Investigating Age-Friendly Communities Through Walkability

by

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

ABSTRACT

Walkability is a measure of how conducive a particular area is to active transportation, specifically towards walking. Research had placed more emphasis on objective measures of walkability, utilizing audits, indices, and GIS tools to assess urban form. There was considerable less use of subjective experiences to evaluate walking environments until fairly recently (Montemurro, et al., 2011). In accordance to aging populations across developed cities and their shifting needs, research has now redirected its focus to how seniors perceive walkability.

This study investigated the relationship between objective and subjective measures of walkability for senior populations. The objectives of this research are to: i) assess objective walkability in two neighbourhoods within the City of Toronto, Wychwood and Edenbridge-Humber Valley, contrasting of urban form and walkability; ii) investigate the subjective ecological factors that influence how walkability is perceived; and iii) determine the relationship between both measures of walkability relative to senior populations. The multi-phased, mixed-methods approach used in this study required both objective and subjective tools to assessing walkability. The walkability audit, the Senior Walking Environmental Assessment Tool – Revised (SWEAT-R) served as the objective measure and was performed on multiple occasions within both neighbourhoods. Subjective measures included the use of focus groups, go-along interviews, and traditional interviews. A total of twenty-eight participants across both neighbourhoods were recruited and spoken to, upon which saturation in data was reached.

The findings of this research echoed the efficacy of objective measures widely cited in literature, while underscoring the importance of subjective measures in determining contexts that influence perceptions of walkability and walking behaviour outcomes. Objective assessments did not adequately capture the holistic relationships between seniors and their surrounding environments. Planners, public health, and other experts interested in promoting active transportation and healthy built environments for age-friendly communities must utilize effective tools to assess neighbourhood walkability. This study presents suggestions for improved walkability assessments.

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List of Key Definitions

Active Aging: The desire and ability of older adults to integrate physical activity into daily routines, such as walking for transportation, exercise, or pleasure. Active aging may also include engagement in economic or socially productive activities, such as playing in the park with grandchildren and working in the home or yard (Michael, Green, & Farquhar, 2006)

Age-Friendly City / Community: One that encourages active aging by optimizing opportunities for health, participation, and security in order to enhance quality of life as people age (WHO, 2009)

Health: A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (WHO, 1948).

Health Promotion: The process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities. Thus, health promotion is not just the responsibility of the health sector, but goes beyond health life-styles to well-being (WHO, 2009, p. 1)

Pedestrian: A pedestrian is a person moving from place to place, either by foot or by using an assistive mobility device. Pedestrians include residents and visitors to the city of all ages and abilities (Toronto City Council, 2002, p.1)

Senior: An individual of 65 years of age or over (Statistics Canada, 2007)

Walkability: Walkability is a measure of how conducive a particular area is for walking. It is how the built environment is able to support and encourage walking through spaces that facilitate safety and comfort, by connecting members of a community with different destinations within reasonable distances, time, and effort, in addition to offering appeal and visual interest

throughout walking networks (Southworth, 2005). Walking is a constituent of active transportation; walkability additionally influences the ease of which active transportation, such as non-motorized travel, walking, cycling, and travel with mobility devices, can occur (Ontario Ministry of Transportation, 2012; OPPI, 2014).

WELL-BEING: Well-being includes the presence of positive emotions and moods (e.g. contentment, happiness), the absence of negative emotions (e.g. depression, anxiety), satisfaction with life, fulfillment, and positive functioning. In simple terms, well-being can be described as judging life positively and feeling good (CDC, 2016).

CHAPTER 1 | INTRODUCTION

CHAPTER 1.1 | BACKGROUND

Planning and urban design had been auto-centric in the past; cities were developed to cater to the motorist (Gehl, 2010). Small communities were sprawled from one another, often separated by large tracts of land and connected by highways that inadvertently disrupted pedestrian street networks. Within neighbourhoods, disconnected street patterns and low residential densities were often the case, rendering it difficult for many to find short routes between destinations (Kerr, Rosenberg, & Frank, 2012). Planning and design in North America during the mid-twentieth century thus effectively ignored the pedestrian realm and experience by emphasizing motorized travel (Gehl, 2010). Streets lost their intimacy and became merely service roads for automobiles, devoid of public life (Forsyth & Southworth, 2008).

Urbanization and sprawl have been major forces shaping cities in the last half-century. Motorists are no longer on centre stage, as planners and other experts strive to create sustainable, healthy, and age-friendly spaces conducive to active living and walkability for pedestrians. Seniors have become a priority age group across disciplines, including planning and public health, in recent years due to aging populations (Ontario Senior's Secretariat, 2013). Baby boomers in North America are aging; within an Ontario context, it is estimated that the province will be home to more people over the age of 65 years than children under 15 years of age by 2017 (Ontario Senior's Secretariat, 2013). This is equivalent to one in every six Ontario citizen being over the age of 65 years in a very short period of time. Aging populations across developed

countries create shifting population needs and call for the promotion and development of age-friendly, healthy communities (World Health Organization, 2007).

An age-friendly community is one that is able to successfully adapt its infrastructure and services to improve accessibility and inclusion for all seniors of differing needs (World Health Organization, 2007). The endorsement of age-friendliness at a local level by the influential international agency, the World Health Organization (WHO), has raised the awareness and initiated discussion of age-friendly communities (Lui, Everingham, Warburton, Cuthill, & Bartlett, 2009; Plouffe & Kalache, 2010). The WHO has stressed the linkages between health and the natural, built, and social milieus, as well as the role of local environments to promote healthy active living for all members of a community. In literature, the terms “age-friendly city”, “age-friendly community”, “livable community”, as well as “community for all ages” are used to describe living spaces conducive to active aging for all ages. This particular study will utilize the term, “age-friendly community”, due to its implicit greater focus on non-physical aspects of spaces; social spatial aspects are increasingly seen as important indicators of walkability and age-friendliness (Lui, Everingham, Warburton, Cuthill, & Bartlett, 2009). This interchangable use mirrors the language used across literature (Lui, Everingham, Warburton, Cuthill, & Bartlett, 2009) and underscores the relevance or close relationship the concept has to local governments and their people. To accommodate the challenges of aging populations, community-planning processes necessitate comprehensive understanding of relationships between community environments and senior quality of life. Because seniors spend the most amount of time within their homes and communities (Kerr, Rosenberg, & Frank, 2012), planning at the community-level is most relevant to their needs.

Walkability, now a growing priority area for planners and public health experts, is an important attribute necessary to achieve age-friendliness (Glickman, Ring, Kleban, & Hoffman, 2013). To measure built form that is hospitable to pedestrians, walkability is a commonly-used indicator used at the neighbourhood level. It is measured using objective (quantitative) or subjective (qualitative) approaches; objective tools include walkability audits, indices, and GIS (Clifton, Livi Smith, & Rodriguez, 2007; Cunningham, Michael, Farquhar, & Lapidus, 2005; Rundle, Bader, Richards, Neckerman, & Teitler, 2011; Weiss, R.L, Maantay, & Fahs, 2010), while subjective approaches include interviews, focus groups, and observation (van Lenthe & Kamphuis, 2011). Objective measures had been predominantly used in walkability research until the fairly recent shift towards subjective as well as mixed approaches (Leslie E. , et al., 2005; Montemurro, et al., 2011) in order to account for varying perceptions of built form and community environments that determine walking behaviour (Ewing & Handy, 2009; Phillips, Schneider, & Mercer, 2004). Walkability has become an important approach for planners to help cities achieve healthy and age-friendly communities that make meaningful differences in the day-to-day lives of its residents, especially in the health and well-being of older adult populations. Improved mobility and opportunities to remain active increases overall physical activity and overall well-being; walking has been known to decrease risks of obesity, depression, and other chronic diseases (Takano, Nakamura, & Watanabe, 2002).

Health can be defined in many different ways by placing emphasis on certain constituents over others (Dannenberg & Wendel, 2011). When the built environment and individual behaviour are involved, however, the definition of health can assume a standpoint of health

promotion. Health, as defined in this research, is therefore consistent to one developed by the WHO (2009, p.1) for health promotion:

> *…the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment…Health is a positive concept emphasizing social and personal resources, as well as physical capacities. Therefore, health promotion is not just the responsibility of the health sector, but goes beyond health life-styles to well-being.*

Health is emphasized as a resource for daily living by this definition. It becomes task-focused and is a function of whether or or not an individual possesses the ability to take part in healthy activities. Moreover, emphasis is placed on the fact that health is not solely determined by health care and the wider health sector, but on individual well-being. According to the Centers for Disease Control and Prevention, well-being encompasses positive emotions and moods with an absence of negative emotions, contributing towards life satisfaction, fulfillment, and positive functioning (2016). Health and well-being are evidently largely dependent on individual moods, thereby indicating healthy built environments possess roles in influencing resident emotions and quality of life. Retirees can spend most of their time within their community and homes; up to eight or nine hours a day can be spent seated (Kerr, Rosenberg, & Frank, 2011). Prolonged sedentary lifestyles can lead to functional deterioration, increased burden of disease, and loss of independence; these are preventable with physical activity (Angevaren, Aufdemkampe, Verhaar, Aleman, & Vanhees, 2008; Phillips, Schneider, & Mercer, 2004). Seniors therefore stand to benefit the

most from healthy built environments that encourage activity and interaction in comparison to younger people (Phillips, Schneider, & Mercer, 2004).

In contemporary planning, experts have acknowledged the importance of micro details within the built environment, which are often perceived differently between one person to the next, in influencing pedestrian behaviour. According to Handy (1996), "because the pedestrian sees, hears, smells, and feels much of the surrounding environment, urban form is likely to play a greater role in the choice to walk." This movement has been supported by health research regarding the many positive health outcomes of walkable (Berke, M, Gottlieb, Moudon, & Larson, 2007; Frank, Kerr, Rosenberg, & King, 2010; Li, Harmer, Cardinal, & Vongjaturapat, 2009), and sustainable cities (Frank & Engelke, 2001). Walking is identified as a "green" form of transport due to its nearly non-existent environmental impact and ability to reduce car congestion. It is also a socially-equitable form of transportation as all ages and socio-economic classes of a population are capable of it (Forsyth & Southworth, 2008). There are therefore wide-ranging motives to develop walkable communities for seniors, supported by numerous bodies of research (Alley, Liebig, Pynoos, Banerjee, & Choi, 2007; Cohen, et al., 2007; Leyden, 2003; Negron-Poblete, Séguin, & Apparicio, 2014).

Chapter 1.2 | Research Significance

Walkability has become the foundation for complete, sustainable, and healthier cities. It is capable of promoting physical activity gained through purposeful utilitarian or recreational walking. In addition to promoting health benefits, a physical environment capable of encouraging utilitarian walking is able to add social value into a community (Leyden, 2003).

Walkability therefore contributes towards all eight of the physical and social domains for age-friendly communities, a notion explored further within Chapter 2.5. A critical aspect of an age-friendly community is to have accessible and walkable spaces for active aging and aging in place (WHO, 2009). This becomes especially important when older adults lose mobility and the ability to operate vehicles independently. An issue with assessing walkability, however, is that there is no standard approach though there are several audits developed by local organizations and researchers available. Walkability can be measured objectively and subjectively (Negron-Poblete, Séguin, & Apparicio, 2014). Research has shown that the phenomenon may be best measured through a combination of quantitative and qualitative approaches (Montemurro, et al., 2011).

The findings of this study highlight the efficacy of specific objective measures widely cited in the literature while emphasizing the importance of several previously overlooked subjective measures. Relevance of physical and social measures towards seniors' perceptions of walkability and subsequent walking behaviour will be discussed. Planners interested in promoting active transportation amongst members of the growing senior population need to utilize accurate tools to assess neighbourhood walkability. This study will present suggestions for how to incorporate relevant measures to conduct effective community assessments of walkability for seniors.

Chapter 1.3 | Research Question and Objectives

Objective measures of walkability are valuable for quantitative, systematic, and fine assessments. They tend to focus on the most commonly referenced criteria for walkability: land use, street connectivity, and residential density (Dannenberg & Wendel, 2011). However, these do not offer much detail pertaining to path contexts such as neighbourhood social capital, sense

of community, perceived safety, and general feelings experienced during walks. Such characteristics of a walking environment have been suggested by literature to be best evaluated using subjective measures of walkability (Brown, Werner, Amburgey, & Szalay, 2007; Ewing & Handy, 2009; Lynch, 1980). These measures include techniques that require dialogue between researchers and populations of interest, as walkability is not experienced the same way by all members of society. What one individual might think to be perfectly walkable may not be so for another (Leslie E., et al., 2005). A majority of walkability indices as well as urban design and planning literature use the standard norms of walking distances and speeds. They generally fail to recognize differences in human bodies and their respective physical capabilities (Andrews, Hall, Evans, & Colls, 2012); different lengths of time might be needed for travel as some individuals may need to pause and rest (Michael, Green, & Farquhar, 2006). Seniors have been found to walk at slower speeds than younger pedestrians; seniors walk along sidewalks and cross streets at least 0.3 m/s slower (Montufar, Arango, Porter, & Nakagawa, 2007).

There are negative implications for the sole use of objective measures of walkability as they may not be accurate in determining walkability for all members of a neighbourhood. Experiential data may be necessary to create a more holistic understanding of how built environments influence walkability for specific sub-populations such as older adults, however there has been considerable less use of perceptual data on community walkability until fairly recently (Montemurro, et al., 2011). The broad aim of this study is to therefore investigate objective and subjective measures of walkability amongst seniors. The research question is:

> *What is the relationship between perceived and objectively measured walkability in two contrasting neighbourhoods for older adult populations?*

The theoretical premise of this research assumes individual values, beliefs, and well-being are shaped by various levels of environmental factors, according to the ecological model used to describe active living behaviours (Sallis, et al., 2006). Therefore, how walkability is seen and understood by senior citizens differ by lived experiences. To investigate this research question, the objectives of this study were to: i) comprehensively understand walking experiences that are unique to seniors and their differing mobility levels; ii) investigate the built environment and its physical and social characteristics that are perceived by seniors to stimulate or deter walking; iii) and study the connection between objectively and subjectively measured walkable characteristics of the built environment for seniors.

CHAPTER 1.4 | THESIS ORGANIZATION

This thesis is structured into six chapters. This introductory chapter provides background literature pertinent to understanding the intent and significance of this research, in addition to presenting the driving research question and objectives. The subsequent chapter presents current literature, highlighting four key topic areas: the built environment and measures of walkability, senior walkability, the determinants of walking behaviour, as well as the age-friendly community. Chapter Three introduces the case study neighbourhoods and describes the research design and methodology used to perform this study. Chapter Four summaries the results of the walkability audits, focus groups, go-along interviews, and traditional interviews conducted with research participants recruited from Wychwood and Edenbridge-Humber Valley. The significance of these findings, research limitations, and areas for further research are then discussed in Chapter Five. The final chapter provides theoretical and practical recommendations grounded upon the findings of this research and ends with concluding words for this research.

CHAPTER 2 | LITERATURE REVIEW

CHAPTER 2.1 | INTRODUCTION

This review of literature explores the concept of walkability and the many roles it plays in influencing community connectivity, vibrancy, and well-being. Walkability is an important environmental characteristics necessary to achieve health and age-friendliness. It encompasses the extent to which built environments may hinder (or deter) or facilitate (or stimulate) walking for daily living purposes (Andrews, Hall, Evans, & Colls, 2012). Walking behaviour is a function of built form as well as neighbourhood walkability and can be seen as a determinant of health. This literature review discusses the emphasis previous research has placed on objective measures of walkability and the growing need for subjective measures to understand the needs of growing subpopulations such as that of seniors.

This review of literature begins with a discussion of the variables that influence walking behaviour, according to three frameworks often cited in research. The second section discusses the concept of walkability relative to the physical and social qualities of pedestrian-friendly environments. The objective and subjective measures of walkability for seniors are additionally investigated. The third section describes the significance of walkability for seniors in terms of health and well-being. The fourth section looks into the relationship between walkability and its contributions towards the making of age-friendly communities.

CHAPTER 2.2 | DETERMINANTS OF WALKING BEHAVIOUR

It is often the case that the ability to operate vehicles independently is lost amongst seniors (Rosenberg & Everitt, 2001), yet seniors must continue to sustain the ability to

independently carry out daily tasks and remain reasonably active. Built environments can be associated with encouraging physical activity by providing walkable streets. Seniors achieve the most socialization and physical activity when taking strolls around their neighbourhoods (Kerr, Rosenberg, & Frank, 2011). Fortunately, studies have proved even brief strolls outdoors can alleviate the adversities of cognitive impairments (Angevaren, Aufdemkampe, Verhaar, Aleman, & Vanhees, 2008) in addition to reducing risks of Alzheimer's disease (Larson, 2008). These benefits can be attributed to the calming effects and feelings of content that are facilitated by public and green spaces that become accessible in walkable communities which reduce mental fatigue and stress (Coon, et al., 2011), in addition to the physical activity attained by walking and social interaction performed in public spaces. In one study, participants highly enjoyed outdoor activity and reported intentions of future participation in outdoor activity upon completion of the study (Focht, 2009). In another similar study, adverse consequences on mental health were reported immediately upon cessation of outdoor activity (Coon, et al., 2011).

Individuals who are more active and take part in activities such as walking tend to be less isolated, depressed, and anxious (Kerr, Rosenberg, & Frank, 2012). However, physical activity can wane progressively with age (Phillips, Schneider, & Mercer, 2004). Only about 14% of Canadian seniors perform sufficient physical activity for optimal health benefits, according to the National Population Health Survey, indicating a majority of the sub-population is sedentary (Health Canada, 2002). Higher susceptibility to non-communicable diseases, in addition to the loss of muscle tone, bone, and normal mobile function can occur with prolonged physical inactivity (Takano, Nakamura, & Watanabe, 2002). The challenge is that not all seniors possess the strength nor mobile range necessary to perform recommended levels of activity for optimal

health (CSEP, 2012). Many are not able to move independently without walking aids or to even get up from a chair (Phillips, Schneider, & Mercer, 2004). Those who are less agile and mobile are thus encouraged to partake in light physical activities that help improve balance to prevent falls, a predominant concern for seniors (CSEP, 2012). Walking, in the form of short strolls at slower paces either for an intended purpose or recreation, falls under the category of light physical activity (CSEP, 2012). A pedestrian-friendly, walkable environment thus play an integral role in providing senior community members with options for physical activity via purposeful or recreational walking.

Walkability is evaluated upon the presence and extent of three major indicators: land use mix, street connectivity, and residential density (Dannenberg & Wendel, 2011), to be discussed further in Chapter 2.3. These criteria capture an objective semblance of community walkability, though they are specific to the neighbourhood level and do not account for individual interpretations of neighbourhood environments that are influenced by multiple layers of environmental factors (Sallis, et al., 2006). Perceptions of walkability and subsequent walking behaviour outcomes of these interpretations can be understood through the lens of ecological and behavioural models, as well as variables for self-motivation that induce activity. A distinguishing characteristic between ecological and behavioural models is that the former places more emphasis on the broader environmental community as well as policies whereas the latter tends to focus more on individual and social influences such as friends and family (Sallis, Owen, & Fisher, 2008). They are therefore useful in understanding health behaviour and developing approaches to health intervention that target change at broad levels of influence (Sallis, Owen, & Fisher, 2008).

CHAPTER 2.2.1 | THE ECOLOGICAL MODEL

The built environment has much influence over individual walking behaviour. Yet, with the plethora of interrelated variables at play, it is difficult to discern how walking choices are exactly made. Basic ecological models are thus used to describe how people are affected by the multiple levels of influence; its fundamental concept is that behaviour is dependent on intrapersonal (psychological and biological), interpersonal (social and cultural), community, organizational, physical environmental, and policy factors (Sallis, Owen, & Fisher, 2008).

Relationships discerned between urban environments and travel behaviour have been inconsistent in literature. Despite working with sample populations of the same age categories, the cross-sectional research conducted possess micro- and macro-level contexts unique to each

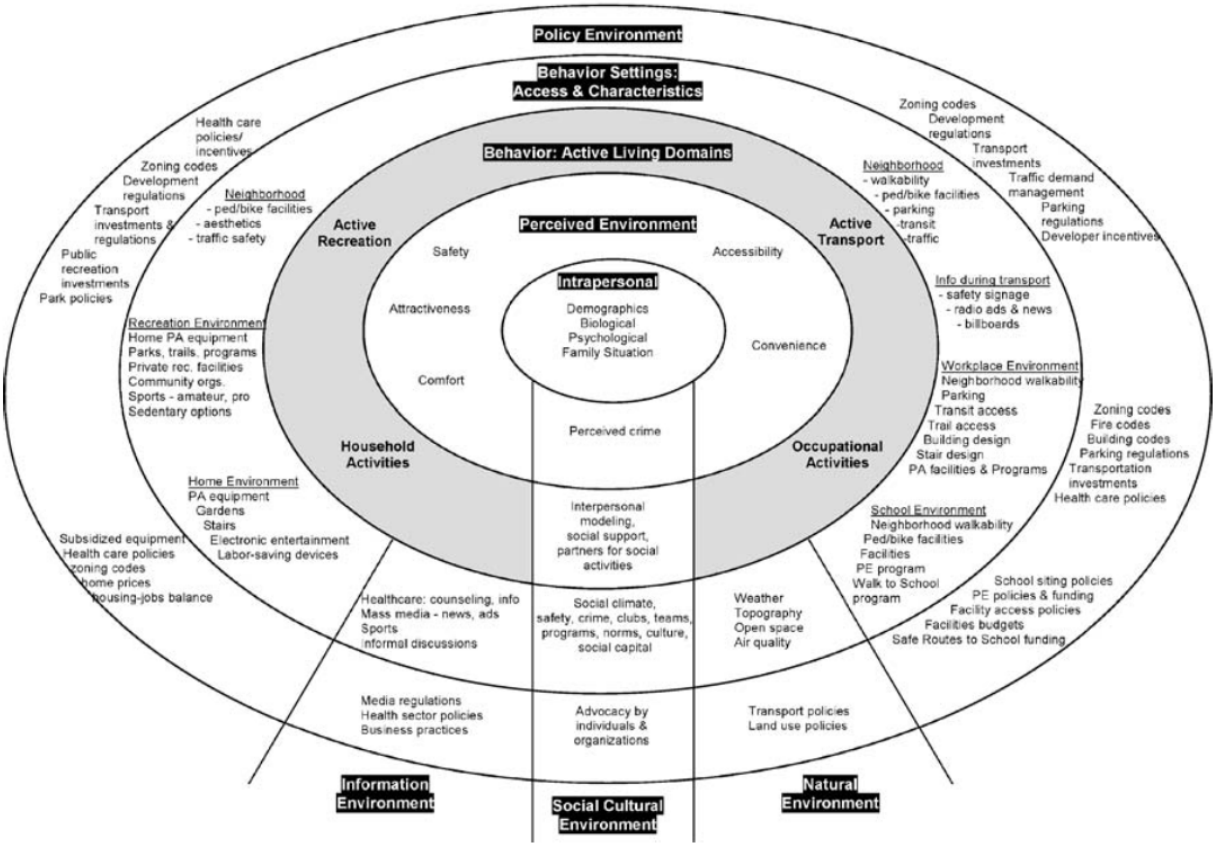

Figure 1: Ecological Model of the Four Domains for Active Living (Sallis, et al., 2006)

community and residents (Frank & Engelke, 2001). Thus, consensus in the evidence regarding theoretical models to validate relationships between travel behaviour and urban forms have not been achieved (Frank & Engelke, 2001). The most commonly used framework, however, has still been the ecological model to describe behaviour as influenced by multiple dynamic and inter-connected environmental factors (Sallis, Owen, & Fisher, 2008).

The ecological model presented in Figure 1, developed by Sallis, et al. (2006), is of a layered structure; several levels of influence are represented by three key features. Firstly, it is structured around four domains of active living that influence behaviour. These domains happen to correspond to walkability: Active Transport, Active Recreation, Occupational Activities, and Household Activities (Sallis, et al., 2006). Second, behaviour settings allude to accessibility and places where physical activity might occur. Third, over-arching interpersonal, or social-cultural, variables work across all levels. This indicates it is perhaps one of the stronger influences on an individual. Additionally, the model includes the perceived environment to be a determining factor in interpreting convenience and accessibility, crime and safety, attractiveness, and comfort (Sallis, et al., 2006). These are all qualities that coincide with known preferences for walking (Ewing & Handy, 2009).

Transport infrastructure and built environment characteristics are evidently not the sole factors that influence the decision to walk as well as sedentary behavioural choices. There are personal preferences and motivation, family and wider social contexts, community normative climates and social networks, and the material resources that are available that influence these choices (Owen, et al., 2011). A major public health and planning challenge is addressing the risks associated with sedentary lifestyles and encouraging physical activity amongst seniors who tend

to possess a range of mobile functions. The reduction in physical activity as a whole in developed countries, particularly amongst older adults, creates a dramatic rise in health care costs, decreases quality of life, and incurs short lifespans (Gehl, 2010). It is thus necessary but difficult to enable and motivate seniors to engage in active lifestyles (Health Canada, 2002; Phillips, Schneider, & Mercer, 2004). Physical activity and daily exercise may no longer be an integral part of daily living for many individuals due to greater access to motorized transportation and services. Yet, attempts must be made to encourage individuals to continue actively seeking activity in their daily lives (Gehl, 2010).

CHAPTER 2.2.2 | WALKING BEHAVIOUR MODEL

As Ewing and Handy (2009) suggest, street environments require much more than good physical design to support habitual walking. As indicated in their conceptual framework for walking behaviour provided in Figure 2, walking spaces attract users through agreeable physical features and design qualities, while appealing to the user (Ewing & Handy, 2009). Physical features directly and indirectly affect the quality of walking environments and experiences (Ewing & Handy, 2009). Physical features themselves are able to facilitate overall walkability, but

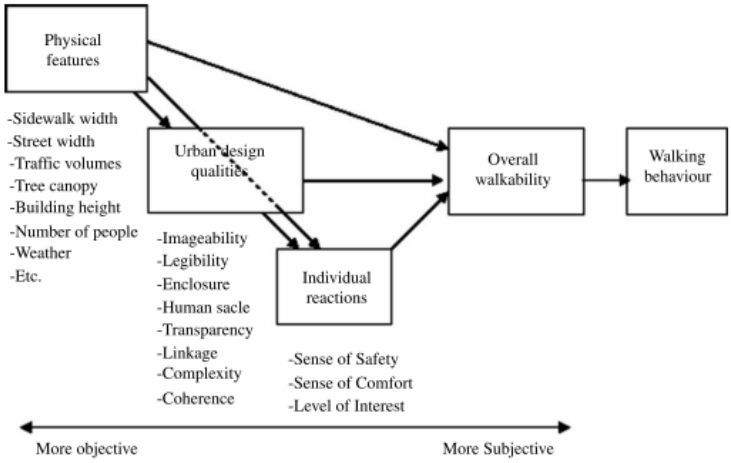

Figure 2: Conceptual Framework for Walking Behaviour (Ewing & Handy, 2009)

with urban design qualities that contribute positively towards individual sensitivities and perceptions of the environment, users may be more inclined to be attracted to the environment and enjoy walking experiences. As indicated in Ewing and Handy's (2009) conceptual framework, physical features play the most significant role in shaping a walking environment and subsequently, the decision to walk.

The three broad factors that influence overall walkability affects individual sensitivities and perceptions of an environment as a place to walk. Evidently, many of these qualities are highly subjective and are thus difficult to foster uniformly. This makes it difficult to truly understand individual walking experiences and motivation to do so.

Chapter 2.2.3 | The Formula for Motivation

Seniors tend to feel they cannot, should not, or simply will not exercise (Phillips, Schneider, & Mercer, 2004). Yet, studies have proven that light strolls of any distance and purpose should be encouraged as they increase movement while facilitating socialization outside individual and retirement homes (Kerr, Rosenberg, & Frank, 2012). Coinciding with the intrapersonal variables of the ecological model (Sallis, et al., 2006), personal motivation is a major determining factor of walking behaviour, affected by perceptions of personal and environmental characteristics.

Motivation is defined as the forces that act upon or within an individual to initiate behaviour and consists of both extrinsic and intrinsic factors (Phillips, Schneider, & Mercer, 2004). The phenomenon encompasses four subjective variables which are important to consider

since self-perceived prognosises are the best predictors of engagement in activity (Geelen & Soons, 1996). The following is a formula for motivation, proposed by Geelen and Soons (1996):

$$\text{Motivation} = \frac{\text{Perceived Chance of Success} \times \text{Perceived Importance of the Goal}}{\text{Perceived Cost} \times \text{Inclination to Remain Sedentary}}$$

Each variable is modifiable (Geelen & Soons, 1996); motivation may be manipulated through coaching and education, and changed through experiences for seniors to adopt and consistently maintain activity (Phillips, Schneider, & Mercer, 2004) such as walking. The balance between the four self-appraised factors determines whether seniors reject or adopt certain behaviours.

Chapter 2.2.3.a | Perceived Chance of Success

The *Perceived Chance of Success* is the most influential variable in the formula for motivation. It is based on how strongly one believes he or she is able to shape his or her own health. It is thus influenced by past experiences, in addition to the self-confidence in being able to perform the activity. Those who believe the likelihood of failing is high will be unlikely to initiate the act under consideration, despite fully understanding the benefits that may be garnered as a result (Phillips, Schneider, & Mercer, 2004). One obstacle to this variable is the control one perceives to have over heath relative to the external environment (Phillips, Schneider, & Mercer, 2004). Thus, change in external environmental factors, which include built and social characteristics, can affect a senior's sense of control over health.

In addition to the obstacle of perceived control over personal health, comorbidities play a role in hindering seniors' *Perceived Chance of Success*. Seniors with pulmonary, cardiac, and rheumatologic ailments are advised by physicians to take heed with engagement in physical

activity. Many misconstrue this advice as a prescription to be inactive. However, very few seniors are outright prohibited from physical activity and the majority can benefit from engaging in some form of activity, despite medical conditions (Bean, Vora, & Frontera, 2004).

Chapter 2.2.3.b | Perceived Importance of a Goal

The *Perceived Importance of a Goal* is the notion of how valuable an activity is and how performing the activity will benefit one's life as a whole (Phillips, Schneider, & Mercer, 2004).The relative meaning that seniors attach to their personal health influences how they view the importance of partaking in activity. Thus, the more highly-regarded one's health is, the higher the likelihood that health-enhancing behaviours would be seen (Phillips, Schneider, & Mercer, 2004). One major obstacle implied for the *Perceived Importance of a Goal* is the personal beliefs and education possessed regarding activity and health. Literature indicates some of the oldest-old of the senior population possess health knowledge that is different from the rest of the population (Phillips, Schneider, & Mercer, 2004). Their health care had focused more on cures, less on prevention, and undervalued social and physical activity. Such misconceptions led some seniors to believe only high-intensity activities such as weight-lifting and running can accrue positive health benefits, though informal activities such as walking a dog and carrying groceries can incur health benefits as well (Phillips, Schneider, & Mercer, 2004).

Chapter 2.2.3.c | Perceived Cost

Perceived Costs are perceived barriers that are strong negative predictors for activity (Phillips, Schneider, & Mercer, 2004). These may be associated with the over-estimation of effort and time needed for an activity, in addition to fear of falls, injury, pain, crime, discipline, knowledge, and skills. Risks of losing time, money, and energy, as well as unavailability of

companions and lack of pleasure are also hindrances to activity. Extrinsic barriers include weather, transportation, exercise facilities, exercise groups, and accessibility to exercise instructions (Peterson & Howland, 2000).

Chapter 2.2.3.d | Inclination to Remain Sedentary

Perceived Cost is closely linked to the *Inclination to Remain Sedentary*, which is the perceived value or benefits related to avoiding activity (Phillips, Schneider, & Mercer, 2004). These are shaped by personal habits in conjunction with prior experiences, meaning if one is in the habit of staying sedentary and does not find any reason to go outdoors and partake in activity, the inclination to remain sedentary indoors may be high. Evidently, these inclinations are deeply rooted in an individual's psyche and are further influenced by psychological issues such as depression. Seniors are more commonly affected by depression than the rest of the population (Kerr, Rosenberg, & Frank, 2011), which can leave seniors feeling a lack of pleasure or interest in participation. When a personal loss is experienced in the form of the loss of a friend or spouse, seniors may feel even more inclined to isolate themselves and remain sedentary. Thus, the external environment must be accommodating and accessible for walking purposes to help entice seniors to leave their homes. Physical environmental factors outside of human control that influence the *Inclination to Remain Sedentary* include weather, space, sunlight, and air quality (Phillips, Schneider, & Mercer, 2004).

Developing the motivation within senior community members to leave their homes and indoor activities for outdoor walks and engagement for healthy aging is not entirely incumbent upon urban planners; evaluation, counselling, encouragement, and empowerment is facilitated by public health experts, clinicians, caregivers, community members, and peers. A global

initiative such as the World Health Organization's (WHO) Age Friendly City has spearheaded the development of cities conducive to healthy aging (World Health Organization, 2007). It advocates for inter-disciplinary work in creating physically and socially inclusive communities where people can fruitfully continue leading independent, mobile, and happy lives as they age. Mere instructions for people to walk and perform other modes of active transportation as part of their daily lives is inadequate to inspire age-friendly, healthy, and walkable communities. Physical infrastructure that allows for quality walking and active transportation, in conjunction with information campaigns to educate the public of the advantages and opportunities that are associated with engaging in active living and aging are necessary steps (Gehl, 2010).

CHAPTER 2.3 | THE BUILT ENVIRONMENT AND WALKABILITY

Walkability is how the built environment is able to support and encourage active transportation or walking through sense of safety and comfort, by connecting members of a community with different destinations within reasonable distances, time, and effort, in addition to offering appeal and visual interest throughout walking networks (Southworth, 2005). Attributes of the built environment most commonly cited to influence active transportation or in this case, walking, are mixed land use, connectivity, and residential density (Dannenberg & Wendel, 2011). The criteria may differ depending on which characteristics are emphasized. Forsyth and Southworth (2008), for instance, look at linkages to other transit modes, degree of mixed land-use, safety, path quality, and path context. Descriptions of the objective characteristics assessed for each of these criterion are presented in Table 1. These can be further broken down into more specific factors that determine walkability: universal accessibility, adequate street networks and sidewalks, low traffic, high densities, safety, landscape design, and

Table 1: The Criteria for Walkability (Forsyth & Southworth, 2008; Southworth, 2005)

Criterium	Description
Connectivity	Path network connectivity is determined by the presence of pedestrian pathways and sidewalks, in addition to the extent of path continuity and absence of obstacles. Distance between destinations, the number of path options, the density of path intersections, and smaller block sizes additionally help make environments more traversable. Barriers to consistent pedestrian access include cul-de sacs, winding roads, few intersections, and lack of pathways.
Fine Grained and Varied Land Use Patterns	An array of accessible activities, resources, and services that are able to meet daily needs should be within walking distance. This includes retail shops, cafés, banks, grocery stores, fitness centres, schools, libraries, and public parks. Typical walking distances can vary across literature, but members of the general population are more inclined to walk to destinations up to 1 kilometer away. (Moudon, et al., 2006).
Linkage to Other Modes	Accessible and convenient transportation that connect people with the larger city and surrounding region are equally important as pedestrian networks that are internally well-connected. A variety of transit options that include the bus, streetcar, subway, and train should be available with reasonable time-distances. A full walkable, complete community would have full connectivity amongst all transit modes. In doing so, local residents may travel seamlessly between foot, car, or rail with relative ease.
Safety	Environments that are perceived to have little crime and traffic are more conducive for pedestrian safety and thus, walking. Auto-oriented environments with fast and high volumes of traffic are not safe, enjoyable, nor attractive for pedestrians. Characteristics that enhance safety include street traffic calming measures such as speed bumps, chicanes, and roundabouts. Sidewalk characteristics include designated crosswalks, pedestrian signs, and accessibility features such as ramps and crossing times for individuals of varied mobility levels.
Path Quality	Essential to walkability and walking experiences is the quality of the walking path itself. Paths should be continuous, be free of bumps or ramps, and smooth for walking with and without aids. Walkable environments should be free of significant barriers to all members of a population, including young children, seniors, and handicapped. Barriers or obstacles on a path may be utility poles, hydrants, parking meters, etc. Pedestrian infrastructure should additionally be available in the form of sidewalks or separated trails, adequate walking space to allow for two to three people to pass, designated pedestrian crossings, street trees, and street furniture.
Path Context	Features that form and influence the quality of path context is the walkability criterium that is least developed and most difficult to determine due to a degree of subjectivity involved. Pedestrians do not want to experience monotonous walking settings. Rather, path networks should engage pedestrians and entice continued walking; attribute such as visual appeal, street design, transparency of ground floor structures, landscaping, visible activity, street trees, lighting, and scenic views all contribute towards path contexts.

aesthetic appeal (Negron-Poblete, Paula, & Apparicio, 2014). The attributes can be objectively measured using various instruments developed by experts that are available, though researchers suggest there are additional characteristics that may be more feasibly assessed using subjective measures (Brown, Werner, Amburgey, & Szalay, 2007; Ewing & Handy, 2009).

In sum, walkability is a neighbourhood feature that renders it convenient for individuals to walk from their homes to common destinations such as services, shops, and areas of employment (Dannenberg & Wendel, 2011).There are two broad forms of physical activity and in this context, walking: utilitarian and recreational. The former occurs for a primary purpose other than the activity itself, such as for travel or for work (Dannenberg & Wendel, 2011; Frank, Engelke, & Schmid, 2003; Handy, Boarnet, Ewing, & Killingsworth, 2002). The latter is performed for leisure, without purpose and purely for personal enjoyment. Such walking can include meandering strolls around a neighbourhood or park, as well as window-shopping along commercial streets (Dannenberg & Wendel, 2011; Frank, Engelke, & Schmid, 2003; Handy, Boarnet, Ewing, & Killingsworth, 2002). A study performed by Cao, Handy, and Mokhtarian (2006) discovered that local shopping streets with low volumes of traffic and integrated path networks were major predictors of utilitarian walking, as opposed to non-utilitarian or recreational walking (Cao, Handy, & Mokhtarian, 2006). Regardless of the intent, a walk is a medium for the many activities and social interactions that may occur along the way (Gehl, 2010). Walkability is an indicator of pedestrian-friendliness (Lo, 2009) and determinant of walking behaviour; such environments should ideally be able to accommodate people of all ages and mobility levels (Southworth, Designing the Walkable City, 2005).

A community intending to promote healthy active living requires pedestrian-friendly, walkable environments (Kerr, Rosenberg, & Frank, 2012). These are planned combinations of functional and aesthetic features designed to create spaces that people are able to connect to (Andrews, Hall, Evans, & Colls, 2012). Such features tend to correlate with higher rates of walking and general physical activity, indicating strong linkages between health outcomes, street environments, and places of residents (Frank, Saelens, Powell, & Chapman, 2007; Saelens & Handy, 2008). In regards to senior populations, a healthy built environment conducive to pedestrianism and walking should support active aging and ensuing aging in place. These are the tenets of an age-friendly city or community (World Health Organization, 2007), a framework many Canadian provinces and cities have adapted to meet shifting demands of aging populations (Lewis & Groh, 2016). Details of this concept are explored further in Chapter 2.5.

Municipal urban design guidelines encourage the development of pedestrian-friendly, walkable environments. The City of Toronto's Pedestrian Charter defines (2002, p.1), "a pedestrian [as] a person moving from place to place, either by foot or by using an assistive mobility device. Pedestrians include residents and visitors to the city of all ages and abilities." Literature suggests, however, that senior walking needs can be poorly met in urban areas, despite the proven evidence for need and health benefits. Fortunately, the initiative to create environments that is supportive of senior walking needs has gained momentum (Alley, Liebig, Pynoos, Banerjee, & Choi, 2007; Kerr, Rosenberg, & Frank, 2012). This is evident in the various quantitative and qualitative tools developed to measure walkability for the needs of different sub-populations, in addition to studies utilizing and investigating the efficacy of these tools (Leslie, et al., 2005; Montemurro, et al., 2011). In addition to academic research, the general

intent of legislation including the Provincial Policy Statement and the Growth Plan for the Greater Golden Horseshoe push for complete, healthy communities. The following is an excerpt from Section 1.5.1 of the Provincial Policy Statement insinuating walkable, accessible environments for all members of a community (Ontario Ministry of Infrastructure, 2014):

> Section 1.5.1
>
> *Healthy, active communities should be promoted by:*
>
> *a) planning public streets, spaces, and facilities to be safe, meet the needs of pedestrians, foster social interaction and facilitate active transportation and community connectivity;*
> *b) planning and providing for a full range and equitable distribution of publicly-accessible built and natural settings for recreation, including facilities, parklands, public spaces, open space areas, trails and linkages and, where practical, water-based resources.*

Figure 3 illustrates common street grids in residential areas and clearly depict intersection density and directedness of routes, altogether influencing the accessibility of areas (Southworth, 2005). According to Southworth (2005), the gridiron street networks seen in

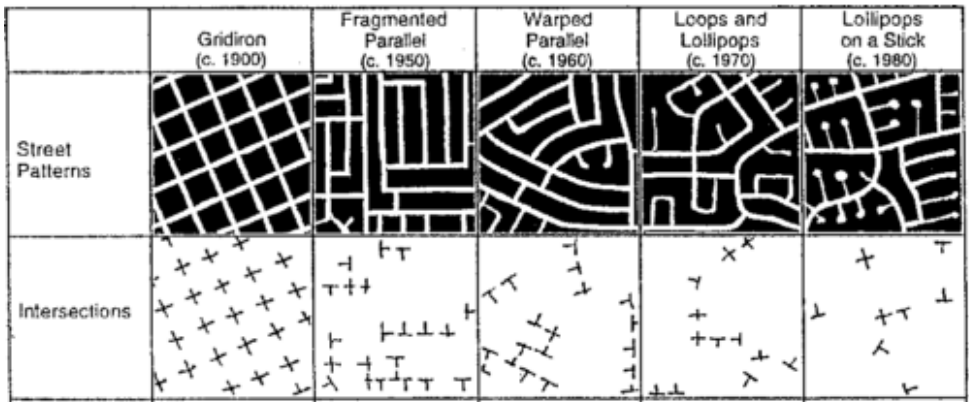

Figure 3: Different Forms of Residential Street Grids (Southworth, 2005)

traditional older neighbourhoods theoretically encourage and increase walking by reducing distances between destinations and offering numerous route options. The curvilinear streets of more conventional neighbourhoods, on the other hand, discourage walking as they increase

distances and reduce the number of route choices (Southworth, 2005). Characteristics of private spaces, including gardens and retail spaces on the ground floor, also play a role in encouraging trips made on foot by seniors (Borst, et al., 2009). These characteristics include areas to sit and rest, low curb heights, and the availability of ramps (Smith & Sylvestre, 2001; Stahl, Carlsson, Hovbrandt, & Iwarsson, 2008) for accessibility that accommodates differing pedestrian needs.

CHAPTER 2.3.1 | OBJECTIVE MEASURES OF WALKABILITY

The most common approaches for objective assessments are audits, indices, and GIS tools, all of which are used differently and assess different aspects of the environment according to varying scopes of research (Clifton, Livi Smith, & Rodriguez, 2007; Cunningham, Michael, Farquhar, & Lapidus, 2005; Rundle, Bader, Richards, Neckerman, & Teitler, 2011; Weiss, R.L, Maantay, & Fahs, 2010). A majority of the walkabiltiy criteria may be assessed objectively; GIS tools are particularly common in research regarding distance and connectivity (Brownson, Hoehner, Day, Forsyth, & Sallis, 2009).

