

Commuting in Halifax, Nova Scotia: Exploring Midlife Women's Perceptions and
Experiences of Active Transportation

by

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DALHOUSIE UNIVERSITY
SCHOOL OF HEALTH AND HUMAN PERFORMANCE

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Dedication

For my family...

And the many people who make our
cities better places to walk, cycle and live...

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Abstract

Nova Scotia is one of the least active provinces in Canada and is experiencing rising levels of obesity and related diseases. Women in Canada have low rates of participation in physical activity, despite the many benefits. The purpose of this research was to develop an understanding of how the built, natural and social environments act as enablers and barriers to the use of active transportation for midlife women. A qualitative, grounded theory approach was used in conjunction with a feminist perspective to explore the research topic. Findings suggest that the characteristics of the route and region, the presence or lack of support, and the perceived value and benefits of active transportation affect the type of transportation mode that is selected for commuting. Findings also reveal the ways that women respond to and overcome barriers. Implications for health promotion and future research are discussed.

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Chapter 1: Introduction

The Issue

Obesity and physical inactivity are substantial health issues facing Canadians today, Atlantic Canadians in particular (Coleman, 2000b). Regular physical activity has been found to provide a number of physical and mental health benefits (Ball, Bauman, Leslie & Owen, 2001), protecting against obesity, heart disease, stroke, hypertension, type II diabetes, breast cancer, colon cancer, osteoporosis, depression, anxiety, and stress (Coleman, 2002). However, only 39% of Canadians, and 38% of Nova Scotians are active enough to gain the health benefits associated with participation in regular physical activity (Canadian Fitness and Lifestyle Research Institute, 2009). Canadian women have substantially lower rates of physical activity than their male counterparts (Coleman, 2003a), and Atlantic Canadian women have some of the lowest rates of physical activity in Canada (Coleman, 2003b). Women are particularly at risk of the effects of physical inactivity as many of the associated diseases, such as osteoporosis and depression, are more prevalent in the female population than the male population (Coleman, 2003a; Public Health Agency of Canada, 2003). Obesity has also been shown to be associated with lower emotional well-being in women, but not in men (Jorm, et al., 2003). While much physical activity research has focused on girls, young women, and older women, there has been little research done to date that examines the relationship that midlife women have with physical activity, particularly midlife Atlantic Canadian women. Studies that do examine midlife women and physical activity tend to look at leisure-time physical activity and very few, if any, consider non-leisure-time physical activity, also known as active transportation.

Nearly one out of three Canadians was in midlife in 2006, defined as between the ages of 41 and 60 years of age, and more people are surviving into old age than ever before (Statistics Canada, 2009). The life expectancy of women is higher than that of men (82.5 years compared to 77.7 years) and, in fact, almost two-thirds of persons aged 80 years and over were women in 2006 (Statistics Canada, 2009). With more people surviving into old age, and a growing population of elderly women, it is important to address the issues of decreased quality of life and increased disability that can accompany aging (Daviglius, et al., 2003). Increasing and sustaining physical activity in midlife and across the lifespan is one way to improve quality of life and prevent disability. It is therefore important for health practitioners and researchers to continue to find new ways to increase and sustain participation in physical activity across the lifespan, particularly for women in Atlantic Canada.

Active transportation refers to non-motorized transportation, including walking, cycling, skateboarding, scootering, inline skating, using manual wheelchairs, snowshoeing, and cross-country skiing (Halifax Regional Municipality, 2008; Litman, 2003). Active transportation is showing great promise as a way to increase or sustain regular physical activity participation, mitigating many of the often cited barriers including lack of time (Badland & Schofield, 2005; Craig, Brownson, Cragg & Dunn, 2002; Health Canada, 2002) and lack of motivation (Craig, et al.) because it builds physical activity into daily routines (Oja, Vuori & Paronen, 1998). Walking and cycling are the most common forms of active transportation as they are inexpensive, convenient activities (Saelens, Sallis & Frank, 2003; Coleman, 2002) that can be practiced relatively safely by large numbers of people (Oja, et al.).

Research has shown that moderate-intensity activity, such as walking and other forms of active transportation, provides similar benefits to health as vigorous activity (Blair & Connelly, Pate et al. & US Department of Health and Human Services as cited by Pikora, Giles-Corti, Bull, Jamrozik & Donovan, 2003), and is associated with lower morbidity and mortality (Stofan, DiPietro, Davis, Kohl & Blair, 1998). Moderate levels of physical activity have also been associated with positive mood, lower levels of anxiety and depression, general well-being, and health-related quality of life (Bize, Johnson & Plotnikoff, 2007; Stephens, 1988). Studies have shown that multiple short bouts of moderate-intensity physical activity have a significant positive impact on adult fitness levels (Titze, Stronegger, Janschitz & Oja, 2008), and the accumulation of several short bouts of physical activity has the potential to improve regularity of physical activity because it is often perceived by the participant to be less time consuming (Murphy as cited by Titze, et al., 2008). Oja and colleagues (1998) found that adults who did 30-minutes of regular walking or cycling to and from work had decreased cardiovascular strain and showed positive changes in blood high-density lipoprotein cholesterol (the good cholesterol). Frank et al. (2006), found that every additional hour per day spent in a car was associated with a 6% increase in the odds of being obese, while every kilometer walked per day was associated with a 4.8% decrease in the odds of being obese.

The built and natural environments, and social roles and responsibilities impact women's participation in physical activity. The characteristics of the built environment, such as safety (minimal hazards) (Ball, et al., 2001; Craig, et al., 2002; Kowal & Fortier, 2007; McCormack, et al., 2004; Pikora, et al., 2003), infrastructure (such as bike lanes, pathways and well maintained routes) (Saelens, et al., 2003; Titze, et al., 2008; Troped et

al., 2001), and aesthetics (whether or not the environment is pleasant to be in) (Ball, et al.; Craig, et al.; Hoehner, Ramirez, Elliott, Handy & Brownson, 2005; Kowal & Fortier; Pikora, et al.; Saelens, et al.), can act as enablers or barriers to physical activity by encouraging or discouraging use, and making active transportation more or less difficult to use. The natural environment can also influence participation in physical activity – particularly physical activity that occurs outdoors – through weather and geographic characteristics of the region, such as local topography (hills) (Cook, 2003; Im, Chee, Lim, Liu & Kim, 2008; Jewson, Spittle & Casey, 2008; Winters, Friesen, Koehoorn & Teschke, 2007).

Social roles and responsibilities can also impact physical activity participation, particularly for midlife women. This group tends to have greater caregiver responsibilities for children and aging parents than men and women in different age groups (Im, et al., 2008; Segar, Spruijt-Metz & Nolen-Hoeksema, 2006), and must also manage social expectations and pressures regarding beauty, physical appearance and their roles as women (such the type and amount of formal and informal work) (Segar, 2006). While much research has focused on how these factors influence women’s participation in physical activity, their impact on active transportation in particular has not yet been explored.

The first step to understanding how active transportation participation levels can be increased is to develop an understanding of the barriers and enablers. This study sought to understand why midlife women typically do or do not engage in active transportation. Outside of this study, there is limited existing research about midlife women’s perceptions of physical activity (Im, et al., 2008), particularly active

transportation. Some studies have found that some midlife women consider physical activity to be inappropriate for women, particularly more ‘masculine’ activities such as basketball or football (Im, et al.; Berg, Cromwell & Arnett, 2002). Researchers have also found that midlife women are discouraged from participating in physical activity because of weather, lack of time, and lack of a companion, but are motivated by health concerns, weight-loss and a desire to improve their appearance (Im, et al.; Kowal & Fortier, 2007; Segar, Eccles, Peck & Richardson, 2007; Segar, et al., 2006). This research sought to develop an understanding of the unique experiences and perceptions that midlife women have of the built, social and natural environments to help health professionals better understand the complex issues of physical inactivity and obesity. By examining the reasons why midlife women do or do not engage in active transportation this research gained valuable information for programming and policy development. Greater knowledge has been gained for how health practitioners and planners can support and help to increase the use of active transportation, thereby improving the health and well-being of midlife women living in Halifax and Nova Scotia.

Purpose of Research and Research Questions

The purpose of this research was to develop an understanding of how the built, natural and social environments act as enablers and barriers to the use of active transportation for midlife women. Using qualitative research methods, the research examined the following questions:

What are the perceived enablers of and barriers to using active modes of transportation for commuting to and from work for midlife women working in Halifax, Nova Scotia?

- a. What aspects of the built environment (if any) act as enablers and/or barriers to the use of active transportation for commuting to and from work?
- b. What aspects of the natural environment (if any) act as enablers and/or barriers to the use of active transportation for commuting to and from work?
- c. What social roles and responsibilities (if any) act as enablers and/or barriers to the use of active transportation for commuting to and from work?

Relevance and Significance of Research

This study explored active transportation from a unique perspective that has not been articulated in the literature until now, that of midlife women. It contributes to the knowledge of gendered experiences of active transportation and provides insight into midlife women's experiences and perceptions. Nova Scotia is one of the least active provinces in Canada (Canadian Fitness and Lifestyle Research Institute, 2009) and is experiencing the negative outcomes of that inactivity with rising levels of obesity and diseases such as diabetes, cardiovascular disease, respiratory disease, depression, and cancers (Coleman, 2000a). Physical inactivity and obesity significantly impact the quality of life of many Nova Scotians, and as such, health promoters are increasingly concerned with working to reverse the trends. Active transportation is showing promise as a way to increase moderate physical activity levels (Badland & Schofield, 2005). The low cost, low skill, and basic nature of active transportation makes it a physical activity that can be

accessed and utilized by a majority of urban Nova Scotians. Unfortunately, only 9.5 percent of employed Nova Scotian women and 7.1 percent of employed midlife women, 35 to 64 years of age, in Nova Scotia walk or cycle to work (Statistics Canada, 2008c). The numbers are only slightly better in the city of Halifax where 11.5 percent of employed women walk or cycle to work, but only 7.9 percent of employed midlife women (35-64 years of age) walk or cycle to work (Statistics Canada, 2008c).

Lack of time is cited as a significant barrier to physical activity in Canada (Badland & Schofield, 2005; Craig, et al., 2002; Health Canada, 2002), along with lack of motivation and skill (Craig, et al.). Active transportation can mitigate these barriers by building physical activity into daily routines since it typically necessitates at least two daily trips: one to get to the destination, and one to return (Oja, et al., 1998). The accumulation of several short bouts of physical activity is often perceived by the participant to be less time consuming, and therefore has the potential to improve the regularity of physical activity (Murphy as cited in Titze, et al., 2008). Cycling has been shown to be more effective than walking in improving fitness because it is typically engaged in at a higher intensity (Oja, et al.).

Active transportation also serves to protect and improve the health of Nova Scotians in an additional way: by decreasing the amount of time that individuals spend in cars it decreases per capita vehicle emissions of pollutants that are harmful to health (Frank et al., 2006). Our personal health is profoundly connected to the natural environment; the natural environment provides us with clean air, food, water and the necessities of life (Barton, 2009). There are also health effects associated with climate change including the spread of infectious diseases, and increases in extreme weather

events which can have negative impacts on food yields (McMichael, Woodruff & Hales, 2006; Patz, et al., 2000). Protecting the environment protects our health.

The economic impact of increasing physical activity levels is also significant. A study by Coleman (2002) found that a 10% increase in the number of people who are physically active in Nova Scotia would result in a savings of \$4.6 million annually in hospital, drug and physician costs, \$7.5 million in total health care spending, and \$17 million in productivity gains, for a total economic savings of \$24.7 million.

Targeting midlife women with this research serves multiple purposes. Canadian women have consistently low levels of participation in physical activity (Coleman, 2003a) putting them at higher risk of obesity, obesity-related diseases, and mental health disorders that negatively impact their quality of life. Midlife women also form a bridge with older populations. Research has shown the importance of physical activity for the elderly but we cannot expect women to be physically active in later life if we do not support them throughout the life course. By addressing the health of midlife women we can help to ensure a better quality of life in old age (Daviglius, et al., 2003). Addressing physical inactivity in midlife women may also have a positive impact on the health and health behaviours of those around them. Women have been shown to have a significant impact on the health behaviours of their families, and their children in particular (DiLorenzo, Stucky-Ropp, Vander Wal & Gotham, 1998; Stucky-Ropp & DiLorenzo, 1993). As the “health keepers of families and communities” (Currie & Wiesenber, 2003, p.892), midlife women who develop physical activity habits, such as using active transportation regularly, may have a positive influence on the health of their children and communities (Daviglius, et al.; DiLorenzo, et al.; Coleman, 2003a).

This research provides practitioners with greater knowledge for how they can support physically active behaviour in midlife women, improving quality of life, decreasing disease and disability now and later in life, and positively influencing the health of children and communities, by supporting active transportation.

Chapter 2: Review of the Literature

Active Transportation and the Built Environment

It is estimated that physical inactivity causes 1.9 million deaths worldwide each year (World Health Organization and Department of Health Physical Activity and Health Improvement and Promotion as cited in Badland & Schofield, 2005). Researchers have begun to examine the role the built environment can play in increasing physical activity levels and participation in active transportation (Brennan Ramirez, et al., 2006). The term ‘built environment’ refers to the built or human-made aspects of the environment including roads, sidewalks, green spaces, paths, parks and buildings. ‘Active transportation’ typically refers to non-motorized forms of transportation, however there are some modes, such as motor-assisted bicycles that have motors that harness and run off of human-powered batteries, which could be considered active transportation because of the activity required to charge the batteries. Research regarding active transportation focuses mainly on walking and cycling because they are popular, inexpensive, convenient activities (Ball, et al., 2001; Saelens, et al., 2003) that can be practiced relatively safely by large numbers of people (Oja, et al., 1998). In most cases, modifications to the built environment that support walking and cycling, such as better maintained sidewalks and roadways, also support other modes of active transportation.

Regular participation in active transportation shows promise as a way to maintain regular physical activity (Badland & Schofield, 2005) and decrease vehicle emissions that are harmful to health (Frank et al., 2006). However, engaging in regular active transportation requires a paradigm shift away from exercise as a separate leisure activity

and towards active living, incorporating activity into daily life. Modifying the built environment to support active transportation can facilitate this paradigm shift. By improving the functionality (such as traffic characteristics, surface type and maintenance, and width of routes), connectivity (directness of travel between destinations), and safety of our built environments, we can create communities that are oriented to mass participation in active transportation and encourage increased physical activity (Stahl, Rutten, Nutbean & Kannas, 2002).

The role of the built environment as a barrier to physical activity is being explored for its potential to reverse the harmful trend of rising obesity rates and related diseases. It is argued that if the built environment affects physical activity, it is reasonable to expect that it also affects obesity and the prevalence of related chronic diseases (Frank et al., 2006). Increased energy output, through increases in non-motorized transport and other physically active behaviours facilitated by improvements in the built environment, can decrease the average annual weight gain and the prevalence of related diseases in North American adults (Orleans, Kraft, Marx & McGinnis, 2003; Saelens, et al., 2003). The link between built environment factors and obesity-related behaviours has been consistently proven (Poortinga, 2006). As Ross, Tremblay and Graham (2004) have identified, health is a function of the characteristics of an individual and the environments in which they live.

The built environment is an important area of study for health professionals. What community leaders, planners, developers and businesses decide to build and how they decide to use the land can either hinder or encourage physical activity. As Powell (2005) observes, our daily activities are shaped by the decisions our community has made

regarding how land is used. McCormack et al. (2004) discusses the built environment as a “behaviour setting” that “provides opportunities, barriers and cues that can facilitate or discourage behaviour, including physical activity” (p. 82). This observation is particularly important for health promoters as we work to prevent physical inactivity in our communities. For the past 50 to 100 years, communities have increasingly been oriented towards automobiles rather than pedestrians, employment opportunities have moved steadily from the farm to the office, and technology has decreased the amount of movement and work required to complete household chores (such as self-propelling vacuums). The options for sedentary recreation activities, such as video games, have also increased (Owen, Leslie, Salmon, & Fotheringham, 2000). As our society continues to develop technologies that decrease manual labour and increase sedentary behaviour one must actively seek out physical activity (Moore, 2008). In this context it is important to provide opportunities for physical activity that are accessible and pleasant. If modifications to the built environment can change the physical activity behaviour of residents (Hoehner, et al., 2005), health promoters are obliged to fully explore and exploit the potential to improve health.

Walkability.

‘Walkability’ is a measure of the walking conditions of the built environment (Saelens, et al., 2003). Walkability has been found to be a more important influence on active transportation participation than sociodemographic variables such as gender, age, and income (Frank et al., 2006). Given that walking is one of the most common and preferred forms of physical activity for the general population (Badland & Schofield,

2005; Pikora, et al., 2003), it presents a promising area for physical activity researchers to explore.

Researchers are currently attempting to refine neighbourhood walkability measurement indicators and tools that factor in the many aspects of the built environment that encourage or discourage walking (Owen, Humpel, Leslie, Bauman & Sallis, 2004). With a set of reliable, universal measurements and indicators, researchers will have a consistent way to classify and compare neighbourhoods, helping community planners and policymakers determine which areas are most in need of infrastructure reform. Saelens, Sallis and Frank (2003) found that residents of highly walkable neighbourhoods make almost two times the number of walking trips per week than residents of low-walkability neighbourhoods (3.1 versus 1.4 trips). This is a significant finding because the difference between 3.1 and 1.4 trips translates into approximately 15 to 30 minutes of additional walking per week for residents of highly-walkable neighbourhoods. For a person weighing 68 kg, this translates into additional energy expenditure of approximately 3,000 to 6,000 kcal, or about 0.4 – 0.8 kg per year (Saelens, et al., 2003). While half to one kilogram of additional weight per year may not appear significant at first glance, multiplying this additional weight by multiple years begins to show a significant effect on lifetime weight gain and the risk of obesity.

Frank et al. (2006) found that people living in more walkable neighbourhoods did more walking and biking for transportation, had lower Body Mass Indexes (BMIs, which identify and measure overweight and obesity), drove less, and produced less air pollution than people living in less walkable neighbourhoods. It is important to note, however, that residents of the most walkable neighbourhoods do not always attain high enough levels

of physical activity to gain health benefits (Pate et al. as cited by Saelens, et al., 2003), and overall, the number of walking trips made per week in the United States is relatively low compared to motorized transportation trips (Saelens, et al.). A similar pattern of walking and cycling trips compared to motorized transportation trips is found in Canada (BEST, 2004; Statistics Canada, 2008c).

Low-income groups tend to have higher levels of participation in active transportation when compared with higher income groups (Frank, Engelke & Schmid, 2003; Hoehner, et al., 2005; Winters, et al., 2007). Higher income households have higher rates of automobile ownership (Frank, et al., 2003; Hoehner, et al.) and rely more heavily on motorized transport (Winters, et al.) than lower income households with lower rates of automobile ownership. This suggests that those who have the financial freedom to choose their mode of transportation choose to use motorized transportation instead of active transportation. The question is why? The literature suggests that the built environment plays a large role in the decision to use or not to use active transportation. Researchers are finding that there are a number of characteristics of the built environment that affect active transportation use and physical activity including safety, functionality, destination/connectivity, land-use, density and aesthetics.

Safety.

Both perceived and objective measures of safety are very important for transportation and recreation-based physical activity (Ball, et al., 2001; Craig, et al., 2002; Kowal & Fortier, 2007; McCormack, et al., 2004; Pikora, et al., 2003). Safety refers to security from traffic, violence and pollution. Oja, et al. (1998) found that

perceived safety of pedestrian and cycling routes is a major barrier to the adoption of walking and cycling for transportation. Other studies have found that being in close proximity to fast-moving traffic is a barrier to walking and cycling (Dill, 2009; Dill & Carr, 2003). Research has also shown that safety from crime and violence is a barrier to walking (Painter, 1996) for women (Keane, 1998).

Functionality.

Functionality refers to the functional characteristics of the built environment such as the gradient and width of routes, traffic characteristics, surface type, maintenance, intersections, bike lanes, streetlights, and sidewalks (Troped, et al., 2001; Saelens, et al., 2003; Titze, et al., 2008). There are many studies that show that increased functionality, such as well-maintained infrastructure, increases physical activity. Dill and Carr (2003) found that each additional mile of bicycle lane per square mile was associated with approximately a one percent increase in the number of people commuting to work by bicycle. Improvements to the cycling route network in the city of Delft, Netherlands increased bike trips in the area by 3% (Wilmink & Hartment as cited in Titze, et al., 2008). Another study by Brownson, et al. (2000) found that the presence of trails helps to promote physical activity among women. Restricting city blocks to pedestrian or cyclist only access, and making stairways more accessible, convenient and pleasant are other ways that functionality can be improved for physical activity (Badland & Schofield, 2005).

Destinations and connectivity.

Connectivity refers to “the directness or ease of travel between two points” and “is directly related to the characteristics of street design” (Saelens, et al., 2003, p. 81). Connectivity and distance to destinations such as work, shops and facilities are particularly important for transportation-based physical activity (Badland & Schofield, 2005; Ball, et al., 2001; Craig, et al., 2002; Hoehner, et al., 2005; Saelens, et al.; Titze, et al., 2008). People who live closer, or within walking distance, to destinations are more likely to engage in active transportation than those who live farther away (Hoehner, et al.).

Land-use and density.

Land-use mix is another aspect of the built environment that influences physical activity behaviour. It is a concept with origins in urban planning research and refers to the integration of different physical space uses within an area, including residential, commercial, office, and public (Saelens, et al., 2003). Multi-use areas have been shown to exert a positive influence on physical activity behaviour and are particularly important for transportation-based physical activity (Badland & Schofield, 2005; Khisty as cited in Craig, et al., 2002; Hoehner, et al., 2005; Saelens, et al.). Population density, which is the number of people living in a given area, also influences transportation-based physical activity behaviour (Badland & Schofield, 2005; Cervero et al. as cited in Ball, et al., 2001; Khisty as cited in Craig, et al.; Saelens, et al.). Density has been found to be one of the most consistent positive correlates of walking trips (Saelens, et al.), likely because areas with higher density also tend to be areas with mixed land-use.

Aesthetics.

Aesthetics refers to the pleasantness and appeal of the environment and includes factors such as cleanliness, visually appealing scenery, interesting architecture, greenery, and the amount of pollution (Ball, et al., 2001; Craig, et al., 2002; Hoehner, et al., 2005; Kowal & Fortier, 2007; Pikora, et al., 2003; Saelens, et al., 2003). It is most frequently a subjective measure, however some researchers have attempted to objectively measure aesthetic attributes such as cleanliness, variety of sights and variety of building designs (Pikora as cited by McCormack et al., 2004). Aesthetics have been found to be more important for recreation-based physical activity than transportation-based physical activity. This could be because leisure activities are typically pursued for pleasure, whereas transportation-based physical activity is more functionally-based, so aspects such as ease of access, distance and travel time may be more highly valued.

Traditional versus suburban sprawl design.

