Property size preferences and the value of private and public outdoor spaces amid a shift to high-density residential development: A case study of Kitchener-Waterloo, Ontario

by

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AUTHOR'S DECLARATION

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

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

Abstract

Planning policies in Ontario, such as the *Provincial Policy Statement* and the *Growth Plan for the Greater Golden Horseshoe*, enforce urban growth boundaries to preserve natural and agricultural lands while improving neighbourhood and city vibrancy. Consequently, urban areas must be intensified through high-density development, which will limit the land available for public green spaces and large private yards. As a result, homebuyers looking for spacious properties will have to rely mainly on the turnover of older homes. Therefore, this thesis explores how residents currently living in homes with private yards value private and public outdoor space, and whether they have interest in upsizing or downsizing their homes in the future. Neighbourhood and property attributes that may be influential in homebuyer decision-making are also investigated.

The cities of Kitchener and Waterloo ("Kitchener-Waterloo") were chosen as the study location, as both cities are affected by the *Growth Plan* and are currently being intensified. From March to August, 2012, a random sample of 1272 households living in homes with private yards were invited to participate in a survey on yard landscaping and maintenance practices and property preferences, after which a total of 206 surveys were analyzed.

Most respondents were living in medium-sized homes with medium-sized yards, and results indicated that homes and yards of medium size would be the most commonly preferred options if residents were to move (considering their household size, health, finances, etc.). On the whole, the target market for high-density homes (i.e. condominiums, small houses, and small yards) came mainly from the aging population. Nevertheless, when asked if they would ever live with less yard space in the future (when their household conditions could differ from what they were at the time of the survey), 58% of all respondents indicated that they may live in a home with a small yard and 41% indicated that they may live with no yard. Such a finding further indicated that residents may find high-density dwellings more appealing as they age.

Based on findings, ways of increasing the appeal of compact dwellings are discussed, such as including a small yard or balcony, providing privacy, ensuring access to public green spaces, and being located in a safe neighbourhood. Landscapes neat in appearance and designed with grass, colourful vegetation, trees, and natural gardens are also expected to increase property appeal.

Overall, if development is to remain restricted to built-up areas, developers and planners will have to create desirable high-density homes located in communities that accommodate the lifestyles of potential residents. This thesis addresses such a challenge by delineating target market groups with

the potential to move to high-density homes, and by providing insight into the variables that may increase the appeal of properties as landscapes are intensified.

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Chapter 1: Introduction

1.1 Managing Growth in Southern Ontario

One of the greatest growth hubs in North America exists within the Greater Golden Horseshoe (GGH), which wraps around the western edge of Lake Ontario from the County of Peterborough to Niagara (Ontario Ministry of Infrastructure [MOI], 2012). According to a recent forecast by Hemson Consulting Ltd. (2013), the population of the GGH may reach almost 12 million by the year 2031 –an increase of nearly 33% since 2011. Over this time, the proportion of seniors will increase as the baby boomers (born between 1946-1965) age, and populations of immigrants will continue to rise (Hemson Consulting Ltd., 2013).

During the second half of the 20th century, an increase in population may have been accommodated by consuming farmland to develop low-density single-detached houses with spacious private yards. Generally referred to as *urban sprawl*, such development began dominating North American landscapes during the post-World War II building-boom, largely as a result of improved transportation and the construction of highways, which created gateways between workplaces in the urban cores and homes in the countryside (Downs, 1998; Johnson, 2001; Squires, 2002). Over time, negative environmental, economic, and social impacts from sprawl have emerged (see reviews by Cook, Hall, & Larson, 2012; Downs, 1998; Johnson, 2001; Nechyba & Walsh, 2004; Robbins & Birkenholtz, 2003; Squires, 2002). Repercussions include fragmentation and loss of natural and agricultural land; changes in vegetative cover and habitat; and decreased opportunities for citizens to connect with nature. In addition, development beyond the urban periphery has required extensive infrastructure and energy to service new regions and provide residents with water (delivery and removal), natural gas, electricity, and garbage pick-up (Burchell & Mukherji, 2003; Hare, 2001; Johnson, 2001; MOI, 2012; Wolfe, 2002). Automobile-dependence accompanying sprawl has also been associated with air pollution and traffic congestion (Zande, 2006), and increased amounts of impermeable surfaces (such as roads) that add to urban heat island effects and cause decreased groundwater infiltration, increased chemical runoff and increased potential for floods (Cook, Hall, & Larson, 2012; Mejía & Moglen, 2009, 2010). In addition, low-density communities have lacked social vibrancy as residents have come to rely on automobiles to reach workplaces and amenities, which are often located in strip malls or industrial parks rather than along walkable, lively streets (Downs, 1998; Gurin, 2003).

Today, to accommodate the evolving population and avoid perpetuating sprawl, Ontario planning policies support land use and development that is sustainable from environmental, economic, and social standpoints. Under the Planning Act, all planning decisions are to be consistent with the Ontario *Provincial Policy Statement* (PPS; Ontario Ministry of Municipal Affairs and Housing [MMAH], 2005). The PPS allows for efficient development that supports strong communities, economic growth, public health and safety, environmental quality and the protection of key resources (MMAH, 2005). Enacted under the 2005 *Places to Grow Act*, the *Growth Plan for the Greater Golden Horseshoe* ("Growth Plan") guides growth until the year 2031, and builds upon the PPS objectives by taking into consideration long-term growth projections and demographic, economic, and geographic characteristics of the GGH. The Growth Plan has been regarded as one of the most progressive planning strategies in North America (MOI, 2006), with objectives modelled after *smart growth* – a planning framework that first emerged in the late 1990s to curtail sprawl (Burchell, Listokin, & Galley, 2000; MOI, 2013a). Smart growth is a set of principles that generally aim to preserve natural and agricultural lands; intensify built-up areas; develop a sense of place within communities through vibrant, pedestrian-oriented streets with mixed uses; utilize existing or green infrastructure; offer a range of affordable housing and transportation options; increase social equity; and create well-connected 'complete communities' powered by strong local economies (Ontario Ministry of Public Infrastructure Renewal [MPIR], 2006; Smart Growth Canada Network [SGCN], 2007; Smart Growth Network [SGN], 2012; United States Environmental Protection Agency [EPA], 2011; Zande, 2006). Goals of *smart growth* are similar to those of another strategy, *new urbanism*, except that new urbanism places greater focus on urban design, assuming that increased quality of life can result from physical form (Talen, 1999). Furthermore, the principles of *transit oriented development* (TOD) are aligned with, and may be integrated within, smart growth plans. TOD is based around the premise that high-density residential lands and mixed-uses around transit stations will be valued for their advantages in accessibility, provide a tax base and appropriate level of ridership to fund the system and divert automobiles from the road (Affordability and Choice Today [ACT], 2009; Calthorpe, 1993; Cervero, et al., 2004; Dieleman & Wegener, 2004; Dittmar & Ohland, 2004).

In addition to smart growth principles, the Growth Plan includes specific urban growth boundaries and targets for intensification and density. According to the PPS, intensification requires an increase in density within previously developed areas through methods such as redevelopment, infill, expansion or conversion of existing buildings, or development of underutilized or vacant lots

(MMAH, 2005). Under the Places to Grow Act, municipalities have updated their Official Plans (OPs) to conform with the Growth Plan (MOI, 2013b). As shifts in landscape patterns occur and greenfield lands become scarce, developers are questioning whether high-density residences (such as apartments, condominiums, townhouses) will meet actual market demand, or whether an increase in low-density dwellings (mainly single-detached houses) should be accommodated.