Each and every neighbourhood can exhibit diverse physical-spatial features. Audits are therefore advantageous for quantitative or objective, systematic, and fine assessment of walkability (Brown, Werner, Amburgey, & Szalay, 2007; Joseph & Zimring, 2007). The Seniors Walking Environmental Audit Tool – Revised (SWEAT-R) is one of the tools that has been implemented in research to assess for walkability relevant to senior needs (Chaudhury, et al., 2011). The tool is cognisant of four broad areas of the built environment: functionality, aesthetics, traffic, and destinations. Specifically, SWEAT-R is able to evaluate crossing areas, buffer zones, land uses and buildings, public spaces, sidewalk characteristics, street characteristics, street life, and maintenance. These are criteria typically assessed in objective

walkability measures (Michael, Green, & Farquhar, 2006). Senior-sensitive indicators include the availability of benches, maximum curb heights at crossing areas, the presence of senior-focused land uses, etc. The Secondary Observation Form that is a companion tool to SWEAT-R is a qualitative assessment of a study area from the perspective of the researchers intended to capture contextual environments pre- and post-audit. It enquires into land uses, quality of public spaces, pedestrian safety, and convenience at the community level (Chaudhury, et al., 2011).

Other walkability audits include the Pedestrian Environment Data Scan (PEDS), Walking Route Audit Tool for Seniors (WRATS), as well as Systematic Pedestrian and Cycling Environmental Scan (SPACES) and Irvine Minnesota Inventory, from which SWEAT-R had been adapted from (Chaudhury, et al., 2011). According to a recent scan of existing walkability audits, there are twenty tools available (Brownson et al, 2009), though only few are sensitive towards senior needs (Chaudhury, et al., 2011). A significant limitation to these hands-off and objective approaches is the varying degree of constancy pertaining to time, day, and season, which complicate the measurement and validation of data. For instance, these factors strongly influence the number of cars and pedestrians on the streets at different points in time (Ewing & Handy, 2009). Audits also tend to be more time-consuming and costly to conduct, mostly due to the expenses required for travel. They are thus typically limited to smaller areas of study rather than larger samples that are geographically-dispersed (Rundle A. G., Bader, Richards, Neckerman, & Teitler, 2011). To overcome this drawback, a recent study utilized Google Street View as an alternate source of data to analyze neighbourhood environments. Although unable to gather in situ data such as noise and traffics speed, this unconventional method allowed multiple

neighbourhood segments to be evaluated within a reasonably short amount of time (Rundle A. G., Bader, Richards, Neckerman, & Teitler, 2011).

Similarly, another recent study employed and validated the use of Walk Score in assessing walkability (Carr, Dunsiger, & Marcus, 2011). Walk Score is an online resource that is an objective metric for measuring walkability. It uses an algorithm to distribute points to specific neighbourhoods based on proximity to different categories of amenities, such as restaurants, grocery stores, theatres, parks, etc. (Walk Score, 2015). Walk Score additionally measures pedestrian-friendliness by assessing for population and intersection density, average block lengths, link/node ratios, and route directedness (Walk Score, 2015), which are all common objective indictors noted in existing literature (Negron-Poblete, Séguin, & Apparicio, 2014; Southworth, 2005).

CHAPTER 2.3.2 | SUBJECTIVE MEASURES OF WALKABILITY

Evident in the wide array of variables that determine walkability, path characteristics may be measured objectively as well as subjectively (Lee & Vernez-Moudon, 2004). Perceptions and experiences unique to users can vary: Is it safe?; Is it far?; Is it difficult to get to?; Is it a pleasant walk? The combination of such objective and subjective characteristics influence the decision to walk and the time willingly spent on walking to reach a destination (Ewing & Handy, 2009; Phillips, Schneider, & Mercer, 2004)

A select few of the criterion for walkability, such as safety as well as path quality and context, would yield more detail by qualitative investigation methods since they are more subjective by nature (Brown, Werner, Amburgey, & Szalay, 2007; Ewing & Handy, 2009; Lynch,

1980). Qualitative approaches to measuring walkability refer to gathering experiential data pertaining to a particular environment. In other words, it involves gathering perceptions and lived experiences from individuals who typically have had personal encounters with a specific place of interest (Andrews, Hall, Evans, & Colls, 2012). Perception can be defined as the awareness and understanding of sensory information (Ewing & Handy, 2009). Perceptions of physical and social environments differ according to interplays between one's culture, past experiences, and subsequent unique interpretations of observations (Ewing & Handy, 2009).

Quantitative tools to measure walkabilty research are more commonly seen due positivist beliefs that they are more reliable than that of subjective measures (van Lenthe & Kamphuis, 2011). Yet, there are elements of the built environment that cannot be objectified and measured, as previously stated; studies prove there is a degree of subjectivity in determining whether a particular area is walkable (Brown, Werner, Amburgey, & Szalay, 2007; Ewing & Handy, 2009; Lynch, 1980). What one person might describe to be walkable due to short distance, another may potentially disagree due to personal mobility limitations that influence perception of distance. This does not mean, however, that objective assessments of walkability should be replaced by experiential measures. In a study conducted by Leslie, et al. (2005), two neighbourhoods had been chosen to represent objectively different land-use mix, street connectivity, and residential density. When participants were asked to provide descriptions of their respective neighbourhoods, the perceived findings coincided with the objective rankings of walkability (Leslie E. , et al., 2005). However, this is not always the case across studies investigating walkability. As van Lenthe & Kamphuis (2011) argue, there is an apparent inconsistency between the two approaches. Perceived measures may not yield the most

accurate depictions of walkability due to residents' lack of adequate knowledge of the environment (van Lenthe & Kamphuis, 2011). This is in addition to their inability to understand their neighbourhood's walkability as a result of personal bias and confounding variables such as loneliness and safety (van Lenthe & Kamphuis, 2011). Yet, these are arguably what make experiential data valuable contributions to research (Ewing & Handy, 2009).

Some common methods of qualitatively assessing walkability include interviews, focus groups, ethnography, and participant observation (Andrews, Hall, Evans, & Colls, 2012). An innovative qualitative method is the go-along interview, which effectively provides the researcher with a full user experience of a space when taken on "spatialized journeys" of the interviewee's neighbourhood (Carpiano, 2009). This particular approach has become increasingly used in walkability studies (Gardner, 2011; van Cauwenberg, et al., 2012).

An early qualitative assessment of walkability utilizing a variation of the go-along interview technique was conducted by Kevin Lynch in 1959 (Lynch, 1980). In this study, participants were instructed to describe their surrounding environments during a walk around their neighbourhoods (Lynch, 1980). Details at the micro-level, such as sidewalk width and upkeep, were identified by the participants (Lynch, 1980). Other small-scale features of the environment not typically assessed in environmental and walkability studies were identified, as well: the attractiveness of buildings, focal points of a street, as well as street or commercial signs salient for pleasant walks (Lynch, 1980). Fairly few studies at this time investigated such minute physical features of walkable environments (Brown, Werner, Amburgey, & Szalay, 2007). Lynch (1980) was able to prove the significance of small environmental features to walking

experiences. Moreover, that psychological experiences of environments play integral roles in walkability (Lynch, 1980).

Perceptual and objective data should be used to supplement one another to produce a more holistic understanding of walkability in a particular area (Andrews, Hall, Evans, & Colls, 2012). Research utilizing participatory methodologies and perceptual knowledge to assess whether environments accommodate the needs of less mobile groups of individuals are becoming more common (Andrews, Hall, Evans, & Colls, 2012). They tend to fill gaps that can be missed in research involving only objective measures of walkability.

CHAPTER 2.3.3 | ACCESSIBILITY

As with "walkability", there are variations of definitions for "accessibility." In environment and planning literature, accessibility is defined as the ease with which activities may be reached (Pirie, 1979). It is an umbrella term that encompasses all variables that influence how people function within their environments (Pirie, 1979). It is thus identified as a main constituent of walkability across literature (Lo, 2009; Negron-Poblete, Séguin, & Apparicio, 2014). In recent empirical studies, evidence determined that accessibility based on the objective and perceived distances to destinations are linked to walking; the greater the distance, the lower the likelihood of walking (Handy, Cao, & Mokhtarian, 2005; Humpel, Owen, & Leslie, 2002; Lee & Vernez-Moudon, 2004; McCormack, Giles-Corti, & Bulsara, 2008; Pikora, et al., 2006). A review conducted by Humpel et al. (2002) of studies assessing physical environments revealed that accessibility, aesthetics, and opportunities had significant positive associations with physical activity across various study areas. Accessibility and opportunity are associated with pedestrian network connectivity and presence of destinations, respectively (Humpel, Owen, & Leslie, 2002).

Therefore, studies of how urban forms affect walking behaviours typically includes a measure of street network connectivity (Frank, Andresen, & Schmid, 2004; Leslie, et al., 2005) as an indicator for accessibility to community destinations.

For any municipality within Ontario, legislation pertaining to accessibility must operate under the Accessibility for Ontarians with Disabilities Act (2005), which mandates accessibility standards to be met across Ontario by 2025. Accessibility does not solely consider public external environments; the periphery and interior of buildings themselves are equally important to consider in developing universally-accessible communities (Iwarsson & Stahl, 2003). Municipal accessibility plans and/or guidelines are used to outline the steps required to identify and remove potential exterior and interior barriers for handicapped individuals. The City of Toronto, for instance, has produced an Accessibility Design Guidelines document intended to address the physical, ocular, auditory, and cognitive needs of individuals with disabilities outside and within publically-accessible buildings (City of Toronto, 2004).

Assessing the accessibility of an environment is necessary to identify any spatial inconsistencies across a city that should be addressed (Talen, 2003). This becomes particularly important to do for older adult populations; a study conducted by Achuthan et al (2010) concluded seniors to be more affected by physical obstacles, barriers, and characteristics of pathways and sidewalks than younger populations. For seniors, it is the combined factors of attributes that limit the risks of falling and attributes that improve neighbourhood aesthetics that determine whether a particular environment is walkable (Achuthan, Titheridge, & Mackett, 2010). Providing improved access to urban resources for aging areas is a crucial step to achieve walkability and sustainable mobility, in addition to encouraging physical activity (Negron-Poblete,

Séguin, & Apparicio, 2014). Measuring environments for walkabiltiy is therefore an important step to determine areas of improvement.

Chapter 2.4 | Senior Walkability and Walking Experiences

Not all environments are walkable due to varying degrees of mobility and perceptions of environmental age-friendliness (Andrews, Hall, Evans, & Colls, 2012), leading to increased research focusing on senior walkability (Kerr, Rosenberg, & Frank, 2011). Existing literature provides a wide-ranging complilation of environmental characteristics that have been objectively and subjectively identified to influence walkability for seniors (Ewing & Handy, 2009; Forsyth & Southworth, 2008; Kerr, Rosenberg, & Frank, 2012; Negron-Poblete, Séguin, & Apparicio, 2014; Southworth, 2005). Many studies are case-specific, though their findings can certainly translate to senior populations in other areas.

Chapter 2.4.1 | Perceived Stimulants and Deterrents of Walking

Compared to younger people, older adults are more affected by the physical characteristics of sidewalks that might impede walking (Achuthan, Titheridge, & Mackett, 2010), due to slower paces (Frank & Engelke, 2001) and the need to pause for rest (Michael, Green, & Farquhar, 2006). Seniors residing in neighbourhoods that feature “traditional” or more “walkable” designs (Saelens, Sallis, & Frank, 2003) have shown to initiate purposive walking for thirty minutes more and partake in more overall physical activity (Frank, Schmid, Sallis, Chapman, & Saelens, 2005) than those living in areas with less walkable “suburban” designs (Frank, et al., 2006). Inner-city neighbourhoods, for instance, tend to be more walkable due to grid-like street patterns, greater land-use mix, and higher densities (Southworth, 2005).

Impediments may include uneven pavement, elevation changes, and encroachments onto pathways by obstructions such as mailboxes (Negron-Poblete, Paula, & Apparicio, 2014). In order for a neighbourhood to be walkable, seniors are likely to look for pleasant aesthetic environments in addition to qualities that limit any risk for accidents such as falling (Montemurro, et al., 2011). Ergonomic design have been indicated to be important as well; seating areas for rest, lower sidewalk heights, and the availabiltiy of ramps and handrails can improve the walking experience (Stahl, Garlsson, Hovbrandt, & Iwarsson, 2008). Older adults prefer to walk in areas with minimal vehicular traffic and routes that constitute straight paths towards desired destinations. This allows for more continuous and shorter travel distances, fewer crosswalks, and ease of orientation as indicated by one study (Michael, Green, & Farquhar, 2006). This becomes particularly important for seniors who rely on the use of walking aids, which often require wider spaces to maneouver. In a sidewalk setting where the path is narrow and many pedestrians are present, seniors may feel uncomfortable and fear for their safety as they force through (Gehl, 2010). Moreover, sidewalks should be continuous as to prevent discouraging pedestrian traffic (Gehl, 2010).

Safety is a major determining factor for seniors; research has indicated seniors may feel vulnerable in public open spaces due to fewer people in the vicinity (Michael, Green, & Farquhar, 2006). Of course, perceptions may vary depending on contextual factors of the neighbourhood (Berke, M, Gottlieb, Moudon, & Larson, 2007). Areas high in human activity tend to trigger perceptions of safety and security; often, areas of mixed function enhance feelings of safety (Gehl, 2010). At night when little happens in outdoor spaces, the presence of furniture, parked bicycles, flowers, and forgotten toys or playgrounds are comforting to pedestrians as they exude

comforting evidences of life and proximity to other people (Gehl, 2010). Additionally, light streaming out from homes and shops can increase feelings of security on the streets (Gehl, 2010). In places that experience harsh winters, the accumulation of snow and ice can be highly problematic for older adults. Walking outdoors thus becomes unfeasible during the winter and other unforgiving weather conditions (Stahl, Garlsson, Hovbrandt, & Iwarsson, 2008). Vehicular traffic is an impediment to pedestrian safety, as well. Automobiles have invaded urban areas in the past fifty years and conditions for pedestrians had deteriorated in urban areas as a result; sidewalks narrowed to make room for automobiles and pedestrian walkways became filled with traffic infrastructure and other obstacles to allocate more room to roadways (Gehl, 2010). Accidents involving pedestrians and cars have risen and thus the fear of becoming a victim to traffic accidents severely impacted pedestrian walking experiences and enjoyment moving about communities by foot (Gehl, 2010). Cities have since combatted against automobile-dominated roadways and have transitioned street networks to become more walkable, though traffic is still identified as a major safety concern for many walkers (Frank & Engelke, 2001; Gehl, 2010).

Evidently, perceived barriers are wide-ranging as they are unique to individuals and context (Berke, M, Gottlieb, Moudon, & Larson, 2007). Additional personal barriers that have been cited include valuation of time and distance, convenience, habit and attitude towards walking, preferences in weather, and safety (Frank & Engelke, 2001). Walkability characteristics for seniors vary across research findings; built environment characteristics such as street connectivity and short block lengths that may determine walkability for the general public may not be the same for older adults. For instance, despite a plethora of routes and intersections available, seniors may still feel discomfort in negotiating crosswalks when travelling on their own

at slower paces (Frank & Engelke, 2001). This is typically out of fear of the long crossing distances and unsignaled intersections (Koepsell, et al., 2002). In fact, seniors have indicated traffic and pedestrian control infrastructure to be one of the most crucial environmental conditions for cities to address for increased safety (Saelens & Handy, 2008).

Lack of consideration for the vulnerable, yet growing populations of seniors and their needs can occur in general walkability assessments. Furthermore, walkability audits exclusively emphasize physical environmental qualities, which do not provide much detail regarding the experiences of walking on a particular street.

Chapter 2.4.2 | Indoor Walking Activities

Seniors tend to have smaller life spaces than the general population with activity spaces 500 metres away from home (Negron-Poblete, Séguin, & Apparicio, 2014) typically due to smaller social networks, reduced activity, and limitations in mobility (Wiles, et al., 2009). This is particularly the case when obstacles are perceived; seniors feel hesitant to go outdoors and consequently limit their outdoor activity and engagement with the community (Kerr, Rosenberg, & Frank, 2012). These factors may subsequently lead to higher participation levels in indoor physical activity groups (Black, 2008). Retirement homes, senior activity centres, community centres, and other long-term care facilities often offer such amenities to their tenants.

Relying solely on indoor physical activities in lieu of outdoor physical activity can do more harm than good, particularly for institutionalized or isolated seniors (Coon, et al., 2011). Research findings encourage continued interaction with the outside community; carrying on with activities as usual is believed to help seniors cope with the physical demands of aging and allows

for healthy living (Goldberg & Beitz, 2006). Though usual high intensity activities may have to be forfeited, alternatives such as walking is much less strenuous. In an experiment with a sample of older adults, illnesses that disrupted normal activity produced feelings of lost independence. (Goldberg & Beitz, 2006). But when the participants replaced their more intense activities with those less physically-taxing, they displayed fewer mood changes and lack of motivation (Goldberg & Beitz, 2006).

When seniors limit themselves by taking part in indoor physical activities in lieu of conducting engaging outdoor walks, however, they are not receiving the benefits that outdoor environments provide. Findings of multiple studies support this notion, as research participants have stated improved moods and energy when exercising outdoors as opposed to exercising indoors with similar activities (Coon, et al., 2011). The socio-cultural environment plays a significant role in altering self-perception, motivation, and behaviour (Owen, et al., 2011). Leaving an institution or retirement home and engaging with people other than seniors can thus enlighten moods, encourage further activity, and promote the perception of youthfulness.

Chapter 2.4.3 | Perceived Social Capital and Sense of Community

A growing body of research posits that strong social networks and interactions incur positive health outcomes to those actively participating within their communities (Leyden, 2003; Talen & Koschinsky, 2013). Such social and community ties are elements of a broader concept, known as social capital (Leyden, 2003). Social capital may be defined as the social networks as well as interactions that foster trust and reciprocity between members of a communtiy (Putnam, 2001). Communities exhibiting high social capital possess members who are actively involved in local affairs, habitually volunteer, and engage frequently with neighbours and friends;

community members are likely to trust and think kindly of one another (Leyden, 2003; Putnam, 2001). High social capital, often in the form of neighouring, has additionally been linked to neighbourhoods that are measured to be highly walkable (Perking & Long, 2002; Rogers, Halstead, Gardner, & Carlson, 2010).

When community members are more emotionally attached to their respective communities, greater involvement in neighbourhood activities can occur which leads to a healthier, happier, and more stable community (Jun & Hur, 2015). Walkable communities are associated with social engagement and trust (Leyden, 2003), in addition to overall sociability (Brown & Cropper, 2001). Moreover, researchers claim walkable communities support the development and upkeep of social capital, a key determinant of quality of life (Rogers, Halstead, Gardner, & Carlson, 2010). Frequent contact, whether spontaneous or intentional, can generate familiarity and eventually foster respect, trust, and other elements that are important to contributing towards feelings of community over time (Granovetter, 1973; Talen, 1999). This indicates a strong social network is key in age-friendly communities for higher quality of life in seniors. In fact, neighbourhoods that possess physical features such as porches are able to influence social participation, subsequently impacting depression and anxiety in older adults (Kubzansky, et al., 2005).

Sense of community is be defined as a place-specific sense of belonging (du Toit, Cerin, Leslie, & Owen, 2007) and is interpreted at the individual level (Perkins & Long, 2002). The phenomenon is typically viewed as a composite measure that includes the factors of membership, emotional connections, as well as needs' fulfilment which is attained through meaningful social networks (Brown & Cropper, 2001). Studies have typically found that

traditional or neighbourhoods perceived and experienced to be more walkable facilitate social interaction and provide enhanced sense of community (Jun & Hur, 2015; Leyden, 2003; Lund, 2002). Positive social interaction in turn can generate local resources that residents may individually as well as collectively utilize for emotional and practical support (du Toit, Cerin, Leslie, & Owen, 2007). With more resources and a greater social network, residents of a community are more likely to feel safe and cared for amongst their neighbours (du Toit, Cerin, Leslie, & Owen, 2007). Social interaction involves activities such as casual conversations, exchanging favours, and participating in activities or events that develop trust as well as reciprocity amongst community members (Putnam, 2001). Consequently, social interaction is key to fostering social capital within a community. With frequent and meaningful social interaction, people are more likely to confer community issues and become engaged in civic activities (Oliver, 2001), leading to valuable community development (Jun & Hur, 2015).

Seniors can benefit greatly from interaction and developing sense of belonging in their communities; isolation and depression is common amongst the aging population (Kerr, Rosenberg, & Frank, 2011) and contributes poorly towards health deterioration and quality of life (Ponde de Léon, Lévy, Fernández, & Ballesteros, 2015). In addition to improving mental health, literature suggests public community spaces surrounded by walkable environments can prevent obesity and other chronic illnesses, improve brain function, happiness, and overall quality of life, as well as enhance the community social fabric for meaningful relationships (Talen & Koschinsky, 2014).

With a heightened sense of community, Parker et al (2001) have found that residents are more likely to identify higher self-reported physical and mental health than those who do not

feel the same about their communities (Lund, 2002). One study in particular had discovered socal cohesion to be strongly correlated with age; older participants of the study were more likely to recount more frequent social interactions with locals in comparison to other age groups of the study (du Toit, Cerin, Leslie, & Owen, 2007). Facilitating a sense of belonging and fostering sense of community with seniors residents of a community thus facilitates aging in place to occur (Wiles, et al., 2009).

Chapter 2.5 | The Age-Friendly Community

An age-friendly city or communtiy aims to optimize "opportunities for health, participation, and security in order to enhance quality of life as people age" (World Health Organization, 2007). It is achieved by creating a safe built environment and socio-cultural setting that is able to support social engagement and continued active lifestyles for all individuals (Ontario, 2013; World Health Organization, 2007). Since active aging is really a life-long process, age-friendly communities do not solely pertain to seniors. Rather, they are physical and socio-cultural environments that support individuals of all ages and mobile capacities (World Health Organization, 2007). This particular study and literature review, however, focuses on seniors.

Aging populations place much pressure on existing and developing urban areas to accommodate the physical and social needs of older adults. Age-friendly community development has therefore become widely recognized as a critical component in contemporary planning within the developed world (Negron-Poblete, Paula, & Apparicio, 2014; Plouffe & Kalache, 2010). This burgeoning movement particularly gained momentum with the WHO's development of the age-friendly community framework, designed to guide cities to proactively

work with large senior populations. Within Ontario, this initiative is a major component of Ontario's Action Plan for Seniors, which is advocated by the Ontario Senior's Secretariat (OSS) (Ontario Senior's Secretariat, 2013). Age-friendly community developments are further supported by the Public Health Agency of Canada (PHAC), as well as the Ontario Professional Planners Institute (OPPI) (Ontario Professional Planners Institute, 2009).

In support of the age-friendly community concept, the WHO conducted a global study to identify eight key domains that contribute towards a city's age-friendliness. These are: outdoor spaces and buildings, transportation, housing, social participation, respect and social inclusion, civic participation and employment, communication and information, as well as community support and health services (World Health Organization, 2007). Each of these domains can be linked to the various physical and social implications of walkability, and subsequent senior health (Alley, Liebig, Pynoos, Banerjee, & Choi, 2007; Plouffe & Kalache, 2010). Moreover, the ecological model discussed in Chapter 2.2.1 corresponds well with the active aging framework where active ageing is dependent on multiple determinants of behaviour: economic, social, physical, personal, behavioural, as well as health and social services (World Health Organization, 2007).

Chapter 2.5.1 | The Domains for Age-Friendliness

The development of senior-friendly communities is interdisciplinary and complex; all elements of the social, natural, and built environments must be evaluated to determine whether they are able to meet the diverse needs of seniors (Ontario, 2013; Plouffe & Kalache, 2010). This is known as the person-environment fit (p-e fit), which is the "relationship between a person's physical and mental capacity and the demands of his or her environment" (Ontario, 2013).

According to Hodge, the p-e fit is an "active transaction" between seniors and their surrounding environments (2008, p.124). These transactions are dynamic, subject to changes at both the individual and community level and determine competence and independence (Lewis & Groh, 2016). A number of metrics can be utilized to measure the p-e fit, but a common approach is to look at the walkability of communities (Ontario, 2013). Therefore, each of the domains can be associated with walkability due to reciprocal influence.

Three of the domains can be sub-categorized to represent the physical environment: transportation, housing, and outdoor spaces and buildings (World Health Organization, 2007). It is evident that these elements of the age-friendly community are strongly linked to personal mobility and therefore, health behaviour and social connectivity (World Health Organization, 2007). Collectively, they are directly able to impede or improve walkability for older adults. A balance in the physical characteristics and social atmosphere must therefore be present; older adults will not be able to utilize and take part in environments that are too demanding, nor will they want to engage in environments that are not stimulating enough (Kerr, Rosenberg, & Frank, 2012). Föbker and Grotz (2006), along with various other researchers, have additionally found that older adults who live in more dense and mixed-use neighbourhoods tend to take a greater number of leisurely walking trips and make more use of their outdoor spaces than those who live in less dense areas (Lynott, McAuley, & McCutcheon, 2009).

The socio-cultural elements of an age-friendly environment can be represented by another three domains: respect and social inclusion, social participation, and civic participation and employment (World Health Organization, 2007). Respect and social inclusion refer to the behaviour and attitudes community members may show towards older adults. This can facilitate

or deter social participation, signifying potential levels of engagement in social activities. Civic participation and employment refers to any opportunity for citizenship and work. This domain is influenced by the overall social environment, combined with economic determinants for active aging that is often defined by the economic contexts of the city as a whole (World Health Organization, 2007). Research has shown that the benefits of walkable communities go beyond encouraging just physical activity. In fact, walking can be an effective way of enhancing social presence in outdoor spaces (Andrews, Hall, Evans, & Colls, 2012). In order to achieve this, the key is to adequately consider the diverse physical needs of all local residents in infrastructure planning and design. Walkable environments are therefore able to solidify a stronger social and civic presence for seniors within their respective communities, which can subsequently improve communication and access to public information (Andrews, Hall, Evans, & Colls, 2012).

Communication and information, as well as community support and health services are the remaining two domains. These involve social service and health determinants, as well as overarching social environments of the community (World Health Organization, 2007). If older adults are able to maintain independency and a degree of mobility, the potential to keep active within their communities is sustained and quality of life can be enhanced (Negron-Poblete, Paula, & Apparicio, 2014). This implies the sustained ability to acquire communtiy information by social networks as well as to reach necessary health services to maintain well-being. These are enhanced through communities that permit seniors to remain engaged with others, which can be attainable through enhanced walkability and accessibility (World Health Organization, 2007).

The eight domains collectively promote improved well-being and quality of life for older adults in areas with aging populations. The Accessibility for Ontarians with Disabilities Act (AODA)

mandates the development of a fully-accessible province by 2025 (Accessibility for Ontarians with Disabilities Act, 2005). This legislation makes Ontario the first worldwide to require accessibility reporting; great strides are being made to promote environments that are hospitable towards seniors. Making communities more "age-friendly" is perhaps the best approach to take to facilitate and motivate active ageing. Seniors may then be more inclined to lead healthy, active lives by continuing to stay involved in their communities (Ontario, 2013).

Chapter 2.5.2 | Active Ageing to Age in Place

To age in place is to be able to remain and live independently within the same community of residence as one grows older and needs begin to change (Dannenberg & Wendel, 2011). The goal of an age-friendly community is to encourage active living amongst older adults, the age cohort that may experience the most challenges to do so due to mobility (Föbker & Grotz, 2006; Lynott, McAuley, & McCutcheon, 2009; Rosenberg & Everitt, 2001). This is accomplished through a community that is supportive of senior populations in its legislation, services, infrastructure, and overall atmosphere by (World Health Organization, 2007):

a. *recognizing the wide range of capacities and resources among older people;*
b. *anticipating and responding flexibly to ageing-related needs and preferences;*
c. *respecting their decisions and lifestyle choices;*
d. *protecting those who are most vulnerable;*
e. *promoting their inclusion in and contribution to all areas of community life.*

Evidently, the phenomenon is influenced by factors related to the physical environment and access to health and social services, in addition to socio-economic factors that influence behaviour and attitudes (World Health Organization, 2007). Taking further account into variances in culture and gender, the WHO's determinants of active aging prove that seniors are

far from being a homogenous population they are often perceived to be (Negron-Poblete, Paula, & Apparicio, 2014; Plouffe & Kalache, 2010).

Altogether, these research findings correspond to the determinants of active aging identified by the WHO for age-friendly communities and support the desire to age in place (World Health Organization, 2007). Figure 4 illustrates the interrelated nature of these conditions that influence an individual's capacity for active aging, the resulting ability to age in place, and overall quality of life. A review of literature has found that a predominant concern for seniors is to be able to continue living independently in areas where they had spent the majority of their active years (Kerr, Rosenberg, & Frank, 2012). This becomes an issue, however, when older adults live in neighbourhoods that are auto-dependent. Limitations in physical mobility may render them isolated if they are not capable of operating a vehicle. The need to design outdoor spaces that are pedestrian-friendly to all ages is therefore heavily implied in various

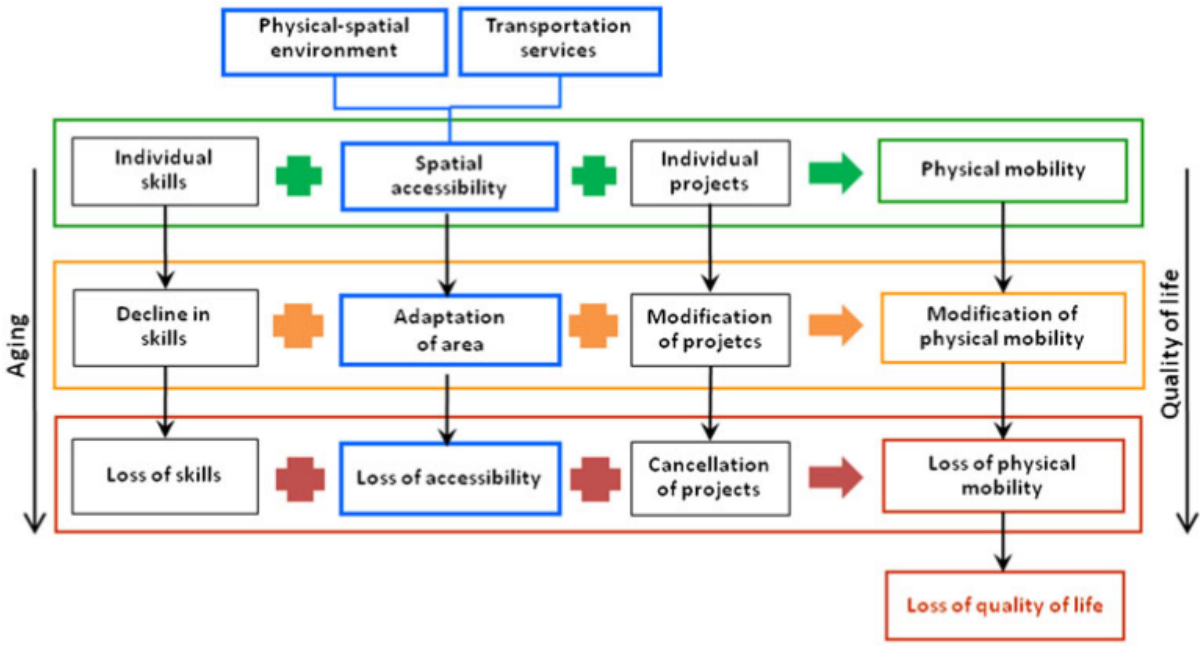

Figure 4: The Relationship between Aging and Quality of Life (Negron-Poblete, Paula, and Apparicio, 2014)

bodies of research for active ageing (Negron-Poblete, Paula, & Apparicio, 2014). In concordance to these conditions, it is evident that the ability to age actively is dependent on factors that are both within and outside of a senior's control. A significant influence comes from a city's acknowledgement of aging populations and an ability to foster age-friendly strategies for complete communities that support the needs of all residents and pedestrians. Urban designs for walkable pedestrian-friendly environments consequently come into play.

Chapter 3.5.2.a | Naturally Occurring Retirement Communities (NORCs)

A naturally occurring retirement community (NORC) is broadly defined as a community where large concentrations of older residents have naturally convened due to the tendency to either remain in or move to such communities during retirement (Masotti, Fick, Johnson-Masotti, & MacLeod, 2006). NORCs occur in varied forms and locations, but are typically seen as neighbourhoods of condominiums, apartments, and single-family homes. Each NORC is unique due to varied socio-demographic characteristics and aging experiences of its residents that create different health needs at the community level, in addition to the physical and social environments of the community (Black, 2008).

Current demographic trends amongst the senior cohort, such as longer life expectancies and the desire to age in place is expected to lead to a significant growth in NORCs as well as support for age-friendly communities (Masotti, Fick, Johnson-Masotti, & MacLeod, 2006; World Health Organization, 2007). As a natural phenomenon, unhealthy NORCs have the potential to negatively affect senior health; it is hypothesized that some NORCs may be healthier than others due to the key role built and social milieus have in determining population health. Moreover, retirees spend a greater amount of time in their communities than the working population

(Roux, Norrel, Haan, Jackson, & Shultz, 2004). Merely providing medical and social services in a NORC does not mean it is healthy. “Healthy” NORCs surrounded by senior-sensitive and supportive physical and social environments impose positive health benefits for seniors, more so than regular NORCs (Masotti, Fick, Johnson-Masotti, & MacLeod, 2006).

Research suggest linkages between residential settings and physical, social, and psychological influences on health (Black, 2008). Thus, neighbourhood environments can slow or facilitate functional decline amongst seniors; seniors residing in deteriorated areas less conducive to active aging have reported more illnesses than seniors living in healthier environments (Balfour & Kaplan, 2002). Seniors with limited social networks have been linked to functional decline (Black, 2008), thereby indicating NORCs situated in isolated areas that limit community interactions have the propensity for poor resident health outcomes.

CHAPTER 2.6 | SUMMARY

The body of research surrounding walkability continues to grow as walkability becomes increasingly critical as a component of healthy, complete communities, particularly for age-friendly environments. Objective assessments are not adequately able to capture such intricate relationships with a street environment’s physical characteristics. Perceptions of walkability therefore vary from one person to the next, thereby making walkability a relative concept. It becomes dependant on varied social contexts and personal circumstances which influence the motivation to take part in walking. Along with environmental contexts, these constitute the ecological model and come together to influence how different individuals experience and make use of their physical environments as pedestrians.

This research was specifically conducted in two contrasting neighbourhoods within Toronto to explore the differences in objective and perceived walkability for seniors. This study was adapted from a similar Australian study, where the researchers investigated how local residents perceived attributes of their neighbourhoods that were objectively different based on GIS analysis (Leslie E. , et al., 2005). The fundamental difference between the research conducted by Leslie et al. (2005) and this particular study was that they had recruited participants between 33 to 40 years of age, indicating focus on a more active and mobile age group. This research, on the other hand, emphasized perceptions of walkability amongst seniors 65 years and older to assess age-friendliness in select Toronto neighbourhoods. This approach addressed a gap in research as few studies have thoroughly assessed subjectivity in physical environments and linked such perceptual data to more widely-noted objective data (Andrews, Hall, Evans, & Colls, 2012; Leslie, et al., 2005; van Lenthe & Kamphuis, 2011).

CHAPTER 3 | RESEARCH DESIGN AND METHODOLOGY

CHAPTER 3.1 | INTRODUCTION

This study aimed to address the following question: *What is the relationship between perceived and objectively measured walkability in two contrasting neighbourhoods for older adult populations?* The objectives of the study were to: i) comprehensively understand walking experiences unique to seniors of varying mobility levels; ii) investigate the physical and social characteristics of the built environment perceived by seniors to stimulate or encumber walking; and iii) study the relationship between objectively and subjectively measured walkable characteristics of the built environment for seniors. To do so, a mixed methods approach was necessary and encompassed walkability audits, surveys, focus groups, go-along interviews, as well as traditional "sit-down" interviews (Carpiano, 2009) where go-along interviews were not possible. These methods collectively met the following research objectives:

i. *Understand the objective walkability characteristics in two neighbourhoods of contrasting physical properties;*
ii. *Understand the perceived ecological factors that hinder and facilitate walkability for seniors;*
iii. *Uncover the relationship between perceptual and objective walkability through multiple cross-analyses within and between neighbourhoods.*

Two neighbourhoods within the City of Toronto, Wychwood and Edenbridge-Humber Valley, were selected as nested case study areas based on physical characteristics objectively measured to be of contrasting walking environments. Qualitative investigation methods were employed to obtain perceptual data from participants for a detailed understanding of how seniors identified and interacted with their immediate physical and social environments. Experiences were linked

to their mobility levels, walking behaviour, and perspectives on health. The differences between the findings of objective and subjective assessments proved the undervalued use of perceptual data to measure walkability.

Each neighbourhood was evaluated objectively using a walkability audit designed for seniors. The audits, using SWEAT-R, were performed without any pre-existing knowledge or experiences of either neighbourhood. Once participants were successfully recruited from various retirement homes within Wychwood and Edenbridge-Humber Valley, they completed short socio-demographic surveys to provide important background information relating to age, sex, and self-reported health levels. A total of twenty-eight participants then took part in either a focus group or go-along interview and were permitted to complete a traditional interview if they were uncomfortable with the go-along interview format. Of the twenty-eight total participants, eighteen joined in on small focus groups ranging from three to six participants and ten took part in interviews. Of these interviews, three were performed using an individual go-along format, three were individual traditional sit-down interviews, and two were dyadic traditional sit-down interviews. The reasons provided by participants who chose to do traditional interviews in lieu of go-along interviews were cold weather, rain, and poor physical health. One participant, Charles, could have conducted a go-along interview but preferred to do a sit-down interview alongside his wife, Gladys, who did not feel physically well enough to walk outdoors that day. A total of twenty-eight participants were recruited and interviewed, at which point saturation in the data was reached. Saturation became apparent when environmental characteristics identified as stimulants and deterrents of walking were recurring and no new information was raised (Patton, 2015). Coding of the transcribed dialogues subsequently commenced, utilizing an adapted

grounded theory approach by Charmaz (2014). Analysis of the objective and subjective walkability data occurred through constant comparisons between the two sets of data and neighbourhoods. Tables were created to depict the positive (stimulating) and negative (deterring) characteristics highlighted by participants to influence their experiences with neighbourhood walkability. Similar tables were generated for SWEAT-R results to permit comparisons between neighbourhoods as well as between the two differing approaches to measuring walkability. Concept maps were additionally used to assist in axial coding to form connections within research findings. Rigour was ensured in all stages of research through various techniques, as discussed in Chapter 3.6. This chapter describes in further detail the steps undertaken for the study that has been briefly outlined here.

Chapter 3.2 | Research Setting

Toronto intends to be recognized as an age-friendly community and the city's Seniors Strategy was launched in 2011 to support that goal (City of Toronto, 2013). Recommendations that are within the city's jurisdiction to plan, manage, and deliver align with each of the eight domains of the age-friendly community framework (City of Toronto, 2013). The strategy additionally emphasizes a sustainable process and articulates four basic principles for age-friendly planning that are embedded throughout each of the recommendations: equity, inclusion, respect, and quality of life (City of Toronto, 2013). All short-term actions had been recommended to City Council to commence in 2013, and medium-term initiatives began in 2014 (City of Toronto, 2013). Currently, Toronto is still working towards age-friendliness.

The first wave of Toronto's Baby Boomers turned 65 years of age in 2011 and now represent 19% of the city's total population (City of Toronto, 2012). Toronto will continue to experience surges in the senior population in coming years, as the two fastest growing age groups were 60 to 64 years as well as 85 years and older between 2006 and 2011. Current projections estimate the senior population to increase by 33% from 2011 to 2031 (City of Toronto, 2012). A large portion of the city's total population is represented by older adults at 13.2%, as of 2013 (Statistics Canada, 2014). According to population projections prepared by the City Planning division of Toronto, growth seen in the senior population to date has surpassed expectations (City of Toronto, 2013). Proactive planning for the aging population has thus become a priority area for the city (City of Toronto, 2013); it is necessary for the city to create physical and social environments that encourage mobility for comfortable travel and positive community support. Built environments at the neighbourhood level must be assessed in order to ensure their environments are able to accommodate growing population numbers, particularly in terms of walkability for seniors of the current as well as future generations.

While age-friendly planning initiatives are fairly new for the city, smart growth principles and complete street designs have already been widely acknowledged by planning and public health experts through research and case studies. They have been incorporated into plans at different levels of government across Canada. The Provincial Grow Plan and the City of Toronto's Official Plan, for instance, encourage high density developments in terms of population and proximity in order to support utilitarian walking (City of Toronto, 2015; Ontario Ministry of Public Infrastructure Renewal, 2006). The city had developed its first Accessibility Plan in 2003 under Ontario with Disabilities Act of 2001, prior to the establishment of the AODA in 2005. The Plan

highlighted various strategies to improve accessibility for individuals with disabilities by 2008, however, these initiatives are still underway (City of Toronto, 2008). Toronto's Pedestrian Charter recognizes people of all ages and mobility levels, whether travelling by foot or by mobility devices (City of Toronto, 2002). Different travel needs must therefore be accommodated by the urban environment in order to allow for safe, convenient, and direct movement from one destination to the next.

Toronto consists of one hundred and forty neighbourhoods, each with unique urban forms and so it is evident ranging walkability levels would exist across the city (City of Toronto, 2009). All one hundred and forty Toronto neighbourhoods underwent a selection criteria to qualify as a participating case study neighbourhood for objective and subjective assessments. This process is described further in Chapter 3.3.2.b.

CHAPTER 3.3 | RESEARCH DESIGN

Qualitative research is ideal for researchers interested in investigating beyond previously-identified variables that are statistically-linked to specific outcomes so that they may understand the contexts in which they occur (Curry, Nembhard, & Bradley, 2009). Yin (2011) considers five distinct but inter-related features of qualitative research to define the research approach:

1) *Studying the meaning of people's lives, under real-world conditions;*
2) *Representing the views and perspectives of the people (participants) in a study;*
3) *Covering the contextual conditions within which people live;*
4) *Contributing insight or emerging concepts that may help to explain human social behaviour;*
5) *Striving to use multiple sources of evidence rather than relying on a single source alone.*

The design and processes of this study contains all four of these elements pertinent to qualitative research that Yin (2011) has highlighted. Specifically in terms of walkability research, the adoption of qualitative research methods is essential to comprehend the dynamic embodied movements and lived experiences of individuals with different abilities (Andrews, Hall, Evans, & Colls, 2012). Thus, as Dingwall and colleagues (1998) so eloquently prescribed, "qualitative research requires real skill, a combination of thought and practice and not a little patience." Qualitative research requires more than the reporting of numbers and data after collection.

Qualitative research is correctly completed and most effective when a concept or phenomenon is explained with relevant context (Creswell, 2014). This particular study on senior walkability comparing the use of objective and subjective measures assumed an exploratory standpoint as the relative efficacy of the measures were investigated. The preconceived notion behind the research question was that subjective measures would garner a more in-depth understanding of the complex and dynamic nature of how walkability is perceived by seniors. Deductive reasoning was anticipated in the analysis phase of this research, as participant observations and statements would be utilized to prove that theory. As with the nature of qualitative research, however, the process rarely unfolds according to plan (Yin, 2011). New, unsuspected information and themes arose as the research process progressed. Referring to Yin's (2011) fourth criterion of qualitative research, qualitative research is not merely used to chronicle everyday life or a phenomenon, but to explain events through pre-conceived or emerging concepts (Yin, 2011). Rather than merely reporting study findings without analysis and interpretation, the new and unanticipated information was interpreted through grounded theory and inductive reasoning. Participant experiences and observations were used to assist in the

research in terms of descriptive and explanatory insight by explaining the psychosocial and social processes behind walking behaviour as an outcome of perceived walkability.

