improve transportation services for older adults. KI-BL, Executive Director at an elder care facility in FCS, suggested the addition of accessible means of active transportation services such as autonomous vehicles along the seawall would benefit older adults with dementia or experiencing mobility restrictions.

> There are examples in various parts of the world of autonomous vehicles that move slowly within pedestrian areas. If you could imagine along the seawall, there would be autonomous vehicles perfectly safe for older people. [It would] be moving slowly [so] that a senior can jump on [or] jump off with easy access (KI-BL).

5.1.4. Discussion and Interpretation

The Age-Friendly Cities Guide recommends convenient and safe transportation services to support older adults age in place (WHO, 2007). Older adult participants reported that even though they owned vehicles, they would prefer to walk or take transportation for their daily needs. Previous research suggests that neighbourhoods with transportation services that offer reliable and accessible transit options close to

home, convenient transit connections, safety at bus stops, and covered shelters at bus stops facilitated older adults' independence, mobility, and aging in place (Bigonnesse et al., 2014; Chaudhury et al., 2012; Dobner et al., 2014; Lockett et al., 2005; Milton et al., 2015; Van Dijk et al., 2015; Van Hees, 2017).

Data from this study are consistent with previous research by demonstrating that frequent transportation services and accessible infrastructure supported participant mobility, thereby facilitating active, social, and independent lives (Bigonnesse et al., 2014; Milton et al., 2015). Both older adults and key informant participants agreed that transit stops were well placed, adequate seating and shelters were present in FCS, and suggested improvements to clean up the Heather Bay bus loop to improve accessibility. However, perceptions differed between both groups regarding the availability of transportation services. Key informants noted that for older adults who could not walk long distances, there were few accessible transit options within the neighbourhood, thereby limiting their ability to be mobile and access amenities outside the FCS neighbourhood. Their perspectives were informed by urban planning and design professional goals of addressing the needs of people with different levels of mobility and providing solutions that offer door-to-door mobility and increase travel opportunities for older adults.

On the other hand, older adult participants of this study did not report issues with the frequency or transit service options. They were satisfied with the convenient and diverse types of transit options within walking distance in FCS. Additionally, they felt the existing transportation services provided them with the freedom and independence to stay socially connected with friends and family, to visit shops and services, and entertainment outside of FCS. Reasons for this may be related to their self-reported high levels of health and mobility. All the older adult participants in this study had no physical conditions that limited their walking and did not use mobility assistive devices. Their perceptions of transit frequency and availability were based on their own experiences as older adults with high ability levels at the time of data collection. This aligns with the person-environment fit model (Lawton & Nahemow, 1973), that personal competence and environmental press factors determine the person-environment fit at a given place. In this case, there was an optimal fit between the FCS environment and transit options, and the older adult participant's competency. Thus, they felt these environmental features were helping them age in place.

The next section presents findings on the role of green spaces in FCS and proximity to shops and services.

5.2. Land use and supportive features

This section covers access to land uses and destination places such as parks and open spaces, shopping centres, community centres, and eating and drinking establishments. Destinations close to home that one can walk to are important aspects supportive of facilitating daily mobility for older adults. Proximity to enjoyable destinations provides a reason or motivator to be active. Two sub-themes emerged from the land use and supportive features theme. First, is the convenient proximity to shops and services for mobility. Second, is the lack of benches and public washrooms in FCS.

5.2.1. 20-minute neighbourhood: Proximity of amenities, shops, and services

This section presents participants' perspectives on easy access to amenities and services that meet their daily needs of shopping, recreation, socializing, and taking care of their health. Most of the older adult participants mentioned that access to shops and services within walking distance kept them active. Proximity to shops and services provided incentives for older adults to get out for some exercise and to run errands. Being close to amenities is beneficial for aging residents' mobility as they maintain their independence and keep physically active. As Mia, long time resident in FCS, wrote in her journal "daily shopping is the way to go for seniors". Local neighbourhood restaurants and the Convivial Café were also brought up as amenities, but these will be discussed later under the social environment section in Chapter 6 (section 6.2.1).

Many older adults mentioned that they appreciated the diversity of shops, professional and health services, and eating establishments located conveniently within walking distance close to home. For example, a few older adults mentioned they would shop at *Dean's Food Store*, a favourite small-scale neighbourhood grocery store on the west side of FCS close to Granville Island for convenience. Guy, a resident in FCS for 41 years, lives half a block from *Dean's Food Store* and is a regular customer there (Figure 5.9).

Figure 5.9. Proximity of amenities: Dean's Food Store

"Dean's [Food Store], located between Alder Crossing and Granville Bridge supports aging in place by offering a range of products and services within easy walking distance – closer than the [Granville Island] public market and No Frills [on Broadway and Cambie]" (Guy).

Leg-in-Boot Square, a mixed commercial and residential area located centrally in FCS was also mentioned by many older adults as a place that facilitated aging in place. The small businesses in Leg-in-Boot Square offered various health-related and professional services such as physiotherapy, a hair salon, an animal hospital, a wellness centre, a dental clinic, insurance agents, and more. While Eve, who lives in a building adjacent to the square, appreciated the proximity to shops and services, she nevertheless mentioned during the interview that she wished for a grocery store on-site (Figure 5.10).

Figure 5.10. Proximity of amenities: Leg-in-Boot Square

"Stores line this square. This is helpful to people in the neighbourhood who need what they offer. The square is easy to get to by walking" (Eve).

Ava, in her 80s, raised her two daughters in FCS and said, "I am thankful to live here because it is near anything and everything we want to do". Older adults did not focus on the lack of amenities or shops within FCS; instead, they included walking to the adjacent South Cambie neighbourhood commercial area as an extension of their daily activity and destination place for shopping. A few participants, like Guy, referred to FCS as the 20-minute neighbourhood.

> We're close to everything and if we don't want to drive, we don't have to. I'm a 20-minute walk from just about every place I go, including Vancouver General Hospital. And it's not much over 20-minutes to St. Paul's Hospital, it doesn't get better than that (Guy).

Similarly, Jax mentioned that if he wanted groceries of more variety than offered in FCS, he had the option to walk 20 minutes either towards Olympic Village or up the hill to shop on Cambie Street for groceries.

> Normally I would walk on the seawall east to Olympic Village to shop or for exercise (Jax).

Ben, now in his 80s, recalled having to drive to destinations to run errands in his old neighbourhood. He felt that shopping in FCS and the adjacent South Cambie neighbourhood was convenient and within easy walking distance.

> The immediate South Cambie district offers a remarkable range of major retail outlets, all of which are easily accessible to pedestrians on wide sidewalks that comfortably accommodate personal shopping carts (Ben).

Several older adults mentioned that the access to multiple community centres with fitness centres that offered seniors recreational programs were facilitators to age in place. Dee reported she could walk to three community centres (False Creek Community Centre on Granville Island, Creekside Community Centre in Olympic Village, and Roundhouse Community Centre in Yaletown) from her home, adding the centres were within 20-minute walking distances. Guy, who had hip replacement surgery, stated that the local community centre recreation program "False Creek Racing Canoe Club was key for seniors staying active as it offered adapted aquatics programs for all levels".

On the other hand, some felt that there were limited amenities in FCS and that it was a barrier to age in place. Max felt that "in the neighbourhood, unfortunately, there aren't many shops actually in the False Creek South area". This may be due to the lack of diversity in the type of amenities rather than quantity as is presented in the next section.

Key informant perspectives on proximity to amenities in FCS

Key informants interviewed expressed a need for more diversity in the type of services available in FCS for aging residents. Two of the four respondents explained that FCS functioned well as a walkable neighbourhood between the various housing developments. However, they noted that the lack of diversity in retail businesses and health services in FCS left residents with limited options for shopping in FCS. For older adults who have mobility limitations, walking to amenities outside of FCS would be considered a long walk. Others who don't drive would face difficulties getting to specialized doctor appointments and attending physiotherapy treatments.

KI-AR mentioned that the design for a commercial district in the original FCS official development plan was never developed. The same key informant, also a resident of FCS, appreciated the neighbourhood's small-scale grocery shop *Dean's Food Store*,

which was conveniently located across the street from a bus stop, next to an elder care centre.

> Dean's which is on Lamey's Mill Road is a tiny little store, yet all in the neighbourhood know the store. That's where I buy my milk and cookies. [The store] is by the [elder] care home, so some workers come by. [The store] is across from the bus stop [so it's easy] to get off the bus and pick up groceries. It's the only store that is supported between Granville Market and Olympic Village (KI-AR).

5.2.2. Discussion and Interpretation

In their study, Wang and Shepley (2018) found that the presence of destinations for walking to and from daily living activities (e.g., health services or grocery shopping) contributed to more years of aging in place. The findings in this study add to previous research by demonstrating similar patterns. In FCS, access to amenities and services are conveniently located within walking distance and participants refer to FCS as the "20-minute neighbourhood". For example, participants shopped for groceries in the small neighbourhood convenience store in FCS. If they needed other items, they would walk to larger shops in adjacent neighbourhoods that are within a 20-minutes walk, cycle, or transit ride from home (Granville Island, Olympic Village, or South Cambie Village).They reported that the diverse types and proximity to small- and large-scale grocery stores, eating establishments, recreation centres, pharmacies, and health services encouraged them to walk every day, which they believed facilitated their ability to age in place.

On the other hand, from a neighbourhood planning perspective, key informants felt amenities and health services for frail older adults were limited in FCS. Based on their scope of professional experience, key informants interpreted this as an opportunity to improve FCS neighbourhood planning policies for a robust commercial district in FCS. Previous research suggests there is a disconnect in the interpretation of aging in place between older adults with lived experience and professionals implementing policies (Buffel et al., 2013; van Hees et al., 2017). These studies suggest that professionals based their perspectives of aging in place on the *function of* place: tangible characteristics that can be constructed physically (van Hees et al., 2017). By contrast, older adults' perceptions of aging in place are based on the *connection to* place: strong neighbourhood connections or place attachment that provide a sense of belonging, positive well-being, as well as promote physical activity, comfort, and security (Mahmood

et al., 2019; van Hees et al., 2017). It is important to acknowledge emotional attachments to how people use space in planning for older adults. That is, since older adults have more direct lived experiences, one must take into consideration the connection to a place to find a balance with the function of the built environment for aging in place. It is important to engage older adults in neighbourhood redevelopment processes to more effectively advance age-friendly policies for aging in place.

The following section presents findings on participant and key informant perceptions on the presence or absence of streetscape amenities to accommodate aging in place.

5.2.3. Outdoor comforts: Benches and public washrooms

Streetscape elements such as benches and public washrooms were mentioned as important built environment features that supported aging in place. Older adult participants were asked to comment on the availability of places to sit in FCS. Key informants were asked to share their experience and knowledge on urban design principles of “streets to stay in” to accommodate pedestrian mobility. Older adults provided mixed responses to the question “Do you have a place to sit and rest?” Most noted that the availability of outdoor benches providing places to sit and rest in FCS was an important factor for aging in place. Ava wrote in her journal that there were plenty of benches in the neighbourhood to support aging in FCS (Figure 5.11).

Figure 5.11. Streetscape amenity: Benches

"People of all ages use this bench. Looks out down False Creek to the east, all the way to the area of Science World. It supports the aging in FCS. There are many benches, in all areas of the creek" (Ava).

While older adults acknowledged that new benches were installed as part of the seawall upgrades, they noted that more benches in busy areas of FCS, such the seawall and Charleson Park were needed. For Ann, benches were important resting options for older adults, which were harder to secure on sunny days. Eve added that some benches were old and not very nice to sit on.

> I don't think there are enough benches for people to sit on. So, if you're older and you're tired, there are not many places you can stop and rest. There may be some benches, but they are very old and grimy with moss on them and not very inviting (Eve).

Additionally, many older adults reported that more benches could be installed in Leg-in-Boot Square. Mia observed that "there's some seating around the edge" of Leg-in-Boot Square and suggested, "more seating in the centre would be nice." She also shared that during the COVID-19 pandemic; people brought their chairs to sit in the square.

Lyn's favourite spot to visit was a courtyard located between housing enclaves. She reported that the enclave courtyard at Starboard Square, surrounded by trees and

greenery, was a facilitator for aging in place and noted it was an accessible space that is easy to walk to (Figure 5.12).

Figure 5.12. Places to sit: Starboard Square

"This is a pleasant area, well used by young families, adults and seniors. A place to sit and chat and enjoy the surroundings and listen to the birds" (Lyn, 70-79).

Without prompts, a few older adults reported access to public washrooms was missing in FCS. During her interview, Dee said she could see from her apartment window, people relieving themselves on the seawall. Ken would like to see portable toilets placed along the seawall or near public parks.

> I think there should be more Johnny-on-the-spot toilets along the seawall. Sometimes you must go, you have to wait and there's nowhere to go. They are renovating the playground for the elementary school; I hope they would put some potties near the park and the playground (Ken).

Key informant perception of streetscape amenities

Amongst the key informants, benches were highly regarded as a useful amenity for aging pedestrians. While some key informants talked about adding more benches for older adults to enjoy views of the water and the greenery, the same respondents revealed benches needed to be designed for accessibility. They explained that for a bench to be used by people of many abilities, it must be designed so people who use mobility assistive devices can easily transfer onto the bench.

KI-AR, also a long-term FCS resident, indicated ledges on stone walls also functioned well as places to sit and linger. This key informant believed benches were well-placed along the seawall, which provided the means for older adults to feel confident walking outside.

> My father was turning 90 when he made his last visit over here, and he used to love going for long walks. He would go for short walks to his favourite bench. That's what he could manage. The bench was 200 yards from my home (KI-AR).

The availability of public washrooms in FCS would have an impact on the amount of time spent outdoors. As described by KI-UPC, anxiety and worry about going out and being uncomfortable can be reduced by providing easy access to public washrooms.

> When I go downtown, especially in COVID times, I've already figured out how much I can drink. I don't drink coffee before I go. I figured out how much time I have in case I must get out of there to go to the washroom somewhere else (KI-UPC).

This theme demonstrates that the availability of benches and public washrooms can be a facilitator for older adults to age in place. There was agreement among older adults and key informants that benches provided places to sit, rest and enjoy views. Public washrooms were also mentioned as a basic amenity missing in FCS.

5.2.4. Discussion and Interpretation

There was agreement among older adults and key informants that well-planned and designed seating areas, such as the presence of benches in key public spaces provided places to rest and foster social connection. This facilitated aging in place by providing older adults the opportunity to be outside with places to sit, rest and enjoy

views. Benches were perceived as motivators for being physically active outdoors. Findings indicate the availability of benches along the seawall facilitated mobility among older adults with limited physical abilities to walk in the community. A few older adults who experienced health issues impacting their mobility reported feeling encouraged to exercise as they were healing because of the proximity of benches at the front steps of their homes. They felt confident walking short distances from one bench to another.

Older adults also shared that they had a favourite bench in the neighbourhood that they frequented daily to meditate and enjoy views of nature and people. Research shows that benches and outdoor seating make it possible for older adults and vulnerable seniors to get out of their homes more, meet friends, and stay in their homes and communities longer (Chaudhury et al., 2012; Chippendale & Boltz, 2015). Age-friendly cities guide reports the availability of outdoor seating as a necessary urban feature for older adults (WHO, 2007). Simple resources like benches promote mobility, and independence, and decrease isolation (WHO, 2007). In short, public benches make neighbourhoods more livable for older adults, improve their health, and increase their social connectedness (Ottoni et al., 2016).

