

The Role of Community Completeness in Older Adults Experiences of Health and
Wellbeing: A Photovoice Study

by

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Abstract

This thesis examines the role of community completeness in the health and wellbeing of older adults. Community completeness is a concept commonly used in urban planning policies by cities, however utilizations and definitions vary between locations. As the older adult population in Canada and around the world grows, it is important to understand older adults' neighbourhood experiences, especially in a time of aging in place policy often encompassing concepts of community completeness. The main objectives of the study were to 1) explore the experiences of older adults within their neighbourhood in the context of their health and wellbeing, and 2) to create a complete community framework that can be used to promote health and wellbeing. A photovoice methodology was utilized to explore the neighborhood-based experiences of participants living in Edmonton, Alberta. These experiences were then examined using Amartya Sen's capability perspective. The thesis begins by examining the academic literature on the associations between the built environment and health and wellbeing. In addition, planning policies from four Canadian cities are also examined. Four main pathways linking the built environment to health and wellbeing of older adults are identified: neighbourhood character, greenspace, walkability, and foodscapes. Utilizing the capability approach, various affordances were identified to propose a complete communities framework that is centered on health and wellbeing. These pathways include explorations of built environment components, as well as individual experiences such as happiness or fear which can influence health and wellbeing.

Preface

The thesis is original work completed by Marcus Jackson. The research project, of which this thesis is part of, received research ethics approval from the University of Alberta Research Ethics Office, Project name “The Role of Community Completeness in Older Adults’ Experiences of Health and Wellbeing: A Photovoice Study”, Pro00090441, May 27, 2019.

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Table of Contents

<i>Abstract</i>	<i>ii</i>
<i>Preface</i>	<i>iii</i>
<i>Acknowledgements</i>	<i>iv</i>
<i>List of Tables</i>	<i>viii</i>
<i>List of Figures</i>	<i>ix</i>
1. Introduction	1
1.1 Overview.....	1
1.2 Key Concepts.....	2
1.2.1 Built Environment and Health	2
1.2.2 Complete Communities within Academic Literature, and Current Planning Policy and Practice	3
1.2.3 Capability Approach.....	4
1.2.4 Aging Population	7
1.3 Significance of This Research	8
1.4 Research Question and Objectives	9
1.5 Methodology.....	10
1.6 Thesis Outline	11
2. Background: The Concept of Complete Communities	14
2.1 Complete Communities	14
2.2 Community Completeness in Academic Literature	14
2.3 Planning Policy and Practice Definitions of Complete Communities	20
2.4 Summary.....	33
3. Literature Review	35
3.1 Built Environment and Health	35
3.2 Walkability and Active Transportation	35
3.3 Green Space	41
3.4 Food Environments	43
3.5 Built Environment Impacts on Older Adults' Health.....	46
3.5.1 Physical Health of Older Adults	47
3.5.2 Older Adults' Health Relationship with the Built Environment	49
3.6 Local Context.....	54
3.7 Summary.....	55
4. Research Methods	57
4.1 Research Approach.....	57
4.2 Collective Case Study Approach	58

4.3 Photovoice Methodology.....	59
4.4 Neighbourhood Site Selection.....	61
4.5 Recruitment and Sample Characteristics	63
4.6 Photovoice Research Process.....	65
4.6.1 Information Session	65
4.6.2 Data Collection: Photo-Taking and Focus Groups	67
4.6.4 Data Analysis	71
4.7 Research Rigour	75
4.8 Ethics and Reflexivity.....	78
4.9 Summary of Methods.....	80
5. Findings	82
5.1 Findings Section Introduction.....	82
5.2 Neighbourhood Character.....	82
5.2.1 Building and Neighbourhood Design	82
5.2.2 Neighbourhood Social Spaces	87
5.2.3 Neighbourhood Disorder	90
5.2.4 Summary	93
5.3 Importance of Green Space.....	94
5.3.1 Happiness of Greenspace	94
5.3.2 Greenspace for Physical Activity	99
5.3.3 Greenspace for promoting wellbeing through peace and quiet	102
5.3.4 Summary	104
5.4 Experiences of walkability	104
5.4.1 Sidewalks.....	104
5.4.2 Traffic and Crossing Design	112
5.4.3 Perceptions of Safety.....	116
5.4.4 Summary	120
5.5 Foodscapes for Health	121
5.5.1 Accessibility of Food	122
5.5.2 Variety of Food Options	124
5.5.2 Summary	126
5.6 Distinctions between Study sites.....	127
5.6.1 Oliver	127
5.6.2 Kilkenny	131
5.6.3 Brander Gardens	132
6. Discussion	135
6.1 Discussion Introduction	135
6.2 Analysis of Findings using the Capability Approach.....	135
6.2.1 Neighbourhood Character	136
6.2.2 Greenspace	139
6.2.3 Walkability	144
6.2.4 Foodscapes	150

6.3 Differences Among the Three Study Sites.....	153
6.4 Summary of Research Findings.....	156
6.5 Complete Community Framework.....	158
6.6 Limitations	166
7. Conclusion	168
 7.1 Conclusion.....	168
 7.2 Policy Recommendations.....	169
Reference List:	172
Appendix A: Recruitment Poster.....	187
Appendix B: Information Letter and Consent Form	188
Appendix C: General Focus Group Questions	192
Appendix D: Photo Journal Questions	193
Appendix E: Complete Community Index Map of Edmonton	194
Appendix F: Member Checking Sheet	195

List of Tables

Table 1: Dimensions of Human Flourishing

Table 2: Complete Community Components of Western Canadian Cities

Table 3: Participant Characteristics

Table 4: List of Photovoice Poster Categories

List of Figures

Figure 1: Historic Buildings

Figure 2: Public Book Exchange

Figure 3: Graffiti on Bench

Figure 4: Beautification of Parking Lot

Figure 5: Loons in Greenspace Pond

Figure 6: Cracked Sidewalk Intervention – Painted Strip and Patching

Figure 7: Benches Near Greenspace

Figure 8: Poor Drainage at Pedestrian Crossing

Figure 9: Homeless Tent Near Bush

Figure 10: Community Store

Figure 11: LRT Steps

1. Introduction

1.1 Overview

There has been growing evidence indicating that built environments, particularly features such as walkability, greenspace, and multimodal transportation, play a role in the health and wellbeing of individuals (Barnett et al., 2017; Bird et al., 2018; McCormack & Shiell, 2011). As a result, there has been an increased focus on understanding how such features can promote health and wellbeing and improve the lives of people. Drawing from global examples that have begun to emerge, recent publications have called for more collaborations between the health and planning fields to more regularly use urban planning as a potential tool for improving health and wellbeing (Day et al., 2013; K. K. Lee, 2019, 2020). This growing interest can also be linked to increased efforts by cities to promote aging in place for the growing older population and with it, the importance of better understanding the perspectives and experiences of older adults within their communities.

This thesis explores the role that community completeness has on the experiences of health and wellbeing of older adults. To achieve a deep understanding of the experiences of older adults, photovoice methodology was utilized. Photovoice methodology asserts that participants are experts within their lived experiences, requiring participants to take pictures of their experiences of their contexts that they feel impacts their lives (Nykiforuk et al., 2011; C. Wang & Burris, 1997). Participants in this study were recruited from three neighbourhoods, which were selected based on a community completeness index that was created using considerations for availability of greenspace, mixed land use, housing diversity, walkability,

healthy food access, and transit options. The study recruited participants from three neighbourhoods that reflected high community completeness, medium community completeness and low community completeness neighbourhoods in Edmonton according to our index. Focus groups were conducted with participants from each of the three types of neighbourhoods. Data was coded inductively and deductively to identify themes in the research, with the resulting findings analyzed under capability theory to examine relationships between factors included in community completeness concepts and participant experiences of health and wellbeing, and to create a complete community framework centered on health and wellbeing.

1.2 Key Concepts

1.2.1 Built Environment and Health

The locale in which one lives in can impact the overall health and wellbeing of individuals; various built environment features have subtle yet forceful influence. Components such as walkability, understood to be the ability for an individual to walk around a particular space (Frank et al., 2010), is a principal focus in this field of research, since walkability can increase motivations for someone to walk within their neighbourhood and in turn, promote physical activity through walking (Barnett et al., 2017; Farkas et al., 2019). Physical activity is vital to health and has been demonstrated to lower chronic disease and combat common age-related health effects, such as osteoarthritis and sarcopenia (Evans, 2010; Stevenson & Roach, 2012; Warburton et al., 2006). Other features that promote physical activity and mental health have been demonstrated in previous research, and include accessibility of greenspace,

availability of healthy food options, transit access, and increased social opportunities (Hunter et al., 2019; Mahendra et al., 2017; McCormack & Shiell, 2011; Minaker et al., 2016). While the physical components of spaces play an important role, individual subjective experiences are also vital to people's interactions with their environments. For example, a sense of safety and place making can encourage or hinder the navigation of spaces (Cerin et al., 2017; Foote & Azaryahu, 2009; Rees-Punia et al., 2018). Overall, built environment factors have a highly interconnected relationship between each other, while influencing the experiences of individuals in different capacities.

1.2.2 Complete Communities within Academic Literature, and Current Planning Policy and Practice

Currently, there has been a rise in the use of complete communities as a concept in urban planning practices. Although the concept has not been strongly addressed nor defined in academic literature, it is commonly used by municipal governments in their urban planning documents. In the planning practice context, complete communities also does not appear to have a consistent definition. A review of several municipal government governments, however, show that value tends to be placed on mixed use developments, multimodal transit opportunities, affordable and variable housing options, and less consistently healthy food options (City of Calgary, 2013; City of Edmonton, 2010; City of Winnipeg, 2011; Metro Vancouver, 2017). While the focus by municipalities on the health and wellbeing impacts of the built environment is a step in the right direction, the current conceptualization of complete communities is variable and there is much room for conceptual refinement of complete communities from a health and wellbeing lens through more empirical study. With an

increasing number of older adults, it is important to understand the challenges that they may face in their neighbourhoods.

1.2.3 Capability Approach

The capability approach was developed by Amartya Sen, who examined people's capabilities as an avenue by which an individual is able to act in particular ways within a particular context or setting that creates affordances (Sen, 2009). Affordances are the cumulative outcome of the freedoms and opportunities one experiences within their contexts. This philosophical understanding has been developed and adapted to a wide variety of applications, such as economics, feminism, wellbeing, poverty, and politics (Alkire, 2002; Alkire & Black, 1997; Fleuret & Atkinson, 2007). While the lenses all provide important contextual understandings for the capabilities approach, for the purpose of this study, the philosophical framework of wellbeing will be utilized.

Prior to exploring the wellbeing facet of the capability approach, the basic components within this philosophy must be understood. At its very core, the capability approach asserts that one's life and wellbeing is influenced by the freedom of an individual's ability to be or to do something (Robeyns, 2016). This lends itself to its normative foundation, which allows for the conceptualization of issues and development of a theoretical explanation of issues, in this circumstance wellbeing and health (Robeyns, 2016). Capabilities are understood to be "a person's real freedoms or opportunities to achieve functioning's" (Robeyns, 2016, p. 8), with functioning's being activities a person can do, or states a person can be in (Robeyns, 2016). For example, a function can either be a state of being, such as being a healthy person, or it can also

be something done by an individual, for example pursuing physical activity. As a result, "capabilities then are a range of attainable and valuable functioning's including sets of skills and power" (Fleuret & Atkinson, 2007, p. 109), which includes components of personal freedom and choice. Limited capabilities, on the other hand, are influenced by accessibility to social capital or other social, contextual, or economic factors (Alkire & Black, 1997). As a result, "the geographical interest here lies in exploring the nature of settings that enable the translation of potential capabilities into attained functioning's" (Fleuret & Atkinson, 2007, p. 109), which lends itself strongly to assisting in the analysis of built environments and their impacts on individuals.

Wellbeing within the capabilities approach is an appropriate lens to analyze the built environment, as it can examine the setting in which individual decisions can be made. Wellbeing in this framework consists of both objective and subjective components, as it encompasses the personal and cultural experiences, but also the concrete understandings of wellbeing (Fleuret & Atkinson, 2007). "Wellbeing is seen within a capabilities approach as the positive freedom to live a flourishing life" (Fleuret & Atkinson, 2007, p. 109), which are dimensions of human flourishing, as shown in table 1, designed by John Finnis (Alkire & Black, 1997). Human flourishing, which is understood to be "the reasons out of which people act in seeking wellbeing" (Alkire & Black, 1997, p.268), is an important component in the evaluation of complete communities, as it encompasses both capability theory and a developed list, table one, of values assist in understanding wellbeing seeking behaviour in various contexts (Alkire & Black, 1997). In addition to identifying capabilities, many of the dimensions of human flourishing are well adapted to evaluating social, cultural, or experiential dimensions of one's

life, due to its ability to indicate wellbeing seeking behaviour. Lastly, by explaining how the basic forms of human flourishing can be used by anyone in whatever manner, Finnis is able to escape the good life and immoral action critique of Nussbaum's dimensions (Alkire & Black, 1997). Furthermore, it also provides an extremely simple list that prevents the warning Sen gave in over specifying dimensions (Alkire & Black, 1997), and thus provides a strong basis of analysis while removing two bigger critiques.

Table 1. Dimensions of human flourishing

(1) 'Life itself - its maintenance and transmission - health, and safety'
(2) Knowledge and Appreciation of Beauty This good is correlative to humans being rational and their resultant capacity to 'know reality and appreciate beauty'.
(3) Some degree of excellence in Work and Play This good is correlative to humans being 'simultaneously rational and animal' and their resultant capacity to 'transform the natural world by using realities, beginning with their own bodily selves, to express meanings and serve purposes'.
(4) Friendship , 'harmony between and among individuals and groups of persons → living at peace with others, neighbourliness, friendship'.
(5) Self-Integration , harmony between the different dimensions of the person, that is, 'inner peace'.
(6) Coherent Self-Determination , or Practical Reasonableness, 'harmony among one's judgements, choices, and performances - peace of conscience and consistency between one's self and its expression'. When exercised by a community, may be better described as 'participation'.
(7) Transcendence , or Religion, 'harmony with some more-than-human source of meaning and value'.

Freedom is a valuable component of wellbeing within the capabilities approach as people must have the agency to act on particular opportunities to enhance their lived experience and must not be forced to a limited set of actions by various contextual factors such as policy, coercion, lack of choice, or poor accessibility. Furthermore, the analytical lens of the capabilities approach allows for the identification of capabilities within one's social,

environmental, and contextual environments. The analytical lens can be utilized to implement mechanisms of change, due to capability approaches' ability to identify means and ends (Robeyns, 2016). While some scholars argue that the capability approach only values ends, such as the outcome of wellbeing, it has been demonstrated that this approach can also identify means of change, for example identifying if one is put in a position to succeed (Robeyns, 2016). The capability approach is applicable to the built environment, as the environmental space does not create wellbeing or health directly but rather provides an individual with the capability to act freely to improve their health and wellbeing. As a result, by utilizing the capabilities approach, built environment interventions to promote health and wellbeing can be identified that simultaneously promote equity for various populations and intervenes through upstream interventions. Lastly, this analytical lens has been used for the discussion of results in the fields of preventive medicine, public health, urban planning, human geography, and policy interventions.

1.2.4 Aging Population

Due to various complex factors, the world has been observing a growing population of older adults, with Canada being no exception. In 2016 the national population of adults 65 years old and older was identified to be at 5.9 million (Statistics Canada, 2017), with the Canadian Institute of Health Information predicting that by 2036 this population will grow to 10.3 million (Canadian Institute for Health Information, 2017). This population trend presents new challenges to Canada's health and social systems. In response, various organizations and municipalities have been taking approaches to increase the ability for adults to age in place. In

policy, aging in place can be understood as the ability for older adults to live healthily, happily, and independently for a longer period of time in their homes and communities (Dupuis-Blanchard et al., 2015; Iecovich, 2014; Wiles et al., 2012). Efforts to increase opportunities for aging in place, such as the World Health Organizations Age-friendly Cities guidelines (2007), demonstrate the importance of the impacts that the built environment has on health. Additionally, the important role the built environment has been highlighted in the overall health and wellbeing of older adults, who are prone to increased rates of mobility and health challenges (Roberts et al., 2015).

The aging in place movement coincides with the increased understanding of the role that the built environment plays within the overall health and wellbeing of individuals across their life course. Edmonton is included within this movement, as the city has undertaken various policy changes to improve aging in place for their older adults (City of Edmonton, 2018; City of Edmonton Community Services, 2007; Edmonton Seniors Coordinating Council, 2011). As a result, it is vital to understand the connections between the priorities placed on aging in place, components of complete communities, and older adults' experiences in Edmonton.

1.3 Significance of This Research

As indicated in the previous section, the increased focus on built environment interventions to improve the health and wellbeing of older adults, particularly as encapsulated within the concept of aging in place, is increasingly becoming a staple within urban planning policy to address a growing aging population. As a result, it is important to understand the experiences, perspectives, and stories of older adults who will be impacted by these policies

and the built environment features so far enacted. This research will examine the role that components of community completeness have on the health and wellbeing experiences of older adults. The research will also be used to assist in creating a complete community framework for health and wellbeing, particularly for older adults. Secondly, there have been many studies on various built environment features and the health and wellbeing of older adults. However, there have not been many studies on the potential health and wellbeing impacts of complete communities and its components. In fact, the definition and study of complete communities appear to be largely missing in the academic literature. As a result, this research seeks to contribute and expand the academic fields of preventive medicine, public health, urban planning, and geography, by taking a systematic approach to defining an index for complete communities, by using the index to identify study participants from neighbourhoods with varying community completeness, and by examining the role that complete community components play in older adults' experience of health and wellbeing.

1.4 Research Question and Objectives

Using a qualitative research methodology, this research examines how neighbourhood design and built environment features impact the experience of health and wellbeing by older adults. This study examines the interaction between space, place, and health of individuals within particular neighbourhood typologies characterized by different levels of community completeness. The overall research question is: what role does community completeness play in older adults' experiences of health and wellbeing?

To answer this question, the following research objectives will be addressed:

1. Academically define community completeness using a health-focused lens and create a framework for researching complete communities;
2. Identify the perceptions and interpret the experiences of older adults regarding the importance of various complete community components to their health and wellbeing.

1.5 Methodology

A qualitative research approach was used to deeply examine the experiences of older adults. A photovoice methodology was chosen as the qualitative method since it encourages participants to take pictures of the study topic to express their stories, experiences, and contexts in ways that dialogue may not capture (C. Wang & Burris, 1997). The picture taking process is expected to allow for the expression of older adults' experiences and contexts, while providing a richer description of their neighbourhood phenomena. Following the picture taking, participants engaged in focus group to discuss the importance of their images, while talking with each other about their shared or independent experiences. The Edmonton sites that were examined were selected on a community completeness index developed based on availability of greenspace, walkability, housing diversity, transit options, mixed use, and healthy food access. For the literature review chapter, the topics and their subtopics adapted for the index were key words used to search current literature, but other key topics included safety, older adults, associations between topics and health, lighting, and other valuable words were used. For the discussion chapter, complete community and complete communities were the main key terms used to identify possible scholarly work across many data bases. The same key words were used to search for their usage in Canadian and American cities.

1.6 Thesis Outline

By engaging in this thesis, I attempt to gain a holistic understanding of older adults' experiences of health and wellbeing within their particular neighbourhoods, which seeks to combine complete community literature with data collected and analyzed on the lived experience of older adults in Edmonton neighbourhoods with different levels of community completeness. The experiences and perspectives of older adults are important in informing the creation of more age friendly spaces, as well as provision of more equitable access to amenities for this population. This current chapter introduces the major themes of the research, which includes the built environment's relationship to the health and wellbeing of aging populations, in particular complete communities as a key component of the built environment that can be shaped by planning policies and interventions. Additionally, the chapter provides research objectives, an overview of the methodology, discussion of capability theory, the rationale for the research, and an outline for the rest of the thesis.

The second chapter of the thesis is the background section, which provides a review of the current academic literature on complete communities. Furthermore, Chapter Two also provides a review of grey literature on complete communities, in particular a review and analysis of complete communities' policies included in the municipal development plans of four Western Canadian cities. These plans guide the urban development of a municipality or city and include foundational policies or concepts for urban developers and planners. These documents include the concept of complete communities, and the components included within the concept are explored and analyzed.

The third chapter provides a literature review for the foundational concepts that have been identified within the complete community's framework. The components include a thorough discussion of the available literature on walkability and active transportation, greenspace, food environments, mixed land use and density, as they relate to the physical health of older adults, as well as cross cutting themes. In order to understand potential impacts of these community completeness components on the experience of health among older adults in the local context of Edmonton, the landscape of Edmonton will be analyzed and discussed.

The fourth chapter discusses the methodology used, including rationale for the photovoice methodology for data collection and frameworks that provide a lens for analysing the data collected. Chapter Four also discusses processes for recruitment, site selection and data collection, and data analysis procedures. Lastly, key aspects of qualitative research including research rigour, ethical obligations, and reflexivity, are discussed.

Chapter Five presents the findings and themes from the data analyses and lays the foundation for the discussion chapter. Based on the research, the themes identified as impacting the experiences of health in Edmonton seniors include; the importance of neighbourhood character, greenspaces, experiences of walkability, foodscapes for health, and distinctions of each site. Within each theme, subthemes and other important features or experiences are presented in sufficient detail to further elaborate on the major themes and create a holistic understanding of the participants' experiences. Photographs are also utilized to help illustrate the particular experiences discussed by study participants in a deeper manner.

Chapter Six provides the discussion related to interpreting the findings under the lens of capability approach to examine the freedoms and functioning opportunities through

complete community components. Through this approach, intervention opportunities are identified to create more equitable spaces for the health and wellbeing of older adults. Furthermore, through a combination of the capability lens, themes identified, existing scientific and grey literature, and urban policy considerations, a framework for complete communities centered on health and wellbeing is proposed. Lastly, the limitations of the research project, as well as its applicability and generalizability are discussed.

The final chapter, Chapter Seven, is the conclusion for the thesis that provides closing statements. The second part of Chapter Seven also provides policy recommendations related to complete communities that Canadian and other cities can consider applying to their MDP or other aspects of urban policy.

2. Background: The Concept of Complete Communities

2.1 Complete Communities

Within this section the academic terminology pertaining to complete communities is explored, as it is a developing concept. Secondly, since the term and concept of complete communities are commonly found in municipal development plans (MDP), the development plans of four Western Canadian cities will be analyzed in detail to determine the meanings and application of complete communities within current municipal planning practice and policy. This analysis does not only examine the definitions used but also the overall policies within these plans to determine the components that are included and/or valued by municipalities. This will assist in the understanding of complete community policy implementation and identify gaps in academic literature.

2.2 Community Completeness in Academic Literature

Community completeness is a developing concept in the world of academia and has limited definition and analysis in the academic literature. A search of the academic literature found three articles on the concept, which will be discussed in this section. In the scholarly literature, there is a shared recognition of the value of community designs that allow for residents to complete non-work trips within a respective vicinity (Grant & Scott, 2012; McArthur, 2018; Merlin, 2014). These trips can involve a variety of activities related to leisure, or for accessing local services, amenities, and errands (Grant & Scott, 2012; McArthur, 2018). The consideration of local amenities within local neighbourhood design is not a new concept, as urban planners since the Garden city movement in 1902 (Clark, 2003) have been advocating for

urban design to meet residents' needs (Grant & Scott, 2012; Merlin, 2014). However, the scale of such communities and distances to amenities must be examined, as discrepancies between different complete community conceptualizations can have profound impacts on neighbourhood design and on the accessibility of amenities for different populations, particularly those who cannot use an automobile.

Merlin (2014), from the field of urban planning, undertook a statistical analysis of available data pertaining to various variables such as density, accessibility share, and other factors to investigate community completeness and urban forms that support it. Merlin (2014), describes a complete community as "a sub-regional geographic boundary within which most residents are able to meet most of their daily and weekly travel demands" (p. 737). While the definition provides an ideal concept of complete community design, the suggested size is between 5800 acres (place) to 21,630 acres (centered community), with a radius from the center of the developments to be 15 minutes of drive time (Merlin, 2014). This size is recommended for the concept of internal tour capture, which can be understood to be "the percentage of tours that begin within and are contained within a given community's boundaries" (Merlin, 2014, p. 737), and respectively grows from 33.3% for a place to 47.6% for a centered community. The higher internal trip capture suggests that by creating centered communities around a principle of centrality that community completeness increases as a higher number of objectives can be met within one's locale.

At this scale, Merlin (2014) argues that community completeness can be predicted by two main measures. Firstly, mixed use development and developmental density, are strong predictors of completeness. They indicate various destinations found within a locale and can

also indicate the availability of jobs within a given area for community residents (Merlin, 2014). However, a balance between available jobs and number of residents is stressed, as too few or too many may contribute to lower completeness scores as residents may have to leave their community in order to work or achieve trip goals, or may not have enough residents to fulfill employment needs of amenities (Merlin, 2014). Secondly, a measure of accessibility share was determined to be the biggest predictor of community completeness. Accessibility share is the ratio between local non-work accessibility and total regional network accessibility (Merlin, 2014). This measure can be understood as the ability to complete activities within a local context rather than needing to travel to a different space to achieve the same goal or activity. In order to achieve successful accessibility share, a community must have a healthy balance of various amenities, both in terms of categories and variations within those categories, such as multiple restaurants, that competes against the regional availability (Merlin, 2014). While Merlin (2014) provides various concepts for understanding complete communities, the scale of his conceptualization creates challenges of access for various populations, such as non-able-bodied individuals, children, and older adults. These individuals can face difficulties with accessibility and the lack of attention given to multimodal transportation options beyond transportation using automobiles may only create bigger barriers.

In comparison, McArthur (2018), from the field of urban planning, provides a smaller scale understanding of complete communities through the case analysis of Vancouver, Auckland, and Melbourne's municipal plans. Through the lens of Addie's (2016) theory of suburban infrastructure, which is a comparative and critical analysis of infrastructural systems, McArthur (2018) examined the complexity of infrastructure planning. In this theory, suburbs

are understood to be the result of higher-level policies, such as MDP's and other guidelines, while also being codependent with city centers, as it provides a place of work and commute for suburban dwellers (Addie, 2016; Filion & Keil, 2017).

With the use of this theory, McArthur (2018) identified four infrastructure interventions that were common across all three cities: (1) relocalisation of suburban areas to complete communities, (2) intra-urban mobility upgrades and intensification, (3) international hubs, and (4) affordable housing. Within the intervention of relocalisation of the suburbs, the goal was to provide a greater number of services, amenities, and attractions within the suburbs, as part of the conceptualization of complete communities (McArthur, 2018). This can be promoted through the implementation of mixed-use locales that offer various amenities, transit options, and services, while also ensuring the availability of diverse affordable housing (McArthur, 2018). In Vancouver's guiding development plan, the creation of complete communities is mandated, while in Melbourne, the creation of 20-minute neighbourhoods is encouraged. This community design goal is to allow the majority of residents to meet daily needs within a 20-minute public transit commute, walk, or cycle (McArthur, 2018). Both complete communities and 20-minute neighbourhoods can be understood to be centered around the concept of accessibility share. Accessibility share can be understood as the ability to complete tasks in the local area, which Merlin (2014) argues to be the biggest predictor of community completeness. However, as outlined by McArthur (2018), 20-minute neighbourhoods and their similar concepts directly impacts the socio-spatial component of suburbs as citizens within that area are faced with both new opportunities and challenges provided by denser spaces.

Additionally, the creation of complete communities can be assisted by the process of intra-urban intensification and mobility upgrades, using densification efforts, urban growth limits, and transit upgrades to assist both urban cores and suburban developments. As outlined by McArthur (2018), complete communities can be used to renegotiate the socio-spatial relationship as transit-oriented development assists in suburban densification, while accommodating future growth, and by increasing the amount of people available for work. Suburban densification can help the development of complete communities as density with transit upgrades can encourage multimodal transportation, which promotes sustainability, accessibility, and physical health, while densification assists in justifying increased amenities and public transit investments (Hancock et al., 2017; McArthur, 2018). Lastly, the need for diverse and affordable housing was identified as necessary for the creation of complete communities, as higher density housing has the goal of creating more affordable housing through land efficiencies and other economic avenues (McArthur, 2018). However, issues surrounding NIMBY-ism, gentrification, cheap peripheral land, and disconnect between affordable housing strategies and urban planning create challenges in implementing affordable housing for municipalities (Bhatta, 2010; Buckenberger, 2012; McArthur, 2018).

Affordable and diverse housing options were also valued within the Canadian context as producers of suburban and urban spaces, which include planners, councillors, and developers, all recognized the importance of housing options (Grant & Scott, 2012). Within this research Grant and Scott (2012), from the field of urban planning, undertook a qualitative project that included both policy analysis and interviews with planners, municipal councillors, and developers of three cities to understand the relationship between housing and practice.

Planners in the study granted perspectives into the values of contemporary planning policy within Canada, as the majority viewed themselves as agents of change in the development of complete communities (Grant & Scott, 2012). Their conceptualization identified an urban fabric constituted by a combination of housing types that provide multimodal transit opportunities for residents allowing one to live, play and work within the community (Grant & Scott, 2012). However, an integrated urban fabric with intertwined diverse housing was not viewed as positively among developers, as they stratified developments by type and consumer profile, to facilitate upward movement of home ownership since they believed that “people prefer to live in relatively homogenous areas” (Grant & Scott, 2012, p. 149). Furthermore, the separation of housing types was further facilitated by their understanding of the Canadian Dream of a single detached house which they argued that the majority of individuals still desired (Grant & Scott, 2012). As a result, in areas of affordability the main housing development was single family housing, while an increase in affordability featured a higher number of multi-family units. It is important to note that affordable housing was discussed by all parties through the lens of ownership and land value, such as how an apartment-style homes may be cheaper than a single-family home but did not examine opportunities for low income individuals (Grant & Scott, 2012).