CHAPTER 3.3.1 | EPISTEMOLOGY

Research and inquiry are guided by a set of beliefs. These beliefs, also known as ontologies (Crotty, 1998), paradigms (Lincoln & Guba, 2000), or worldviews (Creswell, 2014), refer to an individual's beliefs about the nature of reality; it determines how a researcher knows what he/she knows and influences the practice of research (Creswell, 2014). It is the researcher's perspective of the world and nature of research that he/she is inclined to, referring to: what is true? What exists? What is real? Worldviews may be shaped by individual discipline areas, personal experiences, as well as cultural backgrounds. These beliefs held by the researcher shape inclinations towards quantitative or qualitative methods of research (Creswell, 2014); our individual beliefs of the nature of reality determine what can be known about it.

This research, though mixed-methods, is informed by a social constructivist worldview. Social constructivists believe individuals possess an understanding of the world in which they live and work, thereby developing subjective meanings towards specific objects or phenomena based on unique experiences (Creswell, 2014). Meanings are not imprinted upon individuals, but formed through interactions with others as well as cultural and historical norms that had occurred in individual lives (Creswell, 2014). These constructed meanings vary between individuals and are complex in nature, leading researchers to seek to understand their dynamic views through investigation (Berger & Luckmann, 1966). Thus, the goal of social constructivist research is to utilize and rely on participant observations of a phenomena under study as much as possible to determine causal effects. Questions prepared for research guided by social

constructivism are open-ended and depend on participant interpretations of their meanings so that researchers may understand how the participants operate in their life settings (Creswell, 2014). Researchers aim to study the meanings others share of the world and inductively generate theories to illustrate their findings (Creswell, 2014).

The ecological model, presented within Chapter 2.2.1 by Figure 1, is an appropriate framework for research regarding age-friendly communities and senior walkability. The model is able to account for the individual unique perspectives of seniors, the various impediments and supports found within their neighbourhood environments, as well as the complex social connections within them. This particular study utilized the ecological model to steer its research design as well as analysis; seniors are considered to be embedded within their communities and wider neighbourhood variables. As a result, this approach intends to attain a holistic interpretation of aging and walkability within a community context.

Social constructivist researchers understand their personal backgrounds can influence interactions with participants as well as the interpretations of study findings and subsequent analysis (Creswell, 2014). This study was formed out of personal curiosity regarding how senior citizens living in urban areas might perceive their communities and surrounding environments differently from the general population. They were once an often forgotten age group and overlooked due to the unethical view of them nearing their end of life. As an advocate for health and social equity, however, this perspective was unsettling and demanded action in the form of research. Thus, personal interests in how communities can be improved for senior quality of life and prolonged independence prompted the emergence of this study.

CHAPTER 3.3.2 | METHODOLOGY

A mixed-methods approach was taken for this research; walkability audits, socio-demographic surveys, focus groups, go-along interviews, and traditional interviews were conducted with senior participants to determine the relationship between objective and perceived walkability. Quantitative data was extracted from findings of existing studies as well as evaluations of walkability in both neighbourhoods using audits. This approach to inquiry combines both quantitative and qualitative practices of research, resulting in the mixed methods design in which quantitative and qualitative findings were used to explain one another (Creswell & Plano-Clark, 2006). In doing so, cause and effect relationships become identifiable (Curry, Nembhard, & Bradley, 2009).

The use and value of mixed-methods approaches to research in health (Curry, Nembhard, & Bradley, 2009) and planning (Montemurro, et al., 2011) are becoming increasingly recognized as they study objective characteristics and realities of research topic areas (Maxwell & Mittapalli, 2008). The pairing of both forms of investigation can help achieve the corroborating of findings, the generation of more holistic data (Creswell & Plano-Clark, 2006), and use of results from one method to enhance the observations from another (Curry, Nembhard, & Bradley, 2009). Additionally, it aimed to better understand the relative benefits to objective and subjective measures of walkability based on their respective findings. Data was gathered sequentially with the quantitative, or objective, measures of walkability conducted prior to the qualitative, or subjective, measures (Creswell & Plano-Clark, 2006). A basis of relative neighbourhood walkability levels and familiarity of both areas were consequently established.

This research emphasized the value of qualitative investigation methods to investigate walkability, a subject typically dominated by quantitative, objective assessments (Andrews, Hall, Evans, & Colls, 2012; Beard, et al., 2009; Frank, et al., 2010; Frank, Saelend, Powell, & Chapman, 2007; Giles-Corti, et al., 2011; Kerr, Rosenberg, & Frank, 2012; Leslie, et al., 2005). Qualitative research tend to emphasize descriptive details in the data collected, explaining a phenomenon and forming contextual understandings of complex social behaviour (Bryman, Bell, & Teevan, 2012), a valuable element often missed in quantitative research. This particular study intended to bridge that gap by incorporating both methods of data collection into a case study; walkability audits, surveys, focus groups, and go-along interviews are used.

Scripts for the focus groups, interviews, and surveys were developed using select questions adapted from the Age-Friendly City Question Database (Lewis, Groulx, & Ducak, 2013), where items most relevant to neighbourhood walkability and well-being were selected. This database consisted of questions and criteria used to measure various elements of age-friendliness utilized by different institutions and cities, including the World Health Organization, American Association of Retired Persons, and City of Hamilton.

Chapter 3.3.2.a | Stages of Research

This study occurred over two years, beginning with preliminary research and planning to form the research question, objectives, and design. Details of the stages of research beginning with neighbourhood selection and ending in data analysis are presented in Table 2.

Table 2: Stages of Research and Time Frame

Stage	Process	Time Frame
1	Neighbourhood Selection	April 2015
2	Contact Retirement Homes	September 2015 to November 2015
3	Objective Assessment (walkability audits)	October 2015 to November 2015
4	Subjective Assessments (focus groups, go-along interviews, and traditional interviews)	October 2015 to January 2016
5	Data Analysis	January 2016 to May 2016

Chapter 3.3.2.b | Neighbourhood Selection Process

To qualify as a participating neighbourhood in this study, the first criterion for all prospective neighbourhoods was to possess high senior populations as a percentage of the total population in the area. The preliminary identification of these neighbourhoods was performed by using a choropleth map developed by the Toronto Community Health Profiles Partnership, included in Appendix A (Toronto Community Health Profiles Partnership, 2013). A list of contending neighbourhoods for the study was subsequently generated, as indicated in Appendix B. The second criterion for neighbourhood selection was to determine the walkability of each neighbourhood using Walk Score. Thus, similar to the study conducted by Leslie, et al. (2005), two neighbourhoods were chosen to represent objectively different land-use mix, street connectivity, and residential density. Appendix C displays the list of neighbourhoods with their corresponding Walk Scores, rearranged in order of lowest to highest walkability.

Two neighbourhoods were selected for the study based on the aforementioned selection criteria. Wychwood was chosen to represent high walkability and Edenbridge - Humber Valley was representative of low walkability. Their respective walkability levels corresponded to

neighbourhood infrastructure studies conducted by the Institute for Clinical Evaluative Sciences in Toronto (2007), thereby validating Walk Score ratings. A map indicating their location within the City and relative to one another is presented in Appendix D. Neighbourhood profiles, in addition to the objective and perceived physical and social characteristics of both neighbourhoods are discussed in further detail in Chapter Four.

Chapter 3.3.2.c | Walkability Audit: SWEAT-R

Audits are effective tools used to conduct a finer assessment of walkability within a specific area. Neighbourhoods exhibit different physical-spatial features and so walkability audits are able to pinpoint areas to improve (Joseph & Zimring, 2007). The Senior Walking Environmental Audit Tool – Revised (SWEAT-R) has been widely used by researchers and municipalities as it is designed specifically to evaluate senior walkability (Cunningham, Michael, Farquhar, & Lapidus, 2005). SWEAT incorporates elements of the physical environment that are particularly pertinent for older adults, including the legibility of signage, presence of places to sit and rest, as well as the width and safety of walking paths (Cunningham, Michael, Farquhar, & Lapidus, 2005). These audits will complement the Walk Score ratings used to determine the nested case study neighbourhoods, in addition to adding a greater amount of detail regarding physical attributes of each neighbourhood which Walk Score is not able to sufficiently provide.

The SWEAT-R tool was conducted multiple times at different times and on different days to ensure variability in weather conditions as well as human and vehicular traffic were accounted for in the data analysis. This was necessary as cities, such as Toronto, that experience variable weather can render walking unfeasible and especially risky for seniors at different times (Stahl, Carlsson, Hovbrandt, & Iwarsson, 2008). Conducting the audits allowed for an intimate

understanding of the physical and social attributes of both neighbourhoods through personal experience, prior to interacting with participants. References of specific neighbourhood areas made by participants were then immediately understood and more effective probing questions were able to be developed.

Wychwood and Edenbridge-Humber Valley were both assessed using the SWEAT-R tool to objectively identify the physical neighbourhood characteristics that contribute and take away from walkability. The audits were conducted on different days and times in October and November 2015 to ensure a comprehensive assessment and authentic experience of the neighbourhood. Chapter 4.3 corresponds with the tool's assessment categories as the findings of the audits are discussed. Before and after the objective descriptions of each neighbourhood, general observations of each are discussed as part of SWEAT-R's Secondary Observation to be conducted pre- and post-audit.

Activity spaces for seniors are typically reduced to 500 metres (Negron-Poblete, Séguin, & Apparicio, 2014). For this reason, segments assessed as part of the SWEAT-R tool fell within 500 metres and 1000 metres of the two retirement homes within each neighbourhood. The larger 1000 metres buffer zone was included to assess street segments walked by the more mobile senior participants. In accordance with instructions provided in the SWEAT-R Training Manual attained from Dr. Yvonne Michael, co-creator of the tool, one street segment was selected and evaluated for every four neighbourhood blocks. The segments were randomly sampled to ensure variability in the physical characteristics encountered. Maps showing the segments evaluated in both neighbourhoods, along with tables outlining street IDs and names are presented in Appendix E and F, respectively.

Chapter 3.3.2.d | Surveys

A short paper survey consisting of twenty questions was administered to each participant to be completed prior to commencing focus groups or interviews. The survey enquired into socio-demographic information as well as perceived health statuses and built environment characteristics related to walkability. The survey included a mixture of closed and open-ended questions; the closed-ended questions allowed for some of the data to be quantified and the open-ended questions enabled participants to provide more diverse answers that may not have been addressed in other survey questions (Bryman, Bell, & Teevan, 2012). Responses to each question intended to supplement each participant with contextual information, allowing for a more holistic understanding of the discussion they provide during their focus group session or go-along interview. Surveys were paired with detachable health information sheets relative to the neighbourhoods. These were intended to provide participants with contact information of health agencies at various levels of care should they feel in need of assistance. The survey distributed to participants in both neighbourhoods is presented in Appendix G.

Chapter 3.3.2.e | Focus Groups

The focus groups were effective in stimulating thoughtful discussions regarding personal experiences of the neighbourhood and uncovering different interpretations of the built and social characteristics perceived to influence walkability. For this reason, a focus group was a particularly effective way to compel individual reflection on mundane daily events that are often overlooked (Bryman, Bell, & Teevan, 2012). As Edmunds (2000) posits, focus groups are especially useful in collecting information from one study and comparing them across groups

from within the same research study in order to study patterns and assess participant interactions.

This research encompassed four focus groups; one focus group in each retirement home was organized. The participants within each group were of varying ages and mobility levels to encourage discussion on how these variances influenced their perceptions of their neighbourhood and walkability. They were asked for their thoughts on the objective physical and social characteristics often seen in studies to either improve or hinder walkability. All focus groups were audio-recorded and were later transcribed verbatim for analysis. Durations ranged between 33 minutes and 86 minutes in length. Following recommendations from various sources and depending on levels of interest to participate, each consisting between three and six senior participants to allow for adequate time for each participant to contribute in discussions (Krueger & Casey, 2000; Palys & Atchison, 2014); focus groups that were shorter in duration possessed fewer participants. It was difficult to find and schedule a large group of seniors to meet during a specific time and day, due to their conflicting and busy schedules. Amongst those who were unsuccessfully recruited, reasons varied but were primarily due to lack of time and interest in taking part in research. Multiple visits to each retirement home and personal attempts were made to recruit. The members of three focus groups were recruited by gatekeepers and only one was personally organized. It was less challenging to recruit seniors to participate in the focus groups than for the go-along and traditional interviews. One potential reason may be that the seniors feel more comfortable knowing there were other residents of the home participating; the study and interaction with a stranger was thus less ominous.

All focus group participants were members of exercise classes within their respective homes and possessed varying levels of mobility; there were participants who relied heavily on mobility aids as well as participants who required no assistance at all. These participants regularly attended the exercise classes held within their homes on a weekly basis and many were either acquainted with one another or good friends. Familiarity amongst the focus group members enhanced feelings of comfort amongst the participants and formed a more open atmosphere to share personal experiences and exchange opinions (Asanin & Wilson, 2008). Participants may not have discussed topics relating to walkability before, but it was very possible that they did so indirectly by discussing their walking experiences and preferences. One risk associated with focus groups is that members may be influenced by the more dominant, vocal members of their groups (Palys & Atchison, 2014). This risk was diminished by ensuring all members were given the opportunity to vocalize their opinions by prompting all participants to share their experiences and observations. Particular attention was paid to those who appeared more introverted and were quieter during the group discussions. The focus group script is provided in Appendix H.

Chapter 3.3.2.f | Go-Along Interviews

The go-along method is an in-depth interview where the researcher is physically "walked through" the personal lived experiences of a particular place. It is a unique combination of fieldwork and participant observation supplemented with in-depth interviewing; interviews in a "conversational-style" are performed in situ as a guided tour of the participant's neighbourhood is given (Carpiano, 2009; Kusenbach, 2003). This form of interviewing attaches layers of context through narrative and observation. "Macro-contexts" can include socio-cultural background

information that pertain to a particular place or individual. “Micro-contexts” assist in describing the immediate setting of a particular phenomenon under observation. Finally, there is “the object” of study itself (Blommaert & Jie, 2010). The hierarchy of contexts provide greater insight into “the object” under observation, the characteristics it displays, and how the macro- and micro-level contexts influence it. In sum, the go-along method is able to present contextual insights that are typically attained through traditional long-term ethnography within a short period of time (Carpiano, 2009). It has proven to be especially effective in qualitatively studying built environments by incorporating individual experiences into the data (Carpiano, 2009), thus making this method more effective than using photographs or videos of a particular location as substitute (Kusenbach, 2003). It is possible for the participant and researcher to discover new topic areas during the go-along process as immediate visual vues are able to stimulate thought and memories of specific experiences (Eisenberg, Garcia, Frerich, Lechner, & Lust, 2012).

Go-along interviews were the intended method for this study. However, due to the season in which this research was conducted, many participants did not wish to leave their homes and encounter cold weather conditions. At these times, there had been either light rain or snow, strong winds, or cold weather. These weather conditions were described by four participants as unfavourable and unpleasant circumstances for walking outdoors, thereby resulting in them opting for traditional interviews. Two of these four participants and one other participant additionally described a lack of physical strength and fatigue on that particular day; they did not wish to expend themselves with a walk outside. Two participants also believed they did not have adequate time in their busy schedules to fit in a go-along interview, which they perceived to be a lengthy process. It was additionally observed and speculated that many of the

participants did not wish to be part of a go-along interview with a stranger. Although effort was made to present an amicable and honest demeanor, many seniors most likely had reservations with spending time away from their retirement homes with someone they were not familiar with. Having a gatekeeper or other staff member accompany the go-along interview was considered, but they were unable to take time away from their work to assist.

A study emphasizing phenomonological data and analysis would seek thick descriptions of place (Creswell, 2014) and would adhere to the intended go-along format. To reflect the flexible nature of qualitative research (Yin, 2011), the participants were accommodated and the go-along interviews became indoor traditional "sit-down" interviews (Carpiano, 2009) using the go-along interview script. The original research schedule was therefore not altered to remove go-along interviews but was converted to accommodate traditional in situ interviews. Permitting flexibility in the research design is reflective and permissive of the dynamic variables present in reality (Maxwell & Mittapalli, 2008); thought processes and perceptions of walkability that result from shifting environmental circumstances are erratic, influencing the choice to walk. Moreover, the flexibility and accommodation exhibited permitted more insight from participants on hindrances to outdoor walking pertaining to weather, personal health, and motivation.

The traditional interviews were successfully able to gather detailed recounts of walking experiences and observations of the neighbourhood environments from each participant. The information attained through traditional interviews were in fact consistent with data collected through go-along interviews, though with the loss of participant observation and in-place experience for the researcher and participant. This is described further in Chapter 5.1.2.b. Go-along interviews took place in November 2015 and interviews occurred between November

2015 and January 2016. A total of three go-along interviews with individual participants and five interviews were conducted. Three of the interviews were with individual participants and two were dyadic. A best attempt was made to ensure rigour and consistency across the interview settings and questions between the individuals and pairs of individuals questioned. All participants were questioned using the same interview script, presented in Appendix I. Each go-along interview and traditional interview was audio-recorded and followed a semi-structured format with a script of prepared questions. The questions encouraged participants to speak of their immediate physical and social surroundings and share personal stories of any experiences with walking in their relative areas. These in-depth dialogues with each participant allowed for a deeper understanding of the various environmental impediments and facilitators to walking that were observed. To ensure findings were comparable and to enhance credibility, participants were repeatedly requested to elaborate on their statements for fuller descriptions. Such interview prompts are described in further detail in Chapter 3.6.1. In doing so, this study limited the amount of fragmented subjective data gathered. Moreover, performing the walkability audits in both neighbourhoods prior to initiating any dialogies with participants enhanced familiarity with the neighbourhoods. Almost all neighbourhood areas and characteristics were recognized when described and when they became unfamiliar, participants were requested to elaborate for identification later on. Details regarding the efficacy of subjective measures of walkability are provided in Chapter 5.1.2.

Chapter 3.3.2.g | Research Ethics

All procedures complied with the University of Waterloo's Statement on Human Research and Office of Research Ethics Guidelines and Policies, along with the Ethical Conduct for

Research Involving Humans as mandated by the Tri-Council Policy Statement (TCPS2). All interactions with the participants respected guidelines stipulated by the retirement homes of the study. In sum, all procedures were safe for participants and any potential risk of harm were minimized. The anonymity of all participating seniors was ensured through coding to eliminate the risk of identification; pseudonyms were assigned to each participant and utilized in any description throughout this research.

All participants of the study were provided with an official letter of information and an informed consent form signed prior to the commencement of the data collection process. Combined, the purpose of the letter and form was to clarify: the intent of the study; the constituents of the research design; the length of time necessary for full participation; how the gathered data will be utilized; and their rights as participants of the study. Informed consent was provided voluntarily by all participants and they were provided with their own copy for reference. Though there was minimal exposure to psychological and/or physical harm, the possibility of discomfort and over-exertion was acknowledged and participants were cognisant of their right to withdraw from the study at any point in time sans repercussions from the researcher or university. They were informed that their personal information would not be disclosed to the university or public; their identities would remain anonymous and all relevant data would be destroyed once the study was complete.

Chapter 3.4 | Participants and Data Collection

A range of definitions exist across agencies and government organizations for the term "senior". For instance, both Statistics Canada and the Public Health Agency of Canada (PHAC)

indicate senior age begins at 65 years of age (Public Health Agency of Canada, 2010; Statistics Canada, 2007), while the World Health Organization defined a senior to be 60 years of age or older (World Health Organization, 2007). Toronto's Seniors Strategy, however, acknowledged that a strict definition can be stigmatizing (City of Toronto, 2013). While it may be true that an individual is seen to be a senior when they reach 60 years of age, an individual that is chronologically older can still be more independent and active. The data that was used in the formation of Toronto's Seniors Strategy involves individuals as young as 55 years of age and older to create a broad overview of the city's diverse demographic for older adults (City of Toronto, 2013). For the purpose of this research, however, participants were to be 65 years of age or older, following the Statistics Canada and PHAC definitions. The age of participants then aligned with data used in the selection of neighbourhoods.

A total of twenty-eight participants were recruited from four retirement homes in Wychwood and Edenbridge-Humber Valley through a combination of snowball and convenience sampling. Recruitment was initiated through discussions with Executive Directors of pre-selected retirement homes via e-mail. The e-mail script is provided in Appendix J. The Executive Directors then appointed staff members, often holding positions that are variants of a Recreational Program Manager, to serve as the primary gatekeeper to the residents. Snowball sampling occurred when the gatekeepers assisted in recruiting senior residents that he or she was personally familiar with. Often, these were frequent participants of exercise classes. A total of twenty-five participants were recruited through gatekeepers; the number of residents unsuccessfully approached for recruitment by the gatekeepers in each home is unknown. Gatekeepers were available and assisted with recruitment within all four retirement homes,

though not consistently present during all visits and attempts to recruit. In only one of the four retirement homes, a gatekeeper was available to help recruit and schedule interactions with all participants within that home from the begining. In the other three retirement homes, several visits to each home were personally made in attempt to contact potential gatekeepers and recruit participants before gatekeepers became available. Personal attempts to recruit were largely unsuccessful. Residents lounging and relaxing in the dining halls, libraries, and general common areas were approached in a friendly manner and conversations were struck prior to inquiring about participation. A large number of the seniors that were approached did not want to be part of the study and were unable to be encouraged to participate. The following were additional reasons why residents did not wish to partake in the research:

- Lack of interest in participating in a research study
- Scheduling conflicts with other recreational activities in the retirement home
- Did not wish to socialize or be bothered
- Perceived “research” to be far too difficult and cumbersome
- Believed he/she lacked knowledge on the subject matter

It was additionally observed that a number of residents appeared wary of being approached by an unfamiliar individual. Perhaps for fear of their personal safety and interacting with a stranger, these residents objected to taking part in the research altogether. A significant number of seniors hesitated at the term “research”, as well, and were reluctant to participate as the process was perceived to be too difficult despite the simplification of the processes provided to them. A total of three participants were personally recruited through convenience sampling from two retirement homes during three different visits. Approximately forty senior residents across all four retirement homes were approached and unsuccessfully recruited during several different

visits. It is also important to note that four participants of focus groups requested to leave early, prior to the end of the focus group discussions. These participants stated they had other scheduled events to attend or were worried they would miss lunch in the dining halls. It is speculated that two of participants may have also lost interest in the research process or subject matter part way through their focus groups. There were no criteria for eligibility and seniors with varying levels of abilities were encouraged to participate. Those who were interested in partaking in the research, however, had to be capable of providing informed consent after a verbal explanation of the study was received. The informed consent form is presented in Appendix K. Participants were additionally provided with a letter of information on department letterhead, shown in Appendix L.

Between November 2015 and January 2016, participants took part in either a focus group, go-along interview, or traditional interview. Focus groups and traditional interviews took place in the recreational rooms of the retirement homes, while go-along interviews occurred outdoors. Table 3 summarizes the socio-demographic and perceived health details collected from a short survey completed by participants prior to their focus groups, go-along interviews, or traditional interviews. In addition to the socio-demographic and perceived health statuses, the surveys enquired into built environment characteristics liked and disliked by the participants, discussed in further detail respective to each neighbourhood within Chapters 4.3.1 and 4.3.2.

Both neighbourhoods were represented by fourteen senior participants each, most of whom were females; twenty-five participants were females and three participants were males. The sample population was mature in age with a majority over 75 years and more than half over the age of 85 years. The largest age group included nine participants that were 90 years or older. A

Table 3: Socio-demographic and Self-Reported Health Details of Participants

	Wychwood	Edenbridge-Humber Valley	Total	% of Total
Population				
Total	14	14	28	100%
Female	14	11	25	89%
Male	0	3	3	11%
Age				
65 – 69 years	1	0	1	4%
70 – 74 years	0	0	0	0%
75 – 79 years	4	2	6	21%
80 – 84 years	3	1	4	14%
85 – 89 years	4	4	8	29%
90 + years	3	6	9	32%
Marital Status				
Married / Living with Partner	1	5	6	21%
Separated / Divorced	3	1	4	14%
Widowed	8	4	12	43%
Single / Never Married	2	1	3	11%
Country of Birth				
Canada	11	12	23	82%
Ireland	1	0	1	4%
Jamaica	2	0	2	7%
Scotland	0	1	1	4%
Slovenia	0	1	1	4%

	Wychwood	Edenbridge-Humber Valley	Total	% of Total
Duration of Residence in Canada				
0 – 9 years	1	0	1	4%
10 – 19 years	0	0	0	0%
20 – 29 years	1	0	1	4%
50 + years	7	11	18	64%
All of Life	1	0	1	4%
Duration of Residence in the City				
0 – 9 years	0	2	2	7%
10 – 19 years	1	0	1	4%
20 – 29 years	3	0	3	11%
30 – 39 years	0	0	0	0%
40– 49 years	2	3	5	18%
50 – 59 years	3	1	4	14%
60 – 69 years	0	0	0	0%
70 – 79 years	2	3	5	18%
80 – 89 years	2	0	2	7%
90 – 99 years	0	1	1	4%
All of life	1	0	1	4%
Duration of Residence in Neighbourhood				
0 – 9 years	6	4	10	36%
10 – 19 years	2	0	2	7%
20 – 29 years	0	1	1	4%
30 – 39 years	2	0	2	7%
40 – 49 years	0	1	1	4%
50 – 59 years	1	0	1	4%
60 – 69 years	0	1	1	4%
70 – 79 years	0	0	0	0
80- 89 years	0	1	1	4%

significant portion of the seniors originated from Canada, with only five having immigrated from foreign countries. All fourteen of the participants from the Wychwood neighbourhood were women. They were relatively evenly distributed across the age categories, with most falling between 75 years to 90 years or older and the youngest being 65 to 69 years of age. Most of the seniors had lived in the neighbourhood for under 10 years, with the longest being up to 59 years. Of the fourteen participants recruited from Edenbridge-Humber Valley neighbourhood, eleven were women and three were men. The participants from this neighbourhood were older than that of Wychwood, with six participants falling under the age category of 90 years or older. The youngest recruited in this neighbourhood fell under the age category of 75 to 79 years. Most had lived in this neighbourhood for under 10 years, with the longest being up to 89 years.

Chapter 3.5 | Data Analysis

A grounded theory approach was used in the data analysis, as is typical of qualitative research (Bryman, Bell, & Teevan, 2012; Creswell, 2014). The findings and potential theories were grounded in the empirical data as opposed to pre-existing speculations (Charmaz, 2014; Strauss & Corbin, 1998). Data was collected iteratively; data collection and its analysis occured simultaneously, allowing for the formation of new questions based on new information for subsequent probing questions (Bryman, Bell, & Teevan, 2012). A total of twenty-eight participants were recruited; the study encompassed four focus groups, three go-along interviews, and five traditional interviews at which point it was decided data saturation had been achieved with no new themes emerging from discussions. All focus groups, go-along interviews, and traditional interviews were audio-recorded and personally transcribed verbatim. Data analysis commenced upon completion of transcription.

Familiarity with the dataset was enhanced through several readings of each transcript prior to coding, as suggested by Creswell (2014) and Palys and Atchison (2014). At this point, personal memos were noted where reflections of participant discourses were made and notable statements were highlighted for future reference. The twelve transcripts were then assessed line by line for initial coding, following an adapted guide for constructing grounded theory proposed by Charmaz (2014). Initial coding requires the researcher to stick closely to the data and to code in actions as opposed to applying pre-existing categories. Actions reduces the tendencies of coding for types of people, increasing the potential for bias as it puts focus on individuals rather than what is happening in the data (Charmaz, 2014). Following initial coding, focused coding occurred to sift through and organize the initial codes to determine the most salient codes with relevance to research objectives and the overall data set. Significant categories were identified in accordance to research objectives as well as those mentioned frequently across participants. The focused codes, along with their respective categories, were organized into the table format shown in Table 4 to aid the axial coding process. Attention was also paid to themes of lesser

Table 4: Template of the Table Utilised to Organize Codes

	Positive				Negative			
	Category	Codes	Quotes	Frequency	Category	Codes	Quotes	Frequency
Physical								
Social								
Home								
Personal								

frequency or those that deviated from predominant themes but were identified to be important to some participants (Mays & Pope, 2000). The frequency counts shown in Table 4 aided in

highlighting less prevalent topic areas. Axial coding occurred as a last step to draw connections between the initial and focused codes for walking behaviour. The result of axial coding can be seen in the concept maps in Appendix M. Once coded, the objective and subjective data underwent multiple cross analyses within and between neighbourhoods. The results were compared against key findings from notable studies with the ecological and walking behaviour models in mind.

The findings of all dialogue exchanged with participants were additionally organized and presented in the form of concept maps. These are web-like illustrations that show the main themes derived from data collection and help develop connections between the implicit and explicit meanings of participant discourse (Attride-Stirling, 2001). Three concept maps were developed from research findings. The first two illustrate the deterrents and stimulants of walking, both encompassing elements of the built and social environment, as well as personal circumstances and home environments. The third is a summative network that illustrates the relationship between perceived walkabiltiy and walking behaviour. Their structures run parallel to the three basic constituents of grounded theory: concepts, categories, and propositions (Strauss & Corbin, 1998). These maps can be found in Figures 50 and 51 of Appendix M.

Pressure is often placed upon qualitative researchers to quantify their findings for validity. In qualitative research, however, emphasis is not placed on discrete counts of frequencies in which themes appear across data sets but on the underlying meanings of participant observations (Pyett, 2003). It is difficult in qualitative research to accurately determine the number of participants who share the same perspecive on an issue for the number to be validated. Nevertheless, a loose quantifying approach was still taken when

discussing the prevalence of themes in this particular research (i.e. a number of participants expressed…most participants posited that…). Participants were requested to confirm their statements using their own words and in re-phrased ways. Similarly, participants who nodded in agreeance to statements made by others were asked to confirm that they indeed agree to what was said. It is important to note that efforts were still made to rely more on the underlying meanings of participant statements than on frequency counts, as "the rationale for conducting in-depth interviews is that people involved in a phenomenon may have insights that would not otherwise be available to the researcher, and it is the quality of the insight that is important, rather than the number of respondents that share it" (Wainright, 1997, p.11).

SWEAT-R was conducted for Wychwood and Edenbridge-Humber Valley with pen and paper. A clipboard, camera, digital timer, measuring tape, as well as maps of both neighbourhoods were additionally brought into the field, as required by SWEAT-R. Audit results were quantifiable by counting the occurrences of specific physical attributes in both neighbourhoods. This allowed for direct comparisons between functionality, aesthetics, traffic, and destinations, the broad topic areas covered by SWEAT-R questions. Constant comparisons were made by going back and forth between street segments within and between neighbourhoods to determine the objective walkability of Wychwood and Edenbridge-Humber Valley. The purpose of the audit results was to allow comparisons to be made with subjective findings to determine the relationship between the two forms of walkability measures.

Chapter 3.6 | Ensuring Rigour in Qualitative Research

The quality of research and validity of findings are dependent on various steps taken to ensure rigour throughout the data collection and analysis processes. In quantitative research, rigour is ensured by meeting the following criteria: validity, generalizability, reliability, and objectivity (Pyett, 2003; Shenton, 2004). These are analogous to the criteria for qualitative research: credibility, transferability, dependability, and confirmability, respectively (Shenton, 2004). The concept of validity in qualitative research are contested, evident in the several different yet similar approaches to ensuring rigour across literature (Baxter & Eyles, 1996; Creswell, 2014; Lincoln & Guba, 1985; Mays & Pope, 2000).

Adapted from the work of Lincoln and Guba (1985), Baxter & Eyles (1996) propose the following criteria for evaluating rigour in qualitative work: credibility, transferability, dependability, and confirmability. For this study, the adapted evaluation criteria were followed to ensure rigour in the research design, data collection, analysis, and final reporting. The mechanisms used to achieve each of the four measures are discussed below.

Chapter 3.6.1 | Credibility

Credibility is defined as the "authentic representations of experience" (Lincoln & Guba, 1985 p. 512). It is based on the connections made between the experiences attained from the participants and theoretical concepts used to interpret, simplify, and recreate them (Baxter & Eyles, 1996). Hence, credibility is assessed by how descriptions of these interpreted experiences can be relatable to those under similar circumstances and understandable to those outside of the experiences (Lincoln & Guba, 1985); that a true representation of the phenomenon is being

presented (Shenton, 2004). Since it is seen as the most important factor for ensuring trustworthiness (Lincoln & Guba, 1985), particular attention was paid to the mechanisms used to promote confidence in the interpretations.

The main method of triangulation performed to ensure credibility was method triangulation, practiced through the use of focus groups, go-along interviews, and interviews to triangulate participant experiences within and between neighbourhoods. Walkability audits were additionally used to corroborate participant perceptions of walkability. Short socio-demographic surveys were used to gather supplemental information regarding health and mobility. A second mechanism of triangulation performed in this study was the use of direct quotes from multiple participants making similar observations. This demonstrated prevalence amongst the sample population (Baxter & Eyles, 1996). Credibility was additionally ensured when the data became saturated (Mays & Pope, 2000); focus groups, go-along interviews, and interviews ceased once new themes no longer surfaced (Saumure & Given, 2008; Strauss & Corbin, 1998).

During recruitment and data collection, I was cognisant of the fact that individuals may perceive research to be overbearing and thus not wish to take part. As suggested by Shenton (2004), each senior asked to participate was given the opportunity to decline to ensure data collection would only involve those genuinely keen on participating and willing to offer information freely. They were also informed that they would be able to withdraw from the study without any repercussions. Furthermore, participants were encouraged to be honest; that no response could be right or wrong. The purpose and components of the study were fully disclosed to each participant, with emphasis placed on the fact that it was for student research with no affiliations with their retirement homes. In doing so, participants would then feel more

comfortable contributing ideas and sharing stories (Shenton, 2004), thereby encouraging uninhibited conversation and recollections of their experiences. An additional step taken during data collection to ensure credibility was developing rapport with each participant. Personal conversation with each participant took place prior to starting each focus group, go-along interview, or interview. This helped build a sense of trust, in turn allowing for more information-rich responses to interview questions (Baxter & Eyles, 1996; Shenton, 2004). Power relations and the presentation of the researcher are identified to be a critical determinants in ensuring the credibility of data (Baxter & Eyles, 1996). I had been mindful of these factors throughout the data collection process and a reflection of this "disciplined subjectivity" (Baxter & Eyles, 1996) or "bracketing" (Lincoln & Guba, 1985) is provided in Appendix N.

When questioning the participants, a form of member-checking to ensure descriptive validity (Sandelowski, 2008) of the responses occurred. This was in the form of successive probing of discussion topics as well as the re-phrasing of questions in different ways to assess variations or consistencies in responses. Statements made by participants that were unclear were also repeated back to them for verification. During a focus group, for instance, Debra was describing the greenery surrounding the retirement home and around Wychwood and she used the term "formal" to depict her perception of a new park nearby. Although I understood she implied indifference towards man-made and overly-planned greenery through her choice of words, I inquired further into the term "formal" and her general preferences for greenery to ensure my interpretations were correct:

W003: No, on the south side of the building. That new park. In the park. And it looks very formal now. And I'm sorry about the wildness gone. But they say that when plants are in it, I will like it better.

INTERVIEWER: What do you mean by formal?

W003: Bricks, laid out beds, brick walls, and brick underneath, and there's quite chaotic growth along the train tracks – the fence line, it's a part of the train tracks.

…

INTERVIEWER: You prefer natural terrain as opposed to maintained gardens and trimmed hedges - is that what you're saying?

W003: Well, I like – No, I like…plantings and hedges but I think the wildness should be kept because birds nest there. When we first moved in, my husband was in the hospital and I didn't know anyone and I went out and sat in that place there and I heard so many birds. And then I looked around I couldn't see any of them. And it was a northern mockingbird. Bird-watching is good down there.

In another focus group conducted with participants from Edenbridge-Humber Valley, the participants were asked what they believed cities could do to improve senior planning:

INTERVIEWER: What do you think can be done to make sure that your voices are heard and your concerns are met?

E018: Yes. Everybody just sit down and just listen to the seniors talk.

E020: You have to have one of those big developers with a grandmother who listens to him and yeah, that's what you need. A little committee at the bottom, forget it. But you can get to the, you know.

INTERVIEWER: Do you agree?

E019: I guess so [laughs].

E020: It doesn't happen very often.

E019: I don't think they ever listen.

Only one very vocal participant (E018) responded at first and a short silence followed. I wanted to hear responses from all members of the focus group and so I looked directly at the other two participants and asked whether they agreed with the first participants' observations. In doing so, this form of member-checking helped determine whether there would be differences in responses between several participants.

Upon completion of data collection, codes and themes were de-briefed with a co-supervisor to prevent any misconstructions, suppressions, and omissions of pertinent data (Baxter & Eyles, 1996). Moreover, negative case analysis (Baxter & Eyles, 1996), or "deviant case analysis" (Mays & Pope, 2000), was conducted to ensure full coverage of the data in the analysis. Analysis mainly focused on the most prevalent themes across the dataset and a secondary analysis occurred on the lesser occurring themes brought forth by fewer participants. Constant comparisons were consistently applied; this approach ensured breadth and depth in the data analysis and discussion.

CHAPTER 3.6.2 | TRANSFERABILITY

Transferability is defined as the degree to which interpretations "fit within contexts outside of the study situation" (Lincoln & Guba, 1985, p. 512). In qualitative research, the interpretations derived from experiences of participants are generally bound to the time, setting, and people of a particular study (Baxter & Eyles, 1996). It is typical for qualitative researchers to pay particular attention to one context in order to attain rich data of a phenomenon of interest

to discover from new perspectives, to reconstruct, describe, and to hypothesize (Creswell, 2014). To ensure the findings of this particular study are transferable, thick descriptions are provided of the case study areas and participants. Detailed recounts of the research process, including data collection, analysis, interpretation, and theory construction, are presented. In doing so, findings may be transferred to other contexts in future studies.

CHAPTER 3.6.3 | DEPENDABILITY

Dependability is the "consistency with which the same constructs may be matched with the same phenomena over space and time" (Baxter & Eyles, 1996, p. 516). It is consequently largely dependent on the thorough and accurate documentation of the research context for transferability. It is closely linked to credibility, though credibility denotes the accurate representation of participant experiences while dependability looks to the researcher-as-instrument and consistency in interpretation (Baxter & Eyles, 1996). Lincoln and Guba (1985) assert that the demonstration of credibility helps to ensure dependability. Thus, the overlapping mixed-methods approach of this study used to triangulate findings ensures dependability (Shenton, 2004). Moreover, field notes were taken of neighbourhood environments and participant interactions throughout the auditing and interview processes. All focus groups, go-along interviews, and interviews were audio-recorded. Manual verbatim transcription of the files was personally conducted not long afterwards so that observations of behaviours and comments made off-the-record were noted as memos on the transcripts. The following is a field note taken of a conversation with Mildred prior to commencing our go-along interview:

> *When asked for a general idea of where she'd take me on the walk, she gestured with her hands a wide circle and said she usually* "goes all the way

down to the train tracks and all the way up again," *making it seem like a very long walk. In reality, it was not. This shows a difference in distance perception (Personal Memo, 2015)*

The full research process was shared and deliberated with academic supervisor, Dr. Jennifer Dean, who helped ensure appropriate decisions were made. Additionally, co-supervisor Dr. Laura Johnson served as peer examiner to help validate interpretations.

CHAPTER 3.6.4| CONFIRMABILITY

Confirmability refers to the "extent to which biases, motivations, interests or perspectives of the inquirer influence interpretations" (Baxter & Eyles, 1996, p. 512). Steps must be taken to make certain all interpretations are derived from the ideas and experiences of informants, rather than the knowledge and preferences of the researcher (Shenton, 2004). To ensure confirmability, a full paper and electronic trail of the research process was preserved. Thick descriptions of mechanisms used to assure Baxter and Eyles' (1996) criteria for rigour in qualitative research are provided in this section. The descriptions additionally address each item of the evaluation checklist proposed by Rose (1982) and Lincoln and Guba (1985):

1) *What was the natural history of the research?*
2) *What data were collected and by what methods?*
3) *How was the sampling done?*
4) *How was the data analysis done?*
5) *What results were presented?*
6) *How credible and dependable are the data-construct links?*
7) *How credible is the theory/hypothesis?*
8) *How transferable are the findings?*

Moreover, a detailed journal was kept throughout the duration of this study, which kept notes on findings, concerns, interpretations, and justifications for decisions made. Within this journal includes notes made of personal factors that may have influenced research findings. An autobiography is included in Appendix N and includes a reflection disclosing relevant personal predispositions that may influence findings (Shenton, 2004).

CHAPTER 3.7 | SUMMARY

The case study of the two Toronto neighbourhoods, Edenbridge - Humber Valley and Wychwood, and its encompassing mixed methods approach provided a detailed look into the perceptions of neighbourhood walkability for older adults in contrast to objective findings. A walkability audit utilizing the tool, SWEAT-R, was conducted for both neighbourhoods to attain objective environmental characteristics. Subjective measures of walkability included focus groups, go-along interviews, and traditional interviews with participants that were recruited from retirement homes through convenient and snowball sampling. Participants did not undergo any selection criteria, however they had to be over 65 years of age. They possessed mobility levels across the spectrum to encourage discussions regarding the variances in perceived walkability as a reflection of their personal health differences. Go-along interviews and individual interviews allowed for in-depth discussions of environmental observations that contribute or take away from their walking experiences. All research processes were conducted under the research ethics standards stipulated by the University of Waterloo and research rigour was ensured through multiple methods of data collection as well as tools for rigour.

CHAPTER 4 | RESEARCH FINDINGS

CHAPTER 4.1 | INTRODUCTION

This chapter presents the results of twenty-eight surveys, which are summarized below. The purpose of the surveys was to: i) attain socio-demographic and health data as context for each participant and; ii) identify walking concerns that may be missed in the interviews and focus groups. The objective neighbourhood characteristics of both neighbourhoods, assessed using the SWEAT-R tool, are described in detail. The purpose of conducting the walkability audits was to: i) become familiarized with both neighbourhood environments; ii) personally experience the walking conditions of both neighbourhoods and; iii) systematically identify characteristics of the built environment to compare against perceived characteristics derived from subsequent qualitative investigation methods. The results of three go-along interviews, five traditional interviews, and four focus groups conducted with twenty-eight participants across both neighbourhoods are additionally presented in this chapter. The objectives of the study were to: i) understand walking experiences of seniors with varying mobile capabilities; ii) investigate the physical and social attributes of built environments perceived by seniors to stimulate or deter walking; iii) and study the linkages between walkable characteristics that were objectively and subjectively measured relative to seniors. The findings are presented within this chapter in six sections, organized in accordance to the research objectives described above.

CHAPTER 4.2 | HEALTH PROFILE OF PARTICIPANTS

A range of self-perceived mobility levels existed amongst the participants; over half of the participants used some form of mobility aids in the form of a cane, walker, or Nordic poles. Age

is therefore not a direct determinant of mobile capabilities and function. In fact, one participant over the age of 90 years was determined to prove the physical capabilities she possessed at her age by performing leg raises and toe-touching exercises while lying flat on the ground. This participant from Edenbridge-Humber Valley, Rose, had "excellent" self-rated mobility levels, indicated she was very mobile with few difficulties, and kept "extremely active" both indoors and outdoors. Another participant from Edenbridge-Humber Valley, however, was the opposite despite being much younger in age. Between the ages of 75 to 79 years, Edna perceived her mobility level to be "below average" and physical activity levels to be "poor" due to arthritis, restricting her from being physically active outdoors. Edna resorted to keeping active by walking the hallways of her building. In fact, at least 14% of the total sample population preferred to be active indoors as opposed to outdoors. About 36% of the participants were partial to both and 14% of them indicated a lack of physical activity, which implied activity would be performed indoors rather than outdoors. Despite these differences and a large proportion of the sample population choosing to remain indoors, most felt they had "good" mental or emotional well-being and seldom felt socially-isolated or sad. More in-depth details of physical and mental or emotional health of the participants by neighbourhood are presented in Tables 5 and 6.

In addition to information collected of the participants through the survey, personal observations were made during the data collection process that included observations of participant interactions. It was noted that the sample population was predominately mobile, able to move agilely within their respective buildings even with the use of a mobility aid. Those using aids, however, moved at a slower speed and with much more care than others. The participants appeared to be familiar with many other seniors within the vicinity of the focus

group or interview areas, indicating a good sense of community within the retirement homes. Participants were largely very content with their living environments, although a number of them vocalized their frustration with their own physical health impeding activity. Physical ailments most commonly discussed to hinder activity were Arthritis, vision impairments, and feeling unsteady while standing or walking. Experiences with falls were also identified amongst many participants to be the source of their fear with walking outdoors. More detailed descriptions of participant health grouped by their respective neighbourhoods based on Tables 5 and 6 are provided in the subsequent sections.

The participants from Wychwood largely had positive perceptions of their personal mental or emotional well-being, based on questions answered in the surveys distributed to them. In terms of physical health, most seniors from Wychwood perceived themselves to be "good" or "fair" relative to their peers and they were able to keep moderately active. Most preferred to do so outdoors, although at least four participants were partial to staying active both indoors and outdoors. Only one participant preferred to perform physical activity solely indoors and a handful did not keep physically active at all. A larger number of participants from Wychwood experienced some difficulties with mobility and felt restricted from travelling longer distances by walking than those from Edenbridge-Humber Valley. Perceived physical health conditions amongst participants from Edenbridge-Humber Valley were relatively consistent with seniors from Wychwood; seniors in Edenbridge-Humber Valley largely felt their health to be "good" or "fair" and were able to keep active. More participants in Edenbridge-Humber Valley preferred to keep active outdoors and were partial to both indoor and outdoor walking than those from Wychwood. The same number of participants across both neighbourhoods indicated

Table 5: Survey Results of Participants' Self-Rated Physical Health Statuses

	Wychwood	Edenbridge-Humber Valley	Total	% of Total
Physical Health				
Excellent	1	2	3	11%
Good	9	10	19	68%
Fair	3	2	5	18%
Poor	1	0	1	4%
Mobility Level				
Excellent	0	4	4	14%
Above Average	6	3	9	32%
Average	5	6	11	39%
Below Average	3	1	4	14%
Physical Activity Level				
Extremely Active	2	3	5	18%
Moderately Active	12	10	22	79%
Poor	0	1	1	4%
Physical Activity Preference				
Walking / Jogging / Running Outdoors	5	5	10	36%
Walking / Jogging / Running Indoors	1	3	4	14%
Both	4	6	10	36%
I am not Physically Active	3	1	4	14%
Use of Mobility Aids				
Yes	9	9	18	64%
No	5	5	10	36%
Mobility Level				
I am very mobile / No difficulty with mobility	4	8	12	43%
I have some sort of difficulty with mobility	11	4	15	54%
I can go short distances only	4	3	7	25%
I have a lot of difficulty with mobility	1	0	1	4%
I need someone to help me at all times	1	0	1	4%
I am mostly bedridden	0	0	0	0

Table 6: Survey Results of Participants' Self-Rated Mental or Emotional Health Statuses

	Wychwood	Edenbridge-Humber Valley	Total	% of Total
Mental / Emotional Well-being				
Excellent	5	6	11	39%
Good	7	6	13	46%
Fair	0	1	1	4%
Poor	1	0	0	0%
Do not know / Prefer not to answer	1	0	1	4%
Feeling Socially Isolated				
Often	0	0	0	0
Sometimes	4	0	4	14%
Rarely	5	3	8	29%
Never	1	9	10	36%
Do not know / Prefer not to answer	1	0	1	4%
Feeling sad / Unhappy				
Always	0	0	0	0
Often	3	0	3	11%
Sometimes	7	3	10	36%
Rarely	3	6	9	32%
Never	1	5	6	21%
Do not know / Prefer not to answer	0	0	0	0%
Friends or Family in the Area				
Yes	9	13	22	79%
No	5	1	6	21%

use of some form of mobility aid to walk. Despite the fact, survey results indicated more participants here felt they were physically mobile and able to go longer distances than those residing in Wychwood.

More participants in Wychwood neighbourhood felt socially-isolated and sad than those residing in Edenbridge-Humber Valley. As a result, participants from Wychwood exhibited poorer self-perceived mental and emotional well-being than those in Edenbridge-Humber Valley. Moreover, participants in Wychwood possessed fewer friends or family in the area, thus illustrating a smaller social network both within respective retirement homes and neighbourhoods. Similar to those in Wychwood, the participants in Edenbridge-Humber Valley largely perceived their mental or emotional well-being to be "excellent" or "good" and only "rarely" or "never" feeling socially-isolated or sad. All but one participant possessed family or friends in the retirement homes and neighbourhood to interact with and depend upon.

Of note, it was difficult for the participants to separate themselves from their retirement homes since their lives were so closely linked to them. A more in-depth discussion of this matter is presented in the following sub-chapter.

Chapter 4.3 | Objective and Perceived Neighbourhood Characteristics

This section addresses the three objectives of this thesis: i) to understand the objective walkability characteristics in two neighbourhoods of contrasting physical properties; ii) to understand the perceived ecological factors that hinder and facilitate walkability for seniors; iii) and to uncover the relationship between perceptual and objective walkability through cross-analyses within and between neighbourhoods. In doing so, this chapter determines whether gaps exist between objective and subjective measures of walkability for seniors in Wychwood and Edenbridge-Humber Valley.

Table 7: Objective Results of Select Indicators

Indicator	Wychwood (% of segments)	Edenbridge-Humber Valley (% of segments)
Crossing Areas		
Both Sides (NW Corner)	72	50
Both Sides (SE Corner)	60	23
Presence of Traffic/Pedestrian Signals/Systems	69	61
Land Use and Buildings		
Single-family Homes (Detached)	72	82
Multi-family Dwellings	72	18
Recreational Uses	5	5
Commercial Uses	26	14
Service Uses	22	14
Sidewalks		
Continuous (both sides)	97	67
Sidewalks on no sides	2	9
Condition (good)	71	45
Sidewalks slope (gentle)	83	82
Sidewalk obstructions (none)	59	86
Benches (1 or more)	19	27
Street Life		
Porches (all/most)	2	0
Buffer (both sides)	5	59
Public space (none)	76	50
Public Transit Stops	17	27
Safety & Comfort / Street Characteristics		
4 + Lanes of Traffic	16	23
Bike Lanes	9	14
Traffic Calming Devices	79	59
Ending in cul-de-sacs or Dead-end	3	23
Aesthetics		
Quality of Public Spaces (High)	14	27
Buildings Well-maintained (all/most)	52	77
Yards Well-maintained (all/most)	55	77
Litter/Broken Glass/Graffiti (None/Almost None)	78	95
Level of Difficulty		
Very Easy	66	59
Easy	28	23
Average	5	9
Difficult	2	9
Very Difficult	0	0

Wychwood and Edenbridge-Humber Valley were objectively evaluated using the walkability audit tool, SWEAT-R, in October and November 2015, respectively. The

neighbourhoods were each assessed twice on separate occasions; a full audit during the day and a second visit at night were performed for each neighbourhood to evaluate variations in walking experiences at different times of day. Table 7 presents a concise view of audit results for both neighbourhoods, based on select SWEAT-R items that were also discussed amongst participants. Using this table, comparisons of objective results can be made across neighbourhoods. The following sections are organized by neighbourhood and themes that correspond to both the SWEAT-R evaluation indicators as well as topics commonly discussed amongst participants. Thus, both objective and subjective descriptions of the built and social environments for Wychwood and Edenbridge-Humber Valley are presented below.

CHAPTER 4.3.1 | WYCHWOOD

Wychwood represents the neighbourhood objectively measured to be of high walkability in this study. It is located in south-central Toronto, as indicated on the map in Appendix D. It is home to 13,990 residents as of 2011, of which 21% or 2,915 are of senior age (City of Toronto, 2012). The neighbourhood's senior population was 44% greater than the total population of

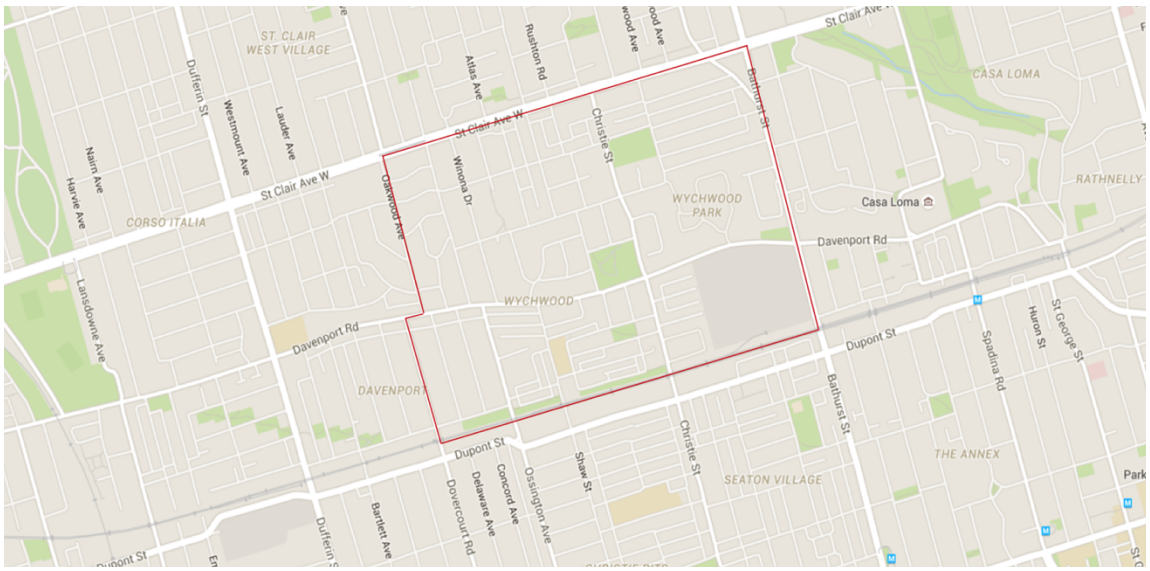

Figure 5: Map of Wychwood Neighbourhood Boundaries (Google Maps, 2016)

seniors across the whole of the City (City of Toronto, 2012). Wychwood possesses two hundred and thirty-three neighbourhood blocks, indicating fifty-eight street segments must be assessed using the SWEAT-R tool. This calculation is based on instructions provided in the SWEAT-R Training Manual (Michael, n.d.). A map depicting the segments selected for audit is provided in Appendix E, Figure 48. I possessed no knowledge of the Wychwood neighbourhood prior to performing this research; I had not explored its streets, restaurants, or shops before conducting the walkability audits. Preliminary assessments of the area using Google Maps' Satellite and Street Views in April 2015, in combination with a review of grey literature pertaining to the neighbourhood were thus the initial experiences of the area.

Nestled within the neighbourhood is an exclusive enclave of sixty private residential homes tucked atop the hills of Davenport Ridge, known as Wychwood Park. The higher objective walkability assessment of the Wychwood area can largely be attributed to the well-connected streets, as indicated in Figure 5. The downtown core and south-central areas of Toronto have been objectively measured in previous studies to feature higher road network densities and mixed land uses. Consistent with these physical attributes, active forms of transportation are more commonly performed in these areas in comparisons to neighbourhoods further from the downtown (Glazier, Ross, Gozdyra, Creatore, & Booth, 2007). When participants were requested to reflect upon the neighbourhood's walkability, all participants agreed the area was indeed highly walkable. Mildred, a participant residing in Christie Gardens, stated during our go-along interview that:

> *…it's very pleasant walking around here. And as you see, we've hardly passed anybody here – I don't know if we have passed anybody before. Very quiet.*

Which is important for walking. One doesn't want a noisy or busy district…I think fewer people is better…If there was nothing but shops or factories around, I wouldn't want to go for walks…If I was left in the middle of an area with office buildings, I wouldn't want to go for walks.

Mildred was walking through Frankel Lambert Park, one of the two medium-sized parks directly adjacent to Christie Gardens that residents often visit. At 11:30 am on Tuesday, November 17, 2015, there was little pedestrian and street traffic along the sidewalks and roads, making for a tranquil residential environment to walk in. With the exception of a few physical deterrents pertaining to sidewalks, crossing areas, and weather, participant perceptions of the neighbourhood were consistent with its high walkability rating.

CHAPTER 4.3.1.A | CROSSING AREAS

Among the street segments assessed, approximately half offered intended crossing areas for pedestrians, indicated with painted lines and different materials for the paved road in some

Figure 6: Zebra-Striping on Segment W15, Wychwood Avenue (Google Maps, 2016)

Figure 7: Colour and Material Contrast on Segment W23, Biggar Avenue (Google Maps, 2016)

areas. As indicated in Figure 6, pedestrians and drivers are guided by zebra striping on the pavement on segment W15. Additionally, moderate grooves are placed on the curb cuts on both sides and there is a slight colour contrast between the sidewalk and ground pavement. A sidewalk extension is also present on this segment, decreasing the distance required for pedestrians to cross the street. On segment W23, as shown in Figure 7, colour and material contrasts are implemented into the sidewalk and curb cut to elevate pedestrian tactility and visibility when navigating intersections. Although not all segments possessed traffic signals or pedestrian signals, all segments had stop signs to help slow traffic and provide opportunity for crossing. Mid-block crossing areas were not widely prevalent across the segments assessed. There had only been one instance of a mid-block crossing area on segment W8, allowing pedestrians to cross Pinewood Avenue to Humewood Park. However, there were no traffic or pedestrian signals nor were there any pedestrian signs apparent near the crossing area.

Participants had little praise for crosswalks and intersections across the neighbourhood, despite the traffic calming and pedestrian-assisting features in place. Most participants found it difficult to comfortably make it across an intersection in time before the lights changed, causing them to feel nervous and to hurry. Rushing across an intersection can take an enormous amount of effort, particularly if mobile capabilities and strength are lower. Lori, a resident of St. Matthew's Bracondale House, uses a walker at all times and exhibited great frustration with the stop lights in place near her home:

> *…it's an awful crossing…making it in time because the numbers change very quickly. Not all the time. It's at different times. For example, now it changed*

> *quickly…you have to be really aware. You're best to wait until it just changes before you venture out.*

Pedestrian signs within the neighbourhood were timed as part of SWEAT-R and found to range between 13 and 33 seconds, varying by the type of intersection. The specific intersection identified by Lori permitted 18 seconds for pedestrians to cross. Even Mabel, a more physically-active and mobile participant from St. Matthew's Bracondale House, did not like to be rushed across the street by stop lights. She did not require mobility aids but she sympathized with those who did, as it made outdoor walking experiences more difficult:

> *…the cars are gonna go if you don't move fast, they're moving in front of you! But is says, "yield to pedestrians." But sometimes they do it, sometimes they don't…in some areas, they don't have enough seconds. They put the white person on the light and then they give you another 15 seconds over the light. But if somebody is going with a walker, you know, the cars wait for you to cross but you know…there are times when you're tired and you sort of look and there's a car coming this way and a walker's coming that way, so you have to decide which is more dangerous.*

Even with pedestrian yield signs in place, Mabel and other participants witnessed negligent drivers that made crossing intimidating. Combined with insufficient crossing times, unpredictable street traffic and differences in physical capabilities, crosswalks were identified to be a major concern for senior walkability amidst the participants interacted with in Wychwood. This was apparent during a go-along interview with Lori that took place on St. Clair Avenue West, a street with very high pedestrian and street traffic.

Chapter 4.3.1.b | Buffer Area

A buffer area or zone is the space directly adjacent to the sidewalk that provides a spatial barrier to street traffic for pedestrians. Oftentimes, these buffer areas include trees, curb extensions, seating areas, shrubbery, etc. Few streets in Wychwood offered buffer zones. This results in pedestrians walking in close proximity to street traffic, particularly when sidewalk path obstructions are present and force walkers to step onto the street due to lack of space. When sidewalks are clear, however, the absence of buffers do not pose a problem. Figure 8 illustrates a residential street void of any buffer areas typically found in Wychwood. Among the fifty-eight segments assessed using SWEAT-R, only five possessed buffer areas alongside of sidewalks; primarily along arterial roads such as St. Clair Avenue West and Dupont Street. In Figure 9,

Figure 8: Few Buffer Zones Along Residential Streets in Wychwood (Google Maps, 2016)

Figure 9: Buffer Zone Along Segment W17, St. Clair Avenue West

segment W17 provides a wide distance between commercial uses and the street. Pedestrians are provided with the option of walking along the innermost side of the sidewalk where they are buffered by large planters with trees and greenery. Amongst the segments that did possess buffer areas, the number of mature trees that were present and offered shade were plentiful; numbers ranged between five and twenty, relative to segment length.

The large, mature trees found across the neighbourhood either along the few buffer areas or within private lots were regarded as pleasant and calming aesthetics. Wychwood Park, an enclosed residential area within the neighbourhood was particularly enshrouded with many tall trees and was identified by one participant as *"spiritual to walk through...especially when the sun's hitting [the] leaves"* (W004). Only one participant, Mabel, did not share the same sentiment as the other participants. Referring to St. Clair Avenue West, she found the trees planted along the edges of the sidewalks to be a nuisance:

> *…they put these trees to make it look like Forest Hill. Well, it's nice but you should put them right at the sidewalk… Sometimes you're tired and you walk right into that tree and you know, you fall over!*

She criticized the attempt to beautify the neighbourhood and saw trees as obstructions narrowing the pedestrian right-of-way. Her observation contrasts the general consensus in literature that regards trees along sidewalks or within buffer areas to enhance walking experiences and aesthetics (Brown, Werner, Amburgey, & Szalay, 2007; Talen & Koschinsky, 2013; van Cauwenberg, et al., 2012), though Gehl (2010) does indicate that trees may become physical obstructions along narrow paths.

The street segments assessed in Wychwood consisted mainly of residential, commercial, office and service, as well as institutional. The predominant building height of the general area ranged between one to two stories or three to four stories, depending on the uses present. The most common form of housing found in this community were in the form of detached single family homes, duplexes, and low-rise multi-family homes. Almost all segments contained a combination of these types of housing. Figure 10 and 11 depict the types of homes typically found throughout the neighbourhood. In addition to these homes, four mid- to high-rise retirement homes were found within neighbourhood boundaries. Residents of Christie Gardens were particularly fond of their immediate area, due to the fact that the home is enclosed on one

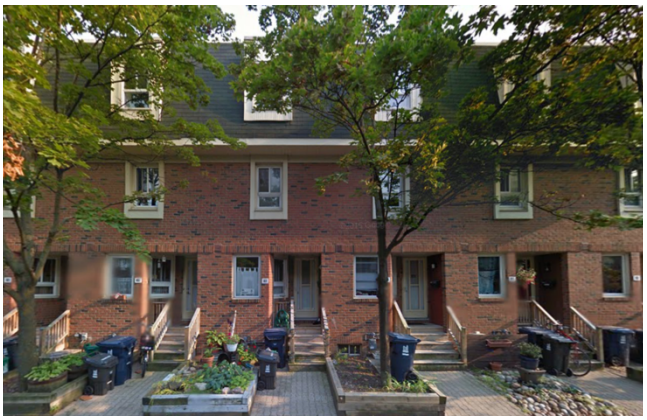

Figure 10: Typical Single-Detached Home found in Wychwood (Google Maps, 2016)

Figure 11: Typical Duplex Home found in Wychwood (Google Maps, 2016)

side by a concrete wall; this enclosure separated the home from the busy Dupont Street just South of Christie Gardens. When asked whether the participants wished for more commercial uses and services nearby, several voiced their opposition to the idea. Charlotte, for instance, was perfectly content with the neighbourhood's resources and preferred to keep the immediate area residential. She enjoyed the predominately residential environment with retail uses nearby.

A majority of the commercial, institutional, as well as office and service land uses were present along arterial roads such as St. Clair Avenue West, Bathurst Street, Dupont Street, as well as Christie Street. These occurred in rows along the street segments that created continuous facades, as opposed to the strip malls or plazas more commonly seen in Edenbridge-Humber Valley. St. Clair West Avenue in particular consisted of a wide variety of restaurants and shops, including the following on segments W14 and W17: various ethnically-diverse restaurants, a delicatessen, convenience stores, dry cleaners, health centres, clothing stores, a karate centre, a church as well as offices for community council members. A St. Matthew Bracondale House resident, Lori, observed during her go-along interview that shops and resources along St. Clair Avenue West were able to meet all her personal needs. Without a car, both utilitarian and recreational walking were important to Lori and being able to comfortably do so encouraged her to leave her home for fresh air and exercise:

> *We have the convenience stores, you know, which is great for necessities. Where I was before, you had to walk a bit to get near a store… But on the whole, I think it's very, very good. And I am inclined to go out more now than I would have done in my old apartment. For that reason, easy to nip down the convenience store and the drug store.*

Figure 12: Retail Uses Along Segment W17, St. Clair Avenue West (Google Maps, 2016)

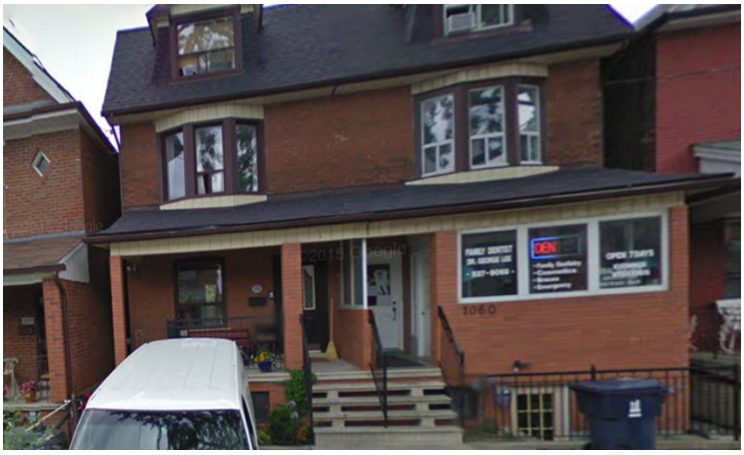

Figure 13: Daycare Centre on Segment W28, Burnside Drive (Lee, 2016)

Figure 14: Dental Office on Segment 49, Shaw Street (Google Maps, 2016)

Lori additionally emphasized how difficult it was to manoeuver her walker within the stores themselves; aisles and merchandise are oftentimes placed too close together and stores lacked ample walking room when using a mobility aid. On the nearby segments W12 and W13 on Vaughan Road and Bathurst Street, respectively, uses included: Wychwood Public Library, a community medical centre and pharmacy, a carpet store, dollar store, optical store, bank, hair salon, home hardware store, and tae kwon do centre. The commercial and office and service uses typical to Wychwood are depicted in Figure 12 of segment W17, St. Clair Avenue West. In addition to these uses, various churches of different religion as well as elementary and secondary schools were found dispersed across the neighbourhood.

In contrast to Edenbridge-Humber Valley, select commercial as well as office and service uses were found integrated into residential areas; land uses in Edenbridge-Humber Valley were clearly segregated. Figure 13 shows a small daycare found along residential segment W28, albeit closer to the arterial Bathurst Street. Similarly, Figure 14 shows a private dental office was found embedded and blended in within a residential area along segment W49. A pitfall of residing in an

area with such varied mixed-use is the noise associated with the density of commercial uses. One participant from St. Matthew's Bracondale House, Mabel, mentioned the loud music and noise from restaurant patrons heard late in the night. Situated in such close proximity to popular restaurants that stay open late, she observed that residents of the retirement home facing busier streets may be bothered by nearby bustling nightlife. When windows are shut and residents are adjusted to the faint noise that could still be heard however, Mabel posits that street noise at night does not pose too large a problem for residents.

Senior-oriented buildings and uses were not widely prevalent within Wychwood with the exception of a retirement home and assisted living facility near segment W42, Christie Street. Buildings designated for senior activities and services were otherwise not available. This does not appear to bother many of the participants, as both homes were identified to offer a multitude of services and amenities for its residents. Shuttle buses and delivery services were available for them to reach shopping destinations further away and to have groceries or prescriptions delivered to the home. Additionally, various social gathering places were present throughout the neighbourhood that could be visited by local seniors. These included a number of coffee shops, restaurants, corner stores, and a public library. Notably, the Stop's Farmers' Market at Wychwood Barns is at the heart of the neighbourhood and open weekends to the public. A number of participants periodically visit the Market for both food goods and social interaction.

Chapter 4.3.1.d | Public Spaces

Public spaces in the form of parks and playgrounds are found dispersed throughout the neighbourhood, evident when studying a map of the area as well as from multiple statements made by participants. Most notable are Christie Pits Park, a 1000 metres walk, as well as Marian Engels Park and Hillcrest Park, both within a 500 metres walk from the Christie Gardens retirement home. Both go-along interviews with participants from Christie Gardens included walks within and near both of these parks. Figure 15 below is of Frankel Lambert Park, a small space including a children's playground just outside of Christie Gardens that is less than 200 metres away. Most participants exhibited much delight when speaking of children seen around the neighbourhood and enjoyed walking in parks where children can be seen playing.

Figure 15: Frankel Lambert Park Near Christie Gardens (Lee, 2016)

Figure 16: Concrete Wall with Graffiti Alone Frankel Lambert Park (Lee, 2016)

Additionally illustrated in Figure 16, Frankel Lambert Park's calm aesthetics are slightly deterred by graffiti sprayed along the concrete wall directly adjacent to the park. Mildred observed the graffiti to take away from the park, having hard time relating to what some people of the general public might perceive as urban street art:

It's obtrusive. It doesn't have anything to do with my life or any interest I have so I just look at it and reject it.

Humewood park is within a 500 metres walk from St. Matthew's Bracondale House. Most parks and outdoor playing fields ranged in quality from neutral to high, based on the amount of litter present and equipment in disrepair.

Figure 17: Typical Bench Found in Wychwood on Segment W17, St. Clair Avenue West (Lee, 2016)

Figure 18: Typical Bench Found in Wychwood on Segment W13, Vaughan Road (Google Maps, 2016)

Most parks provide seating for its visitors. In addition to the benches seen within parks, they are also offered across the community near transit stops and along select sidewalks. Benches or other structures appropriate for sitting were present along eleven of the fifty-eight street segments. This low number is largely attributed to the fact that many of the segments assessed were of residential streets, which do not typically offer public seating for community members

Figure 19: Public Wall Mural on Segment W42, Christie Street (Google Maps, 2016)

unless transit stops or parks are present. One issue personally observed of public seating areas along pedestrian walkways was that they were situated very close to the street. Shown in Figure 17 and 18 are benches typically seen along the streets within Wychwood, on segments W17 and W13. Additionally, only half of the benches observed offered back support. Thus, although they were observed to be widely used at the time of the audit, sitting on the benches during periods of high vehicular traffic may be uncomfortable for some people. Interestingly, this was not a specific issue directly raised by any participants. Instead, participants from the neighbourhood identified the general lack of benches in the area to be a problem. It is possible that the aforementioned existing benches were noticed but deemed unsafe to sit on due to their proximity to the street.

Public art was present within the neighbourhood in the form of murals along a number of street segments. Shown in Figure 19 is an example of the types of street art seen in the area, along segment W42. Although noted in SWEAT-R, neither this particular installment nor public art in general were mentioned by participants.

Chapter 4.3.1.e | Sidewalks

All street segments that were assessed offered continuous sidewalks on both sides of the street, with the exception of one segment that was a single back-road that served as a roadway for both automated vehicles and pedestrians. All sidewalks were of concrete material, creating surfaces stated by all participants to be more comfortable and safer to walk on; cobblestones and other uneven paved materials were tripping hazards. Minimum widths mostly ranged between four to six feet or less than four feet wide. Referring to those that are more narrow in

width, Mabel declared insufficient space for pedestrians to comfortably walk when there are trees and other sidewalk pedestrians present. Another participant, Elizabeth, specifically emphasized the presence of bikers on sidewalks to be an issue for safety. Seniors are often startled when bikers ride by them from behind, taking them by surprise.

Figure 20, 21, 22: Fallen Leaves on the Ground on Segment W30, Bathurst Street (Lee, 2016)

Not all segments were free of obstructions; some sidewalks within residential areas were partially impeded by utility poles or garbage, recycling, and green bins outside of homes. Moreover, fallen leaves covered a select few of the segments where the city had not yet performed maintenance. Figures 20, 21, and 22 illustrate the sidewalk conditions during one of the audits conducted in October 2015 of segment W30. Fallen Autumn leaves completely covered some parts of the sidewalks. Although it is possible to walk over them, they were thought to impede seniors and mobility aids when conducting the walkability audit. With no path obstructions and other pedestrians present, however, the sidewalk widths were adequately spacious for walking.

There had been few sidewalk segments under construction at the time of the audit. Thirteen of the segments assessed, however, may benefit from repair as some slightly uneven or cracked. In addition to these faults, more than half the sidewalks observed had patches of grass growing through its cracks. As illustrated in Figure 23, these tufts of grass as seen on segment W24 can potentially pose as tripping hazards to the unwary. Other than these few segments that were of poorer quality, most sidewalk surfaces within Wychwood were comfortable to walk on. Most of the segments were of a flat or gentle slope. Only a select few segments within Bracondale Hill and Wychwood Park were more moderately to steeply sloped and required more care to keep steady while walking. Several participants noted the very steep slopes within these areas and noted that even with the help of walkers, the slopes were difficult to manoeuver.

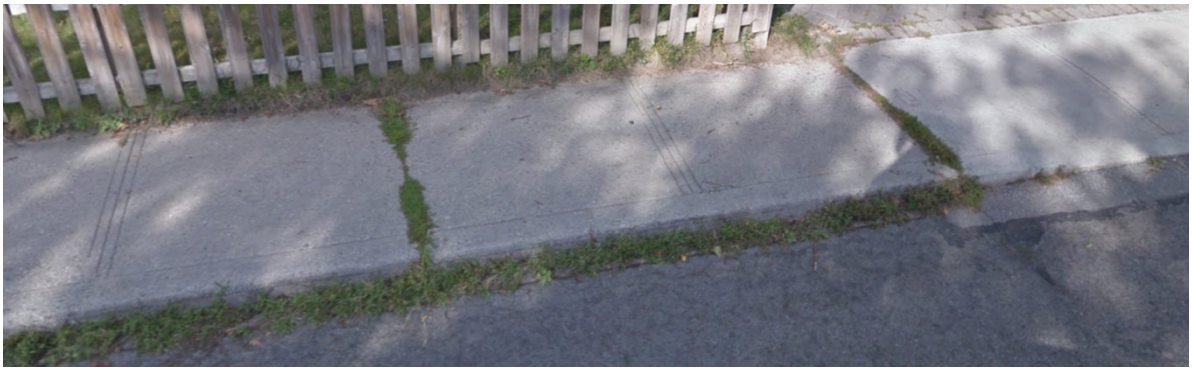

Figure 23: Tripping Hazard on Segment W24, Highview Crescent (Lee, 2016)

Chapter 4.3.1.f | Street Characteristics

Based on the audit performed, Wychwood consists mostly of two-lane traffic streets, with a small number being one-way streets. Only two segments out of the fifty-eight ended in dead ends. Segments accommodating four lanes of traffic are also present along St. Clair Avenue West, Dovercourt Road, Ossington Avenue, Davenport Road, Oakwood Avenue, Dupont Street, and Bathurst Street. Only Shaw Street, Davenport Road, and Christie Street offered bike lanes, a

factor that most likely contributed to the number of bicyclists seen riding on sidewalks by various participants. These were identified as a nuisance to pedestrians and unsafe for senior walkers.

All streets were made of concrete or asphalt material and conditions predominately ranging between "moderate" to "good" with a few in "poor" condition. Those in poor condition exhibited potholes as well as cracked and uneven driving surfaces. In terms of traffic-calming devices, the most commonly seen across the neighbourhood were speed bumps, marked crosswalks, and a few instances of sidewalk extensions. It was noted that there were few signs for pedestrian and traffic activity relative to the size of the community and level of vehicular traffic surrounding it. Although not directly linking the two, multiple participants had stated local traffic to be unbearably high and loud. Florence, a resident of Christie Gardens, would try to avoid traffic as much as possible:

> *I usually choose to walk late in the day so [that] rush hour is relatively over. It's peaceful* (W007).

Yet, traffic and unfavourable walking conditions cannot always be avoided. As Mildred pointed out during her go-along interview, even if a particular destination is accessible in terms of distance, the experience of reaching there may not be entirely pleasant for everyone:

> *I wouldn't want to walk on a very busy street like Christie Street for instance. I sometimes have to walk down there when going to the grocery shop or the bank. But it's not pleasant walking. It's just part one has to go through to get to where one wants.*

Additional and more frequent signage along street segments may therefore be beneficial in reducing traffic speed and carelessness as many cars were observed to be driving over legal speed limits near residential areas. Signs for pedestrian and children activity were mostly concentrated around schools, as depicted in Figure 24 of segment W22.

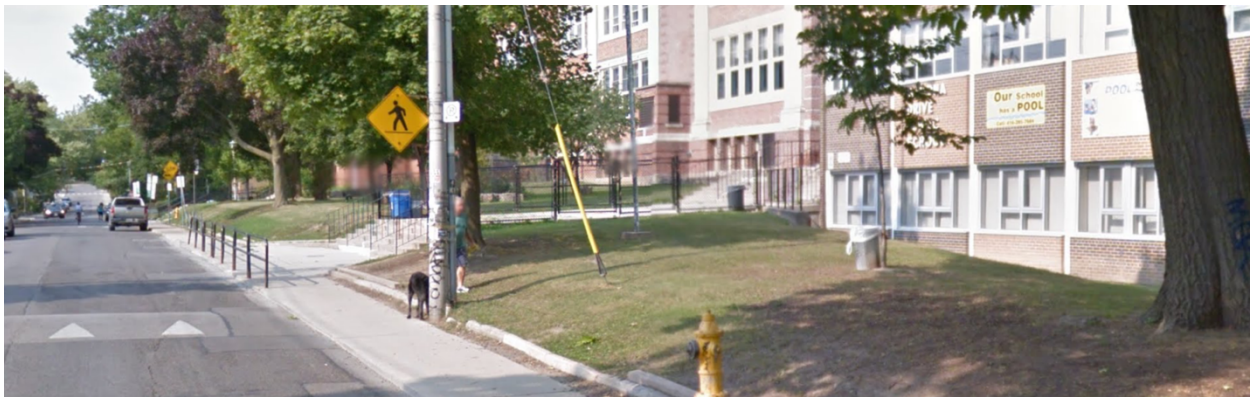

Figure 24: Pedestrian Yield Sign Outside a School on Segment W22, Winona Drive (Google Maps, 2016)

CHAPTER 4.3.1.G | STREET LIFE

The neighbourhood was adequately lit with evenly dispersed streetlights across the segments. Only a small number of residential streets were poorly-lit during a visit to the neighbourhood on the evening of October 29, 2015. Although not a part of the audit, the small gated community within Wychwood Park relied solely on light provided by private homes to illuminate its streets. With the exception of this particular area, there was no difficulty personally experienced in navigating the general area at night. The participants, however, felt differently about nightfall. They did not feel safe walking outdoors at night, particularly by themselves as it "would be a foolish thing to do." Elizabeth, a very physically-active resident of Christie Gardens, attributed her fear to *"teenagers on their bikes…gathering together."* Visibility at night was regarded as an issue as well, as impaired night vision increased the risks of falls.

Although not a truly accurate indicator of transit accessibility due to the randomized selection of segments, most bus stops are situated along the arterial roads surrounding the neighbourhood. There were mixed feelings exhibited over public transit use amongst the participants; local buses and the subway were regarded as either convenient or difficult to ride by different participants. There was no direct link between mobility level and ease of public transit use; Judy and Diana both used walkers on a daily basis and exhibited similar mobility levels, despite Diana being older. Judy indicated she was comfortable and happy to take public transit to reach destinations too far to travel by foot. Diana, however, experienced trouble with public transit:

> *If your balance is not good, I don't want to take chances for myself or for other people.*

Bus stops were commonly found sheltered, typically offering one or two seats for transit riders. When seeking a place to sit and rest while walking, front porches of residential buildings also serve as seating areas. In this neighbourhood, residential homes are not set as far back into their respective lots as compared to those in Edenbridge-Humber Valley. More than half of the homes observed are thus able to adequately offer seats on their front porches for those who need it, as seen in the homes in Figure 10 and 11 of Section 4.3.1.c. Additionally, many restaurants along St. Clair Avenue West and some along Dupont offer outdoor dining areas that may allow pedestrians to sit on and rest if needed. However, not every individual may feel comfortable sitting on others' private properties. This was made evident when two participants, Elizabeth and Judy, discussed their differing opinions on whether they would feel comfortable sitting on

somebody's front stoop. Judy would have no problem doing so if she needed to whilst Elizabeth had reservations as she felt she would be infringing upon personal property.

Chapter 4.3.1.h | Maintenance

Using SWEAT-R to audit the neighbourhood revealed the maintenance and overall condition of the buildings, streets, and open spaces within the area to be partial between good and poor. Many of the buildings were in disrepair due to unkempt lawns, garbage strewn near the entrance, graffiti, and dishevelled facades. Multiple participants, including frequent walker, Diana, made note of the negligence exhibited by local residents over the placement and clearance of garbage bins. She found sidewalks surrounding Christie Gardens often obstructed by bins, rendering it difficult to safely manoeuver her walker while remaining on the sidewalk.

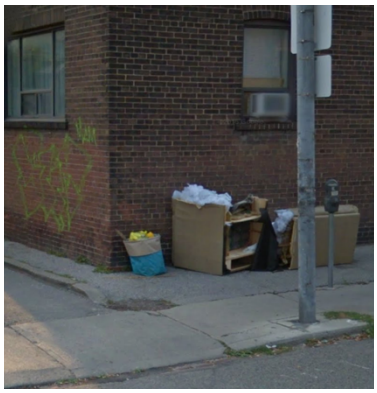

Figure 25: Unmaintained and Dirty Home with Graffiti on Segment W13, Vaughan Road (Lee, 2016)

Figure 26: Strewn Garbage and Graffiti near Home on Segment W15, Wychwood Avenue (Lee, 2016)

Figure 27: Derelict Building with Graffiti on Segment W45, Bathurst Street (Lee, 2016)

Although not a large number, a few retail stores possessed barred windows. As depicted in Figures 25, 26, and 27, of segments W13, W15, and W45, such buildings can be unwelcoming to visitors. These examples, fortunately, do not reflect the entire neighbourhood, as many private homes are very well-kept and decorated. This is particularly the case with the homes near Wychwood Park, a previously gated community with larger well-to-do homes. Perhaps for

these reasons, combined with the fact that the retirement homes participants were recruited from were not in close proximity to buildings in poorer condition, participants did not identify any issues regarding the condition of buildings within the neighbourhood. In fact, the participants from Wychwood largely felt the neighbourhood to be well-maintained and clean. Specific mention was made to the very apt snow-clearance performed by the city as well as by groundskeepers of the retirement homes.

Chapter 4.3.1.i | Safety

The safety of the neighbourhood was not an indicator of walkability assessed as part of SWEAT-R. All descriptions of safety in the neighbourhood's safety are thus based on participant perceptions of their surrounding environment and other local residents in the area. Objective details of crime, however, could be attained from Toronto Police Services statistics and compared to participant observations; a total of 124 counts of crime incidences were reported in 2014 alone (Toronto Police Services, 2014). This is greater than the number of reported crimes in Edenbridge-Humber Valley in the same year.

Participants from Wychwood conveyed more negative perceptions of safety in the neighbourhood than positive. Moreover, there were more recounts of crime and hazards in Wychwood than there were from Edenbridge-Humber Valley. Teenagers in groups on their bicycles as well as homeless men, for instance, made seniors nervous when outside of their home. With a more diverse population passing through the neighbourhood on a daily basis, participants advised that awareness and being careful are key to living in the neighbourhood: *"if you pay attention, it's safe enough."* However, as Lori affirmed during her go-along interview, *"it depends on the individual*." Margaret, aged between 85 to 89 years, had endured two serious

falls in the few months prior to her focus group. Since these accidents, she began to rely on her walker after losing her mobility and became hesitant to go outdoors due to declined motor skills, balance, and strength. A fear of additional falls that would significantly further deteriorate her physical health was a major deterring factor as well. Being bound at home and relying on the accompaniment of others to go outdoors, she did feel the need to worry about safety:

> *I can't [walk outside] and so it doesn't matter to me [laughs]. But it's fine, I find it fine. When I go out with my kids or anyone, I need my walker and I have no problem thinking about these problems like that. It's much better, apparently, than it used to be.*

Other seniors, however, may still possess the physical strength to confidently defend themselves if needed. Mabel, for instance, is a 75 to 79 year old woman who did not require any form of mobility aid to walk. She felt very safe in her neighbourhood due to her physical health and advised:

> *You have to use your common sense. They say you should be neat and dainty. At night or even during the day, it sometimes doesn't pay because if somebody's getting rough with you, you have to be aggressive towards them and they'll be afraid of you… But the thing is, I was very aggressive to this person and I said, "what is it that you want?" But I was so hyper and he ran away!*

Regardless of whether it is day or night, accidents and harm are unpredictable. To Mabel, the ability to fend for herself was very important. Unfortunately, not all seniors possess that capability.

Chapter 4.3.1.j | Social Capital and Sense of Community

The social capital present and experienced in Wychwood is another indicator of walkability not assessed as part of SWEAT-R. All participants spoke of the people they encountered within their neighbourhoods, as well their sense of community within the neighbourhood very highly; few negative comments were made in comparison to the good. Additionally, the participants from Wychwood provided more positive feedback regarding the neighbourhood social capital than those in Edenbridge-Humber Valley. Almost all participants enjoyed the interactions and relationships they had with local community members. The willingness of local residents to greet and help the participants made them feel welcome and safe in the neighbourhood:

> *I'm sure they would help if you had a problem. I find most people really friendly. I make a point of saying hello to everybody I pass. Even today in a parkway over there there was a girl playing with her dog over there and she said hello. So basically it's very friendly (W002).*

The location and number of retirement homes in an area plays a role as well. Christie Gardens is located within a residential pocket due to a concrete wall separating one side against Dupont Street. Another long-term care facility is only one block away, creating a concentrated area of seniors. Debra noticed this impacted how community members acted towards seniors:

> *We dominate the neighbourhood. They know they have to be nice to us.*

Few negative comments were made of the social capital and sense of community in the neighbourhood. Two participants from Christie Gardens, however, noticed very few walkers in the home's immediate area during their go-along interviews that took place at 11:30 am and

3:30 pm and on Tuesday, November 17, 2015. With empty streets within a residential area, participants felt insecure about safety; fear of falls heightened when chances of being found were low. Additionally, three participants did not seem to like the low-income area Christie Gardens was located in. One participant, Judy, commented on the subsidized homes found nearby during our focus group:

> *The area is geared to income, is it not? So you can tell that you're walking along that it's a bare garden and you realize that well, they probably don't have the money to put in plants. This is what I usually figure.*

She implied low-income areas to be less preferable to walk in due to the inability to keep the gardens maintained. Connections were made between low-income pockets of the neighbourhood and safety, with one participant noticing teenagers that looked a *"little rough"* (W004). Fear of crime was heightened amongst a few of the participants, whom preferred to stay indoors particularly at night to avoid any mishaps.

Chapter 4.3.1.k | Secondary Observation

A general neighbourhood scan using the SWEAT-R Secondary Observation Form was performed again once all street segments in the neighbourhood had been audited. This post-audit assessment of Wychwood consisted of personal observations made of walkability in terms of the built and social environments in the area.

Land uses in Wychwood were mixed; commercial and institutional uses could be found within residential areas. There were quite a few corner stores found throughout the neighbourhood, therefore increasing convenience and accessibility to daily necessities for local residents. Additionally, there were a number of parks and smaller parkettes that served as

gathering spaces for community members. While conducting the audit, there were a number of people relaxing and strolling through these spaces during the day. There were notably many mothers and young children playing in the playgrounds. In terms of pedestrians, there were few people walking within the residential areas of the neighbourhood and far more pedestrians along streets such as St. Clair Avenue West, Bathurst Street, Christie Street, and Davenport Road. On the day of the go-along interview with Lori, November 19, 2015, a large number of people were walking along the sidewalks on St. Clair Avenue West and going in and out of the various restaurants. With the number of people on the sidewalks and the row of open stores during the day, it felt safe to walk alone in the neighbourhood.

CHAPTER 4.3.2 | EDENBRIDGE-HUMBER VALLEY

Edenbridge-Humber Valley is representative of low walkability in this study. It is located in West Toronto, as shown on the map in Appendix D. A total of 14,885 people reside in this neighbourhood, 19% or 2,770 of which were of senior age as of 2011 (City of Toronto, 2012). This group of seniors was 29% greater than the total population of seniors across all of Toronto (City of Toronto, 2012). Edenbridge-Humber Valley consists of eighty-nine neighbourhood blocks, equating to twenty-two street segments to be assessed using SWEAT-R. A map depicting the segments selected for audit is provided in Appendix F, Figure 49. Although I am familiar with the general Etobicoke area in terms of its location relative to the City of Toronto, I had no previous knowledge of this particular neighbourhood prior to conducting this research. Thus, a

preliminary assessment of the neighbourhood performed through Google Maps' Satellite and Street Views in April 2015 was the first time seeing and experiencing the area.

The lower objective walkability assessment of Edenbridge-Humber Valley becomes

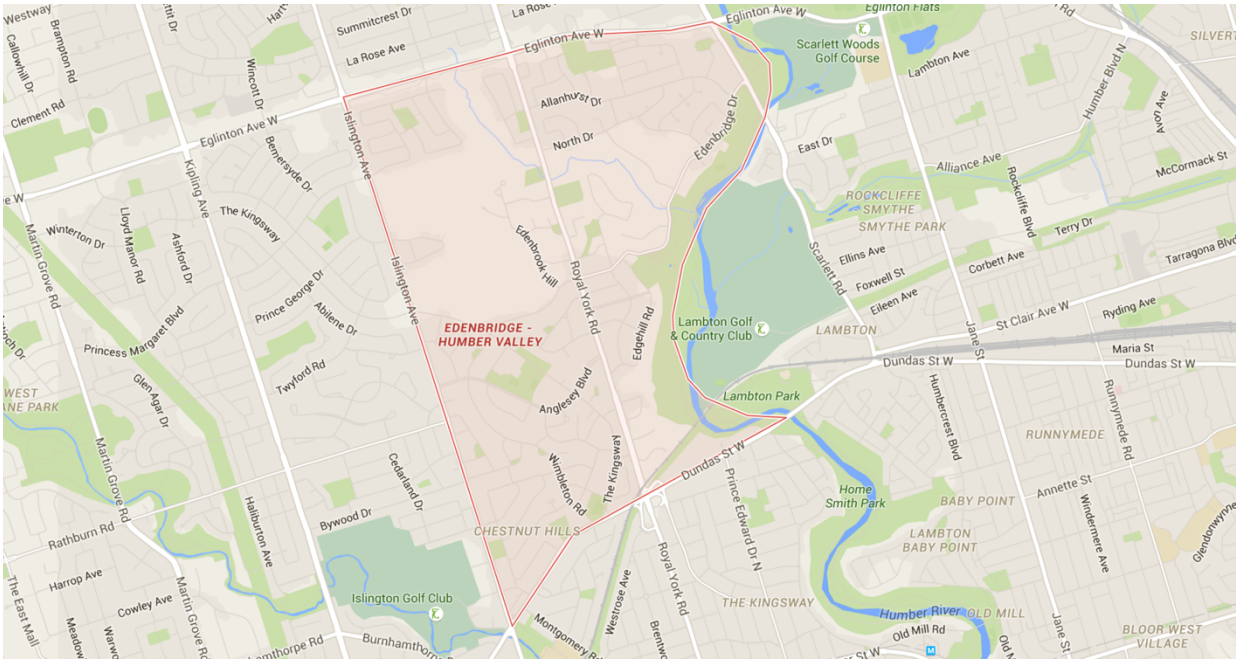

Figure 28: Map of Edenbridge-Humber Valley Neighbourhood Boundaries (Google Maps, 2016)

evident when studying the neighbourhood map, provided in Figure 28; the vast majority of land is open space and its winding roads are in a "loops and lollipops" (Southworth, 2005) fashion. A lack of consistency thus exists in terms of street connectivity, decreasing the ease of travel from one point to the next. Additionally, the area is predominately residential and possesses few varied uses within the immediate area. Most retail stores, services, and other places to carry out daily chores are concentrated along the arterial roads surrounding the neighbourhood periphery: Eglinton Avenue West, Islington Avenue, Dundas Street West, Scarlett Road, and Royal York Road. However, with the vast open, green spaces in the neighbourhood, it was anticipated it would be quiet and comfortable to walk through. This was verified by multiple

participants spoken to throughout the data collection process. Rose, a highly-active and energetic participant from Chartwell Scarlett Heights, had only praise for her neighbourhood:

> *To me, you listen to the news and all you hear is bad things downtown. And a lot of noise and no – I like the more peaceful atmosphere that we have here. I don't think I could cope with downtown.*

With the vast expanse of open space present within the neighbourhood, however, travelling to and fro for a senior proved to be challenging. Edna, a resident of Chartwell Scarlett Heights, insinuated this relationship between distance and walkability during her interview. Although the attractiveness and scenic features of the neighbourhood undoubtedly encourage outdoor activity and walking, she implied physical strength and endurance are necessary to do so:

> *It's very attractive…what could be more difficult? It's not difficult, is it? If you're a walker, this is an excellent walking place.*

Edna stated walking is not difficult in Edenbridge-Humber Valley. However, her statement insinuated the area to only be suitable for those who are generally accustomed to walking due to the far distances between destinations within the neighbourhood, thereby implying immobile individuals to perceive the area to be less walkable. This opinion was shared by another participant from the same home, Ava:

> *You can walk around the neighbourhood. You can walk around the park. It's a lot of walking if you can do it. If you can do it.*

Ava shared her opinion of the neighbourhood during an interview in her home at Chartwell Scarlett Heights with four other participants who agreed with her statement. Edenbridge-Humber Valley was perceived to be walkable for the seniors, permitting their physical health

would allow them to do so. However, with the exception of the highly-regarded scenery enticing outdoor activity amongst the seniors, the participants were not able to identify destinations to walk to. According to Helen, "there's no reason for us to go out from A to B! There's nothing for us! Just look around" (E018). With the exception of scenic walks, seniors have nowhere to go within comfortable walking distance.

Chapter 4.3.2.a | Crossing Areas

Among the street segments assessed using SWEAT-R, roughly half possessed intended crossing areas for pedestrians indicated by painted lines or changes in pavement colour. There were few segments situated deeper within the residential areas of the neighbourhood, however, that did not offer intended nor marked crossing areas for pedestrians due to a lack of sidewalks. Moreover, intended crossing areas for pedestrians existed on the busy Dundas Street West but markings on the ground as well as traffic and pedestrian signs were not available to guide traffic. Figure 29 of segment E17 depicts this pedestrian debacle; walkers must rush across the street and remain on a small median before completing the cross over to the other side of the road. There are few mid-block crossing areas throughout the neighbourhood as per the segments assessed; only segment E9 offered mid-block crossing to and from La Rose Park. As indicated in Figure 30, the area is not marked and crossing is not aided by any signalling systems or yield signs. To cross from the park on the right to the sidewalk on the left, pedestrians must take heed to traffic on their own.

The traffic and pedestrian signals and systems present in this neighbourhood were primarily automated traffic signals, stops signs, as well as pedestrian activated signals and automated signals. The time allotted by the traffic signals, both pedestrian activated and non-

activated, ranged between 22 to 25 seconds. Shorter allotted times were identified as concerns for the participants in Edenbridge-Humber Valley, similar to those residing in Wychwood. Particularly amongst those who relied on mobility aids and walked at a slower pace, ensuring streets are safely crossed was illustrated as an ordeal for seniors. Gladys, a participant from Delmanor Prince Edward with limited mobility who used a walker, described the dilemma she faced when crossing streets near her home:

> *I wait for that light and I rush too much to get across. Now, I shouldn't be doing that – I realize that myself – but I just do it, don't I? I wait until they actually stop – you never know when somebody is having [car] problems and can't stop his car…I don't want to walk until it's got my light…that shows how old I am. I don't want to have to rush! Because that's when you can get into trouble. And when I see that there's only 6 seconds left…I'm not starting out... I'm very careful at the lights. That's the one thing that bothers me. I will not venture out unless I've got, maybe 15 on the little clock.*


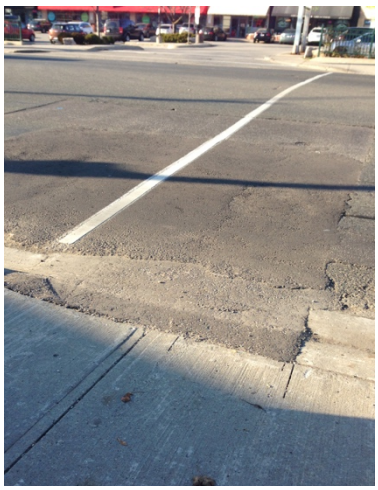

Figure 29: Crosswalk at Busy Intersection With No Pedestrian Signage on E17, Dundas Street West (Lee, 2016)

Figure 30: Unmarked Mid-Block Crossing to La Rose Park on Segment E9, La Rose Avenue (Google Maps, 2016)

Figure 31: Cracked and Uneven Crosswalk on Segment E17, Dundas Street West (Lee, 2016)

Sharing the same concerns as the participants interviewed in Wychwood, Gladys revealed that issues do not lie solely on seniors themselves and the speed at which they cross, but with vehicles on the street as well. Seniors must be wary of their own pace and balance, while watching out for negligent drivers. The ability to cross in time and fear associated with doing so was revealed to grow over time. George, a participant from Chartwell Scarlet Heights, experienced these difficulties first hand as he realized his walking speed slowed over the years, which further prevented him from taking part in other physical forms of activity:

> *[Difficulty crossing] is kind of an age-divided thing…as long as I could, I was walking back and forth over there and I could, you know, squeeze out a little bit and get there before the light changes. But as you get older, you're gonna slow down a little bit. Some people are gonna slow down a lot! And certainly that takes that extra exercise away from them.*

For accessibility and ease of crossing, all segments had ramps and most had grooves in the pavement as well as differing shades of grey as curb cut features. Not all ramps, however, were in good condition. As evident in Figure 31, a crosswalk along segment E17 was in disrepair with cracks and uneven areas. This might be difficult for seniors to maneouver over with or without the use of mobility aids.

CHAPTER 4.3.2.B | BUFFER AREA

Buffer zones are widely prevalent across the segments assessed; thirteen segments offered tree-lined buffer zones on both sides of the street. Of the remaining segments, three provided tree-lined buffer zones on only one side and six did not have buffer areas at all. Buffer zone widths ranged between thirty-six inches to as wide as eighty-nine inches in some places,

offering more distance from roads. Due to the absence of buffer zones in some areas, the number of mature trees along the buffers ranged between zero to fifty-four. The range, of course, is largely attributable to the length of the segment. Additionally, segments that had zero mature trees along the buffers still possessed younger, smaller trees as well as larger trees within private lots that still provided coverage along the sidewalks. The trees within the neighbourhood were well-loved by all participants from both retirement homes. For Agnes in particular, the trees in the area were perceived to be *"by far the best thing in this neighbourhood."* Of course, not all trees within the neighbourhood were along the buffer areas; they were predominately found within residential areas and trails along Humber River.

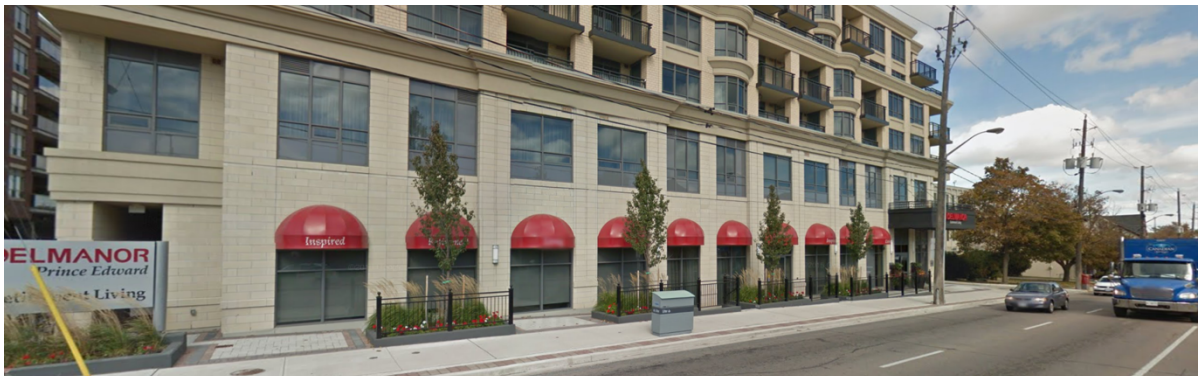

Figure 32: Lack of Sufficient Buffer Area Outside of Retirement Home (Google Maps, 2016)

Outside of Delmanor Prince Edward, buffer zones are narrow along Dundas Street West. Figure 32 shows the sidewalk immediately outside of the retirement home, evidently lacking a buffer area to separate pedestrians and traffic. During a focus group conducted with three women at this residence on January 22, 2016, the close proximity of the sidewalk to the busy arterial road made walking outside their home nerve-wracking. One participant, Helen, voiced her concern of walking along Dundas Street West:

> *When you're walking along the bridge – oh my god – you have to hang on! You have to hand on. Traffic shakes everything!*

Helen is referring to the overpass above the Humber River along Dundas Street West, just a block away from Delmanor Prince Edward. Even with a walker, she felt unsteady with the speed at which vehicles travelled along the street. SWEAT-R assessments of segments along Dundas Street West revealed a lack of traffic calming devices. In conjunction with the lack of buffer zones, traffic travelling at high speeds would consequently be perceived as even faster.

Chapter 4.3.2.c | Land Uses and Buildings

Residential, commercial, as well as some office and service land uses were dominant in Edenbridge-Humber Valley. Being mostly a residential area, nineteen of the twenty-two audited segments contained some form of housing. The most commonly found were single detached homes and duplexes. Figure 33 shows the types of homes typically found in this neighbourhood. Most of these types of homes were found in the inner regions of the neighbourhood and a number of low- and high-rise buildings of various sizes were found along busier arterial roads.

Among the street segments, commercial as well as office and service land uses were concentrated along Dundas St West, Royal York Road, and La Rose Avenue. The location of these areas were dispersed, offering accessible stores and other resources to local residents living in different pockets of the neighbourhood. A few of the coffee shops and restaurants could also

Figure 33: Typical Single-Detached Home found in Edenbridge-Humber Valley (Google Maps, 2016)

serve as community gathering places. Segment E9 contains the La Rose Plaza which provides a pizza shop, sandwich shop, convenience store, bank, pharmacy, coin laundry, as well as a church. On the E12 segment sitting on Dundas St West, the Humber Bridge Plaza included commercial uses such as a: home accents store as well as a cake, pastry, coffee, and flower shop. Institutional land uses include a foot and dental hygiene clinic. The most commercial uses were concentrated along segment E17, Dundas St West, within the Kingsway Hills Plaza. It included uses such as various restaurants, a grocery store, pharmacy, bank, gas station, a coffee shop, pet store, and toy store. A second nearby plaza contained an optometrist, a holistic health clinic, chiropractic clinic, seniors' day support centre, nail salon, hair salon, veterinary hospital, dry cleaning, and a clothing store, to name a few. Figure 34 is of the Kingsway Hills Plaza and illustrates the typical commercial set-up within the neighbourhood. Segments audited only contained strip malls or rows of stores and did not have large shopping malls or big box stores.

Figure 34: Kingsway Hills Plaza on Segment E17, Dundas Street West (Google Maps, 2016)

Participants exhibited a mixed response to the accessibility and variety of commercial and institutional uses available in the neighbourhood. In both retirement homes, participants had access to one or two plazas within a few blocks away and appeared relatively content with what they had to offer for simple everyday needs. However, it is important to note that most

participants identified the use of public transit or their retirement home's in-house shuttle bus to get to the various shopping areas within their neighbourhood. Gladys is one of them:

> *Well, I love to shop but I think that with the convenience of the bus here, we can get to any of the big malls.*

This, combined with the various negative perceptions regarding the far distance required to walk in order to reach these areas, indicated a lack of easily-accessible commercial and institutional resources in the area. Often, as participants indicated, the stores could be walked to but walking back home with shopping bags would be too difficult for them to do. Additionally, many of the commercial uses did not cater to senior needs nor did they pique their interests. The home accents store and toy store, for instance, were perceived by Agnes to be more fitting towards the families living in the area:

> *A mixed sort of shopping area – I don't know what they call it. Because there's not really any stores you want to wander into there, except Java Joe's or whatever it's called and the drug store… So it's a mixed group of stores that are not quite interesting… It's more family-oriented than seniors.*

Despite many participants' perception that the area lacked commercial uses that interested seniors, most participant strongly opposed to any new large commercial development when they were suggested. Helen, a participant from Chartwell Scarlett Heights, was particularly adamant about keeping the neighbourhood untouched:

> *No, no, no, no, no. We have enough retail stores out there. Leave them out there. We like to see a lot of grass, green, flowers, everything. And the river – Humber River. We see the ducks and everything there. Leave it alone.*

Living in Edenbridge-Humber Valley was a trade-off between convenience and vast open space; they wanted to keep the calm, serene, and green environment that they saw to be the most attractive feature of the area. There were a small number of participants, however, that noted preference for an increased number of smaller retail stores to shop in. One participant additionally mentioned developing a store such as a Walmart nearby, possible to increase access to a wide variety of goods within walking distance.

Segment E17 contained the only visibly designated senior's centre within neighbourhood boundaries. However, it did not appear to be in operation at the time of the audit. In fact, when one participant of Delmanor Prince Edward was asked whether she noticed its existence, she stated she did not know a senior's centre was offered in the area but was not bothered by the fact since all services are provided in-house within the retirement home.

The predominant building height in the neighbourhood ranged between one to two stories due to the large number of single family homes and low-rise commercial buildings. Taller buildings were situated along Eglinton Avenue West, Dundas Street West, Islington Avenue, and Scarlett Road, and a few of the taller buildings were visible from a further distance. Only segments E12 and E17 contained commercial buildings with vertical mixed use; retail stores occupied the ground floor while office spaces were on upper floors.

Chapter 4.3.2.d | Public Spaces

Parks and playgrounds are most prevalent along a number of street segments in Edenbridge-Humber Valley, amongst the list of public spaces in the SWEAT-R used. In fact, various small parks are dispersed throughout the residential areas of the neighbourhood.

Segment E9, for instance, is along La Rose Park and is shown in Figure 35. It offers a playground and outdoor open space for local residents to make use of. One participant, Ava, frequently visits the La Rose Plaza not too far from La Rose Park and perceived the park to be beautiful, quiet, and safe. There were no negative comments made by any participant of the park spaces within the neighbourhood. Additionally, outdoor fitness and recreation areas that include sports fields are available in the neighbourhood, such as the one along segment E15 shown in Figure 36. Although the sports fields are a part of Lambton Kingsway Jr Middle School's grounds, they are available to use for the general public after school hours.

Public seating areas were available in many of the parks across the neighbourhood, such as La Rose Park, shown in Figure 35. Aside from these park benches, however, there are very few public benches or other areas to sit along the street segments assessed. Those that are available

Figure 35: La Rose Park on Segment E9, La Rose Avenue (Google Maps, 2016)
Figure 36: Lambton Kingsway Jr Middle School Sports Fields on Segment E15, Marquis Avenue (Google Maps, 2016)

are transit benches and even those were few. The benches offered at bus stops mostly offered back support and were covered to shelter transit riders from rain and snow. Only one bench found along Dundas St W, segment E17, was found to have garbage littered on the ground and dirty glass panes. Other than this instance, the park spaces, recreational areas, and public seating

areas were well-maintained and undamaged. Participant remarks were consistent with these findings as all mentions of benches were associated with park benches. With the exception of these, participants identified a lack of public places to comfortably sit and rest while walking. One participant, Robert, jokingly suggested leaning on lamp posts in lieu of sitting on benches.

The Humber River and Humber River Recreational Trail was not part of the audit; however, it is important to note its close proximity to the neighbourhood. Portions of the river and trail are within a 500 metres and 1000 metres walking distance from the two retirement homes in which participants were recruited. The trails consisted of signage indicating main paths and pathways both paved and dirt roads to walk on. Large mature trees and shrubbery were present along all paths, creating a pleasant green environment. The trails and the Humber River itself appeared to be one of the most well-loved attributes of the neighbourhood amongst the participants. In combination with the vast open space throughout the area, created a very *"attractive"* (E027) environment for the senior participants to live in. There were no negative comments made regarding the open spaces, greenery, and overall aesthetics of Edenbridge-Humber Valley.

CHAPTER 4.5.2.E | SIDEWALKS

Sidewalks are present on at least one side of the street on all segments, except for E11 and E21, residential roads which do not offer sidewalks for pedestrians at all. Shown below in Figure 37, this presents a concern along segment E21 as paths may at times be obstructed by outdoor recreational objects such as basketball and hockey nets in addition to children playing on the streets. Fortunately, the number of segments without sidewalks are few and the

remaining twenty segments possessed either sidewalks on one or both sides of the street. All sidewalks along the segments were continuous, excluding two on segments E16 and E20. Presented in Figure 38, Kingsgarden Road on segment E20 can prove to be troublesome for walkers due to discontinuity in the sidewalk. Walkers are thus forced to walk alongside of cars on Kingsway Crescent, once turning from Kingsgarden Road. All sidewalks were made of concrete

Figure 37: Obstructions on Path with No Sidewalks on Segment E21, Princeton Road (Lee, 2016)
Figure 38: Discontinuous Sidewalk on Segment E20, Kingsgarden Road (Google Maps, 2016)

material and conditions ranged between "moderate" to "good," with only segment E16's sidewalks garnering a rating of "poor." Shown in Figure 39, the residential Walford Road was uneven and discontinuous due to driveways and shrubbery, serving as obstructions blocking pedestrians. This was the only segment found to have sidewalk obstructions that impeded walkability. Most other segments were smooth and clear of utility poles, garbage bins, and parked cars. Moreover, most streets were either flat or had gently slopes and all segments measured a minimum sidewalk width of at least four feet. Only four segments had more "moderate" slopes within residential areas. Perhaps for these reasons, no street segments were found to be under construction and blocked at the time of the audit. Participant recounts of sidewalk conditions were overall consistent with audit findings, illustrated by one participant's

description of sidewalks being *"very, very good"* (E016) in the area. Participants did not make any negative comments pertaining to the condition and maintenance of sidewalks apart from slopes experienced in some areas. Particularly when using walkers, some participants felt unsteady walking downhill and had to hold onto their walkers carefully with the brakes on.

Though sidewalks were objectively measured and perceived to be well-serviced and in good condition, a lack of protection from the sun, rain, and/or snow in the form of structure such as arcades and awnings, however was prevalent across all segments. This is attributable to the fact that all commercial and residential buildings were set back further from the roads. Even if commercial buildings possessed awnings to shelter pedestrians, they are not situated directly beside sidewalks. For this reason, these cases were not considered feasible to be accounted for. Arcades, awnings, and other similar structures along sidewalks were a part of the SWEAT-R assessment. However, participants made no mention and showed no concern over these neighbourhood features during our conversations.

Figure 39: Discontinuous and Uneven Sidewalk on Segment E16, Walford Road (Google Maps, 2016)

Chapter 4.3.2.f | Street Characteristics

Predominately a residential area, the street segments assessed were mainly residential roads. For this reason, all but four of the street segments possessed two lanes of traffic.

Segments E3, E5, E17, and E22 were on Scarlett Rd, Eglinton Ave W, Dundas St W, and Royal York Rd, respectively, and possessed four lanes of traffic. All segments were two-way streets and were made of asphalt. Fourteen of the roads possessed some form of traffic calming devices. These included speed bumps, marked crosswalks, sidewalk extensions, as well as signs for traffic and pedestrian activity. One participant from Delmanor Prince Edward, Ethel, noticed traffic lights were further apart on Dundas Street West, allowing for faster street traffic. Several other participants noticed the high volume and speed of vehicular traffic along Dundas Street West, seeing it as a *"very noisy street"* (E017). For residence living in Chartwell Scarlett Heights on Eglinton Avenue West, participants often hear sirens from emergency vehicles travelling along Weston Road to hospitals.

Other signage included yield signs for crossing deer in more forested areas. The most prevalent forms of traffic calming measures were marked crosswalks and sidewalk extensions along roads that tend to experience more vehicular traffic. Figure 40 of segment E14 is a depiction of a marked crosswalk as well as a sidewalk extension that abuts into the buffer zone to diminish crossing distances for pedestrians. Pedestrian permeability is low in this neighbourhood, with a number of segments ending in cul-de-sacs. One segment however, E7,

Figure 40: Colour Contrasting Crosswalk and Extension on Segment E14, Prince Edward Dr (Google Maps, 2016)

allowed for pedestrian thruway into Buttonwood Park. An entrance into the park at the end of Featherwood Place is presented in Figure 41. The low permeability did not seem to bother the participants; they typically stayed along main roads and seldom ventured into residential areas where cul-de-sacs were more prevalent. Since the retirement homes were along Eglinton Avenue West and Dundas Street West, this neighbourhood characteristic was not an issue for senior walkability.

Bike lanes were not widely prevalent across the segments with only the three segments all along Royal York Rd, E6, E18, and E22, offering designated bike lanes on a two-lane two-way street. The streets assessed within this neighbourhood were well-maintained, with conditions partial between "moderate" to "good." Those receiving the former rating possessed a number of cracks, slight potholes, and unevenness along the roads and those receiving the latter rating

Figure 41: Cul-de-sac with Pedestrian Thruway at Segment E7, Featherwood Place (Google Maps, 2016)

were smooth and seemed recently paved. Despite the slightly poorer conditions of roughly half the segments, there were no segments under repair at the time of the audit.

Chapter 4.3.2.g | Street Life

Based on the streets selected for assessment, Edenbridge-Humber Valley is not widely accessible by bus transit. Only six of the twenty-two segments possessed transit stops, most of

which were on the busier arterial roads. Participants from both retirement homes did not seem to be frequent public transit riders, as they spoke of transit ridership from a third person point of view. Only one participant from Delmanor Prince Edward, Ethel, made a recount of a personal experience taking the TTC bus in front of the home. Her first encounter had been negative and deterred her from ever taking the bus from Dundas Street West again, due to a lack of scheduling consistency:

> *The bus is terrible…The bus is just awful. It goes along here every 30 minutes except you never know when it's going to come. It leaves High Park at a certain time and it leaves Kipling, but there's absolutely no line of reason what time it hits here… So I walk to Royal York Rd and I take the bus and that's every 10 minutes you can get a bus down there; it's much better.*

Ethel then resorted to walking 10 minutes away in order to catch a more punctual bus. Ethel is capable of doing so as she is still physically apt at only 75 to 69 years of age. Both standing and waiting for unpredictable amounts of time as well as walking 10 minutes away for a bus, however, can be difficult for seniors of lesser physical capabilities. Though infrequent, the bus stops are well-lit with streetlights within their vicinity. The number of streetlights along the segments that were evaluated varied between zero to twenty-eight; residential roads possessed fewer lights and the busier arterial roads were the most well-lit. Visits were made on the evening of November 10, 2015 to the streets and segments such as E11 and E13 were very dark, with only the light from homes illuminating the streets. Many of the homes, however, were set back further into the lot and so illumination from lights in the home were faint. Moreover, the set back of homes prevented pedestrians from comfortably sitting and resting on front porches if needed; walkers would have to walk up driveways and into the lots in order to reach any

structure to sit on. For this reason, as illustrated in Figure 42, the front porches of these residential buildings were not considered appropriate to comfortably sit on. Moreover, participants had not made any recounts of walking into residential areas, thereby insinuating they seldom do so. It is unknown whether it is because of the lack of pedestrian infrastructure or permeability that deters them from doing so.

Outdoor dining areas to sit and rest were absent along all street segments, except for segments E9 and E17, where there are retail shops and restaurants offer patios. These segments also consist of restaurants and coffee shops that provide access to publically-accessible restrooms, in addition to facilities on segments E12 and E22. Lastly, parking for the general public was only seen to be available on segments E9, E17, and E22, where there are plazas with more parking spaces offered. These parking lots are disliked and seen as *"terrible"* (E020) due to the amount of walking required to get through them and to their shopping destinations.

Figure 42: Far Set-back of Homes in Edenbridge-Humber Valley (Google Maps, 2016)

CHAPTER 4.3.2.H | MAINTENANCE

The audit of neighbourhood maintenance revealed the quality and upkeep of the general area to be high, with few buildings and public spaces falling in disrepair. All buildings were assessed to be in good condition with the exception of a small number of private residential homes and retail stores that were disorderly and sported grime, chipped paint, and dishevelled lawns. There was only one abandoned building put up for lease on segment E12 at the time of the audit, presented in Figure 43. No litter, broken glass, or graffiti were found to be strewn on the ground or walls along the street segments. Since the audits were performed in Autumn, however, fallen leaves were found strewn along sidewalks and grass. Figure 44, taken of segment E22, is a depiction of similar scenarios regarding unraked leaves seen across a large

Figure 43: Abandoned Building on Segment E12, Dundas Street West (Google Maps, 2016)
Figure 44: Unraked Leaves on Segment E22, Royal York Road (Lee, 2016)

number of the street segments. A large number of the segments were along residential roads and all empty garbage, green, and recycling bins were seen neatly tucked away with only a few toppled over. Fortunately, these did not obstruct walking paths.

Participant perceptions of the neighbourhood's cleanliness and maintenance were consistent with audit findings. To cite one participant, Edna, they had *"nothing to complain about at all"*; all participants found the parks, streets, sidewalks, and general neighbourhood to be well-cared for by the city and private property owners. A quote taken from an interview with Rose is able to summarize the sentiments felt by the other participants:

> *You see very little paper and things in the park… And I think the neighbourhood is clean. There might be a plastic bag blow through or a piece of paper blow through, but the park is kept clean… It makes you feel good! It makes you feel clean.*

Not only is neighbourhood cleanliness important for aesthetics, Rose implies there are implications for health and overall quality of life. Her statement proved there are direct relationships between the built environment and how seniors living in the area may feel about themselves.

Chapter 4.3.2.i | Safety

Objective details of crime were attained from Toronto Police Services statistics and could be compared to participant observations; a total of 113 counts of crime incidences were reported in 2014 (Toronto Police Services, 2014). This is less than the number of reported crimes in Wychwood in the same year.

In Edenbridge-Humber Valley, there were fewer concerns over safety than those voiced by Wychwood participants. Participants from both retirement homes believed the neighbourhood to be very safe, hearing of few crime instances over the years. A number of the

participants attributed the area's safety to the lack of teenagers present. Robert, a resident of Chartwell Scarlett Heights, associated crime with teenagers and development:

> *See, the beauty of this area at the moment is there's really no area where teenagers can congregate and form gangs. Once you start developing, even with low-rise one storey buildings, that's what's gonna happen. It's gonna start congregating areas for teenagers and so on. At the moment, there's nothing*.

As discussed in Chapter 4.3.2.c, land uses in the neighbourhood are predominately catered towards families. Therefore, as Robert suggests, there is little to do that would interest teenagers and with few teenagers present, seniors feel more at ease outdoors in the wider community. The presence of teenagers was not the sole indicator of safety identified by the participants; nightfall was determined to be a safety hazard for seniors. At night, the participants felt it difficult to properly see, adding to their fear of falls:

> *Daytime, no nighttime. No way… Because it's dangerous at night for us to go, we could trip and fall and we have to wear these pendants but it doesn't work when we're outside. It only works on the inside* (E018)

Helen additionally raised the issue of their retirement home's safety pendant only working indoors. With few walkers out in the neighbourhood in general, Helen perceived lower chances of being found by others if a fall were to occur.

Chapter 4.3.2.j | Social Capital and Sense of Community

Based on participant recounts of the wider community, *"you can see seniors, you can see children, families"* (E023). All participants found other local community members to be friendly and helpful, creating a pleasant environment outside of the retirement home:

> *I have always found that you make the first spoken word and very few people will ignore you. If you say, "hello," they say, "hello," back. And I have found this neighbourhood that way* (E026)

However, many participants have noticed infrequent and sometimes seldom contact with other community members. This means *"you really don't get to know them. Because other than walking, you never see them"* (E026). Another participant, George, felt the same way:

> *You really don't get to know your neighbourhoods per se because you live in the area. Most of the areas, they're private. They live here at night. They're gone in the morning; you know? Whether they're going by bus or transit, or whatever the heck they're going on. They don't see any of their neighbours until they get back at night.*

Identifying Edenbridge-Humber Valley as a bedroom community, participants implied it was difficult to establish a relationship with the community and its members. Even if commuters came back to the neighbourhood at night, participants felt *"no reason to go out at night at all"* (E016) due to a lack of places open during the evenings. Thus, many participants implied a disconnection with the community due to the lack of social interaction.

Chapter 4.3.2.k | Secondary Observation

Consistent with first impressions, the neighbourhood was largely residential with large open spaces in the form of parks, recreational areas, natural wildlife, as well as greenery on private lots. These collectively created a calm walking environment, particularly within the residential areas. Despite the fact, it was noted that there were very few walkers throughout the neighbourhood. The walkers that were present were on the busy arterial roads at the time of the audits; fewer were found walking within the residential areas. The low number of walkers seen

on the streets of Edenbridge-Humber Valley may be due to the far distances between destinations of interest present. There are large open areas between buildings, many of which are parking lots or green spaces. To walk from a residential area to a commercial strip, there is therefore little to entertain the walker apart from trees and greenery.

A visit to the neighbourhood on the evening of November 10, 2015 found very little to no pedestrians outdoors. With widely spaced lighting, very little lighting in the residential areas, and commercial areas closed for the night, locals had few reasons to be out. The night environment in this neighbourhood was less favourable to walk in compared to daylight, where there are many cars on the road. Though most likely very safe due to the predominant residential use, locals would most likely be hesitant to be outdoors in the evening.

Chapter 4.4 | Perception of Retirement Home Environments

All participants lived in retirement homes within boundaries of their respective neighbourhoods. These homes offered an array of amenities and services to its residents. In addition to private apartments for independent living, the retirement homes offered meals served in dining lounges, salon services, libraries, exercise equipment, exercise classes, social events, and shuttle bus services. This chapter describes participant experiences with their homes in relation to the wider community and walkability.

Chapter 4.4.1 | Wychwood

Participants from Wychwood were recruited from St. Matthew's Bracondale House and Christie Gardens Apartments and Care. Both groups of participants appeared content, enjoying the services provided and sense of community experienced within the homes. In fact, the social

networks and interactions within the homes themselves seemed to have a more significant impact on many of the participants than the neighbourhood as a whole. Mildred, for instance, had a hard time speaking solely of the neighbourhood when enquired about her life in Wychwood:

> *Very pleasant. Of course, the pleasant part is Christie Gardens which is a very good place for a senior to live. And I've been there nearly 2 years and I feel I am very lucky to be there* (W006).

Her views were shared by another resident of Christie Gardens, Florence, who found it *"really hard to disassociate with Christie Gardens."* This can largely be attributed to the strong sense of community experienced by many of the participants with fellow residents, building staff, and caregivers. As stated by a resident of St. Matthew's Bracondale House, *"we're like a big family here"* (W013). During visits to both homes in Wychwood, residents were familiar with another and many participated in social events or dined together in groups.

According to Mabel, *"you have to take an interest."* Residents of the retirement homes were provided with an array of activities to take part in on a daily basis. These activities ranged from exercise classes to musical plays and choirs brought in for entertainment. However, residents had to assume the responsibility of actively participating:

> *You gotta keep involved, because it's so easy lay on your couch and watch TV but you've gotta get out and speak to people – get involved in programs and that…We have 30 programs here that we can get involved in – 30 things – so nobody should be bored* (W001).

In Christie Gardens and similarly in St. Matthew's Bracondale House, the variety of activities cater to the different interests of residents. With activities planned for the day as well as the evenings, participants were content and able to keep their schedules well-filled. In fact:

> *There's so much to do at night here – you know, there's lectures, there's concerts – sometimes you just want to stay home!* (W003)

Travelling to destinations outside of the homes could be difficult, particularly with limitations in mobility. Providing entertainment indoors limited the need for residents to leave the home. In fact, participants often *"walk up and down the corridors in the winter time for their exercises…and [they] get social activity in the halls*" (W004) because *"sometimes it's not possible [to go outside] so it's better to walk, period"* (W003). An alternative option to walking the hallways of the home is to participate in exercise classes offered on a regular basis.

> *When you live inside in a small apartment, you really need to force yourself to go out and meet – even coming to the exercise classes, a part of the exercise is the social side as well* (W008).

As Lori suggested, both physical activity in the form of walking as well as social interaction are both attainable while remaining indoors.

Few negative comments were made of the participants' living environments. One notable statement made by Mabel, however, reflected how a number of seniors must feel when living amongst other seniors:

> *My father was 91 years old and accustomed to being up and down and sideways with health and stuff. When you come into a home and you see the*

> *same thing or you feel the same thing, it gets to you… So that's why they take the people out.*

Mabel believed it would be harmful to overall well-being if seniors were to solely stay indoors. To be surrounded by seniors and their ailments would take a toll on emotional well-being. Both homes in this neighbourhood offered shuttle buses to scheduled destinations on a daily basis, allowing many of the participants to maintain wider activity spaces. The buses were said to be often used by the participants, particularly amongst those less mobile and no longer driving.

CHAPTER 4.4.2 | EDENBRIDGE-HUMBER VALLEY

Participants from Edenbridge-Humber Valley resided in Delmanor Prince Edward and Chartwell Scarlett Heights. Similar to the sentiments shared by Wychwood participants, both groups were very content with the living conditions provided by their respective homes. In fact, many of the participants found it difficult to disassociate their lives and overall perceptions of community from their respective retirement homes. When a focus group at Chartwell Scarlett Heights was posed the question, *"What is it like to live in this neighbourhood as a senior?"* Bernice was the first to respond, *"How do we answer that? Because our life is in here,"* to which other participants agreed. This inferred their activity spaces predominately remained within the retirement home, resulting in the home making a more significant impact on their quality of life than the wider community. In effect, some participants perceived Edenbridge-Humber Valley and particularly the community within the retirement homes themselves as akin to a *"small town*" (E027), perhaps due to their close-knit and respectful environments:

> *A very small town. We're very neighbourly and nobody comes and bothers me to join things if I'm not interested, you know? But if I want to be part of*

> *something, I know I'm welcome. And that's small-town. They don't come and live with you but they don't ignore you either. It's good. It's friendly* (E028).

Participants often greeted and conversed with other fellow residents passing by their focus groups or interviews. With the ability to experience strong and reciprocal social networks within the homes, participants felt they had little need to leave their buildings for social interaction:

> *We don't have to go to a seniors' community place because we have everything here* (E016).

As indicated by the statement made by Gladys above, some participants have no need for a seniors' community or activity centre outside of the retirement homes. Of note, participants from Edenbridge-Humber Valley spoke more of the community within their retirement homes than those in Wychwood. More specifically, participants here actively spoke more of the in-house amenities and services as well as indoor physical activity than any other subject matter. This may be attributed to the fact that land uses surrounding both homes in this neighbourhood lacked in variety and as indicated by Agnes, the stores *"are not quite interesting…it's more family-oriented than [for] seniors"*. Retailers were often brought into the homes themselves to allow residents to shop without leaving the building. Even Rose, a very active and mobile participant over 90 years of age, did not feel the need to venture out often for shopping:

> *They bring in clothing here, the stores. They bring them in and – I've bought this here, I've bought that here, you can buy shoes, you can buy hats, you can buy scarves, underwear… Yeah, we don't need the stores, really.*

If the retailers were found to be unsatisfactory, both homes offered shuttle bus services that brought residents to different scheduled destinations:

> *Delmanor owns a bus – they take us to our banks, to Loblaw's, to Walmart, they take us downtown to the theatres. They take us to the casinos. To go shop at Sherway. We go to Cloverdale mall; we go to Shoppers Drug Mart at Six Points Plaza. What do I need to worry about?... You get that calendar that tells you what day they go to all those places. So you just make arrangements, you sign up, and they take you. Oh, it is a great service. One time there were only four of us signed up to go to Walmart so they sent us over in a cab! So I wouldn't – I don't know what they could do to improve it for seniors (E016).*

With both these services available to residents to use, there is little need for utilitarian walking in Edenbridge-Humber Valley. A number of participants indeed seemed to have few reasons to leave their homes, even for fresh air. Gladys and other residents of Delmanor Prince Edward did not have to leave the building to be outdoors for fresh air:

> *No, [walking indoors] isn't as good because you're not getting any fresh air. But we have that roof! Have you been up to see that roof?... You could go there and you can walk around there. Your walk around the main building in the centre – for my walking – 164 steps. So people walk around!*

Some participants may lack the motivation to go outdoors altogether. Edna, for instance, had Arthritis and required a walker at all times. In the six years living at Chartwell Scarlett Heights, she had only went out for a walk around the property grounds once. Although she found a comfortable place to sit down and enjoyed the experience, she felt too lazy to ever repeat the exercise again. She understood the benefits of going outdoors for fresh air and performing physical activity, but lacked the motivation to do so: *"I should do that more often, but I'm lazy."* Additionally, the distance between the homes and commercial areas nearby may be too far for Edna and other seniors to travel. Edna, for instance, had great difficulty with physical movement

due to Arthritis and relied on a walker. She explained, *"without going outside, it's quite a journey to me to go down to the hairdressers… I'm feeling pain with every step."* Just walking to the hairdresser within the home required much effort for Edna, as well as for many other seniors with similar health circumstances: *"Most of us are active just walking down the building"* (E022). In fact, many participants felt no desire to recreationally walk far from the home at all: *"There's no reason to walk around there [near residential area]. We walk around our own grounds"* (E018). A number of participants thus performed most of their walking indoors to and from various ends of their buildings and walking outside of their homes amongst these less mobile participants additionally occurred within shopping malls and plazas, as implied by the previous quotes. Indoor walking environments are evidently quite different from outdoor environments and comparisons between the two may be conducted in future studies. This notion is addressed further in Chapter 5.3.