WHO's (2007) approach acknowledges the importance of meeting the needs of people of all ages and abilities. Age-friendly features incorporated into neighbourhood plans to provide valuable public infrastructure benefit older adults, younger community members, and children. For example, access to public washrooms in FCS provides the comfort and motivation for older adults to spend more time outdoors and offers relief for caregivers with young children. WHO (2007) recommends that the availability of clean, conveniently located, well signed, accessible toilets are an important age-friendly feature of the built environment. This study's findings are consistent with previous research, confirming that the provision of accessible public washrooms positively influences mobility, thus facilitating aging in place (Chaudhury et al., 2012; Mahmood & Keating, 2012).

The next section presents findings on shared land-use conflicts and perceived personal safety in unsafe surroundings.

5.3. Safety: Shared use conflicts and perceived personal safety

This section presents findings on the pedestrian landscape as it relates to safety and security. Three safety themes emerged from content analysis of interviews and photo-documentation journal submissions by older adults. First is the feeling of uneasiness around cyclists on shared-use paths. The second is encounters with dogs in parks. The third safety theme – perceived personal safety during the day or at night in FCS – is presented last, with findings from both older adults and key informants.

5.3.1. Seawall as the neighbourhood spine: Pedestrian vs cyclist conflict

The importance of a sense of safety walking or wheeling on the seawall for older adults cannot be overlooked. Older adults highlighted immediate access to the seawall as an advantage of living in FCS. As a popular route for residents, it functions as the neighbourhood connector, where walking and cycling are the main ways of getting around. Due to its relatively flat and smooth terrain, older adults agreed that it is an important route to support older adults' mobility for aging in place. However, the ability for older adults to enjoy a stroll on the seawall without fear of speeding cyclists knocking them over presented a barrier for many older adults to fully enjoy the experience.

A variety of new and innovative modes of active transportation or electric personal transporters such as electric bicycles, scooters, skateboards, and unicycles have been introduced in recent years. Older adults identified speed and careless riding behavior as factors for feeling uneasy around cyclists and people using electric personal transporters. One older adult participant mentioned her neighbour was hit by a motorized scooter and another recalled a time when she was knocked over by a skateboarder while walking on the seawall.

Older adults reported that careless cycling behaviors such as weaving in and out of pedestrian lanes, excessive speed, and failing to stop for pedestrians took away from the enjoyment of using the seawall to get from one place to another. The cyclists' behavior forced them to take alternate walking routes for fear of being hit. Ken, a 25-year resident in FCS shared in his interview what he had observed:

> Some scooters zoom by and motorized skateboards zip by. [The use of] motor scooters are getting more popular. Even though there are separate pedestrian and cycle lanes, it's too close. Sometimes a bike wants to pass another bike and then they get into the pedestrian side so it could be intimidating to some older people (Ken).

A few older adults mentioned that they had wished the designated Seaside Bypass bike route was better used by cyclists who travel at high speeds commuting through their neighbourhood. Since 2016, sections of roadways in FCS (Lamey's Mill Road and Charleson Street, see Appendix G: FCS Route Map for location) remained closed to non-transit vehicles to improve the safety and comfort of cyclists on the Seaside Bypass route by shifting vehicle traffic onto West 6th Avenue. Despite the City's effort to provide an alternate route for commuter cyclists, Mia who lives in co-operative housing near Lamey's Mill Road expressed frustration that cyclists continued to use the seawall "as a speedway". Max who takes daily walks on the seawall for recreation purposes and to run errands, mentioned in his photo documentation journal that cyclists' speed was a barrier to being active and aging in place. In his interview, Jax also noted similar frustrations:

> Cyclists who are commuters heading east or west, a lot of them come through the neighbourhood. [They ride along] the seawall and are going as fast as they can [to] get to work or home from work. Older people complain that they are going too fast, so the city was trying to encourage cyclists to use the roadway cycling route (Jax).

Older adults agreed that the seawall upgrades to separate walking and bicycle paths improved conditions for pedestrians. As depicted in Dee's photograph below, shared pathways with a green boulevard in between to separate pedestrians and cyclists provided a notable feature of feeling safe walking on the seawall (Figure 5.13).

Figure 5.13. Safety: Green boulevard separating walking and cycling

"Such a pleasure and much safer to walk…and have the bicycles on a separate path. It is so much safer for seniors to walk on the seawall when the bicycles are not weaving in and out of the walkers like it was in the past. There was always a fear of being hit and injured by a rider" (Dee).

However, despite the upgrades to separate walking and cycling pathways, older adults mentioned careless cyclists crisscrossing between pathways, and these cyclists' disregard for pedestrian safety continues to be an issue. In Ben's view, bicycle regulations needed to be implemented and enforced especially since the seawall improvements increased pedestrian and cycling traffic (Figure 5.14).

Figure 5.14. From neighbourhood “high street” to recreational thoroughfare

With the initiative to complete [and improve] the shared biking and walking [paths], this section of the Seawall (Charleson Park) has become even busier than it has previously. [This area] sometimes seems more like a recreational highway, leading to significant unintended consequences for seniors’ mobility within the neighbourhood (Ben).

Even with new bike lane designs to improve pedestrian and cyclist safety at narrow sections on the seawall, older adults identified the commercial area at the Moberly Road cul-de-sac as a hazardous place for vulnerable pedestrians. As an avid walker who walks 10,000 steps a day, Dee felt invisible to cyclists and feared for her safety by crossing the busy intersection. She explained that cyclists often ignored countermeasures that were designed to address road user conflicts and reduce collisions between people walking, cycling, and driving (Figure 5.15). This concern was echoed by Ann and Max, who both mentioned that pedestrians at busy seawall intersections were confused as to who had the right of way.

Figure 5.15. Confusing and dangerous intersection on the seawall

"This represents a barrier to aging in place as being a dangerous area to be walking with the bicycles often racing through this area. It is a danger to [pedestrians] trying to walk across the marked crosswalk as the bicycle riders hardly ever slow down or stop to allow [people] to cross. Maybe one in 15 or 25 stop and the rest just barrel on. If you're a senior and you have mobility problems [or use a walker], [it] can be scary" (Dee).

Additionally, older adults reported the absence of marked crosswalks with advanced yield markings at convenient locations for pedestrians to cross as barriers to aging in place. In her interview, Ava, a long-time FCS resident, emphasized that she often feels ignored as a pedestrian by fast-moving cyclists as she waits to cross the pathway. In her photo documentation journal, she suggested more signs and markers before and after pedestrian crossings "to let the cyclist know about the crosswalk before he/she is at it" (Ava). Max also felt that pedestrian crossings on the shared path at the seawall could be redesigned to improve pedestrian safety (Figure 5.16).

Figure 5.16. Poorly marked shared-use path

"No warning to [cyclists] that pedestrians may be crossing their path, no visible signs with green discs showing bike/walking paths separation and can be quite dangerous" (Max).

Key informant perception of pedestrian vs cyclist conflict

KI-AR, who walks and cycles the seawall daily mentioned that the seawall attracts a diverse mix of users. Among the users are people walking for recreation, residents running errands, people roller-skating, skateboarding, or using scooters to get around, families on recreational bike rides, cycling groups focused on long-distance rides, and commuters speeding to work. KI-AR appreciated the recent seawall upgrades to improve walking and cycling infrastructure. However, KI-AR felt that by separating users, the bike lane along the seawall turned into a highway for all types of wheeled active transportation (motorized scooters, bicycles, skateboards) moving at high speeds putting pedestrians in greater danger of being hit. As a result, the seawall bicycle path has become a route "to get to places, from A to B, rather than one to stay in" (KI-AR).

To improve cues for both pedestrian and cyclist safety, another key informant suggested defining the use of the space with bright markings or texture changes before pedestrian crossings. Others suggested installing more signage redirecting cyclists off

the seawall onto the designated bicycle commuter route in FCS to improve pedestrian safety. Unfortunately, as another key informant pointed out, the designated bicycle commuter route off the seawall was not well used. The next section presents results on shared use conflicts amongst users of Charleson Park.

5.3.2. Charleson Park: Pedestrian vs dog conflict

The shared park space at Charleson Park was a divergent topic for many participants. Some considered sharing the space with dogs as mobility enablers while others thought their presence in the park as mobility challenges. A few older adults mentioned that the off-leash area for dogs in Charleson Park was a safe place for pets to play. Some said that they enjoyed walking to the park to watch dogs play (Figure 5.17). Others mentioned that dogs reduced loneliness and kept older adults physically active. Ben, who wasn't a pet parent, believed dogs improved older adults' mental and physical health, just as cycling had health benefits for older adults by helping them keep active.

> For dog owners, including seniors, dog walking is also a strong motivator for continued mobility, and dogs are an important social lubricant for community interaction (Ben).

Figure 5.17. Dogs playing at Charleson Park

"This is a gathering for dogs cavorting in the water and playing in the dog park. Very busy and lots of seats for viewing" (Lyn).

Even though an area of the park is designated off-leash for dogs, many older adults felt unsafe and uncomfortable walking through Charleson Park because of dogs racing back and forth across the park. Many older adults mentioned they feared being injured by unleashed dogs running from the seawall side of the park to play in the waterfall area at the other end of the park. Lyn who lives near the park said that she avoided walking along the footpath that cuts through the middle of Charleson Park for fear of tripping over dogs. Ben shared Lyn's sentiments, citing:

> Several people have been nearly knocked down by large dogs [running back and forth across the park, between the waterfall and dog area]. For people who fear dogs, or people who have little kids, or have significant mobility issues, that's a scary place, so people tend to avoid it. With my current mobility, I have decided that going the back way, which is up this other path that goes along the berm, is safer (Ben).

Older adults had mixed feelings about the dog park at Charleson Park. Most reported feeling scared of being knocked over by dogs running across the park. A few said that they liked walking to Charleson Park, precisely because they like to see dogs playing and running around.

5.3.3. I feel safe walking in FCS

Perceptions of personal safety from crime or feeling unsafe in their surroundings may have an impact on older adults to age in place. When asked about what makes it safe or unsafe to walk in their neighbourhood, all the older adults considered FCS a safe neighbourhood to walk around during the day. While some mentioned they also felt safe walking around the neighbourhood at night, others mentioned they were not as comfortable walking at night, especially through darker areas of the neighbourhood. Mia, an active grandmother, attributed feeling safe because of the constant pedestrian traffic in the neighbourhood providing natural surveillance or eyes on the street.

> People are walking around all the time [in FCS]. I go to [Kitsilano] or Shaughnessy [neighbourhoods] and there's nobody on the streets [because] they're all driving their cars to get anywhere. That to me is not a good sign of safety. I know [in FCS] I'm going to probably run into somebody walking their dog or a jogger. There are more people out now at night. I'm [getting out] to get some fresh air because of the situation with COVID. I find that a safe feeling, just knowing that there are other people outside (Mia).

Long-time resident Guy chose to raise his family in FCS because of the neighbourhood's low crime rates. Like Mia, he explained that FCS was a safe place because there are always people walking in FCS. Guy also suggested that the design and placement of the buildings played a role in encouraging street activity.

> It's a safe area because there are people around you know. In 40 years [there] have been two incidents and a couple of bike thefts. It's because of the way [the neighbourhood is] designed, where the buildings face each other [and] there are so many pathways [that allow] people to interact (Guy).

Jax, a member of the FCS neighbourhood association, reported that crime or issues surrounding pedestrian safety were rarely brought up at neighbourhood meetings. Petty crimes such as bike thefts, car break-ins, and stolen property from building underground garages occur rarely. Ava has been living in the neighbourhood for 40 years and recalled that the only crime she experienced in all the years she lived in FCS was two bikes stolen from her condominium garage. She also reported feeling safe going for a short walk after dark.

> I think it's a good place to age and as far as safety. I've never heard of anybody being accosted on the seawall. I would not be frightened to go out probably till 11:00 [pm] or so and have a short walk by myself (Ava).

Although older adults generally felt safe from crime in FCS, some pointed out a few common areas that were deemed problematic in the neighbourhood. Dee, an avid walker, and stroke survivor shared that she was confronted on the seawall by a man with mental illness. Since that incident, she practiced pedestrian safety by carrying a noise-making device and avoiding dark places at night.

Others mentioned that people tenting and loitering under Cambie Bridge was problematic, and yet felt compassion for them. As Dee stated in her interview, "we have an issue with people who should have more mental health [support], but that's the only thing that makes me feel unsafe, and it's all over the city, it's not just here". Ben mentioned that his partner "doesn't like walking [back] from the Canada Line [rapid transit station] to our place because it's dark and a little bit forbidding, but she hasn't had any negative experiences". He also added that they do not go out at night, except to local restaurants in FCS.

Older adults reported that they felt safer walking at night on the seawall since new outdoor lighting fixtures were installed as part of the seawall improvement project. Many said they felt less safe walking the inside pathways connecting residential enclaves at night because of insufficient after-dark lighting due to older lighting technology and dense greenery. Mia expressed that she felt safer when the bushes were thinned out, which she believed prevented people from hiding and sleeping under the shrubs.

Key informant perceptions of pedestrian safety

Two out of the four key informants reported similar areas of concern as older adults when asked about pedestrian safety in FCS. KI-AR agreed with the older adults' perceptions that "unclaimed territories" such as the path to and from the Canada Line rapid transit station and Leg-in-Boot Square as unsafe areas to walk at night. KI-AR noted that dark areas increased fears of danger for a more vulnerable person. Adding strings of lightbulbs along these pathways would create a "friendlier" space. Even though KI-AR perceived incidents of crime were low in FCS, it was acknowledged that:

> We do have thieves around from time to time [in FCS], and I haven't heard much about needles and so on. There's a layer of antisocial behavior, we mostly see it in a bit of graffiti here and there (KI-AR).

KI-CP also felt the layout of pedestrian pathways in FCS presented a barrier for older adults aging in place.

> The type of design [may be] more conducive to daytime use as opposed to nighttime use. I feel when it's dark or when it's raining, I can imagine some seniors not feeling quite safe walking through non-marked areas, private areas, well-treed areas that may not have as many eyes on the street (KI-CP).

5.3.4. Discussion and Interpretation

Safety is unquestionably critical to older adults as they age in place (Wang & Shepley, 2018; Mahmood et al., 2019). Past research suggests the fear of falling, and the potential for falls and injuries impact the mobility of older adults – something which is seen as an important aspect for the elderly to be able to age in place (Bigonnesse et al., 2018; Vine et al., 2012; Yen et al., 2009). The safety of older adults especially those experiencing mental and physical changes should also be considered as they navigate

shared informal and formal spaces. When asked about safety concerns living in FCS, most older adults generally reported feeling safe walking along the seawall. Some older adults mentioned encounters with aggressive people in the neighbourhood, near misses with cyclists speeding, and weaving between pedestrian and cycling paths on the seawall made them feel unsafe. A few older adults felt that sharing pedestrian paths and open spaces with unleashed dogs increased the potential for falls causing injury to older adults, which may impact their mobility. Yet, others reported dogs reduced loneliness, improved their mental health, and kept older adults physically active.