1.2 Study Purpose

As Growth Plan initiatives are realized and city populations and urban structure evolve, it is important that planners re-evaluate resident expectations and preferences to track potential changes in market demand. Large areas of residential landscapes have previously been dedicated to private yards (Mathieu, Freeman, & Aryal, 2007), but intensification limits the land available for new private and public green spaces (ACT, 2009). Thus, households looking for spacious lots will have to rely mainly on the turnover of older houses. Ontario is characterized by growing populations of young professionals, empty nesters, aging baby boomers, and immigrants, who may embrace the lifestyle that high-density neighbourhoods can offer. Nevertheless, a large cohort of the population in their child-bearing years may continue to seek a suburban lifestyle. Studies indicate that households value yards for many reasons, such as providing a connection to nature, helping to establish a home, and as a space for recreational and social activities (Blaine, Clayton, Robbins & Grewal, 2012; Francis & Hester, 1990; Gross & Lane, 2007; Kortright & Wakefield, 2011). Therefore, if high-density landscapes are to attract residents who currently live on low-density properties, it is important that compact environments maintain the quality of life associated with suburban living. Consequently, this study investigates households living in homes with yards to determine their potential interest in moving to low- and high-density properties, and whether access to outdoor spaces and other amenities may influence decisions on where to live. In addition, aspects of yards and public outdoor spaces that are valued by residents are explored in order to suggest ways of incorporating attractive features into small private outdoor spaces and common green spaces.

1.3 Thesis Objectives and Research Questions

To guide the study, five major objectives have been defined, along with research questions that address each objective. Most research questions pertaining to property preferences will be investigated based on resident subgroups of:

- couples with children and without children;

- age groups (age 25-45; 46-55; 56-65; 66 and older);
- working and retired respondents; and
- household income brackets ($50,000-74,999; $75,000-99,999; $100,000-149,999; $150,000-249,999)

Objectives appear in bold, with relevant research questions listed below.

1. **To determine if residents currently living in homes with private yards may move to more compact dwellings, and to describe the types of residents who are most, and least, likely to do so.**
    - What are the current residence and yard sizes of each resident subgroup?
    - How would resident subgroups differ in their residence and yard size preferences if they were to move to another home (considering their current household size, finances, health, etc.)?
    - What proportions of each resident subgroup are likely to move in 0-5 years; 6-10 years; and 11-25 years?
2. **To discuss whether the proportion of residents who may move from low-density to high-density dwellings is likely to support an ongoing demand for low-density dwellings.**
    - What proportion of residents would have preference for upsizing and what proportion would have preference for downsizing, if they had to move (given their current household size, finances, health, etc.)?
    - When do residents living in each home size (i.e. small, medium, and large) plan to move?
3. **To investigate if, and how, residents value private outdoor space and to determine key features of private outdoor spaces that may appeal to potential homebuyers**
    - How important were yard characteristics when residents chose their current home?
    - What are the important ways that residents use their yards?
    - How important is yard appearance?
    - How much time and money are residents willing to devote to their current yards?
    - What types of yard landscapes generally appeal, and do not appeal, to residents, and why?
4. **To investigate if, and how, residents value public outdoor space and to determine key features of public outdoor spaces that may appeal to potential homebuyers.**

- What do residents like to have in public outdoor spaces?
- How important was public outdoor space when residents chose their current home?
- How important would public outdoor space be in encouraging residents to live with no private yard or a small private yard in the future?

5. **To identify other property and neighbourhood attributes that may act as "sway factors" to encourage homebuyers to choose a property in a high-density environment.**
    - What property and neighbourhood attributes encouraged residents to choose their current homes?
    - What characteristics do residents suggest may encourage them to live with a small yard or no yard in the future?

1.4 Use of Terms

The terms *high density* and *compact* are used within this thesis to describe a landscape that is intensified with residential buildings such as apartments, condominiums, and town houses (i.e. that have no yard space or small yard space); and *low density* is used to describe a landscape that is more spacious and sprawling, characterized mainly by single-detached dwellings (i.e. that have medium, large, or very large yards). Furthermore, when discussing cities on the whole, the term *landscape* refers to the topography and collective land uses and urban forms that are encompassed within the city area. Meanwhile, when discussing specific outdoor spaces (such as private yards or public parks) *landscape* or *landscaping* are terms used to describe the type and design of vegetation within the green space.

1.5 Kitchener-Waterloo as a Case Study

This research focuses on the mid-sized Cities of Kitchener and Waterloo ("Kitchener-Waterloo"), Ontario, which are part of the Regional Municipality of Waterloo ("the Region") located within the GGH. With a population of nearly 220,000, Kitchener is the largest city in the Region, while the City of Waterloo ranks third with a population of nearly 99,000 (as of the 2011 Census; Statistics Canada, 2012a,b). In response to the Growth Plan and the Region of Waterloo OP, urban growth boundaries and density targets have been incorporated into the OPs of Kitchener and Waterloo (City of Kitchener, 2010a; City of Waterloo, 2012c). Intensification has been occurring across the region over the past decade, as single-detached houses as a percentage of new dwellings has gone from 73% in 2002 to 39% in 2012, with apartments becoming more common particularly in the last three years

(Regional Municipality of Waterloo, 2013). Therefore, this study investigates a location impacted by the Growth Plan to provide a snapshot of residential preferences at a time when intensification initiatives are being executed. As a result, the study can act as a reference to investigate preference changes at a later date when additional Growth Plan objectives are further realized.

1.6 Research Method Overview

A random sample of households living in homes with private yards across Kitchener-Waterloo were invited to participate in a questionnaire adapted from similar surveys conducted in 1995 (Suffling unpublished, 1995) and 2004 (Ellis unpublished, 2006) under the direction of Dr. Roger Suffling. The previous surveys focused mainly on yard landscaping and maintenance practices, while the 2012 survey also included questions related to residence and yard size preferences, and neighbourhood characteristics important in homebuyer decision-making. The recipients of the 1994 mail surveys were determined based on a randomized sample of tax rolls, and the 2004 sample consisted of the 1994 addresses in addition to a random sample of areas developed since 1994. The same addresses that received invitations to participate in the 2004 study were invited in 2012, along with a random sample of addresses for homes that had been built after the 2004 survey. Sampling occurred between March 2, 2012 and August 1, 2012, after which a total of 206 participants had responded with surveys that could be analysed. Descriptive and inferential statistics using chi square tests were then derived using Microsoft Excel and the statistics program, R (R Development Core Team, 2011).

1.7 Thesis Layout

This thesis begins with a review of literature on the ways that residents value private and public outdoor spaces. Next is a chapter on the study site of Kitchener-Waterloo, which gives a description of the area and its typical development patterns. Chapter four describes the study methods, and chapter five presents the survey results. The discussion chapter then interprets the results and relates them to the literature and other relevant documents. To conclude, a summary is provided and recommendations directed at planners, developers, and government agencies are offered regarding residential land use and landscape design as Growth Plan objectives come to fruition. Appendices include calculations used to determine sample sizes; detailed statistical results; a complete copy of the questionnaire; comparisons in respondent yard size categories as estimated by respondents compared to estimates using GIS data; and respondent yard sizes in comparison to Kitchener and Waterloo city data.

Chapter 2: How Residents Value Private and Public Outdoor Space

2.1 Introduction

Intensification of residential landscapes reduces the amount of open space that may be dedicated for public green space or private yards. Consequently, it is important that planners, landscape architects, and developers consider which aspects of private and public green spaces are important to residents so that key features can be integrated into new developments and public spaces. Therefore, the following chapter begins with an exploration of whether private yards are important to residents, with a focus on how yards may contribute to quality of life and how yard appearance may help establish a home, impact maintenance requirements, and be affected by neighbourhood norms. Next, known benefits of public outdoor space, community gardens, and views are outlined to investigate the importance of conserving public green space and whether it may encourage residents to live with minimal private outdoor space. The remainder of the chapter relates to how public outdoor space may impact property values; the types of landscape elements that may be important to preserve or incorporate across communities; and factors to consider when planning for public green spaces.