Many participants chose to walk indoors rather than outdoors due to comfort, convenience, and weather. Yet, a number of participants still prefer outdoor activity; indoor environments were dull with little to keep residents entertained while walking the halls:

> *I think it's more important to walk outdoors than indoors. Because walking down a corridor is extremely boring… What are you going to look at in a corridor? Walls (E017).*

There were divided opinions amongst the participants who preferred outdoor over indoor activity. While the predominant reasons for indoor walking were physical health limitations and weather, a number of the more mobile participants were not opposed to indoor walking as well.

Thus, outdoor walking behaviour can also be attributed to varying circumstances at the individual level.

Chapter 4.5 | Personal Circumstances

Whether directly or indirectly, each participant had alluded to some form of personal circumstance that either facilitated or inhibited walking. Most of these participant observations pertained to physical health and personal motivation. Good physical health and mobility levels enabled seniors to leave their homes at will and walk in their neighbourhoods. More than half of the participants were comfortably able to do so either with or without a mobility aid. A number of participants, however, were only occasionally able to with short distances and frequent breaks depending on fluctuating states of well-being. Debra, for instance, experienced discomfort with physical activity, stating "my body is an obstacle" (W003). She would have episodes of arthritic pain, limiting the amount of activity she could perform:

> *I now recently developed another episode of arthritis. And my feet are very sore and swollen and my hands are very sore. My hips, my knees…walking is quite difficult now. But it used to be that I walked 40 minutes a day … It hurts so much. Arthritis hurts so much and I don't wish to push it through that pain.*

Debra was only able to conduct her usual walks around the neighbourhood when the pain subsided. A number of participants, on the other hand, were not able to leave their homes at all despite the desire to. Reasons varied, ranging from physical inability to fear of falls from previous accidents. Judy describes her weakened physical health and its impact on her ability to participate in activities around her:

> *The trouble was that when I came, I was only 81. I said, "Yes, yes, yes," and now I'm saying, "No, no, no." Because I had a lot of energy and got involved in a lot of things because I had the energy and enthusiasm. I still do, but as years go on you just have a few more problems…those steps are getting steeper every year.*

Margaret had two falls outside of her home in the months before her focus group and had remained indoors since, due to physical deterioration and instructions from her daughters to do so. When asked what could be done to the physical or social environments of Wychwood to improve and ease her walking experiences outdoors, she sadly replied:

> *My need's nothing. I'm a lost case.*

As with a few other participants, Margaret was defeated by her physical health and no longer possessed the enthusiasm or motivation to interact with the outdoors. Frustrated, she no longer concerned herself with issues regarding walking. Not all participants shared this opinion, however, as many still pushed themselves to remain active physically and socially. Understanding the benefits of remaining active, particularly outdoors, was proven to be the underlying cause of self-motivation amongst many participants. Judy relied on a walker and despite some discomfort experienced when walking, she continued to encourage herself and found her time walking outdoors to be healing:

> *Keep active. You gotta keep involved, because it's so easy lay on your couch and watch TV but you've gotta get out and speak to people – get involved in programs…It's not healthy to stay in your apartment. You start getting morbid and thinking. Get outside and don't think.*

A number of participants conveyed a fear of becoming immobile if they ceased walking and other forms of light activity. In fact, the drive to maintain and optimize health was greater than

draws of the physical and social environments. As Agnes described, *"Nothing encourages me except for the fact that I know I have to walk everyday."* Mildred felt similarly as she described her walking patterns:

> *Sometimes I do it just to get some exercise and get some fresh air. I don't really care where I go. Most times I just wander off in any direction at random… There is a group who does [indoor walking], I haven't ever thought of joining them. I would far rather off be being outdoors for a walk (W006)*

Similar to opinions shared by other participants, it appeared that physical and social environmental characteristics did not play the sole role in determining walking behaviour. Participants in both neighbourhoods seemed to walk regardless, feeling more concerned with walking as a form of physical activity to attain health benefits over anything else. Thus, the preliminary conclusion from these findings was that stimulants of walking from the physical and social environments in participant neighbourhoods were only added benefits in encouraging walking behaviour. A more walkable environment, however, would still help make it easier for seniors to navigate and manoeuver themselves outdoors.

A further assessment of transcripts defeated this preliminary conclusion, as it revealed the physical health and personal motivation themes to be most frequently identified as deterrents of walking behaviour amongst participants in Edenbridge-Humber Valley. This may be attributed to the existing land uses near both retirement homes that participants were unable to relate and take an interest in. Helen, resident of Delmanor Prince Edward, described the lack of destinations that interested her and other seniors:

> *Well, there's no reason for us to go out from A to B! There's nothing there for us! Just look around (E018).*

In Wychwood, zero participants indicated a lack of motivation. This suggested that the lack of diverse uses in Edenbridge-Humber Valley may have contributed towards the absence of motivation amongst some of the participants, despite the understanding of the health benefits linked to walking. Helen and Edna, for instance, were both unmotivated; the former stated that she, "just never bothered. Damn lazy. Too lazy, that's why. Too lazy" (E017) and the latter claimed: "No. That doesn't interest me – not exercise! Move more than I have to? I don't think so" (E028). Both women understood the health benefits of walking and keeping physically active as a whole, as indicated in their transcripts. Walking behaviour is thus largely dependent upon personal motivation and at a broader level, perspectives on health outcomes; whether or not well-being is important and valued.

Chapter 4.6 | Emotion

Walkability is linked to the ability to walk and thus, physical health. Without the motor skills to do so, seniors lose their independence and must remain in their homes. Yet, being outdoors and experiencing green open space and trees can improve spirits; outdoor environments can be sources of fresh air, sunshine, and community interactions. Charlotte described her pleasant and almost enlightening experiences with her walks outside. She found being cooped up in her apartment to be socially-isolating and doing so would put a damper on her mood and mental health:

> *It's good for you mentally and emotionally, just being outside. I enjoy it all the time, just even looking at the sky or trees or whatever it is. I think it's that*

> *getting you out of yourself. Just staying in – I mean, depressed is a little too strong – but you know, you just need it. It's uplifting.*

Participants of this study were partial to walking both indoors and outdoors, with a slightly greater number in Edenbridge-Humber Valley preferring to do so in the hallways of their homes. Yet, doing so limited their exposures to the aforementioned positive benefits of being and walking outdoors. This is even more so when a greater sense of community is perceived within retirement homes than in the wider community:

> *You wouldn't be so lonely if you lived in a house by yourself… You wouldn't like it by yourself and it would be hard to even talk to neighbours because a lot of neighbours don't like to talk to old people. They don't! But here, we've got everybody to talk to (E018).*

Ageism was identified as an issue when speaking of sense of community in Edenbridge-Humber Valley by a few participants; they found few people to relate to and did not believe they were seen as members of the community by the people outside of their retirement homes. This perception self-facilitated their sedentary behaviour and seclusion, further increasing risks of isolation and depression.

Feelings of frustration and melancholy were exhibited by a number of participants who no longer felt capable of walking independently outdoors and engaging in activities outside of the home. Margaret was the strongest indication of self-exasperation and appeared to abandon all hope; when asked how Wychwood could be improved for senior walkability, she sadly replied, *"my need's nothing. I'm a lost case."* She reminisced the strength she possessed when she was younger and physically healthier: *"I was a walker. A great walker…but not I can't walk at all without help."* She was no longer the same person she remembered herself to be and seemed to

lack any motivation and zest for life, further facilitating poorly perceived walkability and discouraging any walking behaviour.

The identification of participant emotions in the data resulted from a negative case analysis (Baxter & Eyles, 1996), as only a few participant alluded to emotional ties to walkability and their walking experiences. Despite the lesser prominence of the theme, senior emotions relative to walking experiences are important areas to study as there are implications for stimulating and hindering walking behaviour.

Chapter 4.7 | Summary of Neighbourhood Comparisons

Wychwood represented a neighbourhood of high walkability and Edenbridge-Humber Valley exhibited a neighbourhood of low walkability in this study. A walkability audit of fifty-eight randomly selected street segments using the tool, SWEAT-R, did indeed reveal an area of higher walkability in comparison to the twenty-two segments evaluated in Edenbridge-Humber Valley. This is particularly the case when assessing the land uses and buildings, sidewalks, streets, as well as the overall level of difficulty experienced walking in the neighbourhoods. These physical attributes play important roles in shaping community walkability and were discussed at length by participants in both neighbourhoods.

SWEAT-R results of Wychwood and Edenbridge-Humber Valley, as presented in Table 7 in Chapter 4.3, revealed the former to be of higher walkability than the latter. Wychwood street segments produced higher percentages of walkable street segments for most indicators, including the availability of curb cuts at crossing areas and continuous sidewalks. Looking at the overall level of difficulty alone, Wychwood possessed a greater proportion of street segments

that were very easy to walk and a lower proportion of difficult streets. Levels of difficulty were assessed based on factors including the degree of slopes, number of obstructions, level of pedestrian and vehicular traffic, as well as the presence of pedestrian infrastructure at crossing areas. Moreover, a number of participants from Edenbridge-Humber Valley expressed much negativity towards the lack of relevant land uses and their accessibility in terms of walking distances.

There were select areas where Edenbridge-Humber Valley fared better than Wychwood; the latter performed poorly in terms of sidewalk obstructions, benches, street life, bike lanes, and aesthetics. Since all participants agreed to the relative walkability levels of their neighbourhoods, however, this alludes to one potential limitation of this study relating to the segments selected for audit. Segments were randomly selected in both neighbourhoods, yet a misrepresentation of the neighbourhood could result due to the large number of possible street segments. Random sampling of segments resulted in Wychwoods's audit to exhibit a far greater proportion of purely residential streets than Edenbridge-Humber Valley. Temporal variances in neighbourhood environments due to time of day, week, and season influence audit results, as well. For instance, the presence of garbage and recycling bins on the street, fallen leaves, and presence of walkers can all vary substantially. These factors may have then portrayed Wychwood as less walkable than it truly was and vice versa, at the time of audit. Despite the fact, however, participant observations of neighbourhood characteristics were still harmonious with SWEAT-R findings.

CHAPTER 4.8 | CONCLUSION

This chapter presents the findings of four focus groups, three go-along interviews, and five traditional interviews with twenty-eight senior residents of four retirement homes between Wychwood and Edenbridge-Humber Valley. Additionally, the objective assessment of the neighbourhoods from the tool, SWEAT-R, are presented for comparison. The participants were asked to describe their walking experiences within their respective neighbourhoods; whether they had observed any characteristics that encouraged or deterred walking behaviour in the built and social environments.

The findings revealed that participant perceptions of walkability in their neighbourhoods were mostly consistent with results from SWEAT-R. Elements of the social environments including safety and social capital, however, were ineffectively captured. SWEAT-R focused on the number of street lamps, lanes of traffic, as well as crossing times at crosswalks. These illustrated an indirect portrayal of how safe a pedestrian may feel, but failed to depict a perception of crime or sense of security in the area. In terms of social capital, the audit did not capture the number of people on the streets, the friendliness of locals, and levels of social interaction that may occur in public spaces. Public spaces may be available and counted, but could be underused. Social capital was important to participants as it fostered sense of community, encouraging further interactions with the wider community. Although observations of both safety and social capital could be made in the Secondary Observation Form, researcher recounts of the social environments differ from the lived experiences of senior participants.

A number of discrepancies were additionally present due to the inability of SWEAT-R to account for temporal variances in neighbourhood conditions and accurate perceptions of walkability. The qualitative investigation methods were able to acquire additional personal information of the participants that served as valuable context shaping walking choices. These include descriptions of their overall health, personal motivation to remain active, and the convenience of their retirement homes. The participants largely agreed that walking both indoors and outdoors are necessary for health and should be performed when possible, no matter the physical and social conditions of the neighbourhood. Walkable communities are thus seen as an added benefit rather than a necessity for walking for seniors, particularly since activity spaces shrink with age. With these findings in mind, there are theoretical and methodological implications for walking behaviour and walkability assessment tools that would benefit seniors living independently in urban areas. These will be discussed in the following chapter.

CHAPTER 5 | DISCUSSION

CHAPTER 5.1 | SUMMARY OF KEY FINDINGS

The preceding chapter describes the key findings of this research relative to objective and subjective, as well as positively and negatively perceived environmental attributes identified by senior participants. This chapter presents a more focused analysis and discussion of the key research findings in addition to their implications.

CHAPTER 5.1.1 | DETERMINING LINKAGES

Some researchers posit there is too weak a correlation between the built environment and walkability; it is unclear whether built forms are most influential in stimulating walking behaviour, while others argue the opposite (Frank, et al., 2010). The findings of this research contribute toward this ongoing debate as factors outside of the built environment were identified by participants to influence perceptions and subsequent drivers of walking behaviour. This raises the question of whether it is possible to foster positive perceptions of walkability and motivate walking behaviour through the built environment, despite hindering social and personal factors. This is discussed in further detail within this chapter.

As described in Chapter Four, the social environment, unique personal circumstances, and living environments are three broad variables that play integral roles in shaping perceived walkability and determining walking behaviour, thereby highlighting the significance of the ecological model. Built form is thus merely one of the many factors that determine how walkability is perceived and resulting behaviour. Along with characteristics of the physical environment, these are arranged in the concept maps that represent findings from both

neighbourhoods, presented in Appendix M. The concept maps summarize the key themes derived from the research data and serve as an organizational tool to allow for an in-depth understanding of the stimulants and deterrents of walking behaviour and their dynamics, as described in Chapter Three. Physical characteristics that have both stimulating and deterring properties for walking behaviour include the themes: path characteristics, street characteristics, land uses and buildings, public spaces, nature and animals, as well as aesthetics. Social characteristics include social capital and safety. The home environment theme encompasses characteristics of living conditions that influence outdoor walking behaviour. The personal circumstances theme is representative of variables such as health and emotion at the individual level that determine how walkability and the act of walking is perceived and carried out.

Overall, findings were consistent with quantitative research that revealed the number of commercial destinations within safe (Booth, Owen, Bauman, Clavisi, & Leslie, 2000) and comfortable walking distances (King, et al., 2003; Patterson & Chapman, 2004) and were positively linked with higher rates of walking amongst seniors, while perceived vehicular traffic was negatively correlated (Wilcox, Bopp, Oberrecht, Kammermann, & McElmurray, 2003). Findings were additionally parallel to the fact that walking environments are experienced differently by different people, particularly between those of varying motor skills and function (Montemurro, et al., 2011; Negron-Poblete, Séguin, & Apparicio, 2014). Participants highly dependent upon their mobility devices reported greater difficulties with walking in outdoor environments and those who appeared to possess better physical health described less fear of safety hazards within their neighbourhoods. Moreover, age was not a major determining factor in walking behaviour as even the oldest of the participants was able to keep active and perform

her regular shopping chores nearby her home. Findings additionally echoed existing research pertaining to walkability, social capital, and sense of community (Leyden, 2003); more positive perceptions of walkability and higher levels of walking behaviour were apparent amongst participants from the more walkable Wychwood than the less walkable Edenbridge-Humber Valley. This consequently highlighted one of the major findings of this study: seniors living in less walkable, almost isolated areas from lack of varied land uses and social capital, are more susceptible to remain in their homes and lose interactions with the wider community. This was the case amongst many of the participants residing in Edenbridge-Humber Valley. With few interesting destinations to walk to and a small number of pedestrians on the streets as well as community members in public areas, residents of retirement homes were left to develop stronger social ties and networks within their homes with fellow senior residents despite many wishing for wider connections outside. There are thus implications for theoretical as well as practical planning, social strategies, and interventions. These are discussed in Chapter 6.1.

Chapter 5.1.2 | Measuring Walkability

Wychwood and Edenbridge-Humber Valley were selected for this study to represent opposing objectively measured walkability, and in fact participants perceived these differences in accordance with their self-reports. Higher population density, street connectivity, and mixed land-uses have been linked consistently to increased rates of walking (Saelens, Sallis, & Frank, 2003). The findings of this research revealed the same results as a greater proportion of Wychwood participants expressed positive perceptions of walkability and interest in walking in their neighbourhood than those in Edenbridge-Humber Valley. Potential reasons are provided in this section, along with summaries of key findings in both neighbourhoods.

Themes most prominently brought forward in the dialogues with Wychwood participants include land uses and buildings, public spaces, and sidewalk characteristics. Participants had many positive experiences with the diverse and accessible mix of land land uses in the area, in addition to the availability of park spaces and public areas to sit. Based on the objective audit results, Wychwood possessed a range of land uses dispersed throughout its neighbourhood boundaries. Commercial, public, institutional, and office uses were found integrated within residential areas; segregated land uses were seldom found. Moreover, mixed-uses were dense due to smaller lot sizes prevalent throughout the area as well as vertical uses in select areas. Coupled with a predominant gridiron street network, residents across neighbourhood should possess good access to varied uses. Participants from Wychwood confirmed these objective findings, as most spoke well of the everyday resources and services within walking distance. These included public park spaces and their outdoor seating areas, a number of which were found within walking distance to the retirement homes. Perceived and objective findings for public spaces and benches were thus misaligned, most likely due to smaller activity spaces that are typical of seniors. Street segments were evenly dispersed throughout the neighbourhood, yet the participants spoke mostly of spaces within vicinity of their homes.

SWEAT-R revealed sidewalk conditions to be relatively good, based on availability, path continuity, width, condition, slope, and obstructions. These objective findings proved to be another misalignment with perceived findings, as participants provided more negative observations of Wychwood's sidewalks than positive. The proportion of Wychwood participants using mobility aids was 64%, which contributed towards difficulties that would be experienced with less than perfect sidewalk conditions. A number of participants described their challenges

with manoeuvering their walkers around other pedestrians, obstructions, and cracks in the sidewalk. These struggles cannot be accurately understood using SWEAT-R. Another discrepancy between objective and subjective findings revealed in the data collected from Wychwood was the frequently discussed theme, nature and animals. Numerous participants discussed the appeal of birds, dogs, general greenery, and trails. SWEAT-R only captures the number of trees along buffer zones and maintenance of gardens. Although such observations could be included in the Secondary Observation Form, it is difficult to accurately mimic senior perceptions.

Participant observations of Wychwood were largely consistent with audit results. However, dialogues exchanged with senior participants revealed the audit did not consider the social environment that were pertinent to walking experiences as much as the built environments. Participants reflected most upon community safety and social capital. Though both were enquired into in the SWEAT-R Secondary Observation Form, general neighbourhood scans conducted by researchers were not as accurate as observations made by seniors themselves. The presence of teenagers in Wychwood, for instance, was not deemed to be of issue prior to speaking with participants. Several participants, however, associated teenagers with crime and preferred to walk in areas where few were present. In addition, participants made observations of street life, social interactions, children, and overall sense of community experienced outside of their retirement homes. For some of them, such as Charlotte, engaging in conversation and developing relationships with nearby residents enriched her frequent strolls outside Christie Gardens. These findings were not comprehensively captured by SWEAT-R, nor its Secondary Observation Form.

The themes most notably discussed by Edenbridge-Humber Valley participants included neighbourhood aesthetics, land uses and buildings, street characteristics, and sidewalk characteristics. Participants provided the most positive recounts of neighbourhood aesthetics out of these themes. The general green environment, trails, and Humber River were all highly appealing to each participant. On the contrary, land uses and buildings, street characteristics, and sidewalk characteristics were not perceived well. As described in Chapter 4.3.1, Edenbridge-Humber Valley consisted of winding roads in a "loops and lollipops" fashion which reduced connectivity and ease of travel between one place to the next. Wide open spaces and parking lots additionally contributed to the perception distance, due to the lack of features and continuous facades that would engage the interest of pedestrians. The neighbourhood exhibited segregated land uses and was predominately residential with select strips along arterial roads offering assorted uses. Though these commercial areas were spatially well-dispersed, many participants did not consider them to be within walking distance. Moreover, a number of participants believed nearby uses to be more well-suited towards families than to seniors. These two factors combined were not adequately addressed in SWEAT-R. The tool did include checklists for all forms of land uses as well as visually-explicit senior-oriented buildings, but the checklist itself does not check whether seniors would feel welcome or take interest in them. These attributes must then be included in the SWEAT-R Secondary Observation Form, albeit based on researcher observations. In terms of street and sidewalk characteristics, participants were unhappy with the level of traffic, slopes, and permitted crossing times at crosswalks. Their statements aligned with objective findings, as seen in Table 7. As briefly described, the overall green environment and nature present in Edenbridge-Humber Valley was widely appreciated

amongst participants in this neighbourhood. Thus, nature and animals was a prominent theme in the data collected here. Similar to what was described in Chapter 4.6.1, SWEAT-R had insufficient coverage of this indicator of walkability.

Participant observations of walkability in Edenbridge-Humber Valley were largely consistent with audit results. Similar to data gathered in Wychwood, social environmental characteristics were poorly represented in the SWEAT-R tool; community safety and social capital were two prominent recurring themes discussed at length by the participants that are not accurately depicted in the SWEAT-R checklist and Secondary Observation Form. With residential and commercial uses that are less dense than that observed in Wychwood, it was noted in the Secondary Observation Form that perceptions of crime and danger may be high due to a lack of "eyes on the street." Yet, participants believed the opposite and saw Edenbridge-Humber Valley to be a safe family-oriented neighbourhood. In terms of social capital, participants provided a mixture of responses regarding the number of social encounters and neighbourliness experienced in the area. Most, however, found few locals outdoors to interact with and thus developed poor relationships with the wider community. This feeling could result in higher participation rates in indoor activities within the retirement homes if sense of community is fostered more strongly within the home. These findings, as with those in Wychwood, were not accurately captured by SWEAT-R, nor the Secondary Observation Form.

In sum, participants expressed less concern over physical pedestrian infrastructure; it was hypothesized that the participants would focus most on areas relevant to walking surfaces, crosswalks, curb extensions, and traffic, based on literature. While they certainly did speak to these attributes, much emphasis was placed on social environments which alluded to the

significance of factors such as perceived social capital and safety. Personal circumstances and home environments were additionally discussed at length as participants described their physical stamina, emotion, motivation, as well as the convenience and communities within respective retirement homes that affect perceived walkability and walking behaviour. Evidently, these factors were self-regarded as more significant and influential to walkability than the built environment itself. Living in a retirement home can be socially-isolating to members of the wider community, a fact supported by various statements made by several participants. Mabel, for instance, craved interactions with members of younger adult populations and found her spirits lifted when she was not around members of her age group all the time. This could be a sentiment shared by other participants, as they described the negative and positive aspects of their surrounding social environments. Moreover, Seniors tend to spend more time in their communities in comparison to the working population (Roux, Norrel, Haan, Jackson, & Shultz, 2004). In fact, trends indicate that senior populations are returning to urban areas in part to avoid isolation that is typically associated with rural areas to gain access to better social networks and services (Masotti, Fick, Johnson-Masotti, & MacLeod, 2006). Environmental stressors that are continuously experienced by seniors can cause significant harm to well-being and increase risks of illness. Stress-inducing factors to seniors include, but are not limited to, changes in social activities and networks, leisure, and isolation (Masotti, Fick, Johnson-Masotti, & MacLeod, 2006). Thus, elements of social environments including the presence of teenagers, perception of safety, social interactions, and sense of community have been proven to be major determinants of health for senior citizens and were inherently perceived amongst participants of this study.

The three key findings of this research emerging from interactions with all twenty-eight participants pertained to social environments, personal circumstances, and home environments. The findings particularly underscored the poor coverage of variables relating to social environments in SWEAT-R and other similar walkability audits. Although SWEAT-R does include questions that enquires into land use, public meeting spaces, and commercial areas that allow for social gatherings, connections are indirect and subject to temporal differences. Personal and home circumstances were not considered in SWEAT-R. Although the two are more related to walking behaviour, they incur considerable influence on how walkability is perceived. For instance, Debra described how her painful episodes of Arthritic pain would prevent her from taking her habitual strolls outdoors around her neighbourhood. Although such short walks would normally be performed without a second thought, the physical pain she experienced likely created a perception of greater distance and struggle for the same walk.

The primary aim of this mixed-methods research was to determine how objective and subjective measures of walkability differ from one another in terms of the data they gather. To solely explore walking behaviour and experiences of walking, less emphasis would be placed on the use of mixed methods. Thick descriptions of experiences and observations would be attained through an in-depth exploratory approach that is more typical of phenomenological research and is not the intent of this particular study (Creswell, 2009). Similarly, the concept of walkability in itself and its derivative environmental characteristics would not require a mixed methods approach; objective measures such as a walkability audit or GIS tools would be utilized. In this study, the walkability audits assisted in the identification of neighbourhood problem areas in terms of physical characteristics less conducive to walking, in addition to attributes widely cited

in literature to enhance walkability. The focus groups, go-along interviews, and traditional interviews supplemented these objective findings with individual contexts, perceptions, and experiences of walking that influence walking behaviour. Therefore, as previously described, there were unanticipated findings that emerged as a result of dialogues exchanged with participants coupled with the use of SWEAT-R. Such findings permitted greater breadth and more linkages to be formed between different ideas, which are useful for topic areas that require further study.

Chapter 5.1.2.a | Efficacy of Objective Measures

SWEAT-R has been repeatedly tested and utilized in senior-focused research to assess community walkability (Chaudhury, et al., 2011). In these studies, SWEAT-R and its supplemental Secondary Observation Form were able to provide descriptive environmental details of urban neighbourhoods (Chaudhury, et al., 2011). Performing the audits permitted familiarization with the research setting, allowing for the development of more relevant probing questions and a more accurate interpretation of participant observations; it would be difficult to truly capture the essence of participant lived experiences if the researcher possessed no knowledge of the neighbourhood under study. For instance, participants in both neighbourhoods made direct references to shopping plazas and spaces nearby by name. If the audits had not been conducted prior to the focus groups and interviews, it would have been difficult to envision their descriptions. The quantitative, objective findings of SWEAT-R additionally permitted direct comparisons of the presence and absence built characteristics deemed conducive to walking between different case study areas, as exhibited in Table 7 of Chapter 4.3. This is an indispensable feature of objective measures of walkability amongst researchers with leanings

towards positivism, who typically place value in discrete numbers (van Lenthe & Kamphuis, 2011). Qualitative investigation methods would not attain the same results, as participant recounts of their lived experiences differ and the language used may be interpreted differently.

There were several challenges in using SWEAT-R, which may be generalized to include other similar walkability audits. Most items were simple dichotomous or counting questions, requiring a "yes" or "no" response or a count of items to indicate the presence of a specific physical attribute, respectively. Multiple items, however, were rating scale questions and provided variability in response options:

26. Determine the quality of public spaces on this segment.

Low quality = 1; Neutral = 2; High quality = 3; NA (no public space) = 98

30a. What is the condition of the sidewalk?

Poor = 1; Moderate = 2; Good = 3; NA (no sidewalks) = 98

34. What is the slope of this segment?

Flat/gentle = 1; Moderate = 2; Steep = 3

54. Difficulty

Very easy = 1; Easy = 2; Average = 3; Difficult = 4; Very difficult = 5

These were four questions in SWEAT-R that may demand too much interpretation from the auditor. For instance, the differences between "moderate" and good" or "easy "to "average" are open to individual auditor judgement. A study conducted by Chaudhury and his team (2011) encountered similar challenges with these types of questions. Researcher observations regarding these items, in addition to items relating to functionality and destinations, were found to be less reliable than other SWEAT-R items that permitted dichotomous responses (Chaudhury, et al.,

2011; Cunningham, Michael, Farquhar, & Lapidus, 2005). Refining the ratings by with definitions for what constitutes “easy”, “average”, etc., could provide clearer and more consistent interpretations by evaluators to improve reliability. SWEAT-R has already been proven to have high inter-rater reliability as a whole (Chaudhury, et al., 2011) and these improvements would further enhance the validity of its results. Evaluators can thus systematically audit neighbourhoods with particular sensitivity towards senior needs with confidence.

A significant portion of SWEAT-R items pertained to land uses; senior-focused uses are addressed in terms of housing and activities:

21. Are there signs signifying that buildings on this segment are senior-oriented?

Senior housing (e.g. independent living, assisted living, retirement homes)

Yes = 1; No = 2; NA (no buildings) = 98

Senior activities (e.g. senior centers, adult day care)

Yes = 1; No = 2; NA (no buildings) = 98

These questions merely considered the presence of senior-oriented land uses. They did not take into account whether or not they were indeed visited and utilized by senior community members. Senior housing, for instance, provides an indirect and rough estimate of senior populations within the assessed area. Such forms of housing and institutions may be expected to offer specific types of services such as in-residence care, meals, recreation, and doctor visits. However, this does not address walkability nor would such senior homes contribute much towards age-friendliness since senior services and activities should be accessible community-wide. The second item of this question took into account senior activities, but again does not consider actual usage amongst seniors. Agnes, for instance, did not notice a seniors’ activity

centre situated just one block away from her home in Edenbridge-Humber Valley. In fact, she saw no need to visit such a place when she lived in a home that catered to all her needs:

> *I've never seen it, but I don't know that people who live in a residence need an activity centre, because you get activities here all the time. There are activities planned pretty well every day.*

This challenges the efficacy of Question 21 in SWEAT-R and suggests that input from real members of the senior community in a neighbourhood is necessary to determine whether senior-oriented land uses are indeed relevant.

Chapter 5.1.2.b | Efficacy of Subjective Measures

The methods of subjective walkability measures utilized in this study, including focus groups, go-along interviews, and traditional interviews, encouraged discussion amongst participants of varying backgrounds, experiences, and abilities. The focus groups were particularly effective in allowing participants of varying motor skills to compare and contrast their different abilities amongst themselves as the discussions were occurring; open-ended, conversational-style questions facilitated open dialogue (Edmunds, 2000). As such, the subjective approaches to measuring walkability fostered an understanding of senior perspectives on neighbourhood walkability as influenced by the built and social milieu. This was anticipated, based on a review of literature presented in Chapter 2.3.2. Though not all individual interviews with participants followed the intended go-along format due to weather, each participant was still able to provide detailed descriptions of their surrounding environments. There was no information attained in the go-along interviews that were especially different than that gained through traditional interviews. In fact, findings were consistent across all qualitative investigation

mediums; the characteristics identified to be hindrances or stimulants of walking behaviour were perceived similarly across participants within their respective neighbourhoods. Opportunities to speak as well as share personal experiences and observations were additionally made as consistent as possible with all participants by using similar interview scripts and prompting to encourage further elaboration. This is described in Chapter 3.6.1. The only element absent from focus groups and traditional interviews was the physical immersion into the setting that a participant is describing, which was the benefit of conducting go-along interviews. Because SWEAT-R was conducted prior to interacting with participants, however, familiarity with both neighbourhoods was already enhanced. Participant recounts of neighbourhood areas and attributes were thus more easily identifiable and understandable, resulting in more fluid dialogue to be exchanged. This additionally allowed participants to provide unhindered descriptions of their neighbourhood walkability and walking experiences.

Participants did not need to be prompted in many cases; most participants were prepared to share their stories and observations of what they had experienced in their communities. This was the result of a comfortable and respectful environment, enabling participants to feel more welcome to share their opinions (Edmunds, 2000). These self-guided dialogues allowed for new issues and themes to arise for further analysis, which is typically what qualitative researchers strive for (Creswell, 2014). Descriptions of their living environments and personal circumstances that included health levels and motivation to engage with the outdoors provided supplemental contextual information that permitted deeper insight into walking behaviour. The emotions associated with the act of walking as well as the meanings they associated with the ability to walk were effectively captured by the in-person interactions and

dialogues exchanged with participants. Objective measures, such as SWEAT-R, would not be able to capture such details; researchers would have to rely on previous literature. However, perceptions of walkability are place-specific and typically warrant case-study approaches to research for accuracy purposes (Brown, Werner, Amburgey, & Szalay, 2007). These subjective tools are therefore required for community-based needs assessments of walkability.

Participant reflections of the built neighbourhood environments were slightly more indicative of high or low walkability than SWEAT-R results, which are expected to be the best measures of objective walkability. Edenbridge-Humber Valley, for instance, only made out to be slightly less walkable according to SWEAT-R as illustrated in Table 7 of Chapter 4.3. Yet, most participant voiced strong opinions of the very low walkable environment they had experienced in Edenbridge-Humber Valley which emphasized its low walkability. Emphasis was placed on the long, strenuous distances between their homes to shopping areas, most of which did not even meet their needs or interests. Moreover, perceptions of distance and relevance of land use vary by person. A commercial plaza complete with a small grocer, coffee shop, and other retail uses was noted to be directly across from Delmanor Prince Edward (E17). Situated in such close proximity, it was hypothesized that senior residents of the home would experience little trouble with shopping and meeting in social spaces. Agnes and Helen, however, both strongly expressed their difficulties travelling across the street and adjacent parking lot, and comfortably bringing back heavy groceries on their walkers without tiring. The audit only captured the presence of different land uses along a street segment and although the Secondary Observation Form could provoke the researcher to reflect on distances or accessibility, they may not always be accurately captured by researcher observations.

Each participant appeared to enjoy partaking in the research process. A number of them had observations, concerns, and ideas to share but received no outlet to do so. As Debra suggested when asked how Wychwood could be improved to cater seniors' needs: *"…do what* you're *doing!"* Investigations that require two-way face-to-face dialogues are able to increase awareness of issues and show seniors that their community cares for their needs, which is often perceived by seniors to be the opposite. Their voices are important when creating walkable communities for seniors since they are at that life stage themselves and possess the best understanding of the challenges that built and social environments pose. This is a limitation in many objective walkability studies, where subjective means of assessing walkability are not considered. Objective tools and researchers themselves, as evident in the findings of this study as well, do not wholly depict how seniors perceive their walking environments. Conducting qualitative research may require more time, finances, and effort to complete, however, the beneficial contributions to more complete findings can outweigh its disadvantages. Sedentary behaviour and insufficient levels of physical activity for optimal health benefits are pressing issues within the senior population (CSEP, 2012; Health Canada, 2002), particularly those residing in places poorly conducive to active aging (Owen, et al., 2011) such as Edenbridge-Humber Valley. With a comprehensive understanding of how seniors experience walking and navigate their neighbourhoods, planners may collaborate with urban designers and public health experts to develop spaces that are most conducive to easy and recurring walking trips. Such community-based approaches to walkability research and subsequent participatory planning and interventions allow seniors to continually feel like contributing members of their community, further supporting tenets of the age-friendly community framework. It is more cost-effective to

dedicate more time and finances into projects that would address real population-based needs for the long-term than to invest in "expert" knowledge using objective or quantitative investigation methods.

There is a facet of subjective measures of walkability that goes beyond the realm of research. Those who participated appeared genuinely pleased to engage in conversation. A number of them remarked the interviews to be a pleasant experience out of their daily norms. This became evident when they deviated from the research topic at times to elaborate on their personal histories and engage in jovial conversation. Moreover, five invitations were received from participants to visit their apartments and chat after their individual interviews were completed. Qualitative investigation measures with seniors can thus be viewed as a form of Friendly Visiting, when senior citizens are recruited for studies in a respectful manner and meaningfully engaged. These interactions can help brighten their day and enlighten moods, an outcome of qualitative research that really surpasses any of its other values and pitfalls.

Chapter 5.1.3 | Full-Serviced Retirement Homes

The inclination to remain sedentary and shrinking activity spaces are most often preceded by declined motor skills that limit mobility and independence (Wiles, et al., 2009). This then often leads to subdued walking behaviour and interactions with the wider community, subsequently resulting in higher participation rates in indoor activities (Coon, et al., 2011). A multitude of services and amenities, briefly outlined in Chapter 4.4, were made available to augment comfort for residents with varying needs. Most participants were able able to *"continue [their] lives as it were before"* (W003) as a result. However, is this really the case? Observations of the participants and their statements indicate otherwise, particularly amongst those residing

in Edenbridge-Humber Valley. Surrounded by vast open space and lacking in destinations within comfortable travel distance for most participants, most were subjected to rely on the amenities, services, community, and social life offered within their homes. An age-friendly community aims to encourage active aging, participation, and connection to the wider community; these full-serviced retirement homes challenge this objective.

Existing literature suggests there is a considerable preference amongst seniors to remain in their own homes as they age (Michael, Green, & Farquhar, 2006), a fact that is being supported by full-serviced retirement homes. The typical activity space for seniors is within 500 metres of their homes (Negron-Poblete, Séguin, & Apparicio, 2014). This was found to be the case for participants of this study; the go-along interviews that took place as well as participant descriptions of the typical walking trips they performed seldom exceeded the 500 metre radius and in fact were often much smaller. Shuttle bus services offered by all four homes to different commercial areas, restaurants, and social events additionally reduced the need for its residents to do so on their own. Moreover, participants from the lower walkability neighbourhood, Edenbridge-Humber Valley, were less inclined to go outdoors due to the greater sense of community experienced within their homes. Their walkability experiences were additionally marred by the lack of interesting destinations to walk to and long travel distances required.

All participants across both neighbourhoods indeed made more complimentary observations regarding their respective retirement homes than pejorative, implying general satisfaction with their living environments. Thus, it is clear there are both positive and negative consequences of living in such facilities. The benefits are more obvious, particularly for seniors who possess limited motor skills and function. Seniors residents of homes that provide mixed

services and amenities are able to conveniently access such benefits, though at a monthly price. Health care that includes on-site nurses and doctor's visits can be attained within their buildings, in addition to scheduled medication deliveries in some homes. Recreational and social events are planned and residents are permitted to attend as they wish, or use in-house shuttle busses to travel to external destinations. Exercise equipment and classes that emphasize physical activity, flexibility, and balance are additionally provided and optional for residents to attend. The negative outcomes of living in retirement homes, however, are less obvious. Living in a relatively confined community and in some cases, such as Edenbridge-Humber Valley, isolated, can result in withered social networks and further shrunken activity spaces. Interactions and relationships are reduced to fellow residents and staff members; communication with members of different age groups and communities become limited, an issue which a number of participants alluded to in their observations. Furthermore, retirement homes that limit the need to venture outdoors and engage with the wider community prevent residents from attaining the benefits of being a part of their communities. Opportunities to participate in community activities as well as experiencing the health benefits of being outdoors in itself are missed. Overall, there are trade-offs associated with residing in retirement homes; strategies must be prioritized to encourage continued active living within the community and reduce subconscious self-isolation.

Additionally, with these amenities and services offered by each retirement home in mind, the participants' experiences with the wider community must be slightly different from seniors living independently in private homes. This study was only able to capture insights from seniors living in private seniors' apartments and those living independently might possess opposing perspectives, thereby warranting a potential area for future study.

Chapter 5.1.4 | Personal Circumstances Affecting Walkability

The physical and social characteristics of a neighbourhood play an important role in influencing walking behaviour; they either stimulate or deter walking, depending on how they are perceived by the walker. Their roles in determining walking behaviour, however, are dwarfed by other individual-level factors including personal health restrictions on activity, motivation, as well as the possession of personal vehicles to a lesser extent. These personal circumstances influence how walkability is perceived, determining the willingness to indulge in walking activities or any other form of physical activity, according to the findings of this study. Participants expressed a range of motor skills and capabilities, as indicated in Table 5 of Chapter 4.2. According to self-reported physical health levels, a larger number of participants from the less walkable Edenbridge Humber-Valley experienced fewer difficulties with mobility than those from Wychwood. The aim of qualitative research is to not focus on counted values, however, this finding is nonetheless noteworthy. Perhaps residents of Edenbridge-Humber Valley acknowledged the low walkability of the neighbourhood, which was indeed recognized by all participants from this area during our discussions, and chose to reside in the area because they still believed they possessed the physical capability of doing so. Or, perhaps participants did not feel bothered by its low walkability due to the comprehensive stock of services and amenities offered by their homes which virtually negated the need to ever leave.

A number of reasons exist and undoubtedly each resident would possess their own rationale for living in their respective neighbourhoods and homes. The issue remains, however, that those who possess difficulties with mobility become increasingly at risk of isolation despite the goodwill of all the in-house amenities and services provided to them. Rheumatic pain,

unsteadiness, and fatigue underscore the self-frustration and subsequent defeat experienced by a number of the participants. Much of the details shared by Margaret, for instance, was grounded upon her fear of leaving St. Matthew's Bracondale House due to two falls experienced recently. She did not feel comfortable venturing outdoors alone and was additionally instructed to remain within the home by family and physicians. She compared herself to Lori, who was a fellow participant in the focus group and an extrovert who revelled in social engagement and activity both in and outside of the home. Lori often walked to the drug store and nearby restaurants along St. Clair Avenue West and did not perceive the distances to be far at all; the walks were identified as easy. Margaret noticed Lori had no reservations walking outdoors alone, despite possessing poor respiratory health, relying on a walker, and being over 90 years in age. Margaret's self-reflection highlights how differences in persona, optimism, and self-encouragements to actively participate in the community even in old age can influence perceived walkability and walking behaviour. Stamina and fatigue can influence perceptions of walkability as well, as indicated by Mabel when she observed the attempt to beautify St. Clair Avenue West with trees to be more of a safety hazard due to the trees narrowing paths and becoming obstacles to walking. As indicated in Chapter 4.3.1.b, she described how tired walkers might not notice trees and walk straight into them. She implied this to be a particular concern for seniors, who often possess impaired vision and balance required to manoeuver around objects situated on pathways. Her observation contrasts the general consensus that trees elevate the aesthetics of walking environments and are regarded as pleasant additions to neighbourhoods as a whole (Brown, Werner, Amburgey, & Szalay, 2007; Talen & Koschinsky, 2013; van Cauwenberg, et al., 2012). Thus, her observation indicates there can be negative safety implications associated

with physical characteristics that are typically regarded as positive assets to neighbourhood environments. The placement of such objects must therefore be carefully considered in order to optimize their positive contributions to walking environments.

Seniors with lower mobility levels can hesitate when it comes to engaging in activity, as evident in the participants of this study. As previously discussed, these individuals are at risk of isolation and depression if they are not supported. Seniors living in retirement living communities and homes are equally at risk as there is reduced interaction with the wider community. Mabel alluded to this fact in her interview as she expressed her desire to engage with younger cohorts – albeit younger seniors; she observed that seniors are more likely to feel their age and notice their health issues when they are surrounded by individuals who experience the same ailments. Mental stimulation and lifted spirits occur when there is continued interaction with lively, young souls. But this raises the question, what can we do for those who are immobile and are not readily accessible to the milieus beyond their secluded living environments? How can the age-friendly community and its incumbent walkable community encompass these individuals, particularly those living further away from the city in secluded homes? The foremost approach to this planning and public health challenge is the fostering of personal motivation. They require encouragement. Perhaps physical limitations do render outdoor activity completely unmanageable, but strategies that bring community activities to isolated seniors can be explored. This topic area, referring to practical recommendations, is further discussed in Chapter 6.1.