As the physical capacity of a person changes as they age, older adult pedestrians may not move as fast as younger people. Additionally, their senses such as vision and hearing may also become compromised. Therefore, the neighbourhood plans must accommodate these changes to ensure pedestrian safety for an aging population. Complexity within environments increases when pedestrians share their space with different modes of transportation, including bikes, skateboards, electric scooters and unicycles, and other assistive devices (e.g., power wheelchairs), some of which travel at high speeds. Literature suggests mobility can be improved by adapting the built environment in such a way where opportunities to remain active are still available, whilst at the same time complementing the needs of older adults as they age (Cauwenberg et al., 2012; Michael et al., 2006; Rosso et al., 2011; Yen & Anderson, 2012). This includes a design that provides separation between pedestrians and different modes of transportation. Safe pedestrian environments encourage increased mobility, which then can be linked to improved physical health and mental wellness, consequently leading to better chances for aging in place.

Additionally, interviews with older adult participants discovered that they felt safe from crime in FCS. Study findings suggest that regardless of objective features that were considered barriers, older adult participants adapted their behaviour to create a desirable fit. They did this by selecting routes that accommodated their abilities and did not go out alone at night. A sense of safety is an important aspect of independent mobility, and consequently, aging in place for older adults. In their research, Mahmood et al. (2019) found that despite adverse conditions, participants perceived their neighbourhood manageable for mobility because they made the adaptations required between their ability levels and the environmental demands to achieve a suitable fit.

The functional aspects of the built environment discussed in this chapter are insufficient for fully understanding the role of the built environment in helping the elderly age in place. Strongly interconnected with – and to some degree, arising from – these functional aspects are therapeutic and social aspects of the built environment. Findings and analyses related to the role of therapeutic and social aspects are discussed in the next chapter.

Chapter 6.

Findings and Interpretations: Therapeutic and Social Aspects of the Built Environment

This chapter presents findings on how the therapeutic aspects of the built environment and social environment of FCS influenced the participants' thoughts on aging in place. Three notable aspects emerged through the investigation: (1) the therapeutic role of natural green spaces and the availability to gather and socialize in public and private spaces; (2) the role of third places in fostering neighbourly awareness and connections; and (3) intergenerational connections facilitating aging in place.

6.1. Therapeutic urban spaces

6.1.1. Oasis within the concrete urban jungle: Role of green spaces in FCS

This section presents findings on the presence of abundant outdoor and green spaces in the built environment within FCS that positively affect the aging in place experience of older adult residents. Older adults' subjective perceptions of positive connections to nature and green spaces as well as the therapeutic mental and physical health benefits of these places are also presented. Older adults highlighted the following facilitators within the outdoor built environment for aging in place: access to green space; wildlife in nature; urban forest; scenic views of the water, downtown, and the North Shore Mountains; and access to water features such as the duck ponds and waterfalls in Charleson Park.

Overall, older adults felt FCS was well maintained and pleasant to walk around. There were very few reported instances of garbage or graffiti. Many valued the landscaping service and maintenance provided by the Parks Board staff. Others gave praise to the residents who took care of their gardens. Older adults reported that the immediate proximity to green spaces and the opportunity to enjoy nature in an urban city environment improved their mental health and motivated them to stay physically active (Figure 6.1). They expressed great appreciation for living in FCS, where green spaces such as the berm in FCS' urban forest, as well as greenways, playgrounds, trails, and

parks were within steps of their home. For instance, Ben expressed that the forest setting in FCS provided sanctuary from the urban jungle.

> Beautiful, relaxing places that are nearby, relatively quiet, and feel like part of the community to which one belongs are powerful motivators for seniors to maintain and practice their mobility (Ben).

Mia reported similar sentiments that one can easily retreat into quieter "inner tree-lined pathways" away from busier pedestrian routes.

> A lot of people love the fact that you can go into quiet places in [FCS] even though you are surrounded by a very dense environment. It's nicely tree-lined (Mia).

Figure 6.1. Access to green space: Parks

"This willow tree in Charleson Park is my favourite. I love to pass by and gives me a reason to walk this way" (Eve).

Older adult participants reported that they enjoyed strolling along the tree-lined greenways, experiencing the beautiful interior semi-private gardens along public pedestrian pathways, and walking through enclave courtyards landscaped with mature trees. Ken, who retired to FCS from the suburbs, pointed out that the abundant greenways, plantings, and landscaping provided a natural respite within the urban built environment (Figure 6.2).

Figure 6.2. Access to green space: Greenways

"[Escaping] the 'concrete jungle'; greenway park, nice brick pathway, trees, and shrubs a soothing scenery which makes the walk so pleasant" (Ken).

Many older adults spoke passionately about the uniqueness and importance of access to green space in FCS whether it was on private property or public lands. For instance, Mia, who lives in a co-op close to Granville Island, felt that all the grounds, especially her garden space, should be a common space for all to enjoy (Figure 6.3).

Figure 6.3. Semi-private space: Welcoming presence

"the space is not enclosed by a fence to encourage neighbours to have a seat. Comfortable outdoor environment for aging members. In the sun, umbrella protection, healthy organic garden, comfortable chairs, and neighbours passing by to say hello to" (Mia, 70-79).

Many older adults looked forward to their daily walks on the seawall alongside the ocean to "watch the seals... there's a lot of nature in the area" (Lyn). Nature lover Dee appreciated that she didn't have to go very far to see birds and animals in their natural habitats. Being so close to nature in the diverse green spaces within her neighbourhood made it easy for her to enjoy her daily walks (Figure 6.4).

Figure 6.4. Access to nature: Wildlife in natural habitat

"Seeing birds and animals in our neighbourhood is always a delight. This is a facilitator for me as I don't have to travel [far] away to see birds and animals in their natural habitats. Walking and enjoying this natural life cycle plus other animal development is so rewarding as it can be enjoyed right where we live" (Dee).

Another key outdoor built environment factor supporting older adults' motivation for aging in FCS is Charleson Park. The master-planned urban park features trails through a wooded berm with mature trees and duck ponds located in the centre of the neighbourhood. Ben, who retired to FCS from another neighbourhood in Vancouver, stressed the importance of having access to the natural world such as the berm for relaxing in, and found them to be powerful motivators for older adults to maintain and practice their mobility (Figure 6.5).

Figure 6.5. Urban forest: "Berm" trail network

"This is for me one of the loveliest features of the neighbourhood. Despite the traffic noise from 6th [Avenue], it is a small stretch of forest walk that is easy to access and very relaxing" (Ben).

Access to forest trails provided the opportunity for quiet reflection, which older adults say contributed to their positive personal well-being (Figure 6.6). Mia felt fortunate she could escape anytime she wanted to a "quiet tree-lined space that gives residents passage ways through the Creek" and Jax thought that the urban forest provided a "wonderful short break from the urban built form".

Figure 6.6. Urban forest: Improved well-being

"I love this photo because it makes me feel I am walking in the woods. In visiting this we connect to our natural place inside us. Memories of childhood come back here" (Mia).

Views of the water, mountains, the sky, and even the city were treasured by the older adults. Long time resident Mia asserted that she would not trade living anywhere else in Vancouver because:

> The vistas are calming and make you feel like you're a part of the world, as opposed to being in a little house in the middle of the suburbs and there's the street in front of you (Mia).

Stroke survivor Dee mentioned that the easy access to nature improved her mental, emotional, and physical function. She acknowledged that the success of her recovery was inspired by the views at her doorstep. She was motivated every day to go outside "for a little bit of a walk…to enjoy the water…watching things in nature… [like] the birds singing and the flowers blooming". Another participant, Ava, expressed that her

happiness increased because of the abundant nature around her, and the access to views in FCS citing that “we see the city, the sky, the mountains, the snow, and the boats on the water, so I am very happy here”.

There are many places in FCS to enjoy unobstructed views. Mia cherished the fact that she could find solitude in her neighbourhood by going to places where she could enjoy the views and feel connected to the ocean and mountains. For Ann, to be able to enjoy the view of Yaletown across False Creek as she walked along the seawall – something which she described as a “beautiful walking path” – was an example of the outdoor environment facilitating the process of aging in place (Figure 6.7).

Figure 6.7. Views: Yaletown from the seawall

“Facilitator of supporting aging in place in FCS, easy walking, lots of benches, view of Yaletown” (Ann).

Additionally, easy access to water features such as the ocean, the waterfall, and ponds in FCS were more ways for older adults to connect with nature. Mia emphasized that the abundant water features that were offered to “everybody without effort” were facilitators for aging residents to remain active. This diversity of land use in FCS encouraged older adults to walk to “a place to listen to water playfully running through a manmade waterfall area” (Figure 6.8). For her, the natural environment away from urban noise was especially important for older adults’ mental well-being.

Figure 6.8. Access to water features: Waterfall

"This photo inspires one to seek out quiet natural spots to connect with. Viewing and having a waterfall cleans me out of troubles or loneliness that aging people can drift into. Very active pathway with dogs, shoppers, and walkers. Nature walks can diminish stress and loneliness in aging people, [plus] the exercise, which is essential" (Mia).

Older adults expressed that access to the ocean provided the opportunity to enjoy recreational water activities and "to be active and to stay active" (Mia). As an avid dragon boater, Guy explained that the easy access to water improved his mental health and provided recreational enjoyment to keep up his physical health. For him, the marina represented a place to relax and enjoy the view as well as to train for the annual dragon boat races.

Without being prompted, Ben further described how he had enjoyed living in FCS because he could escape into interior common spaces in the FCS neighbourhood for

quiet reflection. For Ben, the diverse types of green spaces and easy access to nature within FCS that allows him to move from a busy urban environment into an "interior community with its richness of natural features" contributed to aspects of successful aging in place. As reported in his journal:

> My satisfactions with living here arise from a single and I imagine highly unusual characteristic of this place: just as I can readily move from my home to the outside world, this neighbourhood offers an *interior* within the larger city, one that I can move around in freely, as in my home, as well as easily leave to a larger world. It is full of back routes to one place or another that appeal to me. It has places that feel private, and others that invite sociability (Ben).

Key informant perspectives on the role of green spaces in FCS

KI-UPC remarked that "having access to a waterfront walkway was extraordinary", adding that the waterfront views from the seawall, access to greenery throughout the neighbourhood, and connections to nature promoted walking and there-by improved mental well-being and physical health of older adults.

> It's the 21st century and we realize walking is the magic cure for mental and physical health (KI-UPC).

KI-AR stated that people can "forest bathe" in FCS by walking through the bark mulch path on the berm. Another key informant mentioned green space, open spaces, and places for quiet and reflection as important factors for older adults considering options to age in place.

> You also have open spaces of varying types ranging from enclave gardens in more private spaces to the public parks: Charleson Park, as well as the school [grounds]. That's what I think is great [in FCS], the variety of open space and walkable areas that exist in the neighbourhood (KI-CP).

KI-AR explained that it is hard to tell where private lands end and where public spaces begin in FCS; KI-AR noted that the design of the area lends to this ambiguity. This requires cooperation between the gardeners in the enclaves and the Vancouver Park Board gardeners, so when people walk along, they don't immediately see the property lines, but they are there. KI-AR described many places, such as the enclave courtyards in FCS were purposely not defined with structures, lines, or fences. Instead, the enclaves were designed as open spaces that welcomed residents and the public to share with flexible uses.

Another key informant noted that the diverse types of open spaces available within a short walking distance such as the “enclave gardens in a more private space, the public park, Charleson Park, as well as the school” in FCS were important factors for aging in place.

6.1.2. Discussion and Interpretation

Older adults noted that the naturally built environment in FCS is an asset and an important contributor to aging in place. Availability of green spaces within walking distance from their front doors such as the berm, forest trails, waterfall, duck ponds, parks, and the seawall was valued by older adults as a therapeutic respite from the urban jungle that is the city. Research confirms that living in neighbourhoods with green spaces can positively influence the health and well-being of an older adult. A study in England found that older adults living in more green areas reported greater satisfaction with their neighbourhood as a place to live. They were also more likely to perceive it as attractive (Burton et al., 2011). Convenient proximity to inner sanctuaries or natural pockets within the urban environment positively contributed to older adults' physical and emotional well-being as they: (1) served as destination places for recreation and regular walking routes; (2) promoted healing and recovery from surgery and illness; and (3) provided a place to enjoy quiet time.

In their study on green areas affecting mental health over time, Alcock et al. (2014) found that “moving to a greener urban area was associated with sustained mental health gains”. Research shows that urban green spaces with natural characteristics can generate restorative experiences for urban residents by providing psychological relaxation and stress alleviation to improve mental health, stimulating social contacts, supporting physical activity, and reducing exposure to city environments such as pollution and noise (Bowler et al., 2010; Kaplan, 1984; Richardson et al., 2013; WHO, 2016). The current study supports previous research that found that participants who were able to look out at nature as they recovered in hospitals were able to heal faster, than those who recuperated without a view of nature (Franklin, 2012).

This study’s findings suggest that older adults' attachment to the urban forest within FCS motivated them to leave their homes to walk in the soothing greenery, or to enjoy the views from that vantage point. Despite the COVID-19 pandemic public health

orders that restricted physical gatherings and social interactions, it is likely that the immediate access to the gardens, trees, ponds, trails, ocean, and urban forest in FCS promoted mobility and the physical and mental well-being of this study's participants. Older adults reported taking daily walks to meditate and finding refuge in the neighbourhood's natural sanctuary. Previous research suggests that access and proximity to urban forests, water features, and green spaces facilitated frequent and spontaneous visits (all of which increased opportunities for reflection and relaxation) was able to increase physical activity and improve the well-being of older adults (Beneta & Tuncer, 2019; Cheesbrough et al., 2019; Freeman et al., 2019; Wajchman-Świtalska et al., 2021). Findings in this study also support Farrow and Washburn's (2019) review on the effects of forest bathing – that being in nature reduces stress and anxiety and improves mood and relaxation. The researchers assert that forest bathing – a motivator for being outdoors – also improves physical health. All these factors, then, contribute to the goal of aging in place (Farrow and Washburn, 2019).

Rowles (1983) called the bond between people and places, "place attachment", and is defined as the emotional connection that people establish with specific environments that give meaning to these places (Mackenzie et al., 2014; Mahmood et al., 2019; Rowles, 1983). Strong connections to certain neighbourhood features offer independence, autonomy, and security, which in turn facilitate aging in place (Rowles, 1983). Studies found that these feelings of independence and security help shape the older adults' attachment to a place and their sense of belonging to said place (Gilleard et al., 2007; Wiles et al., 2017). Other research found that deficiencies of the neighbourhood built environment impacting mobility may be under-reported due to strong emotional attachment and familiarity with a place (Dobner et al., 2014).

Findings in this study suggest that older adults have a strong place attachment to the natural beauty in FCS. Older adults cherished the convenient access to these natural areas and valued the ability to interact with nature and wildlife so close to their homes. As discussed in the preceding chapter, physical barriers limiting mobility recorded in photo-documentation journals were dismissed in the interviews as non-issues for aging in place. For example, tree roots along inner pathways and forest trails were mentioned as obstacles to walking. Even though the exposed roots pose safety threats, during the interviews, older adults expressed the desire to keep the natural terrain of the pathways, rather than having it paved to prevent tripping. As an older adult remarked, FCS was

unique in the sense that it offered an environment with rich natural features within an urban city. For them, the meaning of aging in place was attached to the convenience of escaping the noisy urban environment into an inner neighbourhood full of rich natural features.

WHO (2007) suggests that natural outdoor spaces are considered one of the key features of a city's built environment that influences mobility, independence, and quality of life of older adults, and fosters an age-friendly community, which in turn allows people to age in place. While the preceding chapter emphasized that the physical aspects of the outdoor environment have an impact on health, this section emphasizes that aesthetic qualities, and emotional attachments, also have an impact on health – especially one's mental health. These therapeutic aspects of the outdoor built environment, then, are also important for aging in place.