The ideological and value silos between developers and planners was further accentuated by the roles of both parties. As previously discussed, planners viewed themselves as proponents of complete communities that provide a variety of amenities and housing types to meet the various needs of the evolving population (Grant & Scott, 2012). By creating planning policies that supported the development of dense mixed-use areas, they created

avenues in which developers were able to follow suit. However, developers viewed themselves as “responding to but not leading the changes in the suburban market” (Grant & Scott, 2012, p. 150), as they believed that economic factors have been responsible for the change in denser communities. The differing views creates an issue, especially since councillors were seen to be positioned variably between the two perspectives, as the responsibility of creating complete communities is continuously shifted around, which creates a two steps forward one step back scenario (Grant & Scott, 2012). This sentiment is echoed within the Edmonton context, as private developers viewed themselves as one that merely “responds to market demand, and not necessarily shape it” (Clark et al., 2010, p. 48). As a result, the ‘dance of responsibility’ limits the development of truly complete communities, and may require developers to reconsider their role, with planners examining market forces and understanding the developers’ perspectives (Grant & Scott, 2012).

2.3 Planning Policy and Practice Definitions of Complete Communities

The grey literature considered encompasses urban plans and the strategies from four cities in Western Canada, which include Edmonton’s municipal development plan, the Regional Growth Strategy for Vancouver, the municipal development plan for Calgary, and Winnipeg’s municipal development plan with its accompanying Complete Communities guiding policy. A municipal development plan (MDP) is the guiding urban planning policy for a city or metropolitan area, which governs and guides the urban development of the area (City of Edmonton, 2010; City of Winnipeg, 2011a). The concept of complete communities is routinely mentioned within these various planning documents for each city; however, the definitions and

use of the concepts are different in multiple ways. This malleability may be a reflection of the lack of academic definition surrounding the concept as well as a reflection of the way in which city plans manipulate the term to fit their ideals.

To paint a full picture of complete communities, the usage of this concept is also examined within the plans of other major Canadian cities and a few prominent American cities generally thought to be progressive in their urban planning. I attempted to review Montreal's MDP or other planning documents to gain an understanding of their usage of complete communities; however, the documents were in strictly French, which limited my ability to analyze them due to my lack of ability to understand French. Ottawa is currently updating their MDP, which has complete communities as a pillar, but no definition is provided. In the current Ottawa bylaw, complete communities is barely mentioned, and when it is, is found as a component of liveable communities and not as an stand-alone policy (City of Ottawa, 2003). However, a definition is provided; it is defined as "a good balance of facilities and services to meet people's everyday needs, including schools, community facilities, parks, a variety of housing, and places to work and shop" (City of Ottawa, 2003, p. 6). Lastly, within its MDP, the City of Toronto addresses complete communities lightly with no definition provided, and instead stresses the importance of complete streets (City of Toronto, 2002). Toronto, however, does place emphasis on the value of complete communities within their downtown area plan, with greenspace, housing, mixed use amenities, multimodal transportation, cultural and recreational spaces, and character being valued (City of Toronto, 2019). This may suggest that complete communities are only valued within the downtown space and not the Greater Toronto Area.

Moving onto some prominent American cities, New York, Philadelphia, Denver, and Austin are examined. New York City developed and adopted a new city plan in 2015 called OneNYC 2050 which guides urban development, urban policies, and social programs (New York City, 2019). In 2011, its predecessor PlaNYC 2030 dedicated a chapter to public health (New York City, 2019). Within the OneNYC document, components of complete communities such as green space, multimodal transportation, and food accessibility are highlighted, but the specific terminology of complete communities is not used (New York City, 2019). Similarly to NYC, Philadelphia's 2035 municipal plan also addresses some public health goals explicitly and highlights various complete community components, such as transit, greenspace, and various housing types, but complete communities is again not specifically mentioned (City of Philadelphia, 2011). Furthermore, during the search of complete communities in other American cities, the vast majority did not discuss or value complete communities, which may be a reflection of different terminology in the U.S. or having the values of complete communities and their components spread across various goals, policies, and/or within other documents.

The municipal plans of Denver and Austin, however, were different. Within Denver's comprehensive plan, complete communities is discussed as a pillar and the term is used interchangeably with complete neighbourhoods (City of Denver, 2019). Within this pillar, Denver's plan highlights goals pertaining to active environments, food accessibility, and health access, with multimodal transportation and affordable housing identified as supporting goals (City of Denver, 2019). Lastly, Austin's plan also has complete communities as a guiding principle within their comprehensive plan, which demonstrates the importance it places on this concept (City of Austin, 2012). Key aspects of complete communities identified by Austin

include multimodal transportation, healthy food access, green spaces, education, business opportunities, housing, and cultural opportunities (City of Austin, 2012). Overall, while many American cities do not use complete communities as a specific term within their urban policy documents, the plans of U.S. cities do appear to have a more comprehensive approach that capture components of the complete communities concept compared to than other major Canadian cities. In this thesis, the plans of Edmonton, Calgary, Vancouver, and Winnipeg are examined in greater detail.

Provinces derive their powers from the Canadian constitution, and with no mention of municipalities in the constitution, municipalities have very limited autonomy and receive their powers from provincial municipal acts (A. Smith & Spicer, 2018). MDPs in the province of Alberta are mandated by the *Municipal Government Act* (MGA), which is the provincial legislation that provides municipal governments in Alberta with the powers, responsibilities, and roles to govern and develop municipalities (Municipal Government Act, 2000). Provincial municipal acts address policies and laws surrounding municipality powers, and some sections are relevant to complete communities. The main section relevant to complete communities is called “Municipal Development Plans” (Section 632) which outlines the law necessitating municipality councils with a population over 3,500 to develop an MDP (Municipal Government Act, 2000). In relation to complete communities, the MDP must address future growth, future land use, municipal services, and transportation systems of a municipality, and may contain legal sections pertaining to economic development, social development, and other planning policies (Municipal Government Act, 2000). Section 632 “Municipal Development Plans” of the

MGA provides an opportunity to include health-focused wording to ensure the promotion of health and wellbeing is included in all MDPs across Alberta.

The current MDP for Edmonton, which is named “The Way We Grow”, was approved by city council on May 26, 2010, and currently guides the city’s vision for ten years (City of Edmonton, 2010). This MDP is presently going through an updating process to align itself with the newly released CONNECTEDMONTON (City of Edmonton, 2019a) strategic plan for the next ten years. The new proposed MDP has recently been available as a draft for the public but has not been adopted by council. Within this document called “Draft City Plan: One Million More” (City of Edmonton, 2020), complete communities is not discussed explicitly at any length, but some goals of complete communities appear to be found in its four pillars for the city (healthy city, climate resilience, regional prosperity, and urban places), along with its six strategic goals: thrive, live, preserve, access, belong, and create. It is evident that complete community values are included within the proposed city plan (City of Edmonton, 2020). Within the future plan, aspects pertaining to densification, increased multimodal transportation, mixed use planning, walkability, amenity access, urban food spaces, and green spaces within a 15-minute radius are stressed (City of Edmonton, 2020). Since the new policy has yet to be finalized and adopted, “The Way We Grow” will be analyzed.

Within Edmonton’s current MDP (2010) the concept of complete communities is defined as:

A community that is fully developed and meets the needs of the local residents through an entire lifetime. Complete communities provide certainty to residents on the provision of amenities and services and include a range of housing, commerce,

recreational, institutional and public spaces. A complete community provides physical and social environment where residents can live, work and play. (p. 112)

Edmonton's conceptualization of complete communities includes a basis for understanding of the social and temporal impacts of the built environment on the wellbeing of its citizens. Furthermore, the Edmonton MDP recognizes the importance of the social networks of its citizens within communities as it stresses the value of providing various spaces in which individuals are able to meet their social needs. This can be an outcome of various values and city goals, such as promoting sustainability, aging in place, creating sense of place, and creating community champions.

In analyzing the definition, public health does not appear to be an explicit goal identified within the city's conceptualization of complete communities. However, components of complete communities that affect health and wellbeing can be identified by examining the document more closely. For example, the municipality states that its citizens are "among the Canadians most reliant on single passenger car trips in their daily lives" (City of Edmonton, 2010, p.12), which is then mentioned as a social determinant of health (City of Edmonton, 2010). As a result, the MDP mandates that urban growth is to be controlled, complete communities be designed, and an increase in public transportation infrastructure built (City of Edmonton, 2010). The Edmonton MDP identifies six complete community elements: community spaces, affordable housing, multimodal transportation options, accessible recreational spaces, walkable design, and mixture of land use and housing types (City of Edmonton, 2010). Furthermore, parks and greenspaces are mentioned as important considerations for the city. Accessible recreation and cultural spaces are considered important

to the complete community fabric, with active leisure having a higher emphasis over passive leisure. Within the MDP, the availability of amenities within multimodal distances is not specified, which may indicate a flexible approach to mixed use, or may be placed within other specific planning documents. The inclusion of healthy food options within these spaces, in regards to shopping opportunities, community gardens, and fast food outlets, is briefly mentioned.

Calgary's current MDP was accepted by city council in September 2009 and guides the development of Calgary for the next three decades (City of Calgary, 2013). Calgary (2013) defines complete communities as:

A community that is fully developed and meets the needs of local residents through an entire lifetime. Complete communities include a full range of housing, commerce, recreational, institutional and public spaces. A complete community provides a physical and social environment where residents and visitors can live, learn, work and play. (p. 6-3)

There is great similarity between Calgary's and Edmonton's conceptualization of complete communities. The analogous definitions support the argument that the conceptualization of complete communities may not necessarily be distinct between municipalities and may imply stability in ideologies, at least among municipalities that may be located in proximity in a particular part of the country. By examining the definition provided, it appears that convenience, aging in place, options, and mixed-use density are valued, all of which can assist in creating a sense of place for citizens within their neighbourhood. Sense of place can be understood to be either positive or negative emotional bonds that are experienced or developed by an individual within a particular locale, both through design and social interaction

(Foote & Azaryahu, 2009). However, through Calgary's complete community definition, it may be argued that physical and mental health and wellbeing may not be held highly in value.

However, when examining Calgary's MDP, the values surrounding complete communities and health are much more in the forefront. The MDP is split up into multiple sections with the first targeting city-wide plans, which guide development of the entire city. Within this section, complete communities are a dedicated policy initiative related to the city's goal to create compact developments (City of Calgary, 2013). Diversity of housing, recreation, architectural design, urban form, amenities, and other opportunities are valued for creating a space where people are able to age in place across the life course (City of Calgary, 2013). The specific complete community policy, section 2.2.4, requires that developments have a variety of occupational, residential, institutional, green space, transit, and recreational opportunities within active transport distances (City of Calgary, 2013). Similarly, to Edmonton, mandated amenities or distances are not mentioned, however, in comparison to Edmonton, Calgary appeared to slightly have a greater emphasis on passive leisure opportunities. Furthermore, local food growth opportunities are mentioned, such as community gardens, which indicates a value placed on food options for Calgarians (City of Calgary, 2013). Lastly, the complete communities' policy works closely with other city-wide policies that support each other, such as public transit, energized city center, great communities, green space, and urban design (City of Calgary, 2013).

Winnipeg's MDP, called *OurWinnipeg*, was voted for adoption by council on July 20th, 2011 and guides the urban development of the city for the next 25 years (City of Winnipeg, 2011b). Land use planning in Manitoba is governed by *The Planning Act*, which governs the way

land is developed within the province and is split into three separate regulations: development plan requirements, land use policies, and livestock operation (The Planning Act, C.C.S.M. c. P80, 2005). However, while Winnipeg does have to follow *The Planning Act*, it does have greater autonomy in urban planning under the *City of Winnipeg Charter*, which is provincial legislation that states the city must have a long-term development plan (The City of Winnipeg Charter, S.M. c. 2002, c. 39, 2002).

In addition to the MDP, Winnipeg has developed and implemented a complete community guidelines policy, which asserts the development of complete communities as a guiding principle and cornerstone of its urban planning philosophy (City of Winnipeg, 2011a). Complete communities in the Winnipeg context is defined as “places that both offer and support a variety of lifestyle choices, providing opportunities for people of all ages and abilities to live, work, shop, learn and play in close proximity to one another” (City of Winnipeg, 2011a, p. 4). The evaluation of the definition provided exemplifies a strong commitment to mixed use planning which creates opportunities for increased accessibility to services while aspiring to improve social cohesion, aging in place, and sense of place. Similar to Calgary and Edmonton, the strict definition of complete communities in Winnipeg’s plan does not specifically mention the promotion of the health and wellbeing through this concept.

Outside of the definitions of complete communities provided, Winnipeg’s plan additionally describes the characteristics of a complete community, which include mixed use design for maximum accessibility, multiple transportation opportunities that are realistic to particular areas, affordable housing, local employment opportunities and embodying the city’s identity of being a community of communities (City of Winnipeg, 2011a). The value of

multimodal transportation, with a focus on walkability, is apparent within the document. This guiding policy is unique in comparison to the previously mentioned MDPs for Edmonton and Calgary because of the specificity of policy interventions identified. These interventions include various implementation tools as well as highlighting the precise areas of the city that are best suited for particular interventions. As a result, the conceptualization of complete communities in Winnipeg contains core themes but is adapted to meet the needs of particular areas within the city. This may be viewed as a strength because it allows for a flexible approach to complete community design within Winnipeg as it does not force a particular system on a space. It may also be viewed as a weakness as all communities are not necessarily developed with a complete community framework, which may negatively impact the health and wellbeing of the residents within those communities. With a census metropolitan area (CMA) population of 832,200, the plan may be a reflection of Winnipeg's smaller city size allowing for more targeted approaches to development (City of Winnipeg, 2019). In comparison, according to statistics Canada in 2016, Edmonton's CMA population was 1.3 million, Calgary's 1.4 million, and Vancouver's 2.5 million (Statistics Canada, 2017a, 2017b, 2017c).

In the province of British Columbia, the *Local Government Act*, governs the power and responsibilities of municipalities (Local Government Act, 1996). Under this statute, municipalities in the province do not have to create an MDP to guide urban development within their regions, but instead are required to create regional growth strategies (RGS) to guide the land use development of a particular region (Local Government Act, 1996). As a result, the City of Vancouver does not have a guiding MDP, but follows the guidelines and plans outlined within the regional growth strategy of the area, which is called *Metro Vancouver 2040* and

encompasses the entire metro Vancouver area (Metro Vancouver, 2017). Municipalities included in the Metro Vancouver area are the City of Vancouver, and 23 other towns, cities, districts, First Nations, and a township (Metro Vancouver, 2017).

The complete communities' concept is a prominent feature within the Metro Vancouver RGS. The development of complete communities is the focus of the fourth goal of the policy document (Metro Vancouver, 2017). The RGS defines complete communities as "walkable, mixed use, transit-oriented communities where people can: find an appropriate place to live at all stages of their lives, earn a living, access the services they need, and enjoy social, cultural, educational and recreational pursuits." (Metro Vancouver, 2017, p. 45). Conceptualized in this manner, it is apparent that mixed-use planning, likely supported by density, is an integral feature of complete communities, as walkability, transit, and nearby amenities all support and can be outcomes of dense mixed-use planning. The importance of aging in place and livability across the life course is suggested through the values, which is similar to the values of Winnipeg, Calgary, and Edmonton. Furthermore, a variety of housing opportunities is valued within the RGS and stated as a requirement for complete communities (Metro Vancouver, 2017).

Delving deeper into the RGS, Metro Vancouver's conceptualization overtly includes a stated focus on the health and wellbeing outcomes pertaining to the development of complete communities (Metro Vancouver, 2017). Active transport, which includes walking, biking, public transit, or any combination of those is mandated to promote physical activity, with supporting guidelines pertaining to availability of green space, active living, and other physical health opportunities. The importance of placemaking, and community interaction is suggested, which

can support social capital and personal wellbeing. The promotion of community and roof top gardens, and increased access to healthy food retailers, such as near transit nodes, indicate that healthy food access is included within the conceptualization of complete communities (Metro Vancouver, 2017). Lastly, the goal of complete communities and its subsequent guidelines work in conjunction with other policies and goals, such as the policies guiding the creation of compact areas, sustainability, multimodal transportation options, and waste management (Metro Vancouver, 2017).

Across all four municipalities, there is some consistency in how complete communities is defined. All four municipalities strongly value denser mixed-use planning to achieve complete communities as the increase in density can be a precursor to increased amenities, housing opportunities, and walkable neighbourhoods (City of Calgary, 2013; City of Edmonton, 2010; City of Winnipeg, 2011a; Metro Vancouver, 2017). An increase in population density is needed to achieve efficient and financially sensible public transportation as low population density increases operational costs for transit since low ridership and long distances cause negative impacts (Bhatta, 2010; Hancock et al., 2017). As a result, an increase in dense mixed-use planning with a variety of housing options is closely related to the development of neighbourhoods with strong multimodal transportation opportunities. All four municipalities discussed the importance of creating communities that supported people across their life course and promoted aging in place. This was strongly supported by the plans calling for the provision of a variety of amenities to meet various needs, but also a variety in housing options, which in the Canadian context was viewed as opportunities for individuals with changing family

or financial needs to move to housing that meet their current needs (City of Calgary, 2013; City of Edmonton, 2010; City of Winnipeg, 2011b; Grant & Scott, 2012; Metro Vancouver, 2017).

While the definitions shared values in common, there were some discrepancies. Firstly, Vancouver appeared to be the only municipality that explicitly identified the importance of creating opportunities for healthy food options for its citizens. The RGS discussed the importance of not only local opportunities for residents to grow their own food but stated the added value in increasing the accessibility of healthy food options, such as in neighbourhoods or at transit hubs (Metro Vancouver, 2017). Within Calgary's and Edmonton's MDPs, the opportunity for local food production, such as community gardens, are not stated in detail, and this perhaps indirectly could assist with increasing opportunities for healthy food choices (City of Calgary, 2013; City of Edmonton, 2010). Winnipeg, Edmonton, and Calgary focused more on regional food system production within city limits, such as through large scale farms regionally to support local farmers (City of Calgary, 2013; City of Edmonton, 2010; City of Winnipeg, 2011a). Their plans appear to lack focus on healthy food access for all citizens. While urban design is an integral component of complete communities, such as for accessibility and uniqueness, a focus on architecture was missing from Vancouver and Winnipeg. Edmonton and Calgary discussed the importance of architecture, such as through beauty and visually permeable materials, as a way to integrate land use, promote a sense of place, and to create a civic identity (City of Calgary, 2013; City of Edmonton, 2010). The similarities and differences within the complete community conceptualization of the four municipalities are shown in Table 2, categorized by built environment factors identified to be important for health in the academic literature. These evidence-based built environment factors in turn were used within

our study to create an index of community completeness centered on health and wellbeing, that was used to target different neighbourhoods for study participant recruitment. These factors were also integrated into a framework for analyzing the components of complete communities that impact the experiences of health and wellbeing among this study's participants.

Table 2. Complete Community Components of Western Canadian Cities

Cities	Housing Types	Walkability	Mixed use	Multimodal Transportation	Greenspace	Healthy Food Access	Design
Edmonton	✓	✓	✓	✓	✓		✓
Calgary	✓	✓	✓	✓	✓		✓
Winnipeg	✓	✓	✓	✓	✓		
Vancouver	✓	✓	✓	✓	✓	✓	

2.4 Summary

The grey literature surrounding the topic of complete communities is increasing, such as in the inclusion of the concept in municipal plans. In addition to explicit mention of complete communities, dense, mixed-use planning, walkability, multimodal transportation, aging in place, and greenspace appear to be valued directions and characteristics in the municipal plans of all four Western Canadian municipalities examined. Since these factors have been shown by the research to have important impacts on health outcomes such as physical activity and social connections, the inclusion of the complete communities concept and the components encompassing these factors offers the possibility of health considerations integration in the new directions that municipalities are going with their developments. However, a key gap in the

grey literature is the lack of focus on the following areas: healthy food accessibility as a key component of mixed use; distinguishing active from passive or sedentary forms of recreation in recreation access and leisure amenities considerations; considerations for design; inclusion of older adults' opinions and experiences. These areas need to be addressed in order to maximize the age friendliness of our spaces.

3. Literature Review

3.1 Built Environment and Health

The association of built environment factors and health, both positive and negative, are increasingly being examined. They help to identify potential ways to improve the health and wellbeing of the population. While there is a vast array of built environment factors that have been found to be associated with health outcomes, six key built environment factors included in the four Canadian MDPs reviewed are: green space, healthy food access, walkability, multimodal transportation, residential density, and mixed-use planning will be examined. Due to the intertwined nature of density and mixed-use planning, these two components will be examined concurrently with each of the following topics: walkability and multimodal transportation, green space, and healthy food access. The section below details the relationships found in the academic literature between the six built environment factors and health outcomes (and thus help to identify the components of complete communities that are important for health).

3.2 Walkability and Active Transportation

Research pertaining to the walkability and active transportation has been increasing in public health, urban planning, preventive medicine, and other fields related to land use and health (Farkas et al., 2019; Frank et al., 2010; Van Cauwenberg et al., 2018). This is due to the increased understanding of the associations between the built environment and health outcomes, in particular the promotion of physical activity among citizens thorough urban design (Barnett et al., 2017; Van Cauwenberg et al., 2016).

Walkability and active transportation are associated with increased physical activity of individuals. Physical activity across the life course has been shown to prevent cancers, cardiovascular disease, diabetes, obesity, and various other chronic diseases (Farkas et al., 2019; Wahid et al., 2016; Warburton et al., 2006), now the leading causes of mortality in Canada (Statistics Canada, 2019a). Currently in Canada, it is recommended that youth engage in a minimum of “60 min of moderate to vigorous-intensity physical activity [MVPA] daily” (Tremblay et al., 2011, p.40), with both adults and seniors partaking in a minimum of 150 minutes of MVPA weekly, in bouts of at least ten minutes. Positive health impacts are observed as these minimums are surpassed. The biggest impacts for health are seen at the bottom of the activity range (Tremblay et al., 2011), when people transition from inactivity to at least some activity. Recent research has indicated that 16% of Canadian adults achieve the MVPA guidelines, which has profound health and economic impacts with the estimated total of indirect and direct healthcare costs of inactivity reaching \$6.8 billion in 2009 (Clarke et al., 2019; Janssen, 2012). More walkable and active transportation-supportive neighbourhoods have been shown to be associated with increased overall activity levels, which in turn can improve the health and wellbeing of citizens (G. R. McCormack & Shiell, 2011; Public Health Agency of Canada, 2018b).

Walkability can be understood as the ability for an individual to walk to various destinations within their neighbourhood. A commonly utilized conceptualization of walkability is an objectively measured index proposed by Frank et al. (2010), which includes the components of residential density, connectivity of streets, pedestrian access, and mixed land use within an area. Spaces that have various destinations within walking distance, are highly

connected with high accessibility, and high residential density are considered to be highly walkable (Frank et al., 2010; Van Cauwenberg et al., 2016). Residential density facilitates walkability by creating economically sustainable spaces for businesses and services nearby, while increasing the number of people who may partake in walking behaviour (Frank et al., 2010; G. R. McCormack & Shiell, 2011). Various reviews have evaluated walkability based on a framework created by Pikora et al, (2003), which identifies four neighbourhood characteristics associated with walking including destinations, functional features such as density or neighbourhood typology, aesthetic features, and safety (Brownson et al., 2009; Ding & Gebel, 2012; Farkas et al., 2019; G. McCormack et al., 2004). Aesthetic and urban design features, such as tree lined streets, architecture, or public art have been shown to be associated with walking behaviour; however due to the subjective nature of aesthetic elements, the determination of impact is not yet conclusive (Cerin et al., 2017; Choi et al., 2017; Farkas et al., 2019; Salvo et al., 2018). Lastly, highly walkable neighbourhoods with nearby amenities have been shown to improve social capital for residents, as personal connections and sense of place are heightened due to increased social interaction (Mazumdar et al., 2018). Overall, it can be argued that walkability includes a wide variety of characteristics; however, density, connectivity, and mixed-use destinations appear to be the biggest predictors of walking (Cerin et al., 2017; Farkas et al., 2019; G. R. McCormack & Shiell, 2011; M. Smith et al., 2017).

The overall design of the streetscape of a particular neighbourhood or space can be associated with health outcomes of individuals through direct and indirect pathways. Different road typologies, such as highways, arterial roads, and woonerfs, which are roads that share space between pedestrians and motorists (Biddulph, 2012), can influence walking behaviour

across the life course due to differences in speed limits and walking amenities such as crosswalks (Stoker et al., 2015). In addition to roads, it has been shown in available research that grid networks within neighbourhoods, due to the higher number of connections and typically shorter blocks to destinations, are associated with physical activity through increased active transport to destinations (Sharifi, 2019). However, mixed-use destinations such as parks or restaurants uses can promote physical activity through active transport (Ewing et al., 2016; G. R. McCormack & Shiell, 2011). Amenities in pedestrian heavy locations such as benches, garbage cans, planter boxes, and lighting have been shown to be associated with increased physical activity as these assists in meeting needs for various people, such as places to rest for the elderly (Ewing et al., 2016; Hassen & Kaufman, 2016; Stoker et al., 2015). Architecture impacts should also be considered when designing urban spaces, as human scale design, and visually permeable façades should be incorporated, as it has been associated to increase perceptions of safety and sense of place (Ewing et al., 2016; Hassen & Kaufman, 2016; Sharifi, 2019). Additionally, architecture and interior built environments can be used to encourage regular physical activity. For example, stair use supported by access to staircases, signage and design interventions can be used to promote health, with a Harvard Alumni men's study finding that those who took 20-34 floors of stairs a week reduced their risk of stroke by 29% (Lee I-Min & Paffenbarger Ralph S., 1998; K. K. Lee et al., 2012; Ruff et al., 2014). Building height, placement, road widths, and materials should be considered, as these details can create heat pockets in the winter or provide cooling effects in the summer, both of which can be associated to encourage pedestrian activity (Sharifi, 2019). Lastly, providing walkable spaces not only increases health through physical activity, but also have also been found to be associated with

improved social wellbeing through social capital and social connections (Giles-Corti et al., 2016; Hassen & Kaufman, 2016; Mazumdar et al., 2018).

Active transportation can be understood to be either walking or biking for the purpose of transportation, such as to one's job, and does not include walking or biking for leisure (Cerin et al., 2017; de Nazelle et al., 2011; G. R. McCormack & Shiell, 2011; Mueller et al., 2015). The utilization of walking or biking to and from public transportation locations, such as bus stops or transit hubs can also be included within the realm of active transport (Cerin et al., 2017; G. R. McCormack & Shiell, 2011). It has been found that increasing access to public transportation can improve light to moderate-intensity physical activity (LMPA) by roughly 35 minutes a week, which is roughly one fifth of the WHO moderate-intensity physical activity recommendation of 150 minutes a week (Xiao et al., 2019). Similarly to walkability, active transport is supported by density, mixed use planning, connectivity, and accessibility (Cerin et al., 2017; de Nazelle et al., 2011; G. R. McCormack & Shiell, 2011). Density and mixed-use planning are requirements for effective public transportation, as low-density sprawl creates economic challenges for municipalities due to low ridership and higher maintenance costs (Bhatta, 2010; Hancock et al., 2017; Xiao et al., 2019). Walkability and active transport are also related to the concept of accessibility share, with the ability to complete daily trips within ones' neighbourhood a part of community completeness and contributing to improving physical activity (McArthur, 2018; Merlin, 2014). Through supporting the utilization of bikes, features such as bike lanes, bicycle parking, and other bicycle infrastructure, can assist in increasing ridership (de Nazelle et al., 2011; Pucher et al., 2010). However, in one review, residential density was not associated with increased biking behaviour (G. R. McCormack & Shiell, 2011). Overall, the promotion and

implementation of active transport can improve health of citizens by increasing physical activity, with biking in particular having potential to assist Canadians in meeting MVPA minimums (Tremblay et al., 2011; Xiao et al., 2019).

The perception of safety in a neighbourhood is important to both active transport and walkability, as a decreased sense of safety may inhibit people from participating in non-vehicular modes of transportation. Fear is understood to be a negative emotional reaction to perceptions of crime or threats to personal safety that may arise from experiences, knowledge, perceptions, or materials that people associate with crime or personal threats (Foster & Giles-Corti, 2008). Both objective and subjective measures of safety are used in studies, however, subjective experiences of safety are important to understand, as it can be related to the WHO's conceptualization of health, which defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 2006). Pedestrian friendly amenities such as curb extensions, raised crosswalks, lower speed limits, and separation from vehicular traffic have been associated with both objective and subjective measures of safety for pedestrians, while improving pedestrian connectivity (de Nazelle et al., 2011; M. Smith et al., 2017; Stoker et al., 2015). Perceptions of crime in one's neighbourhood has been shown to be associated with decreased physical activity, which can contribute to negative health effects, however, objective measures of crime have been inconsistently associated with health impacts (Cerin et al., 2017; Foster & Giles-Corti, 2008; Rees-Punia et al., 2018; Yu & Lippert, 2016). Nevertheless, due to their ability to affect perceptions of safety, it is suggested that litter be cleaned up, lighting be improved, and other interventions used to improve the sense of safety (Garvin et al., 2012; Hayward et al., 2015; G. R. McCormack &

Shiell, 2011). By improving pedestrian perceptions of safety, physical activity has been associated to increase, as well as mental health, which can improve the health and wellbeing of residents.

3.3 Green Space

Green space within the world of academia can be understood to be a variety of spaces, such as natural green spaces, parks, or walking trails (Hunter et al., 2019). Research has increased in this area because of environmental aspects, but also due to the important health and wellbeing impacts they can have on individuals. The higher rates of urbanization can be a contributing factor, as the higher proportion of urban dwellers can pose challenges to green space access in cities.

Green space has been associated to improve health and wellbeing of citizens through a variety of pathways, with increased physical activity playing an important role in this process. Increased access to parks, trails, and other forms of greenspace provide settings for increased physical activity such as walking, sports, or biking (Hunter et al., 2019; A. Lee et al., 2015; G. R. McCormack & Shiell, 2011). These spaces are argued to be vital for children and adolescents, as increased access and usage of greenspaces within this age group are correlated with increased physical activity through the life course, contributing to decreased long term risks of non-communicable diseases such as obesity and cancer (Douglas et al., 2017). The availability of greenspaces has been associated to improve not only physical activity through walking, but also has been shown to improve the probability of people increasing their MVPA through other activities (Hunter et al., 2019; Kondo et al., 2018). However, just improving greenspace with

amenities such as outdoor gyms or renovated parks is not enough to improve physical activity, as promotion of uses and amenities are needed to help meet desired physical activity outcomes (Hunter et al., 2019).