2.2 How Households Value Private Yards

Research indicates that private yards contribute to quality of life in various ways, acting as a setting to establish a home, express identity, provide privacy, pass along traditions, build relationships, develop connections with nature, provide food, and improve physical and mental health (Blaine et al., 2012; Francis & Hester, 1990; Gobster, Nassauer, Daniel, & Fry, 2007; Gross & Lane, 2007; Kortright and Wakefield, 2011). Often, yards are valued as areas in which to relax and release stress (Bhatti & Church, 2004; Gross & Lane, 2007), as exposure to natural environments has been known to positively affect health and well-being (Francis & Hester, 1990; Parsons, 1991). For instance, many youth participants in a study by Gross and Lane (2007) chose to complete stressful tasks, such as homework, outdoors. Furthermore, yards can represent independence, as areas where children can play free from parents, and as symbols of character and status in mid-life (Gross & Lane, 2007). Thus, the inability to manage a yard later in life can also represent a loss of independence, making this transition a particularly difficult one for avid gardeners (Bhatti, 2006; Gross & Lane, 2007).

Most participants in a study by Gross & Lane (2007) indicated that their desire for a garden did not arise until they became homeowners. Gardening can be an enjoyable hobby (Bhatti & Church, 2000) and, as evident in a study conducted in Toronto by Kortright and Wakefield (2011), gardening can

have a different meaning for everyone. In their study, gardens were classified based on how they were valued by residents, including "teaching gardens", "cook's gardens", "environmental gardens", "hobby gardens", and "aesthetic gardens" (Kortright & Wakefield, 2011, p. 44-45). They found that immigrants would garden for comfort, since it reminded them of practices in their home countries. In addition, gardens were considered useful to teach children about nature (also noted by Longhurst, 2006), and people were generally more likely to grow their own food if their parents had taught them in childhood (Kortright & Wakefield, 2011). Evidently, tending to the garden can be important for enjoying private outdoor space, and likely contributes to the desire to own properties with yards.

Arnold and Lang (2007) note that households today differ from those of the early-to-mid 1900s, when yards for the middle-class family became common in suburbs. Compared to the past, current households tend to be characterized by fewer children, men *and women* working full-time, single-parents, or individuals living alone (Industry Canada, 2011). Busier lifestyles may leave less time for yard use and maintenance, and entertainment such as television, computers and video games may keep most activities indoors (Arnold & Lang, 2007). This assumption is supported by the results of the study by Arnold and Lang (2007), in which Los Angeles households with young children and parents working full time spent little leisure time in their private yards. Nevertheless, those same families generally invested in yard furniture and were concerned with the appearance of their yards. In other words, residents may value owning a yard, even if it is not often used. On the whole, yards tend to be valued by residents as places to view (i.e. to observe nature), as places to use (i.e. for physical activity and socialization) (Blaine et al., 2012), and as places to find mental peace (Bhatti & Church, 2004; Gross & Lane, 2007; Francis & Hester, 1990; Parsons, 1991).

2.3 The Importance of Yard Appearance

Yards occupy a large portion of residential landscapes and can contribute to the aesthetic cohesion of a community, so yard appearance is often important to homeowners and can impact property value (Robbins and Sharp 2003b; Yabiku, Casagrande, & Farley-Metzger, 2008). Well-maintained yards can be a source of pride, and households with unkempt yards are generally looked at negatively by society (Blaine et al., 2012; Henderson, Perkins, & Nelischer, 1998; Nassauer, 2011; Pollan, 1991). In particular, there is an expectation that front yards should appeal to neighbours and help create a unified landscape across the community (Arnold & Lang, 2007; Blomley, 2005; Pollan, 1991). Many studies have found that designs in front yards tend to differ from backyards, with front yard designs in accordance with local norms and backyard designs expressing unique household preferences (Fraser

& Kenney, 2000; Larsen & Harlan, 2006; Nassauer et al., 2009; Zmyslony & Gagnon, 2000). For example, Zmyslony and Gagnon (2000) studied the relationship between spatial factors and front yard similarity in residential neighbourhoods in Montréal. They found evidence of "neighbour mimicry", with about 20% of the of front-yard vegetation varying with distance, and more similarity between yards on the same side of the street (Zmyslony & Gagnon, 2000). Moreover, Larsen and Harlan (2006) found that income was a strong predictor for front yard preferences, while personal preference was a strong indicator of preferences in the backyard.

Societal norms that influence yard appearance may be introduced through entertainment sources such as magazines, television shows, books, and the internet (Longhurst, 2006). In addition, minimum expectations for yard appearance may be imposed by bylaws, such as those for the Cities of Kitchener and Waterloo, which require yards to be free of undesirable materials such as garbage or weeds and long grass (i.e. over 6" in Waterloo), and require the removal of vegetation that may pose a safety hazard (City of Kitchener, 2010d; City of Waterloo, 2012b). Perhaps the strongest norm across North American yard landscapes is to have a pristine manicured lawn (Pollan, 1991; Robbins & Birkenholtz, 2003). The importance of lawns and their appearance is rooted in history. As described by Feagan and Ripmeester (1999), until about the mid-1800s, manicured lawns were exclusive to the wealthy, who aimed at creating the rural feel of English estates. By the end of the 19th century, norms were being established as middle-class households grew lawns to mimic the rich and portray the image of an ideal orderly household. Expectations increased after World War I, and by the 1930s, the ability to hire others to maintain the yard was desirable (Feagan & Ripmeester, 1999). Although the lawn was established as a residential feature by the early 1900s, industrialization, monoculture, and advances in yard chemicals following World War II further established the lawn as a landscape to conform to neighbourhood expectations (Robbins & Birkenholtz, 2003; Robbins & Sharp, 2003b).

Unfortunately, establishing pristine lawns requires maintenance activities that can impact the environment and are difficult to measure and control, as summarized in review articles (e.g. Cook, Hall, & Larson, 2012; Robbins & Birkenholtz, 2003). Some examples include air pollution attributed to lawn mowing; altered water inputs and pressure on water systems from watering lawns; and other issues attributed to the application of lawn chemicals (i.e. herbicides, pesticides, fertilizers) such as altered ecosystems and chemical runoff that causes unhealthy levels of nutrients and toxins in waterways and groundwater. Although households claim to care about environmental health, people tend to use lawn chemicals to create an idealistic lawn (Robbins & Sharp, 2003a). For example, Ohio

households surveyed by Blaine et al. (2012) generally believed that "property values" and "neighbourhood pride" would be positively impacted if their neighbours applied lawn chemicals (either themselves or using a company). Robbins and Sharp (2003a) discuss the important role that yard chemical companies play in encouraging chemical application, including market strategies that convey messages tying household values and environmental health to lush, weed-free lawns.