6.2. Social environment

This section presents findings on how the social environment of FCS influenced participants' thoughts on aging in place. Two social aspects emerged as being notable: the first is the role of third places fostering neighbourly awareness, while the second is the older adults' perceptions of intergenerational connections facilitating aging in place.

6.2.1. Third places: Neighbourly awareness and social connectors

One of the main draws for older adult participants to go outside was that it increased their chance to meet people. This section presents findings on the availability of places to gather within the neighbourhood public realm and their role in social connections with neighbours and meeting new acquaintances.

Many older adults cited that neighbourhood establishments like the *Convivial Café* supported aging in place by drawing people out of their homes. Located at the edge of Leg-in-Boot Square, the coffee shop was accessible to people using mobility devices and is a magnet for residents seeking casual or deep conversations (Figure 6.9). As a frequent customer, Ben felt at home there, citing:

> When I walk to *Convivial Café*, I am likely to see people I know. The proprietor and other neighbours say hi on the way in and out. There is

> a kind of familiarity that is very important to sustain and continue to encourage through the built environment (Ben).

It was also reported that the café was a place that encouraged social interactions. Many older adults referred to *Convivial Café* fondly as “Beth’s Place”. It is considered a home away from home, or “third place” – a place that provides an accessible space to facilitate social interactions between regulars (Alidoust, Bosman & Holden, 2019; Oldenburg, 1989). For Ben, the *Convivial Café* contributed to a sense of community, which he believed was a strong factor in supporting healthy aging. He indicated that the social environment may be just as or more important than the built environment for facilitating aging in place.

> The café, for seniors and other residents from a wide swath of the neighbourhood has become a magnet for me and many others for casual engagement with Beth (owner) and others of widely differing personal circumstances. It has also been something of a catalyst for a variety of community projects, including a program of musical performances in [Leg-in-Boot] square that has drawn large appreciative audiences (Ben).

Others expressed that this beloved coffee shop provided more than just coffee, baked goods, and sandwiches. It served as a converging point to build relationships, share experiences, and exchange ideas. For Ann, the café was the motivation for hosting community projects such as outdoor concert fundraisers and a memorial for a well-known homeless resident.

Figure 6.9. Third Places: *Convivial Café* aka Beth's Place

"The *Convivial Café* is the sort of welcoming neighbourhood spot that strongly facilitates aging in place. Among the regulars are several dementia sufferers who come with spouses or walking companions to enjoy some sweets and some smiles. Other folks drop by to take advantage of the "pay it forward" board that enables them to enjoy a coffee, soup, or sandwich paid for by donations from others. The outdoor seating as well as the book exchange cabinet just by the door encourage casual encounters and help to make it an attractive draw for largely housebound seniors" (Ben).

A few older adults mentioned that *Branas*, the *Wicklow Pub,* and *Mahony's* at Stamps Landing were neighbourhood go-to restaurants with a positive "community vibe" (Ben). Ann reported that restaurants conveniently located within walking distance were facilitators of aging in place. She enjoyed dining on the outdoor patio with water views (Figure 6.10).

Figure 6.10. Amenities close-by: *Branas* restaurant

"A favourite spot for fine dining and the view. Nice to have a quality restaurant so close" (Ann).

Even more interesting was the overwhelming response from older adults who mentioned the seawall as a social connector. One participant expressed that it was easy to meet people and build social relationships because they had the seawall as a common interest. Dee had many friends living in the same apartment building, but for her, social networking took place out on the seawall.

> It's interesting to meet people on the pathways and get to know them. You're starting to get a social network from the seawall, which at my age it's fun to go out there and meet people on the seawall that you know, and you don't know. It's [on the seawall] that you get to know each other (Dee).

Retired professor Ben highlighted that making friends in FCS was easy compared to his old neighbourhood of 30 years, where he said he only knew neighbours as casual acquaintances. For Ben, FCS has a distinct neighbourhood quality that he

described as a “sense of an internal community that is socially sustainable as well as physically sustaining”. The social and built environments were hard to separate and, according to him, interacted constantly. He expressed that the built environment encouraged social connections by design and felt strongly that the urban design in FCS created familiarity within a space for people to feel “close” to one another.

> In terms of aging in place, having neighbours nearby and even strangers nearby that you can see regularly, that you can have casual exchanges with, that you can also make friends so you could meet with on a semi-regular basis to my experience is remarkable. I think there are features in this neighbourhood (FCS) that encouraged that in a major way (Ben).

Key informant perspectives on neighbourly awareness and social connections

Two out of four key informants stated that the design of front doors facing each other in courtyard settings promoted casual and social interactions. KI-AR described that the urban design on FCS was planned “at that scale of gentle common kindness and that's the ethos of the place. There were specific design principles about how paths would go through to take people past their front doors to build community”.

> On a human scale, but certainly, from the pedestrian perspective, I think that False Creek South does subscribe to positive interactions between people the way it’s designed (KI-CP).

During the COVID-19 pandemic, FCS afforded additional spaces for social connections through its enclave courtyards and main plaza Leg-in-Boot Square. For KI-AR the value of such spaces was that it enabled the creation of informal social settings for people to interact.

> Sitting out in the [courtyard] in early COVID-19 was great because that was where some young friends would come by on their bikes. We met in the courtyard. We sat and had a cup of tea and did all our safe distancing (KI-AR).

The next section presents older adult participants' perspectives on the built environment facilitating intergenerational relationships, thereby promoting social participation and incentives for aging in place.

6.2.2. Intergenerational exchange: A place for old and young

Two out of eleven older adults experienced intergenerational living in FCS. Ava and her young family of four moved to FCS over 40 years ago. During that time, she said her family benefited from her parents living within walking distance.

> All ages enjoy the area, often three generations of family. It was perfect to walk there. My parents were active seniors, and we all enjoyed the space (Ava).

Mia raised her daughter in FCS and had the chance to be a part of her granddaughter's life. Both her daughter and granddaughter live in the co-op unit next to her.

> I started here in my early 30s. I have gone through the whole landscape of living in the creek with children, with my mom who also lived in the creek. So now I'm in my early 70s. It's been a whole horizon experience that has satisfied every stage in my life (Mia).

For Ben, his feelings of well-being increased by seeing young children "playing freely as their parents chat together" in an enclave courtyard. He felt that being a part of intergenerational activities brought joyfulness into his day. Others shared that FCS was the ideal place to share experiences with their grandchildren. Guy mentioned that when his granddaughter visited from overseas, he took her to all his children's favourite places to play in FCS (Figure 6.11).

Figure 6.11. Intergenerational connections: Places to play and connect

"The rocks, stream, and pond offer recreation to all ages — our then preschool and primary-age daughters in the 1980s introduced me to climbing routes up the rocks. This traffic-free and pleasant place to explore with a visiting grandchild support our aging in place" (Guy).

Child-friendly spaces such as schools and playgrounds also provided support for intergenerational connections. Ann mentioned that she looked forward to the completion of the new playground so that she and her grandchildren can explore the new play structures. Jax also mentioned that sometimes during his daily walk, he would stop by to chat with parents picking up their children after school and would interact with the children who would be playing outside (Figure 6.12).

Figure 6.12. Intergenerational connections: FCS elementary school

"Often grandparents who live here will drop off the smaller kids and pick them up. It also offers a chance for a small amount of natural and occasional interaction between the kids, their parents, and older residents who happen to pass by at the end of the school day" (Jax).

6.2.3. Discussion and Interpretation

Although this study focused on examining the presence or absence of built environment features that impact aging in place, findings revealed that the social environment was also crucial to older adult participants' experience of aging in FCS. Objective (physical attributes in the outdoor built environment) and subjective perceptions of participants are often intertwined. Mahmood et al. (2019) suggest that subjective data, or one's perceptions, provide insights into the daily lived experiences of older adults to understand their needs and interactions within their neighbourhood built environment. Findings in this study revealed that both older adult and key informant participants valued the diversity of opportunities within the outdoor environment and gathering places in FCS for older adults to connect and socialize (e.g., seawall, enclave courtyards, and places such as the Convivial Café in Leg-in-Boot Square). Several older adult participants also remarked that it was easy to make friends in FCS within a short time. This contributed to their feeling of being valued as active community members and creating a sense of belonging to FCS. Although these feelings of "insideness" or a sense of belonging develop over time (Rowles, 1990), both long-time residents and older adults

who only moved to FCS after retirement mentioned that they felt like insiders in the community; that they belonged and were socially connected within the neighbourhood.

Findings also revealed that older adults looked forward to spontaneous social interactions such as bumping into neighbours or meeting new acquaintances on the seawall, as well as developing friendships with regulars and the owner of the *Convivial Café*. Previous research referred to these gathering sites as “third places” or places where people go to meet others to exchange ideas and build relationships outside of their homes and work (Gardner, 2014; Oldenburg, 2014; Van Hees et al., 2017). Third places increase social participation by providing opportunities for developing and maintaining meaningful social connections (Gardner, 2014; Van Hees et al., 2017). Gardner’s study (2011) on neighbourhood social networks revealed that third places were significant for older adults aging in place because these sites facilitated informal social networks, which in turn promoted mobility and healthy aging. Neighbourhood social networks were considered important for establishing familiarity, developing a sense of belonging, and attachment to place in the everyday lives of older adults aging in place (Buffel & Phillipson, 2019; Bigonnesse et al., 2014, Gardner, 2014; Wiles et al., 2012).

Another finding on the social aspect was that older adults’ mention of intergenerational connections in FCS. Previous research showed that meaningful intergenerational relationships increase feelings of well-being and contribute to the aging experience of older adults (Bigonesse et al., 2014; Chaudhury et al., 2013; Gardner, 2011; Kaplan et al., 2007). Older adults in this study cherished the opportunity to take their grandchildren to areas in FCS where their children once played. Findings revealed that neighbourhood schoolyards, playgrounds, parks, and enclave courtyards provided spaces within which meaningful social interactions between older adults and neighbours with kids could occur. These findings support other research which showed that intergenerational activities can lead to meaningful social connections and a sense of belonging that supports older adults with their capacity to age in place (Bigonesse et al., 2014; Golant, 2011).

6.3. Summary of findings

The findings in this and the two preceding chapters covered the perspectives of older adults and key informants on the role of the outdoor built environment on aging in place in False Creek South (FCS). The physical environment, both natural and built, played an important role in older adult participants' decision to stay in FCS. They unanimously expressed the desire to stay in FCS for as long as possible. One key factor that was stressful for older adults, and thus perceived as a barrier to aging in place, was the ongoing lease negotiations in False Creek South with the City of Vancouver.

Facilitators for aging in place included the close walking distance to shops and services, feeling safe from traffic and crime, the availability of green space and nature at their doorstep, water views, easy access to several types of transportation options to take them from one place to another, and a network of friends in the neighbourhood to keep them company. Although key informants stated FCS was a highly walkable neighbourhood with opportunities for social interaction, they also identified some barriers to aging in place. They mentioned health and social services for older adults, diverse shopping options, proximity to transportation services, and appropriate housing options were missing in FCS.

The rest of the findings presented in this chapter were grouped under five major themes: (1) functionality of the built environment; (2) land use and supportive features; (3) safety; and (4) therapeutic urban spaces; and (5) social environment.

Under the functionality of the built environment topic, older adults commented on the poor condition of sidewalks and unclear pedestrian crossings along the seawall. They felt these aspects were areas for improvement in the neighbourhood to facilitate aging in place. Older adult and key informant participants both reported obstacles on sidewalks, uneven surfaces from protruding tree roots, pavement materials such as flagstone pavers and cobblestones and hilly terrain were among the deterrents that affected the pedestrian experience. Enhancers included wider sidewalks and canopies for weather protection. Key informants felt that FCS lacked wayfinding cues such as direct visual access, audio, and texture informational cues for people facing changing mental and physical abilities.

Findings further indicate FCS to be a well-connected neighbourhood, with multiple walking-path options for older adults to choose from. The seawall provided grand views of the ocean, the city skyline across False Creek, and the North Shore Mountains. Fountain Way, the inner pathway connector between housing enclaves, provided respite from busy crowds even during the COVID-19 pandemic. Older adults perceived FCS as a neighbourhood that was easy to get around by foot and by transit. They reported access to reliable transportation services and proximity to bus stops, rapid transit, and water ferries that connected them to destinations inside and outside their neighbourhood. Even though most of the public transit infrastructure was old, older adults did not complain. Instead, it was reported that these were adequate for their current needs. By contrast, key informants expressed concern for older adults who couldn't walk far distances. They felt that there were not a lot of accessible transit options in FCS, which limited the older adult's ability to move within and outside the neighbourhood.

Regarding land use and supportive features, older adult participants were content with the proximity to shops, and access to health and professional services in FCS. One participant expressed that they would like to see a larger format grocery store, while others were happy picking up smaller items at the local corner store or walking 10 minutes (from Stamps Landing) to shop in the Cambie Village neighbourhood. Many viewed adjacent shopping districts (Olympic Village, Granville Island, Yaletown, Downtown Vancouver) as an extension of the FCS neighbourhood and would frequent these areas as part of their daily activity. In contrast, key informants felt amenities such as grocery stores, community centres, and health and social support services were lacking in FCS, which may deter the quality of life and well-being of older adults.

Generally, older adults felt that FCS was well kept and maintained. They gave credit to the residents who took good care of their gardens and to Park Board crews who landscaped the public park areas. While they appreciated the new benches that were installed as part of the seawall upgrade, older adults pointed out that more benches were needed in Leg-in-Boot Square, at Charleson Park, and along the seawall. Many older adults mentioned that public washrooms in FCS would provide additional reasons for older adults to spend more time outdoors. Key informants agreed with older adult participants that installing public washrooms is an important streetscape amenity that everyone can use.

In the safety section, dominant themes centered on feeling unsafe around speeding cyclists on the seawall and fear of being knocked over by dogs running back and forth in Charleson Park. Key informants reported that designated commuter routes were underutilized by cyclists who traveled at high speeds. Both older adults and key informants reported that pedestrian safety was impacted by the speed of bicycles and other types of active transportation such as motorized scooters and skateboards on the seawall. Despite the upgrades on the seawall to improve safety which included widening the pathway to separate walking and cycling, pedestrian crossings were mentioned as dangerous intersections because cyclists did not stop or slow down to allow people to cross safely. To improve safety, more signage and clear markings before crossings were suggested by both groups.

Generally, older adults felt safe from crime in FCS, reporting that the most serious crimes were bicycle thefts from underground garages. Most older adults did not go out at night and avoided dark places with poor lighting. Both older adults and key informants agreed that lighting could be added in darker areas around FCS to improve safety for pedestrians walking along the seawall, in between housing enclaves, and around transit stations.

On the topic of therapeutic aspects of the built environment, the availability and proximity to the natural environment and green spaces such as the master-planned urban forest in FCS were reported essential for older adults' mental and physical health. Access to water features, greenways, playgrounds, trails, and parks within steps of their home was considered critical for older adults to maintain their mobility. Older adults were proud of the open design of FCS. They considered all areas, including private gardens and courtyard enclave common spaces for everyone to enjoy. Key informants identified the access to green spaces, waterfront views, and ability to "forest bathe" in an urban setting as remarkable features that encourage older adults to be outside, thereby supporting the process of aging in place.