Overall greenspace has been studied in conjunction with various physical health outcomes across the life course. Increased access to greenspace has been associated to improve cardiovascular health, decrease mortality, lower risk of diabetes and stroke, decrease cortisol and LDL, and incidents of obesity (Douglas et al., 2017; Fong et al., 2018; Kondo et al., 2018; Twohig-Bennett & Jones, 2018). It is suggested that these outcomes are caused by the increased rate of physical activity that typically occurs in greener areas, as physical activity is a protective factor for non-communicable diseases (Tremblay et al., 2011; Warburton et al., 2006). Secondly, negative health impacts are also influenced by social wellbeing, as increased social connections and other forms of social capital are associated to decrease stress and social isolation (Fong et al., 2018; A. Lee et al., 2015; Mazumdar et al., 2018). Greenspaces play an important role in facilitating these social connections, as they provide space for interaction between residents and strangers, can improve accessibility to walkable amenities, and create a sense of place (Fong et al., 2018; Mazumdar et al., 2018; G. R. McCormack & Shiell, 2011). Accessibility of such spaces are a determinant of use, with the ideal distance to be a five minute walk (A. Lee et al., 2015); however, low socioeconomic status neighbourhoods tend to have less available of green space, which highlights the complex nature of greenspace and health (Dahmann et al., 2010). Overall, the availability of greenspaces can assist in improving both physical and social health, while playing a vital role in improving health equity among urban dwellers, which may decrease healthcare costs that may result from NCD's.

The relationship between greenspace and mental health has been researched quite extensively in recent years as the evidence surrounding the potential benefits of greenspace exposure on improving wellbeing has been growing. Various reviews and studies have identified the potential of greenspace, both in access and green streets, to decrease depressive symptoms in individuals (Douglas et al., 2017; Fong et al., 2018; Hunter et al., 2019). Secondly, access to greenspace has been associated with decreased levels of perceived stress in individuals, as it can provide a calm restorative space that improves mood, which can also improve physical health such as lower risk of cardiovascular illness (Douglas et al., 2017; Kondo et al., 2018; R. Wang et al., 2019). Additionally, it is associated that parks can play a big role in decreasing stress in adults through increases social connections with other local citizens, while also increasing physical activity (Douglas et al., 2017). Accessibility to greenspace may play an important role in the development of children and adolescents, as it is associated that increased greenspace may assist in mitigating ADHD symptoms, improve focus, and possibly increase working memory (de Keijzer et al., 2016; Douglas et al., 2017; Kondo et al., 2018). Overall, various studies provide encouraging evidence that greenspace has various positive effects on mental health, it is important to understand that it is not entirely conclusive as there have not been many longitudinal studies complete (Fong et al., 2018; Gascon et al., 2015).

3.4 Food Environments

Nutrition in daily diet plays an important role in the overall health and wellbeing of individuals as a healthy diet has protective factors against chronic diseases such as cancer and obesity (Vandevijvere et al., 2013). Currently, an unhealthy diet is a common occurrence in the

Canadian population (Garriguet, 2009), which is “the leading risk for death and the second leading risk of disability in Canada” (Bacon et al., 2019, p. 393). This is a result of the low consumption of fruits, nuts, and vegetables, combined with the rise in consumption of processed foods, sugary foods, high intakes of sodium, and high caloric meals (Bacon et al., 2019). Consequently, this raises the risk of hypertension, diabetes, cancer, and obesity (Bacon et al., 2019; Lieffers et al., 2018; Schiffrian et al., 2016). The economic cost of the increasingly poor diet of Canadians was estimated in 2016 to cost \$13.8 billion dollars (Lieffers et al., 2018), which indicates the need to address diet concerns immediately. As a result of this need, there has been a growing interest in examining the role that food environments have on the health and wellbeing of individuals (Mahendra et al., 2017).

Glanz and colleagues (2005) healthy nutritional environment framework has underpinned many research endeavours regarding healthy food environments, as it provides analysis on various contextual and environmental factors (Glanz et al., 2005; Mahendra et al., 2017; Minaker et al., 2016; Stevenson et al., 2019). Within this framework, there are four food environments: organizational environment, such as work or school, the media environment, which refers to aspects such as advertisement or government reports; consumer environment, such as the availability of healthy food options within stores and nutrition information of food; and community environment, which relates to the location and accessibility of food stores (Glanz et al., 2005). While all factors are important, due to the built environment focus, only consumer, organizational home environment, and community environment will be utilized. These are vital as all three environments go hand in hand, as the home environment is influenced by food availability at nearby locations, with the consumer environment dictating

which foods are available within stores, and the community network determining the accessibility, distribution, and availability of food sources. Within Canada, the overall food environment is inconsistently associated with diet quality, however, the food environment and body mass index (BMI) is more consistently associated (Minaker et al., 2016; Stevenson et al., 2019). This may be an outcome of accessibility of food locations, but also may be a function of affordability of healthy food options (Minaker et al., 2016; Stevenson et al., 2019).

These points lead into the concept of food deserts, which is understood to be spaces, typically of lower socioeconomic status (SES), that have poor accessibility to affordable healthy food options such as grocery stores (Walker et al., 2010). Food desert research commonly utilizes a 1 kilometer distance to determine healthy food access, such as grocery stores or supermarkets, for individuals within a particular neighbourhood, which includes real distance/road network or radius (Lu & Qiu, 2015; Minaker et al., 2016; Robitaille & Paquette, 2020; H. Wang et al., 2014; Yang et al., 2020). This can be concern for the health and wellbeing of individuals within these spaces as this may contribute to unhealthy eating behaviours. While these spaces can commonly be found in the United States of America, research has demonstrated that food deserts are a rarity in Canada, such as in Edmonton, as low SES spaces have higher access to grocery stores than high SES neighbourhoods (Minaker et al., 2016). However, Canada is not void of poor food environments, as food swamps are routinely found. Food swamps are defined as “neighbourhoods that are both materially deprived and have high geographic access to food retailers perceived as promoting mainly minimally nutritious food options such as fast food outlets and convenience stores” (Minaker et al., 2016, p. 4). These spaces can potentially be associated with obesogenic environments, which are spaces that

promote obesity through lack of access to healthy food options and poor physical activity spaces (Martínez-García et al., 2019; Rendina et al., 2019). Food swamps fit together with the previously discussed consumer and community environment, as cost and accessibility of food may influence health, such as BMI (Glanz et al., 2005; Stevenson et al., 2019). In order to combat these challenges, interventions such as community gardens, zoning changes, removal of supermarket covenants, balance and density of healthy food options, farmers markets, healthy corner stores, and small local stores with healthy food have been proposed (Cameron et al., 2010; Le et al., 2016; Mah et al., 2017, 2018; Mahendra et al., 2017; Minaker et al., 2016; Polsky et al., 2016; H. Wang et al., 2014). As a result of these changes, especially in regard to food swamps and other SES challenged spaces, food environment interventions can be seen as health equity opportunities (Minaker et al., 2016).

3.5 Built Environment Impacts on Older Adults' Health

Due to the aging process, older adults experience the built environment in a different manner than younger populations. This creates challenges in built environment design and becomes important to understand the challenges this demographic faces. This section will identify the physical health of older adults, such as morbidity, physical activity, and chronic diseases. Additionally, it will draw on literature to identify avenues in which the built environment impacts the health and wellbeing of older adults.

3.5.1 Physical Health of Older Adults

By the year 2036, the older adult population in Canada is expected to be roughly one quarter of all Canadians (Statistics Canada, 2010). While the baby boomer cohort has various definitions, it may be understood to be individuals born between the years of 1946 and 1964 (Pruchno, 2012). The aging population can be attributed to increases in both lower fertility rates, which in 2016 was 1.54 (Provencher et al., 2018), and increased life expectancy, which was 82 years in 2016 (Christensen et al., 2009; Statistics Canada, 2016). While increased longevity is a positive thing for individuals, it does pose health challenges as older adults do face increased rates of chronic disease. As a result, it is important to understand the health challenges they face, especially in regard to their relationship to the built environment as municipalities have begun implementing policies to assist older adults to live within their communities longer.

As the body ages, it becomes increasingly worn down over years of use, which in turn can increase the risk of certain diseases and also may develop various conditions. As a result, due to factors such as the accumulation of health impacts over their life course and genetics, older adults are prone to higher rates of morbidity, which impact their health and wellbeing, and ultimately their quality of life (Christensen et al., 2009). However, through various factors such as exercise, a healthy diet, and stopping tobacco use, aspects and negative health consequences that may arise from morbidity may not be completely preventable, but may be mitigated and delayed (Benjamin Emelia J. et al., 2017; Piepoli et al., 2016; Tremblay et al., 2011; Warburton et al., 2006). This may be understood as the compression of morbidity, which is theory developed by James Fries, and states that through positive health behaviours, such as

exercise and diet, that the age of first morbidity can be increased to limit the number of years that one may experience with morbidities (Fries, 2005). He argues that through multiple longitudinal studies, such as the University of Pennsylvania and runners studies, which demonstrated through good health behaviours that “disability was postponed by 8.3 years” (p. 6) and by 12 years, respectively (Fries et al., 2011). However, while there have been some studies indicating a compression of morbidity through healthier behaviours across the life course, some authors have disregarded the theory, due to lack of widespread evidence across multiple nations, if loss of mobility is considered, and because morbidity prevention has not been decreased as much as mortality has (Chatterji et al., 2015; Crimmins, 2015; Crimmins & Beltrán-Sánchez, 2011).

NCD's are a significant concern for this population, such as cardiovascular disease (CVD), which is typically caused by atherosclerosis that occurs over the life course and can lead to heart attack or stroke (Andrawes et al., 2005). Due to the life course, older adults have higher incidences of acute myocardial infarction, ischemic heart disease, and heart failure (Public Health Agency of Canada, 2018a), which played role in CVD being the second and third leading cause of death for Canada in 2018 (Statistics Canada, 2019a). Cancer is another major NCD that impacts older adults, as it was the leading cause of death in 2018 (Statistics Canada, 2019a), with approximately 90% of diagnosis and 96% of cancer deaths occurring in Canadians over the age of 50 (Canadian Cancer Statistics Advisory Committee, 2019). Osteoporosis is another NCD that disproportionately impacts older adults, especially women, which is the decreasing bone density and can increase the risk of broken bones (Wade et al., 2014). Obesity is another health risk, as the overweight population is growing in Canada, with 34.6% and 26.7% of the older

adult population being overweight or obese, respectively, with a higher proportion of men at 40.8% and 34.7% respectively (Statistics Canada, 2015; Twells et al., 2014). There is an argument surrounding the obesity paradox, which argues that while being overweight in earlier years of life is detrimental, that a higher BMI may have protective factors against mortality, especially those who already have chronic conditions (DeCaria et al., 2012; Lavie et al., 2014; Oreopoulos et al., 2008). However, obesity in individuals is a common cause of multimorbidity, having two or more chronic diseases, and also impacts older adults significantly (Roberts et al., 2015). Lastly, osteoarthritis is a significant concern for this population, with 45% of older adults in Canada with the condition (MacDonald et al., 2014), which is the degradation of cartilage causing joint pain, swelling, and limit mobility (Kraus et al., 2015), thus decreasing physical activity and may play a role in developing sarcopenia and its resulting consequences (Evans, 2010; Seene & Kaasik, 2012). Overall, older adults face a wide variety of physical health challenges, with NCD's and chronic disease playing an important role in their overall health and wellbeing.

3.5.2 Older Adults' Health Relationship with the Built Environment

As discussed, in comparison to the general population, older adults face a higher rate of NCD's which detrimentally impact their quality of life. While there is a plethora of complex factors that may influence their overall health, for the purpose of this section, the built environment will be taken into consideration.

Research has routinely demonstrated the important role of physical activity in protecting against poor physical and mental health problems that plague older adults, such as

obesity, diabetes, cardiovascular diseases and cancer (Farkas et al., 2019; Warburton et al., 2006). Furthermore, while it may seem counterintuitive to some, physical activity can also play a role in preventing the pain caused by osteoarthritis, which is a common ailment in older adults (Kraus et al., 2015; MacDonald et al., 2014). This is an important consideration as the older population is more reliant on the built environment to meet their daily needs than the general population. This is due to various factors, such as the loss of their driver's license, requirements for smaller spatial distances, and mobility issues (Kerr et al., 2012). As a result, the built environment impacts are may be even more significant for promoting older adults' health.

Highly walkable spaces promote health and wellbeing by encouraging walking and other forms of active transportation, which in turn increase the ability to partake in physical activity (G. R. McCormack & Shiell, 2011). However, due to lower mobility and other physical challenges, older adults face increased challenges in navigating the built environment. Aspects such as cracked sidewalks, potholes, low quality foot paths, and poor weather-related maintenance are barriers to walking for older adults, as they pose increased risk of falling or other negative outcomes (Garvin et al., 2012; Salvo et al., 2018; Van Cauwenberg et al., 2018). Secondly, perceptions of safety appear to play an important role in older adults desire to partake in active transport, as increased perceptions of safety, such as increased lighting, less physical disorder, or more eyes on the street, play an encouraging role in physical activity (Barnett et al., 2017; Cerin et al., 2017; Garvin et al., 2012; Salvo et al., 2018; Van Cauwenberg et al., 2018). Lastly, reflecting the results from other demographics, older adults appear to

engage in increased physical activity if the walkable spaces are aesthetically appealing (Cerin et al., 2017; Salvo et al., 2018).

Density and amenities that are nearby can play a vital role in the health and wellbeing for older adults through two pathways: increased access to various services, and reduced barriers to active transportation (Kerr et al., 2012; Salvo et al., 2018). By allowing older adults to meet their needs independently, public transportation is associated with promoting health, wellbeing, mobility, independence, and accessibility for older adults (Cerin et al., 2017; Gardner, 2011; Kerr et al., 2012; Van Cauwenberg et al., 2018), since the loss of ones' ability to drive limits access and reduces their sense of independence (Kerr et al., 2012; Yassuda et al., 1997). However, density and population are needed to facilitate effective public transportation, as sprawl provides economic challenges for efficient transportation (Bhatta, 2010). Another facilitator of health through density is mixed use planning, by which proper design can allow for the placement of not only essential services for older adults, but also third spaces and transitory zones, which are "inclusive public spaces where older residents feel a ownership and belonging" (Gardner, 2011, p. 267), such as cafes. Density and mixed use planning support these third spaces, parks, and can also promote relationships to neighbours, and chance interactions with others, which in turn can increase older adults' ability to age in place, improve social capital, mental health, and wellbeing by promoting both social connectedness and sense of belonging, while reducing social isolation (Dupuis-Blanchard et al., 2015; Gardner, 2011; Kerr et al., 2012; Mazumdar et al., 2018; Salvo et al., 2018). Additionally, these spaces can improve physical health of individuals, as the increased potential of physical activity can play protective factors to NCD's (Farkas et al., 2019; Warburton et al., 2006). Physical activity not only improves

physical health, but has been associated to improve both cognitive and mental health, as increased physical activity can improve brain plasticity, neurogenesis, improve cognitive functioning in people with Alzheimer's, improve depression, and executive control processes (Cotman & Berchtold, 2002; Hillman et al., 2008; Lautenschlager et al., 2008)

Aging in place is related to the aspects of the built environment outlined above. Aging in place can be understood to be older adults' ability to age as long as possible within their home and community, rather than moving prematurely to living facilities or new spaces (Dalmer, 2019; Iecovich, 2014). To date, aging in place research has focused on the home environment, but recently fields of urban planning and environmental gerontology have demonstrated the importance of neighbourhood environments for both health and wellbeing (Oswald et al., 2011; Wiles et al., 2012). Social connectedness is a central part of aging in place, as the social connection and support between friends, neighbours, family, and strangers, promotes health and wellbeing of older adults, while also improving quality of life (Dupuis-Blanchard et al., 2015; Gardner, 2011; Iecovich, 2014; Wiles et al., 2012). This positive relationship with people and spaces can also facilitate a sense of place, the foundation of aging in place (Iecovich, 2014), and is understood to be the transition of space, one that has no previous emotional experience, to place, which is a space that has emotional experience and attachment (Foote & Azaryahu, 2009). There has been criticism surrounding the implementation of aging in place policy, as some have argued that it follows a deinstitutionalization strategy, in which governments promote older adults to live as long as possible in their communities in order to limit the financial burden of institutional care costs of the growing older adult population (Dalmer, 2019; Iecovich, 2014; Sixsmith & Sixsmith, 2008). However, by understanding the value placed by

older adults on their desire to stay in their communities for independence and social connection, this criticism may not be as relevant to older adults' experiences. Overall, the emotional and social connectedness of ones' neighbourhood is a vital factor in the overall support of older adults to age in place.

Age friendly cities are a growing facet of aging in place policy, as the overall design of cities are now being considered to promote the health and wellbeing of older adults. These inclusive, accessible, and empowering spaces enable the active aging of individuals, with overall design and services to promote older adults' health, wellbeing, and participation into daily life (Fitzgerald & Caro, 2014; Kano et al., 2018; Plouffe & Kalache, 2011). The WHO have created an age friendly guidelines document that assists cities and other government bodies in the development of these spaces, and include the following eight pillars: outdoor spaces and buildings, housing, transportation, community support and health services, social participation, communication and information, civic participation and employment, and respect and inclusion (World Health Organization, 2007). While each component outlines specific and broad interventions to improve the lives of older adults, the list demonstrates the overall intersection between the built environment, health and wellbeing, and social environment of ones' life (Fitzgerald & Caro, 2014; Kerr et al., 2012; Lui et al., 2009). This sentiment is echoed through previously discussed conceptualizations of aging in place in academic literature, but also through the concerns raised through qualitative research of older adults on their perceptions of aging in place (Dupuis-Blanchard et al., 2015; Iecovich, 2014; Kerr et al., 2012; Wiles et al., 2012). However, Fitzgerald and Caro (2014), have identified how climate, topography, population density, health services access, and social organization are preconditions of effective

age friendly policy, as these components will impact the overall design and implementation of such endeavours. Overall, an age friendly city is a space that facilitates health and wellbeing through both social and built environments, is one of enablement, and not only improves the lives of older adults, but also of all ages and abilities (Plouffe & Kalache, 2011). It is an effective policy tool to assist cities in meeting aging in place goals, while demonstrating the value of older adults and their lived experience.

3.6 Local Context

In comparison to other major metropolises of the world, cities in Canada tend to be characterized by large suburban sprawl (Hancock et al., 2017), with Edmonton being no exception. Edmonton is a low density, sprawling Northern city that has cold, long winters with hot short summers, and an ageing population (Cheesbrough et al., 2019; Garvin et al., 2012). Additionally, while more recent analyses have not been conducted, a report in 2012 scored urban sprawl in Canada, with higher values meaning increased sprawl, and out of the major cities Edmonton scored 0.38, with Vancouver scoring -1.65, Calgary scoring -0.35, and Winnipeg scoring 0.05 in comparison (Seliske et al., 2012). Low density areas are not conducive to successful aging, as the sprawl presents challenges to accessibility, mobility, and health, as these spaces tend to provide low walkability, poor public transportation, and possible contributions to social isolation (Bhatta, 2010; Cerin et al., 2017; Hancock et al., 2017). The 2019 census revealed that the city has a population of 972,223 (City of Edmonton, 2019b), with a metropolitan population of 1.3 million (Statistics Canada, 2019b). A recent study of Edmonton demonstrated how population aging, which is the proportion of older adults to the rest of the

population, “is distributed in a radial pattern, with a higher degree concentrated in the center of the city, and the intensity decreasing farther away from the center” (Chen, Bouferguene, Shirgaokar, & Al-Hussein, 2020, p. 6).

Since 2007, the City of Edmonton has taken steps to improve aging in place policy (City of Edmonton Community Services, 2007), such as by introducing an age friendly design guidelines and becoming an WHO age friendly city in 2010 (City of Edmonton, 2018; Edmonton Seniors Coordinating Council, 2011), which indicates an increased commitment to the improvement of the health and wellbeing of older adults. Furthermore, these interventions and policies also suggest the city’s understanding of the built environment as an SDH for older adults. However, recent reports have indicated built environment features negatively impacting effective age friendly policy implementation in Edmonton, which include a lack of social interconnectedness, lack of age friendly amenities, and weak transportation support (City of Edmonton, 2017). Overall, with the rising older population in Edmonton, along with the efforts put forth by the city, it is important to understand the built environment impacts on the health and wellbeing of older adults, while situating the local context in perspective.

3.7 Summary

Outside of the grey literature, the conceptualization of complete communities is lacking in both quality and quantity. There is a lack of literature defining complete communities and its components. However, the current academic literature on the built environment’s association with health and wellbeing of the general population is quite strong, with various built environment factors identified in playing a facilitating or hindering role in the pursuit of health

and wellbeing. The more general built environment literature can thus be used as a strong foundation for the development and inquiry of complete community conceptualization centered on health and wellbeing and defining potential components relevant to the health and wellbeing, including for older adults. Various studies examining singular or related built environment features' influence on the health and wellbeing impacts of older adults, but there has been limited examination on neighbourhood scale studies exploring the holistic features and their cumulative influence on the health and wellbeing of older adults. This study addresses these gaps in the literature including creating an index for complete communities centered on health and wellbeing by using evidence-based built environment factors to assist in defining its possible components, using the index to distinguish neighbourhoods with different levels of community completeness from which to recruit study participants, and collecting data to better understand the relationships between complete communities components and the experiences of health and wellbeing in older adults in neighbourhoods defined to have high, medium and low community completeness.

4. Research Methods

4.1 Research Approach

A qualitative collective case study research approach was undertaken involving three Edmonton sites. These sites for comparison were selected based on an index of community completeness, with the index created through use of available data sets of six environmental factors associated with health that could be defined as potential components of a community completeness concept centered on health: greenspace, walkability, transit stops, mixed-use, mix of housing types, and healthy food access. A qualitative approach using photovoice and focus groups was chosen to explore in an in-depth manner participants' experiences of health and wellbeing and the relationship of these experiences to built environment factors in their neighbourhoods with different levels of community completeness. This study selected participants from the three sites across the city, allowing for the identification of important similarities and differences across the neighbourhood typologies. In each site, photovoice methodology was utilized that involved participants taking pictures of the built environment factors in their neighbourhoods, and subsequently engaging in a focus group discussion of their personal experiences and perspectives related to health and wellbeing pertaining to the photographs. The rest of the chapter will explain in-depth the various steps undertaken in the research process, while discussing the decision-making process in the methodology selection.

4.2 Collective Case Study Approach

A case study is a research method where a particular phenomenon is intensively studied and examined to understand the various contextual, relational, and experiential aspects in an in-depth manner (Hardwick, 2017; Heale & Twycross, 2018). This method was chosen as an appropriate method to allow for the exploration of the potential facets of complete communities that could impact health and wellbeing through the lens of older adults. A key component of case studies is the naturalistic value placed on study sites, as it allows for the exploration of the complexities of a case within its natural state, in this case older adults within their communities with different levels of community completeness, and not an experimental design that allows for the manipulation of various components (Crowe et al., 2011; Mayan, 2016). There are various types of case studies; such as descriptive, which explores theory prior to case analysis (Hardwick, 2017), or instrumental, which looks at a case and its unique phenomenon (Crowe et al., 2011). A collective case study approach was taken for this study. This approach utilizes an examination of multiple sites to develop a holistic awareness of a particular topic, but also allows for the comparison of the sites to learn the commonalities and differences of the spaces (Crowe et al., 2011; Hardwick, 2017). This can assist in facilitating the transferability of the findings to other locales (Hardwick, 2017).

Additionally, a collective case study approach was selected since the exploratory factor allows for asking the why, how, and what questions that can be overlooked in other methodologies and can identify gaps in interventions or existing approaches (Crowe et al., 2011). Furthermore, this process can allow for the evaluation of particular theories, values, or ideas, as the exploration of theoretical concepts can be stated before research to examine

these in particular spaces (Hardwick, 2017), which in this case is the examination of complete communities' experiences and their relationship to the experiences of health and wellbeing in older adults. Overall, the collective case study approach assists in developing an in-depth understanding of the complexities in community design on the lives of older adults in various communities, while allowing for cross examination of sites to identify similarities and commonalities. The next section will explain photovoice methodology.

4.3 Photovoice Methodology

Photovoice methodology was developed by Wang and Burris (1997), as a way for participants to utilize cameras to visually record components that they deem important within their community. This research method was originally constructed through the combination of documentary photography that utilizes visual data to explore experiences, empowerment education to allow for different participant groups to discuss critical aspects of one's life, and feminist theory which asserts that knowledge is experiential and must be examined in that manner (Sutton-Brown, 2014; C. Wang & Burris, 1997). These core ideas provide a conceptual foundation for exploring one's life through experiential photographs and for facilitating critical dialogue. As the methodology has developed, three main goals of photovoice have been identified: to allow participants to showcase and reflect on their relationship between themselves and their community's strengths and weaknesses; to allow small groups of individuals to utilize photographs to create critical discussion; and to ultimately inform policymakers and other stakeholders (C. Wang & Burris, 1997). Overall, the use of visual data as

an exploratory method of understanding experience was foundational to the development of photovoice methodology.

Visual information provides the opportunity to explore the unique experiences and perceptions that individuals may have, as photographs have the capacity to capture settings, experiences, contexts, and stories that may be challenging to express through other methods, such as surveys, interviews, and may be especially difficult in quantitative methodologies (Novek et al., 2012; van Hees et al., 2017; C. Wang & Burris, 1997). Furthermore, the use of photographs have the ability to induce reactions, emotions, experiences, and thoughts, especially in relation to the exploration of context, which allows for an increasingly holistic understanding of a setting (Carpiano, 2009; C. Wang & Burris, 1997). This can facilitate the exploration of older adults' experiences, as pictures may help bring back memories or assist in explaining particular circumstances (Carpiano, 2009; Novek et al., 2012). As a result, due to its ability to deeply explore context and experience, as well as place the participant as the expert in their lived experience, photovoice methodology allows for the understanding of place through the participants' lens. This lends itself strongly to Wang and Burris's (1997) values of facilitating critical dialogue and empowering less studied individuals. Furthermore, this methodology provides flexibility in the research process, as it allows for understanding of the participant's point of view, but also can be adapted to fit particular projects, populations, settings, and diverse issues (Nykiforuk et al., 2011; Sutton-Brown, 2014; C. Wang & Burris, 1997).

Photovoice methodology was selected for this study because it not only allows for the exploration of older adult's experiences pertaining to the built environment, but through their

expertise, may provide future opportunities to inform stakeholders for relevant community change. Photovoice can utilize either focus groups or interviews to explore the photographs, however, focus groups were chosen as appropriate as a collective understanding of themes and exploration of these themes through participant interaction provides rich understanding of experiences (Novek et al., 2012; Nykiforuk et al., 2011). Once the photographs are taken, participants and the researcher engage in a focus group to explore the importance of particular images that were selected (Belon et al., 2014; Novek et al., 2012; C. Wang & Burris, 1997). The combination of dialogue and photos provide the opportunity for a rich description of participants' experiences, which allows for the deeper understanding of complex issues and experiences (Belon et al., 2014; van Hees et al., 2017). Moreover, the use of photographs assists in the visualization of barriers or facilitators to health and wellbeing of older adults, while providing visual data to corresponding stories (Belon et al., 2014).

4.4 Neighbourhood Site Selection

Sites were selected based on an index that allowed comparisons of all neighborhoods in Edmonton using basic criteria that scored neighborhoods on housing diversity, transportation options, green space, grocery store availability, walkability, and mixed-use development. These characteristics were selected based on the complete community components that are being examined throughout this project. The data utilized to create the index was accessed through the City of Edmonton Open data portal, DMTI data sets, and data sets from H. Wang et al's (2014) food desert study. These included GIS shape files, GIS locations of grocery stores and businesses, data sets pertaining to business locations, housing diversity, and bus stops. The

types of data contained within these data sets and used to analyze complete community components consisted of GIS coordinates, spread sheets with various attributes, such as neighbourhood ID numbers and latitude and longitude coordinates, and data values. These values were converted into overall z-scores, which allows for understanding raw scores in relation to its deviation from the population mean (Rolle et al., 2006). Subsequently the scores were added across all six categories to calculate the total of z-scores. While this process is not precise, it was an approach to generally understand the various community completeness profiles of each neighbourhood within Edmonton.

Once the index evaluating the overall community completeness was created, neighbourhoods were ranked on a continuum from highest (most complete) to lowest (least complete). The scores were integrated into ArcGIS and were merged with the neighbourhood shapefiles to create a complete communities map, as seen in Appendix E, to visualize the completeness of the Edmonton neighbourhoods. This allowed for the selection of neighbourhoods that met the high, medium, and low complete criteria. Through this process, twenty possible neighbourhoods categorized into completeness levels of high, medium, and low were identified. Out of the twenty sites, three potential sites for focused participant recruitment were chosen through use of socioeconomic data and older adult population size of the neighbourhoods within each of the completeness categories. Efforts were made to ensure that community completeness was the main form of inquiry. Data from the 2016 Edmonton census were utilized to evaluate the older adult population of neighbourhoods within Edmonton, as this supports efforts to improve increased recruitment efforts within these spaces and to possibly gain a broader understanding of older adult experiences due to the

higher likelihood of participants. Secondly, in attempts to limit socioeconomic status impacts in each neighbourhood, the average home price within possible sites were examined, with neighbourhoods with the lowest prices within each completeness category selected. Home price was used as a rough estimate of socioeconomic status, as the municipal census data response rate for income was poorly responded to by citizens. The neighbourhoods of Brander Gardens (BG), Kilkenny (K), and Oliver (O) were selected as the main points of inquiry representing neighbourhoods from low, medium and high community completeness categories, respectively; however, due to recruitment challenges, immediately surrounding neighbourhoods to the three chosen neighbourhoods were also included in the recruitment process.