Feagan and Ripmeester (1999) suggest that lawns dominate the North American landscape mainly because they are accepted as the norm. These norms may be challenged if other landscape designs are more appealing, environmentally acceptable, or more suitable to certain physical landscapes. In addition, since some people love having nice gardens but not everyone enjoys or has time for yard care (Longhurst, 2006), property preferences may also be influenced by levels of required yard maintenance (Larson et al., 2009). Naturalized landscapes are being discussed as helpful for supporting native species populations and biodiversity and, depending on the situation, requiring less work and fewer expenses (Longhurst, 2006; Özgüner, Kendle, & Bisgrove, 2007). Some studies have explored the acceptance of lawn alternatives, and who may be interested in such designs. For example, Helfand, Park, Nassauer, and Kosek (2006) found that people were willing to pay less for conventional lawn landscapes than for landscapes with native plants integrated into appealing designs. In addition, Hope et al. (2003) conducted a study in Arizona, and saw what they called a "luxury effect" where plant diversity was positively correlated with income levels. Moreover, Henderson et al. (1998) indicate that physical landscape characteristics likely influence landscape choices. They conducted a study in Guelph, Ontario, and found that alternative landscape designs tended to exist in older neighbourhoods, often in the presence of certain key features, for reasons discussed below:

- **Older, large trees** provide additional shade that makes it harder for grass to grow, and may increase privacy and create a sense of enclosure, encouraging residents to be more creative in their designs
- **Narrow boulevards** may be thought of as part of the property, creating an increased sense of ownership in comparison to wider boulevards that commonly have buried utilities and are associated with city streets
- Small strips of lawn in **small yards** may seem impractical to bother mowing
- **Mature vegetation** on the streetscape and sometimes in adjacent woodlots appropriately blend with alternative designs

- **Older, established communities** may welcome diversity as part of their character; whereas newer neighbourhoods tend to be relatively homogenous
- **Overall congruency with surrounding landscape** may make alternative designs more acceptable from the perspective of neighbours

The way that residents value using their yards may also impact how they choose to design their outdoor spaces. Larson et al. (2009) found that comfort and leisure were important factors in landscape preferences, and that cleanliness and familiarity sometimes related to comfort. Moreover, wildlife attractions may be important since connection with wildlife can make time spent in the yard enjoyable for some people (Gross & Lane, 2007). Privacy also tends to be a prime function of property (Blomley, 2005), so it is often important that yard designs prevent neighbours from seeing into homes and viewing outdoor activities. Ideal levels of privacy are often linked to large detached houses (Lindsay, Williams, & Dair, 2010); however, despite the substantial size of some front yards, many households refrain from using front yards because they are open to the street (Arnold & Lang, 2007). Thus, Lindsay et al. (2010) emphasize the importance of maintaining privacy in high-density environments.

In summary, homeowners place significant value on yard appearance, and their yard designs and management practices tend to be influenced by societal norms. Although lawns tend to dominate residential landscapes across North America, homeowner preferences for alternative yard vegetation may be influenced by factors such as required maintenance, environmental impacts, physical landscape characteristics, intended yard uses, and privacy.

2.4 Benefits of Public Green Space

Recently the Husqvarna Group released their 2013 *Global Green Space Report* based on a survey conducted in November 2012. Their results indicated that global use of green space is declining, although nearly 90% of world citizens believe having access to green space is a human right. Of the Canadian respondents, 56% believed that green space "contributes a lot" and 29% believed that green space "contributes somewhat" to quality of life. Jim (2008) also alludes to the importance of green infrastructure in maintaining and increasing quality of life, particularly for residents of metropolitan areas.

Just as private yards help establish household identity, Heidt and Neef (2008) highlight that urban green spaces can give character to a city, providing the example of Central Park in New York City.

They note that such spaces can create order in a city, improve the aesthetic experience, provide a sense of privacy, allow people to connect with and learn about nature, and give people a place to relax and exercise (Heidt & Neef, 2008). It is no surprise, then, that such spaces are valuable features in a community, and likely help create a sense of place at the neighbourhood level. For example, when asked to describe their neighbourhood, participants of a study by Kaplan and Austin (2004) mentioned features of nature or open space more frequently than all other categories – an example of the importance that the outdoor environment has in establishing community character.

Public outdoor spaces may be valued as settings for formal community events as well as informal personal and group enjoyment (Birch, 2007). Various studies indicate that areas with natural features (particularly trees) tend to attract people, allowing for social interaction, and, as Coley, Kuo, and Sullivan (1997) highlight, the potential for greater supervision and safety. For instance, using manipulated photographs, Kuo, Bacaicoa, and Sullivan (1998) found that increased tree density and grass maintenance in a courtyard were positively associated with perceived safety, particularly if views were relatively unobstructed. Moreover, Kuo and Sullivan (2001) investigated crime rates in public housing apartment buildings in another area of Chicago, and found that the amount of greenness surrounding a building was inversely related to the number of violent and property crimes. Furthermore, Taylor, Wiley, Kuo, and Sullivan (1998) found that children growing up in public housing areas of the inner-city who played in areas with high vegetation levels had greater levels of play and were more likely to be near adults than those in areas with less vegetation. Older generations also benefit from green spaces, as evident in a UK study by Kweon, Sullivan, and Wiley (1998), who found a correlation between the time that older residents (between the ages of 64 and 91) spent in common green spaces, and the interaction they had with neighbours and their sense of community.

As with private yards, mental and physical health benefits are associated with exposure to public green space. Respondents of the Husqvarna (2013) study seemed aware of such effects, as 76% indicated that public green space was effective or very effective in reducing stress and/or anxiety and 47% believed it was effective or very effective in reducing problems with concentration. Based on their Danish Health Interview Survey, Stigsdotter et al. (2010) found that individuals who were less stressed tended to visit green spaces for physical and social outdoor activities, while stressed individuals visited natural areas to relax. While community landscapes may be used concretely for exercise or relaxation, public spaces may also be used simply to enjoy the environment. For instance,

Schipperijn et al. (2010) found that "to enjoy the weather and get fresh air" (p.133) was the most common reason for visiting green space, listed by about 87% of their respondents. Accessibility is a key factor to benefitting from public spaces, evident in the study by Stigsdotter et al. (2010), who found that those living further than one kilometer from green space generally reported poorer health than those living closer, and were more likely to experience stress than those living within 300m of green space.

In order to live closer to nature, 39% of the Husqvarna (2013) respondents said that they would live further from entertainment and 33% said they would increase their commute time, while fewer would be willing to live further from friends or family and only 6% said they would be willing to pay more taxes. The study results indicated that the average Canadian lives within 10 minutes of a park and 25 minutes of a forest, yet 25% of participants were not satisfied with the amount of time they spent in parks and 37% were not satisfied with the amount of time they spent in forests. The importance of accessibility to green space was also apparent the study by Schipperijn et al. (2010), in which over 90% of people living less than 300m away from green space visited the space on a weekly basis, and 43% visited it daily. Furthermore, participants of the Husqvarna (2013) study had particular concern for the lack of time that children spend in green spaces compared to when respondents were young. Thus, 74% of respondents indicated that they would like their children to spend "more" or "much more" time in gardens; and 79% and 64% indicated the same for parks and forests, respectively. Richard Louv (2008) elaborates on such concern for connecting children to the environment in his book, *Last child in the woods: Saving our children from nature deficit disorder*. Overall, public green space can positively impact quality of life in ways comparable to private yards, by providing serene and safe environments that promote recreation, social interaction, and connection to nature.

2.5 Values of Community Gardening

Community gardens can also provide benefits similar to those obtained in domestic gardening (Armstrong, 2000; Blake & Cloutier-Fisher, 2009; Kortright & Wakefield, 2011). For example, Armstrong (2000) found that citizens in upstate New York used community gardens for reasons such as accessing fresh food, enjoying nature, and improving mental health. While privacy is lost in garden sharing, the associated social interaction can provide numerous advantages. Hancock (2001) highlights that community gardening can facilitate new relationships among community members of various ages and cultural backgrounds, and encourage them to share recipes and gardening knowledge. He also notes that food grown can help support low income families, who may take the

food home directly from the garden or may find it at a local food bank. In addition, as people age, their reduced ability to garden can be devastating (Bhatti, 2006), so community gardens can be important in retirement communities (Armstrong, 2000). For many of the aforementioned reasons, Armstrong (2000) found that organized community gardens generally improved neighbourhood conditions, particularly in low-income communities.