Verma and Huttunen (2015) suggest that perceived neighbourhood quality and outdoor space attachment such as views from apartments and balconies and being close to the sea were important sources of well-being for study participants. The opportunities for older adults' well-being are increased when there are places in the neighbourhood where natural beauty can be enjoyed. Pleasing neighbourhood places

can counteract feelings of loneliness. Access to green areas helped promote older adults' participation in outdoor activities by encouraging them to leave their homes and be outside (Verma & Huttunen, 2015), which facilitates a sense of involvement and connection to the neighbourhood. In the context of aging in place, Wiles et al., (2017) found that being able to form positive place attachments is related to health and well-being as one ages. Her research highlighted the importance of access to nature and the outdoors as these features contributed to feeling connected to the neighbourhood, which is an important factor in well-being.

The consensus was that older adult participants and key informants felt that the social aspects of the built environment in FCS facilitated aging in place. Opportunities to socially connect were mentioned by both older adults and key informants as an important aspect of aging in place. Older adults' feedback focused on third places such as *Convivial Café* and the seawall as places that provided incentives for older adults to venture outdoors to meet old and new acquaintances. They looked forward to their daily walk to *Convivial Café* as it provided the social environment to form new relationships and exchange ideas. The seawall was mentioned as an informal place to connect with friends and strangers alike. Key informants attested that the bold and innovative neighbourhood plan that was implemented at the time when FCS was built helped promote social interactions. They placed value on urban design as an important factor for facilitating aging in place.

Intergenerational connection was another theme that emerged as a facilitator for aging in place. Older adults reported that they were very active in their grandchildren's lives and mentioned that the outdoor environment in FCS made it fun to meet and play with grandchildren. The elementary school was another place for older adults to interact with the children and their parents.

This and the two preceding chapters presented findings on the role of the outdoor built environment on aging in place and covered the comparisons between older adults and key informants across five overarching themes and their related sub-themes. Findings were also discussed as they linked to the existing literature on aging in place, built environment, and neighbourhoods. The next and concluding chapter presents an overview of the research. It also covers research limitations and implications and how

future research can address these gaps, as well as recommendations for policy makers and final thoughts.

Chapter 7.

Conclusion

This chapter presents the research summary, meaning, relevance, and lessons learned because of this study. The following sections link themes that emerged from the findings to the literature. This is followed by implications for urban planning practices and policies. Limitations and implications for future academic research and my final thoughts are also presented at the end of this chapter.

Research Summary

The purpose of this research was to discover which outdoor built environment factors support or prevent older adults from aging in place in False Creek South, a neighbourhood in Vancouver, British Columbia. This qualitative study used semi-structured interviews, supplemented by photographs and journal entries of 11 older adult participants of this study who presently reside in FCS. Additionally, findings from key informant semi-structured interviews provided professional insights from urban planners and service providers on the built environment and aging in place. Research questions that guided this study were:

- What are older adult residents' perceptions of FCS as they age in this neighbourhood?
- What are key informants' perceptions on the role of the outdoor built environment for aging in place?
- What role does the outdoor built environment of a neighbourhood play in older adults' decision to age in FCS?

Data collected from older adult participants within their neighbourhood outdoor environment allowed them to articulate their perspectives on what aging in place meant to them and on the neighbourhood environment's role in this process. Participants were also required to capture important features through photographs. Together, the photographs and qualitative interviews provided a deeper understanding of the older adults' interaction with their neighbourhood outdoor built environment.

Population aging is an increasingly important issue and needs to be a priority in urban planning policies. This study provided a snapshot of the aging population through 15 interviews in a unique neighbourhood environment. The older adult participants expressed a strong desire to remain active members in their neighbourhood as they age. The findings of this study emphasized the importance of the functional or objective aspects of the outdoor built environment, such as unobstructed and smooth pedestrian-oriented pathways, availability of benches and washrooms, safe walking paths, including accessible public transportation systems and diverse transit services for older adults to age in place. Findings also discovered the significance of therapeutic and social aspects of the outdoor built environment as facilitators of aging in place. Key assumptions in this study were that person-environment relationships are continuously changing, and that planning can have a positive influence on aging in place by mediating this relationship in a way to enhance positives and decrease negatives.

During interviews, older adults were expected to point out objective features within the FCS neighbourhood that might impact aging in place. However, more compelling were the subjective aspects that older adult participants perceived as facilitators or barriers of aging in place. Proximity to shops within short walking distances, robust public transportation, safe sidewalk networks, and opportunities for physical activity in green spaces and other functional features were all identified as facilitators of aging in place. However, physical barriers captured in the participants' photo documentation were sometimes minimized as barriers in interviews. This highlights how obstacles could be negotiated due to familiarity and healthy lifestyles: older adult participants did not focus on or mention how existing barriers could be removed or redesigned for safety, function, or comfort. Instead, they placed the responsibility on themselves to be careful in how they used these spaces. They drew upon their lived experience at the individual, social, and community levels as part of their competency to achieve a suitable person-environment fit (Mahmood, 2019, citing Wild, Wiles, & Allen, 2013). This highlights the role of place attachment, accumulative memories, and familiarity with places taking precedence over actual barriers within the built environment (Rowles, 1978).

This research study began by looking for the presence and absence of outdoor built environment features that impact aging in place with an emphasis on functionality, especially as it relates to mobility. However, interviews with older adults demonstrated

that their ability and desire to age in place is not limited to the physical features of the built environment. Findings from this research uncovered two additional aspects: the influence of therapeutic aspects of the built environment, and the importance of the social environment on aging in place. Older adults' reasons for aging in place go beyond the functional aspects noted above. Findings of this study indicate that the unique land use pattern and urban design of FCS motivated older adults to stay active, which was central to their aging in place experience. Key features included the meandering configuration of streets, pedestrian-oriented pathways, the seawall, as well as the abundance of natural green spaces from smaller semi-private open spaces leading to wooded berms and larger, more public ones. Older adult participants felt a strong sense of belonging and connection to FCS because of their daily walks to special places within their neighbourhood. These positive experiences and memories, created within the natural built environment, promoted mental and physical well-being, and positively impacted their decision to remain in FCS as they age. In addition to enhancing this sense of well-being, outdoor built environment features were seen to facilitate social interaction. For example, establishing social connections and a sense of belonging in FCS was achievable by simply saying "hello" to strangers on the seawall or by visiting the local convenience store or coffee shop where the owners know their name.

Social factors and affective issues such as meaning and attachment to place are also important to people's aging experience and should be considered in concert with each other and with functional aspects of the built environment. Bigonnesse and Chaudhury's (2020) study on the concept of aging in place in neighbourhood environments suggests that the built and social environment should be researched simultaneously as they both shape the experience of place.

FCS Neighbourhood Planning

Findings from this study can contribute to neighbourhood planning processes and help shape policies that support aging in place by planning convenient, safe, and pleasing environments to enable physical activity and foster well-being. Given that the FCS Neighbourhood Planning Program was paused in 2018, and the City Council directed City staff to proceed with a revised neighbourhood planning process only in October 2021, the recommendations below seek to offer some insights for planners to consider.

As my findings demonstrate, expectations of professionals on the outdoor built environment for aging in place can differ from older adults' experiences and what they value as important in the built environment to support aging in their neighbourhood for as long as possible. As a person's physical health changes with age, neighbourhoods can be planned to accommodate declining mental and physical capacities by considering the types of facilities and infrastructure that will be needed to address the future needs of this segment of the City's growing population. This can enable people to age in the neighbourhood of their choice, in places that are familiar to them, and where they feel socially comfortable with neighbours. The availability of appropriate services nearby also adds to the inclusive environment that is sought after. The future FCS neighbourhood planning process should collaborate with older adults as equal partners in developing policies and in planning the neighbourhood environment (Buffell et al., 2012; Plouffe & Kalache, 2010; Phillips, 2017; Phillips et al., 2004). Planning collaboratively with older adults provides urban planners with a better understanding of their specific needs and issues (Phillips, 2017). This approach enhances the credibility of urban planning and research without losing sight of local community values (Mahmood et al, 2012; Novec & Menec, 2013; Minkler & Wallarstein, 2008).

To ensure the safety, independence, mobility, and well-being of older adults who wish to age in place, more attention needs to be given to shared streets and public spaces that emphasize improving conditions for all users. Both older adult and key informant participants mentioned accidents and conflicts between pedestrians and cyclists were ongoing issues despite the City's efforts to improve safety and mobility along the seawall. Future planning could take inspiration from European models, such as Dutch and Danish policies that incorporate urban mobility, social norms, and cultural setting as important factors in urban planning and design (Nello-Deakin & Nikolaeva, 2019). FCS already has some excellent features that promote aging in place. Adding considerations, such as woonerf or "living street" concepts[4] (Nalmpantis et al., 2017) to future development in FCS and other urban areas would facilitate aging in place. The planning process should include collaborative charettes with older adult residents to identify conflicts at nodes or intersections to facilitate resolutions. Safer shared spaces

[4] Woonerf (or "living street") concepts consist of the following guidelines which can be transferred to local contexts: a variety of surface treatments, use of trees, plantings and street furniture, bollards, and streetlights to define space, and elimination of raised pavements or vertical curbs (Nalmpantis et al., 2017).

where people are made to be more aware of each other also reaffirm a sense of belonging in the neighbourhood, which previous research suggests promotes aging in place (Mackenzie et al., 2014; Novek & Menec, 2013).

In 1973, the False Creek South Official Development Plan outlined policies recognizing that keys to a viable neighbourhood included the spatial quality of green spaces and proximity to the physical environment. Findings reported here indicate that the proximity and availability of public green spaces, enclave courtyards, and an urban forest in FCS provided therapeutic aspects that are highly beneficial for improving older adults' mental well-being and physical health. These aspects should be maintained and enhanced in FCS. A study conducted in the Netherlands found that the design of high-quality green spaces support social contact between neighbours, increases overall livability, and strengthens communities for the aging population (Kemperman & Timmermans, 2011). According to WHO (2007), the city's natural surroundings such as age-friendly green spaces in urban areas are valued by older adults.

Governments and international organizations agree that supporting older adults to continue living in a community they are familiar with for as long as possible makes economic and social sense (Lui et al., 2009). Age-friendly policies that support aging in place will help the City address challenges of older adult population growth and subsequent pressures on municipal and provincial resources. Building on previous age-friendly initiatives and action plans, the future neighbourhood planning program can establish a framework and outline resources to develop a detailed implementation plan. Working closely with the public, experts in the community and an advisory committee, the City of Vancouver can enhance its AFC profile by embedding age-friendly policies into the upcoming FCS neighbourhood planning program. These AFC policies would reinforce citywide goals for urban design, neighbourhood walkability, and proximity to accessible transportation, health services, and amenities. This would enable residents to actively age in place with dignity, respect, and independence. While there are specific considerations for older adults, age-friendly features incorporate design standards that consider a built environment for all ages.

Planning departments, including Engineering and Parks, are under constant pressure to deliver more with fewer resources. Competing city-wide priorities such as affordability and the housing crisis, protecting the local economy, increasing equity and

social issues, and climate change have the highest priority impacts funding for developing AFC policies. So far, aging in place policies and the AFC principles have not achieved the profile necessary to make them a driving force in Council chambers. Despite the City of Vancouver's Age-Friendly Community designation from the Province of British Columbia, past trends have demonstrated AFC initiatives and policies conceived without broad support from Council face an uphill battle to gain status in the budgeting process. The City of Vancouver can enhance its profile by embedding age-friendly policies into the future FCS neighbourhood planning program.

Limitations and implications for future research

An obvious limitation of this study is the small sample size. Results might not represent the opinions of the older adults who did not have the opportunity to participate or reflect the needs of diverse older adults. This concern over a small sample size was mitigated by collecting data from experts with urban planning and aging in place knowledge, who could draw from broader experience to fill the gaps. All participants of this study reported in English. Most had above median income, post-secondary education, and lived with their spouse. These characteristics represent a narrower view of cultural and linguistic factors. As such, this study did not achieve a social, cultural, and socio-economic analysis sensitive to the impacts of the built environment on aging in place based on race, class, gender, and sexuality (Byrnes et al., 2006). To gain more fair, equitable, and inclusive perspectives, further research should focus on determining the role of built environment impacts on aging in place through the lens of intersectionality. In addition, more research is required to determine factors that shape older adults' perceptions of aging in place by targeting residents who have moved out of FCS because they couldn't age in place due to physical, social, and economic barriers.

Another limitation was the participation criteria used for this study; the selected participants were older adults who were mobile, healthy, and socially and physically active. Their recruitment meant that data could readily be gathered across the neighbourhood (because of their active nature). Participants with cognitive dysfunctions, mobility issues, and older adults living in institutions or care facilities were excluded because they need special care in adapted environments. Concequently, findings did not reflect the needs of older adults with mobility challenges and other disabilities. To

expand on the results presented in this study, future research should consider barriers and facilitators for people with mobility and cognitive challenges.

Data collection was conducted in a pedestrian-friendly, mostly car-free inner-city urban neighbourhood in the City of Vancouver. As a result, findings are most relevant to these types of urban neighbourhoods and may not apply to car-dependent neighbourhoods. Additionally, results from this study may not be generalizable outside of the FCS neighbourhood because of its unique waterfront and car-free characteristics. FCS's innovative urban design standards have been the subject of international urban planning case studies, highlighting the uniqueness of this neighbourhood as a product of the City of Vancouver's mixed-use planning experiment with public spaces and housing models. Similarly, specific beneficial aspects of the built environment that facilitate aging in place identified in this study may provide good examples to apply more generally.

Uncertainty around lease negotiations with the City of Vancouver was identified as a key concern for older adults, making them feel vulnerable. Similarly, urban renewal projects can leave older adults in vulnerable housing situations, finding themselves between having small assets or income just above the limits for supportive housing, but also not being about to afford suitable private housing at current costs. Future research could investigate the effects of urban redevelopment on older adults' aging in place, including how spatial justice can be achieved for older adults living in urban areas (Buffel & Phillipson, 2019). It is important to evaluate these changes to develop equitable aging in place policies that are appropriate for the current and future needs of older adults.

Future research could also investigate older adults' perceptions of their neighbourhood boundary, where they spend their time in their neighbourhood, the degree they are influenced by the built and social environmental aspects of other neighbourhoods, or modes of transportation (use of public or vehicle or friends and family). Milton et al. (2015) suggest that neighbourhoods were viewed as being defined by people and activities rather than geographical space. His research found that participants would re-draw the boundaries of what they perceived to be their neighbourhood, over the geographical definition of the neighbourhood. Researching how other spaces are perceived and used could reveal attachments and how place influences the well-being of older adults. Future research could focus on how people

become bonded to the places in which they live so that their lived experiences can be better understood.

Final thoughts

The intersection of population aging, and urbanization calls for urban planners to strengthen age-friendly plans and policies with a focus on healthy aging in cities. Understanding the process of aging should not be limited to the field of gerontology. To accommodate challenges of population-aging, neighbourhood planning processes require a comprehensive understanding of the impact of the outdoor built environment on older adults' ability to age in place. This research had set out to gain a better understanding of why older adults choose to age in place with specific attention to identifying aspects of the built environment that are seen as barriers and facilitators for aging in place from the perspectives of older adults.

For older adults, the desire to stay in FCS was related to the easy access to well-connected pedestrian networks, lively public street life, amenities such as restaurants and green spaces nearby, pedestrian safety from traffic and generally feeling safe from crime in FCS. Living in a neighbourhood near parks with gardens, water features, greenways, and the urban forest, was reported as an essential therapeutic aspect to help with major surgery and stroke recovery, relieve stress and anxiety, and increase energy levels. Opportunities to make social connections, thus mitigating social isolation and loneliness, were also mentioned as important aspects of aging in place.