4.5 Recruitment and Sample Characteristics

A total of nine participants were recruited from the three neighbourhood study sites, which attempted to meet the recommended number of participants to facilitate an effective group discussion, which is six to ten participants per focus group (Novek et al., 2012; O.Nyumba et al., 2018; van Hees et al., 2017). However, the participants recruited were able to provide a rich description of their experiences, and the lower number may have facilitated a deeper conversation about their stories and experiences. There were attempts to recruit additional participants; however, due to the Covid-19 pandemic, recruitment procedures were halted to ensure the protection of older adults, since they are more prone to increased morbidity and mortality outcomes of Covid-19 (Zhou et al., 2020). Older adults were recruited through a combination of the following: engagement at senior centers, newspaper ads, community

networks, snowball sampling, and posters at recreation centers, community leagues, pharmacies and medical clinics. While random sampling for the population would have been ideal, the low numbers of potential participants initially recruited instigated the necessity to engage in snowball sampling, where participants were asked to recommend a few other participants. Recruitment efforts began in summer 2019 and continued to fall 2019. While the ability to take images during this time may be easier, it may limit the true understanding of older adults' experiences year-round as the winter months could not be deeply examined. Participants were selected based on the following inclusion criteria: 65 or older, free of any significant mental disabilities, ability to operate a camera, and independently mobile, either with or without a device. This criterion is needed as participants were required to take photos without potentially harming themselves and to ensure that participants were able to recall the meanings pertaining to the photographs during focus group discussion. The age of 65 was determined to be appropriate, as the Canadian government determines seniors to be over 65 (Statistics Canada, 2010, 2017), and also was the cutoff for other studies (Belon et al., 2014; Edwards & Dulai, 2018; Kondo, 2016; Vrkljan et al., 2011; Warner et al., 2017). Table 3 visualizes the characteristics of the participants in the research study. In total there were nine participants, with six female and three male individuals, an average age of 71.8, and a range of 66 to 78 years old.

Table 3: Participant Characteristics

Neighbourhood	Participants	Age	Gender
BG	2	75, 78	2 F
K	4	67, 71, 72, 66	2 F, 2 M
O	3	72, 72, 73	2 F, 1 M

4.6 Photovoice Research Process

4.6.1 Information Session

The photovoice data collection process followed the guidelines outlined by Sutton-Brown, (2014), Novek et al., (2012), and Wang & Burris, (1997). Once a group of participants were recruited, an orientation meeting was held to discuss the project's scope, with participants educated about the project, their responsibilities, the researchers' responsibilities, risks, benefits, and other aspects regarding the research. During this time, participants were asked to complete the information letter and consent forms which provided consent for their participation and also the use of their images to help convey themes. Initial meetings were held with participants from their respective areas, which allowed for individuals to meet other participants, as it may allow for easier dialogue during the future focus groups (Sutton-Brown, 2014). These orientation meetings were held in locations that the participants were familiar with, such as a friend's home, senior center, or church. In addition to outlining responsibilities, the orientation provided training for the use of the cameras selected. Older adults were also taught how to delete pictures from the camera, which provides the opportunity to take more images if they encounter more significant built environment components. This is a

recommended procedure for photovoice studies with older adult participants, as it ensures that everyone understands the use of cameras and to also double check the inclusionary criterion (Sutton-Brown, 2014). During this time some participants asked if they could use their camera phones to take images and send them to me via message or email, which I allowed. Furthermore, during this meeting the overall theme was discussed, with various example themes relating to complete community features provided, as was important for them to conceptualize built environment features that influence their health and wellbeing while providing some guidance for photo taking. However, an open-ended theme was provided as it creates the opportunity of themes to evolve from the data (Sutton-Brown, 2014).

Similarly to Sutton-Brown (2014), older adults had various questions pertaining to what constituted as appropriate photos, as they originally imagined only physical components, such as cracked sidewalks, to be acceptable. It was through discussions surrounding the value placed around their experiences of health and wellbeing that participants were able to understand the ability to capture experiences, emotions, social contexts, and stories through photos. Secondly, older adults were concerned about taking the perfect photo, as they wanted to do an excellent job in capturing the space-related issues they wanted to convey. However, this was a potential risk in limiting the breadth of data, but also possibly the personal safety of participants. As a result, it was stressed that perfect photos were not required, as the ability to discuss the photos in a focus group would allow for the exploration of themes or experiences that they would like to convey.

4.6.2 Data Collection: Photo-Taking and Focus Groups

Prior to the data collection process, a pilot process was undertaken with three human geography graduate students from the University of Alberta where, over three hours, the orientation, photo categorization, and focus group process were tested. The pilot test was done in conjunction with two of my supervisors, where the feedback from both professors and three graduate students were used to fine tune the data collection procedure. Over a two- to three-week period, participants were asked to take a maximum of 25 photographs that capture built environment features that influence their experiences of health and wellbeing. A cap is recommended for the number of photos, as each photo presents rich data, which can be challenging to sort through, especially with larger groups of participants (Garvin et al., 2012). The two- to three-week period provides participants the opportunity to take a variety of pictures in various weather conditions, day light levels, or the ability to capture places that were not immediately recognized as important, while also placing a time constraint to motivate participants (Garvin et al., 2012; Novek et al., 2012; van Hees et al., 2017). Secondly, the cap can encourage older adults to prioritize pictures that may be more prudent to their experiences as the limit forces them to choose the important ones. Participants were asked to keep a logbook of answers (Appendix D) pertaining to each photo, as this can assist in recalling various details for the focus group (Novek et al., 2012; van Hees et al., 2017). The logbook was adapted from van Hees et al., (2017) and asked participants to answer five questions: 1. When was the photograph taken? 2. Where was the photograph taken? 3. What is in the photograph? 4. What does the object or place in the photograph mean to you? 5. How does the experience with the object or place influence your health and wellbeing? The logbook questions also strive

to paint a holistic understanding around each particular photograph to create a comprehensive image of one's experience.

Once the participants from a particular section had completed their photographs, the cameras were collected; those who had requested to take pictures on their cellphones sent in their images. Following the collection of images, they were developed into physical copies and delivered to each participant. It was during this time that the participants were reminded to select the top ten images that they wanted to discuss from their collection, consistent with the recommended process to select images that one feels to be vital (Garvin et al., 2012; van Hees et al., 2017).

The focus group discussions were held at the orientation locations, as it provided accessibility to the participants, and can also assist in qualitative research through by providing a sense of familiarity that can help people open up more (Bryman & Bell, 2016). The 90-minute focus groups were planned to be held two weeks following the data collection process; however, due to scheduling conflicts and other difficulties, the focus groups were held after one month for Kilkenny, one and a half months for Brander Gardens, and two months for Oliver. As a result, the photo journal was vital to the success of this project. To begin the focus group, participants were asked to place their photographs on a poster that aligned with a category relevant to complete communities and wellness, as derived from previous literature poster category (table 2), which is a process outlined by Garvin et al., (2012). These were simplified so participants could understand these concepts with the goal of limiting the guidance of their picture taking experience. To provide some clarity, "transit" is understood to be transportation options, such as biking and bussing, "places that have stores and services that

“meet my needs” pertain to mixed use, and the “ease of getting around” is a reflection of walkability. The placement of photographs on the respective posters that captured particular experiences allows for the flow of dialogue which assisted in creating cross conversations between the participants (Garvin et al., 2012). During this time, roughly half the participants typically asked me questions about where their photo should be placed; however, to ensure that I did not guide them with my worldview, I would respond by asking them what experience they were trying to convey. This process allowed participants to explore their own perspectives and experiences, while also creating dialogue with other participants in regard to the photovoice study.

Table 4. List of Photovoice Poster Categories

Where it is easy to get around	Where is it hard to get around
Place/thing that contributes to a healthy diet	Place/thing that contributes to an unhealthy diet
Places with enough greenspace	Places that do not have enough greenspace
Place that have stores and services that meet my needs	Place that do not have stores and services that meet my needs
Places with enough transit options	Places without enough transit options
Places/things that bring me joy	Places/things that bring me unhappiness
Places where I feel safe	Places where I do not feel safe
Places/things that add character to my neighbourhood	Places/things that detract from my neighbourhoods’ character

Following the placement of photos, the oral component of the focus group began. Prior to the focus group, participants were thanked for their time, reminded about the audio recording and transcription process, and also advised about the ethical considerations of their participation, such that private, delicate, or detailed discussions of one’s life should be kept private within the confines of the focus group and not revealed to others. The audio was

recorded through two separate recorders, in case one malfunctioned. In order to begin the focus group, participants were asked to introduce themselves and to quickly explain their favourite part of their neighbourhood. Through active listening, this process allowed me to identify a category to initially explore, as the transition between a brief group discussion pertaining to an initial theme to a poster proved effective in engaging participants. Throughout the focus group, active listening guided the discussion between posters, which created a different dialogue stream through each; however, in every focus group, each poster was given the opportunity to be discussed. Following the discussion of the posters and photographs, the focus group concluded by asking the participants about a suggestion they would make to improve the built environment of their neighbourhood, which allowed an opportunity for participants to make meaningful personal suggestions. Due to the significant time commitment for the research process, each person received a \$25 gift card to a grocery store in their neighbourhood. The focus groups were audio recorded and transcribed into Word files, which were uploaded to the qualitative data analysis software program NVivo to allow for the data analysis process to begin.

Lastly, I include some reflections on field notes that pertained to the data collection process. Many of the participants were extremely keen on doing a good job throughout the data collection process, with many of them contacting me on multiple occasions to ensure that they were following the proper procedures. This demonstrated the commitment that each individual had to the research project, but also showcased their interest in advancing academic literature in hope of creating positive change. Furthermore, the majority of participants were quite participatory throughout the focus group, as each individual had personal opinions they

wanted to share, while also typically answering questions succinctly. However, there were times in which discussions were drifting quite a bit off of topic, which created a dilemma pertaining to my responsibility of intervening or allowing the side discussion to grow as it may reveal data that I was not expecting. For the majority, the discussions were allowed to drift; however, there were a few times in which I had to intervene to assist in centralizing the group back onto the research topic. Overall, the participants appeared to be quite involved throughout the research process and expressed gratitude at the conclusion of the focus group, which may demonstrate the benefit they saw in participating and helped reassure myself about the importance of the topic.

4.6.4 Data Analysis

Traditionally, photovoice methodology utilizes an inductive data analysis, but for this project deductive and inductive data analysis were undertaken (Fereday & Muir-Cochrane, 2006; Garvin et al., 2012). This allows for the understanding of emerging themes that participants identified as important, but also assists in meeting the research objectives, which was to understand older adults' values surrounding complete community components and the complete community framework. Furthermore, by having multiple sites, analyzing similarities and differences among sites is also possible. As a result, for deductive coding, codes were placed within the poster categories pertaining to allow for broad categorization of themes. Secondly, inductive coding, which emerged through latent content analysis and followed Mayan's guide, (2016), was used to examine the transcript and codes within the categories for important concerns or emerging themes (Garvin et al., 2012). These codes can expand on the

broader conceptualizations, identify emerging new ideas about other codes, or altogether create new themes (Fereday & Muir-Cochrane, 2006). Codes were limited to ten to twelve categories and will be examined for both internal and external homogeneity (Mayan, 2016). These were analyzed to determine the number of themes, which normally is between one to three (Mayan, 2016). The following sections will outline and describe the coding and data analysis process that was used in five steps.

Step 1: Initial Coding and Data Familiarization

Focus groups were conducted by myself, as the process of being present and forming discussions through active listening allowed me to gain an initial understanding of important ideas. Furthermore, the use of field notes during and after each focus group allowed me to highlight certain emotions, themes, ideas, and concerns that arose in each discussion, while also documenting group reactions to particular ideas that are difficult to identify over audio. Due to time constraints, the audio was transcribed by professionals.

Each transcript was initially coded deductively to the photo categories to meet the needs of one of the research outcomes. The categories were as follows (Table 2): where is it easy to get around, where is it hard to get around, places/things that contribute to a healthy diet, places/things that contribute to an unhealthy diet, places with enough greenspace, places without enough greenspace, places that have stores and services to meet my needs, places that do not have stores and services to meet my needs, places with enough transit options, places without transit options, places/things that bring me joy, places/things that bring me unhappiness, places where I feel safe, places where I don't feel safe, places/things that add character to my neighbourhood, and places/things that detract from my neighbourhoods

character. Furthermore, this allowed for guiding the data analysis process as the initial categories provided a framework in which to deeply explore the experiences of health and wellbeing of participants.

Step 2: Inductive Coding

Following the initial coding, each component was coded and evaluated inductively for themes that may arise throughout the data. This process followed the lens provided by photovoice methodology that asserts that participants are experts within their reality, which also falls within the social-constructivist epistemology. This assisted in providing a perspective to coding that attempted to understand the data through the worldview of the participants and not myself. In order to assist in this process, a series of questions were used to help tease out the deeper meanings of their experiences. The questions were as follows: how the participants talk about each category (positive or negative), what characteristics they identify, what promotes or hinders the utilization of neighbourhood characteristics. This allowed for the inductive coding to delve deeper, as experience-based codes were able to be developed to understand built environment impacts on various levels of influence such as personal to holistic. Thematic analysis was utilized to determine emerging themes, but also assisted in highlighting themes that crosscut various nodes.

Step 3: Creation of Categories

Concept maps were utilized to assist in developing themes and categories, with categories pertaining to a set of ideas that capture a group of codes and themes being abstract concepts that cut through categories to form ideas and stories (Mayan, 2016). These were done by hand on pieces of paper, as the flexibility in creating new documents to follow the

developing ideas was essential and assisted in lowering time commitments that software platforms may have created. Due to the deductive coding process initially undertaken, the categories were followed simply; however, the relationships between the various categories proved to be challenging. The inductive coding process in Step 2 facilitated the interconnected relationships between the various categories, but also evaluated the experiences of participants within the built environment features. This process in conjunction with mind mapping exercises created a level-based finding map, which indicated cross cutting themes that explained strongly the experiences of participants in various situations. The continuous development of both the mind maps and themes allowed for the evolution of crude codes and categories to become highly refined with coding depth and relationships that correctly portrayed such ideas. Once the final iteration was completed, some codes were shifted around to different categories that explained the themes better.

Once the analysis was completed, the codes within the categories were checked for both internal homogeneity, which is accuracy of codes within the category, and external homogeneity, which is the separation of thoughts and relationships between the categories, to ensure the accuracy of code placements within the themes (Mayan, 2016). In addition to the process conducted to check the accuracy of codes, it is also used to establish independent categories that do not have too much overlap, which may indicate a poor job of code distinction (Mayan, 2016).

Step 4: Finalizing Themes

Once the themes were developed, I took a step back to contemplate the relationship between the overall research question and objectives, with the stories that came out of the

data. This process allowed me to focus my attention back to the original goal to ensure that objectives were being met while correctly formulating an accurate understanding and representation of the data. Through this development, themes and codes were tweaked to accurately portray the stories of the participants while remaining in line with the research goals and outcomes. Furthermore, I analysed the themes with the prominent stories that arose from the data to ensure the accuracy of themes. Finally, I named the overarching themes with terms and descriptions that best captured the essence of the experiences of the participants.

Step 5: Write up

The final concept map, the NVivo code categorization, notes, previous iterations of the maps and codes, and the stories of the individuals provide the basis of the findings and the resulting thesis. The following chapter will describe the findings and relationships, with the pictures providing a visual component to understanding the stories of participants.

4.7 Research Rigour

Research rigour was a key component throughout the research process, which includes validity, reliability, and generalizability as without these values the quality of the research process would have been reduced or even nulled. As a result, Mayan's (2016) conceptualization of Morse, Barrett, Mayan, Olson, and Spiers's (2002) of generalizability, validity, and reliability were used.

Mayan's (2016) application of validity is similar to quantitative data, as it is important that the results come accurately from the data and not from misinterpretations or misrepresentations of the data. As a result, validity was implemented in three ways. Firstly, a

rich description of the data was created to ensure the understanding of each theme and phenomena was maximized by the data at hand. This allows for a deeper conceptualization of experiences, contextual understanding, meanings, and stories behind the pictures and discussion. Secondly, the use of pictures in photovoice promotes validity, as the ability to tie transcripts with pictures allows for a more accurate interpretation of conversations. This was achieved by instructing participants to number their pictures, which allowed myself to verify which pictures were discussed throughout the focus group to assist in accurate coding. Lastly, member checking was utilized to promote validity, as the accuracy of data interpretation is important to the overall research project as inaccurate representation omits the results. This was achieved by sending a simplified version of bullet form points to participants and asking for their feedback to my interpretation of results (Appendix F). Eight of the nine participants engaged in either email or phone conversations to discuss the findings, with every person agreeing that my outcomes were accurate representations of their experiences.

Mayan (2016) argues that reliability comes through repetition of findings throughout the data sets, as the replication of results through different researchers or participants would be challenging in a photovoice method since factors such as context and dialogue development provide barriers to replication. Reliability was observed in this research process as emergent themes across all three focus groups demonstrated a repetition of values or challenges across the different sites. Furthermore, member checking was utilized to ensure the researcher's conceptualization of the findings was accurate and representative of the participants' experiences. Field notes and a data journal was used to ensure an audit trail of ideas and to also help with coherent development of concepts while rationalizing decision-making processes. The

audio recording of focus groups allowed me to listen to particular sections of discussion to understand in-depth emotion, but also to check the accuracy of the transcriptions. However, complete reliability could not be achieved as the Covid-19 pandemic limited the ability to host another round of focus group to check these themes and were reliant on individual communication. This is a limitation of this study.

Mayan's (2016) interpretation of generalizability argues that participants should be from a broad range of experiences and perspectives pertaining to the research topic, as their contribution allows for the deep understanding of the phenomena examined. This allows for the resulting findings to be generalizable to similar situations, as the sample size in qualitative work poses challenges to generalization to the general public. As a result, this research project applies generalizability in a qualitative sense as participants were recruited from three different sites based on community completeness. This allows for the exploration of neighbourhood design impacts of health and wellbeing across sites to determine if there were any similar values or difficulties, while exploring a broad range of completeness that reflect the range of neighbourhoods that are present in northern cities. Furthermore, participants ranged from completely mobile to needing some assistance in navigating the built environment, such as through the use of a walker when outside, which allowed for the capture of experiences of older adults with varying mobilities and assists in bolstering generalizability. However, due to snowball sampling and the physical nature of the research study, complete generalizability cannot be established as a random selection of people across neighbourhoods could not be used.

4.8 Ethics and Reflexivity

This project was approved by the ethics review board at the University of Alberta and was considered to be under the evaluation category of REB 1. The following are the main ethical considerations; the inclusionary criteria and protection of participants, both of which have been informed by the TCPS2 as the ethical governing body in Canadian research (Canadian Institutes of Health Research et al., 2014).

The inclusionary criteria are associated with the ethical consideration of justice and recommends that participants are over the age of 65, free of cognitive impairment, are able to use a camera, and are able to move independently with or without a device. While individuals with cognitive impairments are encouraged to participate in research where appropriate, for the purpose of this research, participants were required to be free of cognitive impairments, as the discussion and conceptualization of themes are key components of the photovoice study. However, participants were not excluded if they were not able to operate a camera, as they had the opportunity to have a friend, caregiver, spouse, or adult child to assist them. This approach ensured that individuals with some physical challenges have the chance to participate.

The second consideration is concern for welfare, as older adults may put themselves at risk when taking pictures due to various reasons. As a result, at the orientation, participants were reminded about protecting themselves when taking photographs and not subjecting themselves to risks. Furthermore, it was discussed how images have the ability to capture contexts, settings, and stories, and thus one did not need a perfect shot to explain a topic but can discuss it during the focus group.

Positioned within this study as a graduate student researcher, reflexivity was an important process that had to be undertaken to ensure that I understood my position, experiences, and background on the data collection and analysis process (Dodgson, 2019; Probst, 2015). First, due to my educational background, a potential barrier of concept discussion was met throughout the research process. Being situated within a graduate level of education and examining academic literature concepts, it can become challenging to communicate these ideas to individuals who have never been to university before or have been removed from academia for decades. As a result, it was important to learn how to communicate my interests, goals, concepts, and research in an accessible manner. In addition to the potential communication barrier, my position as a researcher posed some challenges to the power dynamic at the beginning as during recruitment and the onset of the research process, some people voiced concerns about not being validated, such as through surveys, or that I was just using them to achieve my outcome. Thus, it was important to understand these concerns while ensuring that I was genuinely interested in their experiences and stories. The orientation that was hosted before the beginning of the research process was a critical step in overcoming these barriers, as this event provided digestible information, allowed myself to communicate the value of their experiences, and provided a safe space for them to ask questions.

Secondly, as a mid-twenties healthy and active male, my positional understanding of some of the challenges, concerns, and values placed on built environment experiences by the participants may not be relatable, experienced, or fully understood by myself. However, in my position as a researcher, it was my obligation to listen to the participants' experiences and

stories that were told, as they are the experts within their world and within the research. The orientation and focus group assisted with this process as the ability to explore ideas and ask questions allowed me to grow and learn from the participants, while gaining a richer description of their experiences. I believe that this process and discussion with the individuals assisted in providing a welcoming space, which facilitated honest answers by everyone.

The use of audit trails and research memos assisted with the process of reflexivity as these written notes were used to ensure that my positionality as a researcher, active male, and educational background was kept as limited as possible. This was achieved by the notes as the memos were able to inform me of any biases that were slipping into my research, or to ensure that my thought process was not clouded by my positionality and was representative of my participants' experiences. Furthermore, the memos and audit trail also ensured increased trustworthiness of the research, as it helped me be as objective as possible, while ensuring accurate representations of experiences and stories.

4.9 Summary of Methods

A collective case study approach was utilized, as it allowed for the comparison of multiple sites on a community completeness, but also provides the opportunity to engage in highlighting similarities and differences between the sites. A photovoice methodology was selected as it asserts that participants are experts within their lived experience and because imagines are able to capture experiences, contexts, and stories in ways that pure dialogue cannot (Belon et al., 2014; Nykiforuk et al., 2011; C. Wang & Burris, 1997). A total of nine participants from three study sites were recruited, with the sites being selected based on three

levels of community completeness, low, medium, and high. The focus groups transcripts were coded deductively to poster categories and then were coded inductively to discover the ideas, stories, and experiences that arose from the data. Inductive coding followed Mayan's (2016) guide to assist in accurate coding and theme development, as improper evaluation can pose challenges to theme formulation and research rigor. Overall the final themes were able to capture the stories and essence of the data which assisted in determining how built environment components impact older adults' experiences of health and wellbeing.

5. Findings

5.1 Findings Section Introduction

Throughout the data analysis process, participants across all three focus groups discussed a range of results and experiences that became broader themes. These concepts play a significant role in understanding the similar experiences of older adults in differing community designs, which may indicate findings that can positively impact future neighbourhood design. Secondly, a brief discussion pertaining to the differences of each neighbourhood will be discussed.

5.2 Neighbourhood Character

Participants described throughout many themes about the importance of design, aesthetics, character, and beauty in relation to their health and wellbeing. This pathway of influence manifest in the emotion of happiness, as pleasant design was seen by participants to positively influence health and wellbeing by promoting mental health, social connections, and physical activity. This relationship was demonstrated through four distinct avenues that participants discussed across all three study sites.

5.2.1 Building and Neighbourhood Design

The aesthetics and character of buildings and neighbourhood design featured prominently in the experiences of happiness felt by the majority of participants across all three study sites. Through their pictures, individuals showed how particular buildings and neighbourhood designs added character to their neighbourhood spaces. BG1 (age 75-78), with the letter referring to the corresponding neighbourhood, in this case Brander Gardens,

discussed how within her neighbourhood “the buildings that were being built, the diversity of them. That really made sense to me. And I found that really appealing and the space between the houses I find really appealing.” She expanded this to describe how:

I really like that, but I really love the modern architecture that's coming up. My only thing with all architecture is that you can place it to the year that it formed. You know every flat roofed box type building was built in 2018, 19, 20 probably until 25 until they or maybe 30 until they reinvent the roof. And that's how it goes. I wouldn't want to move to a neighbourhood where everything is square and flat roofed either. I like the fact that we have some of those houses through here. You know they've taken down the old things and put up other things, that's always appealing to me. So, this area aesthetically I think is appealing.

Through this quote and following focus group discussion, it is apparent that a variety of housing and architecture styles plays a positive role in promoting character and happiness in an individual’s life. This is reflected in another comment by BG1 (age 75-78), who was frustrated by “bloody suburban sprawl” and questioned if this “is a recession why are they still building ginormous houses that are this far apart?” BG2 (age 75-78), followed up by stated how suburban sprawl was the “first thing I noticed when we moved here. It's like oh my god, like it reminded me of that song, little boxes on the hillside, little boxes made of ticky tacky. They're all the same.” These quotes demonstrate how the lack of diversity in housing style can create a negative experience of the neighbourhood.

The influence of architecture and design does not stop at housing styles, as the entire fabric of the community must be considered. The fine details such as street names played a role in improving the character of the neighbourhood, as K2 (age 66-72), described how it:

is another thing I like. The street names are all names of people, of military people and it's like the old Griesbach and the people of that live there and were in the wars and fought for us. They're not forgotten, they're still there, they're all around.

The named streets provided a sense of pride and joy for ones' neighbourhood as it demonstrated a form of respect to individuals who have sacrificed themselves for Canada. This may also be an outcome of the participants generation, who most likely would have had older family members or friends who had experienced the world wars, and thus may have a higher understanding of the symbolism of such details.

Recognition of historical importance of design are not limited to symbolic streets, as historic buildings and design improved character within neighbourhoods, especially in Oliver, which is an older neighbourhood. These buildings, such as shown in figure 1 were described as lovely, adding character, and important to the neighbourhood. Participants described how the removal of historic buildings had a negative experience on happiness as it detracted character from their neighbourhood. This was especially relevant in the downtown area as Oliver was described to be a historical community, and with the removal of these buildings or the addition of modern high-rises without consideration of these spaces were discussed in a negative manner. This was exacerbated by the fact that they felt that due to the lack of active residents and detraction of character, that these high-rises were unnecessary, as O1 (age 72-73), described

Figure 1: Historic Building



how “there’s no need for these spaces. From my window, when I look at half of these buildings at night, three fourths of the windows are black. It’s all built on speculation.” Thus, the lack of rationale to remove or deteriorate historic spaces negatively impacted the happiness and character experienced in ones’ neighbourhood. However, it was not strictly older buildings that added character and joy into a neighbourhood, but unique design. Bauhaus design, which is an architectural and design movement from Germany from 1919 to 1933 that focused on simplicity and functionality (Gropius et al., 2016), was an example that provided character to the Oliver community. This reflects the previous comments pertaining to differences in architectural style in promoting happiness in residents.

Lastly, through the data analysis process, noise was related to design in two out of the three focus group discussions. There was nothing positive about noise, as it was detrimental to

overall happiness, health, and wellbeing. Within a more suburban context, the implementation of high-rise buildings was viewed as a positive contributor to housing needs, however, one participant, K4 (age 66-72), described how:

on the roof of that they've got their HVAC system. And it's so noisy in the summer, when we have our window open you can't really sleep and it's two or three blocks away but it partly, that angle there's nothing in between. There's all kinds of stuff between us but nothing at that height.

This negatively impacted their own health and wellbeing as their sleep was disturbed, which highlights the noise impacts of building designs in low profile communities. However, participants in Oliver (age 72-73), discussed the impacts of living on a main road as “drag racers”, trucks, loud adaptations to vehicles, and speeding have contributed to a lowered experience of health and happiness. Participant O1 (age 72-73), described the sound to be created predominantly through speeding, as:

Speed is a large component of the noise. And spring, summer, and fall. Winter is the only time we have any break from it, because they can't speed, or they wouldn't make it very far. But they make the loop down through the U district, Groat Road, back up. They make the loop, Jasper Avenue. And from 5:00 in the afternoon on weekends, till 4:00 in the morning.

While on the surface this may be viewed as a result of individual behavior, public policy towards speeding, and police enforcement. On a design level it may encourage the need to develop traffic calming interventions on streets with a combination of heavy traffic and residential buildings like

downtown, such as raised crosswalks, that lower speed and reduce noise for residents. Furthermore, O2 (age 72-73), highlighted how “foliage dampens the sound a bit”, which may encourage municipalities to introduce more trees near residential spaces in dense areas to improve noise maintenance.

5.2.2 Neighbourhood Social Spaces

Neighbourhood design, art, intergenerational spaces, and social connections all played a role in promoting happiness in the research participants. While art or festivals may be conceptualized more closely with design and aesthetics, these factors played a role in promoting social connections and in turn happiness.

Social connections appeared to be facilitated through both direct and indirect contact with others within their neighbourhood space. Through the research direct contact can be understood to be social connections that arise through personal communication and rapport building through social activities or interactions. This was observed through small scale interactions with neighbours, with K3 (age 66-72), describing how she could “sit on my pad and I could watch people walk by and say hi, I haven't seen you all winter and all this and that.” This short interaction was understood to be “pleasant”, as it allowed to create a sense of comradery between the participants and the residents within their community. These social interactions between residents boosted happiness in their lives and allowed for a positive outlook on their neighbourhood, as K2 (age 66-72), explained how “I have great neighbours and yeah it is very friendly neighbourhood.” Other forms of direct contact may come from facilities or other third spaces that facilitate social connection between individuals, such as at a restaurant, senior centers, or church. However, to further promote these direct social connections, a variety of

amenities or activities for older adults should be available, as concerns about the lack of options was discussed with the Brander Gardens participants.

For many participants indirect social connections were also seen as important for wellbeing as this form of contact can be understood to be the observation or presence of others in their community, which includes the removal of direct relationships with strangers. This was observed in many situations within the community context across the three study sites.

For example, in Oliver, O3's (age 72-73) picture, figure 2, visualizes a public book exchange library that was placed under the category of "places that bring me joy", which is viewed as a positive, since "it's there any you can exchange books with people, and take one, leave one." The book exchange allows for indirect social connections through the exchange of

Figure 2: Public Book Exchange



books, which assists in placemaking. Furthermore, the observation of individuals in communities provided increased social connections, even in regard to strangers. Due to ethical consideration of strangers in the photographs, the image will not be showcased. However, K2 (age 66-72), demonstrated this through an image taken of a father and daughter who walk together daily, which was placed under the category places/things that bring me joy, who discussed how this promoted a sense of community. She also built upon this concept by dismissing the safety concern by describing the picture how:

This one here is just in front of my house actually and that gentleman walks his daughter to school every day and picks her up every day and they walk in front of my house. And it's just something different, unique to see in the middle of the city that people are actually... Kids are still... And I don't think he does it because she's not safe because it's not an unsafe neighbourhood, but it is just kind of nice to see.

Other forms of indirect social connections that promote happiness in participants was the availability of multigenerational spaces and community events. Participants placed multigenerational spaces under the category of places that add character to my neighbourhood, as it assisted in bringing happiness through indirect connections with other generations and cultures. Furthermore, the ability to bring their grandchildren to such spaces within their neighbourhood was highlighted to be valuable. Other forms of indirect social connections were discussed through art festivals or other community events. These were valued by individuals who had experienced these community events, as it provided additional multigenerational spaces such that K2 (age 66-72), described it as "very family orientated, like there's kids all over the place and you don't have to worry about them because there's always somebody there that's watching

them. Doesn't even have to be your own. It's really good." Even though these individuals are strangers, a sense of community can be extracted from this quote, as feelings of happiness, security, and social connections can be found. Furthermore, K1 (age 66-72), viewed festivals as "awesome, because they don't have a problem shutting down the main road and it really brings their community together." This quote cements the notion of indirect social connections playing an important role in promoting happiness and sense of community within neighbourhoods, as a central shared experience may play a role in community identity.

5.2.3 Neighbourhood Disorder

The previous two sections discussed the positive components of the built environment to bring about happiness in participants, however, there are negative features that bring about unhappiness and frustration. These features were observed in all focus groups and have the ability to detract from neighbourhood character, provide challenges to participants, and lower the aesthetic quality of spaces.

Lack of respect observed by the vast majority of participants and was an overarching theme that brought together the various components that were detrimental to the relationship between the overall quality of aesthetics in a neighbourhood space and the happiness that it can evoke. Graffiti, also described as tagging, was understood to be a very frustrating for the majority of the participants, as the mere suggestion of it brought upon a discussion pertaining to its destructive nature. The following is a conversation between two participants (age 75-78), in Brander Gardens which showcases the negative emotional response to graffiti:

BG2 That's my number one pet peeve, damage and graffiti.

BG1 That's reprehensible because you're destroying property for no purpose at all. It's something I know that the graffiti and in some instances, graffiti is great art.

BG2 I don't consider that an art type graffiti but this blatant spray painting over a building or something like that.

BG1 Your car or come in, people who come in your house and destroy the damn thing and steal it if you want but don't destroy it.

BG2 No, that to me it's a lack of respect, you're right at the bottom of the list.

BG1 You're a bottom feeder for sure.

This dialogue between the two participants is an important one as they were able to separate the value between artistic forms of graffiti and general tagging, which can be used for policy and artistic expression. Furthermore, graffiti, as seen in figure 3 is seen in such a negative manner, that BG1 (age 75-78), considers individuals who partake in such behaviour to be on par with criminals who destroy homes when committing burglary. This quote is able to demonstrate the

Figure 3: Graffiti on Bench



pure frustration that participants have to general tagging that occurs within their own community.

Graffiti in the downtown area was described to be “a minor annoyance” by O2. It was also viewed as not a major issue by a participant, however, the reasoning for this cannot be concluded. The removal of graffiti in Oliver was seen to be positive, as it was placed under the category of places that make me feel safe. However, graffiti did not create feelings of fear, just frustration, as BG1 (age 75-78), explained how:

It makes me mad, I don't feel unsafe. If I found somebody doing that, I would tell them a thing or two and hit them with my cane if they bothered me, I'd try if I could stand on one... But I... No, I would say something to somebody.

Trash, litter, and other forms of disrespect were also viewed to be detrimental to the overall aesthetic of a neighbourhood and detracted from the character of it. The overall lack of cleanliness that occurs due to trash appears to create frustration and disgust among participants.

K2 (age 66-72), explained how:

it's an area that there were homeless people as well. Well I shouldn't say that I didn't know that they were homeless people. But they were... Had their bikes and their bags and so instead of taking a picture of them while they were rooting through all of this stuff, I just took a picture of the stuff and it's... What happens is they go into the bins pull everything out and just leave it. And it's just... Because the garbage people won't come and put it back in. So, it's really detracting because nobody wants to be touching it or putting it back in the bin.

A relational tension between the various agents is a concern, as the responsibility of cleanliness is not accepted or acted upon by the characters. As a result, the lack of onus of cleaning up the mess created is passed along the various actors without anyone taking responsibility, which creates a situation where it is not cleaned up. This is repeated in other neighbourhoods as O2 discussed how at “lunchtime people parking in the street and leaving their McDonald’s wrappers and stuff. And the overnight visitors, their used condoms.” K2 (age 66-72), described how “there is a garbage can there, there's a bus stop right there as well and the garbage is usually around the garbage can instead of in it,” which indicates how the availability of trash cans does not limit litter. Lastly, trash is not the only cleanliness issue, as dog owners refusing to clean up after their pets caused issues, as BG1 (age 75-78), discussed how “when I come home and I've been out walking and I walk [the dog] of course, and then I find that I've got dog poop on the wheels of my walker. I don't like that.” While it may not seem like a huge deal for owners, for older adults with mobility challenges, it presents increased predicaments that one must face. Overall, visual disorder from litter, trash, and other forms of disrespect detracts neighbourhood character, which is detrimental to the happiness and wellbeing of older adults.

5.2.4 Summary

The aesthetic environment of the neighbourhood space can take many forms, such as through neighbourhood design, art, graffiti, architecture, and trash, while also including social connections that may arise from the design of the neighbourhood fabric. As a result, it is important to consider the experiences that older adults encounter to ensure the maximization of health and happiness that one can have, while encouraging neighbourhood design that positively engages residents.

5.3 Importance of Green Space

Greenspace appears to play a significant role in promoting wellbeing in participants across all three study sites, as it is demonstrated to be a strong component of complete communities. This is achieved through experiences of happiness, wellbeing, improved physical activity, improved mental health, feelings of improved physical health, and social connections. This significant finding indicates the important role that greenspace plays in the health and wellbeing of individuals in communities. Furthermore, it encouraged physical activity through walking for leisure, but may also play a role in mediating against spaces with limited recreational spaces.

5.3.1 Happiness of Greenspace

Building upon the previous section of character, every participant described various factors of greenspaces and beauty in relation to happiness, place attachment, and importance to the neighbourhood fabric. However, due to the focus on greenspace and related features, it has been included in the greenspace section.

For the vast majority of participants, the beauty of greenspace within one's neighbourhood fabric appeared to play an important role in promoting happiness as there were three distinctive roles. Firstly, greenspace was able to bring a strong aesthetic value to the neighbourhood, which created a space that was conducive to promoting topophilia in participants. Topophilia is understood to be the process of positive placemaking where a love of place is developed (Foote & Azaryahu, 2009). This was strongly reflected by Kilkenny participants (age 66-72), who discussed the positive value that Amur Maples had in their

neighbourhood, as the longevity, which have been around for a minimum of 50 years, and beauty of these trees promoted happiness.

- K2 It's beautiful. Absolutely beautiful.
- K3 Yes, they look really gorgeous because [unclear] see like the bright red leaves too often.
- K2 Because they're far where the environment is.
- K3 And there's about three blocks of them or four blocks, there's a lot.
- K2 And I think they did that on purpose Namao didn't they when they planted them, they made sure that they were treated...
- K2 Well Amur maples are interesting because when you buy them you can't tell... When you plant them, you don't know if they're going to be red or yellow. So, part of this is fortuitous that they got a bunch. If you buy it at the nursery when they're green you can't tell what the fall colour will be.

Furthermore, through this collective dialogue, image, and placement under the category of place/things that bring me joy, it is apparent that trees are able to add character and intrinsic value to lives of residents. Additionally, other features in greenspaces such as memorials, flowers, and park space can also add to topophilia. K2 (age 66-72), describes such a space as "a memorial in the centre of it, there are hills, grass areas, stone thingies that look like ancient times and it is very quiet, and it is refreshing and very beautiful." Lastly, BG2 (age 75-78), describes how greenspaces in personal spaces can also have very beneficial impacts to health and happiness as she discusses how she can:

look out over the courtyard through my plants or whatever, read a book and it's cheaper than going to Bermuda or Cuba or any of those places and more convenient. And you've totally transported yourself by going out the door.

Thus, while it may be easy to examine greenspaces in larger scales, the overall scale may not have a tremendous impact, as the overall beauty may be sufficient in promoting happiness in individuals.

Secondly, building upon the first factor, the majority of participants discussed how small placements of greenery or flowers had a profound positive impact on the happiness and wellbeing of many older adults in their communities. Participants in Oliver were discussing the overall drab aesthetic of particular streets and bus stops that lacked greenspace. However, O1 (age 72-73), described how “I didn’t take a picture of the wonderful plant boxes that are out on the boulevards here, where the bus stops are. Those are fabulous. And that was a wonderful idea.” This quote indicates how a small greenery addition to particularly car-dominant spaces can have uplifting impacts on the lives of participants. This was echoed by K2 (age 66-72), which can be seen in figure 4:

- K2 B3 is mine and it's in the Londonderry Save On parking lot. And the first time I drove by I thought, where did that happen and how, when and how but it's beautiful and so it's really nice. I can stand in front of it with my back to the parking lot and the upper level and stuff. And I can stand there and look at it and not even realize that there's a parking lot behind me. I don't hear anything. It's right on 137th Avenue in that south west corner and it's beautiful and whoever did it did a really nice job, really nice. And it's nice to see something like that in amongst a bunch of concrete. It's not huge but it's a fair size and I'm just glad it's there, because it's really nice.
- IV So obviously it makes you feel happier. Does it make you feel healthier?
- K2 I don't so much healthier, well healthier because I'm happy. Yes.

As a result, while many communities in Edmonton may be car dependent, for individuals who partake in active transportation or merely inhabit such a space, the placement of greenspace or other forms of greenery appear to play a role in promoting health and happiness.

Figure 4: Beautification of Parking Lot



Lastly, in relation to the first two factors, treelined streets had a significant impact in improving happiness, physical activity, and walkability for participants. This was observed predominantly in Oliver, but trees encouraged walking in all study sites. Treelined streets played two significant roles. Firstly, they improve walkability by providing shade, sense of peace, and also heightened sense of health. O1 (age 72-73), described this concept as:

I was limited in my photos, but also the immediate neighbourhood has many trees, and the trees provide lovely shade. When I walk, it's very pleasant because even on a very warm day, I have the shade. The trees. The streets are tree lined, and in this immediate neighbourhood, the trees make a lovely difference in walkability in summer. And it's very pleasant. That part of it is very pleasant. It's the sidewalks that are the problem there.

O3 (age 72-73), expanded on this by stating how:

Yes, definitely the trees. And that's why if I'm walking, even if I have to go to someplace on Jasper Avenue, I will walk on Jasper as long as I have to. Then I'd cut down and walk along 100th. Or I'd go up and do 102nd, rather than being on the traffic zone. It's not as healthy either with the traffic. You get all the fumes and everything. The buses. Of course, they tell you if you live near out a major traffic area, you're going to have lung disease and all that stuff. I've chosen to live on Jasper Avenue, so that's my fault.

As a result, it is evident that treelined streets in traffic heavy spaces are able to mitigate, even if it is purely anecdotal, the negative experiences that one may face from traffic and other factors. Secondly, in addition to the very practical and tangible factors pertaining to treelined streets, it also plays an aesthetic and joy role in promoting walkability. This was echoed across many of the participants, but was strongly expressed by O1 (age 72-73), who stated:

It encourages you to get out and enjoy your neighbourhood. If you're in an ugly neighbourhood, and I have lived in neighbourhoods that were absolutely devoid of aesthetics, for short times, you don't want to walk. And just like O3 says, you want to avoid walking in those areas that are not aesthetically pleasing and take a side street.

So, it really encourages you to get out and enjoy your community.

Overall, the aesthetic quality of greenspaces, especially in traffic heavy areas have been demonstrated to limit the negative experiences that may arise, and can promote health, happiness, and walking in individuals.

5.3.2 Greenspace for Physical Activity

Greenspace not only provides opportunities for improving happiness in lives of older adults, but also serves as an important medium for this population in their pursuit of physical activity. For every participant, physical activity in greenspaces came predominantly through walking, as the ability to participate in other forms of recreational activity such as sports was not mentioned and may be challenging due to the mobility challenges that participants discussed.

Parks and trails were a key component in promoting physical activity as they provide space that is centered around greenspace and not transit or other forms of travel. The majority of participants expressed this importance as walking was part of their daily routine in achieving their physical activity goals. This was expressed by O1 (age 72-73), who stated “Every day. I walk every day. And I do enjoy the greenspace,” and also by K4 (age 66-72), who explained how “I walk around there all the time, it's about 2.2 kilometres from my house around the block, around the back twice and back home. So, I can get about 4,000 steps.” These quotes may be simple; however, they indicate the importance of walkable greenspaces in the pursuit of daily fitness goals of older adults. For participants with limited greenspace, as the ones in Kilkenny, the overall aesthetic and quality of greenspace also had a tremendous role in promoting walking for physical activity as participants were willing to drive 15 minutes to high quality parks to partake in walking. Key factors within these spaces were high quality trails, observations spaces, trees, and art. Also, water features within parks, whether it was natural ponds, pools, storm water management ponds, or rivers, were highlighted to be important elements in pursuing walking in particular spaces. As shown in figure 5, K3 (age 66-72),

demonstrates this by discussing how he “love[s] the walk, it's walkability is what it is. Griesbach is the ultimate for me in this neighbourhood. We go there for walks quite a bit,” with a “lots of little lakes, lots of walkways all connected” being a key factor in pursuing opportunities in this space. K4 (age 66-72), described how “that water is storm water management water so it's manmade but it's really, really, it's nice down there,” which indicated the value of blue spaces had in promoting physical activity in greenspaces.

Figure 5: Loons in Greenspace Pond



In furthering the importance of parks and green spaces being essential spaces for physical activity, it appears that these locations can play a mediating role for older adults in neighbourhoods with inadequate access to recreation facilities. Only one of the three

communities studied had a recreation facility located within their neighbourhood, which limits accessibility to physical recreation. As a result, these spaces may encourage older adults to increase physical activity. Secondly, these spaces play an important role in promoting multigenerational spaces in communities as it was highlighted to encourage these interactions.

BG1 (age 75-78), discussed how:

All I can say for me is that it's really important to have that kind of space and certainly the park and all of the... With the slides and the playground area there's a basketball court and there's that hill. All of that really makes a difference in the neighbourhood. Because people can congregate. The kids can go there.

This brought the ability for other generations to partake in physical activity while promoting social cohesion in the community through indirect social connections. This was explained by K2 (age 66-72), who stated:

Well the one at the top through the [image] I just... It's in a playground. The trees are right off the road and there's benches around there, it's a spray park and just the creativity of what he put in there and you can hear the kids laughing and splashing around and grandparents and youngsters just all over there. It's great for the kids and yet it's a safe spot.

Lastly, in order to promote physical activity and walking in older adults, it is important to consider the built environment features that facilitate accessibility of these spaces. Participants who regularly utilized parks and trail systems stressed the importance of age friendly amenities, such as park benches. This was reflected by BG1 (age 75-78):

Well, I run out of steam quite easily. Sometimes I just I have a day where I can take the dog on, I can walk him out and walk around. And other times if I'm going over into Ramsay or to that small park I'll head for the bench because I just, I sit there and just relax and enjoy the space, the dog sniffs all over the place so that he can... His little brain cells can grow and then he'll sit there and look at me like "why are you still sitting here." And so, we get up and we move on to other places. But it's really nice to have these benches around. I think both for families that want to walk in the parks or especially for seniors who go to those areas. Or the lookouts and you can sit on a bench and... I don't know, just let your mind wander.

This quote indicates the value of benches as it provides a resting area for older adults who may be tired, but also allows a space that can contribute to mental wellbeing through the experience of peace and quiet. Other key amenities in greenspace were washrooms, not merely outhouses but heated washrooms, as it was described as making a huge difference in navigating such a space. Other participants expanded on this concept to discuss how bathrooms and cafes encouraged the use of such spaces. Overall, the greenspace available for older adults appears to play an important role in promoting physical activity in ones' life, but aspects related to aesthetics, features, and amenities are important to maximize the experience and use of such spaces.

5.3.3 Greenspace for promoting wellbeing through peace and quiet

For the majority of participants greenspaces were found to be places that promoted wellbeing through peace and quiet. This was seen to be a crucial in the lives of participants, as it

allowed one to be in a calm state, which was the opposite of the typical surrounding environment. This was expressed by BG1 (age 75-78):

I think it's mental health, I think it's mental health and it would be physical fitness if I could... I don't run through the grass. I always look at the space and think that's so I see people running and I think, I can see me running but the body just doesn't do it. It just does not do that anymore. But yes, I think it just gives me a sense of wellbeing of, I don't know... Calm.

Furthermore, this sense of peace was suggested to improve mental health as well in participants. This was expanded by K2 (age 66-72):

and it's somewhere safe it's just... And you're one with nature, so if you're stressed out or anything it's the best place to go for a walk and just relax and there's like K4 was saying it's quiet, it's peaceful and your stress just goes away.

Through these two quotes and the focus group discussions, it is apparent that greenspace plays a facilitating role in mental health and wellbeing, which was valued by the majority of participants. Trees played a huge role in facilitating this in nonpark spaces, as they brought sensations of calm to pedestrians, lowered noise and stress, reduced perceptions of negative health impacts of cars, and created feelings of happiness. Lastly, this was echoed for suburban developments as BG1 (age 75-78), stated how "it gives you that sense of space and wellbeing. We need to pay attention to trees and to green spaces instead of this bloody suburban sprawl that keeps pushing the city that way." Overall, the availability of greenspace can play an encouraging role in promoting mental health through peace and quiet, while allowing one to relax in nature.

5.3.4 Summary

Greenspace was understood by every participant to be a crucial component to the overall community fabric for older adults across all three study sites. This indicates the sheer importance it has on the lives of participants in various neighbourhoods. Furthermore, when taking into the consideration the health impacts that such spaces can have, such as through physical activity, mental health, and happiness, it becomes apparent that thoughtful greenspace design is a necessity for older adults.

5.4 Experiences of walkability

The mere placement of walkable components, such as crosswalks, sidewalks, and mixed-use amenities is not sufficient in promoting walkability in individuals. The experiential landscape must be taken into consideration to truly encourage walkability, especially in regard to infrastructure that facilitates walkability such as sidewalks or neighbourhood fabrics. Feelings pertaining to security are critical in maximizing walkability, as perceptions of crime or fear will decrease walking, negatively impact health and wellbeing, while decreasing physical activity and accessibility.

5.4.1 Sidewalks

For every participant, sidewalks were an important consideration for the urban fabric, especially in relation to walking behaviour for both leisure and travel. As a result, two factors that arise from sidewalks will be discussed; quality, and happiness.

A sense of security in relation to sidewalks was a critical component to overall walkability for older adults across all three study sites. Firstly, the vast majority of participants identified the quality of sidewalks as a factor in their ability to navigate the built environment, as cracked sidewalks were discussed to be a major detriment to walkability. These spaces posed tripping hazards for older adults, especially for ones with mobility challenges. K2 (age 66-72), discussed this:

There's ladies with buggies, baby buggies and stuff and it could topple one of those. I've tripped on them or turned my ankle, not anything serious but if a more elderly person did it who doesn't have the balance. They could fall and break a hip.

While this participant indicated their own misfortunes with cracked sidewalks, they highlighted the heightened risk that others with mobility challenges may face. This was experienced by BG1 (age 75-78):

Well for me I just noticed that as we're walking around in the... I'm walking this around the corner and going north from left hand and left again from my house that it surprised me that there were that many big cracks in the sidewalks that are unsafe. Not I think for younger people they're not going to have any problem with them. But as you say with the snow on top of that it's slippery, they are not even and with a walker to go over them I'm continually trying to dodge the cracks and hold the dog. So that makes a real difference for me as far as safety goes. The other day I stepped sideways off of one of those and lost the leash and almost had a heart attack because luckily, he was very busy sniffing. And I was able to stand, move over, leave the chair, move over and get the

leash before he could run off. And then just step sideways until I got back to my chair but it's moving laterally is... No, it's not good for the body.

Through this quote a couple important concerns are highlighted. Firstly, cracked sidewalks echo K2 (age 66-72), in that they pose falling risk but are developed farther to indicate such spaces as unsafe for older adults. Secondly, the heightened risk of falling due to cracked sidewalks and navigating such spaces with a walker are experienced as this participant unfortunately fell. This was recalled as a harrowing experience as not only was health negatively impacted, but fear regarding the loss of her puppy was highlighted. As discussed, she was extremely lucky, as she most likely would not have been able to catch the puppy due to her fall and walker, which would have placed an unnecessary emotional burden on her due to the cracked sidewalk.

Cracked sidewalks also posed challenges to people in wheelchairs as the wheelchairs are not designed for bumps and were reported to cause discomfort in those individuals. Lastly, weather brought up as an additional risk placed upon sidewalks that participants had to navigate, as 7/9 individuals highlighted this risk.

However, the city's response to cracked sidewalk management was scrutinized by the vast majority of participants. The efforts to patch, highlight, and even did not meet the satisfaction of participants as it ultimately did not address the risk of falling or uneven surfaces due to the cracks. This was explained by O1 (age 72-73), and visualized in figure 6:

And painting stripes on the sidewalk to let you know there's a crack in the sidewalk is totally useless. Pouring rain, I'm walking on the sidewalk, and I trip and fall and hurt my hand because there's a yellow stripe on the sidewalk, and I should have seen it, except it was pouring rain. And I'm concentrating on getting where I need to go without being

drenched. So, it's little things like that are more important, and they're not expensive. They're not a waste of money.

Figure 6: Cracked Sidewalk Intervention – Painted Strip and Patching



Furthermore, tarring was observed to be a negative intervention as well.

- K1 But mostly it's the cracks in the road, even the sidewalks are just ugly, the panels are different heights. It's not a panel but the sections of sidewalk, some are up some are down, some are up some are down. I can't remember the last time and doing that doesn't really solve the problem.
- IV Oh filling in the cracks here.
- K1 The tarring or whatever they do yeah. It doesn't help.
- K2 No it just makes another level.
- K1 Yes exactly, exactly.

As a result, by understanding these two quotes it is apparent that band aid solutions to built environment issues such as sidewalks may cause more problems than anticipated, even if the motivations are positive. Cracked sidewalks and poor management of these issues were seen to reduce the overall character and aesthetic value of the neighbourhood. Lastly, poor management of sidewalks made the vast majority of participants feel not valued by the city, as it made them feel like their wellbeing was not important, with other policies and efforts being valued more than their health. This was described by O1 (age 72-73):

And also, paying more attention to the liveability of the apartment neighbourhoods. The neighbourhoods that have a density of apartments. Whereas if it's a housing district, the taxpayers will usually exert pressure on the city to clean up their act and repair the sidewalks. But when you have a lot of transient or apartment dwellers, who aren't paying taxes directly, they seem to become lax and get away with broken sidewalks and poor ambience in the neighbourhood. There's more ambience in the neighbourhoods that are with mostly houses, single occupants or single-family dwellings. But in neighbourhoods with high density of apartments, there seems to be more of this, let's just let it go. And it just tells the residents, you're not important. It's disrespectful. The broken sidewalk, it's almost a block long, and it's been there a long time.

This quote demonstrates the emotional frustration of the city's poor response in addressing these concerns. However, single family neighbourhoods were not immune to this as described below (age 75-78):

BG2 The potholes aren't bad; they do get onto the potholes when I have phoned about the potholes it was fixed the next day.

BG1 I'm sure it was but then again, the Mercedes might break its axle or something on the pothole. So that's way different than a senior breaking their leg. I don't feel very important to politicians in general and I think after living this long that I should. I should feel like I matter.

This quote describes the older adults' feelings pertaining to pothole management versus older adult health and wellbeing. Thus, it is evident that not only do these spaces impact health, but it can impact happiness through poor aesthetics. Furthermore, it is important to understand the theme of lack of perceived value felt by the participants across the three study sites, as this appeared to negatively impact health and wellbeing. This occurred through emotional pathways, as the perceptions of fear from falling, lack of response by the city, and poor maintenance all decreased the sense of personal value, which is significant. Overall, poor sidewalk quality impacts health through falling hazards, poor happiness, and low feelings of value, as these are spaces that may be more frequently used by older adults.

Building upon the quality of sidewalks, the consistent placement of sidewalks and age friendly amenities along these paths should be considered. Narrow sidewalks were discussed to pose challenges as there was not enough room for pedestrians, especially in denser areas, and thus multiuse paths were desired. This was suggested by O2 (age 72-73):

There should be different standards for this century I think. Multiuse paths of some sort, or whatever. Because there's the cars and the others. And I can't really see the scooters being out in traffic anyway, but they might survive in this area. But on Jasper or even 100th Avenue, they're taking their lives into their hands.

However, these multiuse paths should be age friendly focused as cramped spaces with cyclists or other commuters was highlighted to pose safety concerns for older adults. Sidewalks that

had irregular patterns or unpredictable placements were understood to be determinantal to the overall walkability of a neighbourhood, as walking through obstacles were viewed as a negative. This was discussed by K3 (age 66-72), “but one thing that troubled me when I looked at all of this. Sidewalks just stop. And you're walking along, and it stops.” Furthermore, it was highlighted by Kilkenny participants (age 66-72), that some urban or construction policy may play a factor in inconsistent placement of sidewalks that negatively impact walkability.

K4 Yes, it's tough from the east. It's just they've got that big concrete wall. One of the problems, I think, is developers get concessions from the city so it's too... To make a sidewalk I used to be in the landscape business. To make the sidewalk from the middle of the wall north they need a retaining wall. It would have cost maybe \$400,000 to put a sidewalk in plus the sidewalk. So, they get relaxations of so many rules and I don't know if that happened there, but I can see it happening for sure.

IV What area is that?

K1 When you go in the northernmost driveway from the east side, so you go in and then you turn a sharp right to go down by the gym and around to [overtalking]. And you go straight and it's where Simons is now. So, from there north there's no sidewalk. And on the other side of the street there's no sidewalk either, it's only. So, you have to cross the street, cross the boulevard and cross another service road to get a sidewalk. And yes, it's too steep to walk on the grass and that's why there's no sidewalk.

Through the past few quotes it is evident that cracked sidewalks are not the only persisting issue, but the irregular implementation of walkable components pose navigation issues and can limit accessibility and physical activity in older adults.

Benches were highlighted for two separate reasons to be a simple yet effective intervention to improve the walkability of older adults in the community. Firstly, it provides a space to rest for older adults, especially for individuals who get tired or have mobility issues.

This was mentioned perfectly by O2 (age 72-73), who stated how park benches were important to him due to his past bad hip, “because I’d have to either squat or kneel down to reduce the pressure. Now I don’t need them that much.” Secondly, benches had the ability to improve social wellbeing and connections between community members, which was seen as a positive for older adults. This was observed in figure 7 and expressed by O1 (age 72-73), who said “something as simple as having two park benches facing each other, with a little bit of greenspace around it, it’s totally inviting and welcoming. We need more of that.”

Figure 7: Benches Near Some Greenspace



However, O2 (age 72-73), mentioned how the building material of benches should be considered since:

plain cardboard, plain plywood, whatever, with a horizontal surface, next to a dusty street. It collects a lot of dust. Some of the wrought iron open grid works quite well but does tend to get a little bit cold in this weather.

Overall, the placement of age friendly amenities, such as benches which were highly discussed by many participants and can play an important role in improving the walkability of older adults in the community. In addition to such interventions, the continuous network of sidewalks and the overall quality of the sidewalks were highlighted to improve the accessibility and mobility of older adults in communities.

5.4.2 Traffic and Crossing Design

Traffic overall had a smaller impact on walkability than safety or sidewalks, however the realm that encompasses traffic, such as speed, crossings, and intersection design had meaningful impacts on older adults' ability to navigate the built environment.

Traffic speed was not highlighted as a major concern for personal mobility in their own neighbourhoods, however it appeared to be a more communal concern, as participants were worried about its negative impacts on child safety. This was more observed in the less complete communities as speed limits were inconsistent and the long roads were raised to be at risk for speeding. However, due to the more car reliant behaviour of some participants within these sites, negative comments were made towards some park zones with speed limits of 30km/h due to the lack of children playing. In the downtown cohort, speeding was raised as a personal

and communal concern, as the increased speed limits in these areas, which can be 50-60km/h, were viewed as careless of drivers and also a health risk. This was highlighted through a comment regarding a fatal accident that occurred near to the focus group date. Overall, traffic may not have a huge impact on health and wellbeing of older adults but can be factor involved in the overall walkability concept.

Navigating spaces where walking and traffic intersect was highlighted as a concern for older adults within the focus groups, as the increased walking rates, especially in the Oliver cohort, made one more in tune with these spaces, as there were two areas of major concern. Firstly, crossing lights were discussed as an important facet of walkability, especially for those in Oliver (age 72-73), who undertook walking more for transit than leisure. These features are important for older adults, as unsynchronized pedestrian lights not only negatively impacted walkability, it also posed risk for missing key transit rides and increased probability of pedestrian collisions. This was encapsulated by a brief discussion:

- O1 Yes. You will get two signals for the same direction, which no one's using, and the direction the traffic is flowing, will just continue going. So, if you're freezing, if it's pouring rain and seniors have to stand double time, which can be almost ten minutes sometimes.
- IV Wow.
- O1 Waiting for the light. And seniors sometimes will assume that when the first light has cancelled, you'll get the opposite direction. It doesn't happen. They're halfway across the road and the light hasn't changed. But you're getting the east west twice, and no one's crossing there. No one's requested it. Even if you request the north south, you'll get the east west a second time in a row. And I called the city about it. Nothing's happened.

Through this quote concerns regarding safety, walkability, independence, and accessibility are all highlighted, which can overtime negatively impact walkability for older adults. As a result,

there may be negative social and health outcomes that may arise from traffic centric lighting systems.

Building upon the topic of pedestrian lighting, crosswalk design is another built environment feature that allows for navigation for walking, as this space is the intersection of traffic and walking. Through focus group discussions, mostly in the semi-complete and most complete neighbourhoods, this appeared to be discussed in a negative manner, as only poor features were highlighted. This may be reflection of overall poor design, or just may be that negative experiences are much more impactful than successful interventions. The main consideration in crosswalk design was the impact of weather, as it created various navigation challenges for participants. Firstly, it was reported that poor weather, which is common in Edmonton, presented crossing problems. These revolve around mud heavy spaces and water problems, as this makes navigation difficult, especially for those who use wheelchairs or accessibility scooters. This concern was captured perfectly by a group discussion (age 72-73):

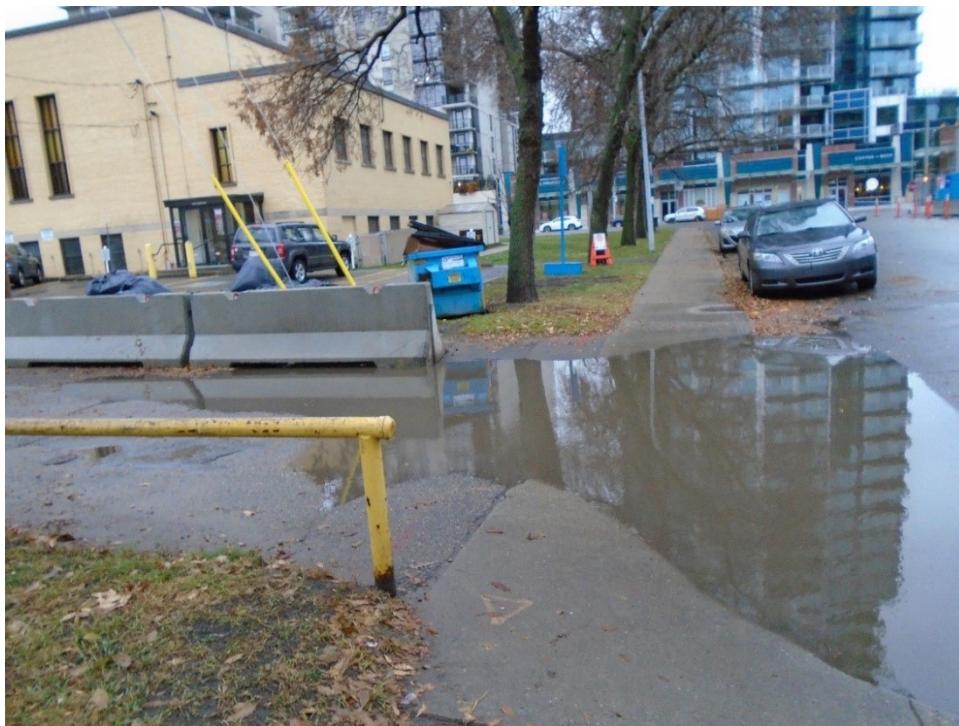
- O2 That's settling where the [redacted] parkade is underneath there. But the idea was when they did the [redacted] Programme to redo this stuff. The water is to come from this direction, all the way to the end of the street, cross the lane, and then down the drain. Otherwise, it all comes to a drain at the opposite corner here, which like many of the drains gets plugged or it's not at the low point.
- O1 No, they should be at the low point, but they're not.
- O2 So, there probably is some settling due to building high rises, etc.
- O1 Consistently, yes. In spring, it is absolutely awful. Eight inches of icy slush. In spring, you see seniors and walkers, and wheelchairs, on the roadway, because there's no place else.
- IV That's super dangerous.
- O3 It is. And in the spring when it's slushy, look, I thought I could walk up those side streets to Oliver Park, Oliver Square area. It's just horrible. All of them are horrible. 16 even is horrible. I thought 16 would be better. It's not. 24 is the only

street that you can go up with security when it's like that. And then, of course you're out of your way.

- O1 And the crossings are all problematic in spring, when there's rain.
- O3 You get with windrows, the stuff that comes in from the ploughing, the snow. And then, on the other side. And then, you've got the centre. And if you get a hollow, then the water just stays there and the ice stays there. And you walk halfway up the block and God, I can't. And you can't get out. You have to go back, because you can't go over those banks. It's not good for pedestrians.

Through this discussion and figure 8, it is apparent that poor crosswalk design in relation to weather has many negative impacts to the overall walkability of a neighbourhood. However, it is apparent that personal safety is the biggest concern as traffic collisions, falling, getting stuck, back pedaling, and crossing pose unique and significant health risks. As a result, while drainage features are important for vehicles and building design, pedestrian experiences must be taken into account when designing walkable spaces as poor design not only poses health risks but may reduce individuals' desire to walk in these spaces which run counterintuitive to community goals. Lastly, different crossing materials such as brick, was highlighted to be considered unessential by pedestrians and may even increase falling risks due to lack of grip. However, this concern was discussed by one participant, and also was a reflection pertaining to the frustration of crosswalk material over new sidewalks. Overall, the intersection of engineering and weather plays an underappreciated role in promoting or hindering walkability.

Figure 8: Poor Drainage at Pedestrian Crossing



5.4.3 Perceptions of Safety

For the majority of participants, perceptions of safety played a big role in their encouragement to navigate the built environment for physical activity, transportation, or even walking to their car. While none of the participants discussed crime impacting them directly, the sense of security was a deciding factor for many activities. As a result, it is important to understand the factors that influence older adult behaviour. The following section will be split up into two sections, lighting and observations, and perceptions of crime and fear.

Lighting and observations of others on perceptions of safety and security were highlighted to play a big role in the health and wellbeing of older adults, as it was discussed in its ability to influence behaviour. Lights were highlighted as important factors in perceptions of safety in its ability to illuminate pathways or other built environment features, which indicated

the removal of the unknown, while improving the ability of others to see them. These unknowns can be falling hazards, other people, blocked passages, or forms of hazards that may arise through the built environment. This was observed along pathways, parking lots, and other walkable spaces. Good lights along pathways were seen as positives to walkability as one participant discussed how she used to walk 40 minutes one way to her job downtown due to good visibility, which made her feel safe. Furthermore, K2 (age 66-72), discussed how her “night vision isn't that great anymore”, which enforces the need for good lighting, as it was described as essential to neighbourhoods. This was further reflected as poor lighting had a detrimental impact on perceptions of safety, as K4 (age 66-72), described how they avoid a particular alley due to poor lighting:

There's really good lights, there's no lights in the alley, there's really good lights in the mall. Too good actually, put in new LED lights that shine in your windows at night. But where this concrete wall is unlit. There's solid probably six-inch concrete wall probably five feet high, six feet high and it runs from there right down to the corner.

The poor lighting was discussed as limiting visibility around the corner, which perpetuated fear through the inability to remove the unpredictable. Walking was not the only component impacted, as participants discussed how they felt unsafe in parking lots with inadequate lighting.

Building upon lighting, the ability to be observed by others was another factor in promoting a sense of security in walkability and navigating the built environment. This was highlighted to occur through two forms, technology and people. Firstly, the lack of technology

in patrolling a space created lowered senses of safety through poor observation. This was described nicely by participants in Kilkenny (age 66-72):

- K3 No closed-circuit TV and that floors me in the back. There's no closed circuit and especially in that corner.
- K2 We should contact the city and maybe they'll put them in.
- K3 It takes something to happen unfortunately.
- K2 It does in most cases, right. Gee I wasn't aware of that. Now I'm really afraid to go around.

Through this discussion, it is apparent that the addition of CCTV's or other forms of technological monitoring of spaces can improve the sense of safety for older adults. Secondly, increased interaction and observation with strangers appears to improve perceptions of safety, as participants described how the increased eyes on the street improved safety. These spaces were ideally described by K3 (age 66-72), as "an open space where you can see things and that. No concealment as much as possible." Within a more built up space, such as downtown, O2 (age 72-73), described the importance of interactable spaces:

One of the things is they're getting a little bit more eyeballs on the street and having an active platform on the lower floors. But once people are in those apartments, they don't interact with the street. Whereas we're on the street, and at least in the summertime, people actually can interact and say hi or whatever.

Through this quote, increased number of pedestrians, visual permeability of buildings on ground floors, mixed use, and weather all play a role in increasing the feelings of eyes on the street to improve safety for walkability. The increased number of individuals using greenspaces for recreation was also highlighted to improve feelings of safety. Overall, lighting, CCTV's, and

increased pedestrian interaction was highlighted to improve perceptions of safety to encourage walkability.

Perceptions of safety and fear of crime or threats played a role in promoting or hindering ones' motivation for navigating the neighbourhood for walking. The perception of safety is an important consideration as a singular event or concern was more than enough to persuade the majority of individuals to avoid particular routes, or at least be highly cautious of such spaces. This was described by participants in Kilkenny (age 66-72):

- K4 This ones the most direct route from my house to the mall and it never used to bother me but about a month ago, I don't know if you heard the news story where this woman was assaulted, and they waited 80 minutes or something for the ambulance.
- K2 That was that alley?
- K4 That was right there. So, at night I don't go that way anymore. But now there's all kinds of people hanging around, just doesn't feel safe.

As a result of a single event, walkability for participants was diminished as direct routes are now impassable due to fear. This was further echoed by other participants as O1 (age 72-73), discussed how:

I don't walk in the river valley at all because of that. I did when I first moved here, and I came into a few situations that it felt very threatening. And I don't walk alone. When I'm alone, I don't walk in the river valley at all, or on those walkways.

As a result, through a couple of harrowing experiences, walkability and enjoyment of greenspaces is diminished, which appears to negatively impact health and wellbeing. However, just the mere perception of crime or fear is enough to discourage walking. This was discussed by K3 (age 66-72), "although there have been recently interesting people back there. They sit on those picnic benches near the picnic tables. It doesn't trouble me that much, but my wife

won't walk back there by herself ever, ever." Furthermore, one participant described, shown in figure 9, how the presence of homeless tents created feelings of fear as she discussed how "normally it doesn't bother me, but it was just shocking, and I didn't feel safe." These quotes demonstrate the negative impact that fear or perception of others can have on walkability and livability in ones' neighbourhood. Lastly, even if participants did not personally experience these emotions, if someone close to them had experienced it, they were likely to avoid such areas. However, it may be important to note that 66% of participants were female, and they voiced more concerns about safety than the male participants. As a result, it is important to consider the factors that negatively impacts feelings of fear and safety, as they do play a big role in promoting or hindering walkability in older adults.

5.4.4 Summary

Overall, experiences of safety in walkable spaces come in many forms, such as sidewalk quality, traffic safety, crossing design, crime, and fear. However, while these features may appear to be easily understood through a quantitative lens, it is important to understand the reasons and experiences that modify behaviour or emotions in older adults, as these experiences play a central role in promoting walkability in this age group.

Figure 9: Homeless Tent Near Bush



5.5 Foodscapes for Health

Food played an important role in the lives of participants, as the importance of accessible healthy food options was highlighted throughout all three focus groups. This played a role in promoting physical health as they had the agency to choose and prepare healthy foods for themselves. Furthermore, a variety of food choices was described to be an important factor in foodscapes within their community, as it allowed them to meet their food needs within their communities, but also added to feelings of happiness. Concerns related to affordability,

accessibility, and covenants were raised in food environments, which can play a detrimental role in health and wellbeing.

5.5.1 Accessibility of Food

Food accessibility was identified as a key component for complete communities by participants across all three study sites, with healthy food access being on the forefront of the topic. Acceptable access to grocery stores were talked about fondly by all participants, with fast food stores and lack of access talked negatively to happiness, as discussed by K4 (age 66-72), “who wants to see a Kentucky Fried Chicken your A&Ws and all that, you see enough in the malls and things like that.” Furthermore, it was apparent that communities with higher completeness scores had high accessibility to grocery stores within their neighbourhood or nearby places. This was demonstrated by the difference between Oliver (age 72-73), which had participants describing four stores, versus Brander Gardens who had nothing and required a personal vehicle to achieve shopping trips. While this was not highlighted as a concern for Brander Garden participants, future concerns, when driving may not be an option, were not mentioned. However, this concern was voiced in Kilkenny (age 66-72), which was a somewhat complete community, with participants discussing:

- K2 They've closed so many of the grocery stores in the areas that are inhabited by seniors. And it's really hard for them to get around. You hear of people complaining about it all the time. Unless you drive but not everybody drives.
- K3 And not everybody has family that can do it for them. Because a lot of elderly people are on their own.
- K2 They've taken a bus to get groceries, how are you going to carry them?
- K1 The ma and pa stores.
- K2 Yes, yes. There aren't any anymore because...

K3 Places like Walmart.

Through this quote, it is apparent that in communities without strong density, that smaller local food stores are going out of business due to the franchise supermarkets choking them out. As a result of this economic growth of some companies, the downstream impacts are not only felt by local business owners, but also the health and wellbeing of older adults. This concern was further elaborated on by some participants who brought up the concern of covenants within urban policy. Through these legal agreements, one stakeholder may sell land to other stakeholders with the stipulation that another grocery store may not be created. Covenants ensures that competition for one grocery store does not become encroached by others. However, this negatively impacts the accessibility of healthy food options for older adults within a community. Secondly, it was demonstrated by the majority of participants of the significance of these small local food stores, as it served as a social space and neighbourhood identity for older adults.

Community gardens were lightly discussed as avenues in which to increase healthy food access for older adults and other members of the community. However, two major concerns were highlighted. Firstly, access for older adults in obtaining a space to garden was brought up as a challenge since space for community gardens in communities is tight to begin with. Secondly, for some older adults, mobility challenges pose further obstacles to manage in order to participate in some gardening activities. This was explained by BG1 (age 75-78):

For community type of a garden I suppose that might be good but I'm not mobile and so when I'm putting out flowers and doing it along my driveway. So, I've got the little shovel, chain and stuff like that beside me and I can do a pot at a time and then go sit

down and then go and do another pot at a time. And to bend over and there is just that's... I can't anymore do that stuff and I can't... I used to be able to do all the pots and clean up around the bush, it's too heavy to lift. I simply I can't do that anymore.

As a result, through this quote it is evident that while community gardens may be beneficial for healthier food access, age friendly design limitations pose challenges for older adults' participation in such spaces. However, for more mobile citizens, as described by Kilkenny participants (age 66-72), having home gardens improved healthy food access:

- K2 I do I have a huge backyard, but I only grow peas and carrots and raspberries.
K3 I have grapes actually.
IV You have grapes?
K3 This year we got 14 ice cream pails of grapes. Gave it to the whatever [unclear] whatever. We didn't do it ourselves, there's an organization that makes jam and stuff, they go out and pick people's fruit if you can't. So, we picked them and gave them to them. We still have a bunch in the freezer from last year, tomatoes in pots, I have one sunny place in the yard that's where the grape is, but I put tomatoes in pots in the wagon and I can move it around.

Overall, healthy food access is important to the lives of older adults, as it can improve health and wellbeing through increased nutrition, independence, social connections, and accessibility.

5.5.2 Variety of Food Options

A variety of food options was viewed as positive for a community, as a mixture of food places provided a couple of key roles for participants. As previously mentioned, it firstly allows for individuals to meet their food needs by providing an array of options. Examples provided were bakeries, restaurants, and grocery stores. Secondly, it provided social spaces within their own neighbourhood for participants, as these locations served as mediums for connecting with

other community members, local business owners, friends, and family. This was discussed in Brander Gardens (age 75-78):

- BG2 Another thing I like about Riverbend Square is that I put a picture of different... Maybe I didn't put them in. There's a good variety and they have some really neat restaurants in there. So, if you want a variety of restaurants you can...
- BG1 Different foods yes.
- BG2 Different food. When my sister-in-law comes, she loves curry, [my husband] won't eat it. So, she and I go to that curry corner that's on there and load up. We go and just fill up take everything cold that's our next meal. Stuff like that.
- BG1 And we like Pho Express.
- BG2 Yes.
- BG1 I really like that, it's Vietnamese food, Vietnamese.
- BG2 That's really good.

Participants in Kilkenny (age 66-72), also highlighted this finding as they described a particular store, figure 10, within their neighbourhood as holding an identity and possibly bringing people together:

- K2 And that's right beside Sabrina Butterfly. Daphine they used to... She started used to be no-one else, but Cream of Tarts and her husband does all the branding, baking and they were downtown just on 104th where the market is, and they closed down there and now she's opening up Daphine. It's a great place and she's got really healthy, well you can eat healthy, you can have a sweet. She's a great baker she does good desserts and he's the best bread you have to sometimes look at both sides of it, there are two.
- K3 Oh really.
- K2 That's it yes but they only bake certain days, so the line looks long on those days.

The ability for local stores to provide food access was highlighted as important, and also created a sense of pride for participants. As a result, the promotion of local businesses within the neighbourhood mixed use fabric can play an important role in encouraging food access, improving neighbourhood connections, and also keeping citizens shopping within their locale which contributes to community completeness.

Figure 10: Community Store



5.5.2 Summary

Overall, healthy food access plays an important role in promoting the health and

happiness of older adults in their communities. Furthermore, a variety of locations provide diversity in food, while also creating social spaces for residents to create closer bonds with their own community and ensuring that one can complete their shopping needs within their locale.

5.6 Distinctions between Study sites

5.6.1 Oliver

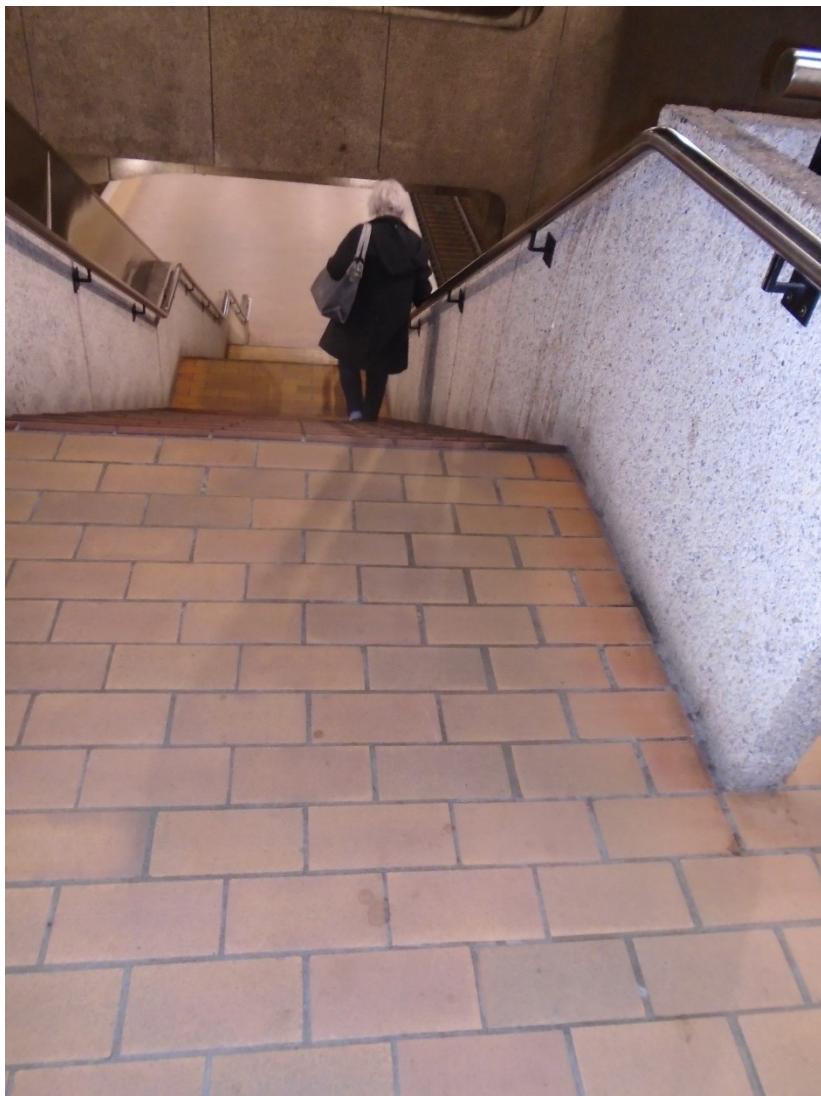
In comparison across all three study sites, Oliver was evaluated to be the most complete community, as it had strong mixed use, transit, walkability, housing diversity, and healthy food options. This may not come as a surprise as this neighbourhood was located in the downtown of Edmonton and had the highest density versus all other sites. As a result, participants within this space appeared to be able to meet a higher proportion of their daily or health needs through local amenities than participants in other communities. This was demonstrated by O3 (age 72-73):

That's my picture. That is where my doctor is, and where my rheumatologist is, and where my gynaecologist is. And they have an X ray clinic there, so you don't have to go elsewhere for that. And they have now opened a little bakery, a place that you can have a little lunch. They have an eye place there that's been recently added. A physiotherapy. And the primary care network used to be there. And I did an exercise programme with them. They've since moved up to [redacted] Centre. But I go to [redacted] Clinic a lot, so that's very important to me.

In addition to this quote, other individuals highlighted the importance of various grocery stores, pharmacies, greenspaces, and other amenities that help them achieve healthy living. As a

result, in addition to health and wellbeing, it can be concluded that strong mixed-use planning in communities is able to facilitate accessibility and independence in older adults.

Figure 11: LRT Steps



Oliver was the main community in which participants discussed the importance of public transportation. This may be a reflection of the reliance on this mode of transportation, as this group was not as car reliant as other communities, but also because how density facilitates effective public transportation. As a result, participants stressed the importance and value of

public transportation to meet their daily needs and improve accessibility, with busses and the LRT being a focus. However, while there were many positives, poor transit design at LRT stations in relation to safety was strongly highlighted. Firstly, poor accessibility as seen in figure 11 was discussed as a limitation for older adults and non-able-bodied individuals, as described by participants (age 72-73):

- O1 However, the LRT is not a good option for seniors because of the many stairs and the frequently malfunctioning or dysfunctioning elevators and escalators. There must be 80 steps that you need to take when the elevators and escalators aren't working, to get in and out of that building.
- O2 And the original line is on the periphery of the neighbourhood. The new line might help.
- O1 But the escalators are always out of service, and the elevators are frequently out of service. My 85-year-old sister, I met her at the train station in Bellevue, took her to the central station thinking we'd take the elevator. The elevator wasn't working. The escalator wasn't working. The only way out of there was for her to climb 80 stairs.

This quote demonstrates how poor age-friendly design can lead to poor accessibility for older adults, and as a result, decreases the ability for this group to navigate the built environment. Furthermore, this poor experience can negatively impact older individuals enough that they may decide to not take LRT as a form of transit. In addition to lack of accessibility, fear of crime and poor visibility appeared to plague the LRT stations downtown. This was explained by O1 (age 72-73):

I find that the LRT, in the late afternoons, the LRT, those long, narrow, dim lit hallways, with all those staircases. I can't move very fast going up stairs. If I see someone who looks like they could attack me, I'm really panicked because I wouldn't have any defence. And yes, after the fact, they may be able to check the camera to identify the

person, but that doesn't help me if I'm injured or dead. So, I feel that the LRT is very unsafe in late afternoons. The station itself and also the long dark stairwells. Dimly lit stairwells.

She (age 72-73) also further elaborated on this by discussing how:

I was returning late from visiting my sister at the [hospital]. And the central station, LRT, was absolutely terrifying. Someone was following me, and I just didn't look either way. I moved as fast I could and got into the well-lit as fast as I could. But if that person had attacked me, no one would know. It was awful. It was very deserted. It was probably about 5:30. The LRT central was very deserted. There were only two of us.

Through these two quotes it is apparent that the lack of accessibility, poor lighting, low number of riders, lack of security, and perceptions of fear cause very negative emotions and experiences for older adults. In turn this diminishes accessibility, physical and mental health, multimodal transportation, and independence in participants.

Overall, the residents of Oliver appeared to enjoy the space that they resided in but highlighted various pros and cons of their community. Within these spaces, neighbourhood amenities and walkability were the most prominent themes, however greenspace for walking, and perceptions of safety were also key themes that arose. Walkability in this group was heavily discussed due to the higher incidence of walking, with negatives, such as poor crosswalk design, cracked sidewalks, and pedestrian infrastructure discussed in detail.

5.6.2 Kilkenny

Based on the evaluation of neighbourhood completeness, Kilkenny was considered to be somewhat complete, as it was considered to be a mostly suburban development, however had an increased number of amenities and other services nearby. Participants in this group appeared to be the happiest out of all of the sites examined as comments were increasingly positive in comparison to other sites. Furthermore, individuals in this group have resided in this neighbourhood the longest, with many individuals growing up in or near this neighbourhood. As a result, the increased topophilia of their neighbourhood may be due to the increased ability for them to partake in placemaking activities and also the longevity of their residence may allow for them to explore their spaces in a more in-depth manner. However, this positive reflection may also be attributed to the independence that these individuals showed, but also may be due to the individuals who decided to participant in the research study.

A key difference between Kilkenny and the other research sites was the availability of a mall within the locale. This local hub was observed to be an essential component to the community due to the various features and amenities that it provided. This was explained by K3 (age 66-72):

So, the mall is there it's handy, I can walk around in the winter when weather is bad, when I walk to the store sometimes, I have a Fitbit so I have to get my 12,500 steps a day. And sometimes it's walking around the mall. So, it's handy it's good to have it there. The community as a whole has all kinds of amenities from Londonderry Rec Centre to this place. It's got all kinds of stuff, Dairy Queen. So, the important things.

In addition to strong mixed use that it provides for residents, it provides a place for older adults to meet their daily physical activity goals. This was further supported by the other age friendly amenities within the mall, such as washrooms, cafes, and other third spaces. This was explained by participants (age 66-72):

- K2 No I walk, I do the same thing I go there in winter time early morning because I can't... I don't want to walk outside so I go to Londonderry in the winter, walk in the mornings.
- K3 I agree I'm usually there too and it's got bathrooms and coffee so we're [unclear] centre right. They are a true asset to every community actually.

As a result, malls and other infrastructure within an age-friendly lens can provide incidental benefits to the health and wellbeing of older adults, as it can provide opportunities to pursue health. These benefits are important as the mall has demonstrated that while the main use is shopping, it provides many other facets in improving the liveability of ones' neighbourhood space, such as through walking, age friendly amenities, and social opportunities. Within this group of participants, all aspects relating to greenspace was valued the most, with perceptions of safety, sidewalk quality, and food accessibility being prominent themes that arose from this cohort.

5.6.3 Brander Gardens

Brander Gardens was the least complete neighbourhood out of the three studied sites, as it was classified as a food desert, did not have many amenities nearby, poor walkability, poor transit, and was predominantly has single family housing. However, the two participants had no grown up in the area throughout their whole life but decided to move here due to the

greenspace and peace and quiet that the neighbourhood offered. BG1 (age 75-78) described this self-selection:

And it gave us enough room for [my stepson]. It was bigger actually than what we needed but we needed space for him to be able to grow up. So that's why we ended up in Brander Gardens and then, as you know, to roam around and find the playground space and everything was just a big bonus.

Through this quote, it is apparent for some individuals that greenspace and suburban developments may be ideal to raise younger children or family, as the space is viewed as ideal. This sentiment is built upon, as this group of participants discussed the challenges of living downtown, such as cramped space, not being able to open windows, poor accessibility, and lack of peace. As a result, while complete communities may be viewed as ideal for particular values, for some other individuals, the ideal may be more of a suburban car dependant space. Due to the small sample size the self-selection of quiet neighbourhoods cannot be generalizable but may reflect the need to provide balanced housing options of older adults.

The lack of mixed-use amenities was not seen as a problem, but a strength as they would rather drive 7 minutes to a spot, as it ensured that their house and neighbourhood would not be negatively impacted by traffic. The value placed on peace and quiet highlights the importance placed on a variety of housing options for older adults, as it echoes the sentiments around leaving downtown. This calmness may also have played a role in the low sense of fear pertaining to crime, as participants in these spaces discussed how the crime observed, or the crime personally experienced, as a robbery while home, did not impact their sense of safety.

This was explained by BG1 (age 75-78), “we’ve had incidents throughout over the years. It doesn't make me feel unsafe it just makes me feel edgy.”

Overall, Brander Gardens was seen as ideal for the individuals who participated and highlighted the need to have a variety of housing options for older adults. The value placed on greenspace, variety of architecture, and peace and quiet, were factors that improved placemaking for participants. For the themes discussed throughout the chapter, greenspace, which includes physical activity, mental wellbeing, and happiness, sidewalk quality, variety of food options, and neighbourhood disorder were found to be the prominent themes in this cohort. This is a reflection of the values placed upon the various complete community components and focus group discussions by the Brander Gardens participants.

6. Discussion

6.1 Discussion Introduction

This chapter will discuss the findings in conjunction with existing literature. First, the discussion will utilize the capability approach to analyze the themes as it provides a powerful lens for understanding the findings. Secondly, after taking stock of the current literature and findings together, a new complete community framework will be proposed. Lastly, policy recommendations to promote complete communities with a health and age friendly focus will be discussed.

6.2 Analysis of Findings using the Capability Approach

The capability approach is centered around the tenet that people and their overall wellbeing is guided by the freedom for individual to be in any state that they desire and what they are able to do (Robeyns, 2016). Capabilities, which are the freedoms and opportunities, allow a person to achieve a particular capacity of functioning, which is the state or activity a person is able to be in (Fleuret & Atkinson, 2007; Robeyns, 2016). This freedom is important as it provides the agency to act on opportunities to improve ones' wellbeing, and the cumulative opportunities create affordances for one to live a flourishing life (Fleuret & Atkinson, 2007).

6.2.1 Neighbourhood Character

The vast majority of participants highlighted the impact that neighbourhood character had on their experiences of health and wellbeing. Characteristics such as neighbourhood and building design, social connections, variety of housing styles, and social disorder impacted the overall reported happiness of individuals. These findings resonate with aging in place literature and theory which have shown that variability in architecture, small details in community layout, and neighbourhood social connections, both direct and indirect improve happiness, physical activity, and sense of place (Kerr et al., 2012; Michael et al., 2006; Salvo et al., 2018; Wiles et al., 2012). This was stressed by the participants as the unique spaces provided a sense of individuality and authenticity between their neighbourhood and themselves, which in turn were reflected in place attachment through comments pertaining to the uniqueness and sense of community one felt in their neighbourhood (Foote & Azaryahu, 2009). The importance of placemaking was also observed with historic buildings, as the removal of these spaces negatively impacted place making for participants. As a result, the increased happiness, social connections, and place attachment that arise from neighbourhood character and design (Dupuis-Blanchard et al., 2015; Gardner, 2011; Wiles et al., 2012), all of which is foundational to aging in place (Iecovich, 2014), played an important role in promoting health and wellbeing in among participants. Furthermore, these findings in conjunction with the literature, strengthen the importance of having a variety of housing types and design outlined within the original community completeness index discussed in the Methods section. This pathway does not only arise with variations in housing but are understood to play an important role in placemaking, social connections, and in turn have the possible ability to improve aging in place.

When examining these findings through the lens of capability theory, neighbourhood design and character appeared to provide opportunities to achieve a healthier state of functioning through two pathways, place attachment and social connections. First of all, improved neighbourhood designs and character provide the opportunities for an individual to develop place attachment in ways that may not be present in other neighbourhoods. Additionally, due to its ability to improve motivations in pursuing physical activity, neighbourhood designs and character may play a role in increasing the overall physical health levels of the citizens within a particular space (Cerin et al., 2017; Choi et al., 2017; Farkas et al., 2019). Secondly, the highlighted social opportunities, such as neighbours, community events, and community centres provide the opportunity for individuals to decide their level of interaction and contribution to such activities. This freedom was demonstrated by the participants from Brander Gardens discussing contentment with socializing within their small informal group, while the Kilkenny group were active members of their local senior centre. However, it is important to note that both groups were happy with their situation. Lastly, a variety of amenities or activities for older adults may be important for improved social connections; concerns about the lack of options were discussed by the Brander Gardens participants. Demonstrated through the associations in the research and existing literature, social interactions are quite important for older adults, as it can improve the health and wellbeing of this cohort, with random interactions being the most beneficial, such as through book exchange sites (Dupuis-Blanchard et al., 2015; Gardner, 2011).

Consequently, through my focus group discussions, it was also apparent that noise and neighbourhood disorder, such as graffiti, litter, and destruction were perceived by study participants to negatively impact the overall character of their neighbourhood, and in turn

frustrated participants. This is in line with other studies which have identified the negative experiences and emotions that can arise from neighbourhood disorder and noise, such as poor navigation of the built environment, loss of function, and lowered place attachment (Garvin et al., 2012; Kerr et al., 2012). As a result, neighbourhood disorder and noise are understood to be a negative component to aging in place, as these hindrances and frustrations do not allow one to live in their community peacefully. This factor was described by the Brander Garden participants as a motivation to move to the suburbs to escape from the noise and density of downtown. The importance of noise and social disorder was not captured within the original complete community index, but through the analysis of the findings it can be understood to be an important facilitator to aging in place. As a result, future iterations of the index should take efforts to include these factors to more comprehensively ensure aging in place can be facilitated.

Thus, when examined through a capability lens, social disorder and noise concerns observed within neighbourhoods was perceived by participants to limit their opportunity to grow their placemaking. As a result, older adults' affordances to age in place are decreased, which can have negative health effects, such as increased stress, reduced walkability, and lowered place attachment (Garvin et al., 2012; Hayward et al., 2015; McCormack & Shiell, 2011). As a result, neighbourhood disorder and noise are an important consideration, as these factors proved to be frustrating for participants who have lived in these communities and have relatively strong emotional bonds to their neighbourhoods, and as a result may impact new older adult residents in a greater manner. Thus, the overall maintenance and cleanliness of neighbourhood spaces should be encouraged, because a clean environment may provide increased capability to engage in placemaking. Additionally, noise should be addressed due to its ability to lower place making.

One participant, O2, highlighted how “foliage dampens the sound a bit”, which indicates an approach that can potentially increase the opportunity to partake in placemaking through improved noise maintenance. Lastly, the downtown (Oliver) cohort discussed their strongly perceived negative impacts of noise created by drivers and speeding. Built environment interventions such as raised crosswalks, narrower streets, and increased number of turns have been shown in previous studies to decrease speed (Stoker et al., 2015) and in turn reduce noise. Including such solutions could provide opportunities for neighbourhood residents to partake in increased placemaking and help to improve safety of pedestrians in the downtown space, which may allow individuals to achieve a healthier state of functioning.

6.2.2 Greenspace

Every participant discussed the importance of greenspace as it was demonstrated to significantly impact their daily lives in three major ways. Firstly, building upon the previous section, focus group discussions and pictures showcased how greenspace contributed to the overall happiness participants said they felt within their neighbourhood. Greenspace added to the formation of topophilia, a key component of a positive sense of place that can assist in promoting aging in place through place attachment (Dupuis-Blanchard et al., 2015; Iecovich, 2014). As discussed in section 5.2.1, these factors were tied to beautification elements of neighbourhood spaces, such as trees, memorials, and flowers. In addition to the increased topophilia and joy that was experienced, the enhanced mood and neighbourhood satisfaction that was reported to arise out of greenspace and similar forms of beauty, such as flowers in parking lots, is in line with other studies found in a previous systematic review of greenspace benefits (Ambrey & Fleming, 2014; Kondo et al., 2018). Consistent with previous studies, my

study found that the overall quality of the neighbourhood greenspace in one's community can impact the reported happiness of individuals. This implication is important for the complete community index, as the subjective emotional implications that can arise from greenspace appears to be associated with increased place attachment, physical activity, and aging in place (Dupuis-Blanchard et al., 2015; Iecovich, 2014). Furthermore, while greenspace in the original index only examined dedicated areas of greenspaces within neighbourhoods, the findings of this study that relate to beautification of neighbourhood elements, such as treelined streets, and their ability to also produce happiness, suggest that such elements should be included in further refinement of the index for community completeness.

When examining neighbourhood greenspace through lens of capability approach, it can be asserted that quality of greenspace provides the opportunity for one to engage in placemaking behaviour. Greenspace can allow for improved aging in place and improving social connections, both of which are important to the health and wellbeing of older adults (Dupuis-Blanchard et al., 2015; Iecovich, 2014). This can be exercised on a grander scale such as entire street blocks or visual features in parks, but through the discussions in section 5.2.1 and figure 4, as suggested by participant discussions, small scale interventions such as beautification of parking lots or flowers at bus stops may be enough to improve the mood of older adults. Through these interventions, even the smaller placements of greenery appear to provide the opportunity for individuals to achieve a state of functioning, which in this case is the state of happiness and wellbeing. This finding should provide incentives to invest in beautification through greenspace interventions as it can provide the opportunity for some individuals to engage in placemaking and for improved mood, which in turn can improve health and wellbeing.

Secondly, participants highlighted the importance of greenspaces in terms of their mental health and wellbeing through the pathways of satisfaction and calmness. The experiences of calmness and satisfaction highlighted in my study aligns itself with many other studies that have demonstrated the importance of greenspace on the mental health of individuals (Fong et al., 2018; Hunter et al., 2019; Kondo et al., 2018). Since participants did not discuss any specific negative mental health conditions such as depression, anxiety, or other cognitive challenges, it is not possible to confirm the impact that greenspace has on these factors. However, when examining the role that greenspace has on promoting mental health through peace and quiet, participant discussions included these features as providing opportunities for individuals to pursue activities that improve their wellbeing. This was demonstrated in section 5.2.3 as participants discussed how these spaces were utilized to engage in calming activities and to reduce stress, which provided them the functioning of a lowered stress state. However, no mention about its impact during the winter months were mentioned. Thus, to improve the mental health of residents, it is important for cities to strongly consider investing in greenspaces and other green based factors such as flowers and trees in communities, especially ones that are lacking in this capability.

Lastly, greenspace was strongly valued, as participants unanimously highlighted the value of parks, trails, and tree lined streets for its capacity to support physical activity for older adults, all of which furthers the strong existing literature around this topic (Hunter et al., 2019; A. Lee et al., 2015; McCormack & Shiell, 2011). Furthermore, as shown in section 5.2.2, walking was the key form of exercise that was discussed by study participants, with many of the previously discussed variables all playing a role for promoting this activity. Additionally,

participants without sufficient greenspace discussed how they would travel to other communities to partake in walking for leisure, which indicates a strong value placed on these spaces. It is also important to note that only one of the three communities had a recreation facility in its vicinity, and thus greenspaces may play a mediating role in physical activity in individuals with a lack of access to other forms of recreational spaces. Due to greenspace being so vital for exercise for older adults, with trails, benches, and other supporting features within these spaces assisting with user-friendliness of these spaces, future community completeness indices should additionally attempt to capture different greenspace features as well as greenspace types, such as differences between neighbourhood parks and walking trails in nature-based spaces. Such differences among greenspaces may be important as participants indicated that they would travel fifteen minutes to reach specific types of high-quality greenspaces with certain features, such as blue spaces. Attempts to capture the data may come from built environment audits, open city data, and/or GIS data that examine spatial features.

From the perspective of the capability approach, it is apparent that the lack of high-quality greenspace could limit the opportunity of individuals to partake in physical activity, which might negatively impact the health and wellbeing of individuals (Warburton et al., 2006). Since all of the participants who reported travelling to other communities to access greenspaces also reported having a personal car, for older adults or other individuals with limited mobility or agency, the ability to engage in greenspaces outside their communities may be severely hindered. As a result, due to the lack of access to high quality greenspaces, older adults' physical health is negatively impacted. Additionally, building upon previous paragraphs, the mental health improvements and place attachment benefits of green spaces may not be experienced as well.

Thus, the inclusion of high-quality greenspaces within neighbourhoods is important, or to create spaces across multiple neighbourhood spaces to allow every individual the opportunity to engage in health seeking behaviour, and to improve their dimensions of human flourishing.

It is important to note the value placed on blue spaces that were located within the greenspaces. Blue spaces are typically defined as bodies of water, either moving or still, in either natural or man-made spaces, that is either accessible to people or within observing distance (Finlay et al., 2015; Gascon et al., 2017; Völker & Kistemann, 2011). While there are a limited number of studies, blue spaces have been found to promote positive mood, lower stress, increase placemaking, and encourage recreation (Finlay et al., 2015; Gascon et al., 2017; Völker & Kistemann, 2011). As a result, blue space features may be an important feature in landscape design, as it was demonstrated in both the literature and my study's participant experiences in Oliver and Kilkenny. Blue spaces may provide further opportunities for individuals to pursue health-focused activities, and lead to increased health functioning and human flourishing, while also potentially improving the ecology of the neighbourhood environment. Increased scholarly research, however, is still needed for a deeper understanding of blue spaces and its impacts.

Overall, the placement and addition of greenspace components, both small and large, appear to provide opportunity for residents in communities to pursue health seeking behaviours which can in turn improve their health and wellbeing.

6.2.3 Walkability

Walking was discussed to be the main form of physical activity undertaken by the participants across all three focus groups, indicating the importance of the walking environment in neighbourhood spaces. It was evident that the built environment played a vital role in the ability or motivation of study participants to navigate these spaces. The first key component of walkability identified was the quality of sidewalks, both the physical state as well as their continuity. These elements of sidewalks were identified to be important by every participant. These sidewalk elements were also reported as contributing to two associated factors: sense of security and neighbourhood character. Sense of security related to risks of falls and was discussed by study participants to be a major barrier in walkability. The perception of safety is a subjective measurement of fear within a particular space (Foster & Giles-Corti, 2008). This fear of falls reflects the findings of past studies evaluating the built environment (Garvin et al., 2012; Salvo et al., 2018; Van Cauwenberg et al., 2018). Building upon this, the majority of participants voiced disapproval of the City of Edmonton's efforts in managing these concerns, as the attempts of covering cracks with paint or tar, and grinding cracks down was met with scrutiny, as it increased hazards, and took away from neighbourhood character. Furthermore, it is important to understand that these haphazard efforts in mitigating sidewalk quality made participants feel like they were not heard or valued by the city, as potholes were repaired while calls to improve walkability factors were not. This had a detrimental impact to the health and wellbeing of participants, as perceptions of security, aging in place, and subjective measures of self-worth were decreased.

All of these factors would be expected to negatively influence aging in place, which is a goal outlined by the City of Edmonton (City of Edmonton Community Services, 2007; Edmonton Seniors Coordinating Council, 2011). Furthermore, within Edmonton's MDP, sidewalks are mentioned, but the overall quality of these amenities are not stressed. There is opportunity for the goal of aging in place to be more robustly addressed through an additional emphasis on sidewalk quality and continuity in City of Edmonton documents. This was stressed by Oliver participants, even though Oliver was already determined to be the most walkable community in my study. Age friendly components, such as benches were highlighted by study participants as potential ways to significantly improve walkability along sidewalks and other walking routes. Lastly, while the original community completeness index examined walkability from a mixed use perspective, more robust efforts to understand the overall quality of sidewalks should be included in future iterations, as it impacts walkability, sense of wellbeing, accessibility, and aging in place.

When examined through the lens of capability theory, the poor-quality sidewalks experienced in all three study sites limits the opportunity of individuals to partake in walking as a form of transportation and exercise. As a result, the citizens within these communities would not have the capability to maximize their state of functioning, which can have negative health and healthcare system impacts, such as increased risk of NCD's (Farkas et al., 2019; Warburton et al., 2006) and increased healthcare costs (Janssen, 2012). Freeze-thaw cycles provide a unique challenge to Edmonton, which can significantly impact the longevity of concrete as the movement of water within the pores and the expansion that is observed when ice is formed creates microcracks that lead into long term damage (Basheer et al., 2001). However, this is a

reality that many Northern cities face, and ways to improve aging in place through walkability has been identified by study participants as needing to focus on sidewalk quality in Edmonton. Benches and other age friendly amenities, such as washrooms, were also discussed by study participants as being needed to facilitate walking and independence opportunities in older adults.

Traffic and street crossing design were discussed as another predicament that older adults had to navigate. Many of the points brought up by study participants were negative in nature. As shown in section 5.3.2, traffic speed, poor pedestrian crossing timers, and intersection design in light of poor weather considerations were highlighted. Traffic speed concerns are also reflected in the literature, as a review concluded that:

evidence indicates that when struck by a vehicle traveling forty miles per hour (mph; 64.4 km/h), a pedestrian has an 85 percent chance of death, and the fatality rate drops to 45 percent at thirty mph (48.2 km/h) and to 5 percent at twenty mph (32.2 km/h) (Stoker et al., 2015).

There is cause for concern, as older adults face a greater risk of vehicular pedestrian collisions, from a variety of factors including engaging in walking for travel more frequently, moving slower, and having other health challenges that limit reactivity to vehicles (Kerr et al., 2012; Stoker et al., 2015; World Health Organization, 2013). Participants in Oliver discussed poor pedestrian crossing timers, which they felt encouraged older adults to partake in risky crossings. The insufficient time to cross a streets has also been highlighted as a challenge in the literature (Stoker et al., 2015; World Health Organization, 2013). While weather is commonly discussed as a barrier to walking in older adults (Garvin et al., 2012; Rosenberg et al., 2013; Stoker et al., 2015), poor drainage at

crossings were highlighted as a key concern by study participants; this issue has not been sufficiently discussed in literature. A byproduct of curb ramps, civil engineering, or drainage design, poor drainage of water at street crossings is an obstacle that must be overcome to improve the walkability of pedestrians. Engaging in an analysis of walkability through the capability approach, the study has indicated that street crossings and the lack of traffic calming measures in study participants' neighbourhoods hinders their opportunity to achieve optimal healthy functioning, due to limited walkability. This has been shown in previous studies to reduce walking as a mode of transportation and to lower physical activity (Cerin et al., 2017; Tremblay et al., 2011; Van Cauwenberg et al., 2018). An improved focus on traffic safety for older pedestrians must be undertaken. More responsive pedestrian crossing timers, raised crosswalks, narrower streets, and increased radius of turns have been shown in a review to slow traffic and improve safety (Stoker et al., 2015), which would provide increased opportunities for older adults to navigate the built environment. Lastly, similarly to sidewalk quality, aspects pertaining to pedestrian safety and crossings, and their weather-related design implications should be considered in future iterations of complete community indices.

Perceptions of safety, in relation to crime was discussed by the majority of study participants to be an important factor in their motivation and ability to navigate the built environment. As shown in section 5.3.3, lighting, eyes on the street, knowledge of crime, CCTV's, and stories of crime or fear from friends, all played a role in reducing study participants' motivation for walking. These findings appear to be consistent with previous literature discussing the perceptions of safety and physical activity in built environments (Barnett et al., 2017; Cerin et al., 2017; Garvin et al., 2012; Kerr et al., 2012; Salvo et al., 2018; Van Cauwenberg et al., 2018).

The study's results regarding perceptions of crime and the willingness to walk are also consistent with previous studies, as subjective measures have been shown to be more consistently associated with health impacts for older adults than objective measures (Cerin et al., 2017; Foster & Giles-Corti, 2008; Rees-Punia et al., 2018; Yu & Lippert, 2016). The subjective and objective nature was observed by a study participant who reported that she did not feel unsafe in her home or neighbourhood despite experiencing an attempted home robbery in her own home. However, the finding around the importance of subjective experiences of security indicates an increased importance on the value placed on the experiential landscape within neighbourhoods. This indicates the necessity for scholars and policy makers to investigate emotions and experiences of individuals within their neighbourhood spaces in qualitative ways to gain an understanding of the subjective nature of security. Furthermore, while challenging, the current literature and findings relating to the importance of subjective measures of safety, demonstrates the importance for complete community indices to take efforts to measure these experiences and emotions, as it can have significant impacts on walkability and independence for seniors. If not possible to examine subjective measures in an objective tool, efforts to measure built environment features that promote a sense of security, such as lighting and transparency features that promote "eyes on the street", should be included.

Qualitative forms of inquiry is able to reveal information that may be challenging in quantitative or objective ways (Novek et al., 2012; van Hees et al., 2017; C. Wang & Burris, 1997), and can improve built environments through the understanding of experience, which is form of wellbeing. Many of the concerns and suggestions discussed by study participants on the issue of crime appear to fit within the topic of surveillance in crime prevention through environmental

design (CPTED). CPTED is a concept that works to lower incidences of crime through appropriate built environment design changes, such as features that can improve surveillance and limit opportunistic crime, which may include increased lighting, fences, and locking gates (Cozens et al., 2005; Cozens & Love, 2015). CPTED measures for improved surveillance include CCTVs for mechanical observation of a space, lighting for increased visual permeability in darker hours, and features for informal surveillance that increase the number of residents or people watching or interacting in a space (e.g. ground-level windows) (Cozens et al., 2005).

When examining this through a capability lens, the participants' built environments does not appear to provide enough opportunities for individuals to lead a flourishing life, because physical activity and walking are hindered to various degrees for many study participants. Fear of crime has been shown to be associated with increased obesity rates due to lowered physical activity in other studies (Suglia et al., 2016; Yu & Lippert, 2016). As a result, to provide the affordance for individuals to walk and to improve their physical and mental health, built environment additions such as increased lighting, improved transparency, and CCTVs, could be used to improve the perception of safety. Improved perceptions of security may assist in the perceived freedom of individuals to pursue health-based activities. Emotions and experiences, such as perceptions of safety, play an important role in the motivation of participants to partake in walking as a form of leisure or travel, and this factor was shared across all study subjects and the literature.

6.2.4 Foodscapes

Foodscapes were not discussed by participants in as much depth as the previous themes, but through the focus groups it was found to be a key component of complete communities. Food spaces were identified to be important factors through two pathways, accessibility to healthy food options and having access to a variety of food options. Study participants identified that access to healthy food options and a variety of food options as providing individuals the opportunity to pursue a healthier lifestyle through nutrition and these concepts were strongly valued by participants. Two distinct place-based connections with food were identified.

Firstly, according to Glanz and colleagues' (2005) healthy nutrition environments framework, both the consumer and community environment are important components of the foodscape fabric, with both influencing the organizational home environment. The consumer environment, which is the organizational food network such as surrounding food stores or placement of items within a grocery store (Glanz et al., 2005), was discussed by study participants as a facet of their foodscapes. A strong community environment, defined as the distribution and accessibility of food sources (Glanz et al., 2005), was strongly valued by participants across all three study sites. However, due to the importance of the community food environment among the participants, it may be argued to be the most important space within the healthy nutrition environments framework for the health and wellbeing of older adults. It is important to note that this may be the result of the study focusing on the built environment and not the other components of the framework. Through a previous study it was determined that Brander Gardens was a food desert (H. Wang et al., 2014), and through the complete communities index map, it is shown that Oliver and Kilkenny had access to supermarkets within 1 kilometer.

However, in future iterations of complete community indices, the scale of food environments should possibly be reduced, as older adults take longer to walk, face increased challenges, and are comfortable walking shorter distances due to these challenges (Tsai et al., 2016; Tsunoda et al., 2020; World Health Organization, 2013). Lastly, other features of the complete community index can also facilitate healthy eating behaviours through increased access if shorter walkable distances are not possible, such as 20 minute neighbourhoods, where necessary trips can be completed in either a 20 minute walk, bike, or bus ride (McArthur, 2018).

Through the lens of capability theory, a stronger community food environment, in terms of healthy food options, provides the opportunity for individuals to act on the desire to achieve a higher state of health functioning through diet. This was reflected in participants' negative comments regarding the abundance of fast food options within communities and malls, indicating their concern for the community food environment and their potential support for discouraging unhealthy food environments. Participants in my study demonstrated concerns about unhealthy community environments for food which we have the opportunity to improve through increased emphasis for healthy food amenities in mixed use developments, removal of restrictive covenants that may limit access to places that sell healthy food, and other initiatives to increase access to healthy food options.

The second placed-based connection to foodscapes was connected with aging in place. Since aging in place is the ability for people to live in their community for as long as possible (Dupuis-Blanchard et al., 2015; Iecovich, 2014), a community environment with access to food options is a necessary foundation. Aligned with the literature (Bird et al., 2018), focus groups in my study pointed to the existence of healthy community food environment as providing them

the opportunity to pursue a healthy diet, which in turn improves aging in place and allowing one to live in their community longer. Furthermore, as discussed in section 5.4.1 and 5.4.2, a variety of food options within the community was discussed by study participants as potentially improving aging in place in two additional ways. Firstly, a variety of food options, both restaurants and healthy food options, allows one to live in the community longer since the individual is able to meet a higher proportion of their food needs within their community. This is associated with the concept of accessibility share (Merlin, 2014) discussed in section 2.1, since an individual is able to complete their food activities within their community or vicinity around the neighbourhood. Furthermore, this can strengthen the concept of accessibility share, as a mix of different amenities, such as food locations and recreation spaces, and variations of those amenities, such as multiple grocery stores and different types of restaurants, is needed to facilitate both aging in place and mixed-use discussions. Aging in place is supported by improving increased access to services (Kerr et al., 2012; Salvo et al., 2018). Through both the literature and participant experiences, a healthy community food environment was valued and is deemed important for inclusion in complete communities. In this study, when it came to their health and wellbeing, participants also showed a negative perception of large numbers of fast food outlets and a positive perception of having access to a variety of food options and of local food options. Participants also regarded such food spaces as social spaces, providing further rationale that healthy food environments consisting of a high variety of local healthy food options and low numbers of fast food outlets should be included in future complete community indices. However, in order for complete community indices to include these factors of the food environment, data

pertaining to types of food premises and choices within neighbourhood spaces, especially in regard to healthy food access and variety of choices, will be needed.

Secondly, participants discussed the importance of small neighbourhood stores as central points for social connections and neighbourhood identity. These stores contribute to aging in place by acting as additional transitory zones and third places (Gardner, 2011), which can add a sense of ownership and connection to one's neighbourhood. Through the lens of capability theory, a variety of neighbourhood stores can provide the opportunity to pursue both social connections and aging in place, as these spaces facilitate positive placemaking for older adults. To promote aging in place, mixed use planning within communities should be a priority and a variety of healthy food amenities should be part of that mix of uses. Overall, the community food environment and aging in place are major concerns for older adults in our study.

6.3 Differences Among the Three Study Sites

Due to the small sample size of communities and participants, it is not possible to form strong generalizations and definitive conclusions about the differences found among the three sites. However, some of the differences that were identified are discussed here, examined using the capability lens.

Oliver was the most complete neighbourhood out of the three, which was reflected in its high mix of land uses that were highly valued by all of its participants as it allowed them to meet their various needs. The high amount of mixed use was perceived to provide opportunities to achieve a state of health functioning, and included spaces for third places, healthy food options,

transit, housing, and health services. Participants felt neighbourhood community stores to be positive spaces. The Oliver focus group also expressed the value they placed on public transit, with two out of three participants stating they did not drive and depended on this mode of transportation. This reflects the literature that increased public transportation allows for greater access to services and improved mobility for older adults (Cerin et al., 2017; Kerr et al., 2012; Salvo et al., 2018; Van Cauwenberg et al., 2018; Yassuda et al., 1997). However, due to the safety concerns highlighted in section 5.5.1, participants were often hesitant to engage in public transportation. These safety concerns that arise from the emotional and experiential relationship to the built environment provide further rationale for investigating the perceptions of and value placed on security in further iterations of complete community frameworks. In older adults, various contextual and intersecting factors are involved in using transit, as is reflected in both this study and the literature. To provide the freedoms needed to achieve a healthy state of functioning through physical activity from active transport and increased accessibility to transportation, built features such as egress options and lighting at transit centres that can increase perceptions of security, must be addressed.

The mall in Kilkenny played a major role in the Kilkenny participant discussions of their community as various amenities including health centers, health services, healthy food options, and shopping, were provided by the mall created affordances for older adults to meet their daily needs. The mall was seen as extremely important by some residents in the community as there is a prominent senior centre and senior living facility located in the neighbourhood. The mall provides the opportunity for them to achieve a higher state of functioning, as health, nutrition, and service needs can be easily met, and encourages the importance of accessibility share (Merlin,

2014). Furthermore, the mall provided a space for physical activity and social connections in the winter months, with age-friendly amenities such as washrooms, which provides further opportunities for aging in place and placemaking, and was also observed in another Edmonton study (Garvin et al., 2012). While it is not feasible for each community to develop a mall for its citizens, the importance of a central space within a community is highlighted, and in turn may indicate the need for future opportunities to develop denser mixed-use spaces that meet the needs of people living in the area.

The value placed on greenspace, as well as peace and quiet by the Brander Gardens participants reflects the findings found in other studies (Douglas et al., 2017; Fong et al., 2018; McCormack & Shiell, 2011). The quiet greenspaces provided the opportunity for individuals in Brander Gardens to achieve a healthier state of functioning, as it removed them from the daily stressors experienced, which indicates greenspaces importance in other neighbourhoods. Secondly, this focus group discussed their decision to move to the suburbs to increase their sense of calm, and space for their family. The value placed on suburbs indicates the importance of providing a variety of housing options for older adults, as some may want different locales to age in place, as some locations may not be suitable. As a result, while many studies discuss the importance of dense mixed use communities (Hancock et al., 2017; Kerr et al., 2012; Salvo et al., 2018), to maximize aging in place, various housing opportunities should be available across a variety of locations. However, it is important to note that these participants were still able to drive to amenities that they needed and did not discuss future issues when driving is not possible, which may make particular needs harder to meet, such as accessing healthy food. This is an

important consideration, as Brander Gardens can be classified as a food desert under certain measure (H. Wang et al., 2014).

6.4 Summary of Research Findings

Through my research, the affordances provided by the built environment appears to be perceived by older adults to have a profound influence on the ability for individuals to age in place and to engage in activities that promote their health and wellbeing. Overall, my study has demonstrated that for the majority of individuals participating in focus groups, the ability to achieve a healthy state of functioning are impacted by the opportunities provided in their neighbourhood environments. Participants have demonstrated that they value the neighbourhood opportunities needed to achieve a healthier and happier state. This was observed in all of the major themes found in this study, such as the value placed on accessible healthy food options or walkability, and if the affordance was not provided, that individuals will seek out other opportunities if they are able to achieve a state of health and wellbeing functioning, such as exploring other neighbourhoods for greenspaces. Strong efforts should be made to provide the opportunities for individuals to achieve healthy functioning in every community and neighbourhood, as people tend to enact their daily lives and activities on these opportunities. This is also aligned with the inverted socioecological model of health promotion, where the policy and environments are placed at the center, such that these spaces provide the freedom of choice, and can be viewed as system changes (Golden et al., 2015).

When the themes are analyzed through the capability approach, the overall character and design, greenspace quality, foodscape accessibility, and perceptions of safety in walkability

within a particular space provide opportunities, both negative and positive, for older adults to achieve a higher state of functioning. These components enact on health behaviour in different pathways, such as through physical activity, healthier diet, increased accessibility to services, improved mood, and mental health. To maximize aging in place and improved quality of life, the concerns and positives of each component should be investigated within contextual placement of complete communities. While subjective to individuals, within the neighbourhood character realm, policy should value architectural diversity, historical buildings, social opportunities, and cleanliness, as these aspects were shown to improve placemaking and aging in place for older adults. Greenspace was also shown to improve aging in place through placemaking, improved mental health, physical activity, and inclusion of blue spaces, all of which are also supported by additional academic research. Experiences of walkability was another key affordance to active living, as poor sidewalk quality, street crossing quality, age-friendly amenities, and perceptions of security, either created or hindered opportunities to achieve a higher state of functioning. Perceptions of security are subjective but was indicated to be a strong force in decision making, and thus should be considered in policy to improve human flourishing. Lastly, a healthy community nutrition environment related to foodscapes was strongly valued to be a key component of complete communities and provided the affordance to engage in a healthy diet, which was highlighted by study participants to be important. Overall, when given the opportunity to engage in healthy behaviours, older adults appeared to enact on those freedoms provided by the opportunities in their built environments. Thus, policy makers and stakeholders such as developers, urban planner and designers, need to pay attention to the importance of providing

as many affordances as possible for older adults to be able to improve their health and aging in place.

6.5 Complete Community Framework

The concept of complete communities was previously discussed in chapter 2. There has been limited academic exploration of the specific components in conjunction with each other, which should be encompassed within the concept. By analyzing various MDP's and other urban planning policy documents, it was observed that the term "complete communities" was routinely used in relation to the planning of Western Canadian cities. However, each city had different conceptualizations and use of the term, which may indicate a lack of consensus on its components. For the four cities that were examined Edmonton, Calgary, Winnipeg, and Vancouver, all valued a variety of housing types, walkability, mixed use, multimodal transportation, and greenspace. However, only Edmonton and Calgary explicitly discussed the importance of design, and only Vancouver highlighted the importance of healthy food access. Additionally, all four cities mentioned the value of aging in place. Based on the findings and pathways identified through my research, the grey literature, and the academic literature, a new complete communities' framework will be presented here, especially in the context of aging in place and promoting the health and wellbeing of aging populations. The following section will briefly engage with capability theory to inform the reader of some of the main tenets proposed, with important affordances outlined from my study as well the academic and grey literature.

Before the framework can be proposed, a brief discussion pertaining to capability theory must ensue to provide the basis of the framework from a theoretical standpoint. As shown

throughout the Discussion chapter, the capabilities, which are the freedoms and opportunities, allow one to reach a particular capacity of functioning, which is the state or activity a person is able to be in (Fleuret & Atkinson, 2007; Robeyns, 2016). Within the built environment, particular forms such as accessible healthy food options contribute to the capability of one to achieve a healthier state through diet. As a result, a person is not forced into a decision, but they are merely provided the freedom to choose one option among various other options. Amartya Sen who created capability theory examined development as a central tenet, but did not examine it under an economics lens, but development of capabilities. Sen argued "that the objective of development should be the expansion of people's capabilities – of their freedoms, their opportunities to achieve and enjoy states of affairs that they have value and have reason to value" (Alkire, 2010, p.193). Individuals within this theory do not act as the rational *homo economicus* but attempt to maximize their own wellbeing. Furthermore, as agents, through their actions they can advance or hinder freedoms and affordances (Alkire, 2010). As a result, through policy, which is an outcome of decision making, the resulting freedoms and capabilities to achieve a state of functioning is grown or reduced. Within the built environment lens, this can be concluded as urban planning policies, that ultimately provide a range of freedoms for individuals to achieve a particular state.

As a result of policy being viewed as a pathway to improve or hinder freedoms to achieve higher states of wellbeing, it is important to view urban planning under the same lens. Furthermore, it is also termed urban development, and as a result Sen's conceptualization of development, it is a fitting way to further urban planning. When taking the grey literature, academic scholarship and this study's photovoice research findings into consideration under the

capability theory, a framework to improve the lives of residents is created. The following components should be placed within future complete community policy and research frameworks; high quality greenspace, mixed use, variability in housing types, multimodal transportation, high quality walkable spaces, healthy food options, neighbourhood design and character, and safety. Furthermore, within these components, various opportunities to increase the affordances of happiness and place making are presented, such as beautification of greenspaces with flowers, variation of food retail options, variation in housing design, and age friendly amenities. All of these components provide affordances for happiness, health and wellbeing, which allow individuals to engage with the built environment to improve their health and wellbeing in ways that they see fit. The presented features place value on the objective evidence-based aspects pertaining to the built environment, but also encompass the equally as important subjective experiences that arise from people's interactions with the urban fabric. As demonstrated in my study, these emotional and experiential components play a vital role in encouraging or hindering aging in place, physical activity, accessibility, health, and wellbeing. This must be addressed for a community to be considered complete, as an individual will not have the opportunity to engage in healthy behaviour if the experiences of such spaces is negative. As a result, a complete community is a space that aims to maximize the opportunities to partake in health and wellbeing behaviour, which will expand peoples' freedoms and capabilities to pursue higher states of functioning. Through this policy approach, people will not be forced to lose or abort their freedoms, but with the desire to maximize their own wellbeing, will be able to improve the health and wellbeing for all ages. This space will also improve aging in place for older adults and quality of life for other groups of people, such as children and non-able-bodied

individuals. As a result of a list of components, this complete community framework provides evidence behind particular values, but allows for the development and adaptability for application that best fits a particular context.

Examining complete community component development, when taking academic literature, MDP's, and my study's research findings into consideration, the previous values of walkability, mixed use, multimodal transportation, and greenspace were all strongly valued and are consistent with the planning documents. Demonstrated in section 3.0, the interrelations and importance of these factors indicate a research basis for implementing these into community design. A variety of housing types should also be considered a necessity for complete communities, as it provides density that supports walkability, transit, and mixed-use planning (Bhatta, 2010; Frank et al., 2010; McArthur, 2018; McCormack & Shiell, 2011). Lastly, as indicated by the literature, the overall food environment of neighbourhoods should be strongly considered within complete community frameworks, as it provides the accessibility for individuals to support their dietary needs (Glanz et al., 2005; Mahendra et al., 2017; Minaker et al., 2016). Overall, these components have a strongly established academic reasoning for their inclusion in complete community frameworks.

However, when examining the research findings, new considerations, which are highlighted as affordances in the subsequent paragraphs, should be added to complete communities. These can also arise from the features of greenspace, walkability, mixed use, and multimodal transportation, as the emotional and experiential aspects are considered in ways that the original index did not measure. Firstly, participants indicated the need for a variety of housing types within a community to ensure choice in choosing a home, with variation in architecture

and building types understood to promote a sense of place. During the member checking process, one participant also stressed the need for a variety of architecture and housing types within a community, as it can provide a sense of hope for less fortunate individuals to move along the housing hierarchy without feeling like they are locked into a particular housing typology. Secondly, neighbourhood character and design should be considered an important factor for complete communities as high quality character was understood by participants to significantly improve a sense of place and aging in place, while also increasing motivations for walking. Both of these considerations provide increased affordances for individuals to age in place, as increased opportunities for positive sense of place and can allow one to choose which type of housing typology best fit their particular set of needs.

Thirdly, it was indicated in the focus group discussions that walkability as a feature does not necessarily improve walking, but that the overall quality of the design of a space is vital, such as quality of the sidewalks, timing and design of street crossings, and drainage engineering. As a result, high quality design should be a priority, as it provides increased affordances to navigate the built environment in a safe manner, especially for older populations, and thus can affect states of health through improved physical activity. Furthermore, it can also encourage aging in place and placemaking for older adults, as high-quality sidewalks and appropriately designed street crossings, can help in improving aesthetics but possibly helping them feel valued by the city. Poor sidewalk quality and street crossings were outlined as a key weakness in Edmonton. Fourthly, healthy food environments were seen as vital by older adults, not only for accessibility, but also as social spaces, and thus a variety of spaces that offer healthy foods should be routinely included in complete communities. This was not only shown to increase the freedom to eat

healthier, but to increase opportunities for social capital and social connections with other older adults. Finally, to add to the theme of neighbourhood character and design, blue spaces have been demonstrated in emerging literature to improve mental health, encourage exercise, and promote place making (Finlay et al., 2015; Gascon et al., 2017; Völker & Kistemann, 2011); however, more studies are needed. However, within my study, blue spaces were reflected within the participants' comments as ways to enhance affordances within greenspace, and when possible, should be implemented within complete communities.

While what is considered sufficient security can be highly subjective, the overall issue of a sense of security must be considered in complete communities. Safe spaces were understood by the vast majority of participants to improve a sense of place, walkability, lower stress, and improve aging in place, all of which impact health and wellbeing. Features such as improved lighting, CCTVs, permeable building materials that increase transparency and eyes on the street, and egress options from spaces like transit stations were discussed to improve a sense of security and enhance the affordances for older adults to achieve higher states of functioning, especially with spaces where they do not currently feel comfortable. As highlighted in section 3.1, these subjective experiences play an important role in promoting or hindering walking and sense of place, due to the fact the places can also have negative experiences attached to them (Foote & Azaryahu, 2009). Lastly, while highly subjective and contextual, the overall sense of happiness experienced by participants was highlighted to be a key component to placemaking, aging in place, and thus should be considered within complete communities' frameworks. While the feasibility of this may initially be questioned, when this study examined the factors that was reported to bring happiness, such as greenspace, third places, blue spaces, community stores

that provide identity, a variety of food options, and lack of social disorder, it appears that built environment interventions can be situated within spaces to improve happiness. These interventions provide people with increased opportunities to reach states that they value, such as happiness, and the variety of opportunities provided can expand people's choices to fit their needs. This may encourage significant improvements to the health and wellbeing of older adults, and also improve aging in place. As a result, the emotional and experiential aspects that arise from perceptions of security and feelings of happiness provide strong rationale for built environment elements related to safety and people's happiness to be included in complete community indices.

Overall, the components of greenspace, mixed use, variability in housing types, multimodal transportation, high quality walkable spaces, healthy food options, neighbourhood design and character, and experiences of happiness and safety, are all components that need to be addressed in complete communities. All of these variables are evidence-based interventions that have the ability to decrease rates of NCD's, improve physical health, increase wellbeing, facilitate aging in place, and also lower healthcare costs that are increasingly impacting overall budgets of our provinces and countries (Benjamin Emelia J. et al., 2017; Farkas et al., 2019; Janssen, 2012; Oswald et al., 2011; Warburton et al., 2006). This study identifies various reasons for policy makers, urban planners and designers, developers and public health officials to work together to develop, implement and adapt complete communities as an urban planning intervention. Furthermore, the components and affordances that were highlighted provide upstream public health intervention opportunities that are adaptable for particular contexts which improve the equity for health, wellbeing and quality of life for older adults.

The current complete community index utilized initially within this study appears to insufficiently capture all of the needed components of community completeness. To develop an increasingly comprehensive framework or evaluation tool for policy makers, urban planners and academics to use, additional measures for both objective and subjective components need to be integrated. Some tools that may assist in capturing accurate objective data may come from the fields of GIS, as the data points of various features, such as types of food stores like supermarkets, types of greenspace, trails, housing types, mixed use, density, and other data features can all be captured with high detail. This allows for the accurate and objective portrayal of urban features that can be analyzed in relation to various distances and accessibility with both precision and ease. Secondly, built environment audits, such as the MAPS tool (Millstein et al., 2013), can allow for the evaluation of microscale built environment features that were highlighted as important by the literature and participants, which can capture both objective and subjective concerns, such as lighting, traffic calming measures, sidewalk quality, visual permeability of buildings, and visual disorder. Lastly, the application of complete community frameworks within contexts or evaluation of current communities cannot be truly complete without qualitative inquiry into the lives of residents, as their lived experiences within their locales may differ from experiences in various other contexts. While this approach may be intensive, in order to create communities that fully promote health, wellbeing, aging in place, and equity, the objective and subjective features of such spaces must be understood to ensure the best possible outcome. Lastly, due to the long-lasting implications of urban development, the rapidly increasing healthcare costs from rising rates of non-communicable diseases like chronic diseases and mental health issues in Canada as well as an aging population, and the ability of the urban built environment to impact

such health and aging issues, it is imperative that health and wellbeing be at the forefront of urban policy.

6.6 Limitations

While there have been important findings demonstrated through the research process, it is important to highlight the limitations of the study that may impact its quality, applicability, or generalizability. First of all, while the nine total participants provided a rich description of their neighbourhoods and experiences of built environments, the total number was lower than the 18-30 participants originally proposed. Due to the lower number of participants, the findings may not have covered the full range of experiences. In other words, claims of data saturation cannot be made. Reflecting upon the lower number of participants, original recruitment efforts using posters, newspaper advertisements and other forms of passive recruitment proved to be ineffective. Due to the complex nature and time commitment needed for a photovoice research project, active recruitment efforts such as visiting community networks such as churches and senior centers to speak directly with potential participants, proved to be more effective for this study and should be implemented in future research.

Other limitations that arise from recruitment can be tied with characteristics of participants, as the nature of the study probably skewed participants to be free of physical disabilities, and thus may not reflective of older adults with physical or mental difficulties. I attempted to overcome this by allowing mobility challenged individuals to be assisted in the project, but no one with such challenges participated. Another limitation is the hindered ability

to compare among the three separate sites, as the less than expected recruitment numbers provide challenges in gaining a broader understanding of neighbourhood spaces. Furthermore, this was attempted to be overcome with another round of recruitment, but the Covid-19 pandemic halted additional active recruitment efforts and thus could not be overcome. Another limitation that arose from the recruitment and data collection process was the time frame, as it occurred only in the summer and early fall. As a result, a full representation of neighbourhood impacts on the lives of participants during the winter months cannot be understood, as the pictures and stories did not engage with this season. However, in attempts to overcome this, participants who asked to bring in pictures they already had from past winters were allowed to do so, as it was important for them and also allowed theme exploration related to winter. Discussions pertaining to winter impacts did arise in the focus groups, which assisted in gaining some insight in winter experiences. Lastly, while discussed in section 4.7, my positionality as an active and young adult male may limit my understanding of the viewpoints of older adults, most of whom were female. Even with reflexivity and empathy, the differences in world views, experiences, generational differences, and power relations may not have been fully overcome. As a result, a true understanding of participants worldviews may not have been applied.

7. Conclusion

7.1 Conclusion

The findings that arose from the research strengthen the importance of various complete community components of cities, but also is able to highlight vital considerations of neighbourhood components that have not been fully included within policy. These considerations developed strongly from emotional relations and experiences to the built environment such as sense of security and feelings of happiness, which suggests that neighbourhoods need to examine the experiential context of spaces. This is a development of complete community policy, as the placement of age friendly or built environment features is not enough, since the emotional and experiential landscape must be considered. Furthermore, it can be tied with the placemaking process, since space becomes place through experiences, both negative and positive, which is a pillar of aging in place (Foote & Azaryahu, 2009; Iecovich, 2014). As a result, to achieve the maximum possible impact from complete community developments, which include both greenfield and brownfield sites, the findings from this research must be considered.

“The social determinants of health has come to stand for the societal factors that shape the health of individuals and populations” (Bryant, Raphael, Schrecker, & Labonte, 2010), with the Public Health Agency of Canada considering the BE as a core SDH for Canadians (Public Health Agency of Canada, 2013). As a result, by improving the built environment and the complete community framework with an increased health focused lens, the neighbourhood spaces may become more equitable for older adults, as the material built environment barriers

of space will be reduced (Lynch & Kaplan, 2000). This provides the freedom for individuals to achieve a healthier state of functioning, as the research indicated that given the opportunity, participants will engage in health seeking behaviours. Due to the intensive and long-lasting nature of built environment interventions, it is important to create spaces that facilitate health, as it is a preventive public health effort. Built environment equity becomes especially critical during the current nature of Canadian society as the older adult population is growing (Statistics Canada, 2010). As a result, in order to promote the health and wellbeing of older adults and the general public, while improving aging in place, the components of quality of walkability, sense of security, happiness, healthy food environments, and quality of greenspaces should be considered to truly make complete communities complete. In order to gain a deeper and broader understanding of these findings and topic, future research should examine complete communities in more transit orientated cities to delve deeper into transit orientated individuals and spaces, and to examine rural communities, as the social and urban contexts vary differently from cities.

7.2 Policy Recommendations

With the older adult population growing and with the increased focus on aging in place and complete communities it is important to create spaces that provide freedoms for individuals to pursue health opportunities. As a result, to improve the built environment and complete community policy, the following policy recommendations are proposed:

- 1) Amend complete community guidelines to include:

- a. Greenspace, walkability, transportation options, housing diversity, mixed use planning, and healthy food options.
 - b. Adopt policies and guidelines to improve the experiential landscape that improve happiness which improve aging in place and placemaking.
 - i. Beautification of public spaces.
 - ii. Design standards for buildings and public spaces.
 - iii. High quality greenspaces.
 - iv. Opportunities for social interaction.
 - c. Adopt policies and guidelines to improve the experiential landscape that improve sense of security which improve aging in place and placemaking.
 - i. Improve lighting.
 - ii. Increase sense of eyes on the street.
 - iii. Improve walkability standards.
 - d. Implement quality standards for sidewalk maintenance, age friendly amenities, and quality.
 - e. Provide accessible greenspaces.
- 2) Change land use bylaws and other urban policies:
- a. Remove covenants that reduce access to healthy food options.
 - b. Create pedestrian focused civil engineering standards, such as at crosswalks and drainages.
 - i. Raised crosswalks on pedestrian heavy arterial roads reduce speed and can limit puddles at curb cut outs.

- 3) Amend mixed use guidelines and policies:
 - a. Implement mandatory healthy food options within to improve access to healthy food.
 - b. Support local shopping and food location development, as it provides important social spaces.

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Appendix A: Recruitment Poster



Interested in telling us how your neighbourhood impacts your health and wellbeing?

Participate in a study about (insert neighbourhood name here)!

If you are 65 or over, live independently, and can use a camera, you are invited to participate in the study.

What you will do:

- Over 2-weeks take pictures of features in your neighbourhood that influences your health
- Participate in a 90-minute focus group to talk about your experiences and meanings of the pictures

What we will learn:

- Neighbourhood features that influence your experience of health and wellbeing
- How to improve neighbourhood design

Contact: If you have any questions about the study or are interested in participating, please contact the study coordinator through email at:
mrjackso@ualberta.ca or at 780-387-8347

This study has been reviewed by the Research Ethics Board (Pro00090441) at the University of Alberta.

Appendix B: Information Letter and Consent Form

INFORMATION LETTER and CONSENT FORM

Study Title: The Role of Community Completeness on Older Adults' Experiences of Health and Wellbeing: A Photovoice Study

Research Investigator:

NAME: Marcus Jackson

ADDRESS:

University of Alberta

Edmonton, AB, T6G 2R3

EMAIL: mrjackso@ualberta.ca

Phone: 780-387-8347

Supervisors:

Professor Supervisors:

Dr. Karen Lee & Dr. Joshua Evans

ADDRESS:

University of Alberta

Edmonton, AB, T6G 2R3

EMAIL: kk1@ualberta.ca

Joshua.evans@ualberta.ca

Background

- You are being asked to participate in this thesis study to look at the role neighbourhood features has on your experiences of health and wellbeing.
- The results of the study will be used in support of my master thesis research and will potentially inform various policy makers.
- Your contact information was received from the initial email conversation and phone interview.

Purpose

- The purpose of this research is to look at the role community completeness has on older adults' experiences of health and wellbeing.
- It hopes to benefit the academic fields of; preventive medicine, public health, urban planning, and human geography. It also hopes to inform policy makers and urban planners, to help design healthier neighbourhoods.

Study Procedures

- The research project will happen over the course of 1–2 months, and will consist of a 1-hour orientation, 2 week opportunity to take photographs, and a 90-minute focus group.
- You will be asked to attend an initial orientation meeting to discuss the project, responsibilities, and training. This will approximately take 1 hour.
- You will sign out a camera and over 2 weeks you will take 25 pictures of features in your neighbourhood that positively or negatively impacts your health and wellbeing. For each question, please fill out the question journal the best you can. At the end of the 2 weeks, you will return the digital cameras back to the researcher who will collect the cameras and send you copies of your photographs.

- A focus group will be held after the picture taking timeframe to discuss the importance of your photographs. This will occur roughly 2-3 weeks after the photographs are taken. For the focus group please bring your 10 most important images that you would like to talk about and also please bring the question journal with you.
- There will be no cost to you during the course of the research. If parking payment is required, you will be compensated for up to three hours and the payment will be in cash.
- After you have completed both the photographs and the focus group, you will receive a \$25 gift card to a grocery store in or closest to your neighbourhood. Refreshments and snacks will be provided at the focus group.
- Detail all type(s) of data to be collected, e.g.
 - focus groups: 6-10 people per group, 90-minute duration, everyone who took pictures will be invited to attend. These will be audio recorded and transcribed.
 - images: Pictures will be taken with a Sony DSC-W800 digital camera which you will sign out. A friend, spouse, caregiver, or adult child can help you take photos. But please have the photos be about your experience and not your assistants. You will be releasing your chosen photos for analysis.
- Indicate procedures for
 - A focus group or group discussion is proposed for the winter or spring months to discuss the accuracy of the findings and to talk about how the winter impacts your photographs. You will be invited to attend when a potential date is decided on.
 - If you would like, you are welcome to have copies of the images that you took during the course of the research.

Benefits

- You may benefit from participating in the research as it may inform policy makers or urban planners to design healthier and more accessible neighbourhoods.
- We hope that the information we get from doing this study will help us better understand your experiences of health and wellbeing in various levels of community completeness. This will help in developing the concept in academic study and policy.

Risk

- Personal safety risks may happen when taking pictures, such as risk of falls, slips, pedestrians, or motor vehicles. Please be aware of your surroundings when taking pictures and do not put yourself at risk for a picture.
- There may be risks to being in this study that are not known. If we learn anything during the research that may affect your willingness to continue being in the study, we will tell you right away.

Voluntary Participation

- You are under no obligation to participate in this study. The participation is completely voluntary, and you are not obliged to answer any specific questions even if participating in the study.
- Even if you agree to be in the study you can change your mind and withdraw at any time. In the event of opting out before the focus groups, your images will be deleted, and you are not required to attend the focus group. However, once the focus group begins, you will not have the option of removing your data from the study. This is due to the fact that it presents significant challenges to the data collection and data analysis process. But if you feel the need to remove yourself from the focus group at any time, you are free to do so.
- If you would like to withdraw or have any questions, please contact Marcus Jackson in person, email at mrjackso@ualberta.ca, or by phone at 780-387-8347

Confidentiality & Anonymity

- The research may be used in any combination of possibilities that include; thesis, research articles, presentations, and teaching.
- The data collected will be kept confidential, with only the researcher and 2 professor supervisors having access to the data.
- Any identifiable information will be anonymized, so that it cannot be traced back to you. Any images that contain identifiable information will not be used in any presentations, teaching, research articles, or thesis writings.
- Confidentiality cannot be guaranteed during or after the focus group. We ask you to not share any information discussed during the focus group to ensure the confidentiality of other participants.
- Consent forms, photographs, audio recordings of the transcripts, pictures of the focus group, and anonymized transcripts will all be kept in a locked room and cabinet only accessible to the researcher and supervisors. All of this data will be kept in this secure location for a minimum of 5 years following the completion of the research project. All electronic materials will be password locked and encrypted, with all identifiable information removed.
- If you would like a copy of the resulting report, please contact Marcus Jackson through email or in person indicating your interest.
- We may use the data we get from this study in future research, but if we do this it will have to be approved by a Research Ethics Board.

Further Information

- If you have any further questions regarding this study, please do not hesitate to contact:
 - a. Marcus Jackson: mrjacks@ualberta.ca or 780-387-8347
 - b. Dr. Joshua Evans: Joshua.evans@ualberta.ca
 - c. Dr. Karen Lee: kkl1@ualberta.ca
- The plan for this study has been reviewed by a Research Ethics Board at the University of Alberta. If you have questions about your rights or how research should be conducted, you can call (780) 492-2615. This office is independent of the researchers.

Consent Statement

I have read this form and the research study has been explained to me. I have been given the opportunity to ask questions and my questions have been answered. If I have additional questions, I have been told whom to contact. I agree to participate in the research study described above and will receive a copy of this consent form. I will receive a copy of this consent form after I sign it.

Participant's Name (printed) and Signature

Date

Name (printed) and Signature of Person Obtaining Consent

Date

Appendix C: General Focus Group Questions

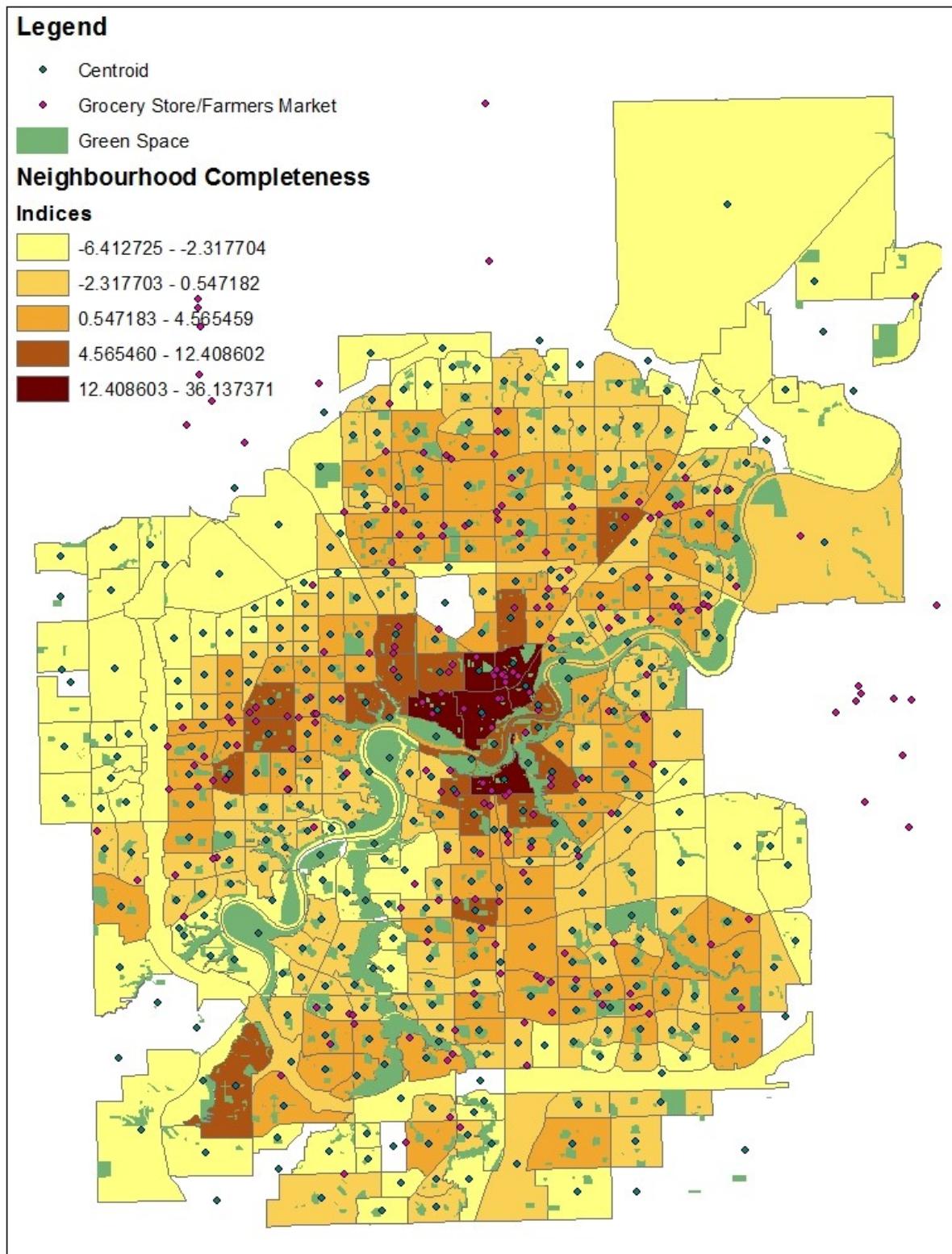
- 1) Why did you take this picture?
- 2) What does this picture mean to you?
- 3) Why is this picture important?
- 4) How does this picture promote or hinder your health and wellbeing?
- 5) What would you change in the photo to promote your health?
- 6) Which complete community component is most important to you?

*These can occur in any order

Appendix D: Photo Journal Questions

1. When was the photograph taken?
2. Where was the photograph taken?
3. What is in the photograph?
4. What does the object or place in the photograph mean to you? How does the experience with the object or place influence your health or wellbeing?

Appendix E: Complete Community Index Map of Edmonton



Appendix F: Member Checking Sheet

General Findings for Complete Communities Photovoice Research:

Theme 1: Neighbourhood Character

- Neighbourhood and building design played a role in promoting happiness.
 - E.g.) nice architecture, mix of housing types, neighbourhood features
 - Noise that came from poor design reduced levels of happiness.
- Social opportunities in the neighbourhood promoted happiness and social connections.
 - E.g.) Talking with neighbours and community events.
 - Indirect interactions such as seeing kids or community book exchange boxes helped people enjoy their neighbourhood.
- Neighbourhood Disorder such as litter and graffiti reduced levels of happiness.

Theme 2: The Importance of Greenspace

- The beauty of greenspace, parks, trees, and flowers made people feel happy, and encouraged people to walk and enjoy their neighbourhood more. Greenspace also supports mental health by promoting peace and quiet.
- Parks and greenspace encourage physical activity because people want to go walking in these spaces more. Trails and water features, such as ponds and creeks are also important.

Theme 3: Walkability

- Poor sidewalk quality lowers walkability because of increased falling risks and takes away from neighbourhood character. The City of Edmonton's efforts to manage it, such as painting lines or covering cracks only made it worse. It made people feel like they are not valued.
- Poor crosswalk designs such as slow crossing timers, big puddles at crosswalks, and poor weather considerations, such as snow and ice make walking very difficult.
- Feelings of safety are important for walking. Poor lighting and visibility, crime, bad previous experiences, and low number of people outside can discourage walking.

Theme 4: Food Environment

- A variety of healthy food options within a person's community was understood to be important for both health and happiness.
- A variety of restaurants within their neighbourhood helped people enjoy their community more and provided social spaces.

Oliver

- Increased levels of mixed-use amenities, such as bakeries, doctor offices, pharmacies, and grocery stores, help to improve quality of life.
- LRT station design was understood to decrease sense of safety due to poor lighting, steps, and lack of security.

Kilkenny

- Participants appeared to be the happiest out of all the communities and felt connected to their neighbourhood.
- Londonderry Mall plays an important role in the community, as it has many amenities that provide age friendly features such as washrooms and was a social space.

Brander Gardens

- The calm neighbourhood provided peace and quiet was highly valued, and the parks nearby were an important factor to health and wellbeing.
- The corner stores provided enough neighbourhood amenities for the individuals as the ability to drive to groceries was preferred for the peace and quiet in their neighbourhood.