Although community gardens are desirable, land is not always available to support their existence. Therefore, Blake and Cloutier-Fisher (2009) discuss the concept of backyard garden sharing to overcome the struggle for space. Garden sharing programs allow community members to design, maintain, and/or utilize the garden of another homeowner. The study revealed a variety of social, physical, and mental benefits that were experienced by both the non-senior volunteer gardeners and the senior homeowners with whom they were partnered. Homeowners that seemed to gain the most value were citizens in poor health, who could not manage their gardens without help. Therefore, garden sharing may become more important as Canada's 'baby boomer' generation ages. Furthermore, in addition to gaining a portion of the food grown, volunteers enjoyed access to a natural environment that was not available in their current living arrangements. Blake and Cloutier-Fisher (2009) suggested that garden sharing has the greatest potential for success in areas where environmental resources are limited and when there is a designated project coordinator. Overall, community gardening and garden sharing have similar benefits to gardening at home, but their appeal may depend on the level of social interaction people desire when gardening.

2.6 Values Associated With Views

A key characteristic of compact development is "building up", with above-ground residences that trade private yards for a balcony and a view. Just as greater health values are associated with experiences in natural landscapes, views of natural landscapes tend to be more beneficial than those of urban landscapes, contributing positively to health and well being, and correlating with mental and physical recovery from stress and illness (Velarde, Fry & Tveit, 2007; Ulrich, 1986). For example, Ulrich (1984) found that patients recovering from gall bladder surgery in rooms with windows that looked onto trees experienced better recovery than those in rooms with windows facing a brick wall. Interestingly, it seems that views also have a unique correlation with success. Matsuoka (2010) found that cafeteria and classroom windows with views of landscapes abundant with trees and shrubs were correlated with lower crime rates, and with greater educational performance and college ambitions than were views of lawns, playing fields, and parking lots. Similarly, Tennessen and Cimprich (1995)

found that students living in dormitories with windows looking onto more natural views (e.g. lakes and trees) scored better on tests of directed attention than those living with views lacking the same quantity of natural features (e.g. city streets and other buildings). In other words, as noted by Kaplan (2001), the content of the views from homes without yards should be considered in order to increase the appeal of high-density residences.

2.7 Impacts of Public Outdoor Space on Housing Value

As population density increases and land becomes scarce, the value of outdoor space generally increases (Brander & Koetse, 2011). Various studies have found that public green space can have a positive impact on the value of adjacent dwellings (e.g. Towe, 2009; Kestens, Thériault, & Rosiers, 2004; Asabere & Huffman, 2009). For example, Asabere and Huffman (2009) found that trails and greenbelts, together, accounted for an increase in home values by about 5%, and by about 2% and 4%, respectively, when considered alone. They also found that other public spaces had an effect, including neighbourhood playgrounds, tennis courts, and pools, which would increase value by about 3%, 2%, and 2%, respectively. Natural elements dispersed throughout a neighbourhood can also have important impacts on the cost of a home. In a study conducted in Quebec City by Kestens et al. (2004), housing values in central neighbourhoods were negatively impacted if mature trees were not within 100m of properties for at least half of the residential landscape, whereas a premium of up to 15% could be found on properties surrounded by a lot of greenery. It should be noted, however, that value may vary depending on the characteristics of the nearby space (Towe, 2009). For instance, Kaplan and Austin (2004) conducted a study of residents in new subdivisions in southeastern Michigan and found that availability of forests was a significant predictor of community satisfaction, whereas groomed landscapes and open fields were not. Furthermore, considering the potential benefits of views, home values can be impacted by scenery, with values found to decrease with poorer scenic quality and further distance from key attractions (Benson, Hansen, Schwartz & Smersh, 1998; Bourassa, Hoesli, & Sun, 2004; Chen & Jim, 2009). Overall, preserving and integrating green space into low- and high-density neighbourhoods may increase the marketability of nearby homes.

2.8 Preferences for Public Green Space

As with private yards, public green spaces can connect citizens with nature. Ulrich (1986) notes that American and European adults tend to prefer natural rather than urban landscapes, and that urban

landscapes tend to be more preferable when natural elements are present. As de Groot and van den Born (2003) suggest, an increase in urbanization may lead to a greater appreciation of wild landscapes. One third of the Dutch participants in their study expressed preference for wild landscapes, and over fifty percent were attracted to landscapes "in which one may experience the greatness and forces of nature" (p.135). Many respondents also felt a responsibility for nature that overshadowed the idea of simply mastering nature (de Groot & van den Born, 2003). Similarly, Backlund, Stewart, McDonald, and Miller (2004) conducted a study in Illinois and found that, although developed recreational spaces such as public parks were important, undeveloped wild areas such as forests, streams, lakes and ponds were considered most important. Furthermore, Lafortezza, Corry, Sanesi, and Brown (2008) conducted a study in Italy focusing on potential options for brownfield landscape designs, and found that participants generally preferred landscapes with groups of trees, which were also the landscapes that would best support movement of forest bird species.

Sanesi, Gallis, and Kasperidus (2011) note that tradition and personal experience influence values and expectations for natural areas, and Thompson, Aspinall, and Montarzino (2008) provide evidence that childhood experiences in natural places relate to the frequency and comfort in using such spaces later in life. The effect of culture is evident in a study by Fraser and Kenney (2000), who found preference differences in perceptions of the urban forest between residents from British, Chinese, Italian, and Portuguese communities in Toronto. The British community citizens preferred shade trees, perhaps due to the entrenched ideals of the Garden City Movement that supported elements of the country within the city. Residents of Italian and Portuguese neighbourhoods preferred fruit trees, perhaps influenced by the lack of naturalized landscapes still existing in their native countries. Conversely, Chinese community citizens had the lowest preferences for trees, sometimes even opposing trees in their neighbourhood. Furthermore, Brander and Koetse (2011) found that preferences for urban open spaces varied by region, and Larsen and Harlan (2006) identified differences based on the ecozones from which participants originated. On the whole, people seem to appreciate natural landscapes, but trends in landscape preferences may vary by location and citizen demographic characteristics.

2.9 Considerations for Planning Public Outdoor Spaces

Jim (2008) notes that it is necessary to continuously maintain and provide additional greenery in urbanized areas, and Kaplan (2001) emphasizes that natural elements are not simply amenities, but are important to well-being. Therefore, before developing on natural lands, it is important to evaluate

how to incorporate natural elements into urbanized areas and whether specific elements should be preserved (Jim, 2008; Mahon & Miller, 2003). For example, large trees are regarded as assets for human enjoyment (e.g. aesthetic experience, sense of permanence, heritage value), and since they have slow growth rates, it may be important to preserve old trees as development occurs (Dwyer, Nowak, & Noble, 2003; Fraser & Kenney, 2000). Dorney, Evered and Kitchen (1984) outline ways of determining which trees to preserve based on which specimens would likely withstand stresses of urbanization. Eighty percent of participants in a New Orleans study by Lorenzo, Blance, Qi, and Guidry (2000) were willing to pay taxes to preserve urban trees. As discussed previously, trees also tend to be appreciated by residents and can impact housing value (Kestens et al. (2004). Methods for adding new greenery should also be considered, such as creating green roofs or adding roadside tree corridors, which Jim (2008) stresses as being a cost-effective method of greening the streets.

Although some studies suggest that wild landscapes may be preferable, preferences on the whole are context-dependent, and community characteristics should be considered before assuming certain landscape designs will be useful – particularly in culturally-diverse neighbourhoods (e.g. Fraser & Kenney, 2000). The meaning of landscapes may vary from person to person, depending not only on the physical appearance, safety, laws, costs, maintenance requirements and ecological restrains of the landscape, but also on an individual's past experiences, demographics, familiarity with the landscape, environmental attitude, or knowledge of ecology (Gobster et al., 2007; Kaplan & Herbert, 1987; Larson et al., 2009; Meinig, 1979; van den Berg, Vlek, & Coeterier, 1998; Yabiku et al., 2008).

For public green space to benefit residents, it should accommodate the functions and values of local citizens. For instance, the orderliness of traditional parks may be more preferable than expansive or very dense landscapes that fail to establish a sense of location (Kaplan, 1985). Distinguishing important features of outdoor spaces is a complex task, and Mahon and Miller (2003) provide information on ways of assessing natural lands based on community values (e.g. ecologic, recreational, aesthetic). When investigating how people used and felt about the Chicago River corridor, Gobster and Westphal (2004) found that cleanliness, naturalness, aesthetics, safety, access, and appropriateness of development were important dimensions, which interacted with one another to determine the overall experience. Furthermore, Alves et al. (2008) conducted research in the UK to understand what elements of public parks were important to an older population (i.e. people between 60 and 97), and found that a nuisance-free environment was a key requirement, followed by having facilities (e.g. cafes and toilets) present, along with trees and plants, light traffic, amusing views (e.g.

wildlife), and good maintenance. Ownership of land may also be important, as Towe (2009) found that homeowners generally preferred spaces controlled by private owners rather than the local public (i.e. homeowners' association). Overall, it is important that planners and other stakeholders conduct surveys and studies on the demographic characteristics and preferences of citizens so that green spaces can be designed to function best for local residents.

2.10 Conclusion

Research indicates that outdoor spaces are important components of the residential landscape. It is evident that yards can be valued for tangible uses, such as gardening and recreation, but also for their inherent values, such as providing peace of mind and connection to nature. Since many benefits can be gained through the use of public lands (sometimes simply through views), it seems important to preserve community green space and to question whether people would be satisfied using public rather than private outdoor space. Although people generally seem to value nature, landscape preferences can vary by location and demographic characteristics of residents. In addition, private yard designs tend to be influenced by local norms, although required maintenance levels and interest in environmental alternatives may also impact preferences. Thus, this research explores resident preferences for landscape designs in the context of Kitchener-Waterloo. In addition, this study investigates resident preferences for property sizes, and how access to public green space may encourage residents to live in homes with small yards, or no yards at all. Topics discussed within this chapter provide a basis on which to compare the results and provide recommendations.

Chapter 3: Backgrounder on Kitchener-Waterloo Study Site

3.1 Introduction

This chapter describes the Cities of Kitchener and Waterloo in terms of their physical environments, population demographics, character, green space, urban planning, and intensification development patterns. Furthermore, a recent decision by the Ontario Municipal Board to expand the land budget in the Region (currently under appeal) is briefly discussed. Such information provides a background for understanding the discussion and recommendations within the final chapters of this thesis.

3.2 Location Description

The mid-sized cities of Kitchener and Waterloo (generally referred to as "Kitchener-Waterloo") are situated roughly 100 km south-west of Toronto, within the Regional Municipality of Waterloo ("the Region") (Ontario, 2013). Established in 1973, the Region also includes the City of Cambridge and the Townships of Woolwich, Wellesley, Wilmot, and North Dumfries (City of Waterloo, 2012d; Figure 1). The Region is part of the Greater Golden Horseshoe (GGH), an area of Southern Ontario that is characterized by its Greenbelt, rapidly growing populations, and diverse economic centers (MPIR, 2006; Figure 2).

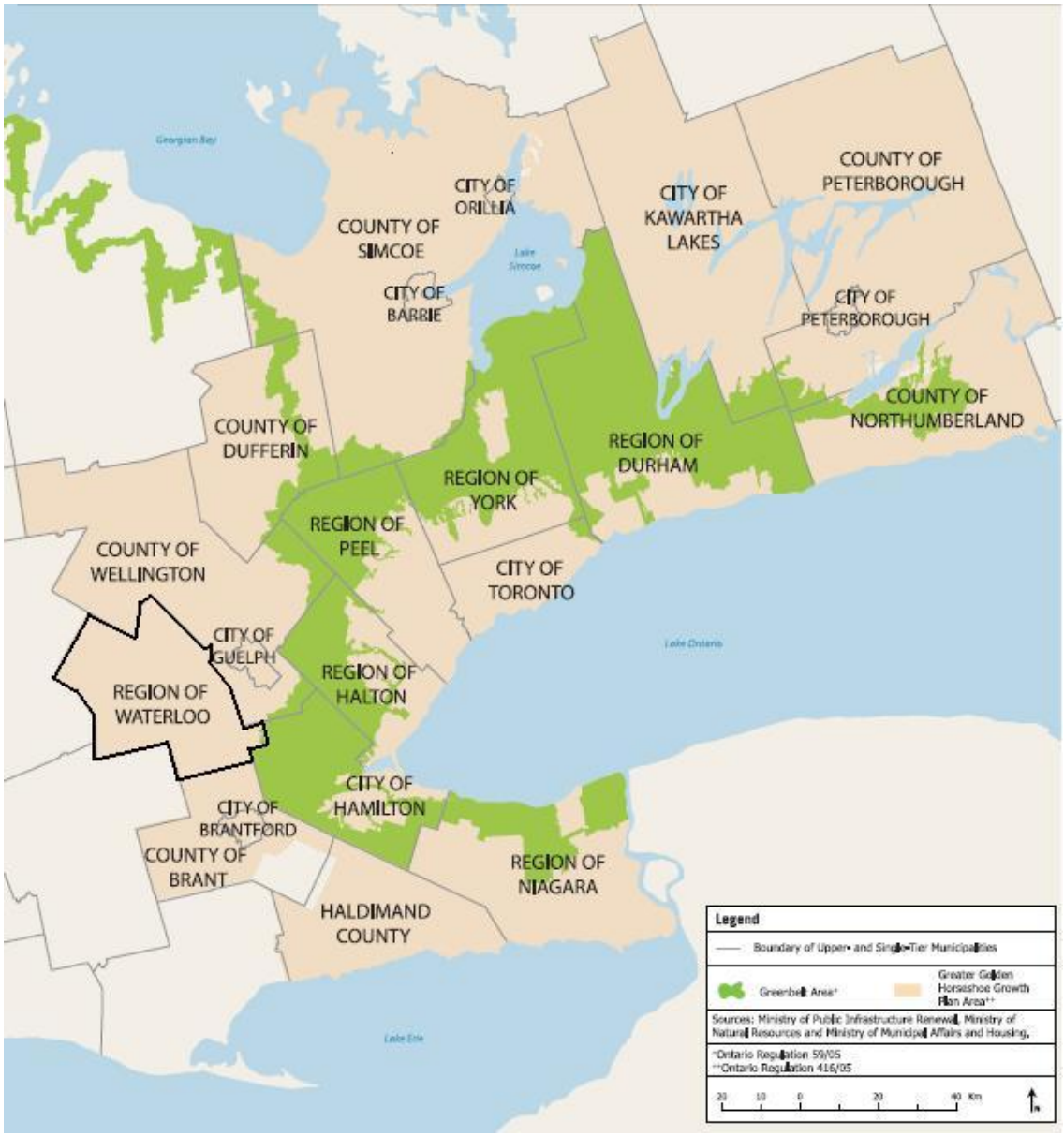

Figure 1. Greater Golden Horseshoe in Southern Ontario

Note: Pink represents the Growth Plan area and green represents the Greenbelt area. Map found in Growth Plan for the Greater Golden Horseshoe, Schedule 1, "Greater Golden Horseshoe Growth Plan Area" (MPIR, 2006). Map was modified to highlight the Region of Waterloo. Note on map source states: *"The information displayed on this map is not to scale, does not accurately reflect approved land-use and planning boundaries, and may be out of date. For more information on precise boundaries, the appropriate municipality should be consulted. For more information on Greenbelt Area boundaries, the Greenbelt Plan 2005 should be consulted. The Province of Ontario assumes no responsibility or liability for any consequences of any use made of this map".*

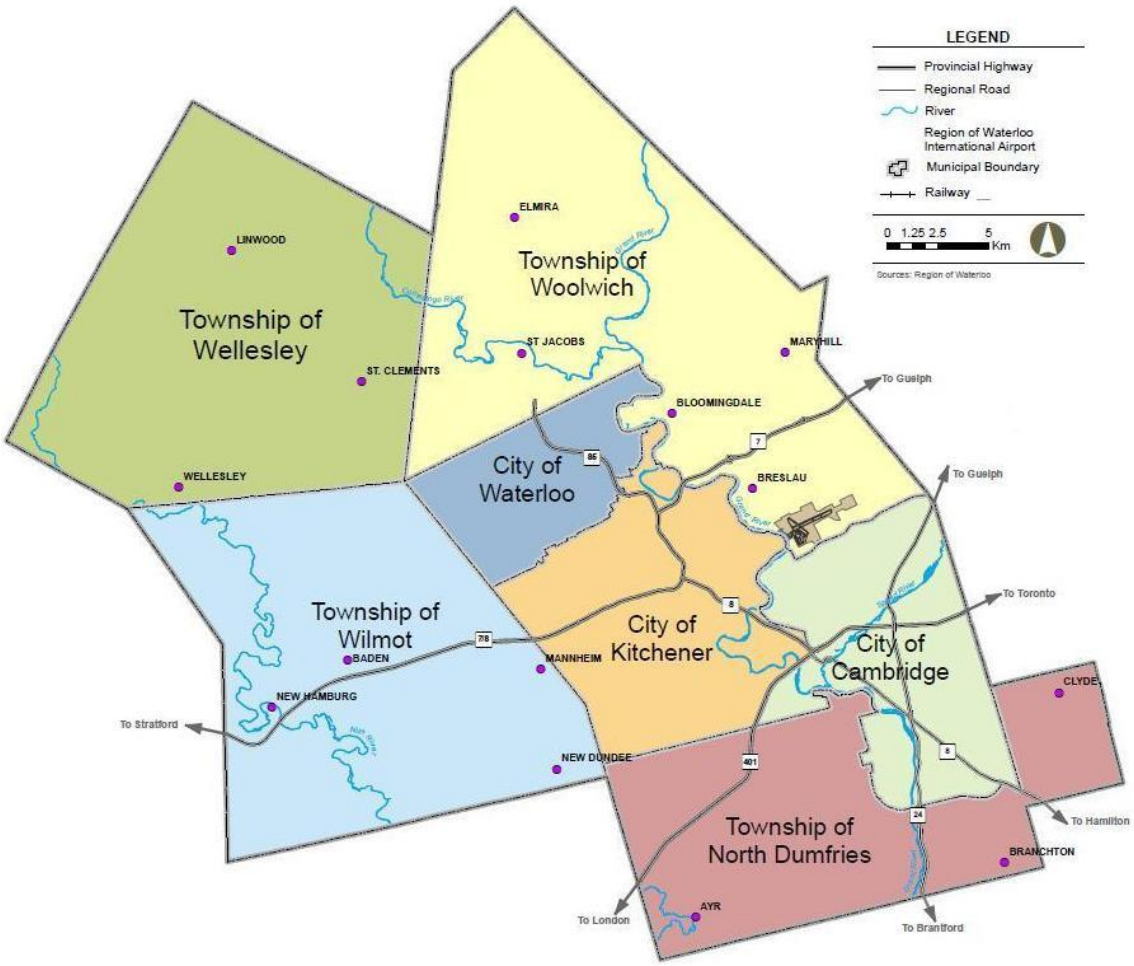

Figure 2. Region of Waterloo.

Note: Map taken from Region of Waterloo Official Plan Map 2 Area Municipalities (ROW, 2010c). Note on map source states: "*As of January 24, 2011, this Plan in its entirety is currently under appeal before the Ontario Municipal Board (OMB). Before using this document, care should be taken to check the updated status of the appeal process on the Region of Waterloo's website. This map forms part of the Official Plan of the Regional Municipality of Waterloo and must be read in conjunction with the policies of the Plan".*

3.3 Population Characteristics

With a population of nearly 220,000, Kitchener is the largest city in the Region, while the City of Waterloo ranks third with a population of nearly 99,000 (as of the 2011 Census; Statistics Canada, 2012a,b). The City of Waterloo also has a non-resident post-secondary student population of 31,670, bringing its 2012 total population to about 124,600 (City of Waterloo, 2012b). Growth in Kitchener has been greater than in Waterloo and slightly greater than the Ontario average (Table 1). Between 2006 and 2011, the population of Ontario rose by nearly 6% (Statistics Canada, 2012c), but was up by

about 7% in Kitchener (Statistics Canada, 2012a) and only by about 1% in Waterloo (Statistics Canada, 2012b). During the same time period, the number of private households in Kitchener increased by almost 9% (Statistics Canada, 2012a), but only by 2% in Waterloo (Statistics Canada, 2012b). Furthermore, the increase in number of census families in Kitchener was over eight times greater than in Waterloo, and slightly higher than in Ontario. Although the land area of Kitchener is over double that of Waterloo, the population density of Kitchener is greater than that of Waterloo (Statistics Canada, 2012 a,b,c; Table 1).

Table 1. Descriptive data for Kitchener, Waterloo, and Ontario from the 2011 Census of Canada.

	Kitchener	Waterloo	Ontario
2011 Population	219,153	98,780	12,851,821
Population Increase Since 2006 (%)	7.1	1.3	5.7
Total private households	86,375	37,520	4,887,505
Increase in total private households from 2006 to 2011 (%)	8.7	2.0	7.3
Number of census families	61,255	26,775	3,612,205
Increase in number of census families between 2006 and 2011 (%)	7.3	0.9	5.5
Median Age	37.2	37.6	40.4
Population aged 0 to 14 (%)	17.6	17.0	17.0
Population aged 15 to 64 (%)	70.1	70.4	68.4
Population aged 65 and over (%)	12.3	12.6	14.6
Land area (km^2)	136.79	64.02	N/A
Population Density (persons/km^2)	1,602.1	1,542.9	N/A

Note: Percent population increases are based on values from the 2006 Census of Canada. All data were obtained from Statistics Canada (2012a,b,c). A "census family" includes "a married couple (with or without children), a common-law couple (with or without children) or a lone parent family" (Statistics Canada, 2012a)

Kitchener and Waterloo have similar median ages (Statistics Canada, 2012 a,b,c; Table 1), which may be lower than that of Ontario due to the population of students who permanently reside in the area. Although most of the population in each city are within working age (between 15 and 64), there

is evidence of an aging population. Between 2006 and 2011, the population aged 65 and older increased by 11.9% in Kitchener (Statistics Canada, 2012a), 14.2% in Waterloo (Statistics Canada, 2012b), and 13.9% in Ontario (Statistics Canada, 2012c). Moreover, both cities are rooted in German ethnicity (City of Kitchener, 2010a; Explore Waterloo Region, 2012b), so German follows English and French as the next most common mother tongue in both cities, represented by 2.6% of the population in Kitchener (Statistics Canada, 2012a) and 2.9% in Waterloo (Statistics Canada, 2012b). The Region is culturally diverse in many other ways, with the fifth highest per capita immigrant population of all urban areas in Canada (Miedema & Vandebelt, 2006, p.1). The next most common mother tongues in Kitchener include Spanish, Romanian, Serbian and Polish (Statistics Canada, 2012a); while in Waterloo the next most common mother tongues are Chinese, Mandarin, Arabic, and Spanish (Statistics Canada, 2012b).

3.4 Character of Kitchener-Waterloo

Kitchener and Waterloo were first settled by Europeans in the early 1800s, when German Mennonites emigrated from Pennsylvania (Region of Waterloo, 2010b). German heritage is still rooted throughout the cities, and is most apparent during the yearly Oktoberfest celebration (the largest Bavarian festival in Canada). First dominated by agriculture, milling, and shipping produce (ROW, 2010b), Kitchener and Waterloo underwent considerable change by the late 1800s and early 1900s, at which time manufacturing industries (e.g. tanning, clothing and footwear production, distilleries, breweries, tire manufacturing, furniture building, etc.), became principal economic drivers. Then, as industries diminished by the late 1900s (University of Waterloo Special Collections Department, n.d.), Kitchener and Waterloo embraced technological advancement to fuel their economy. Today, the cities are home to the University of Waterloo, Wilfred Laurier University, Conestoga College, and other innovative institutions including BlackBerry, the Institute for Quantum Computing, the Centre of International Governance Innovation (CIGI), and the Perimeter Institute for Theoretical Physics (Canada's Technology Triangle, 2009; The Waterloo Region Immigration Partnership, n.d). The Region represents Canada's Technology Triangle and, in 2007, the Intelligent Communities Forum (ICF) named Waterloo the World's Top Intelligent Community (City of Waterloo, 2012e). Other employers in the region include insurance companies (such as Manulife) and Toyota Motor Manufacturing Inc.

Kitchener and Waterloo have embraced change, but have never left behind their heritage. The streetscape along King Street (which runs through Downtown Kitchener and Uptown Waterloo) is a

unique integration of old and new, characterized by modern buildings (Figures 3, 4, 5) alongside old industrial buildings that have been reurbanized into lofts and offices (Figures 6, 7). The essence of the Region is well-captured by the Lang Tannery building, a reurbanized structure that now houses trendy restaurants and offices for leaders in technology, including Google, Desire2Learn and Communitech (Figure 8). Cranes span the skyline, but one does not have to travel far to see Mennonites using horse-and-buggies and working in the locally-famous St. Jacob's and Kitchener markets. In other words, the area has a small-town feel but is well connected to international corporations, technology, and amenities (City of Kitchener, n.d.a). Therefore, aspects of this study should be relatable to small, medium, and large cities, and hopefully lead to recommendations that are relevant across Southern Ontario.

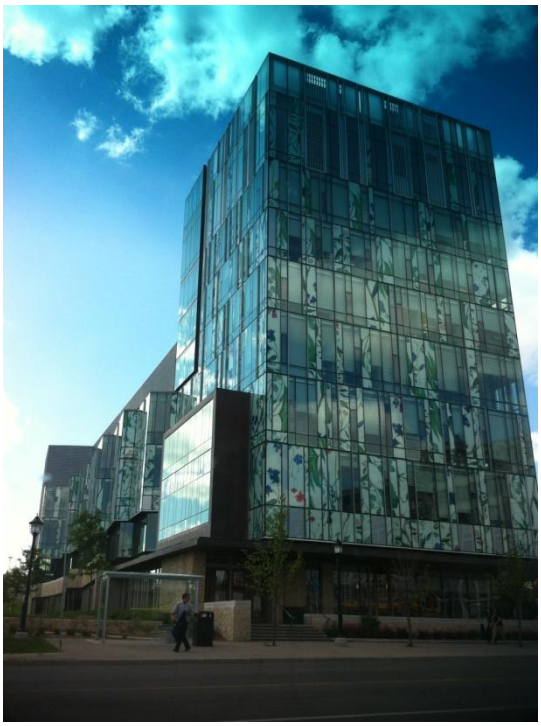

Figure 3. University of Waterloo School of Pharmacy Building in Downtown Kitchener. An example of a modern building on the site of a former tire factory.

Figure 4. Ontario Provincial Courthouse in the Market District of Downtown Kitchener. An example of a modern building.

Figure 5. The Perimeter Institute near Waterloo Park and Uptown Waterloo. An example of a modern building.

Figure 6. Kaufman lofts in Downtown Kitchener. An example of a reurbanized building once used by Kaufman Footwear.

Figure 7. Seagram Lofts near Uptown Waterloo. An example of a reurbanized building once used by Seagram Distillers.

Figure 8. The Lang Tannery building in the Tannery District/Innovation District of Downtown Kitchener. An example of a reurbanized building that now houses high-tech companies, shops and restaurants.

3.5 Green Spaces

Located on the Grand River Watershed, Kitchener and Waterloo have over 100km of trails, including the Iron Horse Trail and the Grand River Trail (Explore Waterloo Region, 2012a,b). The Grand River is a designated Canadian Heritage River (Ontario, 2013), which is a water source for the Region and downstream communities (City of Kitchener, n.d.b). Both cities offer extensive areas of green space, with over 1,300 hectares in Kitchener (City of Kitchener, n.d.b) and 1,600 hectares in Waterloo (Explore Waterloo Region, 2012b). To protect the important ecological functions of their natural lands, Kitchener and Waterloo aim to preserve urban forests (City of Kitchener, 2011; City of Waterloo, 2012b). Furthermore, other public green spaces are interspersed throughout the cities, and some are commonly used for recreation and city events. Examples include Victoria Park in Kitchener, which includes Victoria Lake (Figure 9); and Waterloo Park, which features Silver Lake, the Eby Farmstead, and the Waterloo Central Railway Station with a train that runs into St. Jacob's market (Figure 10). That being said, some central areas along King Street lack parks and natural elements (e.g. Kaufman lofts in Figure 6).

Figure 9. Victoria Park and Victoria Lake in Kitchener.

Figure 10. Waterloo Park with pathways and the train from the Waterloo Central Railway Station.

3.6 Overview of Local Planning Documents

To direct where, when, and how to grow, Kitchener and Waterloo Official Plans (OPs) follow the Growth Plan for the Greater Golden Horseshoe, the Regional Growth Management Strategy (RGMS), the Regional OP, and the Provincial Policy Statement (City of Kitchener, 2010e; ROW, 2003; MPIR, 2006). Kitchener also has its own growth management strategy, which complies with the above strategies (City of Kitchener, 2010c). The plans and strategies generally have similar aims, which are in-line with the smart growth principles discussed in the introductory chapter. For example, goals include preserving natural and agricultural lands; intensifying urban landscapes; creating communities that are vibrant, safe, accessible and affordable for populations of diverse demographics; promoting various modes of transportation (reducing car-dependence); incorporating mixed uses; preserving heritage; and ensuring healthy and sustainable environments (City of Kitchener, 2011; City of Kitchener, n.d.a; City of Kitchener & Downtown Kitchener BIA, 2012; City of Waterloo, 2012b; MPIR, 2006; ROW, 2010c).

Compact development based on density targets is planned to help achieve some of the above objectives. According to the OPs, by the year 2029, Kitchener will be planned to accommodate a

population of 313,000, and Waterloo will be planned to accommodate a population of 138,000 (excluding temporary student residents; City of Kitchener, 2011; City of Waterloo, 2012c). Under the Growth Plan, