HOW DOES NEIGHBOURHOOD ENVIRONMENT AFFECT PHYSICAL ACTIVITY IN LATER LIFE? AN EXPLORATORY CASE STUDY OF TWO NORTH VANCOUVER NEIGHBOURHOODS

by

Ann Frances Isobel Sarte
Post Baccalaureate Diploma (Urban Studies), Simon Fraser University, 2004
Bachelor of Arts (Economics), University of British Columbia, 2000

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APPROVAL

Name: Ann Sarte
Degree: Master of Arts (Gerontology)
Title of Thesis: How does neighbourhood environment affect physical activity in later life? An exploratory case study of two North Vancouver neighbourhoods

Examining Committee:

Chair: Dr. Andrew Sixsmith
Professor, Gerontology, SFU

Dr. Habib Chaudhury
Senior Supervisor
Assistant Professor and Chair, Gerontology, SFU

Dr. Andrew V. Wister
Supervisor
Professor, Gerontology, SFU

Dr. Michael Hayes
Supervisor
Associate Professor, Health Sciences, SFU

Dr. Nadine Schuurman
External Examiner
Associate Professor, Geography, SFU

Date Defended/Approved: March 12, 2008
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ABSTRACT

This case study explores environmental influences on the physical activity of older adults (age 60 and over) in two neighbourhoods. The concept of social capital – the resources available through one’s social networks – is used to explore social factors that affect physical activity in later life. A conceptual framework was developed to map relationships among key study concepts. Research methods included neighbourhood environmental audits, focus groups, and activity diaries. Findings confirmed neighbourhood differences in physical features hypothesized to impact physical activity. Neighbourhood physical and social factors identified as supports and barriers by participants themselves also differed. Moreover, one neighbourhood was found to be more supportive of walking for transport while the other was more supportive of recreational forms of physical activity. Individual participants differed in access to social capital from neighbourhood and personal networks. Relevant planning issues are discussed as they relate to physical activity promotion in later life.

Keywords: physical activity; older adults; neighbourhood; physical environment; social networks; social capital

Subject Terms: aging – environmental aspects; aging – social aspects; older people – health and hygiene; older people – social networks; city planning – health aspects
To Mom and Dad —

Without your loving support and encouragement throughout my years of education, none of this would have been possible. Much love and thanks to you both.
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Approval</td>
<td>ii</td>
</tr>
<tr>
<td></td>
<td>Abstract</td>
<td>iii</td>
</tr>
<tr>
<td></td>
<td>Dedication</td>
<td>iv</td>
</tr>
<tr>
<td></td>
<td>Acknowledgements</td>
<td>v</td>
</tr>
<tr>
<td></td>
<td>Table of Contents</td>
<td>vi</td>
</tr>
<tr>
<td></td>
<td>List of Figures</td>
<td>viii</td>
</tr>
<tr>
<td></td>
<td>List of Tables</td>
<td>ix</td>
</tr>
<tr>
<td>Chapter 1: Introduction</td>
<td>Physical activity and older Canadians</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Neighbourhoods and physical activity of older adults</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Focus of study</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Research questions</td>
<td>4</td>
</tr>
<tr>
<td>Chapter 2: Literature review</td>
<td>Key concepts and definitions</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Physical activity</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Neighbourhood</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Social capital</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Social capital and older adults</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Social capital and physical activity</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Social capital and the physical environment</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Conceptual framework</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Conditions within the broader community</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Neighbourhood characteristics</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Social networks</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Social capital</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Individual access to social capital</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Physical activity</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Research questions</td>
<td>32</td>
</tr>
<tr>
<td>Chapter 3: Methods</td>
<td>Overview of research design and approach</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>Review of secondary data</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Neighbourhood environmental audits</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Focus groups with older adults</td>
<td>34</td>
</tr>
</tbody>
</table>
Solicited activity diaries of older adults.......................................................... 35
Study sample ........................................................................................................ 36
Neighbourhoods ................................................................................................. 36
Older adults .......................................................................................................... 36
Instruments and procedure .................................................................................. 38
   Environmental audit tool and procedure ......................................................... 38
   Focus group procedure and guide ................................................................. 40
   Activity diary instrument procedure ............................................................ 41
Data analysis ......................................................................................................... 43
Trustworthiness ..................................................................................................... 45

Chapter 4: Case narratives and focus group findings ......................................... 49
   Community context: North Vancouver ............................................................. 49
   City of North Vancouver (CNV) ..................................................................... 49
   District of North Vancouver (DNV) ................................................................. 50
   Neighbourhood case: Central Lonsdale, CNV .............................................. 50
   Neighbourhood case: Deep Cove, DNV ......................................................... 51
   Neighbourhood physical environment features .............................................. 52
   Neighbourhood social environment features ............................................... 56
   Focus group findings ......................................................................................... 59
   Profile of focus group participants ............................................................... 59
   Focus group themes ......................................................................................... 61

Chapter 5: Activity diary findings and individual case studies ......................... 80
   Profile of activity diary participants ............................................................... 80
   Diary keeping period ....................................................................................... 80
   Activity index for diary data ........................................................................... 81
      Home-based activities ............................................................................... 82
      Walking activities ....................................................................................... 83
      Physical activities (other than walking) ..................................................... 84
      Social activities .......................................................................................... 85
      Non-physical leisure activities ................................................................... 86
      Auto travel ................................................................................................... 87
      "Social capital" activities .......................................................................... 87
      Social capital resources and physical activity .......................................... 88
      Individual case studies .............................................................................. 89

Chapter 6: Discussion ............................................................................................ 98
   Review of findings ............................................................................................ 98
   Study implications ......................................................................................... 107
   Study limitations ............................................................................................ 115
   Conclusions ..................................................................................................... 118

Appendix ............................................................................................................... 119
   CD-ROM Data ............................................................................................... 119

Reference List ...................................................................................................... 120
LIST OF FIGURES

Figure 2-1 Conceptual framework: Neighbourhood environment, social capital, and physical activity of older adults. .................................................. 18
Figure 4-1: Dwelling type by neighbourhood.......................................................... 52
Figure 4-2: Homeownership rates............................................................................ 58
LIST OF TABLES

Table 2-1 Built environment and physical activity (PA) research ......................... 21
Table 3-1 Summary of four data collection methods and analysis ...................... 45
Table 3-2 Strategies to ensure trustworthiness throughout the research process .......................................................... 48
Table 4-1: Street crossing features ................................................................. 53
Table 4-2: Land uses ................................................................................ 54
Table 4-3: Sidewalk characteristics ............................................................... 55
Table 4-4: Older adult age composition ......................................................... 57
Table 4-5: Focus group issues, themes, and categories .................................... 62
Table 5-1: Activity themes and average time engaged in each activity over one-week period .................................................................................. 82
CHAPTER 1: INTRODUCTION

Physical activity and older Canadians

The Canadian older adult population is more likely to be sedentary or physically inactive than younger age groups. While statistical trends indicate an increase in physical activity participation rates between current and previous cohorts of older Canadians (Victorino & Gauthier, 2005; Wister, 2005), the overall proportion of inactive seniors still remains high (Division of Aging and Seniors, 2002). In a representative sample of Canadians 60 years of age and over, approximately 45% were either sedentary or engaged in physical activity on an infrequent basis (Newsom, Kaplan, Huguet, & McFarland, 2004). Further, the highest rates of physical inactivity are among individuals 85 years of age and over, which is the fastest growing segment of the older adult population (BC Ministry of Health Services, 2004).

The health benefits associated with physical activity are undeniable. Physical activity has been positively linked to several measures of overall well-being, quality of life, and maintenance of functional independence in later life (Blumenthal & Gullette, 2002; Division of Aging and Seniors, 2002). Regular participation in physical activity can prevent, delay, or minimize negative effects associated with chronic conditions commonly experienced in later life, including heart disease, osteoporosis, hypertension, arthritis, and diabetes mellitus. Ample evidence further indicates that engagement in a minimum of thirty minutes of moderate-intensity physical activity on five or more days of

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1 In this study, a “sedentary” individual was defined as someone who does not participate in one or more physical activities of at least 15 minutes duration once a month while an individual who is active on an “infrequent” basis is someone who participates in any physical activity for at least 15 minutes duration between 1 and 11 times per month (Newsom et al., 2004).
the week (e.g., 150 minutes of brisk walking per week) results in positive health outcomes for older adults (Li, Fisher, Bauman, et al., 2005). Even older adults who have been sedentary for most of their lives can benefit from introducing moderate forms of physical activity into their daily routine (Blumenthal & Gullette, Booth, 1997).

Today's health researchers and policymakers are paying close attention to physical activity interventions that target the population as a whole. Use of ecological approaches that focus on the role of environment on physical activity has also been encouraged in research specific to older adults (King, 2001; Minkler, Schauffler, & Clements-Nolle, 2000). The neighbourhood is recognized as a particularly relevant context in which to examine physical activity behaviour, and promote physical activity at the population level.

**Neighbourhoods and physical activity of older adults**

Physical activity performed as part of daily life, such as walking for recreation or transport, usually occurs within one's neighbourhood (Ball, Bauman, Leslie & Owen, 2001; Brownson, Baker, Housemann, Brennan, & Bacak, 2001; Giles-Corti & Donovan, 2002; Satariano & McAuley, 2003; Troped et al., 2001). That several academic journals have recently devoted entire issues to theoretical and empirical research on this topic reflects the importance and interest attributed to it within the research community. In spite of this interest, neighbourhood-based physical activity studies specific to older adults remain limited. This oversight is quite remarkable since gerontologists have long recognized neighbourhoods as particularly salient to older adults faced with multiple social and personal changes (Lawton, 1980; Scheidt & Norris-Baker, 2003; Kendig, 2003; Krause, 2003). An ever-growing number of researchers are now attempting to

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Few studies to date do an adequate job of accounting for both social and physical environmental features that impact physical activity. On the one hand, neighbourhood settings can provide safe and accessible venues for physical activities; alternatively, they may increase perceptions of crime (due to poor visibility, limited surveillance opportunities) and thereby negate any desire one may have to engage in outdoor activity. Physical settings can also either support or negate opportunities to interact with others while engaging in physical activities. Social interactions are thought to be integral to encouraging older individuals to partake in physical activity. Social support, for instance, has been consistently linked to physical activity in older adults (O'Brien Cousins, 1995; Fisher, Li, Michael, & Cleveland, 2004; MacDougall, Cooke, Owen, Willson, & Bauman, 1997). Social support of physical activity is but one type of resource that others can provide to encourage one to be physically active. Social capital – a concept that can be broadly defined as the sum of resources available to an individual through his or her social networks (Flap, 2004) – can be used to explore how social resources might influence physical activity in later life.

Focus of study

The focus of this study is to examine socio-physical characteristics of neighbourhood contexts within which older adults engage in physical activities. Specific interest is in exploring whether the concept of social capital elucidates our understanding of how social processes might influence physical activity behaviours among older adults. A thorough review of the multidisciplinary literature is undertaken in order to develop a conceptual framework that maps relationships among the key study concepts of
neighbourhood environment, social capital, and physical activity. These linkages are then explored using a qualitative, case study approach in two local neighbourhoods. The neighbourhoods were selected to represent two ends of the neighbourhood “walkability” spectrum: one was representative of an “urban,” high density, mixed use neighbourhood, while the other more closely resembled a decentralized “suburban,” auto-oriented, residential neighbourhood.

**Research questions**

The overarching research question for this study is:

- How does neighbourhood environment influence physical activity in later life?

Specific research questions addressed include:

- What is the role of neighbourhood physical environment on physical activity of older adults?
- What is the role of neighbourhood social environment on physical activity of older adults?
- What forms of social capital, if any, emerge as most relevant in the study of physical activity of older adults?

A review of the literature and the conceptual framework are presented in the following chapter. Chapter Three outlines the methods used for data collection and data analysis. Chapters Four and Five introduce the study findings. The final chapter includes a detailed discussion of the findings and their research and planning implications, study limitations, and directions for future research.
CHAPTER 2: LITERATURE REVIEW

The first section of this chapter provides a summary of definitions for key study concepts. It is followed by a general overview of research on social capital and older adults. Research on social capital and physical activity, and social capital and neighbourhood physical environment, are also reviewed. Based on a review of the multidisciplinary literature, a conceptual framework is presented in the second half of the chapter. Concepts and variables identified in the framework are derived from, and supported by, the work of several researchers (Carpiano, 2006; Berkman, Glass, Brissette, & Seeman, 2000; Li, Fisher, Bauman, et al., 2005; Satariano & McAuley, 2003).

Key concepts and definitions

Physical activity

Several definitions and measures of physical activity are applied in health research. This study takes an approach in line with other health research based in the social sciences and examines physical activity as a concept that can take multiple forms (Alfonzo, 2005; Besser & Dannenberg, 2005; Fisher et al., 2004; Giles-Corti & Donovan, 2002; Li, Fisher, & Brownson 2005; Seefeldt, Malina, & Clark, 2002). It is guided by a general taxonomy developed by Frank, Engelke, and Schmid (2003) to distinguish between recreational and utilitarian forms of physical activity. Recreational forms of physical activity are activities engaged in for pleasure and/or health and fitness purposes only; examples include jogging, cycling, lawn bowling, tennis, weight lifting, and strengthening exercises. Utilitarian forms of physical activity are activities – such as
walking or cycling – engaged in to achieve another purpose (Frank et al., 2003). Hence, walking to the store is considered a utilitarian form of physical activity whereas taking a walk with friends in a local park is a recreational form.

Active living

Related to physical activity is the concept of “active living”³. Active living represents a broader, less “prescriptive” movement in physical activity that keeps within the spirit of health promotion (Bercovitz, 1998; Bercovitz & Skinner, 1996; Frankish, Milligan, & Reid, 1998). In 1999, the Active Living Coalition for Older Adults (ALCOA) developed a national active living framework for older Canadians. This report states that:

The movement towards an active living approach is extremely significant for older Canadians. Since structured physical activity is no longer seen as the sole means of gaining benefits, a myriad of activities – such as walking or “wheeling,” gardening, home exercise, swimming, dancing, and even domestic chores of a physical nature – are now considered valuable and essential (ALCOA, 1999, p.4).

In this study, the concept of active living is considered analogous to physical activity.

Neighbourhood

Neighbourhood is one of the most elusive concepts applied to health research. According to Peace, Holland, and Kellaher (2006), neighbourhoods are “geographical areas with personal and social meaning related to the physicality of the environment” (p. 70). Neighbourhood typically refers to a physically-defined area in which a group of people reside, whereas “community” usually refers to a group of people who share

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³Active ageing is another concept that has recently entered the health policy and research lexicon. The World Health Organization (2002) defines active ageing as the “process of optimizing opportunities for health participation and security in order to enhance quality of life as people age” (p. 12). In this sense, “activity” refers to participation of any kind in social, economic, cultural, spiritual, or civic affairs – and not specifically physical activity. The concept of “active ageing” is therefore even broader than active living and will not be explicitly addressed in the proposed study.
common traits, interests, practices, and/or beliefs, irrespective of physical “place.” Consequently, there is no single, agreed upon, definition of neighbourhood applied in health research.

Census tracts often serve as proxies to neighbourhood units in health studies. However, such proxy measures can be less than ideal if administrative boundaries are meaningless to the residents themselves, or to the community agencies responsible for local area service delivery. Diez Roux (2001) states that neighbourhood as a concept remains necessarily flexible because criteria on which it is based varies depending on specific research goals. In addition to administratively defined units, neighbourhoods can be historically-defined, be based on the degree of homogeneity of residents, or be based on people's perceptions of place and their connection with others. As Diez Roux (2001) notes:

Neighborhoods defined on the basis of people's perceptions may be relevant when the neighbourhood characteristics of interest relate to social interactions or cohesion, administratively defined neighbourhoods may be relevant when the hypothesized processes involve policies, and geographically defined neighbourhoods may be relevant when features of the chemical or physical environment (e.g., toxic exposures) are hypothesized to be important (p. 1785).

Macintyre and Ellaway (2000) and Macintyre, Ellaway, and Cummins (2002) further contend that multiple criteria need to be explored in neighbourhood-based health research. As such, this study uses a combination of neighbourhood definitions, and includes features of both the neighbourhood's physical and social environment.

**Social capital**

Since it first entered the health research lexicon approximately twenty years ago, much debate has surrounded application of social capital within health research (Macinko & Starfield, 2001). While unresolved conceptual and methodological issues
remain, there is mounting evidence to indicate important links between social capital and area-based differences in health outcomes, including mortality, self-reported health status, and deaths from heart disease (Baum & Palmer, 2002; Health Canada, 2003; Kawachi, 1999; Lomas, 1998; Subramanian, Lochner, & Kawachi, 2003; Whitley & McKenzie, 2005). The majority of health research has applied social capital as conceptualized by Robert Putnam (1995). Putnam defines social capital as “features of social organization, such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit” (Putnam, p. 67). However, this approach has faced much criticism – especially from a sociological perspective (Carpiano, 2006; Macinko & Starfield; Szreter & Woolcock, 2004).⁴

Criticisms aside, some common themes emerge in social capital and health literature. These themes include the following:

- Unlike other forms of capital, social capital does not reside in individuals nor in physical infrastructure; rather, it is "found" within social relationships.

- Social capital facilitates actions of individual members within a social network so that objectives can be pursued collectively.

- Social capital can exist in many forms and serve either positive or negative purposes.

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⁴ For instance, it is argued that a Putnam-inspired definition of social capital blurs distinctions between social processes that lead to social capital itself, and its eventual outcomes. Trust and cohesion reflect group characteristics that eventually shape social resources (for example, privileged access to employment information) that can be accessed by individual group members. In turn, access to a resource can ultimately lead to a specific outcome (in this example, improved job prospects).
Social capital can be considered a "public good" because it is beneficial (or detrimental) to those who do not directly participate in its creation (or destruction) (Cannuscio, Block, & Kawachi, 2003).\(^5\)

Ongoing debate about social capital's place in health research has led to re-examination of its sociological origins (Moore, Shiell, Hawe, & Haines, 2005). Pierre Bourdieu (1986) is identified as the first critical thinker to provide a systematic analysis of social capital (Portes, 1998). Bourdieu defines social capital as "the aggregate of the actual or potential resources that are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (Bourdieu, 1986, p. 248). An individual's access to social capital will depend upon the size of the social network that he/she is connected to, as well as the volume of capital (e.g., human, cultural and financial) possessed by each member in his/her network (Bourdieu). While Bourdieu does not identify specific examples of social capital, he indicates that resources obtained through group membership include tangible services as well as the symbolic profits associated with belonging to a prestigious group. Bourdieu's theory of social capital has recently been applied to research on socio-spatial phenomena, including health (Carpiano, 2006; Gatrell, Popay, & Thomas, 2004).

Along with Bourdieu, James Coleman is recognized as a pioneer in the theoretical development of social capital and its application in sociological research. Within the social sciences, Coleman's theory of social capital has been applied to studies on family, ethnicity, and community development. Coleman (1988) adopts the following functional definition of social capital:

\[^5\] As an example, residents who live in an area where neighbours participate in a crime watch/prevention program benefit from increased neighbourhood safety as a result of any informal surveillance activity – even if a resident does not directly "patrol" the area he still benefits from the efforts of his neighbours.
[Social capital] is not a single entity, but a variety of different entities having two characteristics in common: They all consist of some aspect of social structure and they facilitate certain actions of individuals who are within the structure. Like other forms of capital, social capital is productive, making possible the achievement of certain ends that would not be attainable in its absence (p. S98).

Coleman further emphasizes the supra-individual element of social capital, focusing on the role of group values in the creation of social capital (Whitley & McKenzie, 2005). He incorporates compositional features of networks (e.g., trust and social norms) with the resources that emerge from such networks (e.g., information potential and informal social control). Consequently, Coleman’s can be considered as problematic as Putnam’s definition, since it, too, can lead to tautological reasoning (Portes, 1998). In this study, Bourdieu’s definition of social capital is used to explore the concept’s value in framing relational resources that may shape physical activity in particular settings within the neighbourhood context.

**Social capital and older adults**

Studies that explore how older adults benefit from social capital draw largely from social network research (Berkman et al., 2000; Keating, Swindle, & Foster, 2005; Stone, 2003). The aging and social network literature draws distinctions between types of networks (e.g., social, support, and care networks) and the resources that flow from them. Network type distinctions are valuable because they acknowledge group membership characteristics that shape resources (Keating et al.). However, most of the literature on social capital and aging has been on “bonding social capital” that comes from personal, social and support networks (Cannuscio et al., 2003; Scharf, Phillipson, Kingston, & Smith, 2001; Sixsmith & Boneham, 2003). Network research on older populations also tends to focus primarily on family caregiving relationships. At present, little data is available on non-caregiving related assistance that family and friends
provide older adults, and on the contribution that fictive kin (i.e., family-type relationships that are not blood- or marriage-related) and neighbours make to an older person’s stock of social capital (Jordan-Marsh & Harden, 2005). As Krause (2003) notes, research on older adults rarely focus on neighbourhood social support systems, and how, if at all, neighbourhood conditions shape local relationships.

**Social capital and physical activity**

Only a few neighbourhood-based physical activity studies include measures of social capital. For example, Brennan, Baker, Haire-Joshu, and Brownson (2003) found that a person’s perceptions of “protective social factors” (a construct that enmeshes dimensions of social capital with other social constructs) are positively associated with an increased likelihood of meeting the United States Center for Disease Control and Prevention’s recommendations for either moderate (i.e., engaging in at least 30-minute bouts of moderate intensity physical activity, five times a week) and/or vigorous activity (i.e., engaging in at least 20-minute bouts of intense physical activity three times a week) (Brennan et al.). This association was found among White but not African American participants. Further, it should be noted that this study did not include neighbourhood physical environment measures, and relied exclusively on a single scale to assess related but theoretically distinct social constructs.

Two studies using data from different adult population surveys in Malmö, Sweden examined the relationship between social capital and physical activity. The first of these studies examined several forms of social capital (e.g., social participation, social anchorage, and social support), and tested whether access to social capital could help explain leisure-time physical activity level differences found between socio-economic status (SES) groups among a sample population, 45-64 years of age (Lindström, Hanson, & Östergren, 2001). Initially observed SES differences (i.e., skilled/non-skilled
manual labourers in contrast to high-level, non-manual labourers were more likely to report low leisure-time physical activity) were weakened once social participation (i.e., how actively the person takes part in social groups) was accounted for in the analysis. Somewhat weaker associations were also found for low social anchorage (i.e., extent one feels of belonging to a social group(s)) and instrumental social support, though this latter association was only observed among women. Social participation was also found to have a decreasing effect on the significant association between SES gradients and leisure-time physical activity level. These authors therefore conclude that some of the observed SES differences in leisure-time physical activity reflect social capital disparities between different SES groups.

In a related study, Lindström, Moghaddassi, and Merlo (2003) measured social capital at both the contextual- and individual-level to test its influence on individual leisure-time physical inactivity. These researchers used migration statistics to measure contextual social capital. To assess social capital at the individual-level they used a measure of individual social participation. Their results indicate that individual social capital is significantly associated with physical inactivity, and is also a strong predictor of neighbourhood differences in physical inactivity. Country of origin and educational level were also strong determinants of the proportion of persons reporting low physical inactivity within neighbourhoods. On the other hand, contextual social capital was not significantly associated with individual-level physical inactivity nor neighbourhood-level differences. Their study is considered novel since it accounts for social factors at both the individual and neighbourhood levels. However, the appropriateness of using migration statistics as a proxy for neighbourhood social capital is debatable. First,

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6 This measure was based on the assumption that a neighbourhood rich in social capital would have a relatively low migration rate, thus suggesting residents were highly “attached” to the neighbourhood and that time was invested in developing social ties.
measure cannot distinguish whether staying in the neighbourhood is by choice or lack thereof; if the latter, it might actually suggest a lack of opportunities for upward mobility, and thus, low social capital. Second, and as identified by the researchers themselves, individual-level factors could be shaped by contextual factors, and therefore, lie on the pathway between social capital and physical activity. Another notable study limitation is that other neighbourhood factors, such as whether there were convenient and accessible recreational facilities nearby, or whether there were local physical activity programs available, were not measured. The study also focused solely on leisure time physical activity.

Only a handful of studies have examined the relationship between social capital-related measures and physical activity of older adults. Fisher et al. (2004) included a neighbourhood-based measure of social cohesion in their study. This measure was found to have a positive association with neighbourhood-level differences in self-reported physical activity levels among a sample of community-dwelling older adults in Portland, Oregon. Social cohesion was measured by aggregating individual responses to questions on neighbours' trustworthiness and helpfulness, perceptions about whether participants' neighbourhood was "close-knit," and whether residents shared similar values. As such, their measure closely corresponds to Putnam's definition of social capital. In another multilevel study, Li, Fisher, and Brownson (2005) included a similar measure of social cohesion along with other neighbourhood environment measures. In their full analytical model (including both individual- and neighbourhood-level predictors), social cohesion was found to be significantly related to neighbourhood walking activity. In other words, neighbourhoods showing high levels of social cohesion also reported higher levels of neighbourhood walking activity. While social cohesion is related to social capital, the appropriateness of using it as a proxy measure of the latter is contestable.
because it does not fully account for how social connections to neighbours and network membership actually affect physical activity participation.

To date, health research on social capital also tends to overlook potential linkages between neighbourhood physical environment and social capital. The few studies that explore this relationship are briefly outlined below.

**Social capital and the physical environment**

Research on how environmental design may either support or hinder the creation of social capital remains largely speculative. Putnam, for instance, alludes to the impact environmental design has on social capital in his book, *Bowling Alone* (2000). He attributes changing social patterns and dwindling stocks of social capital to sprawling urban development and longer commutes that subsequently reduce time available to participate in neighbourhood associations and informal social gatherings with family, friends, and neighbours. Studies using time-use diary data further suggest that increasing commute times are correlated with a decline in level of informal social interaction (Sander, 2002). Frumkin, Frank, and Jackson (2004) recently reviewed research on social capital and urban sprawl and other design practices. They found that environmental design that (a) promotes open public and semi-private space close to residential areas; (b) results in high density and mixed land use; and (c) creates more interesting, walkable environments, are positively associated with greater opportunities for social interaction and arguably, a greater sense of community (Lang & Hornburg, 1998; Leyden, 2003; Lund, 2002).

Post-modern design practices like New Urbanism and Neo-Traditional Design that purportedly enhance the degree and quality of social interaction between neighbours have also garnered recent attention. So far, the few studies that have been
published provide only mixed support for this hypothesis. For instance, Brown and Cropper's (2001) study of a New Urban and a Standard Suburban subdivision found residents in the New Urban neighbourhood type reported greater socialization and outdoor use than their suburban counterparts; however, no difference was found in sense of community perceived by residents in either neighbourhood. In a comparative study of a New Urbanist community with other neighbourhood types in Portland, Oregon, Podobnik (2002) found evidence that New Urbanist design principles like pedestrian-oriented, mixed use development led to greater social cohesion and the generation of social capital. Consequently, this study suffers from a number of issues that hamper most research on this topic (Sander, 2002). Similar to health research on social capital more generally, environmental design research tends to focus exclusively on communitarian aspects (i.e., trust, group cohesion, sense of community) while little regard is given to structural elements of social networks and the social resources derived from these.

Gerontological research has only begun to speculate on environmental influences on social capital and their combined effects on healthy aging (Cannuscio et al., 2003; Clark & McCann, 2003). These studies explore the potential for residential settings (e.g., assisted living and retirement villages) to enhance the social capital available to older adults. Most of these studies define health rather broadly, and do not specifically focus on how social capital might influence participation in health-promoting activities like physical activity. A recent, groundbreaking study by Berke, Gottlieb, et al. (2007) suggests a protective association between a walkable neighbourhood environment and depressive symptoms in older men – over and above the health benefits that accrue from being physically active. While these researchers speculate that social capital and other social processes were likely at play in this association, no
measures of social capital and other indicators of social processes were formally included in the study.

The current study addresses some of the research gaps discussed above. First, it accounts for both physical and social features of the neighbourhood environment (and not just one or the other). Further, it attempts to distinguish between broader characteristics of the social milieu from social capital itself. A conceptual framework that integrates key concepts is used to guide the study. As previously mentioned, development of this framework was grounded in the theoretical and empirical research of several others (Carpiano, 2006; Berkman & Clark, 2003; Li, Fisher, Bauman, et al., 2005; Satariano & McAuley, 2003).

Conceptual framework

The conceptual framework illustrated in Figure 2-1 is based on a broad, socioecological approach to health promotion (Stokols, 1992; Stokols, Grzywacz, McMahan, & Phillips, 2003). Features are specified at three contextual levels: the macro-level (community), the meso-level (neighbourhood), and the micro-level (individual). A socioecological approach acknowledges multiple and dynamic interactions that occur between factors identified at each level. An underlying assumption is that conditions at the more distal, community level shape physical and social elements at the more proximal, neighbourhood level. These environmental features subsequently affect the quantity and quality of social networks and the resources that individuals can access (in other words, social capital). In addition to these environmental determinants, characteristics of the older individual also shape whether or not one has access to, and/or chooses to mobilize social capital available from networks. In turn, the combination of these factors affect the individual’s engagement in physical activity.
Other research supports the value of socio-ecological approaches to health and physical activity research. Berkman and colleagues (2000) developed a multilevel framework to link upstream (macro- and meso-level) to downstream (micro-level) factors to reflect multiple pathways through which social interactions affect individual health. Application of multilevel ecological models in physical activity research has also increased within the last several years (Cunningham & Michael, 2004; A.C. King, Stokols, Talen, Brassington, & Killingsworth, 2002; Spence & Lee, 2002; Satariano & McAuley, 2003). As discussed by Satariano and McAuley (2003), using an ecological model of physical activity for older adults is beneficial because it accounts for the multiple influences on physical activity, including intrapersonal, social, cultural, and physical environmental factors.

It should be further noted that unlike Putnam, Bourdieu’s and Coleman’s theories of social capital are more adept at accounting for multilevel processes that lead to social capital effects on health. Most recently, Carpiano (2006) applied Bourdieu’s concept of social capital to a study of health, and adopted a conceptual model that identified key variables at both the neighbourhood- and individual-levels. Thus, Carpiano’s research significantly informed the development of the conceptual framework used in this study.
Figure 2-1 Conceptual framework: Neighbourhood environment, social capital, and physical activity of older adults.
Conditions within the broader community

Historical, socio-cultural, and economic forces identified at the broader community context inherently influence local systems, and the quality of material and social neighbourhood infrastructures. Inclusion of macro-level factors in the framework is to acknowledge the influence class and power systems have on social network formation and connections between and within social groups at the local level, a consideration that previous models on social capital and health have largely ignored (Gomez & Muntaner, 2005; Lynch, 2000; Navarro, 2004). The relevance of macro-level conditions has also been recognized in physical activity literature. A.C. King et al. (2002) identified distal, macro-level policies as influencing individual physical activity patterns. For example, the design of transit systems, land use zoning bylaws, in addition to existing cultural norms (e.g., transportation and housing preferences), impact (be it directly or indirectly) whether the environment supports or hinders physical activity.

In particular, social policies are examined in physical activity literature (Brownson et al., 2001; Kahn, Ramsey, Brownson, et al., 2002; Sallis, Bauman & Pratt, 1998; Stahl, Rutten, Nutbeam, et al., 2001). Policies, laws, and regulations that encourage physical activity can enhance access to recreational facilities and/or provide informational outreach. In their extensive review, Kahn et al. (2002) note that policy interventions are effective at increasing levels of physical activity. Although the majority of policy-focused interventions do not deal exclusively with the older adult population, it is possible to speculate that policies found applicable to other population groups (e.g., safety policies such as sidewalk repair and timely removal of snow during winter months; access to affordable exercise programs and policies that support access to affordable public transportation options) would also benefit older adults.
Neighbourhood characteristics specified at the meso-level are discussed in the
next section. Substantial research evidence indicates the significant influence
neighbourhood context has on both community and individual health (Ellaway &
Macintyre, 1996; Robert, 1999; Starr, Deary, & Macintyre, 2003; Steptoe & Feldman,
2001). Both neighbourhood physical and social environment features are described in
turn.

**Neighbourhood characteristics**

**Physical environment**

Neighbourhood physical environment includes features of both the natural
environment (e.g., local topography, climate, and quality of air and water supplies) and
built environment (e.g., buildings, streets, sidewalks, and other design elements).
Several reviews of physical environment and physical activity research have been
published over the last few years (Bauman et al., 2002; Frank & Engelke, 2001; Handy,
Boarnet, Ewing, & Killingsworth, 2002; Humpel, Owen, & Leslie, 2002; Kahn et al., 2002;
Lee & Vernez Moudon, 2004; Seefeldt et al., 2002). A growing body of research has
established significant associations between built environment features and physical
activity (Frank, Sallis, Conway, Chapman, Saelens, & Bachman, 2006; Lee & Vernez
Moudon; Saelens, Sallis, & Frank, 2003).

The urban design and transportation planning literature categorizes features of
the built environment in terms of transportation systems, land development patterns, and
urban design features (Frank & Engelke, 2001; Handy et al., 2002; Jackson, 2003).
Research specific to each of these categories is summarized in Table 2-1.
Table 2-1 Built environment and physical activity (PA) research

<table>
<thead>
<tr>
<th>BUILT ENVIRONMENT FEATURES</th>
<th>COMMONLY USED MEASURES</th>
<th>FINDINGS</th>
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<tbody>
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<td>Transportation Systems:</td>
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<td>Street Connectivity</td>
<td>Degree of street</td>
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<td>motorized transportation</td>
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<td>Land Development Patterns:</td>
<td>Number of persons,</td>
<td>Density and PA positively</td>
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<td>Density</td>
<td>residential households,</td>
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<td>Land use mix index/scale</td>
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Transportation systems

Transportation systems determine connectivity between destinations. The layout of the street network and the relative directness and quality of travel it affords various transportation modes determine accessibility and convenience of neighbourhood travel. Frank et al. (2003) identify two archetypes of street networks. The grid street pattern is characterized by smaller blocks and more intersections; it offers more opportunities for direct movement between destinations and provides high street connectivity. Older,
urban centre street layouts are indicative of the grid street pattern. The second type is referred to as the dendritic street network, which forms a hierarchical and curvilinear pattern of streets (Frank & Engelke, 2001). On the one hand are major arterial roads (e.g., highways) designed for heavy traffic and rarely accommodate for non-motorized transportation amenities. On the other hand are residential streets that have “loop-and-lollipop” configurations (e.g., cul-de-sacs typical of post-war, suburban subdivisions); these streets feed into arterial roads via major connector routes. Unlike grid networks, fewer but larger blocks with a low number of intersections per unit area characterize this type of street network (Frank & Engelke). Consequently, dendritic street networks increase trip length and make non-motorized transport options comparatively inconvenient to motorized transport.

There is limited research on the impact of transportation systems on physical activities of older adults (Cunningham & Michael, 2004). However, some evidence suggests that auto traffic compromises perceptions of safety, and that lower perceived safety discourages physical activity. For instance, Li, Fisher, and Brownson (2005) found that neighbourhoods with safe walking environments had lower rates of decline in walking activity among older adults (although this study did not include objective measures of transportation systems and safety of walking was only self-reported). In another study, Patterson and Chapman (2004) compared the relationship between pedestrian-friendly urban form to suburban form, and how these might correlate with several factors including walking activity for older women. Characteristics of the street

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7 The highly connected street network is also a principle of New Urbanism—a design and planning approach that has become popular in North America and elsewhere since the mid-1990s (Grant, 2006).

8 This pattern of street networks became popular in post-war, suburban development, and has been associated with the design and planning principles of Clarence Perry and his concept of the “neighbourhood unit,” which intended to resolve car/pedestrian conflict by separating traffic (Grant, 2006).
network were collected systematically with a standardized global measure of overall quality of neighbourhood built environment. Results from their study indicate that urban neighbourhoods with good pedestrian access are associated with more walking activity.

**Land development patterns**

Land development patterns describe the spatial arrangements of activities and uses. These patterns define physical proximity between destinations (Frank et al., 2003). Land development pattern can be characterized by both density and land use mix.

**Density** can be measured in terms of the number of persons, residential households, employees per unit of area, or number of facilities per square area (Ewing, Schmid, Killingsworth, Zlot, & Raudenbush, 2003; Greiner, Li, Kawarchi, Hunt, & Ahluwalia, 2004; Humpel et al., 2002). Since density is considered the easiest built environment characteristic to measure it is used extensively in research (Handy et al., 2002). Research findings suggest that high density is conducive to reduced travel length and increased transit mode choice (Frank & Pivo, 1995). It is argued that high density provides the critical mass necessary to make commercial facilities and public transportation options economically viable (Brown & Cropper, 2001). Findings from a recent empirical study indicated a significant, positive association between measures of residential and intersection density with the amount of daily, moderate physical activity engaged in among a sample of American adults (Frank, Schmid, Sallis, Chapman, & Saelens, 2005).

**Land use mix** refers to the degree of integration of different types of uses for physical space; in other words, the relative intensity with which residential, office, retail/commercial, public, and civic uses are found within one area (Saelens, Sallis, & Frank, 2003). There is no standardized measure of land use mix applied in research although several studies report a land use mix index or scale (Frank, Andresen, &
Schmid, 2004). Research to date suggests a positive association between greater land use mix and physical activity. Moreover, it is important to note that certain types of uses are expected to be more conducive to physical activity than others (Humpel et al., 2002). For older adults in particular, a land use mix that integrates residential and specific retail/commercial uses (e.g., banks, medical clinics, pharmacies, grocery stores, parks) is likely to lead to greater engagement in utilitarian forms of physical activity (Booth, Owen, Bauman, Clavisi, & Leslie, 2000; Fisher et al., 2004; W.C. King et al., 2003; Wilcox, Castro, King, Housemann, & Brownson, 2000). Conversely, physical activity is not likely to be supported where there is a high presence of factories or other "undesirable" uses that could increase potential exposure to environmental toxins.

So far, results are not consistent across the literature on older adults (Cunningham & Michael, 2004). There is compelling evidence to indicate a positive relationship between walking in later life and residential proximity to commonly used services and amenities, such as medical clinics, grocery stores, and banks (Li, Fisher, & Brownson, 2005; Patterson & Chapman, 2004). Although engagement in physical activity was not the principal outcome under investigation, a recent cohort study conducted by Takano, Nakamura, and Watanabe (2002) found access to nearby walkable, green spaces and streets was positively associated with the five-year survival rate of seniors living in densely populated urban environments in the Greater Tokyo area. As neighbourhood environment becomes increasingly salient in later life due to diminishing personal competencies, close proximity and accessibility to a range of services and public amenities is also recognized as essential at the broader health and well-being level (Glass & Balfour, 2003).
Street- or micro-scale urban design features

Urban design features enhance the aesthetic quality of neighbourhoods at street-level and add to the visual interest of an area (Handy et al., 2002). Provision and quality of street lighting, street paving material, cohesiveness of building types, presence of street trees, and availability of seating are examples of urban design features. Street scale is another aspect of urban design. Measures of street scale, including the ratio of building heights to street width, average distance from street to buildings, or average building setback, help determine whether a street is designed for “human-scale” or “automobile-scale” (Handy et al., 2002). Together, these elements can strongly shape the overall “pleasantness” of a neighbourhood, and perceptions of safety and enjoyment for pedestrians, cyclists, and motorists. While the planning and urban design literature provides guidelines on how to make streetscapes interesting for users, especially pedestrians (Jacobs, 1995), few of these have been examined as they relate to older adults specifically.

Studies on physical activity of older adults usually include measures of urban design (Balfour & Kaplan, 2002; Booth et al., 2000; Chad et al., 2005; W.C. King et al., 2003; Wilcox et al., 2000; Wilcox, Bopp, Oberrecht, Kammerman, & McElmurray, 2003). Presence of street lighting and benches are among the features found to be important to older adults, although some urban design elements (e.g., presence of sidewalks) have received only mixed support in the literature (Cunningham & Michael, 2004). It is worthwhile to note that previous studies rarely provide a systematic, comprehensive assessment of urban design; rather, measures are often limited to a select few.

A continuum of “neighbourhood types”

Transportation systems, land development patterns, and urban design features are not mutually exclusive categories, as aspects of each tend to reinforce the others.
Neighbourhoods can be categorized more broadly, as either “pedestrian-oriented” or “auto-oriented.” At one end of a built environment continuum are neighbourhoods characterized by high connectivity, high density and land use mix, and at the opposing end are neighbourhoods characterized as exclusively residential (e.g., “bedroom communities”) with a hierarchical street system. The majority of neighbourhoods will fall somewhere in between these two extremes.

Social environment

Neighbourhood social environmental characteristics also matter to the study of physical activity. For instance, Michael, Green, and Farquhar (2006) found that older adults valued easy access to shops and services from home were valued not only because they provided opportunities for walking, but also because these shopping destinations provided opportunities to socialize and meet others. Therefore, simply providing a walking trail in a neighbourhood will not necessarily lead to increased physical activity if it is not perceived to be an attractive, safe place where one can meet others and socialize. It is therefore important to account for social characteristics of the neighbourhood in which older adults live when studying their physical activity behaviours.

A number of social factors are included in physical activity studies (Addy et al., 2004; Ball et al., 2001; Kahn et al., 2002; Stahl et al., 2001), and studies specific to older adults (Booth et al., 2000; Fisher et al., 2004; King, 2001; Wilcox et al., 2000; Wilcox et al., 2003). Most physical activity studies include some (usually subjective) measure of neighbourhood safety, and/or personal security from crime. Safety measures have been positively associated with physical activity among older adults (Cunningham & Michael, 9 Other neighbourhood classifications that frequently appear in the literature include “traditional” or “neo-traditional” versus “post-war, modernist” or “suburban,” and “walkable” versus “low density, sprawling.”
Young, Russell, and Powers (2004) found that feelings of safety and sense of neighbourhood belonging mattered to the health and well-being for older Australian women. This study found that neighbourhood safety was negatively associated with urbanization, individual socioeconomic status, and living arrangement (i.e., living alone was associated with feeling less safe). It also found residential stability to be positively associated with sense of neighbourhood belonging, but negatively associated with urbanization. While this study provides important insights, limitations were that degree of urbanization was only broadly defined and no objective measures of neighbourhood environmental features were included.

Neighbourhood-based health studies tend to include indicators of community socio-economic status and income mix, racial and age composition of residents, homeownership rates, average length of stay or residents, and neighbourhood crime rates (Carpiano, 2006; Glass & Balfour, 2003; Raudenbush, 2003; Robert, 2002). Inclusion of these neighbourhood social characteristics is, however, rare in previous physical activity studies, especially those specific to older adults. A recent physical activity study on older adults included measures for senior population density, neighbourhood ethnic composition, and neighbourhood income mix (Fisher et al., 2004). These social indicators were found to be significant to physical activity of older adults. Social characteristics such as these may, in turn, have significant bearing on social interactions and characteristics of social networks within neighbourhoods.

**Social networks**

Networks can be described in terms of both structural and compositional characteristics. Structural characteristics include size, density, homogeneity, and

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10 See Berkman et al. (2000) for a detailed description of the structural and compositional characteristics of network ties.
boundedness (i.e., the degree to which networks are defined by traditional group structures, such as neighbourhood, kin, and work). **Compositional characteristics** include frequency of contact, duration, type of contact, feelings of trust and reciprocity, and multiplexity (i.e., the number of transaction or support types flowing through a set of social ties).

Within the framework, characteristics of social networks are distinguished from social capital itself. While it is recognized that aspects of social networks can have direct bearing on individual health and well being (Kawachi, 1999), it is also recognized that their influence can operate indirectly by conditioning types of resources that flow from these social networks (Berkman et al., 2000; Carpiano, 2006).

**Social capital**

Applying Bourdieu’s definition, social capital refers to the sum of actual or potential resources that an individual can access through his or her social networks. Social capital provides both material and non-material resources to the individual that may subsequently affect his or her propensity to engage in physical activities. Some **positive forms of social capital** are now described below.

**Social support.** Older adults can draw on social support (be it instrumental, emotional, appraisal, or informational) from neighbours, peers, or community health professionals that encourage them to engage in physical activity. In her review of the literature, King (2001) states that support received from peers (e.g., other older participants in exercise groups), exercise program staff, and advice and encouragement from physicians – in addition to the social support commonly provided by family and friends – affects with whether an older adult maintains or adopts a routine of physical activity.
Social leverage. Social leverage may provide an individual or group access to information, such as the benefits of engaging in moderate levels of physical activity, or access to tangible recreational resources (e.g. seniors’ discounts).

Social influence. Social influence refers to both enabling and constraining influences on behaviour, such as peer pressure and social modelling (Berkman et al., 2000). For example, an older adult may be encouraged to participate in physical activity if they observe others in their peer group participating. Conversely, they may be discouraged if they do not see their age peers being active, or if they perceive that taking part in physical activity is considered “inappropriate” behaviour for older people. To date, evidence is inconclusive as to whether there is an association between social modelling (measured as whether or not neighbours or peers participate in physical activity) and an older individual’s propensity to be active (Booth et al., 2000; Humpel et al., 2002). Supporting evidence for the role of subjective norms – such as, perceptions of what others think one should do (e.g., whether or not it is appropriate to participate in certain sports or exercise activities) – has also been mixed in research on the general adult population (Giles-Corti & Donovan, 2002).

Informal social control. Informal social control refers to the ability of neighbourhood residents to maintain social order/combats criminal or deviant activity that compromises neighbourhood safety. It can also refer to the active upkeep or maintenance of public facilities that support several forms of physical activity.

Social engagement. Local opportunities for social engagement and active participation in community groups helps to reinforce meaningful social roles, interpersonal attachment, and can be a key catalyst for generating resources within a neighbourhood (e.g., fundraising or lobbying activities), and can itself be a form of physical activity (e.g., community gardening).
A number of negative forms of social capital may also exist. Thus, the assumption is not that the presence of social capital in a neighbourhood will always lead to beneficial outcomes. Although these forms of social capital have yet to be examined in physical activity research, it is important to be cognizant of their potential effects. A few examples are described below.

**Exclusion and exploitation of others.** Both exclusion of others and exploitation of power differentials result in some individuals benefiting from access to social capital at the expense of others. Neighbourhood-based studies should account for how social capital for some may lead to negative consequences for others in the group, or other networks within the same neighbourhood setting. By way of a hypothetical example, effective neighbourhood lobbying activity to improve local conditions in support of youth recreation may be at the expense of providing facilities that support forms of physical activity more appropriate and accessible to older adults. This can subsequently lead to intergenerational group conflict if environmental design lacks flexibility in use, and/or if residents of different backgrounds lack feelings of trust, cooperation, or obligations to each other.

**Excessive claims and downward levelling effect.** Excessive claims on group members and downward levelling effect both suggest that compositional characteristics of networks, such as reciprocity, obligations and expectations, can be so rigid and restricting that there is little opportunity for individual advancement.

**Free riding.** Free riding refers to the potential for social capital – like any public good – to be depleted or misused because there may be little, tangible incentives for individual users to contribute to the neighbourhood stock. This may result when there are no sanctions or mechanisms in place to address those who do not fulfil obligations or reciprocate actions.
Learned helplessness/excessive dependence. Learned helplessness has been examined in other gerontological literature (Baltes & Wahl, 1992), but not as it specifically relates to social capital or physical activity. It is reasonable to hypothesize that accepting regular offers from neighbours for car rides to the store, or having a neighbour run personal errands on their behalf, might negate reasons for an older adult to walk to nearby shops and/or perform other activities for themselves.\(^1\) While increased environmental press in later life may occur, environments that afford very little challenge or stimulation can be just as detrimental to the health and well-being of older adults (Glass & Balfour, 2003; Lawton & Nahemow, 1973; Shipp & Branch, 1999).

The framework identifies both positive and negative feedback loops to illustrate how social capital may lead to further investments or disinvestments in the overall quality of the neighbourhood environment.

Individual access to social capital

An individual’s access to social capital is moderated by socio-demographic, socio-economic, and social psychological factors (e.g., self-efficacy, intention to exercise). For example, degree of functional and/or cognitive impairment can influence one’s access to social capital. Whether or not an older individual actively participates in local social network(s) will also affect knowledge of, and access to, neighbourhood social capital.

\(^1\) At the same time, it is recognized that this would only be considered detrimental to the older adult’s health if he/she still had the functional capacity to carry out such activities independently or with minimal assistance from others.
Physical activity

The health outcome identified in the framework is physical activity of older adults; as already defined, physical activity can be engaged in for either recreational or utilitarian purposes.

Research questions

To restate, the overarching research question is:

• How does neighbourhood environment influence physical activity in later life?

Specific research questions addressed include:

• What is the role of neighbourhood physical environment on physical activity of older adults?
• What is the role of neighbourhood social environment on physical activity of older adults?
• What forms of social capital, if any, emerge as most relevant in the study of physical activity of older adults?

In this study, most attention is placed on factors and issues that arise from the meso- and micro-levels of the framework. Methodological issues for the study are outlined in the next chapter.
CHAPTER 3: METHODS

Overview of research design and approach

This study is designed as a neighbourhood-based case study. The case study approach is appealing because it allows for in-depth, empirical inquiry into a context-specific phenomenon: in this case, physical activity behaviour of older adults within the neighbourhood setting (Yin, 2003). A qualitative approach is used for several reasons. First, while quantitative methods predominate in health research on social capital, qualitative inquiry has been identified as essential to furthering the knowledge base and theoretical understanding of this topic (Grootaert, Narayan, Nyhan Jones, & Woolcock, 2004). Moreover, few studies to date focus on social capital as it relates to health and well-being of older adults, and no previous qualitative study examines the role of social capital on physical activity behaviour in later life. Finally, research has yet to explore how access to social capital shapes daily health experiences and behaviours within specific contexts, including the neighbourhood in which one lives. Given the focus of this study, qualitative methods allow for a grounded approach to identifying salient issues and interrelationships.

Data were obtained over a 12-month period using the following methods: (i) analysis of neighbourhood-level census data, (ii) collection of neighbourhood-level environmental audit data, (iii) facilitation of focus groups with older adults who live in the neighbourhoods under investigation, and, (iv) completion of one-week activity diaries by older adults from the two neighbourhood cases. Details of each data collection method are provided in the following sub-sections.
Review of secondary data

To gain a better understanding of the socio-demographic makeup of the broader community from which the two neighbourhoods were selected, 2001 Statistics Canada census and relevant municipal data were analyzed.

Neighbourhood environmental audits

Several neighbourhood-based physical activity studies (Fisher et al., 2004; Frank et al., 2006; Humpel et al., 2002; Troped et al., 2001) collect environmental data via direct observation. A trained observer or researcher collects neighbourhood data using a standardized environmental checklist (Craig, Brownson, Cragg, & Dunn, 2002; Day, Boarnet, Alfonzo, & Forsyth, 2006; Ewing et al., 2003). Both objective and subjective environmental data are included in research investigating the link between environment and physical activity (Brownson et al., 2004). As yet, it is unclear which of these are most salient to the study of physical activity of older adults. A recent study further indicates marked variations in objective environmental data and older adults’ perceptions of neighbourhood environment (Michael, Beard, Choi, Farquhar, & Carlson, 2006). In this study, physical environmental data is collected at the segment level. A “segment” is defined as a single block face, including both facing sides of the street. Only a sample of the segments within each neighbourhood was observed, and subsequently aggregated to the neighbourhood-level.

Focus groups with older adults

The focus group is a common data collection method in qualitative health research (Murphy, Cockburn, & Murphy, 1992; Thomas et al., 1992), and has been used in previous health-related social capital, and physical activity studies on older adults (Altschuler, Somkin, & Adler, 2004; Baum & Palmer, 2002; Lees, Clark, Nigg, &
Newman, 2005; Michael et al., 2006). A total of four focus group interviews (two per neighbourhood setting) were completed with older adults for this study. Three of the focus groups were conducted in fall 2006 and one was conducted in spring 2007. Focus group interviews solicited older adults’ perceptions of their neighbourhood physical and social environment, and in what ways it did or did not support physical activity in later life. Group discussions also generated information on social resources that may or may not influence neighbourhood-based physical activity.

The focus groups were held at the same location in each neighbourhood. These locations were mutually agreed upon as convenient and accessible for participants to get to. Assistance in arranging transportation to and from the location was extended to those participants who expressed transportation difficulties. The interview sessions were scheduled at times most convenient to participants. Each focus group interview was approximately 90 minutes in length.

**Solicited activity diaries of older adults**

Diaries have a wide range of applications, and the qualitative and quantitative information that are derived from them are found to be relevant across an array of social science and health research topics (Corti, 1993; Elliott, 1997; Harvey & Pentland, 1999; Ross, Rideout, & Carson, 1994). There is evidence to indicate the diary as both a valid and reliable research method – especially when the information is self-reported, and when the full range of activities that take place in a day are recorded (Robinson, 1999). Additionally, since experiences are recorded as they happen, the risk for errors occurring as a result of memory lapse or faulty recollection is minimized (Rosner & Namazi, 1992). To date, research on social capital has not used diaries as a primary data collection method. Instead, previous studies have used structured questionnaires that are unable to fully capture day-to-day experiences of individuals, and the socio-spatial contexts in
which these experiences occur. Diaries for this study were completed over a one-week period, during the fall of 2006 and the spring of 2007.

**Study sample**

**Neighbourhoods**

Neighbourhood selections were limited to the North Shore community for two primary reasons. First, since the focus was on neighbourhood-based physical activities of older adults, selecting neighbourhoods located within the same community helps to minimize significant variation in community-level factors that can influence physical activity behaviour (e.g., social policies, transportation systems, cultural norms, etc.). The second reason for limiting neighbourhood selections to North Vancouver was convenience. The researcher had previous work and volunteer experience in North Vancouver, and had pre-established contact with local planners, community developers and service providers. Time and resources were therefore saved by securing the trust and support of community leaders in recruiting research participants. Neighbourhood selections of Central Lonsdale and Deep Cove were also based on recommendations received from municipal planners and community developers.

**Older adults**

A convenience sample of older adults was recruited for the study. The sampling frame theoretically included all older adults residing in either of the two neighbourhoods, and who self-identified as meeting the following selection criteria: (a) 60 years of age or over, (b) live independently in either Central Lonsdale or Deep Cove, (c) functional independence (i.e., mobile with or without use of an assistive device), (d) no major cognitive impairment, and (e) English language proficiency (verbal and written). As mentioned, a total of four focus groups were held (two in each neighbourhood). A total of
11 participants took part in Central Lonsdale focus groups and 14 in Deep Cove focus groups. In total, 17 focus group participants also kept an activity diary (8 from Central Lonsdale, 9 from Deep Cove). A total of 12 diaries were completed among Central Lonsdale residents while another 11 were completed among Deep Cove residents.

An essential component of the recruitment strategy was building relationships with local seniors’ service providers and community “gatekeepers” in order to secure their support and assistance in participant recruitment. Gatekeeper responsibility was limited to advertising and raising awareness about the study and need for participants (e.g., posting notices, advertising in newsletters, and/or making public announcements to their members). In addition to approaching gatekeepers, residents residing in community-based seniors housing were also approached. When appropriate, building managers were contacted directly and their permission requested to post notices in buildings and/or to speak directly to residents about the study. Specific efforts were made to access hard-to-reach seniors to increase the diversity of participants. Whenever possible, notices were posted in key public locations, including public libraries and recreation facilities. Community associations and groups were also contacted and requested to advertise the need for study participants. Participants themselves also recommended other potential participants to the researcher.

It should be noted that recruitment still proved difficult in Deep Cove for various reasons. First, the researcher’s attempts to recruit through the seniors program coordinator at the local community centre were initially unsuccessful. While a sufficient number of participants for one focus group were recruited in fall of 2006, recruitment of participants for a second focus group was necessarily delayed until the spring of 2007 (after the busyness of winter holidays and poor weather conditions subsided). Several attempts to recruit residents from subsidized seniors’ housing in Deep Cove were also
largely unsuccessful. These residents were relatively inactive, were more likely to have a
cognitive impairment, and were subsequently unwilling or did not qualify for study
participation. Another reason recruitment was challenging was that resident definitions of
Deep Cove varied significantly. As anticipated, administratively-defined neighbourhood
boundaries did not always coincide with those held by the residents themselves.
Oftentimes while an individual would self-identify as a resident of Deep Cove, their home
address often fell outside of the administratively-defined boundaries. In comparing these
boundaries to maps of Deep Cove based on community-based perceptions, it was found
the latter often included portions of adjacent neighbourhoods. In particular, the Cove Cliff
neighbourhood to the south of Deep Cove proper was identified by some residents as
part of Deep Cove. For this reason, participants who self-identified as Deep Cove
residents might have technically resided in neighbouring Cove Cliff. In total, 4 study
participants who self-identified as meeting study criteria “officially” resided in the Cove
Cliff neighbourhood.

Ethical approval for the study was obtained from the Office of Research Ethics at
Simon Fraser University. Study participants signed a consent form prior to
commencement of focus groups and activity diaries. All participants were assured of
confidentiality throughout the research process, and received a study information
handout. Participants were given the opportunity to withdraw at any point during the
study.

**Instruments and procedure**

**Environmental audit tool and procedure**

A modified version of the Irvine Minnesota Inventory (IMI) audit tool first
developed by Day, Boarnet, Alfonzo, and Forsyth (2006) was used to collect
environmental data in neighbourhoods. A benefit of using an instrument based primarily on IMI was that the original tool was designed for reliable, easy use by individuals not trained in urban planning or urban design (Day et al.). Modifications to IMI were based on the Senior Walking Environmental Assessment Tool (SWEAT) (Cunningham, Michael, Farquhar, & Lapidus, 2005). While SWEAT was intended for data collection on built environment features hypothesized to influence the walking activity of older adults specifically, it does not include features that might be implicated in neighbourhood-based social interactions (e.g., outdoor patios, social gathering places, front porches), which are included in the IMI.

Major categories included in the audit tool are: functionality and accessibility, aesthetics and pleasurability, and personal and traffic safety. Both the IMI and SWEAT have been previously tested for their inter-rater reliability (Day, Boarnet, Alfonzo, Forsyth, & Oakes, 2006; Cunningham et al., 2005). Items included in the modified version were based on findings from reliability assessments and on physical activity research on older adults more generally. Administratively-defined neighbourhood boundaries for Central Lonsdale and Deep Cove were used to collect environmental data. Data collection procedures were based primarily on the IMI Code Books (Day, Boarnet, & Alfonzo, 2005) and the detailed training protocol developed by Alfonzo, Day, and Boarnet (2005). Data were collected by the researcher using a paper version of the audit instrument. The researcher had previous experience utilizing IMI to collect data on the Lower Lonsdale neighbourhood in the City of North Vancouver.

In each neighbourhood, the first segment audited was randomly chosen. As per IMI instructions, the adjacent segment was also assessed if it differed from the previous segment in terms of one of the following characteristics: (1) land uses, (2) sidewalk network, (3) barriers, and (4) pleasantness of walking environment. If the adjacent
segment was judged not to differ in any of these characteristics then it was skipped. Up to three adjacent segments could be skipped. If the fourth segment did not differ from the preceding segments it was still coded and included in the sample. This process continued until all segments in the neighbourhood were observed. As noted in the IMI Code Book, “this sampling procedure is intended to ensure that a sufficient number of segments are observed to characterize the overall physical features of the setting” (Day et al., 2005, p.4). Still photographs of neighbourhood features were also taken to supplement environmental audit data and used during focus group sessions as visual cues/prompts for discussion.

Given the large geographical area of the Central Lonsdale neighbourhood, a significantly greater number of segments were assessed than in Deep Cove, which had a fewer total number of segments, and segments that did not differ substantially from one to the next. In Central Lonsdale, a total of 73 segments were assessed while in Deep Cove, a total of 27 segments were assessed.

**Focus group procedure and guide**

The procedure used to conduct focus groups was informed by the work of Krueger and Casey (2000) and Morgan (1998). Contact information was obtained from individuals who expressed interest in attending a focus group session. Individuals who met eligibility criteria were scheduled to attend a focus group session and received a reminder phone call prior to the interview date. At the beginning of each focus group, participants were asked to fill in a written questionnaire on socio-demographics, residential dwelling type, length of residence in the neighbourhood, reasons for moving to/staying in the neighbourhood, and degree to which they are physically active. The interview guide for focus groups consists of questions falling into four broad categories: (a) perceptions of neighbourhood environment and how it either supports or hinders
physical activity (e.g., locations where an older adult can regularly and/or safely engage in physical activity); (b) perceptions of neighbourhood resources that support physical activities of older adults; (c) perceptions of whether various social resources (e.g., social support, information, etc.) support their physical activities and who these resources are obtained from; and (d) recommendations on how the neighbourhood environment could be improved to meet the needs of older adults. For three of the four focus groups, a colleague with similar research training accompanied the researcher and took additional notes and recorded general reactions of participants. With permission of participants, the discussions were audio-taped and transcribed verbatim. To ensure confidentiality of participants all identifying information was removed from written transcripts and in the reporting of focus group content and analysis (i.e., names were changed). Each focus group participant received a “recreational gift package” that included a copy of Health Canada’s Physical Activity Guide for Older Adults, and a pedometer donated by the North Shore Recreation Commission.

**Activity diary instrument procedure**

In their review of diary research with older adults, Jacelon and Imperio (2005) suggested 1-2 weeks as the optimal length of time for diary-keeping. These authors further note that diaries are especially useful for tracking day-to-day health activities, including daily exercise routines. In another study, Milligan, Bingley, and Gatrell (2005) made use of the diary technique to map health-related behaviour and activity patterns of older adults.

Diary design for this study was further informed by Corti (1993) and others with extensive experience using the diary as a data collection method (Elliott, 1997; Harvey, 1990, Robinson, 1999; Stinson, 1999). The activity diary consists of four main sections: (a) a daily activity chart; (b) daily, personal reflections on activities and experiences; (c)
open-ended questions on the week as a whole, and on neighbourhood supports and barriers to being physically active in general; and (d) a two-page checklist of social resources theoretically assumed to influence physical activity. Similar to focus group participants, diary participants also completed a two-page written questionnaire on socio-demographics, residential dwelling type, length of residence in the neighbourhood, reasons for moving to/staying in the neighbourhood, and degree to which they are physically active.

The format for the daily activity chart was similar to the one used by the Australian Bureau of Statistics (ABS) (Stinson, 1999). Diary participants were asked to record and describe all activities they engaged in over a one-week period, indicating the time and duration of the activity, the location of the activity, and the identities of other persons who were present during the activity (Stinson; Tudor-Locke, Bittman, Merom, & Bauman, 2005). To minimize under-reporting of utilitarian activities or active forms of transport, participants were asked to record all activities they engaged in, not just those they perceive as physical activities. Diarists were also given the opportunity to openly reflect on their daily activities, and to comment on their interactions with others in their neighbourhood. This qualitative information provided further insights into whether or not participants were satisfied with their activities, with the supports available in the neighbourhood, as well as who, how often, and in what ways other people support them in their activities. The activity diary format was pilot-tested with four older adults who met participant eligibility criteria for this study. Recommendations made by these individuals were incorporated into the final version of the diary.

The researcher contacted each diarist via telephone during the diary-keeping week to remind them to record entries on a daily basis, and to respond to any concerns they may have had. If necessary, notes were taken during these check-ups. Diaries
were collected in person by the researcher after the one-week period ended. Each diarist received a thank you card and a $10 gift certificate to either Starbucks Coffee or Chapters Bookstore.

**Data analysis**

Data analysis focused around two primary sources: (i) the initial research questions developed at the conceptual phase of the study, and (ii) the analytical insights and interpretations that emerged during data collection (Patton, 2002). Analysis of secondary and environmental audit data was descriptive in nature. The descriptive analysis focused on identifying key characteristics of the broader community context, and compared the two neighbourhoods in terms of socio-demographic characteristics of neighbourhoods and neighbourhood physical environmental features. By gathering general descriptive data a foundation for qualitative analysis in response to research questions was established (Patton).

Content analysis was carried out on focus group and activity diary data. The initial phase of the analysis involved labelling raw data using key words or phrases. From these, codes were developed and assigned to textual data. Codes were then separated, sorted, and refined into more focused codes to ease the final phase of identifying themes (Charmaz, 2006). Interview guide questions provided a general framework from which core content was identified and emergent themes organized. Cross-case analysis was used to explore how environmental factors, and activity patterns and behaviours differed between participants residing in the two neighbourhoods.

Time use diary data were organized and coded to create an activity index, and total time expended by individuals were summed for each type of activity and then
averaged across individuals within each neighbourhood. When necessary, omissions in
time spent performing activities were subsequently estimated by the researcher. These
estimates were either based on the time recorded for the same or similar activity on
another day (if such detail was provided by the participant), or generated by the
researcher using data available on the Internet (estimated time spent on public transit or
auto travel). Diary data were also analyzed at the individual-level. The selection of
diaries for individual case narratives ensured that a breadth of experiences among older
adults who participated in this study was represented.

A deductive-inductive approach to data analysis was used, such that if
sensitizing concepts (i.e., those with origins in social science theory and research
literature) were found to be inadequate or insufficient, then the researcher formulated
original ideas from the processes that emerged from the data (Charmaz, 2006). In spite
of ongoing debate on maintaining “methodological purity” in research, utilizing both
inductive and deductive approaches within a single, qualitative study has become more
acceptable in practice (Patton, 2002).

Use of traditional scientific research criteria to evaluate quality of study design
and analysis would be inappropriate in a qualitative inquiry (Maxwell, 2005). Built-in
guards against measurement limitations in qualitative research are outlined in the next
section. All phases of data collection and data analysis are outlined in Table 3-1.
Table 3-1 Summary of four data collection methods and analysis

<table>
<thead>
<tr>
<th>DATA COLLECTION</th>
<th>METHOD I</th>
<th>METHOD II</th>
<th>METHOD III</th>
<th>METHOD IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBJECTIVE</td>
<td>To develop a broad contextual view (i.e., &quot;the bigger picture&quot;) of the two neighbourhood cases. Data collected includes socio-demographic data and land use data.</td>
<td>To generate an inventory of neighbourhood physical environment features for the two neighbourhood cases.</td>
<td>To gather information from older adults on perceptions of neighbourhood quality, social resources and physical activity in later life.</td>
<td>To generate detailed qualitative descriptions as well as descriptive numeric data on activity types, and time spent on activities over a one-week period.</td>
</tr>
<tr>
<td>DATA COLLECTION</td>
<td>Review of relevant census and other secondary data.</td>
<td>Direct observation of neighbourhoods using a modified environmental audit tool.</td>
<td>Two focus group sessions conducted in each neighbourhood. Participants are residents who live in the two neighbourhood cases.</td>
<td>Final sample of 20 participants (10 in each neighbourhood) completed activity diaries over a one-week period. Participants are older adults who live in the two neighbourhood cases.</td>
</tr>
<tr>
<td>DATA ANALYSIS</td>
<td>Descriptive statistics provided background information included in narratives of neighbourhood contexts.</td>
<td>Descriptive statistics on neighbourhood physical environment characteristics. These data are included in neighbourhood narratives.</td>
<td>Content analysis of focus group transcripts led to generation of themes. Neighbourhood variations were identified.</td>
<td>Content analysis to generate a list of activity types engaged in by older adults from the two neighbourhoods. Descriptive statistics generated for time use data. Individual case studies also generated.</td>
</tr>
</tbody>
</table>

Trustworthiness

A principal responsibility of a researcher is to ensure that methodological tools meet certain criteria of quality. In particular, the researcher needs to convince her audience that the findings are credible and worth paying attention to – that they are
"trustworthy" (Lincoln & Guba, 1985). The researcher is also expected to ensure the objectivity and “hardness” of the data on which findings and recommendations are based.

Several standardized checks or guards against threats to reliability, validity, and objectivity in quantitative-based studies have been well-documented. Unfortunately, the erroneous assumption is often made that these criteria are applicable to all research inquiries. Such criteria would be insufficient to judge a qualitative-based inquiry into social phenomena. Further, researchers (and their audiences) must be cognizant that criteria on which chosen methods are judged ultimately reflect underlying assumptions of a particular research paradigm. With this in mind, “credibility,” “transferability,” “dependability,” and “confirmability” are criteria that can be used to assess the trustworthiness of qualitative research (Lincoln & Guba, 1985). Strategies used to address these issues are presented below.

To ensure credibility, a qualitative inquiry should be conducted in a way that the probability findings are judged to be credible is enhanced. Triangulation is an accepted strategy used to increase the probability of credible finding. Multiple modes of data collection were used in this study to enhance data credibility. Environmental inventory collected using an audit tool supplemented information gathered via focus groups. Themes that emerged from focus groups were compared against emergent themes from activity diaries. Informal and formal member checks were also used to assess the “truthfulness” with the very individuals from whom the original data were collected (Lincoln & Guba, 1985).

In terms of transferability, the responsibility of the researcher is to provide working hypotheses and a description of the time and context under which these hypotheses were found to hold (Lincoln & Guba, 1985). The transferability of findings is
an empirical matter that depends on the degree of similarity between sending and receiving contexts. Since it is difficult to speculate what those receiving contexts might be, researchers should simply ensure that they have provided a sufficiently detailed description of the "sending" context. A case study approach fundamentally depends upon rich, contextual descriptions. In this study, secondary data were obtained for general, descriptive details of the two neighbourhood contexts and the broader community from which these neighbourhood cases were drawn. Neighbourhood-level environmental data further enhances the description of the neighbourhood physical settings.

**Dependability** refers to the ability of the researcher to account for factors of instability and of phenomenal and/or design induced change in the research. **Confirmability** draws attention to whether or not characteristics of the data are supportable (Lincoln & Guba, 1985). These two issues can be addressed simultaneously by use of an inquiry audit. In an inquiry audit both the process by which the research was conducted and the products (e.g., records, documents, reports) that were generated are examined. For this study, components of an audit trail were kept. The audit trail included records from the inquiry, including raw data (e.g., field notes, digitally recorded interviews); data reduction and analysis products (e.g., summaries of condensed notes); data reconstruction and synthesis products (e.g., themes, findings and conclusions); process notes (e.g., methodological notes); and materials relating to intentions and dispositions (e.g., research proposal). These categories form part of a larger audit model first developed by Halpern (1983) and later detailed by Lincoln and Guba (1985). The record-keeping process ensures thoroughness and discipline throughout data collection and analysis. A summary of the strategies used to address trustworthiness criteria in the study are presented in Table 3-2.
Table 3-2 Strategies to ensure trustworthiness throughout the research process

<table>
<thead>
<tr>
<th>TRUSTWORTHINESS</th>
<th>STRATEGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credibility</td>
<td>Data Triangulation: Multiple sources of data (e.g., environmental assessment, focus groups, diaries) Informal Member Checks: During focus groups and with diarists Formal Member Checks: Conversations with diarists to solicit feedback on accuracy of data interpretations and findings</td>
</tr>
<tr>
<td>Transferability</td>
<td>Provide a rich description of both neighbourhood case studies to allow other researchers to replicate the study, and/or to make an appropriate comparison of findings to other neighbourhood settings</td>
</tr>
<tr>
<td>Dependability</td>
<td>Maintain components of an audit trail</td>
</tr>
<tr>
<td>Confirmability</td>
<td>Maintain components of an audit trail</td>
</tr>
</tbody>
</table>
CHAPTER 4: CASE NARRATIVES AND FOCUS GROUP FINDINGS

This chapter begins with a general description of the North Vancouver community and the two municipalities that comprise it. Case narratives using census and environmental audit data are then presented for the Central Lonsdale and Deep Cove neighbourhoods. In the second half of the chapter, key themes and categories that emerged from analysis of focus group data are summarized.

Community context: North Vancouver

North Vancouver is situated on the northern shore of Burrard Inlet in the Greater Vancouver region. Initially incorporated as a single municipality, North Vancouver was eventually subdivided into three municipalities at the turn of the twentieth century: the City of North Vancouver, the District of North Vancouver, and the District of West Vancouver. The City and District of North Vancouver share several core services including the North Vancouver School District, the North Vancouver Recreation Commission, and the Royal Canadian Mounted Police, North Shore detachment. As of 2006, the City and District had populations of 45,165 and 82,562 residents, respectively (Statistics Canada, 2007).

City of North Vancouver (CNV)

The City of North Vancouver spans 11.95 square kilometres and is located at the southern shoreline of Burrard Inlet. It is bounded by the District on its east, west, and northern sides. The City of North Vancouver is the most urbanized municipality on the North Shore with a population density of 3,812.2 per square kilometre (Statistics...
Canada, 2007). Lonsdale Avenue is considered the major commercial area around which streets and city blocks have been built over the decades. Regional planners identify the City’s Lower Lonsdale and Central Lonsdale neighbourhoods as comprising the North Shore’s downtown.

**District of North Vancouver (DNV)**

The District of North Vancouver covers 160.47 square kilometres and is bounded by Capilano River to the west, Indian Arm to the east, Burrard Inlet to the south, and the North Shore mountains to the north. It has a larger population than the City, but a considerably lower population density (512.9/sq.km.) as residential development is dispersed across a much larger land area. Within the District, the housing stock is primarily single-detached dwellings, which were largely built up following the Second World War. Generally speaking, the District is comprised of several suburban communities that often lack a clear urban centre; only a few community hubs (e.g., Edgemont Village and Lynn Valley) have been established in the District. While by no means urbanized to the same degree as the Lonsdale corridor in the City, these community hubs are more densely populated and contain a mix of land uses relative to other District neighbourhoods.

**Neighbourhood case: Central Lonsdale, CNV**

Central Lonsdale is one of ten identified neighbourhoods in the City of North Vancouver. It is bounded by 8th Street and Keith Road to the south, East 25th Street to the north, reaches as far as Jones Avenue to the west, and Ridgeway Avenue to the east. Central Lonsdale has the highest proportion of residents 55 years of age and over in the City, representing 27% of the entire neighbourhood population (City of North Vancouver, 2004). Older adults are likely drawn to the area because of its high
concentration of shops and amenities and proximity to medical services (including Lions Gate Hospital). Convenient access to public transit along major thoroughfares is also available in the neighbourhood, a feature that may be particularly beneficial to older adults who lack regular access to a car. The area’s abundant supply of rental apartments also offers relatively affordable housing options to low-income seniors (City of North Vancouver). In comparison to other neighbourhoods in North Vancouver, Central Lonsdale has limited availability of single-detached housing while ground-oriented medium density housing and low- and high-rise apartments make an increasing proportion of neighbourhood residential dwellings (City of North Vancouver, n.d.).

**Neighbourhood case: Deep Cove, DNV**

Deep Cove (commonly referred to as, “the Cove”) is situated within the northern part of the Eastern Seymour community in the District of North Vancouver, and is one of fourteen identified neighbourhoods within the Eastern Seymour community. The Cove lies at the entrance of Indian Arm off Burrard Inlet, and its approximate street boundaries include Panorama Drive to the north, Cliffwood Road to the west, and Cove Cliff Road to the south.

The neighbourhood initially developed as a summer resort village, mainly comprised of cottages. Since the early 1980s, the area has experienced rapid growth in its older adult population (District of North Vancouver, 1995). As of 2001, the 55-plus population represented approximately 24% of the total resident population in the neighbourhood (Statistics Canada, 2002). Deep Cove has limited multi-family dwelling types available, and three-quarters of its housing stock is single-detached housing.

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12 The DNV has 9 named communities (not including First Nation lands): Upper Capilano, Lower Capilano, North Lonsdale, Lynn Valley, Lower Lynn, Lynnmour Inter-River, Maplewood, Seymour, and Indian Arm. Each community is comprised of several neighbourhoods.
(District of North Vancouver). Figure 4-1 illustrates the variety of dwelling types available in the two neighbourhoods based on 2001 census data (Statistics Canada).

**Figure 4-1: Dwelling type by neighbourhood** (Data source: Statistics Canada, 2002)

<table>
<thead>
<tr>
<th>Dwelling Type</th>
<th>Central Lonsdale</th>
<th>Deep Cove</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Oriented</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apartment &lt; five storeys</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apartment &gt; five storeys</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single-detached house</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Neighbourhood physical environment features

Environmental audits completed in each neighbourhood suggest that Central Lonsdale and Deep Cove differ in some key physical environment features. The observed features are summarized below in terms of street crossing features, land uses, and sidewalk characteristics.

**Street crossing features**

As can be seen in Table 4-1, several segments observed in Central Lonsdale contained designated pedestrian crossing areas. Significantly fewer crossing areas were marked in Deep Cove. Given the relatively heavy traffic flow along its commercial areas, increased provision of traffic safety features is judged to be more essential in Central Lonsdale. Presence of curb cuts at street intersections also differed across the two neighbourhoods (i.e., greater absence in Deep Cove).
Table 4-1: Street crossing features

<table>
<thead>
<tr>
<th>ENVIRONMENTAL FEATURE</th>
<th>CENTRAL LONSDALE (AS % OF TOTAL SEGMENTS OBSERVED)</th>
<th>DEEP COVE (AS % OF TOTAL SEGMENTS OBSERVED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marked Crosswalk</td>
<td>58.9</td>
<td>29.6</td>
</tr>
<tr>
<td>Traffic Signal</td>
<td>58.9</td>
<td>7.4</td>
</tr>
<tr>
<td>Stop Sign</td>
<td>57.5</td>
<td>40.7</td>
</tr>
<tr>
<td>Pedestrian Activated Signal</td>
<td>39.7</td>
<td>7.4</td>
</tr>
<tr>
<td>Pedestrian Crossing Sign</td>
<td>15.1</td>
<td>14.8</td>
</tr>
<tr>
<td>Curb Cuts (none)</td>
<td>4.1</td>
<td>50.0</td>
</tr>
<tr>
<td>Safety to cross (“very safe”)</td>
<td>84.9</td>
<td>63.0</td>
</tr>
<tr>
<td>Convenient to cross (“very safe”)</td>
<td>79.5</td>
<td>44.4</td>
</tr>
<tr>
<td>Observed Traffic Flow (“low”)</td>
<td>60.3</td>
<td>74.1</td>
</tr>
<tr>
<td>Observed Traffic Flow (“high”)</td>
<td>17.8</td>
<td>0.0</td>
</tr>
<tr>
<td>Traffic Calming Feature (presence of 1 or more)</td>
<td>94.6</td>
<td>88.9</td>
</tr>
</tbody>
</table>

At least one traffic calming feature was present for the majority of segments observed in both neighbourhoods. Curb extensions and traffic circles were more evident in Central Lonsdale, while dead ends were more common in Deep Cove than Central Lonsdale (29.6% to 2.7%, respectively). This observation fits the perception of Deep Cove as a suburban neighbourhood, since the cul-de-sac is a common design feature of this neighbourhood type.

Land uses

The two neighbourhoods differed markedly in the types of land uses present (Table 4-2). As expected, the majority of segments observed in Deep Cove contain single-family dwellings while in Central Lonsdale, multi-family housing (particularly, apartment buildings and condominiums) were more prevalent.
Table 4-2: Land uses

<table>
<thead>
<tr>
<th>ENVIRONMENTAL FEATURE</th>
<th>CENTRAL LONSDALE (AS % OF TOTAL SEGMENTS OBSERVED)</th>
<th>DEEP COVE (AS % OF TOTAL SEGMENTS OBSERVED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Family Homes</td>
<td>43.8</td>
<td>81.5</td>
</tr>
<tr>
<td>Multi-Family Housing</td>
<td>76.8</td>
<td>33.3</td>
</tr>
<tr>
<td>Medical/Health Facility or Clinic</td>
<td>21.9 (n=16)</td>
<td>7.4 (n=2)</td>
</tr>
<tr>
<td>Bank or other Financial Institution</td>
<td>12.3 (n=9)</td>
<td>None</td>
</tr>
<tr>
<td>Retail</td>
<td>28.8 (n=21)</td>
<td>11.1 (n=3)</td>
</tr>
<tr>
<td>Restaurants</td>
<td>21.9 (n=16)</td>
<td>11.1 (n=3)</td>
</tr>
<tr>
<td>Service Facilities</td>
<td>23.3 (n=17)</td>
<td>7.4 (n=2)</td>
</tr>
<tr>
<td>Fitness or Recreational Facilities/Businesses</td>
<td>2.7 (n=2)</td>
<td>14.8 (n=4)</td>
</tr>
<tr>
<td>Community Centre</td>
<td>2.7 (n=2)</td>
<td>None</td>
</tr>
<tr>
<td>Library, Hall/Theatre, Other Civic Facilities</td>
<td>22.0</td>
<td>14.8</td>
</tr>
<tr>
<td>Religious</td>
<td>5.5 (n=4)</td>
<td>7.4 (n=2)</td>
</tr>
<tr>
<td>Mixed Use (&quot;Some/A lot&quot;)</td>
<td>6.8</td>
<td>3.7</td>
</tr>
<tr>
<td>Nature Feature</td>
<td>1.4 (n=1)</td>
<td>44.4 (n=12)</td>
</tr>
<tr>
<td>Public Space</td>
<td>21.9 (n=16)</td>
<td>44.4 (n=12)</td>
</tr>
<tr>
<td>Trails or Paths</td>
<td>12.3</td>
<td>37.0</td>
</tr>
<tr>
<td>Attractive Views</td>
<td>30.1</td>
<td>46.2</td>
</tr>
<tr>
<td>Attractive Park Space</td>
<td>6.8</td>
<td>29.6</td>
</tr>
<tr>
<td>Attractive Plaza/Square</td>
<td>4.1</td>
<td>11.1</td>
</tr>
<tr>
<td>Overall Attractiveness</td>
<td>27.4</td>
<td>40.7</td>
</tr>
</tbody>
</table>

Medical services and financial institutions that older adults might frequent were more prevalent in Central Lonsdale. Additional services, retail, and food establishments were observed more in Central Lonsdale. Commercial gathering places, such as restaurants, coffee shops, and bookstores were also observed more often in Central Lonsdale. Mixed-use developments were not noted to any great extent in either
neighbourhood. Convenient access to nature features (i.e., forested areas, trails) and open public space was noticeably better in the Cove than in Central Lonsdale.

**Sidewalk characteristics**

Neighbourhood differences in sidewalk characteristics that may impact the quality of the pedestrian experience are listed in Table 4-3.

### Table 4-3: Sidewalk characteristics

<table>
<thead>
<tr>
<th>ENVIRONMENTAL FEATURE</th>
<th>CENTRAL LONSDALE (AS % OF TOTAL SEGMENTS OBSERVED)</th>
<th>DEEP COVE (AS % OF TOTAL SEGMENTS OBSERVED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sidewalk (on both sides)</td>
<td>78.1</td>
<td>11.1</td>
</tr>
<tr>
<td>Complete Sidewalks</td>
<td>90.4</td>
<td>44.4</td>
</tr>
<tr>
<td>Good Condition of Sidewalk</td>
<td>65.8</td>
<td>44.4</td>
</tr>
<tr>
<td>Steep Slope</td>
<td>1.4</td>
<td>42.3</td>
</tr>
<tr>
<td>Streetlights</td>
<td>47.9</td>
<td>70.4</td>
</tr>
<tr>
<td>Sidewalk Obstructions</td>
<td>4.1</td>
<td>22.2</td>
</tr>
<tr>
<td>Buffer</td>
<td>37.0</td>
<td>7.7</td>
</tr>
<tr>
<td>Street Furniture</td>
<td>11.0</td>
<td>3.7</td>
</tr>
<tr>
<td>Trees Along Some/Most of the Segment</td>
<td>76.7</td>
<td>92.6</td>
</tr>
<tr>
<td>Benches</td>
<td>20.5</td>
<td>18.5</td>
</tr>
<tr>
<td>Bus Stop Seating</td>
<td>80.0 (12 of 15)</td>
<td>50.0 (2 of 4)</td>
</tr>
<tr>
<td>Bus Stop Lighting</td>
<td>33.3</td>
<td>0.0</td>
</tr>
<tr>
<td>Building Condition ('good')</td>
<td>83.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Areas that Overlook Street ('some/a lot')</td>
<td>26.0</td>
<td>40.7</td>
</tr>
<tr>
<td>Pedestrian Safety</td>
<td>93.2</td>
<td>74.1</td>
</tr>
</tbody>
</table>

Most notable of these items was the lack of continuous sidewalks in Deep Cove, and when sidewalks were present, the quality was observed to be only “moderately good.”
Another physical feature that may significantly influence the pedestrian experience is the slope of a segment, and the topography of Deep Cove made for particularly hilly terrain. In Central Lonsdale, north-south segments were also observed to be moderately sloped. Street lighting was a feature more prevalent in Deep Cove.

Bus stops were observed more often in Central Lonsdale. While the majority of transit stops provided seating, only a third had street lighting nearby. Given that residential dwellings predominate in Deep Cove, it was not surprising that porches were observed to also be prevalent in that neighbourhood. Pedestrian safety in the Cove was deemed to be significantly lower than in Central Lonsdale for both objective and subjective reasons. The lack of sidewalks and the curvilinear nature of several streets in the Cove were perceived to increase the potential for driver-pedestrian conflict. In addition, general absence of foot traffic took away from the pedestrian experience – at least from an “outsider’s” perspective.

In the next section, Canadian census data is aggregated to the neighbourhood-level to compare Central Lonsdale and Deep Cove’s social characteristics.

**Neighbourhood social environment features**

**Socio-demographic neighbourhood composition**

Table 4-4 displays 2001 census data on age composition for the two neighbourhoods. The older adult population is slightly younger in Deep Cove, while a larger proportion of older adults 75 years of age and over reside in Central Lonsdale. Data on ethnocultural diversity, measured as a percentage of immigrant and visible minorities in the neighbourhood population, reveal that Central Lonsdale has a significantly larger percentage of visible minorities compared to Deep Cove (22.5% and 5.6%, respectively) (Statistics Canada, 2002). Moreover, country of origin data confirms
that a significant number of immigrants in Central Lonsdale originate from Iran and other Asian countries, whereas the majority of immigrants living in Deep Cove are from the United Kingdom (Statistics Canada). Observed diversity in the ethnocultural composition of Central Lonsdale may be due to its relatively large stock of low-income rental housing, convenient access to public transit, and close proximity to services and amenities. Indeed, research tends to support this notion as immigrants to Canada are more prone to settle in urbanized centres like Greater Vancouver (Greater Vancouver Regional District, 2003).

Table 4-4: Older adult age composition

<table>
<thead>
<tr>
<th>AGE COHORT</th>
<th>CENTRAL LONSDALE (%)</th>
<th>DEEP COVE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All ages</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>55-59</td>
<td>5.0</td>
<td>7.4</td>
</tr>
<tr>
<td>60-64</td>
<td>4.2</td>
<td>6.4</td>
</tr>
<tr>
<td>65-74</td>
<td>7.6</td>
<td>5.4</td>
</tr>
<tr>
<td>75+</td>
<td>10.1</td>
<td>4.6</td>
</tr>
</tbody>
</table>

Neighbourhood socioeconomic status

Census data on education levels (based on a 20% sample of the population 20 years of age and over) suggest minimal variation between the two neighbourhoods (Statistics Canada, 2002). Residents living in both neighbourhoods are relatively well educated with at least some university education (32% in Central Lonsdale and 40% in Deep Cove) (Statistics Canada). However, median household income is significantly higher in Deep Cove compared to Central Lonsdale ($63,995 and $39,635, respectively). Census data on household income in the year 2000 for all private households reveals a much higher percentage of Deep Cove households in the highest income bracket (Statistics Canada). Incidence of low income in year 2000 for economic
families was only 5.5% in Deep Cove and 16.6% in Central Lonsdale; in contrast, incidence of low income was 40.3% for unattached individuals 15 years of age and over in Deep Cove and 35.1% in Central Lonsdale (Statistics Canada). This statistic reflects how unattached older adults living in Deep Cove may not be as economically advantaged as other residents in the area. Indeed, many older, long-term residents who purchased cottages in the 1960s when housing prices were more affordable may be from a relatively lower income bracket than what is generally perceived for Deep Cove residents as a whole (M. Bostwick, personal communication, February 3, 2006). Subsidized seniors’ housing is also situated in the Cove.

Figure 4-2 indicates that approximately 70% of Deep Cove residents own their homes as opposed to only 40% of Central Lonsdale residents; approximately 60% of Central Lonsdale residents are renters (Statistics Canada, 2002).

Figure 4-2: Homeownership rates (Data source: Statistics Canada, 2002)

![Homeownership rates chart]

The second half of this chapter presents key themes and issues identified during focus group sessions with older adults. Key characteristics of the focus group participants are first presented.
Focus group findings

Profile of focus group participants

In Central Lonsdale, eleven individuals participated in two focus groups while fourteen residents participated in two Deep Cove focus groups. In both neighbourhoods, successful recruitment of participants was concentrated in the local community centres. Consequently, the majority of participants were young-old (60-70 years of age) and self-identified as being both physically and socially active.

Sociodemographic background and socioeconomic status of participants

The mean age for Central Lonsdale participants was 74.6, which is older than the mean age of 68.7 years for Deep Cove participants. The youngest focus group participant was 61 years of age (Deep Cove), while the oldest was 87 years of age (Central Lonsdale). The age variation between the two neighbourhoods is reflective of the overall neighbourhood age structure (as profiled earlier in this chapter using census data). The majority of participants were women, with only six men (3 in each neighbourhood) participating in group discussions. Four Central Lonsdale participants live with a partner while seven live alone. This varies from Deep Cove where eight participants currently live with a partner and only five live alone. Only one focus group participant (Deep Cove) lives with a family member other than a spouse.

The mean number of years Central Lonsdale participants have been in the neighbourhood was 25.0 years and for Deep Cove residents it was 31.1 years. The minimum length of stay was five years (Deep Cove) and the maximum was 56 years (Central Lonsdale).

The majority of Deep Cove participants live in single-detached housing. Among Central Lonsdale participants, dwelling types were more varied with four living in a
townhouse/row house, three living in single-detached housing, three living in a high-rise apartment or condominium (five or more stories), and one living in a low-rise apartment or condominium (less than five stories). Only one participant lives in seniors’ housing (Deep Cove). Rate of homeownership was very high among Deep Cove participants, with 13 of 14 owning their homes; among Central Lonsdale participants, 9 of 11 were homeowners. Overall, homeownership rates among focus group participants were well above census-based averages. The education level of study participants was also higher than census-based averages. Eight Deep Cove and three Central Lonsdale participants have at least an undergraduate university degree.

**Self-reported health and self-reported weekly physical activity level**

Ten of eleven Central Lonsdale participants rated their health positively, while all Deep Cove participants rated their health as such. Nine Central Lonsdale participants noted activity limitations at least some of the time; similarly, 10 Deep Cove participants reported activity limitations at least some of the time. One participant in each neighbourhood indicated that they make use of an assistive device at least some of the time. In terms of participation in formal organizations, all Central Lonsdale participants identified themselves as members of at least one organization. Just under three-quarters of Deep Cove participants identified themselves as a member of at least one formal organization. Self-reported physical activity levels were similar between Central Lonsdale and Deep Cove groups, with 8 and 10 engaging in five or more hours of physical activity per week, respectively.\(^\text{13}\)

\(^{13}\) Note that this is a self-reported estimate of weekly engagement in physical activity indicated on a general information questionnaire. This questionnaire item did not distinguish between types and settings in which they engage in these activities. Such data were instead gathered during focus group discussions and activity diaries.
Focus group themes

Focus group themes identified are grouped under the main discussion topics devised at the conceptual stage of the study. Analysis of focus group data also led to the generation of categories under each theme. When appropriate, relevant issues are discussed by neighbourhood. These are summarized in Table 4-5 on the following pages.
Table 4-5: Focus group issues, themes, and categories

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>THEMES &amp; CATEGORIES</th>
</tr>
</thead>
</table>
| Aging in place (Decision to stay or move) | Neighbourhoods differ in how well they support aging in place and maintaining independence in later life.  
Pull factors (Central Lonsdale):  
- Available neighbourhood amenities; accessible public transportation; neighbourhood walkability; proximity to various services  
Push factors (Deep Cove)  
- Changes in health status may induce a move; no longer able to drive; limited/inaccessible bus service |
| Neighbourhood physical environment | Physical environmental supports and barriers identified by older adults differ by neighbourhoods.  
Walking is a particularly important form of physical activity among older adults.  
- **Central Lonsdale**: Neighbourhood supports both utilitarian and recreational walking activity. Supports (pleasurability afforded by public/private gardens, outdoor patios, benches & other street furniture; traffic calming measures). Barriers (uneven, poorly maintained, and/or uneven sidewalks; lack of street lighting; busy street traffic). Personal walking strategies (avoidance of busy commercial sidewalks; walk on side streets off Lonsdale instead)  
- **Deep Cove**: Neighbourhood supports recreational walking activity. Supports (proximity to local parks and trails; street lighting; cul-de-sac design & limited auto traffic on local streets) Barriers (uneven, steep terrain of trails may not support older, frailer adults) Absence of sidewalks seen as positive and negative by some residents  
Settings for walking activity  
- Participants from both neighbourhoods noted the importance of waterfront walkways and vibrant public space to enhance visual interest for recreational walking  
Value of access to nearby community and recreational facilities.  
- **Central Lonsdale**: Accessible on foot, by bus, and by car  
- **Deep Cove**: Accessible by car  
- Importance of having community space designated for seniors |
<table>
<thead>
<tr>
<th>TOPIC</th>
<th>THEMES &amp; CATEGORIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neighbourhood social</td>
<td>Safety from crime is especially relevant for older adults in urban settings.</td>
</tr>
<tr>
<td>environment</td>
<td>• <strong>Central Lonsdale:</strong> Social vagrants as visual cues of social disorder (e.g., “gangs” of youth, panhandlers, homeless) enhance fear of crime; seen as negative consequence of urban development and population growth</td>
</tr>
<tr>
<td></td>
<td>• <strong>Deep Cove:</strong> Perception of neighbourhood safety was high so did not significantly affect when and where activities were engaged in; fear of bears in residential areas was real and negatively impacted perceptions of safety, especially during summer months</td>
</tr>
<tr>
<td></td>
<td>Conflict with other users may arise for older pedestrians.</td>
</tr>
<tr>
<td></td>
<td>• Participants from both neighbourhoods identified cyclists, skateboarders, wheelchair/scooter users, dog owners as potentially impacting the older pedestrian experience</td>
</tr>
<tr>
<td>Social capital</td>
<td>Social capital is accessed through both formal (neighbourhood) networks and informal (personal) networks.</td>
</tr>
<tr>
<td></td>
<td><strong>Social capital from neighbourhood networks:</strong></td>
</tr>
<tr>
<td></td>
<td>• Senior programming and discounts</td>
</tr>
<tr>
<td></td>
<td>• Designated community space for seniors</td>
</tr>
<tr>
<td></td>
<td>• Community health workers as important sources of information (e.g., connect individuals to appropriate programs and services)</td>
</tr>
<tr>
<td></td>
<td>• Information available through local media and circulation of community recreation guides</td>
</tr>
<tr>
<td></td>
<td>• General practitioners: do not usually target advice on physical activity</td>
</tr>
<tr>
<td></td>
<td><strong>Social capital from personal networks:</strong></td>
</tr>
<tr>
<td></td>
<td>• Provide information</td>
</tr>
<tr>
<td></td>
<td>• Provide social support (encourage, accompany in activity)</td>
</tr>
<tr>
<td></td>
<td>• Importance of socializing when being physically active</td>
</tr>
<tr>
<td></td>
<td>• Increase sense of security (e.g., walking companion)</td>
</tr>
<tr>
<td></td>
<td>• Role models for age peers and neighbours</td>
</tr>
<tr>
<td>TOPIC</td>
<td>THEMES &amp; CATEGORIES</td>
</tr>
<tr>
<td>-------</td>
<td>---------------------</td>
</tr>
</tbody>
</table>
| Other emergent issues | Neighbourhood attachment and ties may affect access to social networks and their resources.  
  • **Deep Cove**: Sense of community; dependent on length of stay in neighbourhood & what stage in the life course moved to area; commonalities with neighbours  
  Neighbourhood boundaries are dynamic (expand and contract over the life course). |
| Recommended changes to neighbourhood environment | Central Lonsdale |
|       | • **Physical**: Sidewalk design elements (smooth, evenly paved sidewalks; provide alternative, accessible pedestrian paths near construction sites; improve street lighting; increase crossing times and enhance pedestrian safety at busy, commercial intersections  
  • **Social**: Provide neighbourhood activities for seniors at night; develop a walking “buddy system”; community education and public awareness on changing realities for seniors; traffic safety education for seniors; Neighbourhood Block Watch program |
|       | Deep Cove  
  • **Physical**: physical expansion of community centre to accommodate growing needs; continuous bike lanes with clearly defined beginning/end points; stressed importance of resident input prior to new development – concern that design changes would change the Cove “too much”  
  • **Social**: Expansion of bus service “deeper” into residential areas of the Cove |

**Aging in place**

*Neighbourhoods differ in how well they support aging in place and maintaining independence in later life.*

**Central Lonsdale and pull factors**

Focus groups discussed the importance of maintaining one’s sense of independence in later life, and the preference to remain in the community for as long as possible. Changes in personal health or the health status of one’s spouse factor heavily in a decision to stay or move. Central Lonsdale participants were more inclined to discuss “pull” factors; that is, neighbourhood features that drew them to live there in the first place. These factors included proximity of residential to commercial establishments,
health services, and community facilities. For many of them, maintaining independence in later life meant still being mobile without having to rely on auto transport. Indeed, many based their decision to move to Central Lonsdale on the area’s walkability, and its convenient access to resources and services. As one 76-year old gentleman living in Central Lonsdale stated:

One of the reasons we moved here was that we were looking down the road to the future and we wanted a place where we didn’t need a car. And as luck would have it, I started losing the use of my peripheral vision and so I couldn’t drive any longer. And I haven’t had a car in two years and it hasn’t made any difference.

Several participants indicated that the move to Central Lonsdale was intended as their last. Given their current age and the number of years they lived in the area, this “last move” decision was likely to have been made during their mid-fifties. As a 76-year old widow remarked: “I purchased [my home in Central Lonsdale] because I thought, I am getting old and it is within walking distance of everything: hospitals, library, doctors, shopping - everything. You could walk to everything.” While this participant still drove to most destinations, she recognized that her neighbourhood would continue to support her activities if and when her health status changes: “But when the time comes when I can no longer drive I’m going to get me one of those little scooters and I’m still going to be mobile.”

Deep cove and push factors

In contrast, the majority of Deep Cove participants acknowledged that changing health circumstances in the future may preclude their ability to drive, and in this case, a move out of the Cove would be inevitable. They also spoke of delaying a move for as long as possible. In contrast to Central Lonsdale participants, their sense of independence was inextricably linked to driving. A 66-year old gentleman living alone felt
that when he could no longer drive, he would have no choice but to move out of the Cove. Taking the bus was simply not an option as the nearest bus stop was an uphill, one kilometre walk he judged to be near impossible to accomplish if his health was poor. There also seemed to be a general perception among Cove participants that those in their community who relied on the bus for transportation were the “frail old” who had (whether by choice or not) less active lifestyles. The reality that their neighbourhood does not offer convenient transportation alternatives to driving reflects how physical design and limited community resources (e.g., infrequent bus service, or bus service limited to main roads) become “push” factors that may induce a decision to move. Deciding to stay in spite of these barriers may result in dependence on personal or community support networks (if available), or an older person will run the risk of becoming socially isolated or housebound.

Neighbourhood physical environment and physical activity in later life

Walking is a particularly important form of physical activity among older adults. Central Lonsdale participants discussed how their neighbourhood sidewalk network supports both recreational walking and walking as an active form of transport. Physical features that enhance the pedestrian experience include presence of public and private gardens, outdoor patios along commercial areas, traffic calming measures (e.g., traffic circles), benches, and tree-lined streets. Such features and amenities were considered to improve the overall “friendliness” of an area, and made walking an enjoyable activity. Physical barriers were also identified, including poorly maintained, uneven sidewalks, narrow sidewalks that cannot accommodate for high pedestrian traffic flows (especially when street furniture and other amenities are also present), and lack of street lighting, which can reduce perceptions of safety. While some participants gave positive feedback on the recent installation of traffic calming measures, traffic safety
remained a concern, especially along busy streets. Some participants stated that they prefer to walk on less busy side streets to avoid potential traffic hazards. Most participants avoid walking at night, especially where lighting is poor, or where uneven sidewalks create tripping hazards.

Deep Cove discussions focused more on recreational walking and other outdoor recreational activities. Proximity of houses to urban parks and trails supported recreational walking for Cove participants. The uneven terrain of local trails was not considered an environmental barrier since most reported being in good health without any major mobility restrictions. However, participants recognized that the uneven terrain of trails may prevent more frail older adults from partaking in this type of exercise, unless they had a walking companion.

Participants confirmed what was observed during neighbourhood environmental audits, that sidewalks are largely absent in their neighbourhood. Interestingly, participant response was mixed as to whether the lack of sidewalks along Cove residential streets was a barrier to local walking activity. Some participants stated that open ditches along the sides of roads and the absence of sidewalks deterred them from walking in the neighbourhood. In contrast, other participants felt the twisting road network and cul-de-sac layout minimized safety issues for pedestrians since low auto traffic flows meant that they could just share the road with motor vehicles. Further, some expressed that local street design was an aspect of the Cove that maintained its historical, “village” feel.

**Settings for walking activities**
Public spaces that afford people watching and socializing were highlighted as particularly enjoyable walk settings. Waterfront walkways were mentioned by both groups as ideal settings because of the diversity of shopping and the various maritime activities that can be viewed there. As one Deep Cove participant remarked on his
favourite waterfront walking destination: "I love Ambleside [Park]. That is my favourite spot on earth…. I can watch the birds there for half an hour, ships going by, you know - whatever. There are a lot of stories, it's interesting. I go down there with a digital camera and [take] lots of pictures." Many participants drive to these destinations on a regular basis in order to partake in a leisurely walk, alone or with friends.

Access to community centres and recreational facilities was noted as an important support for participation in formal exercise programs for both neighbourhoods. A notable difference was that while most Central Lonsdale participants have the option of walking or taking the bus to these facilities, Deep Cove participants must drive. For example, Parkgate Community Centre is about a 5-10 minute drive away from most Deep Cove participants' homes.

Having community space designated for older adults is thought to be essential to support older adult participation in activities. While participants generally accepted community facilities to be inclusive of all ages, they also identified the need for at least some space to be designed specifically to the needs of older adults. Moreover, scheduling older adult activities adjacent to childcare may not serve either group very well. Environmental design could help minimize the amount of noise or distraction caused by other activities going on elsewhere in the facility (for example, installation of soundproof barriers). Clear signage was also mentioned as an important environmental cue.

Neighbourhood social environment and physical activity in later life

Safety from crime is especially relevant for older adults in urban settings.

Perception of safety while walking in one's neighbourhood is strongly influenced by the quality of the social environment. The two neighbourhoods differed in safety concerns identified. Central Lonsdale discussions focused almost exclusively on social
vagrants and youth who "hang out" on streets. Participants perceived the number of homeless and beggars in the neighbourhood has increased in the last several years. Some felt this to be a direct consequence of ongoing intensification of development and increasing residential density, in particular. While no one reported any recent experience with criminal activity or direct conflict with youth, there was a shared perception that this fear was warranted.

In contrast, shared perception among Deep Cove participants was that their neighbourhood was safe and free of crime. Participants noted that the design and layout of neighbourhood streets (namely, the presence of dead-ends) deterred criminal activity because there were no quick, "escape routes." Because crime was not an issue for Cove participants, they generally did not feel the need to restrict their walking activity to daylight hours. A major safety concern that did surface in Cove focus groups was the growing number of bears from nearby forested areas finding their way to residential backyards and streets. Some theorized this to be a negative consequence of expanding development into forested areas, and the growing number of mountain bikers making regular use of local trails.

Conflict with other users

Sharing streetscapes and public spaces may lead to conflicts with other users. Cyclists and skateboarders were identified by participants in both neighbourhoods as potential safety risks for older pedestrians who may not hear them coming from behind. A concern was also expressed that cyclists were using sidewalks instead of riding along streets or on designated bikeways. Some participants questioned whether it was a lack of signage prohibiting cyclists and skateboarders in pedestrian areas, or whether these users simply disregarded restrictions on where one can and cannot cycle or skateboard. There was concern that those in scooters or wheelchairs also presented problems for
other pedestrians. This type of user conflict may be indicative of environmental design (i.e., sidewalk width) unable to accommodate comfortable (non-conflicting) pedestrian traffic flows.

Dogs walked off-leash presented another safety concern for some. In response to this concern, Deep Cove participants noted that the issue has been partially addressed by a by-law that prohibits dogs to be off-leash in public areas. However, some noted that dog owners regularly broke this by-law. Moreover, an anecdote shared by one Cove resident illustrates how rigid enforcement of this by-law may have unintentionally led one older neighbour to give up an important activity:

There’s an old gentleman who lost his wife and he used to go – and I’m really upset about this – to Myrtle Park [to walk his dog]; that was his only form of exercise....he lives on Deep Cove Road [so] he drove there. He was a larger gentleman and he has a German shepherd and he throws his stick and the dog goes and gets it and comes back. [A district worker] gave him a ticket and he’s never been back since.

Social capital and physical activity in later life

Neighbourhood networks and social capital

Participants were invited to comment on whether community resources (e.g., available programs and services, community workers and health professionals, etc.) had any impact on whether they would or could participate in physical activities. Local programs, services, and policies that support senior-specific programming in community centres and recreational facilities were considered important community supports for physical activities. Cost of membership fees was identified as a possible deterrent to participation in such programs. However, age-specific discounts for programs and facilities were generally viewed as useful, cost-minimizing “perks” that they could take advantage of in their “senior” years.
Community workers were described as information gatekeepers that older adults can approach once they have accessed the facility. As one participant and member of the Parkgate Community Centre commented:

Well the physio down here [in Parkgate mall] told me that I should come up here [to the community centre] and take the rehabilitation course. So yeah, she actually told me. And then the rehab people [at the centre] said... that I should go to the ball class because I needed to tighten me up because of my neck and my back so they were very specific [about my needs].

This participant also mentioned that a seniors’ membership package includes an hour-long, personal consultation and orientation tailored to one’s particular needs.

Overall, the majority of participants felt that information on local programs and services was widely available – if one were proactive and sought it out. The local paper was often mentioned as a good information source, as was the North Vancouver Recreation Commission’s Leisure Guide published twice a year, which covers recreation programs and services available across the North Shore. The undertone throughout these discussions was that it was an individual’s responsibility to live a healthy life and be physically active. That said, even if one is not naturally inclined to be active, and is not particularly well-informed about community programs, one can still be introduced and encouraged to enrol in programs and services through established community health networks. A 66-year old gentleman from Deep Cove who suffered a recent heart attack was impressed with the coordination of local health services to assist in his illness recovery. He stated:

I never got into any community activities in my life except when my kids were smaller but I was astounded. I had this heart attack and I, ah, [the] first thing they did was send a woman around to check and give me an exercise program and then I went to Lions...
Gate [Hospital where] they had a nutritionist talk about healthy foods and then [I] got enrolled into this [exercise] program [for cardiac rehabilitation] here [at Parkgate Community Centre]. I'm just absolutely astounded. I think it's excellent.

**General Practitioners**

Focus group participants acknowledged that their general practitioners do little to encourage them to be physically active. The perception that one must be proactive and ask for physician advice was expressed. Participants remarked that a holistic approach to health remains the exception rather than the rule. Nevertheless, participants stated that their doctors could be quite helpful at linking them with useful health promotion resources and services, when they were proactive and specific in asking for information or advice.

**Personal networks and social capital**

Participants were asked to comment on ways, if any, friends, family members, and/or neighbours could support or encourage them to be physically active. At the most basic level, members of their social networks provided general information on programs available. Social support, such as words of encouragement, was also mentioned as a way that others help one to be (or maintain being) physically active. Spouses and friends were particularly important resources for instrumental support. Those who attended group exercise programs identified other members of the class who held them accountable and ensured that they stayed motivated to attend. A 62-year old female participant from Deep Cove remarked on the encouragement she gave to others and how others also reciprocated:

I encourage [circuit training at Parkgate] to all my friends and you know, one day when you don't go to the gym and you've been going every day and you missed a week, you get phone calls:
'Where've you been? What's the matter? Are you okay?' Oh, it's very good! Oh yeah, it's wonderful, it's a support system.

Those who participated in group exercise programs also found that opportunities to socialize either before or after their program were just as much an incentive to exercise as were the health benefits. Community facilities where many participate in programs often accommodated for social gatherings. A female participant commented on how it was her neighbour that first encouraged her to try an exercise class at Silver Harbour. When asked about the benefits of exercising she responded,

Ah, it takes you out of your loneliness because I remember, um, [when] my husband passed away I was alone for two years and all of a sudden I caught on to Silver Harbour; well that was it! Now I've got friends I've got people to talk to, I've got people to drink coffee with…. You know, stuff like that.

This participant further stated that she had never exercised before this period in her life.

In addition to friends encouraging participation in formal group programs, having friends as informal walking companions can also heighten the security one feels while being active. A participant from Central Lonsdale described how she and several other walking group members continued on informally after the formal walking group they participated in was disbanded (due to low participation rates). She noted:

I belong now to an unofficial walking group. It was official and then it got axed because there were not enough people to make up the numbers...the numbers weren't there but a few of us like, 11-12 of us, still get together ...and we... tend to use the trails. We meet up and we either go to Demonstration Forest, or sometimes we go to Burnaby, or Downtown or Bowen Island, and wherever is decided, and if you’re going to be there, [just] turn up and that works quite well, and there’s no money involved. There is usually somebody with a cell phone and somebody who knows the trail well.
This participant further described how these group excursions often led to socializing afterwards, at a local cafe or restaurant. Participants from both neighbourhoods who were active in exercise programs also mentioned organizing potlucks or socials for special holidays.

At a more general level, seeing one’s age peers being active in the neighbourhood may also be encouraging. A very active woman from Deep Cove enjoyed talking to her neighbours as they gardened on her evening walks. She stated, “When I’m on my walk we talk. So that gives them a model. [They think that] if the old girl can do it so can we, so it’s self generation. So I think in our case we are just showing by example.” This idea of being a role model to one’s peers was expressed by others as well. A woman from Deep Cove has been a fitness instructor in the community for several years and was now recognized as an important community asset and a personal inspiration to those who attend her class. One of her participants, an 80-year old female, also served as a role model to her fellow classmates. As discussed by three younger focus group participants: “You see, she’s a very strong person and there aren’t many women her age that even come close,” “But we’re aiming for it,” “She’s one of a kind,” and “We hear the little stories and that and you’re a model...we’re watching.” In this way, she is a social resource to others, without even making any special effort to do so.

Other emergent themes

*Neighbourhood attachment and ties and access to local networks*

The majority of Deep Cove participants raised their children in the neighbourhood, and had an intimate knowledge of the area and the family histories of the people who lived there. A “village-type” setting where residents know their neighbours was a depiction that emerged through comments received from several participants. Some long-term residents talked about organizing block parties with
neighbours and hosting open houses to which they invited old and new neighbours alike. In fact, direct social interaction with neighbours heightened their awareness of the recent turnover of residents, with older residents moving out and families with young children moving in. This shift in neighbourhood composition was generally accepted as a natural cycle of neighbourhood life. In large part, it was considered inevitable given the recent rise in housing costs in the area.

It would be incorrect to suggest that everyone in Deep Cove felt attached, or socially connected to their neighbours, however. There were also Deep Cove participants who stated that they only exchanged pleasantries with their neighbours, and did not share strong feelings of attachment to the neighbourhood or its residents. One woman who moved to Deep Cove to live with her adult daughter after her husband passed away stated that her social ties were mostly based out of Vancouver where she still actively participated in various organizations. While she has lived in the Cove for twenty years now, she does not have a particular affinity for the place or the community as a whole.

Neighbourhood attachment and a sense of neighbourhood identity did not strongly emerge in Central Lonsdale, even though the average length of stay for participants was only about 5 years less than the average among Deep Cove participants. In most instances, participants in Central Lonsdale did not raise their children there; rather (and as alluded to earlier), they had moved to the neighbourhood much later in life. This may explain the lack of attachment felt by most. That being said, one 78-year old widow who has lived in Central Lonsdale for only the last seven years challenges the idea that living in an area for a short period of time precludes any feelings of attachment. For this participant, Central Lonsdale reminded her of her former hometown in Rotterdam:
I’ve only been on the North Shore for seven years and uh, but Lonsdale is a Godsend – so much going on along Lonsdale! I mean doctors, dentists, everybody is here…yeah, I really enjoy living on the North Shore…. [It] reminds me, in Rotterdam I lived in a very old part of the city and it was sort of like a village idea, you know, [with] the stores. Lonsdale reminds me of that. I mean I knew everybody there and I’d say, “hi” and it’s the same here.

At a more general level, Central Lonsdale participants expressed knowing their neighbours, at least enough to exchange greetings. Those who lived in townhomes or condominiums also talked of organized parties and events with other owner-occupiers. Although neighbourhood attachment did not emerge in Central Lonsdale as clearly as it did in discussions with Deep Cove residents, Central Lonsdale participants still spoke of a sense of attachment to the North Shore community as a whole.

**Shifting neighbourhood boundaries over the life course**

Discussion on neighbourhood boundaries also occurred during Deep Cove focus groups. Further probing on this point suggested that neighbourhood boundaries are dynamic over the life course, and expand and contract with “who you consider your neighbours.” As articulated by one participant:

I think you've got a series of [neighbourhood] levels, okay. See, first of all you've got your house so that would make your immediate neighbours, [you know, in] the four directions, and then your street and then after that I was thinking, like those of us who brought our kids up in this area, that increases our neighbourhood because when the kids grow up here, ah, you become knowledgeable of [those] areas, so that's the second bit. And now we're into the next stage when we don't have our kids and we can come up to the programs here [at Parkgate], exercise programs here and whatever we want.... So your neighbourhood gets bigger and bigger [as you get older].
Perception of what area constituted the Deep Cove neighbourhood also shifted with population growth and service delivery changes. Although community facilities, such as the library and community centre, used to be located right in the heart of what is recognized as the Deep Cove village, a move of services first to the Seycove neighbourhood, and then to Parkgate, was deemed necessary to accommodate service expansion to meet growing population needs. Consequently, although Parkgate is a neighbourhood in its own right, Cove participants still considered it as part of their community. This sentiment may also reflect the fact that many long-term Deep Cove residents have recently moved to condominiums in the Parkgate area. Indeed, Parkgate was identified by Cove participants as the likely place they would relocate to if/when the time came they could no longer maintain their current homes, or could no longer drive.

**Recommended changes to neighbourhood environment**

**Central Lonsdale**

Participants were invited to recommend physical and social changes that could improve neighbourhood supportiveness for physical activities. Central Lonsdale participants identified mostly sidewalk design elements, such as ensuring that sidewalks were evenly paved and wide enough to accommodate pedestrian traffic, provision of outdoor patios and street furniture. Construction sites were also noted as hazardous areas that rarely provide adequate, alternative footpaths for pedestrians, and therefore needed to be addressed. Participants also stressed the need for better street lighting, and identified specific areas in their neighbourhood that required immediate attention. Particular interest was in improving pedestrian safety at busy intersections where pedestrian crossing times seemed to be too short, or where cars ignored pedestrian right of way at intersections with flashing lights.
A major social issue for Central Lonsdale participants was the lack of neighborhood activity at night, and youth “hanging out” on the streets. In terms of improving safety at night one female participant suggested a walking “buddy system” to provide companionship for single seniors who walk. She stated:

If there was a walking buddy program in the evening... [that would help]. We have a long winter here. Six months of darkness after seven o’clock at night and I think it would just be great so that seniors have an option and they can stay home if they want to and watch the idiot box or they can [actually] go out.

Another recommendation to address some of the potential conflict older pedestrians face from youth or other street users (i.e., motorists, cyclists, skateboarders) was community education and raising public awareness on the changing health realities of seniors and how these impacted their mobility. The Neighbourhood Block Watch program was also mentioned by one Central Lonsdale participant as combating neighbourhood crime and ensuring the safety of residents. Indeed, this 67-year old male was the Block Watch captain on his street. He discussed the program as a good way to deter illicit activity:

I know everybody’s business from one end of the block to the other ... and they say we’ve never had any troubles since I’ve been doing the job for ten years now, not so much as a break in. So, you get to know your neighbours and they know you. You keep an eye on each other’s properties and when we go away we tell everyone on our block if you see anything suspicious....

And the police was advising a few years ago for people who’ve got big hedges in the front of their garden. For God sakes rip them out; those are the houses that get broken into because they’ve got cover, and that’s the first thing I did – my hedges are gone. And most of the others [on our block] did too.
Deep Cove

Deep Cove participants were less inclined to recommend physical design changes, possibly for fear it would change the overall “feel” and “look” of the Cove. Resident turnover – while considered part of the natural course of life in the neighbourhood – could also garner cause for concern if it led to “too much” physical change and redesign. Physical expansion of community facilities (either at Parkgate or another appropriate area) to accommodate a growing number of users and programs was recommended. It was also recommended that bike lanes for recreational cycling be made continuous in the community, with clearly identified beginning and end points. Participants expressed the importance of resident input prior to any new developments in their neighbourhood, and some participants indicated confidence in the ability of Cove residents to mobilize if they needed to oppose a new development. Cove participants also recommended an expansion of public transit service in the area, particularly in currently under- or un-serviced residential areas.

The next chapter presents the results of activity diaries, the last method of data collection used in this study.
CHAPTER 5: ACTIVITY DIARY FINDINGS AND INDIVIDUAL CASE STUDIES

In the first half of this chapter an activity index formulated from diary data, one-week activity time use averages, and social resources related to physical activities are presented. In the second half, five individual diary cases are presented to highlight different patterns of physical activity behaviour and the socio-physical contexts in which they occur.

Profile of activity diary participants

Twelve Central Lonsdale and eleven Deep Cove participants completed one-week activity diaries. The mean age for Central Lonsdale participants was 74.4 years, whereas for Deep Cove participants it was 69.3 years. The majority of diary participants from both neighbourhoods were women; only four men (3 in Central Lonsdale, 1 in Deep Cove) completed activity diaries. Five Deep Cove participants live with a partner while 7 of Central Lonsdale participants live alone. All other socio-demographic characteristics for diary participants resembled that of focus group participants.

Diary keeping period

All diaries for this study were completed between November 06, 2006 and June 17, 2007. Three-quarters of Central Lonsdale diaries were completed during the fall season and the remaining quarter were completed during the spring season. Similarly, approximately three-quarters of Deep Cove diaries were completed in the spring season and the remaining were completed in the fall season. Based on Environment Canada historical weather data (available online at www.theweathernetwork.ca), the mean
temperature for fall days on which activity data were recorded was 6.99 degrees Celsius. The mean spring temperature for days on which activity data were recorded was 13.59 degrees Celsius. On 39.7% of diary days there was at least some precipitation recorded. For 22% (14 of 63) of unique days on which diary data were recorded, weather conditions were relatively poor (i.e., 7mm of precipitation or more).

Due to the degree of incompleteness and/or atypical events over the course of the one-week diary-keeping period, three diaries (two from Central Lonsdale and one from Deep Cove) were excluded from the final analysis. Thus, ten diaries per neighbourhood were analyzed for a final sample of twenty diaries.

**Activity index for diary data**

Across twenty diarists, a total of 140 diary days and just over 1700 activity entries were reviewed. Raw data from activity diaries (i.e., individual activity entries recorded per day) were labelled using key words and phrases, and these were collapsed into seven main themes that accounted for the range of activities performed by diary participants. An activity index was used as a framework for generating average, weekly activity totals across the two neighbourhoods. As diarists were asked to record all activities, themes and categories reflect all daily activities engaged in and not just physical activities. Activity themes, categories and average time spent in different activity types are summarized in Table 5-1.
Table 5-1: Activity themes and average time engaged in each activity over one-week period

<table>
<thead>
<tr>
<th>Activity Theme/Categories</th>
<th>Average across neighbourhood participants (in hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Central Lonsdale</td>
</tr>
<tr>
<td>Home-based activities (no/low intensity)</td>
<td>26.13</td>
</tr>
<tr>
<td><strong>Walking activity</strong></td>
<td></td>
</tr>
<tr>
<td>Utilitarian walking (alone)</td>
<td>7.18</td>
</tr>
<tr>
<td>Utilitarian walking (with others)</td>
<td>0.89</td>
</tr>
<tr>
<td>Recreational walking (alone)</td>
<td>1.79</td>
</tr>
<tr>
<td>Recreational walking (with others)</td>
<td>1.15</td>
</tr>
<tr>
<td>Walking TOTAL</td>
<td>11.01</td>
</tr>
<tr>
<td><strong>Physical activities (other than walking)</strong></td>
<td></td>
</tr>
<tr>
<td>Recreational, group physical activity</td>
<td>1.08</td>
</tr>
<tr>
<td>Utilitarian, group physical activity</td>
<td>0.98</td>
</tr>
<tr>
<td>Recreational, individual physical activity</td>
<td>0.20</td>
</tr>
<tr>
<td>Utilitarian, individual physical activity</td>
<td>4.04</td>
</tr>
<tr>
<td>Physical activity TOTAL</td>
<td>6.30</td>
</tr>
<tr>
<td><strong>Social activities</strong></td>
<td></td>
</tr>
<tr>
<td>Socializing related to physical activities</td>
<td>0.85</td>
</tr>
<tr>
<td>Face-to-face social activities</td>
<td>6.87</td>
</tr>
<tr>
<td>Telephone and electronic communication</td>
<td>7.30</td>
</tr>
<tr>
<td><strong>Non-physical leisure activities</strong></td>
<td>28.67</td>
</tr>
<tr>
<td><strong>Auto travel</strong></td>
<td></td>
</tr>
<tr>
<td>Auto travel (alone)</td>
<td>1.97</td>
</tr>
<tr>
<td>Auto travel (with others)</td>
<td>0.82</td>
</tr>
<tr>
<td><strong>Social capital activities</strong></td>
<td>5.95</td>
</tr>
</tbody>
</table>

**Home-based activities**

The most common home-based activities that were detailed in diaries were low-intensity household chores (washing dishes, sweeping/dusting, putting the groceries away, etc.); cooking and food preparation; and basic self care practices, such as bathing, dressing, eating and grooming/showering. It should be noted that not all diarists were as diligent in recording their regular household activities, especially their self care.
practices. Given the discrepancy in the level of detail provided, and that the focus of the study was not on non-physical, low-intensity household activities, no specific analysis of this data was performed.

**Walking activities**

Four main categories were identified under walking activity. At the conceptual stage, it was decided to distinguish walking for recreation from walking for transport/utilitarian purposes. Walking behaviour was further categorized by whether or not walking was done alone or with others. “Others” referred to at least one other person, or a pet dog.

Neighbourhood differences were apparent in walking behaviour. The average one-week total for Central Lonsdale was 11.01 hours compared to 6.94 hours for Deep Cove. Central Lonsdale participants engaged in utilitarian walking for an average just over 8 hours (7.18 hours of which on one’s own) and engaged in recreational walking for a one-week average of just under 3 hours (1.79 hours of which on one’s own). In contrast, Deep Cove participants engaged in utilitarian walking an average of 3.20 hours over the course of a week (2.47 hours on one’s own) and engaged in recreational walking for an average of 3.74 hours (2.06 hours with at least one other person or pet).

Settings for walking activity also varied between the two neighbourhoods. Central Lonsdale participants engaged in walking activity primarily within the neighbourhood while carrying out common activities, such as grocery shopping, going to the bank, or visiting the doctor. Length of walking trips varied greatly between individuals, but would often be for 5 to 15 minute bouts. Average daily utilitarian walking times ranged from 5 minutes per day to as much as 2.5 hours among Central Lonsdale participants. A significant portion of walking for transport was also related to taking the bus to more
distal locations on the North Shore. Among Deep Cove participants, utilitarian walking activity occurred most often indoors (e.g., the mall), at locations they would have to drive to access. Recreational walking occurred in parks and trails in the Deep Cove area, and also in more distal recreational destinations, such as Ambleside Park in West Vancouver and Stanley Park in Vancouver's West End. In each neighbourhood, 70-80% of the sample engaged in at least some recreational walking activity over the course of one week.

**Physical activities (other than walking)**

Physical activities other than walking were also categorized in terms of whether or not they were for recreational or utilitarian purposes. In addition, they were categorized in terms of whether they were group- or individually-based. Examples include:

- exercise classes held at a local recreation facility (group recreational physical activity);
- swimming laps at a local pool (individual recreational physical activity); and
- completing moderate- or high-intensity household chores such as gardening, power-washing decks and household renovations (individual or group utilitarian physical activity).

Deep Cove participants engaged in group-based recreational physical activities more often than their Central Lonsdale counterparts (4.81 to 2.05 hours, respectively). This difference is likely because many of the participants from Deep Cove participate in 50-plus and 60-plus exercise classes offered at Parkgate Community Centre, two or three times per week. Individual physical activities were also engaged in by the Deep Cove participants more often than Central Lonsdale participants (6.42 and 4.63 hours, respectively). It should be noted that the higher weekly average level of physical activity for Deep Cove participants (11.15 vs. 6.30) may also reflect the different seasons during
which the two groups completed the diaries, with the majority of Deep Cove residents completing diaries over spring.

By far, gardening was the most common and most frequent individual utilitarian physical activity (other than walking) engaged in by both neighbourhood groups. Neither group engaged in home exercise (e.g. stretching routine) to any significant degree, with only three of the total number of participants recording any home exercise routine over the week.

Social activities

Three main categories emerged among social activities: (i) face-to-face socializing with family and friends, such as entertaining guests at home or having coffee or dinner with friends; (ii) communicating with family and friends via telephone, email or online chatting; and (iii) social gatherings with friends or other program participants, before or directly following formal or informal physical activities. Dinner parties and lunch dates were common ways to socialize among diary participants. Average time spent during the week on face-to-face socializing was 6.87 hours for Central Lonsdale and 10.32 hours for Deep Cove. Telephone communication, particularly with family and friends not living in close proximity also occurred on a weekly, if not daily basis. Email correspondence was notably high for participants in this study, reflecting their average age and education level. The average amount of time spent during the week on phone and electronic communication was 7.30 hours for Central Lonsdale and 3.57 hours for Deep Cove.\footnote{These figures should be interpreted with caution, however, as not every participant was diligent in recording length of phone calls, or time spent on the computer.}

Socializing related to physical activity is of particular interest, especially the contexts in which these gatherings occur. The maximum amount of time a diary
participant spent socializing in conjunction with physical activity was 2.25 hours for the week (66-year old, married female living in Deep Cove). The weekly average for this type of social activity was slightly higher in Central Lonsdale than in Deep Cove: 0.85 hours compared to 0.53 hours, respectively. These social interactions usually occurred following participation in a group exercise program at a community facility. Such “social times” were either formally integrated within the exercise program, or an informal meeting of two or more participants at a nearby cafe or restaurant following class. Those who engaged in recreational walking with others (either informally with friends or more formally with a walking group) also socialized with their walking companion(s), usually coffee and/or lunch following their walk.

**Non-physical leisure activities**

Participants engaged in a variety of non-physical, leisure activities. Common activities included reading, writing, watching television, playing cards (e.g., bridge) and solitary games (e.g., Sudoku, crosswords), and arts and crafts (e.g., sewing). Time spent working on the computer or “surfing” the Internet was also an activity regularly engaged in by several diary participants. Some participants were involved in choir and educational programs (e.g., Elder College). Others attended special events, such as local productions of plays or musical performances, or seasonal open houses (e.g., gardening event, Christmas bazaar). Among Central Lonsdale participants, the average was 28.67 hours while among Deep Cove participants the average was slightly lower at 22.52 hours. Individual totals varied a great deal – from as low as two hours spent during the week to as high as 43 hours.
**Auto travel**

Auto travel was categorized in terms of driving on one’s own and driving with others (as either driver or passenger). A notable difference was observed between participants in the two neighbourhoods for time spent in auto travel over a week. Deep Cove participants, on average, spent approximately 8 hours in a car, whereas Central Lonsdale participants averaged less than three hours for the week. Just half of Central Lonsdale participants drove during their diary week whereas all Deep Cove participants did. Most of weekly auto travel time was spent as the driver; however, it was also evident that quite a few participants would drive (or be driven by) friends or family members. For instance, a diary participant from Deep Cove was obligated to accompany her husband at all times in the car due to his health-related driving restrictions. Duration of individual driving trips varied greatly, with the majority falling between 5-30 minutes. Those who drove on a regular basis tended to trip chain; that is, they would drive to one location and then drive to another destination or two before heading home.

**“Social capital” activities**

Diary data suggests that older adults were engaging in a variety of social capital-generating activities. Types of activities that benefited others around them, or the community more generally, included caregiving activities (usually for spouses, sometimes neighbours/friends), volunteer work (including donating time and other resources to charitable organizations), and teaching or counselling peers or others. A more passive social capital-generating activity that can enhance an overall sense of community was time spent socializing or helping neighbours. Avid gardeners were especially friendly with their neighbours, often chatting while they worked in their yards. In Central Lonsdale and Deep Cove, participants averaged a total of 5.95 and 4.86 hours engaging in this type of activity, respectively.
Social capital resources and physical activity

To further examine individual access to social capital resources related to physical activity, diary participants were asked to indicate whether anyone in their social network engaged in physical activities and/or supported them to be physically active. Results were similar across the two neighbourhood groups except for responses on whether they knew someone, or are someone, who uses public transit. Deep Cove participants were much less likely to know someone or be someone to take the bus, even on a semi-regular basis. Most participants from both neighbourhoods had a friend or neighbour whom they could walk with but few noted ever taking advantage of this resource. Some cannot walk with their friends or neighbours even if they wanted to because of difference in walking ability. As one participant stated, “I have a friend who can go for walks with me but we don’t because I don’t walk as fast as she does [so] I never ask someone to accompany me [when I] walk.” Participants were more likely to invite others to be active than they were to receive similar invitations from others. In general, the participants were socially connected, informed about programs available in the community, and often held active memberships with a centre and/or recreational club. Neighbours were just as likely to be identified as members of one’s social network as family members and friends.

The following five individual cases based on diary data are intended to illustrate the diversity of experiences and physical activity behaviours of study participants. Special attention is given to how access to resources via one’s social network influenced physical activity behaviour settings.
Individual case studies

James

James is a 79-year old single male who has lived in the Central Lonsdale neighbourhood for over thirty years. James has no family members in the area but many friends and acquaintances. He rents a one-bedroom apartment in a low-rise building, situated a block away from the main commercial avenue. He has lived at his current residence for the last seven years. James used to bartend at a hotel, and ran an antique shop in his neighbourhood at one point as well. James noted his current health as “very good,” and in spite of some activity restrictions, he reports being physically active on a regular basis.

For the week that James kept a diary he was physically active for just over twenty hours. By far, his main physical activity was walking for both leisure and utilitarian purposes. He regularly walked his friend’s dog: “I’ve been walking my friend’s dog for eleven years and most mornings revolve around this activity.” During the week, James walked the dog five days in a row, usually for 30-40 minutes at a time. Their walking route was very routine as well, and only spanned about a 3-block radius from his friend’s house located in an adjacent neighbourhood. James described his dog walking route in terms of key landmarks (e.g., the art gallery, the theatre, public gardens, the community centre, etc.). After he returned the dog to his owner, James usually stayed in the area to go shopping and/or to have a leisurely walk on his own. He then bussed back home (about a 10-minute bus ride).

Many of James’ walking excursions were spontaneous, and the destinations varied greatly. One day he wrote about how his original intention to see a movie in Downtown Vancouver changed as he was influenced by local shops he came across during his walk:
After walking the dog I went to the [community centre], and met Jacob with his guitar, sitting in the sun. We talked awhile about music and health matters and then I walked down to the Quay. After just browsing at the shops upstairs I decided to go to [the mall] in West Vancouver – I wished to buy a straw fedora advertised – [but they didn’t have my size] so I walked out. I could still make [the movie] – I had a good half hour – but instead I crossed the road to the south side. Resisted having a coffee, thought I would walk to the back and onto the track leading to Ambleside [Park] – then came to [a produce store so] decided to buy some fruit and vegetables instead. Now loaded down with cauliflower, apricots, limes, and oranges I thought I’d better get home.

During the week, James was very active and involved in different courses offered at local community centres. He relied on public transit to get to these and most other destinations. As he has lived in the area a long time and participates in various activities offered in the community, he often sees familiar faces when he is out-and-about. In his diary he described catching up with friends and neighbours while waiting for the bus. One day, James wrote about reconnecting with friends:

Had a surprise call from Ali, who with his wife, Salma, grew up in Burma as I did.... They also travel every winter as I do, and too attend various activities at the community centres. They have invited me to join them for dinner at [a local restaurant].... We have much to talk about, since we have met just once at a bus stop since we returned from our winter’s travel.

**Florence**

Florence is a 78-year old widow who has lived in her Central Lonsdale, one-bedroom, high-rise apartment for the last twenty-one years. Her building is adjacent to the municipal hall and library. Previously a resident of Windsor Park in the District of
North Vancouver, she decided she was too nervous to be in a house alone so moved here after her husband’s death. In addition, she felt that her former neighbourhood was simply inaccessible, especially because she was dependent on the bus for transportation. When she walked into her current apartment in Central Lonsdale she immediately felt like it was “home.” Florence self-reported her health as “very good”, that her activities were sometimes restricted, and that she occasionally makes use of a walker or cane when she goes out.

For the week that Florence maintained a diary she was physically active for just over 6 hours. Her physical activities included walking for transport and participating in exercise programs targeted to seniors. Florence attended these and other programs (e.g., seniors’ bus trips) with a friend whom she met 4-5 years ago. This friend encouraged her to participate in exercise classes. Now they encourage and support each other in a range of activities. During the week her friend picked her up by car and they drove to the community centre together. They would often shop and/or have lunch or coffee after their activities. In her diary, Florence identified the local restaurants and cafes that she usually dined at with her friends and neighbours.

Social interaction with neighbours is important to Florence. She described how when she first moved into the building several years ago her next-door neighbour asked to use her phone. From that initial contact they developed what she describes as a “buddy system,” in which several older residents kept an eye on each other. If one needed something picked up at the store but couldn’t do it by oneself, then someone else would always be there to lend a helping hand.

Florence continues to provide support to one of her older neighbours:

I have a neighbour that usually doesn’t go out; she has to take the taxi only. Well, Thursday at [the local drug mart] is Customer
Appreciation Day so I told her I would take her out because she says she is too scared to go out on her own...she has a walker and had a brain aneurism. She sees her doctor every single week. She is 90 years old but acts like she is 200! I call her every single day to make sure she’s alive.

Florence expressed that one by one, her “buddies” are passing away. This year she made acquaintance with another neighbour who has subsequently become an important (and younger) member of her support network. She stated:

My friend Yvonne died this January and the girl that lived next door to her – who had just retired – accompanied me to the funeral and we now maintain contact. I told her that now there was nobody left to look after me and she said, “I’ll look after you!” We go shopping together and she has a plot [at the local community garden]. She hasn’t gardened in a long time so she asked if I’d show her. We’ve got it all planted; she does the work and I’m the supervisor. She really is taking care of me.

**Margaret**

Margaret is a recently retired, 67-year old woman who has lived in the City of North Vancouver since she moved with her husband and children from Ontario 34 years ago. Now divorced, she lives in a one-bedroom apartment in the same building as Florence. She chose her current residence because it is close to everything. While she likes the convenience that Central Lonsdale affords she feels it lacks a sense of community that she senses in other North Vancouver neighbourhoods, like Edgemont Village and Deep Cove. She self-reported her health as “very good” and has no activity restrictions.

For the week that Margaret kept a diary she was physically active for just under 28 hours. She walked a lot on her own, for both transport and recreational purposes.
Because of her good health and her enjoyment of walking ("Walking for me has always been therapeutic; I've walked all my life; it is as regular as getting up in the morning and having a cup of coffee"), her walking excursions tended to be long (often lasting between 30-45 minutes), and covered a large area, usually beyond neighbourhood boundaries. When heading to more distal shopping destinations she usually walked one way and bussed home. For example, on Tuesday she walked for nearly an hour to get to a mall, which then took approximately 15-20 minutes by bus to get back home. In her diary, Margaret identified many environmental issues she took note of during her walking trips that week:

[It was a] beautiful day for a walk. Came across a few things that were annoying if not downright dangerous. Construction along Marine Drive, the "sidewalks closed" sign was in the middle of the block instead of beginning so it was a case of turning back to cross at corner or [run risk] of getting run over by walking on [the] road! Extremely annoying and unsafe for me but much more so for someone with a cane or walker. Why was this warning not posted at [the] intersection? Not exactly encouraging people to walk.

On another day she noted, "Have come close to tumbling down Lonsdale several times. Had I not [been] as agile as I am and managed to recover I would have had a few nasty spills."

During the week Margaret also enjoyed regular walks with others. She participated in a formal walking group offered at a community centre in another area within the District of North Vancouver. The walk was an hour and a half in length, along a North Shore trail. The group socialized over coffee at the community centre following their walk together. Margaret no longer feels safe to do trail walking on her own so finds the walking group very beneficial. She described the walk that she did with the group:

"Did a five mile walk with [the] group in Seymour Reforestation Area. Great group, both
male and female, ranging from 60 to 85 [years of age]. My favourite pastime is to walk with a like-minded group." Margaret also participated in a North Shore Walks event during the week. The Active North Shore Network organizes these group walks at various locations on the North Shore during the summer season that are sponsored/hosted by local organizations and community centres. At the walk, Margaret noted befriending a couple who she then convinced to join her Wednesday walking group.

Another physical activity for Margaret was gardening at a local community garden. Gardening is not only a physical but also a social one. Margaret noted "talking shop" and sharing produce with her fellow gardeners. She walked and bussed to the garden during the week, and was accompanied by her neighbour and friend, Florence, on one occasion. Each day she kept the diary, Margaret recorded either spending time with Florence or phoning her to see how she was doing.

**Greg**

Greg is a 71-year old divorced male who lives in seniors' housing in Deep Cove. He moved to the building and neighbourhood just five years ago when he was offered a one-bedroom apartment. Greg described his health as being in-between "very good" and "excellent"; he has been extremely active throughout his life. At one point, Greg even managed and owned a health spa in another region of the province. Greg is originally from New York City and lived in two other states before moving to British Columbia.

Over the week, Greg was physically active for just over 31 hours. His physical activity regimen consisted of swimming and recreational walking, almost daily, and he stated that he has maintained this same physical activity routine for the last ten years. Greg kept a very consistent schedule of activities. He attended daily mass at a church
located about a 20 minute drive from home. From church, he drove another 10 minutes to a fitness centre where he would swim 60 laps for approximately 45 minutes. He routinely followed his time in the pool with 5 minutes in the Jacuzzi and another 10 minutes in the steam room. From the gym he would drive a short distance to Ambleside Park. There, Greg would have a coffee and read the paper/listen to the radio, and then walk along the seawall for about 2.4 kilometres over the course of half an hour. On some days, Greg drove to a grocery store or to the mall to shop before heading home. In the late afternoon, he often took one to two-hour walks around the neighbourhood and in the nearby park.

Greg only participated in individually-based physical activities during the week. He has come to recognize a handful of people who use the pool the same time as he does in the mornings, but interaction is limited. He noted that swimming laps in a shared pool can be problematic: “Swimming was difficult today because there were several people in the pool.” On another day he stated, “I was tired when swimming today and this was complicated by a lady who was swimming very slow backwards. I had to wait several times. Believe it or not some people show very little courtesy in the pool. I must be courteous because I am a man weighing 225 pounds and I don’t want to run into anyone.” One of Greg’s favourite pastimes is walking at a waterfront park. He enjoys the vibrant scenery and the people that he meets while on his walks. On one of his walks during the week he noted meeting a couple from Calgary with whom he exchanged email addresses.

Greg spends most of his time on his own and described himself as “not a groupie.” Nevertheless, he stated that he feels lonely and has a hard time making friends with other older adults who live in his building who are less active than he is, and who have very different life experiences. Greg is open to helping his neighbours, and during
the week he extended his driving services to a couple of neighbours who lack access to a car. He volunteered to drive a neighbour to the hospital during the week. Later that week he walked around the building to ask neighbours to sign a "get well" card for a neighbour. On another day, he drove another neighbour to the cemetery and then to the supermarket. While Greg does express general contentment in leading a life balanced by spiritual, physical, emotional, and intellectual activities, his comments also suggest an air of discontent in the lack of his social activities. Moreover, he was the only diary participant who did not record any time spent during the week socializing, face-to-face, with family and/or friends. His daily social contact was usually brief and limited. On one day he wrote, "It is now 7:00pm and I feel great. I am ready to hoot and howl but there isn't any place to go."

Jocelyn

Jocelyn is a 70-year old woman who lives in a multi-level, single family home in Deep Cove with her husband. She has lived in her house and neighbourhood for the last 17 years. They moved to the area primarily because her husband wanted to live by the water. A retired nurse, Jocelyn keeps an active social life and is a member of a local seniors' acting troupe. Jocelyn self reported her health as “very good.” Bursitis in her left hip limits her activities and, she stated, is the reason why she cannot do the gardening that she so enjoys.

For the week, Jocelyn was physically active for approximately 8.22 hours. Her physical activities were limited to recreational (4.43 hours) and utilitarian walking (3.75 hours), almost all of it done with at least one other person (primarily her husband). Indeed, over the week she recorded morning walks with her husband on four days. In her own words, "I usually walk with my husband who makes a point of dragging me out most mornings." These walks lasted at least 50 minutes and would include walking from
their home to two nearby parks. She noted that the quality of the sidewalk on her street was not particularly conducive to walking: “Our street has very limited sidewalks because of the nature of the landscape so walking can be hazardous.” Although not accounted for in the time recorded for her physical activities, Jocelyn also gets some exercise going up and down the stairs of her multi-level home. Indeed, she noted having to climb up and down several flights of stairs throughout the course of a day. All these stairs is somewhat worrisome to Jocelyn: “My home is definitely not for anybody with a disability. We have 46 stairs over four levels to get to the road and 48 stairs to get to the garage.”

Jocelyn drove to various locations on the North Shore to run her errands and participate in her various social activities. Some shopping destinations she drove to over the week included malls and wholesale warehouses. Driving times varied from 15 to 40 minutes to reach these destinations. Jocelyn attended a weekly rehearsal for her acting group held at the seniors’ activity centre, about a 20-minute drive from her home.

She and her husband are part of a social network of Deep Cove neighbours. During the diary week they attended a few dinner parties, held at a nearby bistro or at one of their friends’ homes. The week she kept a diary Jocelyn was also in regular contact with a neighbour she was teaching how to knit. Indeed, an activity she regularly engaged in on her own was sewing and knitting. Her noted that her other activities were limited for the week she kept a diary due to the wet weather.

The following chapter integrates these and other findings more fully, and relates them to the conceptual framework that guided this study.
CHAPTER 6: DISCUSSION

This study aimed to explore relationships among the physical activity of older adults, neighbourhood environment, and social capital. Using a case study approach, data were collected through environmental audits, focus groups and activity diaries of older adults. Unlike other neighbourhood-based studies on physical activity, this study incorporated a network-based theory of social capital.

Findings are discussed under original research questions. Themes that emerged suggest some differences in issues identified by participants from the two neighbourhoods; this differs from another recent qualitative study conducted by Strath, Isaacs, and Greenwald (2007) that found that environmental supports and barriers to physical activity did not differ substantially for older adults (55 years of age and over) who lived in low- or high-walkable neighbourhoods. A discussion of findings as they relate to the conceptual framework, an evaluation of the activity diary method for use in similar studies, and implications of the research for neighbourhood design and planning, are also included in this chapter. It concludes with a review of this study's limitations, suggestions for future research, and general conclusions.

Review of findings

The role of neighbourhood physical environment on the physical activity of older adults

Group discussions indicated several ways in which features of the neighbourhood physical environment either support or hinder engagement in physical activity. Physical design elements supported walking for transport and walking for
recreational purposes in different ways. Sidewalk design, including smooth, even paving, street lighting, and benches were identified in this study as in other studies (Lockett, Willis, & Edwards, 2005; Prohaska, Belansky, Belza, Buchner, Marshall, McTigue, et al., 2006; Strath et al., 2007). Outdoor patios and green space were also identified as helping to create a more “vibrant, friendly” atmosphere in the urban neighbourhood. It was also noted in this study that sidewalks needed to be wide enough to accommodate for a variety of street users and furniture and not impede pedestrian traffic flows. Participants who lived in the urban neighbourhood noted how proximity of residential areas to various amenities and services supported walking on a regular basis, as did convenient access to public transit. Physical elements that either enhanced or reduced their perception of traffic safety were also discussed. Comments from participants confirmed previous research findings that marked crosswalks with no pedestrian-activated traffic signals or stop signs do not increase their sense of safety (Koepsell et al., 2002). Traffic calming measures, particularly traffic circles observed in the urban neighbourhood, were felt to improve overall traffic safety; this finding maintains the value of such measures to slow vehicular traffic and support walking and cycling activities (Strath et al.).

Participants from the suburban neighbourhood identified that nearby parks and trails supported their recreational walking. However, no participant from this neighbourhood reported walking for utilitarian purposes on a regular basis. Activity diary data confirmed that the sample of residents in this neighbourhood walked mainly for recreational purposes; in contrast, their urban counterparts walked primarily for utilitarian purposes, and also – on average – walked more (both in terms of duration and frequency) than they did. As such, findings from this exploratory case study replicate
those of larger, survey-based studies on walkability of neighbourhoods and physical activity levels (Giles-Corti & Donovan, 2006; Frank et al., 2006; King et al., 2006).

Presence of sidewalks (or lack thereof) did not draw consistent reactions from residents living in the suburban neighbourhood. The limited local auto traffic that cul-de-sacs afford meant – at least for some – that it was safe to walk on the road. The finding that absence of sidewalks may not deter walking activity maintains the mixed support previously found for this physical feature as it relates to the physical activity of older adults (Cunningham & Michael, 2004).

Although not directly related to physical activity behaviour, study participants identified how neighbourhood features could be perceived as either “push” or “pull” factors that lead to an eventual move. Participants from the suburban neighbourhood spoke of delaying a move if they were no longer able to drive or maintain their home, whereas participants from the urban neighbourhood were attracted to the area for the convenience it afforded someone with changing housing and social needs. Factors that influence the decision of an older adult to move or stay were also examined in a study conducted by Erickson, Krout, and Robison (2006) with older adults living in New York county. Using longitudinal data they found that older adults were “pushed” to move by personal crises (usually induced by health issues), while older adults planning a move tended to be “pulled” by housing arrangements with desirable characteristics, including a more appropriately sized residential dwelling, proximity to family, and access to help, if/when needed. Such neighbourhood characteristics support continued independence and mobility (and as such, support walking activity) in later life.
The role of neighbourhood social environment on the physical activity of older adults

As in previous research, perceptions of safety from crime and other personal security hazards emerged as an important issue. Shenassa, Liebhaber and Ezeamama (2006) found that perception of safety was associated with a greater likelihood of exercise, and moreover, that a lower perception of safety was found among residents of multi-family dwelling areas when compared to residents in an area dominated by single-family homes. Participants from the urban neighbourhood confirm that safety concerns deter them from walking on their own – especially at night. Local programs that allow for informal social control of neighbourhood activity, and neighbourhood design that allows for easy, natural surveillance (e.g., ample street lighting, street facing windows) were identified by participants in this and other studies as ways to improve perceptions of safety for older adults (Loukaitou-Sideris, 2006).

Meaningful destinations for walking and other physical activities emerged as an important aspect, as it did in another study that also used focus groups to elicit older adults’ responses to the environment and how it affects their physical activity behaviour (Michael et al., 2006). Findings suggest that favoured walking destinations were those that afford people watching and a variety of visual interests. Indeed, participants noted that they would make the effort to drive or take public transit to waterfront locations for recreational walking purposes. Although their study did not focus on the older adult population, Brown, Werner, Amburgey and Szalay (2006) also found that individuals rated good walking routes as those that they knew others would be drawn too as well.

Neighbourhood ties and attachment were important themes that emerged strongly in discussions with participants from the suburban neighbourhood in this study. Comments suggest that some older adults feel a very strong sense of attachment to the community. Some participants from the suburban neighbourhood knew and often
socialized with their neighbours (e.g., dinner parties, open houses, block parties). In contrast, another study actually found that auto-oriented neighbourhoods were not amenable to neighbourhood social ties (Freeman, 2001). It is important to recognize, however, that many of the participants from the suburban neighbourhood have lived there for close to thirty years, and had also raised their children there. A review on aging and social capital research by Stone (2003) maintains that neighbourhood ties become strong around the age of 40-44, at a stage in the life course usually associated with a stable family life and homeownership. According to Stone, neighbourhood relationships remain consistent and stable throughout adult life, and decrease only at age 80 and over.

Evidence remains mixed on whether higher density, more urban neighbourhoods weaken or strengthen social ties (Freeman, 2001). In the current case study, neighbourhood ties and attachment did not figure prominently in discussions with residents from the urban neighbourhood. This lack of attachment may be a consequence of the majority of participants having moved into the neighbourhood later in life (primarily post-retirement). The assertion that neighbourhood ties will not be as strong if residents did not reside in the neighbourhood during a more stable, family-oriented phase in their life is still speculative, and should be addressed more adequately in future research studies.

**Forms of social capital relevant to the study of physical activity of older adults**

Social interactions that are afforded by neighbourhood settings are also important to older adults engaging in physical activities. Opportunities to socialize with peers in group-based exercise programs and walking programs were valued by many participants across the two neighbourhoods. Social networks fostered in community settings like seniors’ centres provide several resources, including social and instrumental
forms of support. In their recent study, Aday, Kehoe and Farney (2006) noted the positive impact of senior centre friendships on the health and well being for aging women who live alone. They found that involvement in educational and health promotion programs was correlated with increases in health behaviours, and additional mental health benefits were also found.

The current study explored different types of social capital that may be available through either formal (neighbourhood) and informal (personal) social networks. Participants across the two neighbourhoods identified a variety of ways that neighbourhood and family/friend networks supported their physical activities. Networks developed through participation in programs at seniors' centres and recreational facilities helped reinforce and maintain participants' adherence to be physically active. Specific forms of social capital thought to support physical activity of older adults included social support, social leverage (publicly available information on programs and services for seniors), and social influence. In terms of the latter, participants identified their peers (or even self-identified themselves) as role models that inspire others to remain active as they age. A recent review of the literature on social environment and physical activity by McNeill, Kreuter, and Subramanian (2006) find evidence that walking groups, exercise contacts, and buddy systems can increase time spent engaging in physical activity. It also suggests that certain network characteristics, such as frequency of contact and network homogeneity, are positively associated with energy expenditure and exercise adherence.

Activity diary data in this study reveals that the degree and intensity with which one knows and socializes with neighbours can also lead to participation in physical activity. The individual case study of Florence, for instance, indicated that she had gained a walking companion through her friendship with the younger, active Margaret.
This friendship was symbiotic as Florence shares her gardening knowledge to assist Margaret in her community garden plot. It is important to note, however, that access to social resources through networks varied greatly depending on individual competencies and ability to reciprocate the support received.

In addition to social support received from other people, pets (dogs in particular) can also encourage older individuals to be physically active. For instance, one diary participant’s most devoted walking companion was his friend’s dog. A recent study indicates that dog walkers are more likely to achieve the 150 minutes per week that is recommended to older adults (Thorpe et al., 2006). The Australian-based study found that, on average, dog walkers were faster than non-dog walkers/regular walkers.

Individual case studies based on diary data further illustrate the dynamics of social networks and the reciprocal nature of social capital. Social capital flowed both ways between Florence and her neighbours; in their “buddy system” one was expected to both give and receive in social exchanges, and whether or not these could be considered as being equal in degree or quality was less of an issue. For Margaret, while she enjoys socializing with her neighbours she also maintained connections to networks that met her other social needs. Participation in a formal walking group allowed her to do hiking and walking she no longer felt comfortable to do on her own. Her description of the people in her walking group reflected the enjoyment she gets from interacting with other older individuals as active and outgoing as she is. Even though the walking group is not in her neighbourhood, she has the ability to participate in it because she has convenient access to public transit.

The potential for imbalance in social capital flows was evident in the case of Greg, who provided support to his neighbours more often than he received (at least during the week he maintained his diary). Greg further illustrated the potential challenge
older men face in making social connections with others, especially when personal resources and abilities (Greg is exceptionally fit and active for his age) differ from your neighbours. In contrast, Florence had a social network of older, single women in her building who shared her interests and were also seeking companionship. Lack of local connections for Greg may reflect why he performed his physical activities largely in other neighbourhoods. Interestingly, he did not choose closer recreational facilities for his workout but instead, continued to drive to a location that he was more familiar with, even though it was further away from home. Choosing to do his activities in other locations on the North Shore may, in turn, reinforce the lack of social ties he has to the neighbourhood he lives in. It is also worth noting that Greg’s current housing situation is more out of convenience (affordability) than personal preference. He mentioned that if he had the choice, he would prefer living in Ambleside, West Vancouver, where he already spends a significant amount of his time.

Study findings maintain that general practitioners are not consistently providing informational or practical physical activity advice to their older patients. That older adults who participated in the study were relatively active and healthy may explain the lack of advice they received from their doctors. A cross-sectional survey conducted in Australia suggests that practitioners may be more apt to provide exercise advice to some of their clients more than others. Conducted by Eakin, Brown, Schofield, Mummery, and Reeves (2007), this study found that males, the overweight/obese, individuals with chronic conditions, and individuals who more frequently visit their general practitioner, were most likely to receive physical activity advice. In general, however, the cultural norm is still for family doctors and other primary health providers to not give advice on health-promoting behaviours.
Other research evidence suggests that strategies to redress this tendency are worth pursuing. Evaluation of an intervention that trained primary care providers in health behaviour prompts and the use of print materials to offer referrals to exercise programs showed a greater likelihood that patients who received advice to report regular exercise four months after the intervention compared to study control group patients (Ackermann, Deyo, & LeGerfo, 2005). Older adults, in particular, have been found to give weight to physician advice (King, 2001). By way of example, a Canadian survey of community-dwelling women found that those that were sedentary and those at higher nutritional risk identified health professionals, in addition to family and friends, as important facilitators for them to engage in positive health behaviours (Tannenbaum & Shatenstein, 2007).

While analysis for this study focused on physical activity behaviour, diary data collected also provided additional evidence that older adults pursue a wide range of leisure and social activities, many of which can be considered as generating social capital. Study participants identified a range of leisure and recreational pursuits in which they were involved. Many volunteered their time with community-based organizations and provided informal care to spouses and neighbours. Another study exploring how older women stay healthy and happy confirms that in addition to physical activities, older women also gain positive benefits from social gatherings, leisure activities, and productive pursuits (Adamson & Parker, 2006). Glass, Mendes de Leon, Marottoli, and Berkman (1999) further contend that social and productive activities of older adults positively impact health and confer survival benefits through psychosocial pathways; they propose that these activities can complement exercise programs and offer feasible, health-enhancing activity alternatives for the frail elderly.
Study implications

Conceptual framework

Findings reinforce several relationships among concepts identified within the framework, and provide additional support to confirm neighbourhood environmental factors have both direct and indirect impacts on physical activity of older adults. Neighbourhood physical environmental data collected firsthand by the researcher, in addition to subjective data obtained from participants, provided evidence that the two neighbourhood cases differed in key physical features. Further, diary data supported the existence of neighbourhood-level differences in types of physical activities older adults engaged in, and that these, to some extent, could be attributed to quality of the neighbourhood’s physical environment. Moreover, participants from the urban neighbourhood engaged in more walking activity (and in particular, utilitarian walking) than their suburban counterparts. Neighbourhood participants also differed in time spent driving, with suburban participants spending a substantially greater amount of time in the car than participants from the urban neighbourhood.

Neighbourhood social environmental factors that were identified as affecting physical activity behaviour included safety and security issues, access to transportation, and community programs and policies that make participation in exercise and physical activity more convenient and feasible (e.g., affordable). Across the two neighbourhoods, study participants were equally likely to participate in, or at the very least be aware of, community programs available to them. This study was unable to uncover how community characteristics like neighbourhood socioeconomic status (SES) potentially played into this relationship. At the most basic level, however, findings suggest differences in the types of physical activities available and of interest to individuals from different SES groups, with relatively expensive forms of physical activity (e.g., kayaking)
accessible to those who have the disposable income and time available to partake in these types of activities.

Study findings further reflected how neighbourhood and personal networks supported physical activities and enhanced the quality of the experience, making it more enjoyable and/or ensuring that they maintain participation. Other comments received from participants confirm that social resources come in different forms. Findings from this study also suggest that individuals living in the same neighbourhood had disparate access to social capital. As identified in the conceptual framework, access to social capital will vary among individuals who have different personal resources available to them. Additionally, an individual’s access to social capital that can shape physical activity behaviour will largely depend on the resources that their social networks possess.

Another important aspect of the framework is that it captures the interplay between physical and social neighbourhood factors that shape the socio-spatial settings where physical activities can occur. Neighbourhoods that offer safe, socially vibrant, spaces that include pedestrian amenities, such as wide, even sidewalks are particularly supportive of older adults. Community facilities that accommodate for the needs of older adults in physical design of space, in addition to offering programs and services tailored to their interests and abilities, are especially supportive settings in which physical activity behaviour can occur.

The framework proposed in this study is novel because it was conceptualized specifically with older adults in mind. In addition, it builds on previous conceptualizations of social capital effects on health by exploring social capital through one particular pathway (i.e., physical activity). Simultaneously, the framework is flexible enough to guide future studies that look at specific groups of older adults and/or specific settings.
that can support their different activities. By way of an example, the framework can be
used to study older adults in an assisted living setting. In this case, physical environment
factors to explore might include design of shared spaces (both indoors and outdoors),
while social environmental factors might include characteristics of the resident
population within the assisted living facility. Programs and services offered on site, in
addition to structural and compositional elements of resident social interactions, could
also be examined to determine whether they generate social capital that support
activities of individual residents, or of specific groups/types of residents (e.g., frail
elderly, ethnocultural minority groups).

**Activity diary method**

Although the diary method has not been used in other studies examining social
capital and older adults, it has been previously used to track daily health activities and
exercise routines. There were several advantages and disadvantages with this method
of data collection. Diary content provided descriptions of settings in which physical
activities were occurring in and with whom. As such, it could be determined whether a
participant usually engaged in activities on their own or with others, and whether these
activities were occurring in local neighbourhood settings or more distal locations.
Comments received from participants on the diary format indicate that the one week
period was sufficient time to record their activities and that any longer would have
proven too tedious a task.

While most comments on the diary format were positive (e.g., easy to
understand, fill out), some felt that more space was needed for writing their comments
and observations. Some would have also preferred the option of an electronic version of
the diary. An interesting aspect of this method was the personal benefit that several
participants noted. A number felt that keeping the diary allowed them to reflect on their
daily routine, and/or on their interactions with the environment. One comment received by a 67-year old participant was, "I never used to pay attention to maintenance of sidewalks and now I am more aware of my environment." Another 69-year old participant noted how the diary encouraged personal reflection on the quality of her relationship with her spouse: "It has made me realize that I spend a great deal of my time alone as my spouse is over committed to his own activities/interests that do not include me."

Interestingly, several reported that while it would appear that they spent most of their days alone, or that their life was "boring", they were not lonely and they felt they led rich and fulfilling lives. This perspective points out the potential use of the diary method beyond a research tool and as part of an intervention program to self-monitor physical and social activities.

Diaries varied in the degree of detail provided, and not everyone chose to write open reflections/comments to further contextualize how they spent their days. It appears that those who kept relatively predictable schedules (e.g., always walk the dog at the same time every day, always participate in an exercise class at a certain time of day on specific days during the week) kept more detailed recordings of their activities. In addition, those that mentioned previous experiences with keeping diaries, or having worked in a profession where strong organizational skills are essential (e.g., accounting, nursing), were more adept at keeping meticulous tracking of their activities.

Making judgement calls on what activities to record and what activities to omit was ultimately the responsibility of participants. To ensure incidental and utilitarian forms of physical activity would not be missed, diary instructions provided by the researcher were for participants to record all activities. As such, diary writing was perceived by some as too tedious. In hindsight, it would have been more prudent to have participants record only activities outside of the home. That being said, an initial concern when
developing the diary was that by not asking participants to record home-based activities, there was an increased likelihood that they would omit physical activities engaged in semi-private settings, such as gardening or yard work, or household chores that qualify as moderate-intensity physical activity. Additionally, it was worthwhile to explore whether participants were just as, or more likely to be, physically active in the private home setting as they were in neighbourhood settings. 

Overall then, experience with the diary method in this exploratory case study suggests its potential usefulness in similar studies while offering some cautionary notes on its suitability. Further, it is important to keep in mind that the printing costs and resources required to interpret and code a substantial amount of data for each individual participant may warrant other methods more appropriate and cost effective, particularly for studies that have a large sample size.

**Recommendations for neighbourhood design and planning**

Neighbourhood types (urban versus suburban) may present different challenges to planners and policymakers interested in encouraging community members to be physically active. To encourage regular walking activity among older populations, planners and engineers need to pay attention to how pedestrian paths fit within the overall transportation network (i.e., how it works with public transit routes and auto traffic), and how they connect walkers to meaningful destinations and a variety of land uses (Southworth, 2005). The design of pedestrian paths would also differ by walking activity type that it is to support. Joseph and Zimring (2007), for example, found that location of a path, its connectivity to other paths, and the presence of valued destinations nearby, were important for utilitarian walking. Paths they found to be more

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15 Findings from this study suggest that older adults are not regularly engaging in physical activity at home.
supportive of recreational walking were longer, well connected, and offered attractive views of the campus setting. Although their study focused exclusively on path design in retirement community campuses, their findings are relevant and easily transferable to the neighbourhood scale.

While it is important to create neighbourhoods that encourage and support walking, safe driving in older populations should also be encouraged since the majority of older adults will continue to rely on driving as their primary mode of transport. As such, in conjunction with creating amenities to support non-motorized transportation, planners need to also create less challenging driving environments (i.e., improve signage, increase time allowance for making decisions to change lanes and enter/exit roads) (Satariano, 2007). Policies and programs could further complement these design strategies – for example, education and instruction on road safety for older drivers and older pedestrians.

Findings from this study confirm that community facilities need to be easily accessible to older adults. In neighbourhoods similar to the suburban case in this study, where single family homes dominate, convenient access via car and public transit to a “community hub” that contains a mix of uses is essential (such as Parkgate is to Deep Cove and other residents in the Eastern Seymour community). As participants in this study suggest, while it may not be feasible to stay in their single family home forever, at least they have the option to remain in the community and move into housing that is closer to the services and resources that they need. Moreover, the transition into this next phase of life could be eased if they are already familiar with the area, and/or already make use of the facilities and services available there.

Urban neighbourhoods may differ from suburban neighbourhoods in their planning priorities. The physical infrastructure of community facilities may already be
present in urban neighbourhoods, and existing transportation systems may offer
convenient access to residents. However, aging buildings may be an issue, and the
need for renovations and redesign is a real concern that older urban neighbourhoods
must face. Developers and designers should ensure that the physical space and layout
of these facilities accommodate for the specific needs of seniors and the different
activities they engage in, while minimizing any conflict or negative territoriality that may
arise in shared, common spaces (Salari, Brown, & Eaton, 2006). In addition, affordable,
appropriate programming needs to be ensured for a more socially and economically
diverse older population that urbanized areas are likely to have. For example, this
study’s urban case, Central Lonsdale, is home to the most ethnically diverse population
on the North Shore. As such, outreach services and ethnocultural-specific (exercise)
programming should be provided in community facilities (Belza, Walwick, Shiu-Thornton,
Schwartz, Taylor, & LoGerfo, 2004; Lees, Taylor, Hepworth, Feliz, Cassells, & Tobin,
2007; Tannenbaum & Shatenstein, 2007).

As this and other similar studies show, a relevant issue among urban
neighbourhood residents is safety from crime. Environmental design of public buildings
should allow for natural surveillance with sufficient lighting and no elements that would
create “hiding places” or encourage unwanted loitering. Programs targeting older adults
should be offered throughout the day and evening to increase desirable patrons using
these facilities. Residents in the urban neighbourhood also discussed how new
development, and in particular, increasing density, can often be perceived as leading to
increasing problems, including noise pollution. A study on noise and well-being in urban
environments by Gidlöf-Gunnarsson and Öhrström (2007) confirms the importance of
nearby green space to offer relief from road traffic noise levels for residents in urban

113
residential neighbourhoods. These design elements, in turn, help reinforce the area as a pleasant, safe place conducive to walking and other outdoor activities.

Residents from both urban and suburban neighbourhoods may also view new developments as compromising neighbourhood identity or dishonouring the history of place. Manzo and Perkins (2006) highlight how planners and developers can harness neighbourhood attachment and identity to enhance and add credibility to the planning process. Planners need to recognize emotional connections that people have to place and capitalize on common interests expressed, while also recognizing diverse meanings that different groups attribute to neighbourhood places. This can be achieved through ongoing community consultation throughout the design and development stages. Social acceptability of change may be improved by fostering neighbourhood social capital through both formal and informal networks.

Among planning circles, social capital can often be perceived as negative if it leads to "NIMBYISM" (that is, a "not in my back yard" mentality). However, Manzo and Perkins argue that labelling this behaviour as such may be unnecessarily counterproductive. A more productive planning approach would be to address how proposed developments might threaten place attachments by changing the physical fabric of a neighbourhood. In uncovering and understanding place attachments, planners can begin to identify power relationships among residents, and how they manifest in everyday uses and meanings of shared space, and devise solutions that respond to at least some (if not all) concerns for various community groups (Manzo & Perkins).

Another related issue that planners need to be mindful of is potential social exclusion of others, especially those who do not have historical connections to place, or who come from a cultural/socio-economic background different from the majority of residents. Again, the concept of social capital may help in addressing this issue.
Attempts to “bridge” social networks so that emphasis is on commonalities rather than differences would help ease tension between diverse groups. Harnessing resources of local organizations and community brokers to encourage dialogue between groups is also vital. Overall then, it is important that new neighbourhood projects consider built environment, sociocultural, economic and political contexts, and how these in combination impact various groups (e.g., youth, seniors, ethnocultural minorities) within the community.

**Study limitations**

Certain limitations must be taken into account when interpreting this study’s findings. First, convenience samples of both neighbourhoods and participants were notably small, and were not representative of socioeconomic or ethnocultural diversity in the community as a whole. Nevertheless, study findings were similar to those in another study conducted with older urban ethnic-minority women (Lees et al., 2007). Second, the participants in this study were healthy and active on a regular basis, with the majority meeting recommended levels of physical activity (150 minutes per week). Most were also well connected to both neighbourhood and personal social networks. Therefore, the study sample may not reflect issues most relevant to currently inactive or socially excluded older people. An attempt to solicit feedback from hard-to-reach populations for this study was, unfortunately, unsuccessful. Future studies should therefore address this limitation by facilitating focus groups with these vulnerable populations.

Another limitation is that diaries were collected during different seasons, and that there was seasonal imbalance between the two neighbourhood samples of diary participants. A recent study on seasonal variation in leisure-time physical activity among Canadians (19 years of age and over) noted significant differences in energy expenditures and time spent engaging in leisure-time physical activity between the
summer and winter months, and that seasonal variation was relatively high in British Columbia compared to most other provinces (Merchant, Dehghan, & Akhtar-Danesh, 2007). While seasonal effects may be especially pronounced for the seniors' population, it should be noted that data for this study were obtained during the "less extreme" seasons of fall and spring. In addition, while most of the urban neighbourhood data were collected during the colder and wetter fall season, findings indicate that their average utilitarian walking level was still significantly higher than their suburban counterparts. This result highlights how walking for transport is not affected by seasonality to the same degree as recreational walking might be, and thus confirms walking for transport as a feasible physical activity that older adults can engage in year round.

Another limitation was that physical activity was very broadly defined, and diary data relied solely on self-reported frequency and duration of recorded activities. Furthermore, no information on intensity levels for the different activities was collected.\(^\text{16}\) Future studies should apply more rigorous measures of physical activity, and whenever possible, collect objectively measured data on physical activity levels. Gauging intensity levels was not deemed a priority for this study, as the focus was on physical and social characteristics of the settings in which people were physically active. In this way, the broader concept of active living was given more weight in the analysis.

Solely relying on administratively-defined neighbourhood boundaries would have proved to be problematic in this study, especially with the suburban neighbourhood case. Flexibility in how neighbourhoods are defined (i.e., eventually relying on individuals self-identifying as a resident of a particular neighbourhood) is important in understanding social networks and neighbourhood attachment, thus confirming the use of multiple

\(^{16}\) Note, however, that whenever possible, the Compendium of Physical Activities (Ainsworth, Haskell, Whitt, Irwin, Swartz, Strath, et al., 2000) was consulted to verify intensity levels of activities (i.e., household chores) to warrant inclusion as a physical activity that met the minimum recommended moderate-intensity level.
definitions of neighbourhoods in complex studies on environmental behaviour (Diez-Roux, 2001). A methodological issue that remains is how to combine or compare data based on divergent neighbourhood boundaries.

**Future research directions**

In addition to the suggestions already made to address study limitations, several other avenues for future research in this domain exist and are briefly outlined. First, more systematic reviews of literature specific to physical activity of older adults are needed; these reviews should assess both physical and social environmental factors that influence physical activity behaviour of seniors (not just one or the other). Future study designs should also explore differences between objective and subjective neighbourhood environmental and physical activity measures, and explore reasons behind those differences. Studies that include direct observations (both with structured tools and spatial ethnography) in the local settings where older adults commonly engage in physical activity may further our understanding of social and physical dynamics of space, and how they ultimately affect physical activity behaviour.

Future case studies could focus on older adults who have moved from their single family home in an auto-oriented neighbourhood to a condominium or apartment in a more walkable, urban area, to assess whether post-move physical activity levels actually increase. A qualitatively-based study could also explore potential differences of social capital and physical activity behaviour among different ethnocultural groups. Application of a mixed methods approach to explore relationships among social networks, social capital, and physical activity of different groups of older adults would also be a worthwhile research endeavour.
Conclusions

This study offers important insights on how neighbourhood environment affects the physical activity of older adults. Using a case study approach it explored whether older adults who live in neighbourhoods that differ in key environmental factors identify similar (or divergent) issues related to physical activity. Findings suggest that planners and policymakers need to take stock of how different priorities emerge for different neighbourhood types and populations. Some residents feel more of an attachment to their neighbourhood than others; consequently, they may be hesitant to recommend or want physical changes that would compromise their neighbourhood’s identity – regardless of whether it improves the area’s “walkability” (and arguably, its liveability). Similarly, design recommendations that, in theory, support physical activity (e.g., installation of sidewalks) are simply not cost-effective given existing structures and street layouts. An appropriate environmental intervention in an auto-oriented neighbourhood would therefore include improvements to roadway design (to ensure safety of older drivers), as well as provision of adequate public transportation so older people can access exercise and group walking programs offered at community facilities. The study further highlighted the willingness of older adults to move to housing in close proximity to resources and services as their health and social realities change.

The value of applying the concept of social capital to this topical issue also emerged. Planners and policymakers could play an active role in fostering neighbourhood networks that improve access to social capital resources that support physical activity in later life. Creating neighbourhood spaces that encourage safe and friendly interactions, and that accommodate a range of user abilities and needs, is one important way they can encourage social capital exchanges that ultimately promote health and well being for older adults in our communities.
APPENDIX

CD-ROM Data

The CD-ROM attached forms a part of this work.

The PDF files were created with Adobe Acrobat, but may be opened in any PDF program.

PDFs:
- Environmental Audit Tool 73 KB
- Study Information Document 22 KB
- Informed Consent 54 KB
- General Information Questionnaire 19 KB
- Focus Group Discussion Guide 21 KB
- Activity Diary 120 KB
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