Researchers are finding that active transportation, or transportation-based physical activity behaviour as it is also known as, also depends on the type of neighbourhood that one lives in. Traditional neighbourhood designs are proving to be far more conducive to active transportation than suburban sprawl designs (Badland & Schofield, 2005; Saelens, et al., 2003). Traditional design refers to pre-1970s North American design and is characterized by mixed land-use, high connectivity, high walkability, and higher density (Saelens, et al.). These characteristics have proven links to increased physical activity behaviour. Residents of traditional neighbourhoods report about 30-minutes more walking for transportation each week (Saelens, et al.), as well as more total physical

activity compared to those who live in neighbourhoods with less walkable suburban sprawl designs (Frank, et al., 2006). Older residential areas were planned on the premise of low automobile ownership, and infrastructure was designed for comfortable walking distances between daily destinations and transit use (Badland & Schofield, 2005). It is not surprising that residents of older subdivisions make more non-motorized trips and fewer automobile trips than those in newer subdivisions (Badland & Schofield).

Suburban sprawl design is characterized by single land-use orientations, large distances between destinations, lower density, lower connectivity and lower walkability (Saelens, et al., 2003), and does therefore not support active transportation. The street networks in suburban designs require residents to travel large distances to achieve relatively short straight-line distances (Saelens, et al.). The result is that automobiles have become essential for traversing the long distances between destinations. Accordingly, suburban areas have a lower percentage of people walking to work than urban areas (Craig, et al., 2002), and the associated problems in these areas of decreased physical activity, increased pollution, traffic congestion, and the rising costs of health care related to physical inactivity have become serious concerns for health and transportation professionals (Badland & Schofield, 2005; Craig, et al.). Not all suburban designs make active transportation challenging, however. New urbanism is an approach to suburban community design that incorporates principles of traditional residential design such as mixed land-use, walkability and sustainability (Grant, 2008), which support active transportation. Suburban neighbourhoods also typically have more parks and green spaces, less traffic and can be more aesthetically pleasing than traditional neighbourhoods, which can have positive impacts on recreational physical activity.

The health benefits of improving the built environment.

The built environment has the potential to effect physical activity in a way that is fundamentally different from other types of behaviour change programs, in that changes to the built environment can affect entire communities rather than a small proportion of people who are motivated to change regardless of the condition of their environment (McCormack et al., 2004; Saelens, et al., 2003). We can expect that changes to the built environment, such as the improvement or addition of active transportation infrastructure like bike lanes, will be relatively permanent (Saelens, et al.) and have the potential continue to affect new groups of people as new residents arrive in the communities. According to Powell (2005), “the changes in land use and the built environment that might enable people to be more physically active have the potential to benefit all in society” (p. 216). Compared to individually-based behaviour change programs which are subject to the individual circumstances of participants, and frequently result in relapse into physically inactive behaviour (Saelens, et al.), this is very encouraging. Given that the majority of people in Canada live in urban environments (Statistics Canada, 2008a), health promoters have the potential to reach a large number of people through their work with the built environment.

By addressing active transportation infrastructure in the built environment, there is the potential to increase active transportation, and therefore also improve air quality by decreasing pollutants from vehicle emissions while increasing daily physical activity (Frank, et al., 2006; Younger, Morrow-Almeida, Vindigni & Dannenberg, 2008). The design of our built environment impacts the transportation methods we use, which impact the amount of pollution in the air. Mixed land-use, higher density, greater street

connectivity, and shorter distances to destinations are associated with decreased vehicle miles traveled and significantly lower per capita emissions of pollutants that are harmful to health (Frank, et al., 2006). Without clean air, respiratory and cardiovascular diseases increase (Frank, et al., 2006). The built environment is an important area of study for health promoters because of the impact it can have on behaviours that affect the health of the natural environment and thus our health. The link between the built environment, natural environment and health compels health professionals to address issues such as pollution and degradation of the natural environment, and advocate for behaviors and actions, such as active transportation, that will not negatively impact the natural environment.

It is clear from this review of the built environment literature, that the built environment does impact the physical activity levels of adults. Craig, et al. (2002) suggest that ideal communities contain housing, workplaces, shops, green spaces and trails within easy walking distance, streets that are safe for pedestrians and cyclists, and paths that are connected to many destinations. This type of community, which encourages physical activity, can be created by modifying the built environment and attending to the factors that influence participation: safety, functionality, connectivity, land-use, density and aesthetics. As health professionals and community planners, we need to take the next steps towards making these types of environments a reality to improve the physical activity levels and health of our communities. More research is needed to determine the neighbourhood design elements that are most significant to specific populations and that maximize the potential for transportation-based physical activity (Giles-Corti & Donovan, 2002).

Midlife Women and Physical Activity

Research has shown that women's participation in physical activity is closely related to health, social, economic, individual and environmental factors (Barret, 2000; Bryan & Walsh, 2004; Hall, 1998). Women are less likely than men to engage in physical activities, and the disparity between the two genders grows as the intensity of the activities increases (Vertinsky, 1998). Generally, older women tend to be less physically active than younger women (Scharff, Homan, Kreuter & Brennan, 1999). These findings are captured in cycling participation research which shows that cycling is more popular among males, younger adults and those who are physically active in other ways (Moudon, et al., 2005). A study by the Canadian Association for the Advancement of Women and Sport and Physical Activity (CAAWS, 2007) found that there are a number of barriers that prevent women between the ages of 55 and 70 from engaging in physical activity, including: safety concerns, lack of skill and confidence, poor weather, lack of infrastructure, lack of equipment, and cost.

Much physical activity research has focused on young women and elderly women, however little research has examined midlife women specifically. Studies that do relate to midlife women tend to examine midlife *or* women, have a heavy focus on body-image, focus on leisure-time physical activity, or do not differentiate or identify the type of physical activity being examined (for examples, see Brown, Burton & Rowan, 2007; Bryan & Walsh, 2004; Eyler, et al., 2002; Hall, 1998; He & Baker, 2004; Tiggeman & Williamson, 2000). It is important to research midlife women specifically to develop a deeper understanding of their unique perceptions and experiences of physical activity

given the unique demands and stages of this time of life, and midlife women's influence on the health of others.

Social Roles and Responsibilities

Women in midlife have a number of social roles and responsibilities that can act as barriers to physical activity. Midlife is characterized by transitions between roles, responsibilities, and significant life events, particularly for women (Chambers, 2000). Midlife also brings additional social pressures and expectations related to work and caregiving for women (Segar, 2006). "Sandwiched" between childrearing and caring for elderly parents, midlife women have many time pressures to contend with (Segar, et al., 2006). Women's duties as mothers, spouses, family caregivers and workers result in busy schedules that leave little time for personal care (Im, et al., 2008). Despite decades of women working outside the home, their responsibilities at home have not decreased significantly (Currie & Wiesenberg, 2003). The amount of time that men spend on unpaid work in the home is increasing, but women still spend more hours per day on unpaid work (2.5 hours per day for men versus 4.3 hours per day for women) (Marshall, 2006). Lack of time due to work and family responsibilities is a commonly cited reason for not engaging in physical activity (CAAWS, 2007; Im, et al., 2008; Segar, 2006).

Beauty norms and sociocultural pressures developed at a young age also continue to affect women into midlife (Segar, 2006; Reel, SooHoo, Summerhays & Gill, 2008). According to the American Society of Plastic Surgeons (2009), 12 million women underwent cosmetic procedures in 2008 with the majority of patients aged 40 years or older; 47% of patients were 40-54 years of age and 26% were 55 years or older. These

statistics clearly demonstrate that body image and dissatisfaction brought on by socially constructed beauty norms affect midlife women. The ideal body image conveyed in the media is one of fitness and thinness, and women are socialized to seek often-unrealistic cultural standards of beauty, fitness and 'health' (Reel, et al.). Growing older is also often equated with being unattractive, "invisible" (p.323), and undervalued (Reel, et al.).

Women are more likely than men to exercise to lose weight and improve their appearance (Segar, et al., 2006; Tiggeman & Williamson, 2006). Weight-loss is viewed by many women as a way of fighting the negative associations and perceptions of growing older because it is associated with attractiveness (Reel, et al.). Researchers have found, however, that when weight-loss and body-shaping are the motivating factor for exercise, physical activity levels are less likely to be sustained over the long-term (Segar, et al., 2007), which may explain the overall low levels of participation in physical activity by midlife women. It has been suggested that if physical activity is associated with body-shaping or linked to appearance, it may be considered less socially valuable when compared with other activities that are related to family or work, and therefore pursued less often (Segar, et al., 2006).

Another social barrier to physical activity for women is their comfort with physical activity as an appropriate activity. Some women have been socialized to regard many types of physical activity as inappropriate for women (Im, et al., 2008), and years of this socialization results in a personal discomfort with physical activity (Berg, et al., 2002). For women who have been brought up with these values and beliefs there is a decreased likelihood of participation in physical activity, despite the known benefits (Im, et al.). Beauty norms also play a role in the 'appropriateness' of physical activity. Women

are socialized to be feminine, beautiful, clean, and fresh-smelling, which is likely to affect participation in physical activities that may not allow for these appearances to be maintained. For example, in Halifax, cyclists must wear a helmet, which can mess up hairstyles. Active transportation can also be a vigorous activity, particularly in locations where hills are present, which can result in sweating and body odor, both typically considered to be unfeminine characteristics.

The Natural Environment

The natural environment can present significant barriers to physical activity. Geographic characteristics such as weather and landforms can be discouraging factors when considering outdoor physical activity, particularly in Canada where winters are cold and often harsh. Women, midlife women in particular, often cite bad weather as a barrier to physical activity because it is uncomfortable (Cook, 2003; Im, et al., 2008; Jewson, et al., 2008; Winters, et al., 2007). Poor weather also affects the condition and usability of sidewalks, bike lanes and other active transportation routes, when poor clearing results in the build up of ice and snow. Geographic characteristics such as hills can also present challenges to outdoor physical activity and active transportation (Winters, et al.). Areas with a greater prevalence of hills require a more intense physical output and can deter women who do not wish to sweat, or do not have the fitness required to overcome them. While weather and geographic characteristics can present significant barriers, innovative companies are continuously presenting new and improved ways of responding these barriers. Clothing materials are becoming increasingly advanced, and manufacturers are continuously improving the functionality, comfort and style of technical gear making it easier to use, and more attractive to women who wish to be fashionable.

As the literature demonstrates, women's participation in physical activity is complex and affected by many factors. The built and natural environments, along with social roles, responsibilities and norms can present barriers to participation in physical activity, despite the numerous benefits to health. Given the relatively simple nature of active transportation, and its ability to address many of the barriers often cited by midlife women to physical activity, it may prove to be an excellent way to help to address physical inactivity among this population of women. To understand how we can support the use of active transportation, we must first develop an understanding of what barriers this population perceives and experiences, which this study has aimed to do.

Chapter 3: Methodology & Methods

Conceptual Framework

The research questions were explored using a qualitative, grounded theory, feminist approach.

Methodological assumptions.

A constructivist paradigm has been used to guide this research project. Constructivist researchers understand knowledge and truth to be created from the perceptions of individuals and groups (Creswell, 1998; Schwandt, 1994). Constructivist philosophy assumes that knowledge and reality are subjectively constructed in the minds of individuals (Creswell, 1998; Guba & Lincoln, 1994; Schwandt); it is therefore possible for multiple, and oftentimes conflicting, realities to exist simultaneously, which can all be meaningful, insightful and important (Schwandt). Constructivism is concerned with understanding experiences from the perspective of the persons living them (Schwandt). It seeks to understand the meaning of a situation from the point of view of the individuals or group most closely connected and involved with the situation under investigation (Schwandt).

Theoretical perspective: Feminism.

Feminist theory has informed the development of the research questions, methodology and methods. The term 'feminist theory' summarizes a complex set of values and includes a range of perspectives (Campbell & Wasco, 2000; Reinharz, 1992). Although there are many types of feminist theory, each having a slightly different focus,

they are all centered on the experiences of women's lives and a belief that those experiences are legitimate sources of knowledge (Campbell & Wasco; Currie & Wiesenberg, 2003; Dankowski, 2000; Olesen, 1994). Unlike positivist researchers, feminist theorists argue that there is no one truth, authority or objective method that leads to the production of knowledge (Dankowski; Reinharz). Feminist theorists generally see positivist research as problematic; this is because historically, research done using the positivist paradigm has been androcentric and sexist, ignored gender differences and the experiences of women, and often taken the "male-as-the-norm" stance (Dankowski, p.8).

Feminist theory is also pluralistic, holding that there is not a singular female perspective, but many subjective voices and perspectives of women (Kinser & Lewis, 2005; Reinharz, 1992). A feminist research perspective is based on the premise that all human beings have valid experiences that should be incorporated into our understanding of a situation (Reinharz). Kushner and Morrow (2003) suggest that using feminist theory integrates an analysis of social structures into the research and helps to explain human interactions with the social world because it takes a critical approach to understanding.

Feminist research is conducted for the purpose of exploring, understanding and voicing women's perspectives (Dankowski, 2000; Olesen, 1994), and thus it fits well with a grounded theory approach. Feminist research places an emphasis on the experiences of women, centering and highlighting women's diverse and varied circumstances, and the social and cultural norms and institutions that influence their lives (Currie & Wiesenberg, 2003; Kinser & Lewis, 2005; Olesen). It has also been described as research *for* women, as opposed to *on* or *about* women, that seeks to improve the

everyday lives of women through the use of the knowledge gained (Currie & Weisenberg; Dankowski).

Feminist researchers value respect and understanding, and feminist methodologies seek to demonstrate caring through the methodological processes used (Campbell & Wasco, 2000). One way that this is achieved is by establishing rapport and trust between the researcher and participant, and seeking to eliminate the hierarchical relationships of expert versus non-expert (Campbell & Wasco; Davies & Dodd, 2002; Fontana & Frey, 1994). Disclosure of personal experiences and sharing stories where appropriate is one way that feminist researchers, including myself, achieve this, however researchers must be careful to keep the focus on the lives and experiences of the participants (Campbell & Wasco).

Many feminist researchers use a variety of methods and do not limit themselves to a singular perspective or discipline to build knowledge (Reinharz, 1992). Feminist theory supports an interdisciplinary approach to knowledge construction. Carolyn Sherif, as cited by Reinharz, views interdisciplinary study as a solution to the compartmentalization of disciplines, and champions a holistic approach to research that recognizes the interconnectedness of disciplines and the complexity of experiences and behaviors. With this in mind, this study drew on multiple disciplines to inform and situate the analysis and findings, including health promotion, and urban and transportation planning.

The notion that gender is a socially constructed concept, as opposed to a biological truth as it has historically been believed, is also at the heart of feminist research (Kinser & Lewis, 2005). Gender is one of the basic ways that we classify and organize our world. Feminist researchers believe that gender differences are not based in

biological, anatomical differences, but are instead largely the result of socialization. They believe that at a young age we are taught to identify as a girl or as a boy, and the acceptable or desirable behaviors and qualities of our gender. Girls are socialized to be soft, nurturing, passive, cooperative, emotional and beautiful, while boys are socialized to be strong, tough, aggressive, powerful, self-reliant and rational. This socialization assertion is in contrast to the historical belief that these gender characteristics were based on the biological characteristics of men and women (i.e.: men typically have more physical strength and were therefore considered more powerful in other realms). Anatomical differences between men and women have historically fueled the belief that women are biologically inferior to men, a belief that goes as far back as Aristotle's theory of reproduction (Kinser & Lewis). This belief has negatively influenced and affected every aspect of society, including academia, science and research, and women's health (Kinser & Lewis). Feminist research seeks to counter the harmful effects of these historical, biological beliefs by building knowledge that acknowledges the social construction of gender.

This research project was informed by the feminist research philosophies described and sought to explore the subjective experiences of the female participants. One of the primary goals of this study was to voice midlife women's experiences and perceptions of active transportation. The study explored active transportation from the perspective of midlife women and attempted to understand the barriers and enablers as they do.

Strategy of inquiry: Grounded theory.

A grounded theory approach was applied to this research. Grounded theory is both a methodology (i.e.: a set of philosophical assumptions) and a method (i.e.: a set of procedures) (Strauss & Corbin, 1998). It is an inductive approach that begins with a systematic collection and analysis of data (Glaser, 1978; Milliken & Schreiber, 2001; Strauss & Corbin), and either aims to develop a rich conceptual analysis (Charmaz, 2004) or a “grand theory” of the issue being studied (Creswell & Brown as cited by Creswell, 2007). The knowledge generated by grounded theory is rooted in the data and the experiences of participants, and because of this it is thought to offer increased understanding of the topic and suggest meaningful action (Strauss & Corbin). Given the exploratory nature of this study and the limitations (including time and the number of participants), a rich conceptual analysis of the experiences of participants was sought rather than a “grand theory”.

Grounded theory is typically used to gain understanding about questions that relate to social processes, and to explain human behaviour in the context that it is performed (Charmaz, 2004; Creswell, 1998; Glaser, 1978; Wuest, 2007; Wuest, Merritt-Gray, Berman & Ford-Gilboe, 2002). Grounded theory is particularly suited to exploratory research where little is known about the specific topic of research because it is inductive and does not attempt to fit research findings to any preconceived theory. Since the topic of this study is the process of commuting and there is little to no existing research about midlife women’s experiences with active transportation, grounded theory was an appropriate method for this study.

Role of the Researcher

My role as a constructivist researcher was to understand the world through the eyes of the participants and interpret the meanings that they ascribe to it (Schwandt, 1994). To do this, it was important to acknowledge the biases and past experiences which may have shaped my interpretation of the data (Creswell, 2007; Lincoln & Guba, 1985). To do this I engaged in reflexive journaling, an analytic and personally reflective technique that helps develop an understanding of the assumptions, biases, and social constructions of the researcher, which can influence the interpretation of the data (Davies & Dodd, 2002; Schwandt). Reflexive journaling was used throughout the data collection process, including before and after the interviews, with two goals in mind: to record personal thoughts and give context for the interview. This included recording notes about my emotions, participant cues, and factors that may have affected the interaction. I attempted to clarify feelings and biases, record learning and surprises from the research, and identify areas of interest (Ahern, 1999).

About the researcher.

I am a Caucasian, female researcher in my late twenties with an undergraduate degree in Health Education. I enjoy being active, particularly outside. I have been a regular user of active transportation throughout my life, though at various times have been more inclined to drive than to use active modes. I have spent a number of years in Victoria, BC, Toronto, ON, and now Halifax, Nova Scotia. As such, I have an understanding of how different environments shape my personal transportation behaviours, and was keen to understand how they shaped the transportation behaviour of

others. My understanding and personal awareness likely helped me understand and be empathetic to the experiences of participants.

After using active transportation in Victoria, BC, a city with extensive active transportation infrastructure and a culture that supports it, I found it challenging to adapt to Halifax, NS, a city that appeared to me to be more oriented towards the vehicle. Being committed to an active lifestyle, and choosing not to drive, I found ways of overcoming the environmental challenges that exist in Halifax. I was very interested in understanding the barriers that other women of different ages experience and how, if at all, they overcome them.

Inclusion Criteria

As a population, midlife women are a diverse group with a wide range of experiences and many voices. To begin to understand the perceptions of these women a sample was selected based on specific inclusion criteria. Participants met inclusion criteria if they were women; were 40 to 54 inclusive; lived in Halifax, NS; were formally employed outside of the home at least 2 days per week; lived between 1 and 10 km of their place of work; and were healthy (defined as having no injury or chronic illness that would prevent them from engaging in active transportation on a long-term basis).

Age: 40 – 54 years of age.

Within the literature, midlife is considered anywhere between the ages of 35 years (where young adulthood ends) and 65 years (where retirement and older adulthood begins), depending on the parameters and specifications of the particular research study (Berg, et al., 2002; Chambers, 2000; Daviglus, et al., 2003; Kowal & Fortier, 2007;

Segar, et al., 2007). Precisely defining midlife is difficult due to the individual, gender, and social class variations in the timing of role transitions such as motherhood and retirement (Farrell & Rosenberg as cited by Moen & Wethington, 1999). This 30-year age range captures a number of life stages and often includes childrearing, supporting and caring for aging parents, becoming grandparents, and retiring, all of which can influence patterns of interaction with the built and social environments, and participation in active transportation. While age does not necessarily correspond with a specific life stage, there are likely to be more shared experiences among those within a smaller age bracket.

Defining midlife for study purposes is also challenging because of the ever-changing nature of 'midlife'. Midlife is a relatively recent cultural construction that emerged in the twentieth century when longevity increased and the number of births decreased (Moen & Wethington, 1999). These factors are particularly relevant to women given their longer lifespan and family roles and responsibilities (Moen & Wethington). Midlife experiences are also historically situated in the political, cultural norms of the time (Moen & Wethington); women entering midlife in the 1950s had very different experiences, expectations and resources than those entering midlife in the 2000s.

The primary focus of the current study was to examine the interaction of midlife women with the built and natural environments in conjunction with social roles and responsibilities. An attempt was made to seek a sample that was more likely to share the same life stage by limiting the age range to 15 years. The study focused on the middle segment of what the literature considers the midlife age group: women aged 40 – 54 years.

Employment status: Employed.

This study focused specifically on work-related commuting and examined the transportation habits of getting to and from work. As such, it was necessary for participants to be employed. A diverse sample that included different types of workers including professionals, skilled and unskilled workers was sought. Unfortunately, the sample obtained was not as diverse in this criterion as was desired, and most were office workers or professionals (type of work was not collected in the sociodemographic questionnaire, however, most interviews were held at participant workplaces making it possible to approximately determine what they do).

Place: Halifax, Nova Scotia (NS).

It was important to situate the study within a specific geographical area in order to develop a deep understanding of the interaction between the built, natural and social environments. The study targeted those who engaged in paid work outside of the home and lived within a reasonable distance of their workplace. There is very little literature regarding what is considered a ‘reasonable’ distance to travel via active transportation. Many studies refer to distance as being a factor in participation, but few have quantified what a walkable or cyclable distance is, likely because what is considered reasonable is very subjective. Some researchers have suggested that a distance of less than 10 km is a ‘reasonable’ distance to travel (Cook, 2003; Tolley, 1996). Others have suggested that a distance up to 5 km is a reasonable distance to travel via active transportation (Sisson & Tudor-Locke, 2008). In this debate, fitness level, health, and the mode of travel are likely important as 10 km may be reasonable for a cyclist, but unreasonable for a pedestrian. In

Halifax, the median commuting distance is 6.5 km, and 40.7% of workers in the city commute less than 5 km to work (Statistics Canada, 2008b), a distance considered ‘reasonable’ for active transportation by most researchers. Given this information, this study required participants to live between 1 km and 10 km of their place of work. This ensured that they had frequent and regular opportunity to engage in active transportation, and lived within a ‘reasonable’ walking or cycling distance.

Participants were also required to live on or around the Halifax Peninsula, defined as the areas shown on or slightly outside of the Halifax Regional Municipality Peninsula map (Appendix A). The Halifax Peninsula provided an ideal geographical boundary to contain the research area, one that was easily recognizable to potential participants and that provided well-known boundaries for recruitment purposes (i.e.: potential participants would be able to fairly easily assess whether or not they lived within the inclusion area). The Halifax Peninsula also has a good land-use mix, helping to ensure that participants could meet the criteria of living within 1 and 10 km of their place of work.

Participants.

The study sample included 12 participants (see Table 1 for detailed sociodemographic information). One participant was 56 years of age and the rest were between the ages of 40 and 54. The 56-year-old participant was included because the age range originally identified was meant as a guideline to set reasonable limits to participation so that the participant group was homogenous along some dimensions. Given that the older participant met all criteria except for being just slightly outside the age range it was determined that she would be a good candidate for the study.

All participants lived on or around the Halifax Peninsula, and were from a variety of neighbourhoods (see Appendix A for a map of the area). This provided a diversity of residents from all around the Halifax peninsula and surrounding areas, and offered insight into the city environment from a variety of locations and perspectives.

All participants also worked outside of their home within 10 km of their place of work. Ten out of the 12 participants had at least some post-secondary education and nine participants were professionals with household incomes at or above \$65,000 per annum. All participants had between 1 and 3 people living in their household. One participant was a single mother with a very young child, two participants were married with older teenage children, one was living with a partner and a young adult relative, one had a grown child, and the rest were single or living with partners only.

All but one participant uses active transportation at least occasionally, and four use it almost exclusively in conjunction with transit. This provided a population from which I could learn a great deal about the factors that make active transportation possible for midlife women.

Recruitment

Participants were recruited for this study using a purposeful sampling approach and posters. Purposeful sampling (selecting participants that meet a certain criteria) was used to recruit participants from which a great deal was learned about the issues being studied (Guest, Bunce & Johnson, 2006; Patton, 2002). Posters were also used. They were placed in workplaces on the Halifax Peninsula, particularly at universities, government offices, and places of business. Where possible, posters were also placed in

locations where midlife women tend to frequent, including cafes, restaurants, theatres, churches, recreation facilities and retail outlets. Great care was given to developing a poster that would be attractive and inviting to midlife women (see Appendix B). Six participants learned of the study through these posters, and the other 6 learned about it through key informants and snowball sampling. A \$10 honorarium was provided to participants at the start of each interview as a thank you for their time (Appendix C). It was not advertised that an honorarium would be provided.

People who were interested in participating contacted me by email or telephone and were screened prior to setting up an interview time to ensure that they met the inclusion criteria for participation (see Appendix D). Snowball sampling was also used to recruit participants. This was a process that involved asking recruited participants if they knew of other people who met the inclusion criteria who might be interested in participating (Patton, 2002). Key informants who may have had access to the population of interest were also used to recruit potential participants. This included individuals who worked in government offices and academic institutions, and those who were connected to church communities. Key informants were asked to provide potential participants with a copy of the recruitment poster (hardcopy or electronic version), tell them about the study and ask them to contact the primary investigator if they wanted more information or were interested in participating.

The initial study plan was to actively recruit six women who regularly engage in active transportation to get to and from work, and six who do not in order to compare the two groups. Recruitment efforts did not, however, specifically request participants to identify as drivers or as primary users of active transportation, it simply asked for women

who met the inclusion criteria. As data collection progressed it became clear that this dichotomous of classification or grouping of participants was far too simplistic. Initial interviews revealed that commuting behaviours are much more complex, and the mode of transportation chosen on a given day is influenced by a wide range of factors, making a 'usual' or 'regular' mode difficult to identify for many participants. This made the comparison between two groups as originally conceived difficult and irrelevant. Most participants used multiple forms of transportation on a regular basis, for example, driving a couple of times a week and using a combination of active transportation and transit the other days of the week.

The recruitment process took place over a 5-month time period, longer than anticipated, beginning in late October and finishing in late March.

Data Collection

This study used two complimentary forms of data collection: in-depth interviews and a modification of photovoice technique. In-depth interviewing involves meeting in a private space with participants and asking them to discuss their perceptions and experience of active transportation, in this case, using a semi-structured interview guide to keep the discussion on topic. Photovoice is a technique that encourages participants to document their experiences of their communities with photographs that express their everyday lives (Wang, 1999). Traditionally, photovoice techniques bring participants together to discuss their photos and engage in detailed analysis with fellow participants and the researcher over multiple sessions (Wang). Photovoice principles were applied in

this study, however, the method was modified and participants engaged in one-on-one analysis with the researcher in one interview session due to limitations of the study.

Procedure.

The study involved three parts (Figure 1). The first part consisted of an in-depth face-to-face semi-structured interview to discuss how participants typically commute to and from work, and took approximately 1 to 1.5 hours to complete. At the end of the first interview, participants were given a disposable camera (in many cases, participants used their own digital cameras), and instructions on the photovoice component of the study. Participants were given approximately two weeks to take photos, at the end of which time, cameras and photos were collected, and a second interview time was set up. The second interview took between 30-minutes and 1-hour to complete and was used to review, discuss and analyze the photographs that were taken.

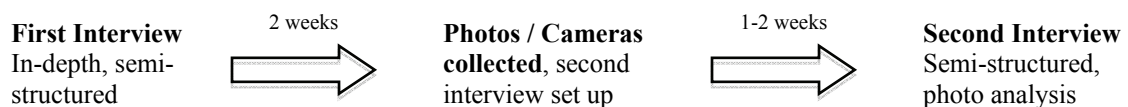


Figure 1. Data collection process

Face-to-face interviews.

In-depth interviewing is an “approach that seeks to create a listening space where meaning is constructed through an interexchange [and] cocreation of verbal viewpoints in the interest of scientific knowing” (Miller & Crabtree, 2004, p. 185). In-depth interviews emphasize “depth, detail, vividness, and nuance” (Rubin & Rubin, 1995, p. 76). Face-to-face interviews are a typical method of data collection in qualitative, grounded theory studies (Creswell, 1998). The purpose of interviewing is to identify and compare

participant understandings and experiences of the topic of study, in this case, physical and social enablers and barriers to active transportation.

The study engaged participants in two face-to-face interviews for data collection purposes. The interview guides (Appendix E & F) were pre-tested prior to data collection with two people from the population of interest who did not participate in the study due to their relationship with the researcher. The first interview was the primary interview where discussion focused on developing an understanding of the participant's perceptions of the physical and social barriers and enablers to active transportation in their lives. The interview started with a series of demographic questions that served a number of functions including establishing the interview style and providing context for data analysis (Miller & Crabtree, 2004). A short mapping exercise where participants were asked to identify key locations, including their place of work and residence, was also used at the start of the first interview. Visual aids have the potential to result in data that are difficult to achieve by verbal methods (Crilly, Blackwell & Carson, 2006). The purpose of the mapping exercise was to jog participants' memory about their commuting routes and routines, and encourage them to think about their physical and social environments. Participants were asked to identify key locations on the map including their workplace, home, and other locations that they frequently visit enroute to and from work. Participants were also asked how far or how long it took them to get to and from work using their primary mode(s) of transportation.

The remainder of the interview was comprised of a series of semi-structured questions that engaged the participant in the research topic and elicited an understanding of the enablers and barriers to active transportation from their perspective (Miller &

Crabtree, 2004; Rubin & Rubin, 1995). The interview process was aided by the use of prompts and probes which tried to maintain the flow of conversation and encourage participants to expand on relevant thoughts, feelings and comments (Miller & Crabtree, 2004). Interviews were audio-recorded with the permission of the participants, and notes taken during and after the interview were used to capture the non-verbal and emotional communications that occurred in the interview, such as body language and facial expressions (Mishler as cited by Miller & Crabtree).

Disposable cameras and photo logs (Appendix G) for the photovoice component of the study were distributed at the first interview. Participants were asked to take photographs of the aspects of their built, natural and social environments that act as barriers and enablers to participation in active transportation. A written copy of the photovoice instructions was also distributed to the participants (Appendix H). Photo logs, a spreadsheet style tool, were used to record information about the photos taken. The log was used to record the location of the photograph, a basic description for identification purposes, participant's relationship to individuals in the photograph (if applicable), and brief comments about why the photograph was taken. This log provided a point of reference for the second interview. Participants were also given the option to use their own digital camera once it was determined that the quality of the disposable cameras was poorer than desired, and after some participants communicated that using their own cameras was easier. Participants were given approximately two weeks to complete the photovoice project (though more time was provided if necessary). Participants were encouraged to take up to 12 photos and document as many of the influencers of their commuting choices as they felt were relevant. Disposable cameras, digital photos, and

photo logs were collected at the end of the two-week time frame. I developed the photos that were taken with disposable cameras.

The second interview was scheduled for approximately two weeks after the first interview. The purpose of the second interview was to allow participants to add new insights that may have arisen during the photovoice process, and to discuss the photos and photovoice experience. This interview was typically between 30-minutes and an hour in length, and was used to review and analyze the photos that were taken.

All interviews were conducted in private spaces where participants were comfortable and which were easily accessed by them. Such spaces included meeting rooms at Dalhousie University, participant workplaces, researcher workspaces, and in one case, a café with a private room.

Interviewing is a social interaction (Davies & Dodd, 2002) and in-depth interviews are “personal and intimate” (Miller & Crabtree, 2004, p. 189) experiences. The objective distance and lack of emotional interaction between researcher and participant that is championed in traditional scientific inquiry is frequently viewed as a barrier to feminist qualitative research. Rapport and trust were developed with participants through the process of sharing identities and developing understanding and empathy (Campbell & Wasco, 2000; Davies & Dodd; Fontana & Frey, 1994); I made every effort to be friendly, approachable and candid with my own experiences, and found that participants were also friendly, candid and open with their experiences. Most participants appeared comfortable in the interviews, demonstrated by their body language, tone of voice and willingness to respond thoughtfully to the questions. The data collected was rich in detail, likely due in part to the rapport and trust that was built.

Feminist researchers acknowledge the emotional aspect of research that examines lived experiences, and are attentive to their own feelings and the feelings of research participants (Campbell & Wasco, 2000). I was attentive to the verbal and non-verbal cues of the participants and was empathetic when participants were discussing sensitive or emotional experiences. The emotions of participants were captured through interview discussions and field notes, and I acknowledged my emotions through a reflexive journaling process. Emotions and thoughts that could have influenced the interview were included in data analysis.

My age and other personal characteristics may have presented some challenges to the interview process, although it does not appear that this had a significant effect, because of the richness of the data that were collected. My younger age may have caused some participants to question whether I could truly understand their experiences. I attempted to minimize this by sharing experiences of personal challenges with physical activity and other relevant experiences where appropriate, and by engaging in empathic listening to convey a sense of understanding and trust. Empathic listening involves being with and understanding the other by listening deeply to what they are saying and communicating that they have been heard through verbal and non-verbal communication (Egan, 2002; Knapp & Hall, 2002). It involves putting aside personal concerns and biases to be fully with participants and understand their struggles and experiences (Egan; Davies & Dodd, 2002).

Photovoice.

Modified photovoice techniques were used to develop a rich understanding of the lived experiences of the participants. Photovoice is a “powerful photographic technique that enables people to assess the strengths and concerns of their community and communicate their views” (Wang & Redwood-Jones, 2001, p. 560). It provides cameras to participants to enable them to document their experiences of their communities (PWHCE, 2009; Wang as cited by IVM, 2009). Photovoice, a technique developed by Wang and colleagues (Wang & Redwood-Jones), is based on theoretical perspectives that are directly in line with those of the study.

Photovoice is rooted in feminist theory (Wang, 1999) and aims to bring forward new or seldom-heard voices, ideas and perspectives to the public forum (Wang & Redwood-Jones, 2001). As a method, it recognizes the importance of women’s experiences (Wang) and “enables women to control the photographic process in order to express, reflect and communicate their everyday lives” (Wang, p. 186). Photovoice originates from a community-based photography perspective which encourages people to take photographs of their friends, family and social environments (Jo Spence as cited by Wang & Redwood-Jones). This study expanded upon Spence’s notion of community-based photography to include the natural and built environments along with the social environments.

Photovoice researchers also hold the belief that everyone is capable of critically examining their environment if given the proper tools (Wang & Redwood-Jones, 2001). Visual images are one such tool that enables critical examination and reflection of a person’s surroundings (Wang & Redwood-Jones). The camera serves as the tool that

enables women to tell “visual stories” (p. 48) about themselves, providing opportunities for expression using their own images and reflections (McIntyre, 2003). Photographs also provide immediate feedback for discussion, and provide an alternative mechanism for communicating experiences, making it possible to view the community in new ways (Wang & Redwood-Jones). Photographs also provide tangible, visual detail and communicate subtle realities of participant experiences that are not easily communicated in other forms (Prosser & Schwartz, 2004).

Photovoice techniques, which were designed as a participatory action research method (Baker & Wang, 2006), typically engage participants in the entire research process including study design, analysis, discussion and dissemination. When photovoice is utilized as originally designed, participants engage in focus-group-style discussions about their photographs, their community, and their experiences taking the photographs, and are often engaged in the analysis process at multiple points in the research process (McIntyre, 2003; Wang, 1999).

In my study, in-depth, one-on-one interviews were used as the primary method of data collection, and photovoice was used in conjunction with the in-depth interviews. As such, this study modified the photovoice approach as originally designed. Instead of engaging participants in the full research process from design to dissemination, participants were included in the initial analysis of the photos. Discussion and analysis took place one-on-one with the researcher in the second interview, instead of in a focus group. While this is a fairly significant departure from photovoice methodology as it was originally designed, my research utilized this methodology in the context of giving women a method through which they could explore and “assess the strengths and

concerns of their community and communicate their views” (Wang & Redwood-Jones, 2001, p. 560). I also utilized this methodology in the context of its feminist theoretical roots, recognizing the importance and value of women’s experiences (Wang, 1999), and allowing them to “reflect and communicate their everyday lives” (Wang, p. 186). Finally, this methodology was used to provide a tool and mechanism for telling “visual stories” (p. 48) and an alternative mechanism for communicating experiences (McIntyre, 2003).

Ethical Considerations

Approval for this study was given by the Dalhousie Health Sciences Research Ethics Board prior to participant recruitment and data collection.

Informed consent.

Participants were required to provide informed consent prior to their participation in the study as per the requirements of the Dalhousie Health Sciences Research Ethics Board (Appendix I & J). In accordance with the Tri-Council Policy Statement, informed consent was obtained using a written consent form that was signed by the participant. The consent form provided information to participants about the research study to be sure they understood the procedures and activities that they were getting involved in, and the potential risks and benefits of the research. The consent form also communicated to the participants their rights including the voluntary nature of their participation, their right to withdraw at any time, and their right to refuse to answer any questions. I distributed and explained the informed consent forms prior to the first interview and revisited informed consent with the participants at the start of the second interview. I also reminded participants of their rights throughout the interviews where appropriate.

It is important to protect the anonymity and confidentiality of participants. All personally identifying information, such as the names of participants, was removed from the data. Direct quotes and photographs used for reporting and dissemination have been accompanied by limited relevant sociodemographic information to provide contextual information for a more complete understanding.

Photovoice.

The use of photovoice techniques had additional ethical considerations. Wang and Redwood-Jones (2001) suggest that it is important to respect the privacy of others, and recommends adherence to privacy laws when using photography in research. Wang and Redwood-Jones (2001) also suggest the use of two additional types of written consent: The first to obtain consent from the subjects who might be recognizable in the photograph, and the second to get permission to use and publish the photos in relation to the research. This study utilized both of these types of consent. Participants were directed to ask for signatures of photo subjects on the photo log if there was a chance that they might be recognizable in the photo. Permission to use and publish the photos in relation to the research was also sought at the start of the second interview (see Appendix J).

Wang and Redwood-Jones (2001) also place a responsibility on the researcher to discuss power, ethics and safety in relation to the use of cameras with participants. They also warn researchers of the risk of influencing participants and data collection when providing instructions and direction, as the researcher might inadvertently create bias by making suggestions for types of things that could or should be photographed. To avoid this, the directions provided to participants in this study were as brief as possible,

examples were limited and participants were encouraged to determine what they thought was relevant and should be photographed (see Appendix E, Part C and Appendix H).

General ethical considerations.

In accordance with the Dalhousie Health Sciences Research Ethics Board, all audiotapes and transcripts are stored in a locked area, and computer files are password protected. Audiotapes will be kept for five years in Dr. Lois Jackson's office in a locked filing cabinet, after which time they will be destroyed.

Participants were given the opportunity to see the results of the study via an abbreviated electronic version of the research findings (see Appendix K).

Data Analysis

Data management.

I transcribed all audio-recorded interviews and imported them into Atlas TI, a qualitative data analysis software program. Atlas TI provides tools for managing large volumes of textual and graphical data allowing for the systematic analysis of a grounded theory approach. Atlas TI allowed me to identify, group, and better understand emergent themes and categories. The diagramming feature of Atlas TI was especially helpful in the mid-stages of analysis because it allowed me to understand relationships between codes. In addition to using Atlas TI, I also worked with the data by hand, using paper to arrange and rearrange codes. As themes emerged I worked with my supervisor to identify major themes and begin writing up the research results.

Analysis techniques.

Grounded theory includes a set of specific guidelines for conducting research originally outlined by Glaser and Strauss (1967), and further developed by Glaser (see Glaser, 1978), Strauss and Corbin (see Strauss & Corbin, 1998) and Charmaz (see Charmaz, 2004, 2006). This study primarily utilized the methods outlined by Strauss and Corbin, and Charmaz (2006). The data analysis process was integrated with data collection in an iterative, constant comparison process, as is characteristic of grounded theory studies (Charmaz, 2004; Strauss & Corbin). Studying the emerging data from the beginning increases awareness of the implicit meanings and assumptions of the participants (Charmaz, 2004). In this manner, I started the analysis/coding process after the first interviews were completed. I began the analysis process by transcribing the audio-recorded interviews to become familiar with the data. I read and re-read interview transcripts throughout the analysis process to ensure the developing categories were grounded in the data. This also ensured I stayed true to the data and captured participants' voices as accurately as possible. Once codes were developed, I went back to do more data collection with some ideas about what was happening, and probed new participants about the ideas, meanings, patterns and thematic categories that were discovered during initial analysis (Charmaz, 2004; Patton, 1990). Grounded theorists rely on knowledge from the "inside" to develop "progressively more abstract conceptual categories" (Charmaz, 2004, p. 497) to integrate and explain the data. Saturation is the point when no new categories, relationships or relevant themes emerge and when categories are fully developed and explained (Corbin & Strauss, 2008). The data were thoroughly analyzed to the point that no new categories or relationships emerged.

While the coding process outlined appears somewhat linear, it is not necessarily so and grounded theorists typically go back and forth between the coding steps throughout the research process (Strauss & Corbin, 1998), as I did. Field notes and memos were also used in conjunction with the coding process as is characteristic of grounded theory. Field notes are comments and observations about data collection including procedural directions and reminders, and memos are thoughts about data analysis (Glaser, 1978; Strauss & Corbin). I also used diagramming as part of the analysis process, which helped me develop an understanding of the relationships between codes and themes.

The photovoice component of the study was analyzed in collaboration with participants to identify meaning and themes. Photos were analyzed using visual analysis techniques, such as those suggested by Malcolm Collier (2001). Analysis of the photographs included: observing the data as a whole to form general impressions; developing themes and meaning with participants in an interview setting; engaging in comparative analysis of the photos taken by a participant; and examining the key features that appeared in photographs (Collier).

Quality and Rigor

The quality and rigor of qualitative research is judged by trustworthiness (Creswell, 2007; Guba & Lincoln, 1994). Trustworthiness is ensured and measured by credibility, transferability, dependability and confirmability (Lincoln & Guba, 1985). According to Lincoln and Guba, credible research accurately conveys the experiences and realities of the participants. There are a number of methods that contribute to the

credibility of a study, including triangulation, peer review, and using grounded theory methods, which offers an analytic procedure for theory development (Creswell, 2007; Lincoln & Guba). Triangulation refers to the use of multiple methods and data sources to study a situation, experience or phenomena (Creswell, 2007; Patton, 1990). Combining multiple data collection methods can help researchers get multiple perspectives on the same issue (Patton, 1990). This study used multiple methods (in-depth interviewing and photovoice) to collect data from multiple participants. Peer review of the research process is another way that credibility is ensured (Creswell, 2007; Lincoln & Guba). In this study, the thesis supervisor and committee regularly checked the research and data analysis process by asking questions about method, meaning and interpretations, thus contributing to the trustworthiness of the findings.

Transferability is another measure of trustworthiness, and refers to the ability of other researchers to determine whether or not findings can be applied to their research (Lincoln & Guba, 1985). Providing rich, thick description of the participant experiences and of the research process allows other researchers to determine if research findings are transferable to their populations (Creswell, 2007; Lincoln & Guba). I have tried to provide a rich, thick description of the research process and of participant experiences in order to ensure transferability and trustworthiness.

Dependability refers to the consistency of findings and the ability to replicate in similar conditions (Lincoln & Guba, 1985). Confirmability refers to the extent to which the findings are grounded in the data, and representative of participant experiences rather than researcher bias and interest (Lincoln & Guba). To ensure that findings are dependable and confirmable, qualitative researchers acknowledge the factors that may

have influenced the research, such as personal biases (Lincoln & Guba). I engaged in personal reflection throughout the research process to identify assumptions and biases that could influence data collection, analysis, and the presentation of findings. It is important to note that while acknowledging bias is necessary, it is considered a strength for constructivist, feminist researchers, because it can guide data collection and serve as a starting point for interpretation and analysis (Olesen, 1994; Reinharz, 1992).

Finally, the systematic approach to analysis and open and axial coding procedures of grounded theory ensured rigor in this study (Charmaz, 2004; Strauss & Corbin, 1998). These procedures are meant to get the researcher deeply acquainted with the data and sensitize them to the details within, helping to ensure that findings are grounded in the data (Charmaz, 2004; Strauss & Corbin). Grounded theory as an approach helps to structure and order the data collection and analysis processes, and provides “rigorous procedures for researchers to check, refine, and develop their ideas and intuitions about the data” (Charmaz, 2004, p. 497).

Dissemination of Results

Results are being disseminated through a number of channels including the thesis and thesis defense. I have presented preliminary findings at an international conference, a local research conference, and at the Health and Human Performance Graduate Seminar at Dalhousie University. I have presented findings to interested community groups and policymakers and will seek others. I will also pursue a publication in a relevant journal.

Chapter 4: Results

Commuting to and from work is an activity that many people engage in on a daily or regular basis. This chapter describes the results of in-depth interviews with 12 midlife women living in Halifax, NS. These women were asked to discuss the enablers and barriers to using AT to commute to and from work, and were specifically asked about the factors in their built, natural and social environments. All but one participant interviewed regularly engage in paid work outside of the home 5 days per week, and one woman works outside of the home at least 2 days per week, and often more. All participants live on or around the Halifax Peninsula. Those who do not live directly on the peninsula work there, and live within 10 km of their place of work. Eleven of the women live within 8 km of their place of work; one lives between 8 and 10 km of her workplace. The term ‘active transportation’ (AT) refers to any mode of self-propelled transportation, but participants in this study only discussed walking and cycling.

Eleven participants reported that they use multiple modes of transportation for commuting. They use different modes of transportation depending on a variety of circumstances, and switch between different types of AT, as well as public transit and driving. One participant exclusively drives to work, and another has used AT regularly in the past, but rarely did so for commuting purposes at the time of the interview. Four participants do not own vehicles. The women discussed many factors that affect their transportation choice for getting to and from work. The key factors can be broken down into four categories: the characteristics of the route and region, the presence or lack of social support, the perceived value and benefits of AT, and the ability to respond to barriers.

Table 1. Participant Demographics

	Typical Commuting Mode	Age	Education	# of people relying on income	# of children	Unconfirmed Marital Status	Self-described distance to work
Rhonda	driver, walker	50-54	Grad	1	0	single	5.11 km
Irene	cyclist, walker	45-49	Some Sec	1	0	single	6 km
Sandra	cyclist	40-44	Grad	2	1 grown	missing data	2.4 km
Maria	cyclist, walker	50-54	Grad	1	0	single	Approx. 4.5 km
Laura	walker	45-49	Some Post-Sec	3	1, older teen	married	7.25 km
Daphne	driver, walker, transit	40-44	Grad	2	1, young	single	Approx. 7 km
Linda	driver	50-54	Sec	3	1, older teen	married	Approx. 7 km
Carol	driver, walker	40-44	Post-Sec	1	0	single	Approx. 1 km
Susan	cyclist, walker	50-54	Grad	2	0	partnered	Approx. 2 km
Lisa	driver, walker, transit	50-54	Grad	2	0	partnered	“not far” (approx. 2 km)
Jill	walker, driver, transit	56	Some Post-Sec + PS	3	0	partnered	1 hr 10 min to walk (approx. 5 km)
Amy	walker, transit	50-54	Grad	2	0	partnered	Between 8 & 10 km

Some Sec = Some Secondary Education
 Sec = Completed Secondary School
 Some Post-Sec = Some Post-Secondary
 Post-Sec = Completed Post-Secondary Degree
 PS = Professional School
 Grad = Graduate Degree

Table 2. Results Summary

Factors Affecting the Use of AT	Example(s)
Characteristics of the Route & Region	
Safety Lack of space and proximity to traffic Condition of the infrastructure Behaviour of others	<i>Lack of bike lanes and trails Potholes, crumbling road shoulders Violence against women; negligent drivers</i>
Aesthetics	<i>Interesting infrastructure, nature</i>
Geographic Characteristics Weather Hills	<i>Snow and rain versus warm, sunny weather Especially challenging at the end of the day; help to meet fitness goals</i>
The Presence or Lack of Support	
Friends and Family Children & household responsibilities	<i>Encouragement, role models Putting children and family first</i>
Workplace Workplace culture Facilities available at work	<i>Workload demands; schedule flexibility Availability of secure storage</i>
Community	<i>Car culture</i>
The Perceived Value and Benefits of AT	
Improving health	<i>Physical activity, stress relief</i>
Interacting with the community and environment	<i>Camaraderie; feeling connected</i>
Protecting the natural environment	<i>Self-propelled versus fossil fuels</i>
Saving money	<i>Vehicle operation versus cost of equipment</i>
Saving time	<i>“Killing two birds with one stone”</i>
Cultivating joy	<i>Enjoying the experience</i>
Responding to Barriers: Strategizing, Planning, Preparing & Acting	
Planning and adjusting the route	<i>Taking less busy or more aesthetically pleasing routes</i>
Being alert and defensive	<i>Being aware of potential threats</i>
Changing modes and gearing down in bad weather	<i>Cycling to walking; walking to transit or driving</i>
Using gear, clothing and equipment	<i>Technical clothing</i>
Building and using personal resources	<i>Skill and fitness development throughout the lifespan</i>
The work of AT and time management	<i>Scheduling time to prepare for AT</i>

The Characteristics of the Route & Region (The Built & Natural Environments)

Participants discussed how the characteristics of their route(s) and region influence their decisions to walk or cycle to work. Three key factors emerged as being particularly relevant for them: the perceived safety of the route, the aesthetic qualities, and the geographic characteristics.

Safety.

Safety was a topic that was discussed extensively in the interviews, and everyone considered the perceived lack of safety to be a major deterrent to their use of AT. Safe AT routes were typically described as those that have dedicated space for walkers and cyclists away from traffic (particularly fast-moving traffic), that are well-maintained and do not contain hazards, and that minimize the threat and likelihood of being harmed by others.

Lack of space and proximity to traffic.

One of the most frequently discussed barriers or deterrents to the use of AT was the lack of dedicated or distinct spaces for cyclists. Participants indicated that they feel at risk of getting hit by a vehicle, which they dislike. The women who use AT reported that they feel quite vulnerable when they are on routes that bring them in close proximity to traffic. “I don’t find Halifax motorists terribly bike-friendly. I guess I’m just scared. Maybe it’s just a bit of a fear I have and discomfort so close to traffic, or in traffic.” (Amy¹). Maria, a regular walker and cyclist, considers the high-traffic sections of her route to be the most problematic. “There’s nothing between the sidewalk and the road

¹ Participant names have been changed to protect their identity.

and all that traffic...the main problem with my commute is that [busy] stretch...people just hightail it through there like crazy. It's dangerous." Laura, a regular walker, feels "safer on the sidewalk" as a pedestrian than as a cyclist on the road. She has observed the ways that motorists respond to cyclists and finds that motorists do not give cyclists enough space when passing.

Linda is the only participant who never uses AT to commute to and from work, and one of the major reasons she does not is because she perceives the risk of cycling between her home and workplace to be too great.

[A friend] used to bike to work...and that's something that even if everybody here [at work] did it I would never do. I don't like [it], I wouldn't bicycle in the city, in traffic. I just wouldn't feel comfortable. It would just scare me...just the traffic and being, you know, feeling really vulnerable. (Linda)

Being in close proximity to traffic is also considered unsafe and unpleasant because of the exposure to vehicle exhaust and harmful pollutants (see Figure 1). Sandra, a regular cyclist who is motivated in part by the cardiovascular health benefits of AT, described the paradox of cycling in traffic: "When you're suckin' in air going up [street] because it's a big hill and all these cars are driving past you, you're actually, from a health context, maybe doing more damage to your lungs."



Figure 2. Traffic and vehicle exhaust during the morning commute².

Halifax does have some spaces along major routes that are dedicated to cycling, but most are considered to be inadequate by participants because they do not offer any protection from traffic. Susan, an occasional cyclist, described a bike lane along a major street on her route where cars frequently move in and out of the bike lane, making her feel vulnerable.

It's terrible on a bike, even though there is a bike lane. But that bike lane is very unsafe and people park in it all the time...they're making deliveries, they're picking somebody up. So you are forced out into traffic all the time. It might as well not be there. (Susan)

Condition of the infrastructure.

Another safety concern for many participants is the condition of the infrastructure. Cracked, uneven and potholed pavement is considered particularly hazardous, and is an important consideration for participants when they make their commuting choices, especially when contemplating cycling. Rhonda, who has in the past cycled to work but

² All photos presented in this chapter were taken by participants.

no longer does so very often, talked about the condition of the road along her route and noted that the “road is considerably less than ideal for biking.” (See Figure 3).



Figure 3. Cracked pavement on the shoulder of the road.

Storm grates can also be very hazardous for cyclists. Many storm grates in Halifax are orientated in such a way that it is possible for a bicycle tire to get caught, and some are so deeply recessed in the pavement that they pose the same risk as a large pothole. “Some of those grates. If you have a narrow tube, narrow tire...it can go right down in them.” (Irene) (see Figure 4).



Figure 4. Tire getting caught in a storm grate.

Behaviour of others.

Another important safety consideration for participants when making transportation decisions is the potential for exposure to the troublesome behaviours of others. There are two types of behaviour that participants are particularly concerned about and feel especially vulnerable to when commuting: the negligence of drivers and physical assault.

Feeling vulnerable to negligent drivers affects both cyclists and pedestrians. Since Maria uses both modes to get to and from work, she experiences this vulnerability from both perspectives and is frustrated by it. There have been many times when she has felt that the ignorance and disrespect of drivers has put her safety at risk.

There are a lot of aggressive drivers, for the cyclists...They don't like to leave the shoulder space, and don't look when they're turning left and right and stuff like that...Even at the crossing structure...with the lights and the flashing...you should never go across that until everything's stopped because there have been situations where it's stopped on one side so you think 'okay, I'll get started crossing 'cuz the traffic in that direction is stopped', and you get out there and the other cars are still whizzing

through as if nothing's happening! And you're there waving your arm, like, 'stop!', and glaring at them. So it's, problematic. (Maria)

Laura, who walks to work regularly, is frustrated by inattentive drivers, particularly those who, despite the provincial law against such activities, talk on handheld cell phones while driving, putting her and others at risk. "People that don't stop for pedestrians, and people that are still on their cell phones, really aggravate me." (Laura). Laura had an upsetting experience when she was crossing at a crosswalk: a driver who was talking on a cell phone skidded to a stop less than a foot from her.

The risk of violence and assault is another safety consideration that many women discussed. Though it was not often explicitly referred to, assault was frequently alluded to in the interviews as a factor in commuting mode choice, particularly when part of the commute would be made in the dark (see Figure 5). Daphne noted that for the most part, her route feels very safe, though she discussed using "common sense" if she is traveling home late at night, and occasionally changes her mode, from walking to taking the bus, as a safety precaution. "You have to use common sense, [in] downtown Dartmouth at night. If it was late at night, I might take the bus and not walk." Lisa, who lives in a neighbourhood that she considers safe, has to pass through areas that are less safe to get to and from work. Her route takes her through sections that are frequented by individuals who work in the sex industry and their customers, and she has had some negative interactions with men that make her feel unsafe. She is also concerned about the risk of violence from drug users who are also known to inhabit sections of her route.

At it's darkest moment, walking alone, I didn't feel comfortable...There's sex workers that will work around there. They're not usually there in the morning, but I have had men, even in broad daylight...try to approach me, because I'm a woman walking down the street...that was a while ago but it's still at the back of my mind. And at night, or if it's still dark in the

morning. [I'm worried about] personal safety...it could be anything, any kind of violence. There's the whole drug scene. And sometimes that's spontaneous, it's not that they know you...And if I look like I might have something...I'm afraid somebody might want whatever it is, in desperation. (Lisa)



Figure 5. Walking home in the dark.

Carol noted that the first few times she walked home from work late at night she was very leery, although it is less of a concern now that she has done it safely a number of times. “At first I was a little leery about walking home at that time of night [between 12 and 2 am], but I’m okay with it now...I know what to expect on my streets.” Rhonda has also walked home at night without incident many times, which has led her to the conclusion that walking at night is not an especially risky activity.

I would probably do it [walk home at night]. And I know lots of women wouldn't, but, partly the routes I'm goin' on are relatively safe, you know, brightly lit, heavily traveled routes. And partly because I've always tended to have the view that if the patriarchy's going to keep me indoors they've won...I'm just not willing to forgo evening walks...after years and years of going out for long walks in the evening by myself, I hardly ever see another human being, much less a bad guy. (Rhonda)

Aesthetics.

While safety is a major barrier to the use of AT for commuting, an aesthetically pleasing route facilitates it. Participants consider aesthetics when deciding what mode of transportation to use; an aesthetically pleasing route can be a significant source of joy and motivation to use AT. When routes are scenic and beautiful participants are more likely to consider and use AT because it is more likely to be a pleasant experience. Nature is very aesthetically pleasing and participants consider natural elements such as gardens, trees, parks and ocean views to be very positive characteristics of their commuting routes (see Figure 6 and Figure 7). As Rhonda put it, “I love my walk. It’s a treat...nice scenery.” Gardens are a particularly pleasing route feature for participants as many of them have an interest in gardening and enjoy the opportunity to look at what other’s have done.



Figure 6. Green space with path.



Figure 7. Natural scenery ('sea smoke') adding to the aesthetic quality of the route.



Figure 8. Interesting architecture, a bridge between Halifax and Dartmouth, NS.

Natural features are not the only characteristics that participants consider to be aesthetically pleasing. Interesting and beautiful architecture is also considered to be a positive feature of participant commuting routes (see Figure 8). Halifax is one of the oldest cities in Canada and so has a number of beautiful old heritage properties that participants appreciate when walking. Susan considers the first part of her commute to be “lovely because those are all historic, heritage buildings”. Laura also appreciates the interesting architecture, “I love looking at old architecture, and there is a ton of beautiful old homes down in this part of town, it’s gorgeous.”

Geographic characteristics.

The geographic characteristics of the region, including vegetation, weather and hills, also have an important impact on whether or not participants choose to use AT to commute to and from work. The presence of natural elements such as greenery is one example of how the geography can facilitate AT through aesthetic quality. The weather and presence of hills can also influence the mode of transportation that participants choose.

Weather.

Weather can make commuting more or less pleasant, and in this way act as a barrier or facilitator of AT. ‘Good’ weather is a strong motivating factor for walking and cycling to work. Participants enjoy nice weather and appear to be much more likely to consider and use AT when the weather is good. When Daphne compares using AT in the winter to using it in the summer, she has no question as to what time of year it is easier and more enjoyable: “Summertime is the easiest. No question.” Linda, a driver who has never walked to work, mused about walking to and from work and only considered it a possibility in the warmer months:

I really enjoy walking...maybe if I tried [actively commuting] once, like in the summer – I wouldn't want to do it in the winter because, if it's not going to be pleasant, I'd rather not do it – but in the summer or the fall or the spring, I think would be [okay]...I wouldn't be totally opposed to trying it and seeing how it [is]...I might. (Linda)

In general, ‘bad’ weather, which is characterized by heavy precipitation, strong winds or cold temperatures, negatively impacts the use of AT in part because it affects physical comfort. “When it’s cold and windy or stormy and stuff like that...[it’s] miserable.” (Maria). Heavy rain also regularly deters participants from using AT to

commute to and from work. As Daphne put it, “[A] piss pouring rain day, yeah, it’s just not worth it.” Jill, who commutes across one of the bridges between Halifax and Dartmouth and walks even when the wind is “screaming”, draws the line at heavy rain in the morning, often choosing to take transit instead because she finds it so uncomfortable and unpleasant to walk in.

Bad weather also influences the perceived safety of AT, and the time and effort required to use it. AT is considered less safe in poor weather, especially when snow and ice decrease visibility and make surface conditions treacherous. Amy walks less when it is snowy, “when it’s slippery or freezing ice conditions, then I probably won’t walk as much.” Almost all participants described how poorly cleared sidewalks and cycling routes can be a barrier (see Figure 9). In Halifax, residents are responsible for clearing the sidewalk in front of their property. This often means that sidewalks are inconsistently cleared. Laura described her walking commute through Halifax as “very frustrating after a snowfall when people don’t clear their sidewalks.” When sidewalks and roadways are not well cleared, the amount of time that it takes to actively commute increases. When sidewalks are poorly cleared it can take Maria an extra 20-minutes. “It’s about a 45- to 50-minute walk depending on how clear the sidewalk is. And there have been times that it’s taken me *more* than an hour, when the sidewalks have been particularly bad...it’s a fair time commitment.”



Figure 9. Partially cleared sidewalk (clearing ends at the property line) making AT challenging.

Hills.

The presence of hills is viewed by many participants as being a negative characteristic of their route and a barrier to the use of AT. Lisa put it this way, “If I can avoid the crest of a hill, I will try.” Rhonda’s route to and from work has a very large hill, which deters her from walking and cycling. Amy chooses to walk instead of cycle because of the hills. “Halifax is hilly...if I have to go all that way and it’s so many hills, I’d rather just walk.” For many, hills are more of a deterrent to AT at the end of the day.

In contrast to some of the participants who perceive hills as a barrier, Sandra thinks hills are a positive aspect of her commute because they help her meet her physical activity goals. Maria also enjoys the cardiovascular health and fitness benefits that the hills along her commuting route provide; she likes the challenge and the variety that they add. “You go up and down and your heart rate goes up and down and you get the good work on your legs...so I like that. And I don’t mind the work.” Many participants find

hills to be physically demanding, but they noted that if they are using AT regularly, the perceived challenge decreases as their fitness improves, decreasing the negative impact of hills.

The Presence or Lack of Support (The Social Environment)

The presence or lack of support for AT also affects the use of AT for commuting to and from work. Support for AT can come from family and friends, the workplace and the community, and is delivered in different forms including verbal messages, role modeling and norms. Support in the form of explicit, verbal messages most frequently comes from family and friends. Support for AT is also communicated through social environments that support and encourage the use of AT. These environments include role models who use AT, and workplaces with flexible hours and manageable workloads. Yet another way that support for AT is communicated is through the built environment, and the provision of physical structures that enable participants to use AT such as changing, showering and equipment storage facilities in the workplace, and bicycle infrastructure in the community. Positive verbal messages, supportive environments and supportive infrastructure facilitate the use of AT. A lack of these elements, or the presence of negative attitudes are a barrier to the use of AT.

Family and friends.

Many participants find that their families and friends generally encourage and support their use of AT. This is often, as Laura notes, because family and friends know how important it is to participants. Laura's daughter understands her need to use AT, "she understands that I feel better...that I need to walk...It's something that has become part

of me so I think everyone's very accepting of it." Jill's partner facilitates her use of AT by encouraging her when she is unmotivated or putting other things like work ahead of her health and wellness. Friends and family members can also provide support for AT by setting an example and sharing experiences, tips and tricks. Daphne looks to her friends for an example when AT seems particularly challenging, because they are regular users of AT (and in fact, do not own a vehicle) and have young children.

They're like our idol. They don't own a car and they walk and bus and bike full-time. So...when times were a little rough for me, I kept thinking 'if they can do it, I can do it too'...and we've had discussions on, 'okay, what do you do, what route do you take?' It's very helpful. (Daphne)

Unfortunately, friends and family are not always enthusiastic and encouraging of participants use of AT. The discouragement from Laura's family is one of the reasons why she does not cycle to work even though she thinks it might be a quicker alternative to walking. "[Husband] and [daughter] keep [saying] 'no, mom, it's too dangerous, you stay on the sidewalk where you are'." However, for others, a lack of support does not deter them. Sandra, a regular cyclist, does not let people's negative comments bother or deter her. Maria's partner claims to be supportive of her active lifestyle and use of AT, but she senses he does not fully support it because of other comments he makes; she continues to use AT regularly despite this.

My partner feels a little, he claims to be supportive but he also says lots of things about how I've got time for all that stuff but not for him, you know, so like that, so there's a bit of, um, underlying resentment or something about the time that that takes away from the time that I spend with him. (Maria)

Children and household responsibilities.

Childrearing and household responsibilities can be a barrier to the use of AT for commuting to and from work. Only one participant has a young child and two participants have adolescent children. The ways in which children affect the commuting modes of participants differs depending on the age of the children. Regardless of age however, the needs of the children and family are always a top priority, and attending to them can use up the time that is needed to prepare for and engage in AT. Coordinating children, particularly young children, and getting them ready can be challenging and time consuming, and sometimes the easiest thing to do is stick with what many consider to be the simplest commuting mode: driving. As Daphne described:

Put kids into a mix and you put two or one adult trying to get out the door and everybody's freakin' out because they're late. It just doesn't lend for trying to take a new way of trying to do things. It's just like, get the car turned on and get out. (Daphne)

On the other hand, Laura's daughter, who is much older, encourages Laura's use of AT so that she can drive to school. "If I didn't walk, she wouldn't have the privilege of driving it [the car] to school every day. So, yeah, I'd say it's probably the biggest factor [encouraging me to walk]."

Protecting their children from harm is another top priority for participants, and this can also influence commuting modes. Linda worries about her adolescent daughter's safety at night and so often drives her to her extracurricular activities; she does not have enough time to get from work to home in time to get her daughter to class if she does not drive to work. Linda also drives because she is primarily responsible for managing household chores and feels pressure to get home quickly to take care of her household

responsibilities. “I like getting home early, because I look after meals and stuff like that, and anything that has to be done around the house, usually I do.”

Workplace.

The workplace can be a source of great support facilitating the use of AT, or it can be a deterrent and barrier when no support exists. The type of work and workplace culture, including work demands, whether or not colleagues use AT, and the types of facilities available, can either facilitate AT or make it incredibly challenging.

Workplace culture.

Workplace culture refers to the attitudes, norms, expectations and values of a place of work. Participants discussed workplaces that make active commuting easier or more difficult. Workplaces that require participants to travel frequently and that have large work demands put pressure on participant’s time, increase fatigue, and are a barrier to the use of AT. Workplaces that have slightly flexible work schedules and allow participants to have more control over their time facilitate the use of AT. Colleagues that use AT set a good example for participants and facilitate the use of AT by making it part of the norm and creating a support network. Linda, who never uses AT, recalled a time when a colleague who walked caused her to consider walking to work.

I’ve very briefly thought about it. Like it might not be that bad. Because [colleague] ...he lived not too far from me...and he walks to work every day...I think it took him about an hour every day. So I sort of thought about it very fleetingly, thought, ‘that would be a good thing to do’, but I’ve never actually seriously considered it or tried it. (Linda)

Not having the pressure of a strict work schedule gives participants the freedom to overcome some of the barriers to AT. Control and flexibility with work schedules gives

participants the ability to handle unexpected factors associated with active commuting, such as having to unexpectedly slow down for safety reasons when the weather is bad, or having to make adjustments to accommodate family needs. Daphne, who has a young child, feels very fortunate to work for an employer who is flexible because it allows her to put her child's needs first and means she does not have to sacrifice her active commute. "There's certainly an environment of flexibility and family-first, and those kinds of things...I'm very lucky to work in an environment that's not a check-in, punch-in, kind of thing or I'd be doomed...I don't have that strain on me."

Carol, who is a small business owner, does not have to worry about getting to work at a certain time, however she used to have frequent offsite meetings with clients that were located all over the city, which regularly prevented her from using AT to get to and from work. She recently decided to make some adjustments to the way her business operated so that she could commute actively on a more regular basis, but knew her clients would need to support those changes if it was to work. She is grateful to have clients who have allowed her to change her work practices so that she does not need to drive to visit them as often. Many participants are required to travel for work and this can be a barrier to the use of AT for commuting purposes. On the days when it is necessary to travel to offsite meetings, most participants drive and do not use AT. "Most of the winter this year we've driven more than we've walked... I think I've had more outside the office meetings." (Jill).

Workload norms and expectations can also facilitate or be a barrier to AT. When participants feel they can leave their workplace at a reasonable time of day and can accomplish their work tasks within the regular workday, they seem more likely to

consider and use AT. Amy, a regular active commuter, works in a job where she rarely feels pressure to take work home and stay late, facilitating her use AT. Laura's job also rarely requires her to stay late: "[Work is] pretty much self contained. At 4:30 I tend to put my sneakers on and head out." Those with large workloads who feel pressure to devote a great deal of their time to their career can find it challenging to use AT.

As director it was really, quite a commitment to walk or to cycle... I would end up being in my office 'till 7, 8, 9, 11, sometimes 2 in the morning, and then being faced with walking or cycling home. (Maria)

One method that many participants use to manage large workloads is to bring work home at the end of the day. The number of items that participants have to carry back and forth, such as computers, work paraphernalia, clothing and gear, can be a deterrent to the use of AT.

Highly demanding workplaces can contribute to fatigue, which can also make AT more difficult. When participants are fatigued, getting out of bed so there is enough time to use active modes of transportation can be challenging and a barrier to AT. Some participants find it difficult to get up early enough to use AT and get to work on time, especially when there is an option to use a vehicle or take a bus to work. Lisa explained why she has not walked as often as she used to: "I'm not getting up early enough to walk...it's easier to just get the bus." Some participants however, are so committed to AT that they are willing to sacrifice sleep for it. Maria, an avid user of AT, forwent sleep to make time for the things she wanted to accomplish, including AT, during a particularly busy time at work.

I was probably constantly in a semi-sleep-deprived situation...my sleep was shortened by at least 2 hours a night... It seemed like I was just...constantly running, changing clothes, gathering stuff together,

packing it up, getting there, getting the bike unlocked, find a place to park the bike...I was tired and running all the time. (Maria)

When participants have worked long days to manage work demands, the prospect of an active commute at the end of the day can be daunting because of fatigue and hunger. Fatigue can also be a problem on the commute home because participants are less alert, and therefore less able to respond quickly to traffic and safety hazards. “At the end of the day, there’s a bit of a feeling that you’re slightly impaired because you’re tired, and everyone else is slightly impaired, and so there can be little jolts of [gasp].” (Rhonda).

Facilities available at work.

The presence of AT supportive facilities at a workplace such as secure storage areas, and places to get changed and groomed, can also have a large impact on the mode of transportation chosen for commuting to work. The ability to keep gear and extra clothing safely stored at work is an important facilitator of AT because it eliminates unprofessional office clutter and relieves the stress of worrying about whether equipment will get stolen or damaged. Maria uses a coat rack to hang her commuting gear on because her office does not have a closet, and she worries that the smell of her sweaty equipment is unpleasant for the people who enter her office. “You don’t want to leave it bundled up in your bag or something ‘cause it gets all musty...[but] you wonder what’s it like with people coming into your office, can they smell it or not?” (Maria). Irene’s workplace provides her with secure equipment storage indirectly: by not reprimanding her when she breaks facility policy and stores her bike inside the building. This frees her from the worry that her bike and equipment might get damaged and stolen. Laura walks instead of cycles in part because her workplace does not have easily accessible storage

facilities and she does not know what she would do with her bike and equipment if she cycled. She finds it easier to manage her minimal walking gear.

[Cycling] would be half the time I would think...but then where would I store the bike during work hours? Would I be able to bring it into the building? What would I do? Would I lock it up outside?... [Walking is] easier, my feet are attached to my body. I can tuck my sneakers under my desk. (Laura)

For those who work in an environment where it is necessary to present a more professional and polished appearance, access to facilities where they can clean up after a vigorous commute and change into work-appropriate clothing is important if AT is to be considered.

As director, [I] felt I should and did dress differently than just a regular employee...they would have the expectation I would think that we would be in business attire...so I would just have to make sure that I had brought it with me or already had it here. Certainly I couldn't wear it and walk to [work] or cycle. (Maria)

Maria's workplace does not have facilities specifically for changing so she improvises and changes in the handicap washroom. Daphne feels fortunate to have shower and changing facilities at her workplace where she can get cleaned up if necessary, "we're very lucky in this department in the sense that we have access to a shower, changing area." Irene also has access to shower and storage facilities which facilitates her use of AT.

The availability of cheap, easily accessible parking close to work also influences many participants' decisions to use or not use AT. Not having easy and affordable access to parking at work increases the motivation to use AT for many. Maria uses AT in part to avoid the hassle of finding parking at work, and a lack of adequate parking is what initially prompted Laura to start using AT.

Probably for the first year I was bringing the car. And then I just said, you know, this is ridiculous because parking down here is insane...it was only a temporary contract...so I wasn't going to invest in a parking pass at that point and then I thought, 'okay, I'm driving, I'm parking in my [relative's] driveway...and I'm walking from there, so why don't I just walk?' And that's how I got to that point. Probably a year of that and then I thought well this is ridiculous, why don't I just walk. (Laura)

If parking is reliably easy to find, cheap and close to work, it is easier for people to use their car. Linda, who never uses AT, has access to this type of parking.

Community.

Participants consider Halifax to be a car-oriented city and reported that the cultural orientation to the car can be a barrier to AT, making it challenging, unpleasant and unsafe. Maria, a regular cyclist, describes the city in this way: "It's not well set-up, generally speaking, in Halifax...for cycling." Other participants feel similarly. As Daphne noted, "Halifax hasn't reached a point yet, of that mentality yet, of understanding bikes. I mean, we've got some bike lanes going which is great, but there's still very much [a] cars rule the roads [attitude]". Susan agreed, "there's no encouragement of, there's no culture of [cycling]...it's barely visible, it's barely tolerated, there's no sense that there's any major effort underway to change it in any significant way."

While participants consider Halifax to be a car-oriented city, Irene is hopeful that it is changing and becoming more AT-friendly, because she sees slow change taking place in the form of infrastructure improvements.

I do find HRM is getting more friendly around, and more open to the whole active way of transportation and commuting. More so than it was ten years ago, for sure. You actually have money that's being invested in that, it's actually a topic that comes up at council meetings now. The bridge with that bike path that's on that, I mean, that was a fight that started way back in the seventies, it took more than 20 years for it to

finally come to life. I know a lot of people don't realize that, they just think, 'oh! Isn't that great! We have this bicycle lane on the bridge.' That was a lot of advocacy. (Irene)

The Perceived Value and Benefits of AT

Participants noted many benefits of using AT, which motivate them and facilitate its use, including: improving health, interacting with the community and natural environment, protecting the natural environment, saving money and time, and cultivating joy. The value that participants place on these perceived benefits seems to be especially important in facilitating the use of AT. The more valuable and important the benefit, and the ease with which that benefit can be gained using AT, the more willing participants are to attempt to overcome the barriers to AT. Participants do not necessarily consider all benefits each time they assess whether or not they will use AT, but they are considered frequently.

Improving health.

Improving health was one of the most frequently discussed benefits of AT. With the exception of safety risks, participants consider AT to be a healthy activity, especially when compared to commuting in a vehicle. Physical activity is the biggest health benefit associated with AT. Laura is highly motivated to walk to work because of the opportunity it gives her to exercise. Many participants consider the opportunity to get physical activity while accomplishing something else they need to do (commute to work) to be a hugely beneficial aspect of AT. As Lisa noted, "I enjoy walking just to walk, but for some reason I like it better that I have a destination." Jill is also motivated to use AT because it allows her to get exercise "naturally". "I really prefer to get my exercise in

some sort of natural kind of [way], when I'm also doing something else, or when it's...sort of combined, it's purposeful." Daphne is also "a big believer in killing two birds with one stone" which motivates and facilitates her use of AT to get to and from work.

Participants also consider stress-relief and mental renewal to be a health benefit of using AT. "I sit and think in silence most of the time, so to walk or cycle is very good to just shake that out. I wouldn't get that positive change on the bus." (Susan). Using AT enables participants to work through and release the stress of the workday (provided their route is safe and does not cause stress). Jill explained how AT benefits her mental health by allowing her to prepare for the workday in the morning and transition out of work at the end of the day:

I just feel better...There's a lot of benefit to my mind. On the way to work I can think about planning the day out and on the way home I can sort of let it go, dump it in the harbour, or whatever. So there are all kinds of emotional, psychological, physical, spiritual benefits...when I'm walking, by the time I get to work I'm definitely more psychologically prepared...And certainly coming home it's kind of like a debrief, or a way to let go of the day, almost like a meditation sort of, before I get home. And I think I'm much more, I'm present much more quickly than if I'm just driving back and forth. (Jill)

Interacting with the community and nature (or, the social and natural environments).

Another frequently discussed benefit is the increased opportunity for interaction with the community and natural environment. Participants described feeling much more connected when they use AT compared to when they drive. As Irene noted, "in a car, you're in your own little bubble. When you're on the bike...I'm part of the community

and part of the environment, and part of what's around me as opposed to just passing through it." When Jill actively commutes she feels connected to the people in her community, which encourages her to use AT when she feels daunted by it. "There's also a whole culture of people who walk the bridge on a regular basis...there's a bit of a camaraderie, and a 'hey, way to go, I'm on the bridge today too'." The opportunity to interact with the natural environment also brings a great deal of enjoyment to participants which was described in the aesthetics section of this chapter. As Laura aptly summarizes, "oh gosh, I love the spring when the flowers start to bloom!" Maria also spoke about the joy of connecting with her environment:

The joy of experiencing the world and the landscape and other people on a human scale...you get this interaction with people on a human, one-to-one relationship that you don't get in a car...on the bicycle...you feel the air on your face, you feel the sun...you see the grass, you see the plants, you hear the birds, you know, you're right there out in it. It's like you're part of the world, it's so immediate, and I just love it, I just love it. I just feel so much more alive. (Maria)

Protecting the natural environment.

Many women who regularly use AT to commute to and from work are motivated by a strong environmental consciousness. They are very aware of the environmental benefits – such as commuting in a way that does not release pollutants into the air – of using self-propelled transportation and are highly committed to reducing their environmental impact, which facilitates their use of AT. Many think of AT as a good way to make a positive difference and express their commitment to the environment.

I think that it's important to walk or use self-propelled [transportation] rather than fossil fuels so that's why I do it...To be a responsible citizen on the earth and recognizing that we share the earth resources with all the other species, I just think we need to not take more than our share, and so

I like to just do what I can that way to just move myself around under my own energy...it just seems like it's right. (Maria)

Those who have a strong environmental consciousness often connect the health of the environment to their personal health, which reinforces their use of AT. Irene's philosophy is simple: "Be kind to yourself and be kind to the earth." She explains it this way: "to do my commute, with my own body, in an earth-friendly way, body-friendly way, for me it's even a spirit-friendly way...when you're on your bike or you're walking...it's continually feeding that consciousness."

Four participants have chosen not to own a car for both environmental and financial reasons. Not owning a vehicle makes AT their transportation norm, rather than the exception. It also eliminates the temptation of driving when time is tight, or when they are feeling low-energy or unmotivated to use AT.

Saving money.

Saving money is another facilitator and motivator for using AT. Compared to the costs of owning and operating a vehicle, AT costs are considered to be low. "To run a car, if you have a car, is \$10,000 a year, to run a bike...is \$250?...obviously that's a big difference there, with insurance and gas and maintenance and all that...so that's a real savings." (Sandra). For Susan, the choice to be car-free and rely exclusively on AT was initially made out of a desire and need to minimize costs because her income was inconsistent. For Daphne, the high cost of parking is a major facilitator of AT, "it's forced me to make other choices."

While the cost of owning and operating a vehicle can be an enabler of AT for participants, the cost of gear for AT can be a barrier. The cost of equipment necessary to

make AT safe, easy and comfortable can be expensive and is one barrier preventing Daphne from biking to work with her young son.

I look at people on bikes and think, 'oh, I wish I was doing that'...I mean using your feet is just so much easier. It's getting...the gear, all that stuff. I was looking at chariots – if I was going to take my son – they're a couple of hundred – \$500 bucks to get one of those...if I could get one second hand...I would, it just never happened. (Daphne)

In comparison to the cost of owning and operating a vehicle, however, many consider the investment in technical gear and equipment to be a cost-effective commuting option.

Using AT also saves money that might be spent on other types of fitness. Many consider AT, particularly walking which does not require a great deal of specialized equipment, to be more economical and financially prudent than a gym membership. Laura has no desire to spend money on fitness facilities when she can get her exercise through AT. “Different people have said, ‘well you should go to a gym’ and, ‘you should take an aerobics class’ or whatever, and I’m cheap, so walking is free!”

Many participants discussed how the high cost of living relatively close to work is a barrier to their use of AT for commuting. This study looked at those who live or work on or around the Halifax Peninsula, which is a fairly affluent area; the cost of housing within a reasonable walking or cycling distance from work is therefore quite high. Many participants considered AT when selecting their homes, but a number chose to live farther away so they could have a nicer or larger home. Many would prefer to live closer to work to facilitate their use of AT, but the cost of doing so is too great.

Saving time.

Many participants talked about trying to be as efficient as possible with their time. One of the biggest benefits and facilitators of AT discussed is the opportunity it provides for “killing two birds with one stone”. As was discussed in the health section, using AT to commute to and from work is considered a time-saving activity because physical activity needs are met while commuting, eliminating the need to find time for physical activity in other parts of the day. For Sandra, AT was the way she was able to be physically active when she had the greater childcare and household responsibilities associated with a young family. “When I was involved in family it was time. Like this makes so much sense...it’s actually half the time to actively commute...it’s a real time saver in terms of getting in my planned cardio and getting to work.”

Participants are constantly making decisions about what they can put their energies towards and often sacrifice personal benefits (such as those related to their health and AT) for the good of others (such as those related to work or family, like getting to work in the quickest manner). When Jill’s work gets demanding, she often takes the car to work because she considers it to be the most time-efficient way to travel, even though she values the other benefits of AT.

I do get into this trap, sometimes, of feeling like I’m so far behind I have to get to work at 6:30 in the morning and I’m there until 7:30 at night, and in those cases I’m pretty driven to take the car because that’s the most efficient – time efficient way – to get there. (Jill)

Cultivating joy.

When it comes to choosing a mode of transportation a major consideration for participants is whether or not they enjoy it. AT provides many opportunities for positive,

joyful experiences (such as interacting with the community and nature), which facilitate the use of AT; and helps participants overcome the barriers. Maria notes many barriers to using AT, but one of the reasons she uses it in spite of the barriers is because of the enjoyment it brings her. “I just *love* it...yeah, there are barriers but you know, obviously there are the rewards. And I *love* the cycle, and there are times when it’s just incredibly beautiful.” Participants enjoy the opportunity to see green spaces and beautiful gardens and the opportunity for quality time with loved ones that AT can provide. Enjoyment also comes from the sense of accomplishment that many feel when they use AT:

I feel a sense of accomplishment before I’ve even technically started my day at work...Physically, mentally, emotionally, it makes me feel good...I’m feeling good because I’m not using my car, I’m not burning gas and I’m not taking up parking, or the road, that kind of thing. Those are all good things...It’s a sense of accomplishment, like, ‘I walked! It’s good! It feels good.’ (Daphne)

Unfortunately, AT is also associated with displeasure, which is a barrier.

Participants do not enjoy feeling unsafe and vulnerable. Linda, who never uses AT does not think she would enjoy it because she considers it unsafe. “Just the traffic and...feeling really vulnerable, it’s not something I’d really enjoy, so I wouldn’t really consider [AT].” Participants also find it more difficult to enjoy AT when the weather is bad.

Responding to Barriers: Strategizing, Planning, Preparing & Acting

While the many benefits motivate participants, there is a great deal of informal work that goes into negotiating the use of AT for commuting purposes. The women that I spoke with deal with barriers and challenges to AT by strategizing, planning and preparing for them. Some challenges require minimal effort to overcome which facilitates

the use of AT, while others require significantly more effort. The amount of strategizing and preparation necessary to make AT possible, comfortable and enjoyable for the women varies depending on the circumstances of the day, week or season. Most strategizing and preparing is typically done in relation to route characteristics such as safety and hills, and other challenging variables such as weather, but strategizing is also done in an attempt to balance social responsibilities like family and career demands. There are many ways that participants respond to barriers including: planning and adjusting their route, being alert and defensive, changing their mode of transportation, using gear and equipment, building and using personal resources, and managing demands on their time.

Planning and adjusting the route.

Route planning takes place before the commute as well as during it, and is usually done to maximize enjoyment and safety. Many participants who engage in AT choose routes that take them past pleasant scenery and points of interest. As Sandra notes, “when you’re walking you may choose to scoot over to a different street because it’s prettier.” Participants do not just adjust their routes to maximize their enjoyment; much strategizing and planning focuses on selecting routes that are safer. Many participants choose routes that are away from fast-moving traffic whenever possible.

Another strategy that cyclists have for getting out of the way of fast-moving traffic is riding on the sidewalks. Many of the women expressed frustration however, at being forced to choose between their personal safety and doing something that is illegal.

Technically you’re not allowed on the sidewalks, but, the other option is sometimes risk of death or injury and you think, well...am I going to piss

off a few pedestrians and maybe get a ticket? Or am I going to end up in the hospital? ... We really shouldn't have to make those choices. (Sandra)

While pedestrians often recognize the safety issues faced by cyclists, they do not like sharing the sidewalks because it makes them feel at risk and unsafe. “It’s the cyclists that go from street to sidewalk and whiz in and about that bother me...they don’t really respect pedestrians.” (Laura).

Taking less-busy streets can be safer and more enjoyable for participants because it minimizes traffic-related safety concerns. However, this strategy can also increase the fear of violence because there are fewer people around. Many participants mediate the risk of violence by altering their routes so they are on busier, well-lit streets when it is dark. Taking less busy routes can also be unsafe and problematic in the winter because of icy conditions. As such, participants also change their routes to more heavily used corridors as a strategy for dealing with challenging winter conditions, as routes that are used more are typically better maintained.

Being alert and defensive.

Another way that participants prepare for and respond to the safety challenges of actively commuting is by being highly alert and proactively responding to the threat of vehicles and other people. Participants spoke of the increased alertness required to cycle with traffic, which can be stressful and a barrier to the use of AT. As Susan put it, “you absolutely can’t shut down during cycling. You have to be very alert.” Participants like Irene and Sandra, who have been regular users of AT for a number of years have developed defensive cycling strategies that make them feel safer. Both use eye contact

and hand signals extensively to communicate with drivers and feel drivers are more respectful of them because of it.

Signaling is crucial in city driving...eye contact...I always drive [cycle] like I run, which is everybody's going to hit you...very defensively in one sense, but offensively in another, in the sense that if I need to take the lane I'll signal and take the lane, because it's safer for them and it's safer for me. (Sandra)

Participants also discussed the need to be alert to keep them safe from violence. Lisa walks through rougher neighbourhoods on her commute and does not wear headphones so that she can be aware of and alert to potential danger. "I won't listen to music while I'm walking, for two reasons: I want to be very aware of what's going on around me day or night, and secondly, I'm afraid somebody might want whatever it is, in desperation." Lisa also walks with her partner when possible, which also makes her feel safer. "I'm keeping an eye. And so is he. It's not something we say... [but] it's on his mind too...anticipating, keeping aware of what and who's around you."

Changing modes and gearing down in bad weather.

In response to the weather, many of the women in the study 'gear down' to an easier, safer, more comfortable mode of transportation in the winter: cyclists become walkers and walkers take the bus or drive. "I walk in the winter and I bike during bike weather... Well, cycling in Halifax is incredibly dangerous so by mid-November when it's getting dark by 4:30, 5...I don't think it's safe. And it's unpleasant...but mainly it's unsafe." (Susan) This is done as a way of mitigating some of the risks and discomforts associated with AT in the winter. Maria's thoughts are shared by many, "I don't cycle in the winter, that's why I walk, cause it's dangerous."

Using gear, clothing and equipment.

Many participants also use special clothing, gear and equipment to increase their comfort and safety when actively commuting in response to bad weather. While these additional items increase comfort, facilitating the use of AT, they can also be problematic and a barrier. Items need to be managed, maintained, and carried around if they are to be useful and the added complexity and hassle of this is a deterrent for some. Carrying extra clothing for AT can be a nuisance, as Lisa put it, “the whole clothing thing drives me crazy. The winter stuff. All the layers and then walking...it’s just too much on. Coats and mitts and scarves. I’d rather not do that.” Managing the additional clothing required to combat discomfort in poor weather can add extra time to AT commuting which can be problematic. “You have to have all these layers and it takes you 15- or 20-minutes just to get geared up to do your ride again. To do the switch over, put all your layers on and bundle, bundle, bundle, bundle.” (Irene).

Clothing that is comfortable and functional for AT is also not typically suitable or appropriate for the office requiring participants to bring a change of clothing to work, which can also be a nuisance. While many participants feel it is important to dress appropriately for work, many who use AT self-describe themselves as not caring much for fashion or beauty norms, which seems to facilitate their use of AT. “I’ve chosen not to buy into all that stuff... I can’t be bothered to deal with all that make-up and hair product and worry too much about my dress, *and* ride my bike to [work] and walk to [work].” (Maria). Cycling is generally considered to require more equipment than walking. For this reason, walking is considered to be less cumbersome than cycling and an easier mode of AT. As Irene put it, “there are less barriers for walking...less equipment.”

Building and using personal resources.

Drawing on past experiences is another way that participants overcome the barriers to AT. Many participants think that past experiences with AT give them a greater sense of comfort with it now and facilitate its use. “I’ve been doing this cycling thing...like 25 years now. [I’ve developed] a lot of spidey senses, I guess. And just things that I know are going to be helpful.” (Irene). Jill actively commutes in the wintertime, even when the weather is poor, and draws on her experiences growing up in the Prairies to help her overcome the challenges of winter weather. “Prairie-ites take a perverse pride in surviving the forty-below and the wicked winds. So there is kind of a thing that kicks in when I see that the day’s going to be horrible...it’s not a big deal.” For Daphne, the fact that she used to cycle regularly makes the prospect of cycling in the future less intimidating, “I used to [cycle]. Not very recent[ly]...10, 11 years ago now...cycled all the time...It wouldn’t be a new thing, it’s just unearthing it.” Past experiences develop skills, abilities and confidence that facilitate the use of AT. Irene cycled as a child and has always been very physically fit; this gave her the confidence to join a cycling club as a young adult where she gained cycling skills. Sandra is also very athletic and thinks that that is what first gave her the confidence to start actively commuting to work.

The work of AT and time management.

Responding to barriers takes time and effort; it requires work. Given that many participants already have limited time and a number of responsibilities, this can be problematic and a barrier to the use of AT. It takes more energy and time to change modes of transportation and get used to new routines than it does to stick with existing

routines, which is also a barrier to the use of AT. Even when participants actively commute regularly, the transition between different modes can be difficult. Maria still finds the transition between walking and cycling to be challenging even though she has been using AT for a number of years. To find the time to prepare for AT, participants plan and schedule their days, and in this way, manage their formal and informal workloads. When Maria's career demands were great she had to be very structured with her time so that she could continue to actively commute, and even then, setting aside time for AT was challenging, "I really had to structure my schedule." For those who have not done a great deal of active commuting, the amount of effort required to switch modes and start a new commuting routine can be too great a barrier to overcome.

As we have seen, participants are very resourceful and innovative when it comes to responding to the barriers to using AT when they feel like they will gain benefits. The women in this study talked about many factors that influence their choice of transportation mode for commuting to and from work. While there are many barriers, such as unsafe infrastructure, a general lack of community support, and challenging weather, there are also many enablers, such as supportive workplaces, beautiful scenery, and the many benefits that AT provides.

Participant suggestions for increasing the use of AT for midlife women in Halifax.

Participants had many suggestions for facilitating the use of AT for commuting to and from work for midlife women living and working in Halifax, NS:

- Improve infrastructure to make it safer and easier to use.

- Create more storage facilities throughout the community that protects equipment from theft and the elements.
- Link cycling mentors with unskilled riders.
- Have more skill development programs.
- Encourage people to ride on trails and away from traffic to build confidence.
- Educate potential AT users about the benefits of AT, and educate drivers about how to safely share the roads.
- Have free or low cost equipment rentals.
- Create tax incentives for the use of AT.

Participant Reflections on Modified Photovoice

This study used a modified form of photovoice to explore midlife women's perceptions of AT. Keeping with feminist research principles warrants a brief reflection of the experience of this methodology from the participant's perspective. Participants were asked to comment on their experiences of taking the photos in the second interview. The experience gave many participants greater insight into their own actions and greater consciousness about the factors that prevent or facilitate their use of AT on a daily basis. Many noted that it was an interesting and unique experience that allowed them to think about their community in a way they had not done before. Participants found the task to be enjoyable and enlightening. As Irene noted, "I thought it was such a rich experience...the process of both the interview and the taking of the pictures, was very...reaffirming for why I make some of the choices that I do make." Daphne found it fun and enjoyed the opportunity it gave her to share her experiences with others. "It was

fun. And it made me kind of think about my route a little bit, and why I like to take this way and what's important about it." While everyone considered the overall experience of taking photos to be positive, two participants expressed discomfort at taking photos in public, and some were not confident that their photos would be "any good". As Laura noted:

I was a little nervous about what people thought when they saw me doing it...I certainly wouldn't have wanted to offend anyone, or upset anyone, so I was just a little, I was just aware of who was around when I was taking them. (Laura)

Table 3. Summary of Barriers and Enablers to AT

Barriers	Enablers
<i>Safety</i>	
Lack of infrastructure that supports AT	Presence of infrastructure for AT that is not in close proximity to traffic (i.e.: bike lanes)
Routes that are perceived as unsafe	Routes that are perceived as safe
Infrastructure that is poorly maintained or contains hazards	Infrastructure that is well maintained and does not contain hazards for AT users
Routes where the threat of violence from others is perceived as high	Routes where the threat of violence from others is perceived as low
<i>Aesthetics</i>	
Lack of green spaces	Presence of green spaces
Unpleasant routes	Clean and pleasant routes
Lack of interesting features along the route	Interesting architecture
<i>Geographic Characteristics</i>	
Poor weather (precipitation, windy, cold)	Good weather (sunshine, warmth)
Hills (physically challenging)	Hills (some enjoy the physical challenge)
<i>Social Support: Family & Friends</i>	
Friends and family who do not verbally encourage or who discourage the use of AT	Verbal encouragement from family and friends
No friends or family who use AT	Friends and family who use AT
Household and caregiving responsibilities	Limited household and caregiving responsibilities
<i>Social Support: Workplace</i>	
Demanding workloads	Realistic workloads
Frequent offsite travel required for work	Little to no offsite travel required for work
Inflexible work schedules	Flexible work schedules
Lack of storage facilities at work	Easily accessible storage facilities for gear and equipment
No showers and changing facilities at work	Showers and changing facilities at work
<i>Social Support: Community</i>	
Community attitudes that do not support AT	Community attitudes that support AT
Not highly valuing the benefits of AT	Highly valuing the benefits of AT (i.e.: improved health, protecting the natural environment, saving time, etc.)
<i>Personal Characteristics</i>	
Not enjoying AT activities	Enjoying AT
Lack of financial flexibility to invest in AT gear	Financial flexibility to invest in AT gear and equipment at outset
Lack of confidence in physical abilities	Confidence in physical abilities
Lack of control over how time is used	Ability to manage, control and adjust how time is used
Lack of energy and resources available to change transportation mode	Energy and resources available to change transportation mode
Lack of experience with AT	Previous experience with AT
Limited AT-related skills	AT-related skills

Chapter 5: Discussion

This research utilized a qualitative, grounded theory approach to explore the perceived enablers and barriers to the use of AT for commuting to and from work for midlife women who live and work in Halifax, NS. This study confirms and expands upon previous research that has explored some of the barriers and enablers to AT, finding that the built environment, natural environment and social environment all play important roles in commuting mode choices, as do women's skills and resources by helping them to overcome the barriers in their environments. This study found that barriers are not static and their impact can change daily, seasonally, or yearly. For example, weather, childrearing, and career demands are factors that continuously change. Some barriers are persistent and cannot be changed by human actions, such as climate and geography, but some are changeable, such as those related to infrastructure and community support. The results of this study suggest that there are many actions that can be taken to help midlife women overcome the barriers to AT and facilitate its use. This study also found that midlife women respond to barriers in many ways, and often work hard to overcome them, which is a unique finding and contribution of this research.

Car Culture, Infrastructure & Safety (The Built and Social Environments and the Connections Between Them)

Many participants think of Halifax as a car-oriented city, where infrastructure and attitudes heavily favour the use of the car for transportation. The social environment shapes and is influenced by the built environment: community members determine what and how to build infrastructure, and the type of infrastructure that is built sends messages

about what is socially acceptable and important: cars, not AT. A key finding of this research is that participants are interested in a different cultural orientation than the one that currently exists. They are interested in a cultural orientation that supports and encourages AT through the attitudes and actions of community members, and the type of infrastructure that is built.

Safety is a theme that came up frequently in this study and was found to be a very important factor in commuting decisions for participants. This finding is consistent with research that has shown that a perceived lack of safety is a major barrier to physical activity (Eyler, et al., 1998; Bennie, Salmon, & Crawford, 2010; CAAWS, 2007; Foster & Giles-Corti, 2008) and the use of AT (Oja, et al., 1998). One of the reasons why safety may be so important to midlife women is because women are generally more averse to health and safety-related risks than men, and research suggests that risk aversion increases with age (Byrnes, Miller & Shafer, 1999; Halek & Eisenhauer, 2001; Nicholson, Soane, Fenton-O'Creevy, & Willman, 2005). This study found that midlife women are deterred from using active transportation if they perceive it as risky.

The existence of well-maintained infrastructure that separates vehicle, pedestrian and bicycle traffic is linked to the perception that using AT is a safe way to commute. This is good news for health promoters as infrastructure is arguably the most easily altered influencer of AT use, provided there is political support to do so. Significant changes to the infrastructure may result in significant changes in the use of AT for commuting. Participants suggested that improved cycling infrastructure, for example, would increase their use of AT for commuting to and from work. This is consistent with previous research which suggests that changing the built environment by adding bike

lanes, trails and racks facilitates cycling (Badland & Schofield, 2005; Cycling in Cities, 2009; Dill, 2009; Dill & Carr, 2003; Moudon et al., 2005). Other research has also suggested that improving the functionality of routes, such as surface maintenance and type of infrastructure, for pedestrians and cyclists is positively associated with an increase in physical activity such as AT, and makes it more appealing (Garrard, Rose & Lo, 2008; Hoehner, et al. 2005; Stahl, et al., 2002; Wardman, Hatfield & Page, 1997).

Cyclists feel at particularly high risk of fast-moving traffic because they have to travel on the road in close proximity to it when there is a lack of cycling infrastructure. This is one reason why cycling infrastructure is so important for participants. When there is no consistent space specifically dedicated to cycling, cycling is perceived as a higher risk mode of transportation than walking. Roadways are considered the domain of the car, and sidewalks for pedestrians – a concept which is reinforced by law in Halifax where it is illegal for cyclists to ride on sidewalks. Cyclists and drivers travel at different speeds, which, when trying to share a space such as a road, can be unsafe. In locations where cyclists and drivers have to share small spaces, some motorists try to squeeze around cyclists instead of temporarily slowing to their pace. This can be frightening and dangerous for cyclists as the cyclist has much more to lose if they hold their ground, as they legally have the right to do. According to the *Nova Scotia Motor Vehicle Act* (Government of Nova Scotia, 2010), cyclists have the same rights and should behave in the same manner as motorists. Motorists should therefore treat cyclists as any other motor vehicle, but do not always do so because they are much smaller. Many participants who cycle noted that they will not stay on the road – where they have every right to be – if they feel at risk from aggressive drivers. While automobile drivers likely do not intend to

bully cyclists, it is often perceived that way from the cyclist's perspective. This is likely the reason why there are fewer midlife and older women who cycle for transportation compared with males and younger adults (Moudon, et al, 2005), who are less risk averse and are generally more confident riders. This research speaks to a need for improved infrastructure, particularly that which gives cyclists their own travel space where there is little chance for interaction with vehicles and traffic. These findings are consistent with the findings of a transportation cycling research study that found that women prefer cycling on off-road paths and not in close proximity to fast-moving traffic (Garrard, et al., 2008).

This study also found that participants who currently engage in AT do so despite a lack of infrastructure in their community, consistent with findings by Moudon, et al. (2005), which suggests that skills, experience and confidence might help women overcome the barrier of inadequate infrastructure. This is consistent with other research that has found that past experience and self-confidence is associated with vigorous exercise (Oman & King, 1998; Rodgers & Gavin, 1998; Sallis, et al., 1989). Given that skills and past experiences facilitate the use of AT, the lack of safe infrastructure may be a bigger barrier for those who are not regular users and do not have as much skill or confidence in their abilities. It has been suggested that the provision of dedicated cycling spaces away from fast-moving traffic increases the appeal of AT particularly for those who are highly concerned about safety and traffic (Dill, 2009). To encourage the use of AT for commuting it is therefore important to foster life-long skill development, and to provide safe infrastructure where new and novice users can gain experience.

This study also found that participants are concerned about the risk of violence and sexual assault when they are alone at night, consistent with other research which has found that personal safety is a barrier to physical activity for women (Eyler, et al., 1998; CAAWS, 2007). In Halifax in 2009, there were 271 calls to police about sexual offenses, and in the first five months of 2010, there were 100 (Halifax Regional Municipality, 2010). In the winter, when darkness falls before the end of the workday and the evening commute is regularly done in the dark, this is a great concern for participants. It speaks to the need for continued effort to be put into making communities safer for women at night, and these types of safety concerns must be addressed through the built and social environments. Creating well-lit routes where users are visible is one way that the built environment can be immediately modified to be more supportive of AT. This study found that midlife women feel safer and are more likely to walk on well-lit routes, consistent with other research that has looked at broader populations (Moudon, et al., 2005; Painter, 1996).

To increase the use of AT by midlife women from a long-term perspective, it is also important to address the cultural roots of violence against women. The United Nations Development Fund for Women (UNIFEM) (2008) cites “structural gender inequality and discrimination” (p.9) as the reason why violence against women persists. Identifying social norms, attitudes and practices that support and perpetuate gender inequality, and working to eliminate them at all levels, from the individual level to international policy and programming, is therefore the key to ending violence against women (Garcia-Moreno & Stockl, 2009; Hyman, Guruge, Stewart & Ahmad, 2000; UNIFEM, 2008; World Health Organization, 2010). Canadian researchers Hyman, et al.

suggest that primary prevention strategies are a promising way to address violence against women, and include: educating the public, increasing awareness, and fostering empowerment. They also suggest that improving infrastructure and community safety initiatives (such as crime prevention) are also important for improving women's safety (Hyman, et al.). In order to encourage the use of AT for midlife women, we must address their safety concerns.

This study found that participants perceive the cultural norms and attitudes in Halifax as generally unsupportive of AT, which is in part communicated through negative comments and behaviours of community members. Participants who cycle stated that they are regularly yelled at by drivers and pedestrians who are frustrated with their presence on the roads and sidewalks. As this research and other research has found, cultural and social attitudes can have a significant impact on the ways that the members of a society act and behave, and can significantly influence physical activity and AT use (Ball, 2006; Eyler, et al., 1998; Eyler, et al., 2002; Giles-Corti & Donovan, 2002; Wendel-Vos, Droomers, Kremers, Brung & van Lenthe, 2007).

The findings of this research suggest that there is a hierarchy of acceptable transportation modes in Halifax: driving, walking, and cycling. Of the three modes of transportation discussed in this study, cycling was thought of as the most unconventional mode of transportation and, as was noted by participants who cycle regularly, there appears to be a general notion that only "crazy" people do it, not "normal" people. This suggests that there is a need to change the attitudes of those who consider cyclists to be fringe members of society, rather than normal, rational members. Given the lack of cultural support for AT, it is not surprising that AT is not as common a practice for

midlife women in Halifax as it is in other places where there it is more culturally acceptable, such as Vancouver, BC or Amsterdam, NL. In these places there is more AT infrastructure and more cyclists: Vancouver has one of the highest rates of cycling in Canada, with almost 12% of the population reporting utilitarian cycling in a typical week (Winters, et al., 2007), and in the Netherlands, 40% of trips are made by bicycle or walking (Pucher & Dijkstra, 2003), compared to only 5.5% of the population reporting regular utilitarian cycling in Halifax (Winters, et al.). This research suggests that in order to increase the use of AT by midlife women, there needs to be a visible cultural acceptance of AT, cycling in particular, as a valued and legitimate mode of transportation. It is interesting to note also that the two types of transportation that are considered the most acceptable are the ones that have clearly identified spaces for use, the road and the sidewalk, which lends support to the argument that it is necessary to develop cycling infrastructure to encourage cultural acceptance of cycling and AT use.

Even though Halifax is perceived by participants as a car-centric community, there appears to be growing support for AT among community members and decision-makers. On November 14, 2006, an Active Transportation Plan was approved in principle by the Halifax Regional Council (Halifax Regional Municipality, 2008). This plan outlines goals and objectives for improving AT infrastructure over a 20-year period ending in 2025, and to “develop a region-wide, visible and connected Active Transportation network of...facilities that are convenient, accommodate the needs of existing and future users and promotes an increase in non-motorized vehicle travel” (p.1-8). There is also an official bicycle plan in Halifax that was published in December 2002 (Halifax Regional Municipality, 2002). These documents are promising for the future of

AT commuting in Halifax. Signs of cultural shifts towards AT are also evidenced by bicycle-supportive articles and advertisements in the local weekly newspaper, *The Coast* (see Benjamin, 2008 & 2010, Beaumont, 2010 and Halifax Cycling Coalition, 2010, for examples), and the Halifax Critical Mass³ bike ride which meets monthly with “no official purpose...but to be the dominant force on the road for a change” (Halifax Critical Mass, 2010, para. 2). Critical mass participants do a monthly bike ride throughout the city en masse to increase visibility and draw attention to cycling as a legitimate and important mode of transportation. The action of riding en masse often brings them into conflict with local police, however. This happened on the September 2009 ride when 3 cyclists were ticketed for failing to ride on the extreme right of the road because a driver called to complain about cyclists holding up traffic (Benjamin, 2009).

One reason why car culture may be so prevalent is because of the link between cars and status. As was noted by Barton (2009), the car is associated with status and self-respect, while walking and bicycling are often thought of as less glamorous modes of travel, a perception that is likely one of the reasons why AT is less prevalent. A change is required to raise the status of walking and cycling, and decrease the status of the automobile. With the increasing awareness of the negative environmental consequences of automobile use this cultural shift may slowly be starting. This in turn could have a positive effect on the use of AT for commuting.

While there is growing awareness of the benefits of AT in Halifax, and, particularly in the last 5 years, more public support for projects that might improve the built environment to make AT safer and more accessible, this support does not

³ Critical Mass is a regular, unstructured bicycling event held in many cities around the world, which draws attention to cycling issues.

necessarily translate into action and the creation of appropriate infrastructure. A recent example of this is the case of Spryfield, a community within the Halifax Regional Municipality. Multiple community projects over the past few years, including the *We Are Spryfield: Our Community Profile 2006* (Teplitsky, LeClair & Willison, 2006), and the *Herring Cove Road Community Development & Streetscape Planning Project* (Ekistics Planning & Design, 2005) have made recommendations for creating an aesthetically pleasing environment and improving AT infrastructure within Spryfield through the addition of bike lanes, trails, and traffic-slowing measures. The reports have been developed through numerous community consultations, and with the advice of a number of community planners. On July 6, 2010, despite the recommendations and expert advice about the economic and health benefits of such changes, Halifax council voted 13 to 9 against placing bike lanes on Herring Cove Road, a major road in Spryfield (Bousquet, 2010). The Spryfield & District Business Commission did not support the recommendation to change two of the four traffic lanes into bicycle lanes, despite the evidence that suggests that such improvements benefit businesses, and effectively lobbied council against the proposed changes (Bousquet). Reports indicate that this opportunity for change, a change that may have had a positive effect on midlife women's use of AT, was blocked in part by a powerful group of business owners. The addition of the bike lanes on Herring Cove Road, a major route connecting communities on the outskirts of the Halifax Regional Municipality to the downtown, may have created a safe, pleasant route for midlife women to actively commute to and from work, had the recommendations been followed. It is these sorts of constraints that make it challenging for Halifax to move forward with AT-supportive change. While enormous efforts have

been launched to improve the city for AT, there is still considerable opposition, suggesting that there is a great deal of work that needs to be done to create change related to AT in Halifax. In the case of Spryfield, documentation suggesting that bike lanes often have positive economic impacts for local businesses did not allay fears that there could be negative economic impacts. For change to take place it will be important to address the concerns and fears of the opposition. Providing concrete examples of AT infrastructure changes that have benefited businesses in other jurisdictions, and a gradual process of implementation, may be one way of alleviating the concerns of business leaders and making those opposed more receptive to change.

The micro-culture within the workplace is also an important consideration when looking at ways of increasing the use of AT for commuting and changing broader cultural attitudes. Social support (Wendel-Vos, et al., 2007) and role modeling (Booth, Owen, Bauman, Clavisi & Leslie, 2000; King, et al., 2000) have been found to be positively associated with walking behaviour, which supports this study's finding that workplace norms and the commuting habits of colleagues can affect the use of AT. The findings of this research suggest that workplace support can be demonstrated in the form of policies and norms that support AT such as realistic workloads (consistent with findings by Bennie, et al., 2010), control over work schedules and minimal offsite travel. This study found that flexibility and control over time may give women the opportunity and freedom to manage their responsibilities and use AT, a finding that supports previous research about the importance of self-efficacy and control over life circumstances for physical activity participation (Oman & King, 1998; Rodgers & Gauvin, 1998; Sallis et al., 1989). This research also found that a workplace culture that encourages and supports AT can be

created through the provision of facilities that make AT easier. This is consistent with research by Bennie et al. and Schwartz, Aytur, Evenson and Rodriguez (2009) who found that workplace facilities that support AT, including equipment storage and changing and showering facilities, increase physical activity and the use of AT.

Aesthetics & Nature (The Natural & Built Environments)

This study found that the aesthetic quality of the built and natural environments can facilitate the use of AT, primarily by increasing enjoyment. The research findings suggest that AT is not just a utilitarian activity for midlife women that gets them from point A to point B. Nature was found to be an important aesthetic attribute that motivates participants to use AT; they report that it improves their mental health by reducing stress, restoring their psyche, and bringing them pleasure. This is consistent with research that has shown that perceptions of attractiveness, aesthetics and greenery positively influence walking (Ball, et al., 2001). Other studies have also shown that contact with nature can promote health through psychological restoration and improve cognitive functioning (Berman, Jonides & Kaplan, 2008; van den Berg, Hartig & Staats, 2007). Improving and maintaining green spaces along AT routes may therefore do more than just encourage participants to use AT, it may also decrease stress, improve mental health, and increase productivity in the workplace.

This study also found that weather and geographic characteristics play a role in AT use for midlife women. The Atlantic Ocean has a moderating effect on the climate of Halifax, but winters are long and summers are short. Halifax has the fourth highest number of wet days (171.2) per year and the second highest total amount of precipitation

(1452.2 mm) compared to other major cities in Canada (Statistics Canada, 2010).

Changing and challenging weather is a reality that Haligonians face, and the inconsistency of the weather from day-to-day, and even throughout the day, can complicate the process of using AT for commuting to and from work. The findings of this research are consistent with other research that has looked at women and physical activity and found that poor weather can be a barrier (CAAWS, 2007; Cook, 2003; Im, et al., 2008; Jewson, et al., 2008; Winters, et al., 2007). This study found that having clothing, gear and equipment that makes AT more comfortable and enjoyable can help overcome the barriers of poor weather and hills. For example, warm, water-proof clothing makes using AT in cold, wet weather more comfortable, and bikes with a number of gears can make going up hills much easier. This is consistent with research done by Wendel-Vos, et al. (2007) who found that the availability of equipment is a determinant of physical activity in adults. While weather is not something that can be changed, infrastructure can support the ease with which AT is used in inclement weather. For example, cycling paths decrease the risk of cycling in poor weather by minimizing the risk of traffic accidents due to poor visibility. Covered bike racks, and changing and storage facilities also make it easier for AT users to easily manage the extra clothing and equipment that is necessary to use AT in bad weather. Improving the speed and quality of snow clearing on AT routes would also increase the ease with which AT can be used in the winter.

The Benefits of AT and the Factors That Motivate Midlife Women

A key finding of this research is that almost all participants perceive a number of benefits to AT, such as improving health, protecting the environment, saving time and money, and providing opportunities to interact with the community. These perceived

benefits motivate them to use AT, but as health promoters know, knowledge of benefits does not always result in the adoption of positive behaviours. Even when participants know the many benefits, there are still times when they find it difficult to use AT to commute to and from work because of barriers such as time pressure and fatigue. Most participants are, however, very innovative and resourceful when responding to the barriers that prevent them from using AT, and the benefits appear to motivate them to do so.

The results of this study show that participants perceive and experience social benefits to using AT. This supports previous research which has found that AT, particularly walking and cycling “create opportunities for informal meetings which build social networks” and develop a sense that the social environment is supportive (Barton, 2009, p.S117). The development of these social networks may explain why the women in this study who use AT regularly are less influenced by a lack of support from close friends and family than those who do not use AT regularly; many of the women who do use AT have built a network of supportive peers in their community that may offset the lack of support from close personal networks. While the support from close friends and families appears to be less critical for regular users of AT, it can still play an important role by helping them to get back to AT if they have temporarily stopped. This speaks again to the need to change cultural and social attitudes to develop more supportive social environments so more people can benefit from the encouragement of family and friends.

Time is often cited as one of the biggest barriers to physical activity (Badland & Schofield, 2005; Bennie, et al., 2010; Craig, et al., 2002; Health Canada, 2002). Even though many participants in this study have some control and flexibility over their time,

enabling their use of AT, most are busy professionals with numerous commitments and social responsibilities. Because of this, participants are continuously assessing the amount of time that they have and what they can fit into that time. Many participants are motivated to use AT because they consider it to be a time-saving activity, allowing them to “kill two birds with one stone”. Promoting this benefit of AT may be a way to increase midlife women’s use of AT for commuting purposes.

It is also important to acknowledge however, that while time is often cited as a barrier to physical activity, it is the demands, expectations and pressures from various aspects of life that are the real barriers. If we were somehow able to increase the number of hours in a day, time would likely still be an issue, for inevitably this time would also be used meeting expectations and demands. Removing the barrier of ‘time’ therefore requires the removal of social pressures and expectations to do it all. The feminist movements have made many important positive changes in our culture, including increasing women’s choice and autonomy with the type of work that they do. However, instead of being able to choose *between*, women today are expected to choose *all*. They are expected to care for and maintain their family and home, volunteer and attend to community needs, *and* be hugely successful and productive at work. It is no surprise that women feel they do not have time to attend to other things such as personal health that do not seem to have the same immediacy. A cultural shift therefore also has to take place to make expectations for achievement more realistic, removing the pressure to do it all, and making a balanced life the measure of success, instead of achievement.

Until a cultural shift favouring balance instead of achievement is reached, time will continue to be important considerations for midlife women when they assess the

viability of AT. While cycling was considered to be a faster mode of transportation by the participants in this study, the time required to manage equipment and get changed and cleaned up upon arrival at work is perceived as requiring so much time that the potential time-saving benefits of cycling are negated; walking then becomes a comparable mode of transportation from a time perspective. This suggests that in order to maintain the timesaving benefits of cycling, workplace infrastructure should include facilities that are easy to access and use, and are designed with efficiency-of-use in mind.

With so many responsibilities, participants seek to balance the work in their lives by finding moments of joy. Depending on the individual, one may find the reward and challenge of intense physical exertion enjoyable, while another may find the mental and physical renewal that comes from an unhurried AT experience enjoyable. Enjoyment was found to be an enabler of AT which is consistent with other research that has found that enjoyment is a correlate of physical activity (Salmon, Owen, Crawford, Bauman & Sallis, 2003). Despite the differences between individuals, there are some factors that generally seem to make AT more enjoyable for midlife women, including aesthetically pleasing environments and risk-free, low-stress routes. Creating aesthetically pleasing environments and safe routes will make AT more enjoyable and will likely lead to an increase in the use of AT by more midlife women.

Implications for Health Promotion Policy & Programming (Removing Barriers & Cultivating Facilitators)

The findings of this study suggest that there is a need for a cultural shift in Halifax, away from car-culture, and towards AT. To minimize barriers and maximize

enablers, and increase the use of AT by midlife women, there must be a wider acceptance of AT as a legitimate and desirable mode of transportation. Infrastructure is one way to create a culture of AT. Addressing car-centric features of the infrastructure will go a long way towards creating a culture of AT. Victoria, BC, Vancouver, BC, Montreal, QC and Portland, OR are four examples of North American cities that are known for being AT-friendly and share some geographic characteristics with Halifax, including hilly terrain, and in the case of Montreal, snowy winters. All of these cities, and others internationally like Amsterdam, NL, have one very important similarity: they all have extensive infrastructure that supports AT by making it safer and more enjoyable, and their official community plans make this type of infrastructure a priority. Forward-thinking community leaders in Halifax also need to make AT infrastructure a top priority and design and implement transportation plans that support walking, cycling and driving equally, keeping in mind the findings from this and other research about the barriers to AT.

Making equipment and gear that enables the use of AT more readily available and accessible, and communicating the benefits and ease of using it will also likely facilitate the use of AT. Creating low-cost, easy to access equipment rental facilities may be one way to expose midlife women to AT options. The City of Montreal has had success with its BIXI (BIcycle taXI) program that allows people to rent a bicycle, ride to a destination and leave the bike at another station (BIXI Montreal, 2010; BIXI System, 2010). Subsidizing or providing tax incentives for other types of gear and equipment, such as rain gear and good walking shoes may be another way to encourage the use of AT for commuting to and from work.

As the participants noted, skills and confidence are also important enablers of AT. Creating education programs that target women across their lifespan are necessary to develop, maintain and reinforce walking and cycling skills and habits throughout women's lives. The earlier AT skills are developed, the more comfortable with AT midlife women will be, making them more likely to use AT to commute to and from work. Early skill development will also help to create a cultural norm of AT, making it more acceptable and 'normal'. While specific AT skills such as bike safety are important, general physical fitness and ability should also be a priority, as this will foster a general confidence in physical abilities that may transfer over to AT. Elementary schools are an important place to begin this education, but education efforts should continue to target women across their lifespan, through secondary and post-secondary education, into the workplace, and the community.

Creating channels for information sharing may be another way to increase skill and confidence with AT for midlife women. The creation of commuting groups that cycle and walk from various locations around the city on a regular basis (perhaps weekly) may be a good way of creating linkages between expert and novice AT users, allowing for information and 'tip' sharing, role modeling and the creation of social support networks. Watching the way expert active commuters navigate their routes, and experiencing it with them in different conditions may help novice users gain skill and confidence in different types of situations. These groups would also likely raise awareness in the community, in a similar way that Critical Mass bike rides do.

Along with education, it is important for supportive, confidence building messages to be communicated through the community. As participants noted,

encouragement from friends and family can be very influential in determining what mode of transportation is selected. There is no reason why these positive messages cannot also be delivered through community channels. Regular public service advertisements may be one way of delivering encouragement to those whose family and friends are unavailable or do not offer support, and may also help to educate the general public about the benefits of using AT, increasing cultural acceptance of it.

Clear communication of policies and best practices is another way that a culture of AT may be cultivated. The rules of the road for cyclists are vague and do not seem to be widely known by drivers or even AT users. Widely communicating clear rules for how cyclists are expected to behave that take into account the needs and preferences of all types of cyclists (novice to expert) may help to create a culture of understanding and respect between all types of commuters, limiting road rage and creating safer transportation conditions. Developing better communication signals that allow pedestrians, cyclists and drivers to increase communication while enroute, and ensuring those signals are widely known may also create a safer environment for AT.

Workplaces can also facilitate the use of AT for commuting to and from work by adopting policies that support AT use. This includes providing employees with greater control over work schedules so that they can overcome some of the barriers that prevent the use of AT like traveling in high-traffic times. Workplaces can also support AT by minimizing the amount of offsite travel that is required of employees, or by providing transportation for employees so that they do not have to rely on their own vehicles. Another way that workplaces can support AT is by maintaining manageable workloads so that employees do not regularly feel they have to stay late or work extra long hours,

which can make it difficult to balance AT with their other responsibilities. Workplaces can also support AT by providing infrastructure that makes AT easier to use, including changing and showering facilities, and safe and protected equipment storage that is easy to access.

Finally, addressing the cultural acceptance of behaviours and attitudes that continue to make women feel unsafe, particularly at night, is necessary to create a culture that facilitates the use of AT for midlife women. We must continue to work towards a cultural and society where women feel safe and do not feel vulnerable to violence and sexual offenses, during the day or night. To achieve this, major organizations working to eliminate violence against women, including the World Health Organization (2010) and the United Nations Development Fund for Women (UNIFEM) (2008), suggest working to promote gender equality and women's rights and empowerment.

Table 4. Summary Table, Implications for Health Promotion

Suggestions for Increasing the Use of AT by Midlife Women for Commuting To and From Work	
Action	• Activity Suggestion
Work to create a cultural shift in Halifax, away from car-culture and towards AT.	<ul style="list-style-type: none"> • Prioritize infrastructure changes and increase the amount of AT-friendly infrastructure.
Increase the availability and accessibility of AT equipment and gear.	<ul style="list-style-type: none"> • Facilities and outlets where equipment can be rented. • Subsidize or provide tax incentives for clothing and equipment.
Create education and skill development programs that target women across the lifespan.	<ul style="list-style-type: none"> • AT specific skills and general fitness.
Create channels for information sharing and opportunities for the development of social support networks.	<ul style="list-style-type: none"> • AT commuting groups.
Deliver positive, AT supportive messages through community channels.	<ul style="list-style-type: none"> • Public service announcements.
Clarify and promote rules of the road and communication techniques between drivers and AT users.	
Encourage and support workplaces in developing policies that support the use of AT.	<ul style="list-style-type: none"> • Provide employees with greater control over work schedules. • Ensure workloads are manageable and can be accomplished within the regular workday.
Encourage and support workplace facility development.	<ul style="list-style-type: none"> • Safe equipment storage. • Showering and changing facilities.
Continue to work towards making women feel safer in their communities, particularly at night.	

Methodological Discussion: Photovoice

All participants completed the photovoice project and returned for a second interview to discuss their photos. The study was designed so that the data from the first interview would be useable if participants were unable to complete the photovoice component of the study and the second interview, however this option was never utilized as all participants engaged in the photovoice component of the study. Keeping with feminist research principals also warrants a brief reflection on the photovoice experience from the researcher perspective. I found the photovoice component to be a positive addition to the research method that enriched the data. It gave participants an opportunity to think about the study topic over multiple days and explore it from different perspectives. The photovoice component also provided an opportunity for multiple interactions with participants helping to build rapport between participant and researcher, which I suspect also contributed to richer data. Finally, taking and reflecting on the photos elicited some new thoughts from participants about their commuting routes and seemed to raise their consciousness about why they commute, and the factors that affect their commuting choices, perceptions and experiences.

I have reflected upon the experience of using photovoice and have some practical suggestions for how to further improve the use of this method. First, when participants used the photo log to record brief comments about why they had taken the photos at the time the photos were taken, the discussion in the second interview was more thoughtful and reflective compared to when they did not. It may therefore be worthwhile to communicate the importance of using the log to participants. Second, even though the first interview prompted participants to consider the social, natural and built environment

influencers, the photos were almost exclusively of tangible, physical influencers. This suggests that while it is possible to capture intangible aspects in photos, it may be challenging. Given the option to photograph tangible and intangible items, tangible items may be given preference because of the ease with which they can be captured. To mitigate this, it may be helpful to specifically request photos from each category that is being studied. Finally, the addition of photovoice to this study required additional time for collection, processing and analysis which should be considered by those with limited timeframes. Overall, the inclusion of photovoice enriched the study, and provided an additional medium through which to communicate experiences and findings, which will be beneficial in affecting change through the dissemination of these results.

Limitations

This study did have some limitations. The recruitment methods resulted in the participation of self-selected participants only. Self-selected participants may be more inclined or open to future participation in active transportation or may be more active in general, and results may therefore be biased. Participants looked favourably upon AT and generally viewed it to be beneficial; most either incorporated it into their regular commuting routines, or sought to incorporate it more in the future. Only one participant did not use, and had never used, AT for commuting and had little interest in using it in the future. Another participant had used AT for commuting purposes in the past, but rarely did so at the time of the interview. This resulted in a sample of women who were able to overcome many of the reported barriers in a manner that allowed them to engage in AT. Had the sample included six women who never engage in AT and six who do so regularly, the research findings may have been somewhat different. For example, the role

of the barriers and the insurmountable challenges to overcoming the barriers may have been more a part of the women's discussions.

Another limitation of this study is that the sample was not as diverse as was desired. Participants were well-educated, with relatively high incomes and this may have had an influence on the results. Furthermore, while ethnic and cultural information was not collected, no participants were visible minorities. Given the importance of the social environment on commuting choices, culture and ethnicity could have an impact on commuting mode choice, and so it is recommended that this be an area for future research.

Given that participants were recruited from a relatively small geographic area, the findings will only reflect the specific experiences of the population studied. Findings may be transferable to other municipalities across Nova Scotia or Canada, however, that have similar characteristics.

Finally, the age of the researcher may have deterred participants from fully opening up about their experiences, however everything was done to build rapport and minimize this possibility. Overall the researcher felt that most participants were very open and eager to share their experiences and the age of the researcher did not seem to have a negative impact on the data collected.

Recommendations for Future Research

Future research can expand upon this study by exploring the experiences of a more diverse population of midlife women, including those with different types of careers, different ethnic and cultural backgrounds, those with lower socioeconomic

status, and women across the range of ages defined as midlife, to develop a more complete understanding of the enablers and barriers to AT for commuting to and from work for midlife women. Future research comparing similar populations in other cities will also be beneficial, and including an examination of local policies will help to develop a more detailed understanding of the factors affecting the use of AT by midlife women. Using similar research questions to explore a male population may also provide further insight into the gendered experiences of AT, and shed some light on how the female and male perspectives of AT differ.

Future research may also wish to examine the ways that barriers to AT could be reduced or eliminated. Researching the underlying causes of opposition to changes that support AT will be especially important, and it may be particularly worthwhile to examine the ways that opposition, such as demonstrated in Spryfield, can be overcome. To do so, it may be beneficial to look at the cultural and sociopolitical contexts of cities that have had success creating AT-supportive environments, such as Montreal, QC and Portland, OR. An examination of the economic impacts of creating AT-supportive infrastructure may also prove worthwhile, particularly if it tracks spending patterns and the impact on local businesses. By examining the concerns of those opposed we are likely to discover ways that the needs of both groups can be met, thereby creating a community environment that is open to change.

Findings suggest that the selection of a mode of transportation is a complex process for participants that is influenced by many factors. Data from this research demonstrate that while midlife women in Halifax perceive and experience many barriers to the use of AT for commuting to and from work, many also perceive a number of

enablers that help them to overcome barriers and challenges. Despite the limitations of this research, the findings suggest that there are a number of things that communities, health promoters, planners and business leaders can do to facilitate the use of AT for midlife women, including fostering cultural change, and physical infrastructure changes to support AT. As this research has demonstrated, in order to make AT the transportation choice of the majority, rather than the minority for commuting to and from work, we must work from many angles.

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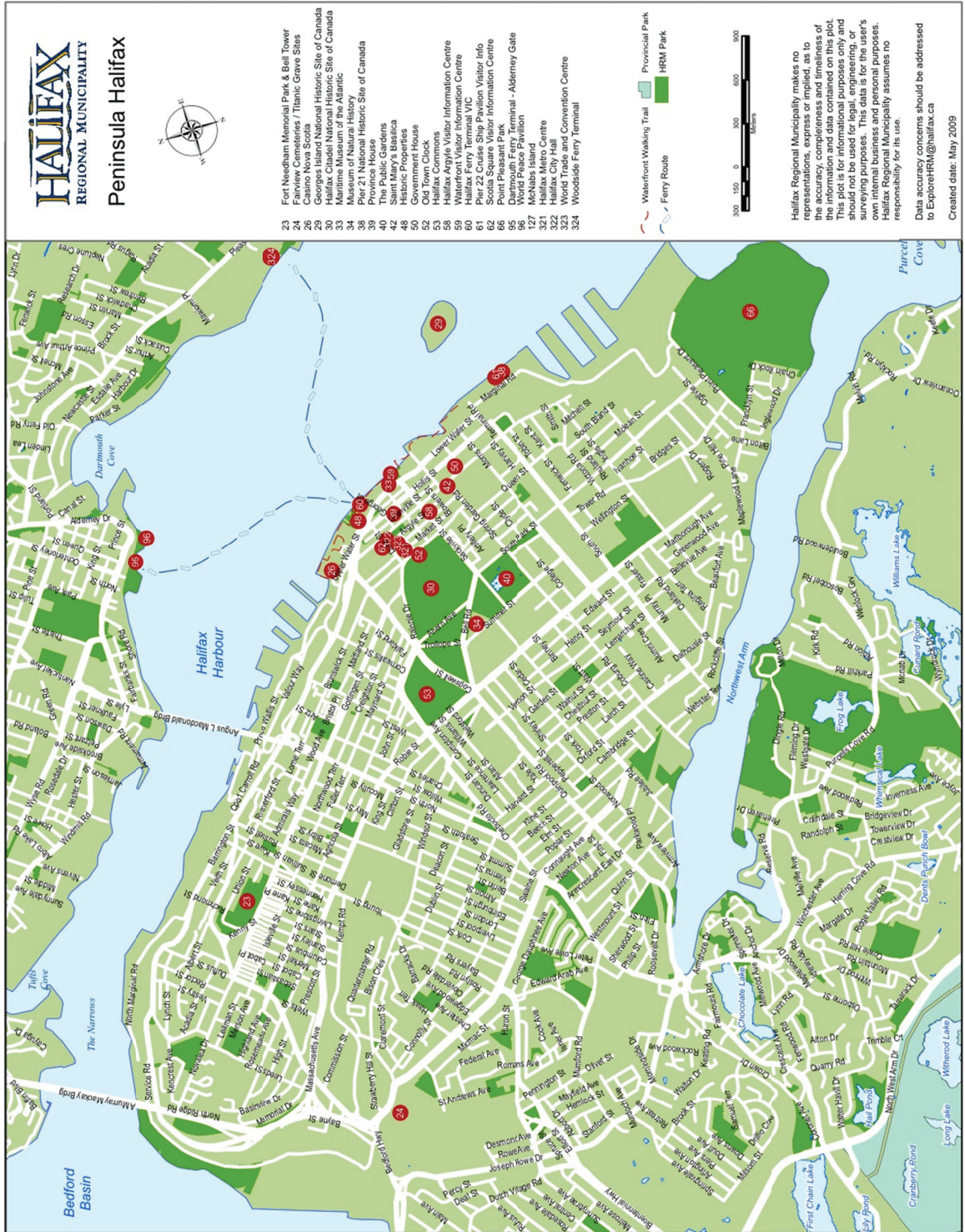
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Appendix A: Inclusion Criteria Map – Halifax Peninsula Boundaries



Appendix B: Recruitment Poster

HOW DO YOU COMMUTE TO WORK?
We're doing a study to look at women's commuting habits in Halifax, NS

- 👩 **Are you a woman between the ages of 40 and 54 years of age?**
- 📍 **Do you live in Halifax within the boundaries of the map above?**
- 🏠 **Do you live between 1 km and 10 km of your workplace?**
(That's approximately within a 2-hour walk, a 1-hour bike ride, or a 20-minute drive)

If so, then we'd like to hear from you!

Contact Kate • kate.johnston@dal.ca • (902) 452-2208

Appendix C: Honorarium Form

I confirm that I received \$ _____ as an honorarium for participating in the _____ interview of the “Commuting in Halifax, Nova Scotia” study.

Name: _____

Signature: _____

Date: _____

Appendix D: Participant Screening Questions

1. Are you a woman between the ages of 40 and 54 years of age? Y N
2. Do you work outside of your home? Y N
3. Do you work a minimum of two days per week? Y N
4. How would you generally classify the type of work that you do?

5. Do you live within the boundaries of the map that was on the recruitment poster - on or around the Halifax Peninsula (boundaries are roughly Purcells Road past Williams Lake to Keefe Dr.; Northwest Arm Drive between First Chain Lake and Witherod Lake; Joseph Howe Drive to the Bedford Hwy; within a few blocks of the harbour on the Dartmouth side)? Y N
6. Do you live between 1 and 10 km from your workplace?

If yes:

- o Provide them with information about the study:
 - o The study will examine the commuting habits of midlife women living in Halifax, Nova Scotia, specifically, commuting to and from work. The purpose of this study is to explore the reasons why midlife women do or do not use active transportation to commute to and from work.
 - o Time commitment is between 2.5 and 4 hours.
 - o It involves doing 1 in-depth interview, taking some photographs, and then getting together for a second time to review the photographs.
- o Get email / contact information to send consent form.

- o Have them provide some suitable times and locations that might work for an interview & let them know will contact them when I confirm a time and space.

Appendix E: Interview Guide – First Interview

Do you have any questions before we begin?

Part A: Sociodemographic Questions:

(Please circle the appropriate answer).

Q1: What is your age category?

- a) 40 – 44
- b) 45 – 49
- c) 50 – 54

Q2: What is the highest level of education that you have attained?

- a) Some secondary education
- b) Completed secondary education
- c) Some post-secondary education
- d) Completed a post-secondary degree (e.g. undergraduate, college diploma)
- e) Completed a graduate degree (e.g. medicine, graduate school)
- f) Other: _____

Q3: What is your approximate annual household income?

- a) Less than \$25,000
- b) \$25,000 - \$45,000
- c) \$45,000 - \$65,000
- d) \$65,000 - \$85,000
- e) \$85,000 - \$105,000
- f) \$105,000 - \$115,000
- g) Greater than \$115,000

Q4: How many people are in your household and have to rely on this income on a regular basis?

Q5: How did you find out about this study?

Part B: In-depth Interview

Active Transportation: refers to non-motorized forms of transportation, including walking, cycling, skateboarding, scootering, inline skating, manual wheelchairs, snowshoeing, cross-country skiing.

Built Environment: includes human-made aspects of the physical environment such as sidewalks, roadways, signage, lights, fences, etc.

Q6: Could you please identify the following on the map (approximately, not exactly):

- a) Place of residence
- b) Place of work
- c) Other places that you typically frequent when you're on your way to or from work (such as the grocery store, daycare or school, etc.). Please list and assign a letter below:

-
- Approximately how far is it to your work from home? If you do not know how far it is in terms of mileage or kilometers just tell me how long it would take to drive.

Q7: Can you describe for me how you typically get to and from work?

- Do you typically go straight from home to work and back again?
- Do you typically make other stops along the way? What kinds? (i.e.: shopping, errands, volunteer, childcare, etc.)?

Q8: Can you tell me a little about why you use the type of transportation mode that you typically use?

- Are there times when you use different modes of transportation for getting to and from work? Can you tell me about those times? What is different about them?
- Do you use different modes of transportation in the summer versus the winter? If so, what types, and can you tell me why?
- Approximately how frequently do you use the various forms of transportation that you just spoke about (walking, cycling, driving, transit, etc.) (Most of the time? Some of the time?)?
- Can you describe for me the route that you take when you drive? Walk? Cycle? Use public transport? For example, is it a route that involves lots of traffic? Are there bicycle paths on the route?

Q9: Can you tell me a little about what influences your decisions to use or not to use active modes of transportation?

- Time?
- Distance?
- Gear, clothing?

- Safety? Traffic patterns?
- Peer group? Family? Friends? Other (physical) activities/interests?
- Anything else?

Q10: Can you tell me how the features of the built environment influence your choice of transportation mode to get to and from work?

- What creates barriers?
- What encourages or facilitates?
- Road / sidewalk conditions?
- Paths?
- Infrastructure?
- Facilities at work? (Bike racks, showers, lockers, etc.)
- Anything else?

Q11: Can you tell me how the natural environment influences your choice of transportation mode?

- What acts as a barrier?
- What encourages or facilitates?
- Weather?
- Geography? Hills?
- Scenery? Vegetation?
- Anything else?

Q12: Can you tell me if your social roles and responsibilities influence your choice of transportation mode to get to and from work? If so, how and in what ways?

- What acts as a barrier?
- What encourages or facilitates?
- Children? Parents? Other caregiver roles?
- Partner? Household responsibilities?
- Career demands?
 - Type of work
 - Expectations at work – presentation/dress, time
 - Workplace policies – lateness, etc.
 - Scheduling
 - Use of AT during the workday?
- Volunteer responsibilities?
- Anything else?

Q13: Do you think there are any changes that could be made to make it easier for you to use active modes of transportation for commuting to and from work on a regular basis?

Imagine walking or cycling along the route that you take or could take to and from work.

- What would it take for you to change what you do to include more active transportation (particularly for those who are primarily drivers)?
- If safety has been a barrier for you, what improvements would make you feel safer?
- Can you think of changes that could be made to the built environment?
- Would decrease the time it takes you to do it? Or changes that could be made so that you had the time?
- Changes that would make it more pleasant for you?
- That would minimize the impact of the natural environment? Clothing? Gear?
- Could the people you know do anything (friends, family, colleagues) to facilitate?
- Could your workplace or employer?

Q14: What does active transportation mean to you?

- Are you interested in it?
- Is it important? If so, why? If not, why not? Is it about physical activity? Environmental protection? Traffic congestion? Etc.
- Do you feel pressure to use it? How does that make you feel? Is it positive, negative?

Q15: Do you have any other comments that you would like to make about the things that we have discussed today that might help me better understand your experiences?

- Active transportation,
- Built environment
- Natural environment
- Your social roles & responsibilities
- Physical activity in general?
- Your health and well-being?

Part C: Introduction to Photovoice Component of Study

Interviewer: The purpose of the photography component of this study is to get a visual representation of the barriers and enablers that we discussed during our interview and any others that you may think of. I'd like you to take the disposable camera that I will give you and take photographs of the things that influence your decisions to participate or not to participate in active transportation on a daily or regular basis. Please take photos of the built environment, the natural environment and your social environment if you feel that they are relevant. If you are taking photos of people, please try not to take photos that they can be recognized in (for example, take a picture of them from behind or from a distance where you cannot easily see their face). There is no right or wrong thing to take photos of. I am interested in what you feel is important.

We will discuss your photos and why you chose to take them, what they represent to you and why they are important in our second interview. Please take a moment to record information about each photograph on the log that you will be given with your camera. This will help us understand the context of the photos and will help in our discussion.

Please record the following information for each photo in the log:

- *The approximate location of the photograph (intersection or area of town)*
- *Your relationship to any individuals in the photograph (daughter, sister, etc.)*
- *Brief comment about why the photograph was taken*

Hand out instructions sheet for future reference, photo log and camera. Determine where and when camera will be picked up.

Interviewer: I'd like to collect the camera from you in approximately 2 weeks. Where and when is a good time to do this? I will contact you the day before I am coming to collect the camera to remind you.

Date: _____ Time: _____ am/pm

Location: _____

Interviewer: I'd like to book our second interview for 1 to 2 weeks after the camera has been collected. Is there a date and time that would work for you?

Second Interview:

Date: _____ Time: _____ am/pm

Location: _____

Appendix F: Interview Guide – Second Interview

Do you have any questions before we begin?

As you may recall, we were talking about your experiences and perceptions of active transportation in our last interview.

For the photography component you were asked to “take photographs of the things that influence your decisions to participate or not to participate in active transportation to get to and from work on a daily or regular basis. Please take photos of the built environment, the natural environment and your social environment if you feel that they are relevant.”

These are the photos that you took. (Take out photos and lay them on the table. Give participant time to review them.) I’d like to discuss the photos that you took and why you chose to take them.

Q1: Can you tell me about your photos (if you are referring to a specific photo, please give a very brief description of it for the sake of the audio-recorder)?

- Are any of them of things that influence your participation in active transportation more than others (either helping or hindering)? If so, which ones? How does the item in the photo help or hinder?

Q2: Do these photos capture the most important or key barriers and enablers to active transportation in your life? If not, could you tell me what is missing and why you weren’t able to take a photo of it?

Q3: Can you see any similarities or themes in the photos?

- Are there more photos of certain types of barriers or enablers? More built environment, natural environment or social roles and responsibilities? Can you tell me about why that might be?

Q4: Do you think any of these photos is more important or better than the others? Why?

- Does it represent a barrier or enabler that is more important or more significant than others for you?

Q5: Can you tell me about your experiences taking the photos?

- Did you enjoy it? Was it challenging? Did it change the way you view your neighbourhood? How did you feel taking the photos?
- Did it make you more aware of your neighbourhood environment? Did it make you feel like you could make changes to your participation levels in active transportation if you wanted to?

That concludes the question segment of this interview. If you would like, you can now review the transcripts from your first interview and then make comments. You do not have to review the transcripts if you do not wish to. Please feel free to comment, clarify something you said, or change something if you do not think you communicated it accurately, whether or not you choose to review the transcripts.

Q6: Is there anything you wish to add or comment on from your first interview about your experiences and perceptions of active transportation, and how the built environment, the natural environment and/or your social roles and responsibilities may affect those experiences and perceptions?

Thank you for taking the time to participate in this study. If you would like, I can send you a copy of the findings when the study is complete.

- o Yes, please send me a copy of the findings when the study is complete.

Email:

Appendix G: Photo Log

Date of Your First Interview: _____

# (admin use)	Location where photo was taken	Your relationship to the individuals in the photograph	Basic description (so we can identify the photo)	Brief comments about why the photo was taken

Appendix H: Participant Photo Instructions

Photograph Instructions

The purpose of the photography component of this study is to get a visual representation of the barriers and enablers that we discussed during our first interview and any others that you may think of.

I'd like you to use the disposable camera to **take up to 12 photographs of the aspects of your life and neighbourhood that influence your decisions to use or not to use active transportation to get to and from work on a daily or regular basis. Please take photos of the built environment, the natural environment and your social environment** if you feel that they are relevant. If you are taking photos of people, please do not take photos where subject's faces can be recognized (for example, take a picture of them from behind or from a distance where you cannot easily see their face). There is no right or wrong thing to take photos of. I am interested in what you think is important.

We will discuss your photos, why you chose to take them, what they represent to you and why they are important in our second interview.

Please record information about each photograph on the log that you will be given with your camera. This will help us understand the context of the photos and will help in our discussion.

For each photograph please record the following in your photo log:

- The approximate location of the photograph (intersection or area of town)
- Your relationship to any individuals in the photograph (daughter, sister, etc.)
- Brief comment about why the photograph was taken

The camera and photo log will be collected from you approximately two weeks from today. We have agreed that the camera will be collected from you:

on _____ at _____ from _____.
date time location

Our second interview is booked for: _____ at _____.
date time

If for any reason, you are not able to complete the photograph portion of the study, are not available for the camera pick up at the arranged time, or need to reschedule your second interview, please contact Kate Johnston at (902) 452-2208 or Kate.Johnston@dal.ca.

Kate Johnston, Principal Investigator
MA Health Promotion candidate
School of Health & Human Performance

Dalhousie University
(902) 452-2208 Kate.Johnston@dal.ca

Appendix I: Informed Consent Form – First Interview

Study Title: Commuting in Halifax, Nova Scotia: Exploring Midlife Women’s Experiences and Perceptions of Active Transportation

Degree Program: Master of Arts, Health Promotion
School of Health & Human Performance
Dalhousie University

Principal Investigator: **Kate Johnston, MA Candidate**
MA Health Promotion candidate
School of Health & Human Performance
Dalhousie University
6230 South Street, Halifax, Nova Scotia, B3H 3J5
Telephone: (902) 452-2208

Research Supervisor: **Dr. Lois Jackson**
School of Health & Human Performance
Dalhousie University
Telephone: (902) 494-1341
Fax: (902) 494-5120
Email: Lois.Jackson@dal.ca

Contact Person: **Kate Johnston**
School of Health & Human Performance
Telephone: (902) 452-2208
Email: Kate.Johnston@dal.ca

Please feel free to contact Kate Johnston if you have any questions or comments about the research, or if you require further information.

1. Introduction

You are invited to take part in a research study about women in midlife (ages 40 to 54) and commuting to and from work.

Taking part in this study is completely **voluntary**. If you decide to participate, you may stop the interview at any time. You do **not** have to answer any questions that you do not wish to answer. You may also withdraw from the study at any time until one week after your second interview has taken place.

A description of the study is below. It will tell you about what you are being asked to do, and what risks might be involved if you choose to participate. Taking part in this study might not help you directly, but we may learn things that could help others in your community.

2. Reason for the study

The study is being conducted to understand the reasons why women in midlife do or do not use active transportation modes such as walking or cycling to get to and from their workplaces and other locations that are visited on the way.

3. The study

The study will examine the commuting habits of midlife women living in Halifax, Nova Scotia, specifically, commuting to and from work. The purpose of this study is to explore the reasons why midlife women do or do not use active transportation to commute to and from work. Active transportation refers to non-motorized transportation, including walking, cycling, skateboarding, scootering, inline skating, using manual wheelchairs, snowshoeing, and cross-country skiing. The study will explore the experiences and perceptions of using (or not using) active transportation modes for getting to and from work for midlife women living on or around the Halifax Peninsula. The knowledge gained from the study will inform policymakers and programmers of the ways in which the built environment, social roles and responsibilities, and interactions with the natural environment, can be changed to promote and encourage the use of active modes of transportation. The term 'built environment' refers to the built or human-made characteristics of the environment including roads, sidewalks, green spaces, paths, parks and buildings. The term 'natural environment' refers to geographic characteristics such as weather, landforms and vegetation. The term 'social environment' refers to your roles and responsibilities such as those related to work, family, parenting, your spouse or partner, volunteerism, and also to cultural expectations and norms such as those related to gender, age, beauty, etc.

4. Who can take part?

You can take part if you are a woman between the ages of 40 and 54 years of age, if you live on or around the Halifax Peninsula, if you are working at least 2 days per week outside of your home, if your place of work is approximately between 1 km and 10 km from your home (which is approximately a 20-minute drive in regular traffic, a 1-hour bike ride, or a 2-hour walk), and if you do not have any chronic illness or injury that would prevent you from walking, cycling or using another mode of active transportation to get to work.

5. Who will be doing the research?

Kate Johnston, MA Health Promotion candidate, will be doing this research, and her MA thesis supervisor (Lois Jackson, PhD., Dalhousie University) will be supervising.

6. What you will be asked to do

The study involves three parts. The first part consists of a face-to-face interview to discuss how you usually commute to and from work that will take approximately one hour to complete, depending on how much you have to say. The interview will take place in a private room at your workplace, in a public library in the Halifax Regional Municipality, at Dalhousie University, or at a different location that is convenient for you and the interviewer. The interview will be conducted at a time that is convenient for you during the day or early evening. The second part involves taking photos of your regular commuting route. You will be asked to take up to 12 photographs of the things in your built, natural and social environments that create barriers or help you to use active transportation to get to and from work. You will be able to use your own digital camera to take the photos if you'd like, or a free disposable camera will be provided for you to take the pictures. The third part of the study involves a second interview, slightly shorter than the first. You will be asked to participate in a second interview approximately 2 to 3 weeks after the first interview, which will be between 30-minutes and 1-hour in length, to review and discuss the photographs that you have taken.

In the first one-on-one interview, you will be asked to talk about how you get to and from work. During this interview you will be asked questions about your experiences and thoughts about active modes of transportation. There are no right or wrong answers. You will be asked to talk about how the built environment, the natural environment and the social environment impact your choice to use or not to use active modes of transportation to get to and from work. You will also be asked to discuss how easy or hard it is, or it would be, for you to actively transport yourself (i.e.: walk or cycle) to and from work. You will be asked if and what types of improvements or changes would make it easier for you to use active modes of transportation (i.e.: walk or cycle) to get to and from work. You will also be asked to identify on a map important locations such as your home, work, and other places that you regularly visit on the way to and from work, to facilitate the discussion. You may also be asked about the routes (including the roads, sidewalks and paths) between those locations.

At the end of the first interview you will be given instructions for the photography component of the study. A free disposable camera will be provided if required, as well as a log to record the approximate location that the photographs were taken, your relationship to the subject(s) in the photographs, and brief comments about why the photographs were taken. You will be given approximately 2 weeks to take up to 12 photographs of your route(s) to work and your social environment and the things that influence your decisions to use or not to use active modes of transportation to get to and from work. It is expected that taking the photographs will require between 15-minutes and 1-hour of your time. After approximately 2 weeks Kate Johnston, the principle investigator, will collect the camera (or digital files) and photo log and will develop the pictures. The photographs will be used for discussion and to illustrate the themes discussed in the interviews.

A second interview will take place approximately two to three weeks after the camera or photos have been collected from you. It is expected that this interview will be shorter than the first (approximately 30-minutes to one hour in length). In the second interview you will be asked to discuss the photographs that you took as well as your experiences taking the photos. The photographs that you take will remain with the researcher.

Both interviews will be tape-recorded if you give permission. The tapes will be typed out word for word by Kate Johnston and will be stored in a locked filing cabinet at Kate Johnston's house or Dalhousie University until the study is completed. Once the study has been completed, the maps, audiotapes, and typed interviews will be kept at Dalhousie University for five years at which time they will be destroyed. Only Kate Johnston and Lois Jackson will have access to the maps, photos, audiotapes and typed interviews. Kate Johnston's thesis committee members, Dr. Renee Lyons, Dalhousie University, and Dr. Patricia Manuel, Dalhousie University, will have access to the photos, maps and transcripts once the personally identifying information has been removed. You will be given an opportunity at the second interview to review the typed out version of your first interview.

It is expected that the total time commitment required of you to take part in this study will be between 2 to 3 hours total over a 3-week period.

7. Possible risks or discomforts

There is minimal risk to taking part in this study. However it may cause you some discomfort or embarrassment. Talking about your neighbourhood and your social relationships might be upsetting to you because it may remind you of or bring up negative

experiences you may have had. Issues of personal safety may come up as well and you may be reminded of times when you have felt unsafe and frightened.

You will only be asked to talk about things that you are comfortable talking about.

8. Possible benefits

There are no direct benefits to you for participating in this study. The study may help us to understand what allows midlife women in Halifax, Nova Scotia to use active transportation, and what prevents them. It may also give us a better understanding of how women in midlife perceive and experience active transportation.

9. Honorarium

You will be given \$10 at the start of the first face-to-face interview, and \$10 at the start of the second face-to-face interview for participating in this study.

10. Confidentiality and Anonymity

The interview will be audio-recorded if you are comfortable with being audio taped and provide permission. If you do not give permission to be audio-recorded the interviewer will take notes. If the interview is audio-recorded, Kate Johnston will type it out word for word. Any names that you mention, or anything that might personally identify you will not be typed out or recorded. Kate Johnston will not discuss any personally identifying information about the participants in the study with other people. All audio-tapes, typed records and maps will be kept in a locked filing cabinet at Dalhousie University for five years after the completion of the thesis, at which time they will be destroyed.

The ideas and topics that are discussed in the interviews will be used for reports, publications and/or presentations. Direct quotes from your interview may be used but only if you provide permission. Your name will not appear with the quotes, however background information such as your age, the number of dependents you have or the distance between your home and workplace may be linked to the quote. Every effort will be made to protect your personal identity.

If you are not able to participate in the second interview, the photos that you take will not be included in the study and will be destroyed, unless you provide permission for their use.

11. Questions

If you have any questions about the study or about taking part in it, please contact Kate Johnston by telephone at (902) 452-2208 or by email at kate.johnston@dal.ca.

12. Problems or concerns

If you have any problems with this study, or want to talk about concerns you have about participating, you may contact Patricia Lindley, Director of Dalhousie University's Office of Human Research Ethics Administration, at (902) 494-1462, or patricia.lindley@dal.ca.

I have read the information provided about the study and have had all of my questions answered. I agree to take part in this study. I understand that taking part in this study

is completely voluntary and that I can stop at any time or refuse to answer any question.

Full name (please print): _____

Signature: _____

Date: _____

- I agree to have my interview tape-recorded.
- I agree to allow my quotes to be used in publications, reports or presentations.

Full name (please print): _____

Signature: _____

Date: _____

Please keep a copy of this consent form for your information. Thank you.

Appendix J: Informed Consent Form – Second Interview

Study Title: Commuting in Halifax, Nova Scotia: Exploring Midlife Women's Experiences and Perceptions of Active Transportation

Degree Program: Master of Arts, Health Promotion
School of Health & Human Performance
Dalhousie University

Principal Investigator: **Kate Johnston, MA Candidate**
MA Health Promotion candidate
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Research Supervisor: **Dr. Lois Jackson**
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Fax: (902) 494-5120
Email: Lois.Jackson@dal.ca

Contact Person: **Kate Johnston**
School of Health & Human Performance
Telephone: (902) 452-2208
Email: Kate.Johnston@dal.ca

Please feel free to contact Kate Johnston if you have any questions or comments about the research, or if you require further information.

1. Introduction

You are invited to take part in a research study about women in midlife (ages 40 to 54) and commuting to and from work.

Taking part in this study is completely **voluntary**. If you decide to participate, you may stop the interview at any time. You do **not** have to answer any questions that you do not wish to answer. You may also withdraw from the study at any time until one week after your second interview has taken place.

A description of the study is below. It will tell you about what you are being asked to do, and what risks might be involved if you choose to participate. Taking part in this study might not help you directly, but we may learn things that could help others in your community.

2. Reason for the study

The study is being conducted to understand the reasons why women in midlife do or do not use active transportation modes such as walking or cycling to get to and from their workplaces and other locations that are visited on the way.

3. The study

The study will examine the commuting habits of midlife women living in Halifax, Nova Scotia, specifically, commuting to and from work. The purpose of this study is to explore the reasons why midlife women do or do not use active modes of transportation to commute to and from work.

Definitions:

Active transportation refers to non-motorized transportation, including walking, cycling, skateboarding, scootering, inline skating, using manual wheelchairs, snowshoeing, and cross-country skiing.

Built environment refers to the built or human-made characteristics of the environment including roads, sidewalks, green spaces, paths, parks and buildings.

Natural environment refers to geographic characteristics such as weather, landforms and vegetation.

Social environment refers to your roles and responsibilities such as those related to work, family, parenting, your spouse or partner, volunteerism, and also to cultural expectations and norms such as those related to gender, age, beauty, etc.

4. Who can take part?

You can take part if you are a woman between the ages of 40 and 54 years of age, if you live on or around the Halifax Peninsula, if you are working at least 2 days per week, outside of your, if your place of work is approximately between 1 km and 10 km from your home (which is approximately a 20-minute drive in regular traffic, a 1-hour bike ride, or a 2-hour walk), and if you do not have any chronic illness or injury that would prevent you from walking, cycling or using another mode of active transportation to get to work.

5. Who will be doing the research?

Kate Johnston will be doing this research, MA Health Promotion candidate, and her MA thesis supervisor (Lois Jackson, PhD., Dalhousie University) will be supervising.

6. What you will be asked to do

You are being asked to take part in the second (and final) interview of this study. You have already participated in the first two parts, which involved a face-to-face interview and taking photographs. You are now being asked to participate in the second and final interview of this study. It is expected that this interview will be between 30-minutes and one-hour in length. The interview will take place in a private room at your workplace, in a public library in the Halifax Regional Municipality, at Dalhousie University, or at a different location that is convenient for you. The interview will be conducted at a time that is convenient for you and the interviewer.

In the second interview you will be asked to discuss your photographs. There are no right or wrong answers. You will also be asked if you would like to review the items that were discussed in your first interview.

This interview will be tape-recorded if you give permission at the end of this consent form. The tapes will be typed out word for word by Kate Johnston and will be stored in locked filing cabinet at Kate Johnston's house or Dalhousie University until the study is completed.

Once the study has been completed, the maps, audiotapes, and typed records will be kept at Dalhousie University for five years at which time they will be destroyed. Only Kate Johnston and Lois Jackson will have access to the maps, photos, audiotapes and typed records of the interviews. Kate Johnston's thesis committee members, Dr. Renee Lyons, Dalhousie University, and Dr. Patricia Manuel, Dalhousie University, will have access to the photos, maps and transcripts once the personally identifying information has been removed.

It is expected that the time commitment required of you to take part in this part of the study will be approximately 30-minutes to 1-hour.

7. Possible risks or discomforts

There is minimal risk to taking part in this study. However it may cause you some discomfort or embarrassment. Talking about your neighbourhood and your social relationships might be upsetting to you because it may remind you of or bring up negative experiences you may have had. Issues of personal safety may come up as well and you may be reminded of times when you have felt unsafe and frightened.

You will only be asked to talk about things that you are comfortable talking about.

8. Possible benefits

There are no direct benefits to you for participating in this study. The study may help us to understand what allows midlife women in Halifax, Nova Scotia to use active transportation, and what prevents them. It may also give us a better understanding of how women in midlife perceive and experience active transportation.

9. Honorarium

You will be given \$10 at the start of the second interview for participating in this study.

10. Confidentiality and Anonymity

The interview will be audio-recorded if you are comfortable with being audio taped and provide permission. If you do not give permission to be audio-recorded the interviewer will take notes. If the interview is audio-recorded, Kate Johnston will type it out word for word. Any names that you mention, or anything that might personally identify you will not be typed out or recorded. Kate Johnston will not discuss any personally identifying information about the participants in the study with anyone. All audio-tapes, typed records and maps will be kept in a locked filing cabinet at Dalhousie University for five years after the completion of the thesis, at which time they will be destroyed.

The ideas and topics that are discussed in the interviews will be used for reports, publications and/or presentations. Direct quotes from your interview may be used but only if you provide permission. Your name will not appear with the quotes, however background information such as your age, the number of dependents you have or the distance between your home and workplace may be linked to the quote. Every effort will be made to protect your personal identity.

If you are not able to participate in the second interview, then the photos that you take will not be used and will be destroyed, unless you provide permission for their inclusion and use.

11. Questions

If you have any questions about the study or about taking part in it, please contact Kate Johnston by telephone at (902) 452-2208 or by email at kate.johnston@dal.ca.

12. Problems or concerns

If you have any problems with this study, or want to talk about concerns you have about participating, you may contact Patricia Lindley, Director of Dalhousie University's Office of Human Research Ethics Administration, at (902) 494-1462, or patricia.lindley@dal.ca.

I have read the information provided about the study and have had all of my questions answered. I agree to take part in the second interview of this study. I understand that taking part in this study is completely voluntary and that I can stop at any time or refuse to answer any question.

Full name (please print): _____

Signature: _____

Date: _____

- I agree to have my interview tape-recorded.
- I agree to allow my quotes to be used in publications, reports or presentations.
- I agree to allow my photos to be used in publications, reports or presentations.

Full name (please print): _____

Signature: _____

Date: _____

Please keep a copy of this consent form for your information. Thank you.

Appendix K: Content of 1-page Results Summary Sent to Participants

Purpose: To develop an understanding of midlife women's perceptions and experiences of using active transportation (AT) for commuting to and from work, and the barriers and enablers to it.

Methods: A qualitative, grounded theory approach was used. Participants were recruited using posters and snowball sampling. Data was collected through in-depth, semi-structured, face-to-face interviews and using modified photovoice techniques.

SUMMARY OF RESEARCH RESULTS

Characteristics of the Route and Region:

Safety: Lack of safety is a major deterrent to the use AT. Safe AT routes were typically described as those that have dedicated space for walkers and cyclists away from traffic (particularly fast-moving traffic), that are well-maintained and do not contain hazards, and that minimize the threat and likelihood of being harmed by others.

Aesthetics: An aesthetically pleasing route can be a significant source of joy, motivating participants to use AT. Natural elements such as gardens, trees, parks and ocean views are very positive characteristics of commuting routes. Interesting architecture is also considered to be aesthetically pleasing.

Weather & Geographic Characteristics: The geographic characteristics of the region, including vegetation, weather and hills, also have an important impact on the choice to use AT. Poor weather can be a deterrent, while good weather can be a facilitator. The presence of hills can be both a positive and negative influence.

The Presence or Lack of Support:

Friends & Family: Friends and family regularly support AT through verbal messages and role modeling, however they can also be discouraging at times. Childrearing and household responsibilities can also be a barrier to the use of AT.

Workplace: Workplaces that require participants to travel frequently and that have high work demands put pressure on participants' time, increase fatigue, and are a barrier to the use of AT. Workplaces that have flexible work schedules facilitate the use of AT. Workplace facilities such as secure storage, and places to change and groom facilitate the use of AT.

Community: Participants consider Halifax to be a car-oriented city and reported that the cultural orientation to the car can be a barrier to AT, making it challenging, unpleasant and unsafe. There are signs that the city is starting to become more receptive and to AT.

The Perceived Value and Benefits of AT:

Participants noted many benefits of using AT, which motivate them and facilitate its use, including: improving health, interacting with the community and natural environment, protecting the natural environment, saving money and time, and cultivating joy. The more valued and important the benefit, and the ease with which that benefit can be gained using AT, the more willing participants seem to be to attempt to overcome the barriers to AT.

Responding to Barriers: Strategizing, Planning, Preparing & Acting:

The many benefits appear to motivate participants to use active modes of transportation for commuting purposes, however there is a great deal of informal work that goes into negotiating the

use of AT. Participants deal with barriers and challenges to AT by strategizing, planning and preparing for them. Some challenges require minimal effort to overcome, while others require significantly more effort, which is a barrier to the use of AT. There are many ways that participants respond to barriers including: planning and adjusting their route, being alert and defensive, changing their mode of transportation, using gear and equipment, building and using personal resources, and managing demands on their time.