Chapter 5.1.5 | Implications for Active Ageing / AFC

The full-serviced retirement homes and other independent older adult apartments that are becoming increasingly widespread across urban areas present a challenge for planners and public health experts to foster active aging. The concern that arose from the findings of this study is that the continual development of full-serviced retirement complexes may result in nodal developments of retirement homes within communities, creating Naturally-Occuring Retirement Communities (NORCs) (Masotti, Fick, Johnson-Masotti, & MacLeod, 2006). Locations in more isolated urban areas with lower land use mix and walkability can lead residents to develop stronger networks and greater sense of community within the homes than outside, as witnessed in the participants from Edenbridge-Humber Valley. Few reasons to remain engaged with the wider community may then remain, further shrinking senior activity spaces to the confines of one building. While such facilities certainly do allow for aging in place, they hinder the involved participation in community activities and continued interaction with society. Participants of this study displayed strong inclinations to limit their interactions to fellow residents of their homes and reduced participation in walking activities that tend to promote social interaction in the neighbourhood. Yet, it is known that participating in group activities outdoors as well as casual social interactions with local community members helps prevent isolation and encourages psychological stimulation amongst seniors (Lord, Després, & Ramadier, 2011). The direct connections made between outdoor activity and health cannot be ignored; only a few studies have found little to no difference between exercising indoors and outdoors (Coon, et al., 2011).

Wychwood was a much denser neighbourhood in terms of varied land uses and people moving through its spaces by foot or vehicle. It is quite a contrast to Edenbridge-Humber Valley, according to audit results and participant observations. Edenbridge-Humber Valley possessed fewer destinations that appealed to local residents to walk to and it was regarded as a commuter city by several participants. A large proportion of community residents abandoned the neighbourhood during the day for work and by nightfall, little to no places were open to serve as public gathering spaces for more vibrant community living. Literature investigating links between the built environment to social connectivity date back to the 1950s (Talen & Koschinsky, 2013) and suggest qualities of built environments can be used as tools to enhance social environments and interaction (Lund, 2002; Talen, 1999). Health benefits of living in retirement homes and NORCs are higher when the physical and social milieus cultivate greater activiy and engagement, in addition to fostering feelings of well-being (Masotti, Fick, Johnson-Masotti, & MacLeod, 2006). Moreover, vibrant public spaces have been identified to be common places of exercise; their presence within neighbourhoods motivate physical activity and engagement (Cohen, et al., 2007). The presence of public spaces for locals to convene and socialize would be futile, however, if they are inaccessible to seniors.

Aging in place has been suggested to be more cost-effective, healthier, and preferred by seniors over institutional care (Hollander, 2001). With the senior population projected to grow at a rapid rate (Health Canada, 2002), costs of health care services must be carefully weighed against interventions that could prevent illnesses and encourage prolonged independent healthy active living. Built environments with attractive open spaces that are easy to access and enjoyable to use are able to bring people together (Thompson, 2007). People are more inclined

to lead healthy active lifestyles if they see others being active and if there are social elements to the activity (Phillips, Schneider, & Mercer, 2004), thus making public spaces and streets excellent resources for activity to take advantage of. This was made evident when Lori described her lack of motivation to leave her apartment and take her daily stroll outdoors. When she heard the laughter of young children playing and vibrant social life outside, however, she became encouraged to join in. Organized activities offer such benefits, but may not always be accessible to everyone due to cost, distance, time, or other personal circumstances that limit accessibility. Thus, a neighbourhood with multiple public spaces that are inclusive and open to varied community members provides seniors with more options for outdoor engagement and activity. This is based on the ecological model, often used in research to understand the multiple levels of influence within an environment on behaviour (Owen, et al., 2011). Levels of influence include social, individual, community/organizational, environmental, and policy (Owen, et al., 2011).

Chapter 5.2 | Research Limitations

Following a qualitative research paradigm, the design of this study is grounded upon experiences as well as their inherent and interpreted meanings. It is common for qualitative investigators to focus on one particular context to investigate, discover, describe, and develop new concepts by reconstructing ideas that were meaningful to the individuals within it (Baxter & Eyles, 1996); qualitative research is bound to the group of individuals, time, and setting investigated. This particular study is therefore limited to the group of twenty-eight seniors recruited across two Toronto neighbourhoods, Wychwood and Edenbridge-Humber Valley, as their physical and social environmental conditions were between October 2015 and January 2016. The generalizability of the findings may thus be limited due to the context-specific nature

of case study designs. However, the generalizability of this study was enhanced in other ways; details of the approaches taken to ensure rigour in data collection and analyses are presented in Chapter 3.6. Generalizability is analogous to transferability, and is the degree to which research findings may be extrapolated to fit within contexts of other studies. In terms of case studies, it is possible for findings to be analytically generalized (Yin, 2003). This occurs when the theoretical underpinnings of a research can be used in the logic and design of future research (Yin, 2003). In fact, this particular research was adapted from a 2005 Australian study (Leslie E. , et al., 2005), thereby proving its analytical generalizability.

All participants were recruited from retirement homes. A form of convenience sampling, this in itself is a limitation as only those who were readily accessible were recruited. This is problematic since participants who are conveniently recruited may not always be the most knowledgeable or informative of a research topic area (Baxter & Eyles, 1996). Yet, this can also be seen as a positive element of the research design since the study intends to investigate perceived walkability amongst all seniors regardless of mobility levels or whether or not walking is performed. This study aimed to understand the rationales behind limited walking activity and perceived hindrances or stimulants of walking. Collectively, these factors indicate the participants do not come from diverse backgrounds that would be typical of senior populations in reality. The sample population did successfully capture, however, a range of mobile levels which indicates the lack of physical health heterogeneity to not be of issue.

The sample population of this study was not as diverse as intended; the sample was predominately female with only three male participants recruited from Edenbridge-Humber Valley. Almost all participants were Caucasian and had either lived in Toronto nearly all their lives

or were born in Canada. There is therefore a lack of ethnic diversity in the sample. The participants may additionally be identified as relatively affluent due to the costly nature of independent senior apartments. Seniors living in independent homes or with their family may possess different experiences and knowledge of their neighbourhoods, which are not captured in the sample population of this study. Thus, what walkability means from the perspectives of seniors from diverse ethnic backgrounds as well as those living in their own homes remains a question for further research.

It was difficult to garner interest in this research amongst senior residents of retirement homes from personal visits and attempts to recruit; recruiting participants was a challenge without the assistance of gatekeepers. Moreover, four participants of focus groups requested to leave before discussions were finished. These individuals either had other scheduled events to attend or wanted to have lunch in the dining halls. It was also speculated that they may have lacked interest in the research process or subject matter. Though these participants did provide descriptions of personal walking experiences and perceptions of neighbourhood walkability while they were in attendance, their early departure meant they were not present to answer all questions in the focus group script. Thus, observations from these four participants on all question areas were not captured. In future attempts at this study, it may be beneficial to consider remuneration in the form of cash or gift cards. These would be distributed upon their completion as participants in the research. Remuneration would thus help inspire interest as well as encourage participation and participation in the research would benefit the participants in terms of monetary gain. In addition, future attempts to recruit participants should take place outside of meal times. Based on interactions with gatekeepers and seniors whom were

successfully recruited, the best times to recruit participants and schedule focus groups or interviews should be before or after occasions where seniors were already assembled for another purpose. This approach is known as "piggybacking" (Kreuger & Casey, 2000).

As part of the focus group and interviews, each participant was asked whether they agreed with the objective walkability rating of their respective neighbourhoods. All participants concurred with no hesitation. However, it is possible that participants adjusted their opinions of their neighbourhood walkability so that their attitudes were "correct" or consistent with the norm. This is known as cognitive dissonance theory, referring to how individuals look for consistency in their beliefs. Where there is a divergence between what is believed and what is told to them, they may adjust their opinions to reconcile any differences (Crano & Prislin, 2006; Festinger, 1957). Therefore, it is conceivable that participants in the study may have altered their attitudes of neighbourhood walkability in order to match what is implied by the researcher. Should this study be performed again in the future, particular care will be taken in the placement of the question: *"Your neighbourhood is measured to be high/low in walkability for the general population. Do you agree or disagree?"* Rather than being one of the first few questions, it will be placed closer to the end of the interview script as a summative question.

Some researchers posit self-selection bias may play a role in influencing perceived walkability; either certain types of built environments provide people with destination and walking choices or people who want these choices tend to choose more walkable neighbourhoods (Greenwald & Boarnet, 2002). Walkable environments might therefore simply attract people with similar characteristics and interests (Talen & Koschinsky, 2013); perhaps those who enjoy walking and are more acquainted with walking for daily purposes. Additionally,

this study relies on self-reported health, levels of walking activity, and personal experiences. Perceptions of highly subjective environmental traits such as aesthetics, safety, and social capital are highly susceptible to variation. Though such variations are what this study intend to investigate, studies have linked feelings of loneliness, depression, and isolation with poorer perceptions of neighbourhood environments in addition to declined activity (van Lenthe & Kamphuis, 2011). Despite these confounding biases that may be prevalent across the participants, it is arguable that these are characteristics that may be found amongst members of the wider senior population as well. Moreover, these factors are difficult to control as it is impossible to predict self-selection bias. It is also unethical to utilize recruitment criteria that prohibits seniors with illnesses regarding mental health from a social and health equity standpoint. Many cases of mental health issues can go unnoticed and undiagnosed, further contributing towards the difficulty in controlling for this trait.

Chapter 5.3 | Areas for Further Research

The past five decades have seen significant strides in how communities plan for seniors (Lewis & Groh, 2016). Elements of the built and social environments are now studied together to attain a more holistic understanding of community livability for senior populations. More research and policy discussion, however, is necessary to identify factors that can complicate or enhance the aging process to encourage aging in place with active aging. Walkability plays a very pivotal role in the heart of this. The aging process is relative to the individual; the heterogeneity of the senior population along with the diversity of personal backgrounds and communities must be recognized. To reflect the diversity of aging experiences and unique individual needs relative

to the community environmental demands, research regarding the most effective community-based approaches is needed.

Diverse socio-demographic backgrounds of the senior population, in addition to their spatial distribution across urban, suburban, and rural communities imply policy approaches will diverge depending on context-specific needs (Alley, Liebig, Pynoos, Banerjee, & Choi, 2007). The findings of this research corroborate the need already highlighted in existing literature for qualitative research to capture the diversity of needs and conditions experienced by the very heterogeneous senior populations (Lewis & Groh, 2016). A step away from the once pervasive use of checklists as the sole approach to measuring walkability and age-friendliness is necessary. Instead, the lived experiences and suggestions that underline real needs must be explored. Doing so will allow planners, urban designers, and public health practitioners to further develop existing bodies of knowledge regarding the ways in which cities change relative to seniors and how any changes to their environment – both positive and negative – may influence quality of life in old age (Phillipson, 2011). There is little documentation regarding the efficacy of specific strategies as well as evaluation of outcomes from specific approaches that influence senior lives (Lui, Everingham, Warburton, Cuthill, & Bartlett, 2009). Moreover, current research pertaining to ecological determinants of physical activity have utilized cross-sectional designs (Humpel, Owen, & Leslie, 2002). Future research must employ prospective, or longitudinal cohort, designs to determine the links between the environment and behaviour and determine whether the associations that are currently established in literature are indeed causal (Humpel, Owen, & Leslie, 2002). A stronger evidence base would be advantageous to guide future age-friendly developments in both process and expectations for outcomes.

The links between walkable environments, social connectivity, and positive health impacts has been subject to inconsistent findings across literature (du Toit, Cerin, Leslie, & Owen, 2007). Both Naser (2003) as well as du Toit and colleagues (2007) found little correlation between walkability and sociability. Another 2004 study revealed the physical environment to be of lesser importance for social interaction even amongst participants living in more walkable neighbourhoods (Kim & Kaplan, 2004). In constrast, one study found more neighbouring and social activity within neighbourhoods displaying new urbanist qualities than in suburban areas (Brown & Cropper, 2001). Leyden (2003) additionally discovered walkability to be a strong indicator for social interaction and participation, leading to familiarity amongst community members. Additionally, findings from Kim and Kaplan (2004) and Lund (2002) purport perceived aesthetic characteristics of the built environment to be particularly influential in determining sense of belonging, place attachment to neighbourhoods, as well as facilitating recreational walking. Even with existing research that opposes such findings, there is much more to gain than to lose with the establishment of walkable communities with strong social cohesion and sense of community. The findings of this study illustrate how important the social environment is to enhance perceptions of walkability. Future research unifying the realms of environmental psychology, public health, and planning must therefore be attempted to explore the social elements and emotional ties of community that appeal to the very heterogeneous group of seniors present in Canadian municipalities. Moreover, future research may explore how seniors perceive communities different from their own; studies may consider combining residents of contrasting neighbourhoods in group discussions to determine whether self-selection bias or desensitization does occur. Such studies may additionally help determine whether seniors

consistently identify the same deterrents and stimulants of walkability regardless of their neighbourhood of residence and familiarity.

Many participants described a decreased need for outdoor walking. This was particularly the case amongst many of those from Edenbridge-Humber Valley that identified a lack of interesting destinations to walk to, the convenience of in-house services, and a reliance on shuttle buses to reach shopping destinations. Amongst the participants from Wychwood who preferred indoor walking, reasons were primarily centered on a lack of physical strength and endurance required to walk in outdoor environments. This study does not explore indoor walking environments; thus comparisons cannot adequately be made against the outdoor walking experiences described by participants. As briefly alluded in Chapter Three, indoor walking environments and its contrasting experiences for senior citizens may be explored in future studies. Such studies will become particularly important in the years following 2025 to measure the effects of the AODA and its associated Action Plan within public buildings and businesses (Accessibility for Ontarians with Disabilities Act, 2005). Moreover, future studies may explore the roles indoor environments play in cities that endure harsh winter conditions that render outdoor environment unfavourable for seniors walking with and without devices.

Retirement homes or Naturally Occurring Retirement Communities (NORC) pose important implications for active aging. They are equipped with a full range of amenities and services and are rising in numbers alongside of senior populations (Masotti, Fick, Johnson-Masotti, & MacLeod, 2006). With seniors feeling more comfortable within the confines of their homes, urban planners face the challenge of continuing the promotion of active aging and continued participation in community activities. The age-friendly community movement has

certainly gained momentum over the years (Lui, Everingham, Warburton, Cuthill, & Bartlett, 2009), yet there is still a limited number of research that has evaluated age-friendly attributes within varied community contexts (Novek & Menec, 2014). What remains to be known is therefore the projected path of these retirement facilities and NORCs that are increasing in breadth and popularity (Masotti, Fick, Johnson-Masotti, & MacLeod, 2006); how will they shape the age-friendly landscape in the near future and how do their frameworks integrate with the walkable community and active ageing concept? It is imperative to understand the dynamics between the services provided by the homes and walkable, age-friendly communities to determine the steps required to continually motivate outdoor activity and engagement amongst senior citizens. Perhaps retirement homes and NORCs have significant roles to play with the impending growth of senior numbers. The age-friendly community aims to create healthy communities that are inclusive of all ages and abilities; allowing retirement homes and NORCs situated in unhealthy environments (Masotti, Fick, Johnson-Masotti, & MacLeod, 2006) to be continually developed without research and guidance can result in living environments unconducive to healthy aging.

Demographic and social trends are important to planners so that policies and communities are developed to meet the changes. Yet, to understand the challenges and accommodate for the needs of aging populations, community planning will need a thorough understanding of the dynamic effects the community environments have on senior quality of life that can only be attained through continual research and evaluation of implemented strategies.

CHAPTER 5.4 | SUMMARY

Effort must be invested in working closely with members of the senior population to identify major concerns and obstacles with walking outdoors, accessing public spaces, and interacting with other local residents. Urban planners, landscape architects, public health practitioners, and engineers must design public spaces that are able to cultivate strong place attachment and sense of community. With deep social ties to the community, seniors would be more inclined to participate in outdoor activities and socialization, thereby leading to healthier active lifestyles that encourage aging in place. An age-friendly community is one that is able to adapt its structures and services to optimize senior accessibility and inclusivity; a walkable city plays an integral role in age-friendliness. The design of the community is both a planning, public health, and governance issue. Gaps between senior abilities and environmental presses must be reduced as future research continues to explore strategies for optimal person-environment fits.

CHAPTER 6 | THESIS CONCLUSIONS AND RECOMMENDATIONS

CHAPTER 6.1 | RECOMMENDATIONS

The findings of this research are relevant to planners, public health practitioners, as well as caregivers and service providers in senior facilities. These recommendations are based on the findings of investigation methods implemented throughout this study; SWEAT-R, focus groups as well as go-along and traditional interviews with senior participants, together with literature.

Most people endure decline in ability with age. Age-friendly communities aim to reduce the environmental stresses on an individual to support a desirable person-environment fit and enriched quality of life (World Health Organization, 2007). Individuals with higher ability levels in environments with lower demands exhibit a desirable person-environment fit and suitable conditions for aging in place. In contrast, poorer quality of life and inappropriate conditions for aging in place ensue when there are high environmental presses on individuals with lower ability levels. It is a public health and more recent planning goal to have regular physical activity increased; walking is a behaviour that is most amenable to influence (Leslie E. , et al., 2005; Siegel, Brackbill, & Heath, 1995).

Understanding how physical and social environmental demands interact with individual abilities to deterring walking behaviour has practical implications. This particular study proved social environments within a community, in addition to built environments, have strong influence in fostering good perceptions of walkability and encouraging walking behaviour. Walking behaviour is amenable to influence in the context of the public health aim to encourage regular physical activity.

CHAPTER 6.1.1 | THEORETICAL RECOMMENDATIONS

Seniors strive to retain their independence, permitting they are able to adapt to physical and social demands of the environment. A heterogeneous population of seniors exists, further complicated by dynamic living environments that shape their perceptions and well-being. Reiterating the literature presented in Chapter Two, Hodge posits the person-environment relationship is an "active transaction" between the environment and senior (2008, p.124), defined by changes at the community level as well as the individual level in order to retain independence and competence (Lewis & Groh, 2016). This very notion was captured in the findings of this research and depicted in a suggested framework for walking behaviour as an outcome of perceived walkability, shown in Figure 45. The framework is a summation of all the experiences regarding walkability gathered from the research participants. There are three broad factors that influence perceived walkability: physical and social environmental characteristics, personal circumstances, and home environments. Together, these determine

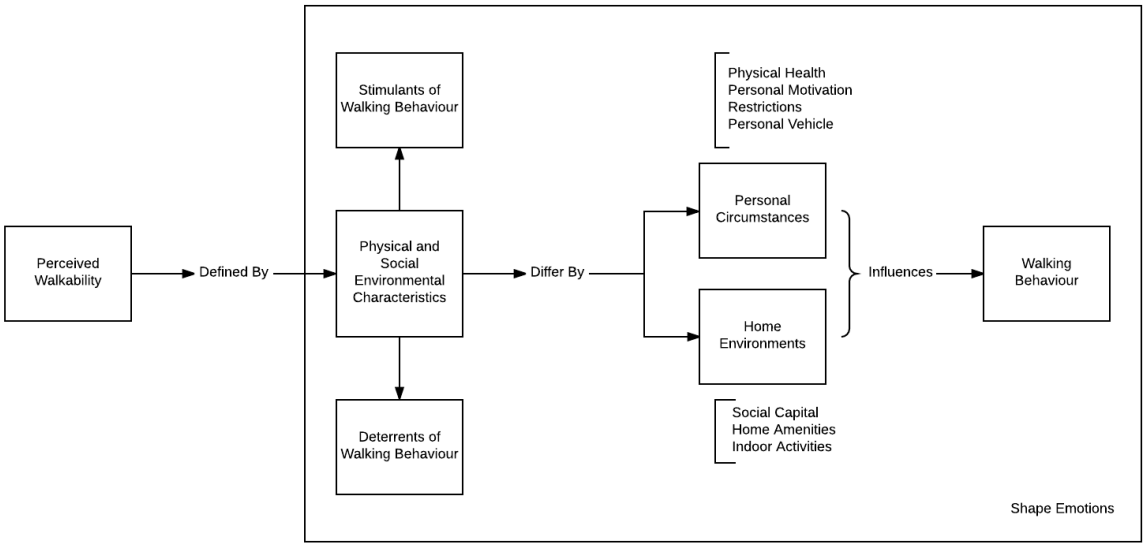

Figure 45: Recommended Framework for Walking Behaviour

whether walking activities occur based on perceived negative and positive traits under the three broad factors that may hinder or stimulate activity.

One important finding from this research that is not adequately covered in current literature are the emotions attached to walking experiences or lack thereof. It is difficult to illustrate emotion and its direct associations to walking behaviour as it does not occur in a linear fashion, based on participant recounts of their experiences. Emotions and feelings are experienced concurrently as obstacles and stimulants of walking are encountered. As participants described, seeing tall beautiful trees and hearing young children play in the park can lift spirits. In contrast, feeling unable to join in on interactions and outdoor activities due to personal inhibitions can be disheartening and continually discourage any further activity. Emotions therefore play a significant role at the individual level that is closely linked to personal motivation and well-being. To date, there is a lack of consensus surrounding a theoretical framework for motivation to encourage physical activity (Phillips, Schneider, & Mercer, 2004), though the formula for motivation presented in Chapter 2.2.3 is able to accurately depict sentiments expressed by participants of this study. Each variable influencing personal motivation can be linked to emotion and there is reciprocal influence between these and perceived walkability and walking behaviour. With the ability to walk, seniors are able to experience the positive aspects of their surrounding environments first-hand and spirits may be lifted. The opposite holds true as well, and if not supported, seniors experiencing negativity in their self-motivation and emotions are at higher risks of isolation and depression.

Chapter 6.1.2 | Practical Recommendations

Seniors can spend upwards of three-quarters of their daytime at home (Oswald & Wahl, 2005). The overwhelming inclination to remain at home, as revealed in this research as well as in existing literature (Michael, Green, & Farquhar, 2006), places seniors at risk of isolation. The senior population is often regarded as a homogenous group; individuals with increased impairment as well as declined mental capacity, motor skills, and independence. Evident in the sample population of this research, however, a spectrum of capabilities exists among the senior population. The age-friendly community concept further challenges the ageist conceptions of older people to active members and contributors of their communities (World Health Organization, 2007).

Chapter 6.1.2.a | Improving How Walkability is Assessed

Comprehending the dynamic role that the neighbourhood context plays in fostering active aging has implications for urban design and policy in community revitalization and new development. Objective measures of walkability provide a quantitative and systematic means of evaluating built environments. A walkability audit such as SWEAT-R exhibits sensitivity towards age-related hindrances and make it possible to assess for relationships between built form and active living. Even the Secondary Observation Form, intended to capture the qualitative or subjective elements of the neighbourhood under study, inaccurately captures senior perceptions of walkability due to the inability of auditors to truly understand walking experiences of others. This notion was discussed in Chapter Four. A holistic understanding can thus only be attained through the addition of lived experiences from the population of interest. A number of participants of this study possessed strong opinions of their neighbourhoods and wanted their

voices to be heard. Helen expressed her desire for meaningful engagement: “Tell them to sit down and listen! Yes. Everybody just sit down and listen to the seniors talk.” Encouraged dialogue between senior citizens and experts, in addition to objective assessments, can therefore create opportunities to collaboratively identify specific strategies that promote inclusivity and senior activity. Based on the experiences with this particular research, focus groups were an excellent tool to support healthy discussions of walking stimulants and impediments between seniors with varying cognitive and motor skills across the spectrum.

Empowering seniors through participatory engagement can profoundly influence motivation. The process would allow seniors to be actively involved in the planning, designing, and selection processes in community development projects such as park spaces and open community spaces. In doing so, seniors could feel more included within the community and in control of their own health and quality of life. The greater the control a person perceives to have of his or her health, the more likely steps would be taken to improve it, according to the motivation formula shown in Chapter 2.2.3 (Phillips, Schneider, & Mercer, 2004). Encouraging engagement and involvement within communities amongst seniors requires interdisciplinary collaboration. Though, planners bear a significant portion of the responsibilities as the fostering of vibrant and inclusive social spaces are dependent upon their knowledge and expertise.

Chapter 6.1.2.b | Community-Based Approaches to Measuring Walkability

Community-based research to assess walkability is another approach to utilizing audits with strong emphasis on stakeholder input that can address environmental demands based on real stakeholder abilities. Tools such as SWEAT-R are easy to learn and use with the support of planning and public health experts. The questions and response options are relatively simple. To

aid those who may be unfamiliar with its terminology, training manuals and visual representations of the items that are assessed in SWEAT-R are available by its founding researchers, in addition to many other similar tools accessible online. Allowing seniors themselves to use these tools doubles as mechanisms to raise their sensitivity of their very own community built environments and pinpoint areas for improvement. A number of participants in this research voiced their frustrations of feeling excluded in conversations regarding matters that affect them. Rose was able to express this shared sentiment during her interview: *"Nobody thinks of seniors! Because you never think of yourself getting old!"* The crowd-sourced objective data would serve the purpose of substantiating specific community needs to city council, consequently influencing policy decisions and advocating intervention in the built form for neighbourhood spaces in critical need. In performing walkability audits in their respective neighbourhoods, senior citizens themselves will learn and help raise awareness within their own cohort of the walkability concept, the built conditions in their neighbourhoods, and raise the likelihood of becoming more engaged community members. Familiarity of their neighbourhoods can be enhanced, fostering sense of place (Wood, Frank, & Giles-Corti, 2010) and community as interactions with the wider community are expedited during audit processes. These actions might have lasting effects as they become educated on the various health benefits and opportunities that are linked with age-friendly, walkable communities. Senior citizens might take pride in their communities that they helped build for the better, further motivating continued engagement with the communities outside of their homes.

Chapter 6.1.2.c | Supporting Social Inclusion and Interactions

A successful age-friendly community is one that is able to encourage inclusivity amongst all members of a community regardless of age by fostering social connectivity through active participation in community affairs. To do so, communities must simultaneously build upon their physical and social assets to foster appeal and motivation. Literature places much emphasis on physical pedestrian infrastructure such as the availability of benches, curb extensions and height, walking surfaces, and crosswalks (Cunningham, Michael, Farquhar, & Lapidus, 2005; Lewis & Groh, 2016). Grounded on the findings of this research and illustrated by the concept map in Chapter 6.1.1, however, neighbourhood social environments play an equally pivotal role in defining walkability and influencing walking behaviour for seniors.

A number of participants in this research expressed strong inclinations to remain in their homes, either due to strong social networks with their peers, lack of motivation, or perceived inability to walk outdoors. These individuals are at risk of isolation if behaviours are not altered. The aim is to foster a greater sense of community in the wider community than within individual retirement homes; social interactions with the community outside of retirement homes and other institutions are necessary to maintain healthy lifestyles and quality of life. The buildings, housing, transportation infrastructure, and landscape of cities contribute towards "confident mobility, healthy behaviours, social participation, and self-determination, or, conversely, to fearful isolation, inactivity, and social exclusion" (Plouffe & Kalache, 2010, p.737). Walk-friendly environments with safe and vibrant public spaces are more conducive to social activity. Seniors who live in communities with spaces that encourage strong social fabrics may be more inclined to leave their homes for social interaction (Wood, Frank, & Giles-Corti, 2010). Found along the

streets, within parks, and outside of busy shopping areas, seniors are able to inadvertently achieve physical activity while performing social interaction with community members; health benefits are therefore two-fold.

Interventions should thus not solely address built form. Motivation to engage in social and physical activity is not entirely incumbent upon urban planners; evaluation, counselling, encouragement, and empowerment is facilitated by public health experts, clinicians, caregivers, community members, and peers. Thus, interdisciplinary collaboration is necessary to foster motivation in seniors to engage in social and physical activity. Programs or services that encourage interactions between seniors and individuals outside of their typical social networks must be continually developed and promoted. Programs that specifically encourage positive relationships between seniors and the teenagers that many of them fear can be explored. Christie Gardens in Wychwood has already taken action in this regard by working with the nearby St. Bruno Elementary School; select residents have volunteered to teach classes and were described by participants to have enjoyed their experiences. Such programs can be broadened to high schools so that seniors may gain experiences and rapport with older teenagers. The Friendly Visiting program that has additionally become widely popular across municipalities and adopted by various seniors' centres and agencies reduces risks of isolation and depression. Volunteers partake in social activities with their senior partners, including walking, chatting, and reading. Programs such as Friendly Visiting are able to reach individuals who have little or no opportunity to leave their homes, potentially due to restrictions in mobility or cognitive impairment.

Education is one approach to develop motivation amongst seniors to leave their respective homes and engage in their communities. There should be an understanding of how

social interaction and engagement within communities can be beneficial to overall health. Rather than remaining self-secluded at home or keeping to the communities found within retirement homes, broadened social networks can enhance quality of life (Goldberg & Beitz, 2006). Of course, this requires a change in the perception of gains and losses, in addition to the willingness to change behaviour to stir motivation. All four retirement homes encountered in this research invite geriatric health and fitness experts to discuss the value in remaining active through low-intensity exercises such as walking. Residents are encouraged to leave their home for strolls or remain in the halls if physical impairments do not permit the outdoors.

Improving how walkability is assessed, coupled with more of these social programs that increase social interactions and foster personal empowerment over individual health must continually be made accessible and well-coordinated to enhance the active aging process.

Chapter 6.1.2.d | Policy Interventions

Policy frameworks must be clear and firm in what is stipulated for planning and development, particularly in regards to the bourgeoning age-friendly planning movement. Though the theoretical and practical advances in the field of planning relative to age-friendliness and walkability have gained momentum and have made strides in the planning and public health realms (Lui, Everingham, Warburton, Cuthill, & Bartlett, 2009), much work is still to be done particularly in regards to policy strength in three areas: 1) needs assessments; 2) the AODA; and 3) urban design guidelines. These areas must be enhanced for strength and ensure planners are equipped with a strong basis for their age-friendly work.

Seniors are more likely to become increasingly active and contributing members of their neighbourhoods with a community that is more walkable, creating a more age-friendly environment. A needs assessment is the initial step to discovering areas of weakness, strengths, opportunities, and threats in regards to the built and social milieus that influence walkability. A needs assessment with data that is collected at the municipal level to reflect the population across the whole of the city can overlook the needs of individual homes, streets, and neighbourhoods (Ontario, 2013). A community needs assessment is thus crucial to capture elements of the differing local contexts across the various communities within a city. The Finding the Right Fit: Age-Friendly Community Planning (2013) guide serves as the Ontario handbook to create age-friendly spaces and within it includes a needs assessment procedure for planners and other experts to utilize. Similar instruments are readily available by other organizations and municipalities, as well. The issue is, however, that they serve as mere guidelines for referral when needed and planners or other authorities are not legally bound to carry them through. Moreover, the quality of needs assessments is not mandated, as well. It may therefore be greatly beneficial to incorporate policy items mandating the execution of accurate community needs assessments within the Ontario Planning Act as well as more area-specific policy documents such as the Toronto Official Plan. The incorporation of language more relevant to seniors and age-planning is necessary with the large number of municipalities across the globe, nation, and province initiating age planning and improving neighbourhoods to accommodate senior needs.

The Ontario government committed to the five accessibility standards in 2005 with the establishment of the AODA. These five standards pertain to: customer service, employment, information and communications, transportation, and the design of public spaces (Ministry of

Municipal Affairs and Housing, 2015). The latter two standards pertaining to transportation infrastructure and the community built environment are most relevant to this particular study, although the former three do have indirect linkages to walkability. A review of the AODA and its standards, set to be achieved by 2025, suggested greater emphasis is needed to encourage and ensure social accessibility for all members of a community. For instance, the AODA had recently undergone an amendment in 2013 in terms of the 2012 Building Code (Ministry of Municipal Affairs and Housing, 2015). With this change, accessibility in newly constructed as well as existing buildings undergoing renovation was substantially enhanced. The new standards to the municipal Building Code include updated door widths, powered or automated doors, as well as tactile walking surface indicators near stairs (Ministry of Municipal Affairs and Housing, 2015). It is evident that the physical environment has been a priority within the AODA and while these updated standards certainly do provide safer spaces with enhanced convenience for many, social environments and its presses have certainly been overlooked. Thus, it may be beneficial to include educational and outreach campaigns to raise the awareness of the needs of senior and disabled populations. In accordance to the ecological model, the most powerful and effective interventions should include: 1) safe, convenient, yet attractive spaces for activity; and 2) establish educational and motivational programs to promote use of such spaces (Sallis, et al., 2006). Mandating such progarms as part of the AODA can enhance accessibility as well as encourage a sense of belonging and inclusivity for those who need it most.

Design guidelines are created, often at the city level, to encourage ergonomic design that would create usable and attractive spaces for people to use. Recommendations for built environment improvements can range, from large to small-scale. The Toronto Accessibility

Design Guidelines, for instance, includes guidelines from accessible park spaces to the colour and texture of outdoor surfaces. While these documents are certainly useful for urban designers, planners, and other experts to refer to, the guidelines do not possess legality by itself. Mandating its use and utilizing the guidelines as enforcable standards can advance the walkability as well as age-friendly planning landscape, as communities may lack well-designed spaces. Specifically, linking the Toronto Accessibility Design Guidelines to the AODA and transitioning it into a policy document will help progress the Toronto Senior Strategy and its action items. Mandating design guidelines in other municipalities by coordinating policies to such documents can be considered as well, to ensure different areas of cities are developed equally to the same standards.Enhancing policy strength in just one area would incur positive well-being impacts for senior populations, however, policy improvements and coordination between all three areas is ideal for quality of life.

Chapter 6.1.2.e | Monitoring and Evaluation

Once community improvements are made to enhance senior walkability and well-being, evaluation and monitoring should be carried out by planning and public health experts to measure their performance and efficacy. As a form of evaluation, Health Impact Assessments may be used. As planners possess the knowledge of how built environments impact well-being, they are in the position to assess the various health implications of community development and plans before approval and implementation (Thompson, 2007). Public health practitioners provide knowledge of specific health outcomes and together with planners, may pinpoint avoidable adverse effects and advise on changes to policy or development so that intended healthy outcomes are achieved. For instance, intervention strategies in the form of more

walkable and universally accessible neighbourhoods with public spaces conducive to socialization. Health Impact Assessments typically encompass a range of quantitative, qualitative, and participatory tools. At this stage, senior community residents may be consulted on the physical and social changes in the neighbourhood that affect their daily living. Evaluation and the continuous monitoring in the years after changes are implemented allow planners and public health experts to learn from the documented successes and failures. With such information, more rigorous age-friendly walkability strategies can be designed for community use.

Chapter 6.2 | Thesis Conclusions

The growing senior population imposes significant stress on the health care system to disseminate adequate services and resources to seniors. This is driven by the belief that medical care is the most important preventative measure to address population health. The ecological environment that is unique to each individual, however, plays a prominent role in determining well-being. Large bodies of research state an individual's physical and social environments play the most influential role in shaping health. Moreover, an aging population and associated research is leading towards growing recognition of neighbourhood environments that are responsive towards the diverse physical and social needs of seniors.

Planners play a key role in building livable, age-friendly places. With their specialized knowledge and training, planners are well-equipped to work collaboratively with city councillors, public health practitioners, urban designers, and seniors themselves to create cities that are conducive to prolonged independence and active aging through complete, walkable communities. There is reciprocal influence between walkability and the eight domains of age-

friendly communities; the benefits of walkable communities are numerous but depend upon built and social environmental characteristics that encourage it. This thesis proved how important subjective measures of walkability are to reveal environmental environmental characteristics overlooked by objective measures. With the sole use of objective or quantitative measures, real population-based needs are not met. Documentation of a neighbourhood environment at the street level that is holistic, systematic, and fine-grained can provide strong evidence for experts to determine strengths, weaknesses, opportunities, and challenges to foster community walkability for seniors. The need for environmental and social modifications can then be justified. This is particularly important for cities such as Toronto with high populations of senior citizens; planning, public health, and design experts can utilize audit data coupled with in-depth lived experiences to critically evaluate neighbourhood characteristics for community engagement and redevelopment.

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List of Appendices

Appendix A: Map of Toronto's Senior Population (2011)

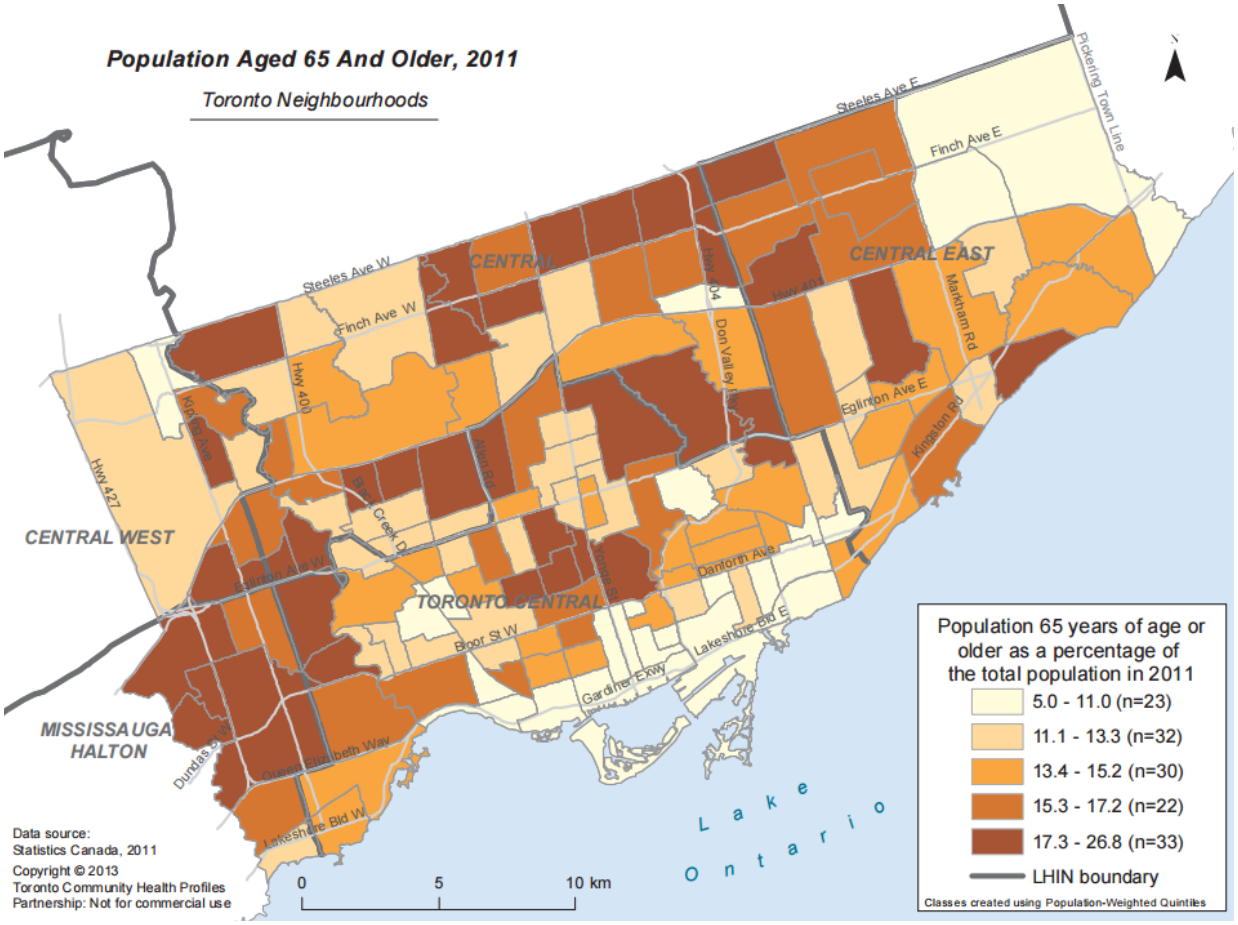

Figure 46: Toronto Neighbourhoods by Population-Weighted Quintiles Data Classification
(Toronto Community Health Profiles Partnership, 2013)

APPENDIX B: NEIGHBOURHOOD SENIOR POPULATION RANKINGS

Table 8: Toronto Neighbourhoods with High Senior Populations as a Percentage of the Total Population (Toronto Community Health Profiles Partnership, 2013)

No.	Neighbourhood
1	Banbury - Don Mills
2	Bathurst Major
3	Bayview Woods - Steeles
4	Bendale
5	Bridle Path - Sunnybrook York Mills
6	Casa Loma
7	Edenbridge - Humber Valley
8	Englemount-Lawrence
9	Eringate - Centennial - West Deane
10	Etobicoke West Mall
11	Forest Hill South
12	Guildwood
13	Hillcrest Village
14	Humber Heights – Westmount
15	Humber Summit
16	Islington City Centre West

No.	Neighbourhood
17	Kingsway South
18	Maple Leaf
19	Markland Wood
20	Newtonbrook East
21	Rexdale Kipling
22	Rosedale Moore Park
23	Rustic
24	Steeles
25	Tam O'Shanter Sullivan
26	Victoria Village
27	Westminster Branson
28	Willowdale West
29	Willowridge - Martingrove - Richview
30	Wychwood
31	Yonge St. Claire
32	Yorkdale - Glen Park

APPENDIX C: NEIGHBOURHOOD WALK SCORE RANKINGS

Table 9: Toronto Neighbourhoods with High Senior Populations as a Percentage of the Total Population and Walk Scores (Toronto Community Health Profiles Partnership, 2013; Walk Score, 2015)

No.	Neighbourhood	Walk Score
1	Edenbridge - Humber Valley	49
2	Willowridge - Martingrove - Richview	51
3	Bayview Woods - Steeles	57
4	Eringate - Centennial - West Deane	57
5	Bridle Path - Sunnybrook York Mills	58
6	Humber Heights – Westmount	58
7	Rexdale Kipling	58
8	Guildwood	59
9	Rustic	60
10	Bathurst Manor	61
11	Humber Summit	61
12	Steeles	61
13	Westminster Branson	61
14	Bendale	64
15	Newtonbrook East	64
16	Tam O'Shanter Sullivan	64
17	Maple Leaf	66
18	Banbury - Don Mills	67
19	Hillcrest Village	68
20	Kingsway South	68
21	Markland Wood	69
22	Englemount-Lawrence	70
23	Victoria Village	71
24	Islington City Centre West	72
25	Yorkdale - Glen Park	72
26	Etobicoke West Mall	74
27	Forest Hill South	76
28	Casa Loma	80
29	Rosedale Moore Park	84
30	Willowdale West	84
31	Yonge St. Claire	84
32	Wychwood	86

APPENDIX D: MAP OF TORONTO - WYCHWOOD AND EDENBRIDGE-HUMBER VALLEY

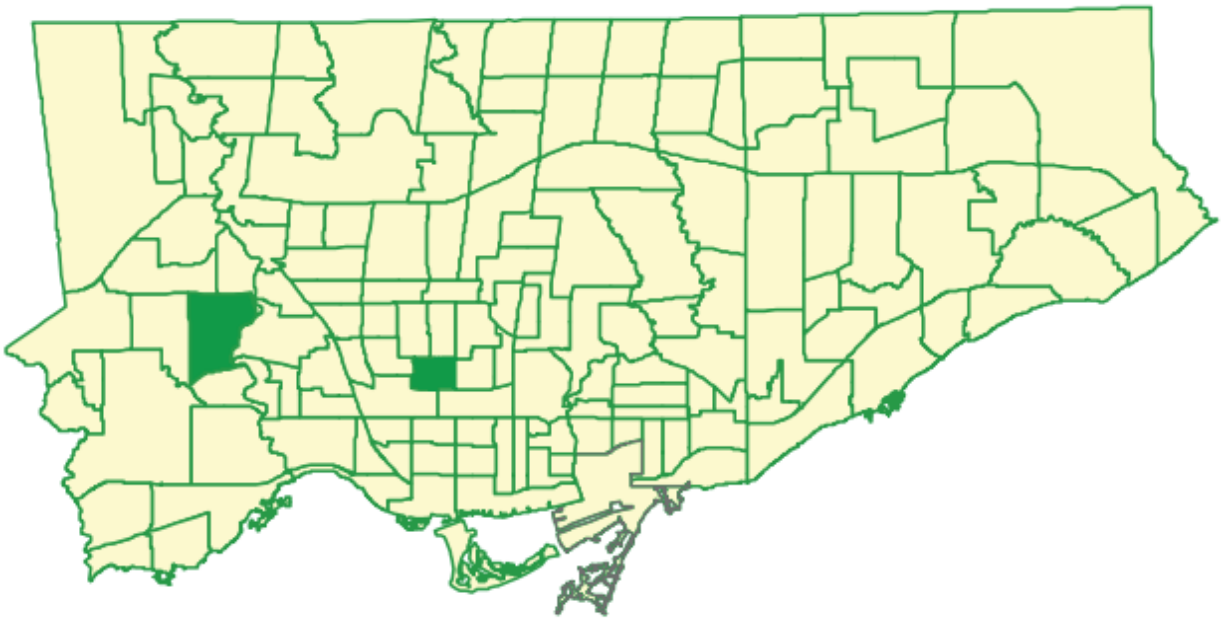

Figure 47: Map of Toronto Highlighting Wychwood and Edenbridge-Humber Valley
(City of Toronto, 2012)

APPENDIX E: STREET SEGMENTS AUDITED IN WYCHWOOD

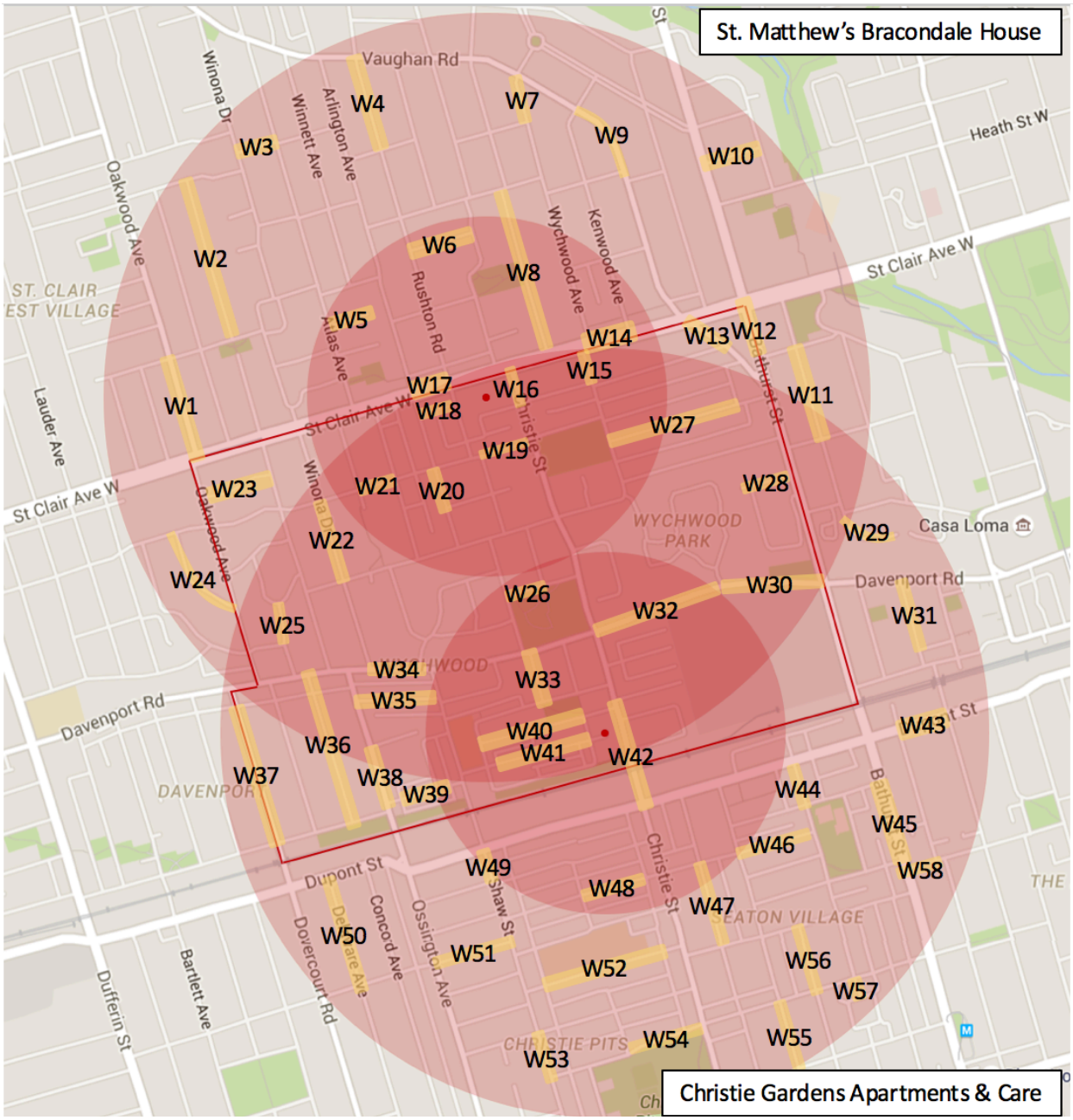

Figure 48: Map of Wychwood (Google Maps, 2016)

Table 10: Wychwood Segment IDs and Street Names

Segment ID	Street Name	Segment ID	Street Name	Segment ID	Street Name
W1	Oakwood Avenue	W21	Benson Avenue	W41	Wychcrest Avenue
W2	Rosenpath Gardens	W22	Winona Drive	W42	Christie Street
W3	Earlsdale Avenue	W23	Biggar Avenue	W43	Dupont Street
W4	Rushton Road	W24	Highview Crescent	W44	Palmerstone Avenue
W5	Grimthorpe Road	W25	Mt. Royal Avenue	W45	Bathurst Street
W6	Wellwood Avenue	W26	Hillcrest Drive	W46	Vermouth Lane
W7	Wychwood Avenue	W27	Helena Avenue	W47	Clinton Street
W8	Pinewood Avenue	W28	Burnside Drive	W48	Yarmouth Road
W9	Kenwood Avenue	W29	Austin Crescent	W49	Shaw Street
W10	Montclair Avenue	W30	Bathurst Street	W50	Delaware Avenue
W11	Hilton Avenue	W31	Howland Avenue	W51	Hallam Street
W12	Bathurst Street	W32	Davenport Road	W52	Essex Street
W13	Vaughan Road	W33	Rains Avenue	W53	Shaw Street
W14	St. Clair Avenue West	W34	Davenport Road	W54	Barton Avenue
W15	Wychwood Avenue	W35	Marchmount Road	W55	Manning Avenue
W16	Christie Street	W36	Somerset Avenue	W56	Euclid Avenue
W17	St. Clair Avenue West	W37	Dovercourt Road	W57	Barton Avenue
W18	Ellsworth Avenue	W38	Ossington Avenue	W58	Wells Street
W19	Benson Avenue	W39	Acores Avenue		
W20	Arlington Avenue	W40	Lamertlodge Avenue		

APPENDIX F: MAP OF EDENBRIDGE-HUMBER VALLEY

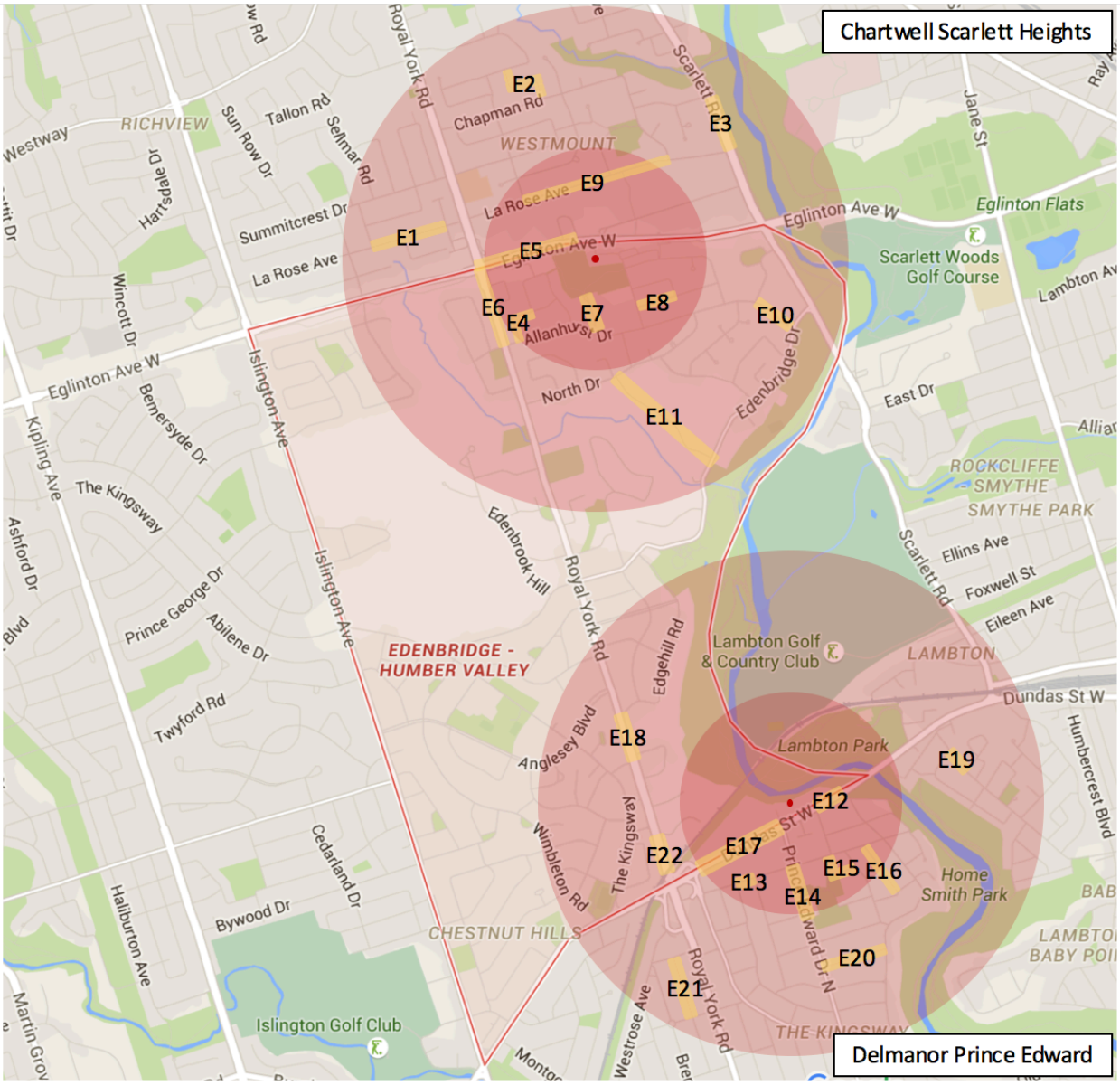

Figure 49: Map of Edenbridge-Humber Valley (Google Maps, 2016)

Table 11: Edenbridge-Humber Valley Segment IDs and Street Names

Segment ID	Segment Street	Segment ID	Segment Street
E1	La Rose Avenue	E12	Dundas Street West
E2	Drury Lane	E13	Government Road
E3	Scarlett Road	E14	Prince Edward Drive
E4	Newell Court	E15	Marquis Avenue
E5	Eglinton Avenue West	E16	Walford Road
E6	Royal York Road	E17	Dundas Street West
E7	Featherwood Place	E18	Royal York Road
E8	Knowland Drive	E19	Varsity Road
E9	La Rose Avenue	E20	Kingsgarden Road
E10	Scarlett Road	E21	Princeton Road
E11	North Drive	E22	Royal York Road

APPENDIX G: SOCIO-DEMOGRAPHIC SURVEY

1. Gender: □ Female □ Male

2. Country of Birth: _____

3. Length of time in Canada: _____ years

4. Age: □ 65-69 □ 70-74 □75-79 □ 80-84 □ 85-89 □ 90+

5. Marital Status:

□ Married/living with partner
□ Separated or divorced
□ Widowed
□ Single/never been married

6. How would you rate your overall physical health? (Check one)

□ Excellent
□ Poor
□ Good
□ Do not know / Prefer not to answer
□ Fair

7. Do you use any mobility aids to get around (e.g. wheelchairs, walking sticks, frames, etc.)?

□ Yes
□ No

8. Thinking about your mobility, including using any mobility aids (e.g. wheelchairs, walking sticks, frames, etc.) (Check all that apply):

□ I am very mobile / I have no difficulty with mobility
□ I have a lot of difficulty with mobility
□ I need someone to help me at all times
□ I have some difficulty with mobility (e.g. going uphill, etc.)
□ I am mostly bedridden
□ I can go short distances only

9. How do you rate your overall mental health/emotional well-being? (Check one)

□ Excellent
□ Poor
□ Good
□ Do not know / Prefer not to answer
□ Fair

10. How often do you feel socially isolated (i.e. lacking social interaction with friends, family, neighbours, or other community members)?

□ Always
□ Rarely
□ Often
□ Never
□ Sometimes
□ Do not know / Prefer not to answer

11. How often do you feel sad or unhappy?

□ Always
□ Often
□ Sometimes
□ Rarely
□ Never
□ Do not know / Prefer not to answer

12. How long have you lived:

a. In this city? ____ year(s) ____ month(s)
b. In this neighbourhood? ____ year(s) ____ month(s)

13. What do you like most about living in this neighbourhood?:

_____
_____

14. What do you like least about living in this neighbourhood?:

_____
_____

15. Do you have family or friends in this neighbourhood (other than in your facility)?:

□ Yes □ No

16. How would you rate your mobility level (ability to move and keep active)?

□ Excellent
□ Above average
□ Average
□ Below average

17. How do you rate your physical activity level?

□ Extremely active
□ Moderately active

18. How do you prefer keeping physically active?

□ Walking/jogging/running outdoors
□ Walking/jogging/running indoors
□ Both
□ I am not physically active

19. Are you able to perform all daily chores in your neighbourhood by walking (shopping, medical appointments, recreation, etc.)?:

□ Grocery store
□ Bank
□ Medical centre (dentist, etc.).
□ Recreational facility
□ Community centre
□ Gym
□ Library
□ Shopping centre
□ Park
□ Other: _____

20. What is the biggest obstacle to walking in your neighbourhood?:

_____
_____

Resource Sheet (Wychwood)

I am concerned with your mental/emotional well-being. If you have provided a low rating for questions 10 to 12, please speak with a nurse, the management team, or a friend you trust in your home. Below are some additional resources for professional help:

LOCAL

Solutions Health Care Associates — 578 St. Clair Ave W
(416)-654-4552

Walk-In & Family Practice Clinic — 799 Bloor St W
(416)-533-1330

SPRINT Senior Care — 140 Merton St
Health and Wellness Programs: (416)-481-6411
SPRINT Senior Care's Health and Wellness Department offers a variety of drop-in and registration-based health promotion, recreational, and social programs to help prevent illness and functional decline, as well as to increase engagement in the community and improve quality of life. These programs are either free or fee-based.

MUNICIPAL

Baycrest Health Sciences — 3560 Bathurst St
Baycrest Seniors Counselling and Referral Service: (416)-785-2500 ext. 2223

Many people find it difficult to navigate the health, long-term care and social service system. If you need information to help you make informed decisions for yourself or a loved one, Baycrest's Seniors Counseling and Referral Service can help you get started.

NATIONAL

Canadian Mental Health Association
Distress Centre: (416)-863-4357

Offers access to emotional support from the safety and security of the closest telephone. Callers can express their thoughts and feelings in confidence. Callers' issues can include problems related to domestic violence, social isolation, suicide, addictions, mental and physical health concerns. The Distress Centre offers emotional support, crisis intervention, suicide prevention and linkage to emergency help when necessary.

Mental Health Helpline: 1-(866)-531-2600
The Mental Health Helpline provides information about mental health services in Ontario. They are funded by the Government of Ontario and may provide information about counselling services and supports within your community; listen and offer support; provide strategies to help you reach your goals and; provide basic education about mental illness.

** You may detach this sheet from the survey to keep for your personal reference.*

Resource Sheet (Edenbridge-Humber Valley)

I am concerned with your mental/emotional well-being. If you have provided a low rating for questions 10 to 12, please speak with a nurse, the management team, or a friend you trust in your home. Below are some additional resources for professional help:

LOCAL

Rexdale Community Health Centre **8 Taber Rd**
Adult Social Programs: (416)-744-6312
A supportive environment for those living with isolation, depression and other mental health issues. Empowers participants through self-expression and the exchange of feelings, thoughts and life issues with others who may be experiencing similar circumstances. Offers a range of group activities that promote physical and social health and emotional well-being: physical fitness classes and various life skills workshops.

West Acres Seniors' Centre **65 Hinton Rd**
(416)-394-8680
Seniors club offers: social activities, educational and support services for 55 years old and older. The club runs regular activities on a weekly basis including: bingo, bridge, choir, cribbage, darts, euchre, ballroom line dancing, round and square dancing, computer lessons, and shuffleboard.

MUNICIPAL

Baycrest Health Sciences **3560 Bathurst St**
Baycrest Seniors Counselling and Referral Service: (416)-785-2500 ext. 2223

Many people find it difficult to navigate the health, long-term care and social service system. If you need information to help you make informed decisions for yourself or a loved one, Baycrest's Seniors Counseling and Referral Service can help you get started.

NATIONAL

Canadian Mental Health Association
Distress Centre: (416)-863-4357
Offers access to emotional support from the safety and security of the closest telephone. Callers can express their thoughts and feelings in confidence. Callers' issues can include problems related to domestic violence, social isolation, suicide, addictions, mental and physical health concerns. The Distress Centre offers emotional support, crisis intervention, suicide prevention and linkage to emergency help when necessary.

Mental Health Helpline: 1-(866)-531-2600
The Mental Health Helpline provides information about mental health services in Ontario. They are funded by the Government of Ontario and may provide information about counselling services and supports within your community; listen and offer support; provide strategies to help you reach your goals and; basic education about mental illness.

** You may detach this sheet from the survey to keep for your personal reference.*

Appendix H: Focus Group Script

Thank you for consenting to taking part in this focus group for my research. As you are well aware from the information letter that was distributed, I am studying the walkability of Toronto neighbourhoods for senior citizens such as yourselves. In the simplest of terms, walkability can be defined as how easy it is to walk in an area for pedestrians. But as you know, the abilities of pedestrians differ based on age, health, and other factors. The city is currently trying to make its streets more age-friendly so that any pedestrian – no matter what age they are – is able to comfortably and safely enjoy a walk in their neighbourhoods for leisure or to run an errand.

I am here today to ask you some questions and gather your personal perspectives on walkability of this neighbourhood – whether you find it difficult to get from point A to B by walking, whether there are any specific obstacles you face that might prevent you from walking, or whether there are any particular qualities of this neighbourhood that encourages you to go out for walks.

I have some of questions to get us started, please feel free to answer or comment at any time. As previously discussed, we will be audio-recording this focus group.

General neighbourhood questions:

1. What is it like to live in this neighbourhood as a senior?
    a. How clean is it? Why or why not?
    b. How safe is it? Why or why not?
    c. Do you find your neighbourhood aesthetically-pleasing? Why/why not?
    d. Do you find people your neighbourhood to be friendly? Why/why not?
    e. Is your neighbourhood a healthy place to live? Why/why not?
    f. Do you find your neighbourhood is more fitting towards younger people or to seniors? Why/why not?
2. For those who have lived here for more than 5 years, has the neighbourhood changed in that time? How so?
3. Is this a good place for seniors?
4. What features (physical and overall atmosphere) would make your neighbourhood better for seniors?
5. Your neighbourhood has been measured to be high/low in walkability for the general population.
    a. Do you agree or disagree? Why?
    b. Do you think there is a gap between walkability for the general population and walkability for seniors?

Walking questions:

1. Do you think walking is important?
   a. What are some of the reasons why walking is important?
   b. Do you think it's important to walk outdoors? Or will walking indoors suffice?
   c. Are there any programs you are involved in for walking/physical activity?
2. What are your general impressions of walkability in your neighbourhood?
   a. What are features (physical and overall atmosphere) that encourage walking?
   b. What are features (physical and overall atmosphere) that are obstacles to walking?

      ** Note: the participants will be prompted with: "sidewalks, traffic, community layout, amenities, safety, social networks, etc."*

   c. Are there other restrictions that prevent you from walking around outside?
   d. Are there policies at your facility that only permit outdoor activity at certain times of day or certain days of the week?
   e. Do you find that your neighbourhood is generally amenable to walkers/wheelchairs/canes?
   f. Is it walkable for seniors of all mobility levels?
3. Do you think there is a gap between walkability for the general population and walkability for seniors?
   a. What are some of the most important qualities for a neighbourhood to have to be walkable specifically for seniors?
4. Do you think the needs of seniors are considered when planning cities?
   a. What can be done to incorporate the needs of seniors into planning processes?
   b. What can be done to incorporate senior needs into planning for age-friendly cities?

Health-related questions:

1. How do you think living in this particular neighbourhood has affected your physical and mental/emotional health? Why?
2. How would you rate your quality of life based on living in this neighbourhood?
3. What are some things you would do to improve your physical and mental/emotional health? How? Why?

Conclusion

1. Do you have any additional comments to make or questions to ask?

Appendix I: Go-Along Interview Script

Thank you for consenting to taking part in this phase of the study. I would like to investigate how senior walkers see their surrounding environment and what physical or social characteristics of the environment they identify to hinder or encourage walking. For instance, a peaceful park or a café around the corner to encourage walking and poorly-lit streets and graffiti to discourage it.

We'll be going on a short walk that will start and end at your retirement home. The interview will run simultaneously with this walk and will go for approximately 30 to 45 minutes. Please let me know if you would like to stop at any time for any reason – you will not be penalized for doing so.

You have full authority over the route we take – it is preferable that you take us on a route that you most frequently walk or to particular areas in this neighbourhood that you have much to comment on in relevance to this study. Please make sure to focus on characteristics of the environment – physical and social – that you notice can hinder or improve walkability in the area. As we walk, I will be asking you questions regarding this neighbourhood and of our immediate surroundings. This interview will be audio-recorded and you may start walking ready.

General neighbourhood Questions:

1. What is it like to live in this neighbourhood as a senior?
    a. How clean is it? Why or why not?
    b. How safe is it? Why or why not?
    c. Do you find your neighbourhood aesthetically-pleasing? Why/why not?
    d. Do you find people your neighbourhood to be friendly? Why/why not?
    e. Is your neighbourhood a healthy place to live? Why or why not?
    f. Do you find your neighbourhood is more fitting towards younger people or to seniors? Why/why not?
2. For those who have lived here for more than 5 years, has the neighbourhood changed in that time? How so?
3. Is this a good place for seniors?
4. What features (physical and overall atmosphere) would make your neighbourhood better for seniors?
5. Your neighbourhood has been measured to be high/low in walkability for the general population.
    a. Do you agree or disagree? Why?
    b. Do you think there is a gap between walkability for the general population and walkability for seniors?

Route-Specific Questions:

1. How often do you go on walks – recreational or to run errands?
2. What is your general impression of walkability in your neighbourhood?
   a. Do you find it easy to get from point A to point B?
   b. What are some of the obstacles you face outside when you're walking?
   c. What are some of the physical obstacles?
      i. What are some of the social/contextual obstacles?
   d. What characteristics of your neighbourhood encourage you to walk?
   e. What are some of the physical encouragements?
      i. What are some of the social/contextual obstacles?
   f. Do you find that your neighbourhood is generally amenable to walkers/wheelchairs/canes? Is it walkable for seniors of all mobility levels?
3. Why are you taking this particular route?
   a. When is the best time to take this route and why?
   b. When is a bad time to take this route and why (i.e. night time, poor weather)?
4. What do you like the most about this route?
   a. Does it influence walkability?
5. Do you prefer taking main roads or back/residential roads? Why/why not?
6. How long have you lived in this neighbourhood?
   a. What do you like about it?
   b. What do you dislike?
   c. Do these influence the walkability of the neighbourhood or your preference for taking walks outside?
   d. If you had the opportunity to move to another neighbourhood that is more walkable, would you? Where would you go and what would the neighbourhood be like?
7. What makes walking easy for seniors in this neighbourhood?
8. What makes walking difficult for seniors in this neighbourhood?
9. Why do you think seniors shy away from walking outside (if they do)?
10. What are some changes you would suggest to the city to make it easier for senior pedestrians?

a. Changes to the physical environment?

b. Changes to the social/contextual environment?

c. Have you seen any features in other senior-friendly neighbourhoods or cities that you would like to be implemented in yours?

Health-related Questions:

1. How do you think living in this particular neighbourhood has affected your physical and mental/emotional health? Why?
2. How would you rate your quality of life based on living in this neighbourhood?
3. What are some things you would do to improve your physical and mental/emotional health? How? Why?

Conclusion

1. Is there anything else you would like to tell me about your neighbourhood and its walkability as we make our way back to the starting point?

APPENDIX J: RECRUITMENT E-MAIL

Hello *(insert name)*,

My name is Emerald Lee and I am a Masters student working under the supervision of Dr. Jennifer Dean and Dr. Robert Shipley in the School of Planning at the University of Waterloo. I am investigating walkability for seniors in the city and I am contacting you in hopes of acquiring volunteers from your retirement home as participants in this study.

The purpose of this research is to investigate how seniors living in different types of neighbourhoods experience their physical and social surroundings. The findings of the study will allow for a broader evaluation of objective and perceived walkability by comparing the differences in how each participant perceive how walkable their neighbourhoods are. The findings will further contribute towards knowledge in the urban planning and public health disciplines, as walkability is a growing area of research; the study will develop knowledge on the necessary physical and social environmental characteristics needed to create an age-friendly city for the growing senior population across Canada.

Seniors interested in taking part in this research must be able to provide legal consent and will be given the choice of participating in either a focus group or a go-along interview. A focus group is essentially a group discussion consisting of five (5) participants at a time. They will be asked a series of prepared questions and shown a few photographs of their neighbourhood to talk about. The focus groups should take no longer than 60 to 90 minutes each and they will be held in your retirement facility for convenience and comfort.

The second option of this study is for participants to take part in a one-on-one go-along interview, which is basically an interview conducted while walking in the neighbourhood of study. Participants opting in on this option of the study must feel comfortable with taking short walks around their neighbourhood with or without mobility aids. The participant will choose the route of the walk as they talk about their experiences with their neighbourhood and specific characteristics believed to discourage or encourage walking. A series of prepared questions will also be asked. The go-along interview will take 30 to 45 minutes to complete and participants may stop and return to the retirement facility at any point during the interview. Mobility aids may be used.

All participants will be asked to complete a short socio-demographic survey before their focus groups or go-along interview. If you would like to review any of the focus group, interview, or survey questions, I would be happy to provide them. However, please do not show any potential participants these questions prior to the study. All focus groups and go-along interviews will be audio-recorded to be analyzed. These audio files will be destroyed once the research is complete. Identities of all participants will be kept confidential.

I would like to assure you that the study has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee. The final decision about your residents participating in this study is yours. If you have residents who may be interested in participating, please contact me at e5lee@uwaterloo.ca and we can schedule a meeting in which I will bring formal letters of information for your residents.

I look forward to hearing from you.

Sincerely,

Emerald Lee

APPENDIX K: INFORMED CONSENT FORM

Investigators:

Principal Investigator: Dr. Robert Shipley
School of Planning
University of Waterloo
Waterloo, Ontario, Canada
(519) 888-4567 ext. 35615
rshipley@uwaterloo.ca

Student Investigator Emerald Lee
School of Planning
University of Waterloo
Waterloo, Ontario, Canada
e5lee@uwaterloo.ca

Purpose of the Study: to investigate interactions between seniors and their neighbourhoods to examine the efficacy of objective and perceived tools to measure walkability, ultimately by exploring how seniors living in two contrasting Toronto neighbourhoods perceive how walkable their neighbourhoods are.

Procedures involved in the Research: Seniors interested in taking part in this research will be given the choice of participating in either a focus group or a go-along interview. A focus group is essentially a group discussion where participants will be asked a series of prepared questions and shown a few photographs of their neighbourhood to talk about. The focus groups should take no longer than 60 to 90 minutes each and they will be held in your retirement facility for the participants' convenience and comfort.

The second option of this study for participants is to take part in a one-on-one go-along interview, which is basically an interview conducted while walking in the neighbourhood of study. The participant will choose the route of the walk as they talk about their experiences with their neighbourhood and specific characteristics believed to discourage or encourage walking. A series of prepared questions will also be asked. The go-along interview will take 30 to 45 minutes to complete and participants may stop and return to the retirement facility at any point during the interview. It is important to note that all participants be aware of their comfort levels for physical activity. Participant should not over-exert themselves and so participants of the go-along interviews may pause to rest as much as needed. Mobility aids may also be used if needed.

All participants will be asked to complete a short socio-demographic survey beforef their focus groups or go-along interview. If you would like to review any of the focus group, interview, or

survey questions, I would be happy to provide them. However, please do not show any potential participants these questions prior to the study. All focus groups and go-along interviews will be audio-recorded to be analyzed. These audio files will be destroyed once the research is complete. Identities of all participants will be kept confidential. **With your permission, the focus groups and interviews will be audio-recorded.**

Participation Benefits and Risks: While this study will not benefit participants directly, the results of the interviews will be used to inform both public health and planning officials, with the hopes of laying the foundation for potential interdisciplinary initiatives that promote age-friendly community development in Toronto. The decision to participate in the research will be kept confidential therefore the risks associated with this study are minimal.

Confidentiality: The choice to participate in this study will be kept completely confidential. Moreover, participant perspectives will be kept confidential by using pseudonyms in place of real names in any presentation or publication of the findings. All paper documents with participant information will be stored in a locked cabinet in the researcher's office at the University of Waterloo and electronic files will be securely encrypted until the study is complete. All recordings and transcripts will also be securely stored by the researcher at the University of Waterloo.

Participation: Participation in this study is voluntary. You may withdraw at any time or even after you have signed this consent form without any consequence to you or your organization. You may also choose to skip any question you are not comfortable with and still remain in the study. If you choose to withdraw part way through the study, you may request that your earlier data be omitted from the study. **With your permission, we would like to use anonymous quotes from your interview in future reports and publications.**

Information about Study Results: All participants will receive a summary of their interview to confirm its accuracy. Additionally, interested participants may be provided with a copy of the research results once the study is complete.

Information about Participating as a Study Subject: If you have questions or require more information about the study, please contact Dr. Robert Shipley by phone (519-888-4567 x35615) or e-mail (rshipley @uwaterloo.ca).

This project has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee. However, the final decision about participation is yours. Participants who have concerns or questions about their involvement in the project may contact the Chief Ethics Officer, Office of Research Ethics at 519-888-4567, extension 36005 or by e-mail at maureen.nummelin@uwaterloo.ca.

Consent

I have read the information presented in the information letter about a study being conducted by Dr. Robert Shipley and Emerald Lee, of the University of Waterloo. I have had the opportunity to ask questions about my involvement in this study, and to receive any additional details I wanted to know about the study. I understand that I may withdraw from the study at any time, if I choose to do so, and I agree to participate in this study. I have been given a copy of this form.

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

□ YES □ NO

I agree to have my interview audio recorded.

□ YES □ NO

I agree to the use of anonymous quotations in any thesis or publication that comes of this research.

□ YES □ NO

Participant Name: _____ (Please print)

Participant Signature: _____

Witness Name: _____ (Please print)

Witness Signature: _____

Date: _____

Appendix L: Letter of Information

(Date)
(Retirement Home)
(Address)

Dear Potential Participant,

This letter is an invitation to consider participating in a student-led study related to senior walkability in urban environments. This letter is intended to provide you with additional information regarding the project and what your involvement would entail.

Walkability is a commonly-used indicator to measure whether built environments are hospitable or walkable for pedestrians. It has become an important metric for cities to achieve healthy and age-friendly communities that make meaningful differences in the day-to-day lives of its residents, especially in older adult populations. Yet, walkability is not experienced or defined equally by all members of society and the needs of seniors can be overlooked when planning for walkable cities.

In response to growing numbers in senior populations, Toronto is currently aiming to become recognized as an age-friendly city. The city launched the planning of its Senior's Strategy in 2011 with initiatives to help reach that goal and it has become necessary for the city to develop physical and social environments that encourage mobility for comfortable travel as well as positive community support. Built environments at the neighbourhood level must then be assessed in order to ensure their environments are able to accommodate growing population numbers, particularly in terms of walkability for seniors of the current as well as future generations.

The purpose of this study is to therefore investigate interactions between seniors and the built environment to examine the effectiveness of objective and subjective/perceived walkability measures, ultimately by exploring how seniors living in two different Toronto neighbourhoods perceive how walkable their neighbourhoods are. At this phase of the study, I am recruiting participants from Wychwood and Edenbridge – Humber Valley to take part in focus groups and go-along interviews.

Participation in this study is voluntary. If you are interested, you must be able to provide legal consent. Participants may either take part in a focus group or a go-along interview. A focus group is essentially an indoor group discussion consisting of five (5) participants at a time. You would be asked a series of prepared questions regarding your neighbourhood. The focus groups should take no longer than 60 to 90 minutes each and they will be held in your retirement facility for

convenience and comfort.

The second option of this study is to take part in a one-on-one go-along interview, which is basically an interview conducted while walking in the neighbourhood of study. You will lead the walk and talk about your experiences with your neighbourhood and specific characteristics believed to discourage or encourage walking. A series of prepared questions will be asked about your neighbourhood and specific qualities of the area. The go-along interview will take 30 to 45 minutes to complete. You may stop and return to the retirement facility at any point during the interview.

All participants will be asked to complete a short socio-demographic survey before their focus groups or go-along interview. All focus groups and go-along interviews will be audio-recorded to be analyzed. These audio files will be destroyed once the research is complete. Identities of all participants will be kept confidential.

With your permission, the focus group and interview will be audio recorded and later transcribed for analysis. *Please see attached information sheet for more details about the full research process.*

You may decide to withdraw from this study at any time or skip any question without any negative consequence. All information you provide is considered completely confidential. Your name will not appear in presentation or report resulting from this study, however, with your permission anonymous quotations may be used.

Data collected during this study will be encrypted to ensure confidentiality; I will be the only person with authorized access to the data and all participant data collected from the focus groups, go-along interview, and surveys will be destroyed once the research is complete. We would like to assure you that this study has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee. However, the final decision about participation is yours.

If you have any questions regarding this study, or would like additional information to assist you in reaching a decision about participation, please contact me using the contact information presented below. You may make direct correspondence yourself or go through management to contact me.

Yours Sincerely,

Emerald Lee
Graduate Student, School of Planning
Faculty of Environment, University of Waterloo
Phone: 416-559-8659
Email: e5lee@uwaterloo.ca

Additional Details Regarding the Research Process

I am not particularly physically active, nor do I regularly walk in my neighbourhood. May I still participate?

Of course – this study welcomes individuals of all mobility levels since the intention is to investigate how all seniors perceive walkability, regardless of fitness and activity level or whether they are members of walking clubs. It is important to note, however, that all participants be aware of their comfort levels for physical activity. We do not want participant to over-exert themselves and so all participants of the go-along interviews may pause to rest as much as needed and may use mobility aids if needed.

I would like to participate in the study, what happens next?

Once you have decided to take part in this study, please notify the appropriate supervisory individual in your home to contact me. Once an adequate number of participants have been confirmed, I will book a convenient time to conduct the focus groups at your home.

I would like to participate in the focus groups but remain anonymous, is that possible?

It is not possible to ensure full anonymity due to the open nature of the focus groups and go-along interviews. However, all information disclosed during your participation will be kept confidential and grouped with responses from other participants. Participation in the study is voluntary and you may decline answering any questions you feel you do not wish to answer or decline contributing to portions of the sessions if you are not comfortable with them. Given the group format of the focus groups, please keep in confidence information or comments that may potentially identify another participant or individual in your facility. All participants must be physically present in their designated focus group or go-along interview for proper data collection. If you are uncomfortable with participating alongside of other focus group participants or walking in your neighbourhood for the go-along interview, then it is unfortunately not possible for you to take part in the study.

Your name will not be identified in the final report. All data collected from the focus groups and go-along interviews will be destroyed upon completion of the research.

Do I need to prepare for anything?

It would be helpful if you could reflect on past experiences you have had in your neighbourhood that are relevant to walking, so that you are better prepared for discussions. Some of the questions that will be asked will pertain to environmental characteristics that encourage of discourage walking and how you perceive walking to be for seniors. Other than personal reflection, no other form of preparation is required to participate in this study.

Will everyone receive remuneration?

Unfortunately, remuneration is not offered for this study.

APPENDIX M: CONCEPT MAPS

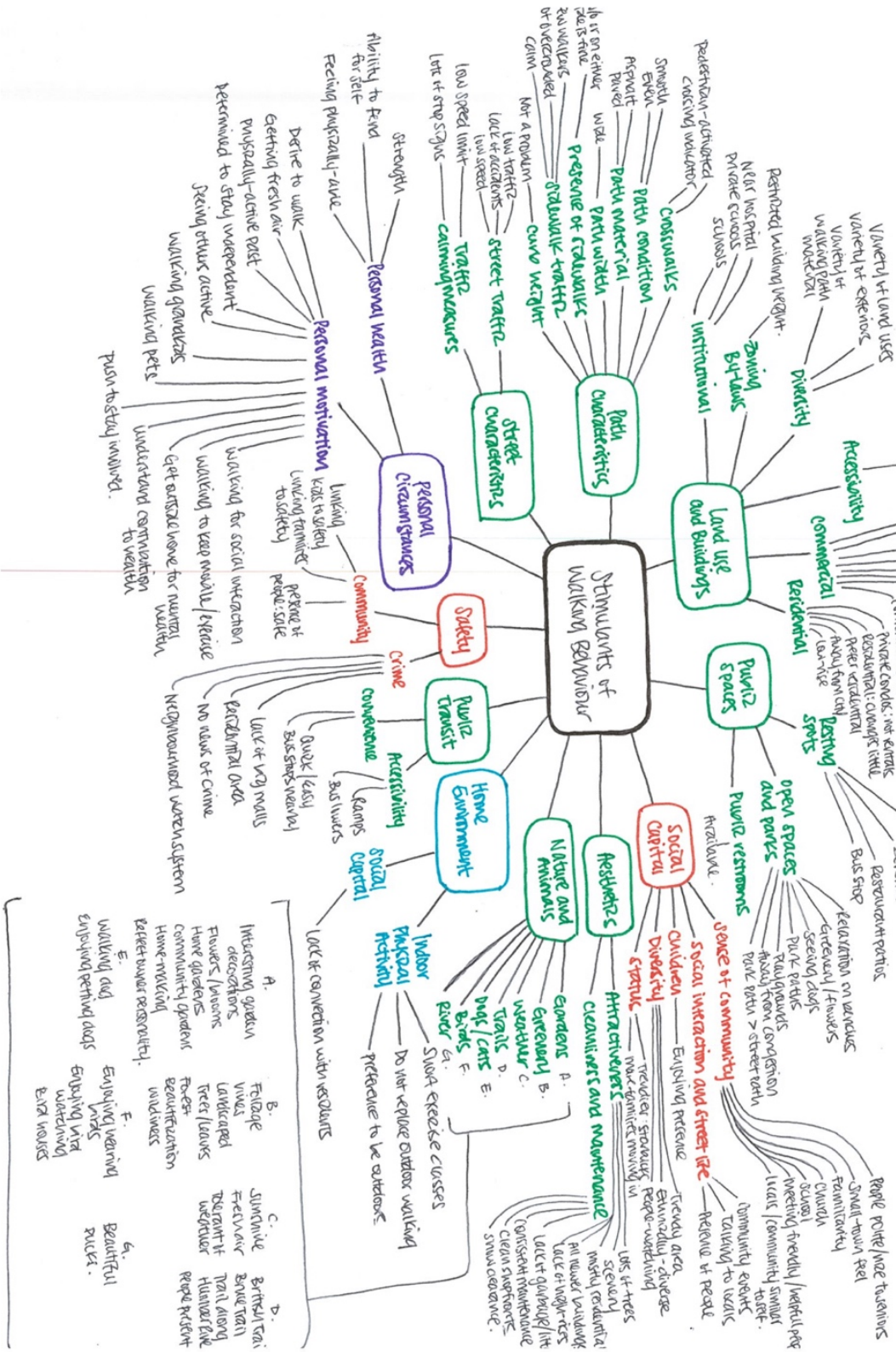

Figure 50: Stimulants of Walking Behaviour

Figure 51: Deterrents of Walking Behaviour

Appendix N: Reflection

This predominately qualitative study was grounded upon a social constructivist paradigm; individuals develop their unique perspectives of their surrounding environments, thus creating subjective interpretations that differ by individual lived experiences (Creswell, 2014). Thus, one concept or phenomenon can be perceived differently by different people. Such is the case with the concept of walkability and I came to this realization when watching my Grandfather navigate the streets of our neighbourhood over time. Walking down the street to the corner shop from our home was once easy and took little effort for him. In the past few years, however, his changing physical health has made it difficult for him to enjoy his daily strolls. Witnessing his struggles first-hand and comparing my personal experiences of our neighbourhood's built and social environments against his fostered an interest in senior well-being. My interest in walkability developed from my Undergraduate studies, where I majored in Geography and Environment Management. Health geography and walkability were concepts often discussed in lecture halls. This knowledge served as a strong foundation for Graduate course material that emphasized the importance of complete communities and healthy built environments through active living. This study thus emerged through a personal interest in senior well-being in urban areas that resulted from personal experiences and observations as well as knowledge attained from Undergraduate and Graduate studies.

I was conscious of my position as a female researcher from a prestigious university when recruiting and interacting with potential and engaged participants of this study. I understood that people may be unfamiliar with concepts such as "qualitative", "walkability", as well as "age-friendly city" and may be intimidated by the term "research." I learned not to approach residents of retirement homes and using the word "research" in my brief preliminary outline of my study; participants who completed their focus groups and interviews later told me they had thought the processes would be much more difficult than anticipated due to the association with "research." Additionally, though I do not hold a notable position at the University of Waterloo, I was cognisant of the fact that participants may feel uncomfortable sharing their personal information. Data collection was thus performed with the understanding that participants of the study should not be treated as research objects; interactions should not solely occur to collect

data from participants. Light, friendly conversations occurred with each participant to brighten the atmosphere and allow them to feel more welcome to share their thoughts with a stranger. This was undoubtedly appreciated and enjoyed by a majority of the participants. One participant, Florence, mailed hand-written thank-you cards to myself, Dr. Jennifer Dean, and Dr. Robert Shipley after our encounter. Additionally, a number of them invited me into their apartments after our discussions, three of which I happily accepted as I saw the joy they exuded when interacting with someone outside of their daily norm.

The completion of this study came with the realization that despite the growing number of studies and bodies of research centred on the aging population, seniors remain an isolated and often neglected population. Members of their own cohort are present to interact with in their homes, but participants described family members that never visited and community members they do not get to speak to either due to their lack of presence on the streets or ageist attitudes. I learned there is much more to active aging and an age-friendly city than walkability and its eight domains; seniors must be reminded they are important members of their communities and must be encouraged to remain motivated and active for well-being. For reasons discussed in Chapter Five, councillors, planners, and public health professionals carry the brunt of this responsibility.