Pedestrian infrastructure and transportation systems that are safe and support multiple levels of mobility will promote the independence of older adults aging in place. Green spaces and third places that facilitate mental health and social connection will promote a sense of belonging and well-being. Planning for functional, therapeutic, and social aspects of the outdoor environment – collaboratively with older adults – can create equitable, livable, age-friendly neighbourhoods with supportive urban design features and services that will enable older adults to age in place.

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Appendix A. Recruitment Flyer

PARTICIPANTS NEEDED FOR:

Exploring the role of the outdoor built environment for AGING IN PLACE

Would you like to help me with my thesis research project?

Hello, my name is ___. I am a master's student at Simon Fraser University. I am conducting a research study to explore the barriers and facilitators of neighbourhood outdoor environments for aging in place in False Creek South.

I am looking for volunteers to participate in my study. Your participation will involve a phone or online video interview. It will also involve you taking photos and documenting negative and positive physical outdoor environmental features you think are important for you to stay in your neighbourhood for as long as possible.

Are you

- 65 years of age or older?
- Living in False Creek South?
- Able to walk comfortably for 45 minutes or longer?
- Able to use a photo-taking device to take pictures?

If you said yes to all the above questions and this study sounds interesting to you or you would like to find out more information, please contact ___ at ___ or email ___.

Please note, if you choose to participate, you can change your mind and leave the study at any time. You can stop the photo documentation activity and/or phone interview at any point if you become uncomfortable for any reason. Your participation is voluntary.

Thank you!

Please contact ___ for more information and to sign up!

Appendix B. Telephone Survey

Telephone Survey

Participant ID# _____ Date _____

Hello. Thank you for calling to find out more information and your interest in participating in my research study on aging in place in False Creek South.

Before we continue, do you have any questions about the study?

May I ask you a few questions to make sure the research criteria are met?

Are you 65 years of age or older?

Do you use a mobility device?

Do you live in False Creek South (provide area boundary if necessary: bounded by Granville Bridge to the west, Cambie Bridge to the east, W. 6th Avenue to the water)?

How many times a week do you go out to walk in your neighbourhood? How about when it's raining or snowing?

Are you comfortable walking or being outdoors 30 minutes or longer?

Are you comfortable taking photographs?

What type of housing do you live in (Co-op, strata condominium, supportive housing, non-market or market rental)?

Thank you very much for your response.

If individual is eligible:

You have met all the criteria to participate in the study.

May I have the following information: phone number, email, address?

What is the best way to contact you: phone call, text message or email?

Can we schedule a time that is convenient for you to conduct the Instruction Session?
Date: Time:

Thank you for agreeing to participate in my study. I will email and mail you the research project information and consent form to review. I will contact you a few days before the Instruction Session to remind you of our appointment. Please feel free to call or email me anytime if you have any concerns or questions.

Do you have any further questions for me?

If individual is not eligible:

I appreciate your interest, but I'm sorry to tell you that for this specific study your situation doesn't quite fit. Thank you for your time and interest.

Take care and goodbye.

Appendix C. Criteria and rationale for participation

Criteria	Rationale
Over 65 years of age	This age group is most applicable to the study as they are reaching the stage of life where aging in place considerations is relevant. FCS inner-city development was conceived in 1972 and completed in the early 1980s. Many original families who moved into FCS still live in the area. Assuming they moved in during their 20s - 30s, they would be 65 years or older today and thus may have already started to age in place. Also, included are people who moved to retire in FCS.
At least two journeys into the neighbourhood per week	It is important that older adult participants were familiar with their neighbourhood outdoor environment since they were instructed to complete a photo-taking and documentation activity of barriers and facilitators of aging in place along a regular or daily walking route within FCS.
Able to walk comfortably and be mobile in the neighbourhood	To fully participate in this study, older adult participants must be mobile, and not use mobility assistive devices such as walkers or wheelchairs. Perceptions of barriers in the environment may be perceived differently between those who are able to walk and those who use mobility assistive devices. While perspectives of the latter would provide great insight, they were not considered in this research.
Live in FCS neighbourhood	This study is on older adults aging in place. I am interested in exploring the experience of older adults who reside in FCS living independently in their own home or apartment (owner, renting, or subsidized housing), not in a nursing home or care facility.
Able to communicate, read and understand English and operate a digital camera	To be able to express their thoughts, ideas, and feelings and be able to take photos of neighbourhood features during the photo-documentation activity.

Appendix D. Project Information and Consent Forms

Research Project Information – Older Adults

Study Title: ***Exploring the role of the outdoor built environment for aging in place: A look into the False Creek South Neighbourhood***

Principal Investigator: ___ **Senior Supervisor**: ___

INTRODUCTION

Your participation in this research is entirely voluntary, so it is up to you to decide whether or not to take part. Before you decide, it is important to understand what the research involves. This information sheet will tell you about the research, what we are asking from you, why the research is being done, what will happen during the research and the possible benefits, risk and discomfort to you. If you wish to participate, you can provide consent by signing the consent form at the end of the information sheet or by providing oral consent. If you do decide to take part in this research, you are still free to withdraw at any time and without giving any reasons for your decision. If you do decide to withdraw, the researcher will destroy all information that you have provided to the research.

Please take time to read the following information carefully before you decide.

What is the purpose of the research?

This study aims to understand 1) older adults' (age 65+ years) residing in False Creek South perspectives on aging in place issues, and 2) impacts of the outdoor built environment on the ability to remain in their neighbourhood by determining the barriers to and facilitators of aging in place in their neighbourhood.

Who can participate in this research?

You are being invited to take part in this research study because you:

- Are age 65 years or older, or over the age of 19
- Live in the False Creek South neighbourhood

- Are able to walk comfortably without mobility aids and able to communicate in English
- Know how to use a photo-taking device to take pictures

Who should not participate in this research?

Interviews will be facilitated in English. Minors, as well as individuals who are unable to understand or speak English, should not participate in this research.

Do I have to take part?

It is up to you to decide whether to take part in the research. Your participation is voluntary. If you do decide to take part, you will be given this information sheet to keep and be asked to provide consent by either signing a consent form or providing oral consent. If you decide to take part, you are still free to withdraw at any time. You can stop the phone or online video sessions (via Zoom, using the Simon Fraser University account) and/or photo-documentation activity at any point if you feel distressed, without giving a reason and without consequences to your employment, education, or services.

What is involved if you decide to take part?

The researcher will email and mail via Canada Post the following documents: Project Information and Consent Form, Participant Demographic Information, map of False Creek South, Photo-taking and Photo Documentation Activity Guide and a large stamped self-addressed envelope. Please note, documents will be prepared and sealed in a plastic bag, then placed in a large mailing envelope at least 48 hours before mailing by the researcher following safety protocols, by wearing a mask, washing hands and wearing gloves.

The researcher will be connecting with you twice in this study, either on the phone or via Zoom for an Instruction Session, and an Interview Session. It is up to you to choose the method of communication you are most comfortable with. Each phone or Zoom session will take approximately 45-60 minutes.

Audio and Video Recordings

With your permission, audio or video recording will be set up for each session. Phone interviews will be audio recorded using a digital recording device, while Zoom interviews will be recorded using the platform's audio and video recording service. This service does not separate audio from video recordings. You can turn off your video camera before joining the session if you do not want to be video recorded. If you prefer not to be audio or video recorded, notes will be taken during the instruction and interview sessions.

Please note that Zoom is a US-based application and data recorded through Zoom could be accessed by the US under the authority of US Patriot Act and Cloud Act, though the likelihood of this happening is low.

To provide permission, you can sign the consent form attached to this document or provide oral consent at the beginning of the instruction session. Before the instruction session starts, the researcher will review the research question and purpose, potential benefits and risks and ask you to provide oral consent to participate in this study and to be recorded during the instruction and interview sessions. Interview recordings are vital for the researcher's analysis, following which all copies of the audio and video recordings will be stored on a password protected, secure SFU server. All audio and video recordings will be safely destroyed after two years. Personal information collected, whether via Zoom, email or phone, will be used by the researcher only for the purpose of completing the Urban Studies Master's Degree. You have the option to opt out of any recordings. Only after your explicit consent, will you be recorded for the purpose of this study.

Instruction Session

At a prearranged time and your choice of communication tool, the researcher will review the goals and objectives of the project. Then, the researcher will review the photo-taking and photo documentation activity (taking photos and writing about each photo content), ethics and safety while taking photos in along the selected walking route, basic photography skills and how to use photo-taking devices such as smart phones, tablets and/or digital cameras.

You will select a daily or regular route within the False Creek South boundary (one you like, one you don't like, a route you take often, or a route you would like to showcase), approximately 15-20 minute walk from your home. You will mark that route on the False Creek South map provided by the principal investigator. Then, on a day of your choice, you will walk the selected route and take 6-8 photos of positive and negative aspects along the route that represents a barrier or facilitator of supporting aging in your neighbourhood. After the pictures are taken, you will write a sentence or two about each picture (guided by 3-4 questions). There are several ways to send your images and notes to the researcher. You can email the documents or mail the documents via Canada Post (large stamped self-addressed envelope will be provided). As a guide, the photo-taking and photo documentation activity should take you 7-10 days to complete, additional time can be added if you need it.

Interview Session

During the phone or online Zoom interview, you will be asked to answer orally approximately three questions about aging in place in False Creek South and nine questions on transportation systems in your neighbourhood. The aim is to understand the barriers and facilitators to aging in the right place in your neighbourhood and how transportation systems play a role in the lives of older adults as they age. Next, we will review each photo you submitted. You will be asked to identify and share your perspectives of physical outdoor aspects you like and dislike or what is missing along the walking route. You will be asked to share your views about negative and positive aspects along the walking route selected such as, the quality of pathways and sidewalks, availability of covered and uncovered seating areas, lighting, access to nature and so on. You will also be asked to share your perceptions of safety from crime and traffic, and neighbourhood aesthetics. With each aspect, you will be asked to explain why and how it would impact your ability to remain in your neighbourhood.

You will be asked to participate for the full duration of the instruction and interview sessions via phone or Zoom. However, you are free to disengage from the research at any time if you do not wish to continue. If you are feeling distressed during the phone or Zoom sessions, we will immediately stop. If you feel distressed during the photo-taking and photo documentation activity, you can immediately cancel the activity at your own

discretion. If you decide to withdraw from the study, we will destroy all information you have provided.

Will my taking part in this research be kept confidential?

With your permission, your interview responses will be used in the research. Your confidentiality will be respected. It is important to note that email is not a confidential medium. If you wish for anything to not be recorded during the interview, you can tell the researcher and they will ensure that it is not recorded.

All data as part of this project, including a consent form, portable hard drives with password-protected files, and all other data relating to the project will be stored in a locked storage cabinet in the home of the principal investigator as well as on a password-protected, secure SFU server. All other data relating to the project will be safely destroyed after two years.

The researcher will maintain ownership of the data for two years following the end of the research. If you decide after the interviews that you no longer wish to have your comments published, you must notify the researcher within 60 days. Once the findings are published, we will not be able to withdraw the information you have provided us.

What are the possible benefits of taking part?

By participating in this study, you will be providing information to the researcher about pedestrian infrastructure and transportation system barriers to and facilitators of aging in place in False Creek South.

What are the potential risks of taking part?

There are no foreseeable risks to you in participating in this study. The only known risk is safety while taking photos in the neighbourhood. You are advised to take care when taking photos and not to do so in traffic or conditions that may cause you discomfort and to practice physical distance or at least 2 meters, stay home when you’re sick and you may choose to wear a non-surgical mask as added precaution of being outside. To maintain confidentiality, do not take photos of yourself and we will use pseudonyms in any written publications. Your name will be replaced with a study-specific identification number. No one will see this information, only the researcher, and it will be immediately

de-identified. There is minimal risk associated with the transmission of identifiable information.

Authorization to Use Photographs

You are requested to permit the use of photographs you take during the photo-documentation activity to be included in the researcher's thesis project report.

What will happen to the results of the research?

Findings from this research will be included in a Master of Urban Studies thesis paper. Results will be shared with a panel of academic experts as the researcher defends their thesis. Final electronic data may be preserved for future use in open access initiatives. All electronic data will be stripped of any information that could identify participants before being uploaded to any open access online repository.

What happens if I decide to withdraw my consent to participate?

Your participation in this research is entirely voluntary. You may withdraw at any time. You do not waive any of your legal rights against the principal investigator, or anyone else by signing this consent form or by providing oral consent to participate. If you withdraw from this study, we will destroy all information you have provided. Refusal to participate or withdrawal after agreeing to participate will not adversely affect or have consequences on you or your employment, education, or services.

Who do I contact if I have questions about the research during my participation?

If you have any questions or desire further information about this study before or during participation, you can contact ___ or email ___@sfu.ca. It is important to note that email is not a secure mode of communication, and thus, sensitive information should not be shared on it. The above given email address should only be used for general information and contact purposes.

Who do I contact if I have any concerns or complaints about how this research is being conducted?

If you have any concerns or complaints with respect to your participation in this research as a research participant, please direct them to ___, Director, Office of Research Ethics at ___@sfu.ca or ___.

Future contact

Would you be willing to be contacted for follow-up purposes?

Yes_____ No _____

Your consent to this study does not extend to any future research.

Research Project Information – Key Informants

Study Title: ***Exploring the role of the outdoor built environment for aging in place: A look into the False Creek South Neighbourhood***

Principal Investigator: ___ **Senior Supervisor**: ___

INTRODUCTION

Your participation in this research is entirely voluntary, so it is up to you to decide whether or not to take part. Before you decide, it is important to understand what the research involves. This information sheet will tell you about the research, what is required from you, why the research is being done, what will happen during the research and the possible benefits, risk and discomfort to you. If you wish to participate, you can provide consent by signing the consent form at the end of the information sheet or by providing oral consent at the beginning of the interview. If you do decide to take part in this research, you are still free to withdraw at any time and without giving any reasons for your decision. If you do decide to withdraw, the researcher will destroy all information that you have provided to the research.

Please take time to read the following information carefully before you decide.

What is the purpose of the research?

This study aims to understand 1) older adults' (age 65+ years) residing in False Creek South perspectives on aging in place issues, and 2) impacts of the outdoor built environment on the ability to remain in their neighbourhood by determining the barriers to and facilitators of aging in place in their neighbourhood.

Do I have to take part?

It is up to you to decide whether to take part in the research. Your participation is voluntary. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a consent form or provide oral consent at the beginning of the interview. If you decide to take part, you are still free to withdraw at any time. You can stop the phone or online video interview at any point if you feel distressed, without giving a reason and without consequences to your employment, education, or services.

What is involved if you decide to take part?

The researcher will interview you over the phone or virtually online via Zoom, using the Simon Fraser University account. It is up to you to choose the method of communication you are most comfortable with. The interview will take approximately one hour at a date and time of your choosing. During the interview the researcher will ask you for your personal opinions on characteristics of a neighbourhood that would allow people to stay in a neighbourhood of their choice for as long as possible, the role of outdoor built environment in False Creek South for aging in place, features in False Creek South that helps keep people active, how the original design of False Creek South supports or presents issues for older adults, and the role of neighbourhood urban design and transportation for aging in place. If you allow, the interview will be audio or video recorded. If you don't, only notes will be taken during the interview.

The researcher will partially transcribe your interview and digitize notes and then permanently delete the recording and/or shred the notes. The transcription and/or notes will be stored on a password protected computer and on Simon Fraser University's secure vault cloud storage service. Only the researcher will have access to this information.

Audio and Video Recordings

Phone interviews will be audio recorded using a digital recording device, while Zoom interviews will be recorded using the platform's audio and video recording service. This service does not separate audio from video recordings. You can turn off your video camera before joining the interview if you do not want to be video recorded.

Please note that Zoom is a US-based application and data recorded through Zoom could be accessed by the US under the authority of US Patriot Act and Cloud Act, although the likelihood of this happening is low.

To provide permission, you can sign the consent form attached to this document or provide oral consent at the beginning of the interview. Before the interview begins, the researcher will review the research question and purpose, potential benefits and risks and ask you to provide oral consent to participate in this study and to be recorded during the interview. Interview recordings are vital for the researcher's analysis, following which

all copies of the audio and video recordings will be stored on a password protected, secure SFU server. All audio and video recordings will be safely destroyed after two years. Personal information collected, whether via Zoom, email or phone, will be used by the researcher only for the purpose of completing the Urban Studies Master's Degree. You have the option to opt out of any recordings. Only after your explicit consent, will you be recorded for the purpose of this study.

Will my taking part in this research be kept confidential?

With your permission, your interview responses will be used in the research. Your confidentiality will be respected. It is important to note that email is not a confidential medium. If you wish for anything to not be recorded during the interview, you can tell the researcher and they will ensure that it is not recorded.

All data as part of this project, including raw (audio or video recordings and notes), transcribed data, signed consent form, portable hard drives with password-protected files and all other data relating to the project will be stored on a password protected computer, in a locked storage cabinet in the home of the researcher, and on Simon Fraser University's secure password protected server. Only the researcher will have access to this information. All data relating to the project will be safely destroyed after two years.

The researcher will maintain ownership of the data for two years following the end of the research. If you decide after the interviews that you no longer wish to have your comments published, you must notify the researcher within 60 days. Once the findings are published, we will not be able to withdraw the information you have provided us.

What are the possible benefits of taking part?

By participating in this study, you will be providing information to the researcher about pedestrian infrastructure and transportation system barriers to and facilitators of aging in place in False Creek South.

What are the potential risks of taking part?

There are no foreseeable risks to you in participating in this study. Your name will be replaced with a study-specific identification number. No one will see this information,

only the researcher, and it will be immediately de-identified. There is minimal risk associated with the transmission of identifiable information.

What will happen to the results of the research?

Findings from this research will be included in a Master of Urban Studies thesis paper. Results will be shared with a panel of academic experts as the researcher defends their thesis. Final electronic data may be preserved for future use in open access initiatives. All electronic data will be stripped of any information that could identify participants before being uploaded to any open access online repository.

What happens if I decide to withdraw my consent to participate?

Your participation in this research is entirely voluntary. You may withdraw at any time. You do not waive any of your legal rights against the principal investigator, or anyone else by signing this consent form or by providing oral consent to participate. If you withdraw from this study, we will destroy all information you have provided. Refusal to participate or withdrawal after agreeing to participate will not adversely affect or have consequences on you or your employment, education, or services.

Who do I contact if I have questions about the research during my participation?

If you have any questions or desire further information about this study before or during participation, you can contact ___. It is important to note that email is not a secure mode of communication, and thus, sensitive information should not be shared on it. The above given email address should only be used for general information and contact purposes.

Who do I contact if I have any concerns or complaints about how this research is being conducted?

If you have any concerns or complaints with respect to your participation in this research as a research participant, please direct them to ___, Director, Office of Research Ethics.

Future contact

Would you be willing to be contacted for follow-up purposes?
Yes_____ No _____

Your consent to this study does not extend to any future research.

Participant Consent and Signature Page

Study Title: ***Exploring the role of the outdoor built environment for aging in place: A look into the False Creek South Neighbourhood***

Taking part in this study is entirely up to you. You have the right to refuse to participate in this study. If you decide to take part, you may choose to withdraw from the study at any time without giving a reason and without any negative impact on you.

My signature on this consent form means:

- I have read and understood the information in this consent form.
- I have had enough time to think about the information provided.
- I have been able to ask for advice if needed.
- I have been able to ask questions and have had satisfactory responses to my questions.
- I understand that all the information collected will be kept confidential and that the results will only be used for scientific purposes.
- I understand that my participation in this study is voluntary.
- I understand that I am completely free at any time to refuse to participate or to withdraw from this study at any time.
- I understand that I am not waiving any of my legal rights as a result of signing this consent form.
- I will receive a signed copy of this consent form for my own records.
- **I consent to participate in this study**
- **I consent to being audio or video recorded Yes____ No____**

_____	_____	_____
Participant's Signature	Printed Name	Date

Investigator Signature

_____	_____	_____
Investigator Signature	Printed Name	Date

My signature above signifies that the study has been reviewed with the study participant by me.

Appendix E. Participant Demographic Questionnaire

Participant Demographic Information

Participant ID# _____ Date_____

Study Title: ***Exploring the role of the outdoor built environment for aging in place: A look into the False Creek South Neighbourhood***

First Name: _____ **Last Name:** _____

What gender do you identify as?

- ☐ Female
- ☐ Male
- ☐ Other: _____
- ☐ Prefer not to answer

What is your age?

- ☐ 60 to 69 years in age
- ☐ 70 to 79 years in age
- ☐ 80 to 89 years in age
- ☐ 90+ years in age
- ☐ Prefer not to answer

What is the highest degree or level of education you have completed?

- ☐ Some High School
- ☐ High School graduation
- ☐ Some years in College/ University but did not get degree
- ☐ Technical Degree (e.g. plumbing, electrical, carpentry, vocational, etc.)
- ☐ Bachelor's Degree
- ☐ Master's Degree
- ☐ PhD or Doctorate
- ☐ Professional Degree (e.g. doctor, lawyer, etc.)
- ☐ Other: _____

What is your family status?

- ☐ Married
- ☐ Divorced
- ☐ Widowed
- ☐ Single
- ☐ Living in a committed relationship, but not married
- ☐ Prefer not to answer

How long have you lived in False Creek South? _____ years

Do you rent or own your current home?

- ☐ Rent
- ☐ Own

What type of housing do you live in?

- ☐ Co-op housing
- ☐ Market rental
- ☐ Non-market rental
- ☐ Supportive housing
- ☐ Seniors housing
- ☐ Condominium – strata
- ☐ Other: _____
- ☐ Prefer not to answer

Who else lives in your household?

- ☐ Spouse or partner
- ☐ Adult son or daughter
- ☐ Relatives
- ☐ Other: _____
- ☐ No one

Are you currently working/ volunteering?

- ☐ Yes
  - ☐ Full time
  - ☐ Part time
- ☐ No, I am retired

What is your annual household income?

- ☐ Less than 10,000
- ☐ 10,000 to 20,000
- ☐ 20,000 to 30,000
- ☐ 30,000 to 40,000
- ☐ 40,000 to 50,000
- ☐ More than 50,000
- ☐ Prefer not to answer

Do you go outside for walks (for recreation, shopping or to run errands) on a regular basis (2 to 3 times a week)?

- ☐ Yes
- ☐ No

Do you use the public transit (bus, rapid transit, sea bus)?

- ☐ Yes
- ☐ No

Appendix F. Photo-taking Guide and Photo-documentation Journal

Thank you for participating in this Master of Urban Studies thesis research project. There are two parts to this activity. One is taking pictures and the other is documenting your thoughts about each photo. Use this guide to help you take photographs and answer the guiding questions to write your thoughts about each photo taken.

Photo-Taking Guidelines

For the purposes of this research project, please take pictures of positive and negative aspects in False Creek South you think are important for you to stay in the neighbourhood for as long as possible. Feel free to capture images of anything you consider as facilitators or barriers in the outdoor environment, as they relate to aging in place. Photos can consist of:

- Outdoor built environment: benches, streets, trees, parks, sidewalks, street corner, pathways, streetlights, etc.
- Positive aspects: directional signs, ramps, curb cuts, quality of sidewalks, covered seating areas, access to nature, etc.
- Negative aspects: uneven pathways, poor lighting, icy sidewalks, litter, graffiti etc.
- Anything else you perceive as a facilitator or barrier to stay in False Creek South for as long as possible.

Please keep in mind:

- Follow the Provincial Public Health Officer's safety protocol: physical distancing of 2 meters, stay home if you are feeling unwell, wear a non-surgical mask (recommended)
- Photos must be taken in the False Creek South boundary area (see map provided)
- Please avoid taking photos of people as you capture positive and negative features in False Creek South that may affect your ability to age in place
- Take care when capturing photos (e.g. cyclists, vehicle traffic, poor weather conditions)

Photo Documentation

For each photo, you will record the date, time and location you took the photo. Use the guiding questions to document your thoughts. Please use the photo documentation journal provided to record your answers.

Guiding questions for photos

1. What does the photo mean to you, and what is the reason for taking the photo?
2. Does it represent a barrier to being active outside the home or does it represent a facilitator of supporting aging in your neighbourhood?
3. Why is it a good example of the built environment or how is it showing a barrier to walking and being mobile in your neighbourhood?

Process

- Select a daily or regular route within the False Creek South boundary area (see map provided for boundary areas). You can choose a route you like, one you don't like, a route you take often, or a route you would like to showcase. Select a route that is about a 15-20 minute walk from your home.
- Mark that route on the False Creek South map provided.
- Use a photo-taking device of your choice (smart phones, tablet or digital cameras work best) to take 6-8 photos.
- For each photo record the date, time and location you took the photo. Use the Photo Documentation Journal to write down your thoughts for each photo.
- You have 10 days to complete the photo-taking and documentation activity.
- After you complete the activity, send the **marked map**, **photo images** and **written or typed notes** to me either by email attachments at ___ or by mail via Canada Post (a large stamped self-addressed envelope will be provided).

Options:

A) Use the envelope provided to send the marked map and written notes of each photo by Canada Post mail. Send your photos by email to ___@sfu.ca. You will have to send a compressed file or send your photo images in more than one email.

B) Send all documents by email: take a picture of the marked map, record your thoughts on each photo by saving onto Word document or typing your thoughts

directly into the body of an email to me. Send your photos in a compressed file or photo images in more than one email.

Please contact me if you have any questions or need technical support on how to take photos or sending images from phone camera, downloading, scanning and attaching documents or images to email, etc.). Call me at ___ or email ___@sfu.ca.

A follow-up interview session will be scheduled within one week of receiving your documents.

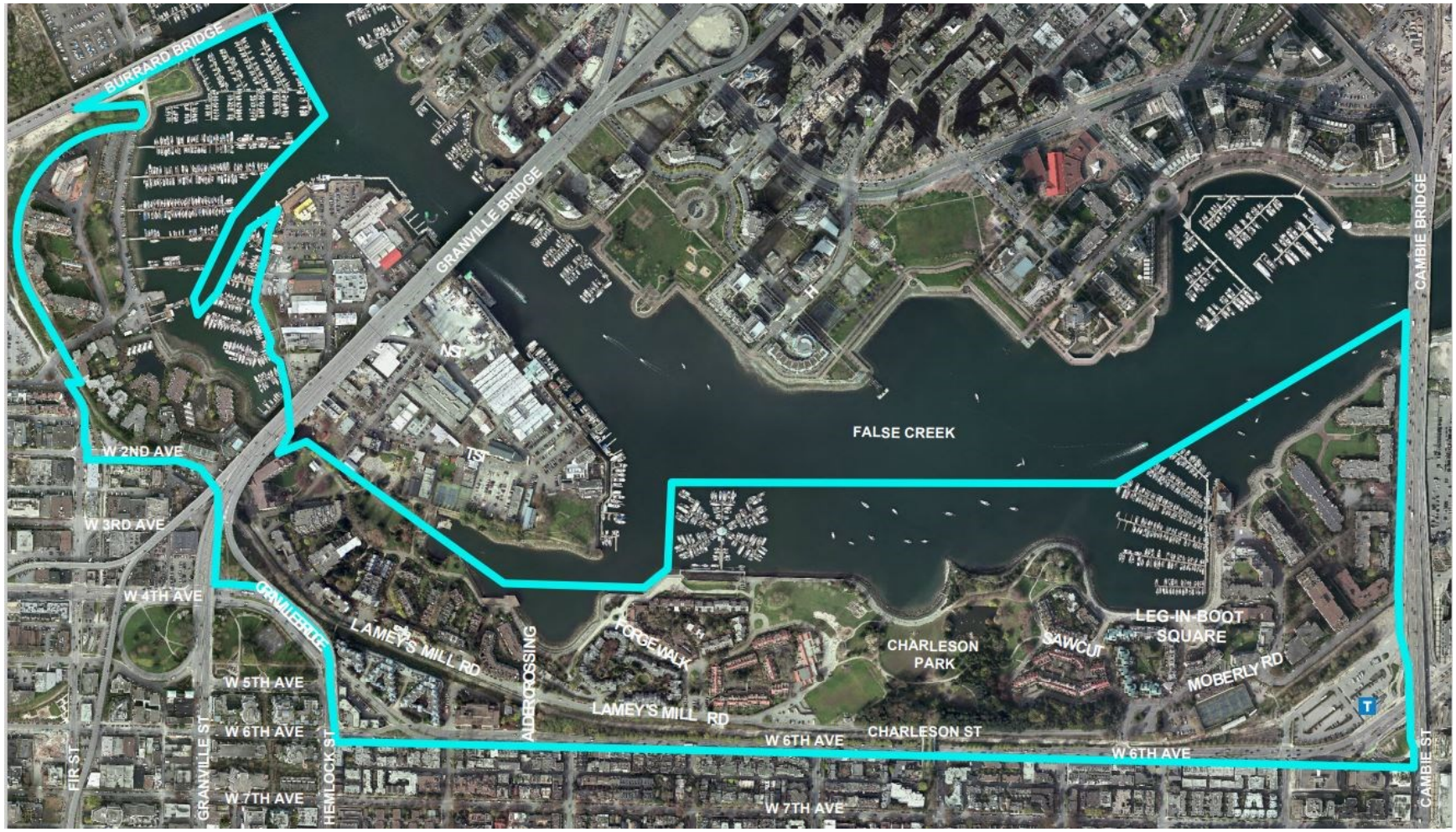
Photo Documentation Journal

1. Select a route in False Creek South, mark it on the map provided
2. Use a photo-taking device (smart phone, tablet, or digital camera) to take 6-8 photos
3. Use this Photo Documentation Journal help you remember why you took the photo
4. Complete the activity within 10 days
5. Send the images, marked map and photo documentation journal to the researcher

Date of Photograph:
Time:
Location of Photo:
Describe the photo:

- What does the photo mean to you, what is the reason for taking the photo?
- Does it represent a barrier to being active outside the home or does it represent a facilitator of supporting aging in place in False Creek South?
- Why is this photo a good example of the outdoor environment as supportive of aging in place, or how is it showing a barrier to walking and being mobile in False Creek South?

Appendix G. FCS Route Map



Appendix H. Interview Guides and Prompts

Built Environmental Audit – Adapted Seniors Walkability Audit in Neighbourhoods (SWAN)

To characterize the built environment in False Creek South I used a validated older adult audit tool called *Stakeholders' Walkability/ Wheelability Audit in Neighbourhood* (SWAN) (Mahmood et al., 2020; Routhier et al., 2019) to develop interview questions and as a guide for deductive analysis referencing objective data related to micro-scale features of the outdoor built environment that influence mobility such as walking for older adults.

The SWAN tool has 116 checklists of objective and subjective items across the following five domains that impact the mobility of older adults: functionality (e.g. functions of street crossings and conditions of sidewalks, safety (e.g. personal and traffic conditions such as bicycle speed and presence of street lights),appearance and maintenance (e.g. presence of public spaces such as parks, gardens, plazas),l and use & support features (e.g. access to services, shops and transit stops) and social aspects (e.g. opportunities to connect with people and intergenerational exchanges) (Mahmood et al., 2020). The domain of functionality and safety are further divided into sub-domains. The function of street crossing and sidewalks are the two sub-domains present under functionality domain; whereas the safety of street features and traffic and personal safety of pedestrians are the two sub-domains that fall under the safety domain. The SWAN tool is composed of two parts which include the audit tool and the secondary observation data, which is a set of open-ended questions.

Older adult interview guide and prompts

Participant ID #_____ Date_____

During the phone or online video interview, I will use prompts and ask specific questions to solicit information related to my study purpose and objectives, to ask for more specific details, to clarify, to better understand something, or if information isn't forthcoming during the photo sharing segment of the interview.

Some of the following questions/prompts have been adapted from *Stakeholders' Walkability Audit in Neighbourhood (SWAN)* (Mahmood et al., 2019).

Phone or Online Video Interview Questions

Aging in place

Do you want to age in your neighbourhood? When you think of your everyday life, is living in False Creek South different from other neighbourhoods you know? Do you think you can stay in this neighbourhood for many years to come?

What would be the characteristics of the perfect neighbourhood that would allow you to stay in your neighbourhood as long as possible?

Is the outdoor built infrastructure of the neighbourhood supportive of you aging in place? What is currently working, what should be kept? What is the most important feature?

Is there any other ideas or perspectives you would like to share?

Transportation

Do you use transit? If you do, how often do you use it?

Does False Creek South have sufficient transit options for people living here?

If yes, what type of transit options are available? If no, what types of transit options would you like to see available?

Is using the transit system easy? What makes using transit system easy in your neighbourhood? What is an obstacle?

Are the bus stops adequate?

Are the bus stops accessible? (provide meaning or definition for “accessible”, if needed)

Is there sufficient lighting at the bus stops?

Are the bus stops sheltered (e.g. covered for protection from rain, sun and snow)?

Are there sufficient seating areas at the bus stops?

Is there anything else you would like to tell me about transit in False Creek South?

Pedestrian Infrastructure

In thinking about your experience of living in this neighbourhood (False Creek South), what aspects or features in the neighbourhood helps you stay active? Why are these features supportive or not supportive for older adults?

Is walking easy in this area? What makes walking easy in your neighbourhood? What makes it difficult or challenging?

<u>Function of Street Crossings, Sidewalks and Walkways</u>

Please identify and describe positive or negative aspects of the sidewalks or walkways.

Prompts: For example, are curb ramps or cuts present, marked crosswalks for pedestrians, width of sidewalks to walk side by side comfortably, sidewalks are smooth and even, steep, clear or obstacles, safe and easy to use during bad weather such as heavy rain and snowy conditions, etc.

<u>Street Features</u>

Are you able to get to where you want to get to safely using the street and walkway in your neighbourhood?

Prompts: Consider street and/or walkway material (is it smooth and is it easy to walk on), condition of the street and/or walkway (cracks, unevenness, potholes), width of sidewalk, do cyclists have designated lanes, etc.

Neighbourhood Aesthetics

Please identify and describe positive or negative aspects of the maintenance and upkeep of the neighbourhood outdoor environment in your area. Are these well maintained? What can be done to make it better?

False Creek South was originally designed as a “garden city” focusing on human scale pedestrian connections between residential enclaves and green space. Is it serving its purpose for you?

Prompts: Do you have a place to sit and rest? What are your thoughts about green spaces in False Creek South?

Pedestrian Safety

Please consider physical and social indicators like presence and quality of street life while answering the following questions.

What makes it safe or unsafe to walk during the day and/or night? Please explain why.

Prompt: If their response is unsafe: is it due to poorly maintained physical features, including roads and walkways, inadequate lighting, presence of graffiti, bars on windows, litter, poor signage, etc.

Prompt: If their response is safe: is it because of well-maintained roads and walkways, good lighting, good signage and visibility, other people around, well maintained green space, etc.

Key informant interview guide and prompts

Participant ID #_____ Date_____

Phone or Zoom Online Video Interview Questions

1. What do you think are urban design characteristics of a suitable neighbourhood that would allow people to stay in a neighbourhood of their choice for as long as possible?

2. Is the outdoor built environment of False Creek South neighbourhood supportive of aging in place (provide definition of aging in place as defined in this study)? What is currently working? Why? Prioritize the top five. What isn't working? Why? What can be done to overcome this barrier?

3. What pedestrian infrastructure aspects or features in False Creek South helps keep people active? Why are these features supportive? Within that, what is a barrier or what is not supportive and why?

4. False Creek South was originally designed as a "garden city" focusing on human scale pedestrian connections between residential enclaves and green space. Does this design serve people of all diverse age groups especially older adults? If it does, why? If it doesn't, why? How can it be better upgraded to serve older adults or persons who uses mobility devices?

5. Does the urban design principles of "streets to stay in" (definition: accommodating lingering pedestrians), outdoor seats with covered canopy (natural), neighbourhood enclaves, pedestrian connections (streets without traffic or intersections foster pedestrian safety for older adults? Please tell me your thoughts about it.

6. What do you think about the public transportation systems in False Creek South area? How important is this for aging in place?

7. Is there any else would you like to share about FCS or anything I didn't cover that you would like to talk about? Are there other ideas or perspectives you would like to share?

Appendix I. Researcher-Led Observation

Adapted SWAN observation summary

Place: Moberly Road
Date: September 26, 2020
Time: 5:05pm
Temperature: 13 degrees Celsius
Weather: overcast, light drizzle

Place: Lamey's Mill Road
Date: September 27, 2020
Time: 3:30pm
Temperature: 17 degrees Celsius
Weather: clear skies

I conducted a neighbourhood scan in False Creek South over two consecutive days in late September. Both scans were done in the late afternoon. One day was overcast and drizzling about 13 degrees Celsius and the other day was sunny clear skies about 17 degrees.

Previous Knowledge of the Neighbourhood
I have some knowledge and familiarity of this neighbourhood as I have visited friends who reside here. I have walked and cycled the seawall many times since teen age years. Over the years, improvements have been made to the seawall to ensure walking and cycling surfaces are accessible, safe, and comfortable with clear markers for designated pedestrian pathways and cycling lanes.

Predominant and Secondary Land Uses
False Creek South was once a run-down industrial area that was re-developed in the 1980s into a medium density, mixed-use area with an extensive network of open and public spaces, focusing on pedestrian-friendly environment and creation of high-amenity community. Residential development predominates the neighbourhood, with commercial land use concentrated in Leg-In-Boot Plaza and a small commercial space in Fountain Way Court.

There is a primary school, playground, community garden space, large sports fields, dog park, harbour/ marina, nature features include ponds, waterfall.

Public Gathering Spaces
There are many areas for social interaction within False Creek South, and these areas are of high quality. The neighbourhood was developed with an extensive system of open and public spaces. Key policy guidelines included the creation of parkland, protecting views to the downtown core and mountains, creation interconnecting pathways with nodes of mini green spaces between each housing development.

Leg-in-Boot Square is a purpose-built commercial plaza that is underused. I conducted two separate observations for Urban Studies classes, and each time I observed the

plaza (once in the Fall and the other in the Spring) there were very few people sitting or gathering in the plaza. Instead, people chose to sit on benches along the seawall.

Within the residential enclaves, I noticed there were a few residents who used the “inner footpaths”. The footpaths weaved in and around each residential development, creating enclaves. Between each enclave were greenspaces with landscaped areas, some with benches. Each development was surrounded by trees, with an open concept instead of a bush wall or concrete wall dividing the sidewalk and private property.

I have used the public gathering spaces along the seawall over the years. FCS seawall is a popular place to meet friends for a coffee at the local Convivial Café and walk to Granville Island, or to take a leisure stroll with the family.

Pedestrian Safety
False Creek South is quite safe because of the way the neighbourhood is designed with “eyes on the street”. The medium-density development of townhouses and apartments face the seawall and street. Personally, as a woman of colour, I rarely go out alone at night and wouldn’t feel 100% safe walking the seawall late at night or between the enclaves, especially along Lamey’s Mill Road adjacent to the railway, or Moberly Road by the bus depot.

The public realm is very clean, not a lot of litter, broken windows, or other physical aspects that make the neighbourhood feel unsafe. Graffiti is concentrated at bus stops. Cyclists are very respectful of pedestrians and give way, even on streets without designated cycle paths.

Pedestrian Convenience
For people using assistive devices, some sections of sidewalks and curb ramps may be challenging. The letdowns between crosswalks are graded; however, some are steep and need maintenance. The crosswalk markings have faded and need a fresh coat of paint. Pedestrian activated signals are immediate when you activate it, providing an adequate amount of time to cross the street. There isn’t a sidewalk the south side of Lamey’s Mill Road west of Alder Crossing. Sidewalk treatments also vary between the west and east side of the neighbourhood. Sidewalks around Moberly Road are made of concrete and are wider, whereas sidewalks along Lamey’s Mill Road are narrower and made of bricks. For both areas, the sidewalks are well maintained and generally free of obstacles (bushes and trees are trimmed away from the sidewalks).

Traffic Volume, Speed and Noise
Traffic in the neighbourbood has reduced significantly since the closure of Charleson Street to non-transit vehicles and access to Granville Island via Lamey’s Mill Road. Traffic is light, however along Moberly Road, vehicles tend to speed. I personally feel the speed limit within the neighbourhood should be reduced to 30km/ hour.

The area is generally quiet, however even with the natural giant trees and railway line buffering 6th Ave, I could hear the vehicular traffic. On Sunday, as I conducted my audit and observation, I could hear the boisterous pirate party boat show on the water. Otherwise, the neighbourhood is quiet.

Additional Comments
False Creek South never ceases to amaze. My connection to the neighbourhood is through the seawall. As a recreation co-ordinator, this neighbourhood was a favourite place to visit when I worked with children and adults use assistive devices. It was a fun place to trundle along because the different surface treatments were provided stimulation for the group as they walked or rolled along the seawall.

This time around as I am evaluating different sections of the neighbourhood, I am forced away from the seawall to observe the street function. There are three layers to FCS: outer street traffic layer, middle local inter-connecting pathways and enclaves, inner seawall layer. Each layer has unique and distinct characteristics that provide access for all to be mobile. Pathways, sidewalks, and streets are better maintained in the outer and inner layers. While the middle layer is mostly accessible there are sections where the bricks have heaved from tree roots and are tripping hazards (I did trip and lose my balance).

Each time I was in the neighbourhood conducting observations, no one approached me. I received curious looks by many visitors to the neighbourhood. Locals ignored me, they are so used to tourists and probably thought I was a tourist with my phone camera snapping pictures journaling my next travel blog.

Most of the bus stops along the outer layer are sheltered and have a garbage bin, and bench seating. However, transit shelters need upgrading and graffiti removal.

Appendix J. Qualitative Themes

Theme	Sub-theme	Content
4.2. Aging in place	4.2.1. I do want to stay here for as long as I can	Data on the desire to aging in place, place attachment to FCS
	4.2.2. Living under a cloud of uncertainty: FCS lease negotiations	Data reflects anxiety and stress due to uncertainty of property lease renewal negotiations with the City of Vancouver. Threats to aging in place
5.1. Functionality of the built environment	5.1.1. Pedestrian infrastructure: Design of sidewalks and crosswalks as barriers or facilitators	Data on positive or negative aspects of pedestrian infrastructure: sidewalk conditions, obstacles, hilly terrain, signage, wayfinding cues
	5.5.3. Transportation services and transit infrastructure - Transportation in FCS: Supportive or unserviceable	Data on public transportation and private ferry service available in FCS, condition of transit infrastructure (absence or presence of benches, garbage receptacles)
5.2. Land use and supportive features	5.2.1. 20-minute neighbourhood: Proximity to amenities, shops, and services	Data on ease of travel to grocery shops, to see doctor, or to run errands, never feeling stuck or isolated
	5.2.3. Outdoor comforts: Benches and public washrooms	Data on amenities – benches at frequent intervals for older adults to sit and rest, enabling people to spend longer time outside – support mental health and local walking when personal mobility is limited, public washrooms play an important role in supporting aging in place.
5.3. Safety: Shared use conflicts and perceived personal safety	5.3.1. Seawall as the neighbourhood spine: Pedestrian vs. cyclist conflict	Data on cyclist speed, ignoring or breaking rules, failing to yield to pedestrians
	5.3.2. Charleson Park: Pedestrian vs. dog conflict	Data on dogs taking over the park and knocking older adults over. Dogs as an incentive for staying active and reducing loneliness.
	5.3.3. I feel safe walking in FCS	Data on feeling safe in the neighbourhood – personal safety from crime, walking at night, lighting
6.1. Aesthetics and therapeutic	6.1.1. Oasis within the concrete urban jungle: Role of green spaces in FCS	Data on urban forest, berm, nature, water features, views as their back yard provided reason to be out and incentive to go for walks. Therapeutic aspects of nature: improved well-being, relaxing, calming, mental and physical health benefits.

Theme	Sub-theme	Content
6.2. Social environment	6.2.1. Third places: Neighbourly awareness and social connectors	Data on third places: Convivial Café as a place for casual and purposeful meet ups, seawall as a social connector, bumping into neighbours outdoors, people are outside walking because the environment is pleasant and safe to walk
	6.2.2. Intergenerational exchange: A place for old and young	Data on intergenerational exchange. Places to take grandchildren in FCS to play and hang out, elementary school – a joy to connect with and see children playing

Appendix K. Older Adult Participant Demographics

Characteristic	Category	Number of Participants (11)
Age	60-69	-
	70-79	8
	80-89	3
	90 + years	-
	Prefer not to answer	-
Gender	Female	6
	Male	5
	Other:	-
	Prefer not to answer	-
Highest level of education	Some high school	-
	High school graduation	-
	Some years in College/ University but did not get degree	1
	Technical Degree	1
	Bachelor's degree	4
	Master's degree	2
	PhD or Doctorate	1
	Professional Degree	1
	Other: Registered nurse	1
Family Status	Married	8
	Divorced	3
	Widowed	-
	Single	-
	Living in a committed relationship, but not married	-
	Prefer not to answer	-
Rent or own home	Rent	1
	Own	10
Type of housing	Co-operative housing	1
	Market rental	-
	Non-market rental	-
	Supportive housing	-
	Senior's housing	-
	Condominium – strata	10
	Other	-
	Prefer not to answer	-
Living arrangement	Spouse or partner	8
	Adult son or daughter	-
	Relatives	-

Characteristic	Category	Number of Participants (11)
	Other	-
	Live alone	3
Employment Status	Retired	6
	Working/ volunteering part-time	5
	Working/ volunteering full-time	-
Annual household income	Less than 10,000	-
	10,000 to 20,000	1
	20,000 to 30,000	1
	30,000 to 40,000	1
	40,000 to 50,000	-
	More than 50,000	6
	Prefer not to answer	2
Do you go outside for walks on a regular basis? (2-3 times a week)	Yes	11
	No	-
Do you use the public transit?	Yes	9
	No	2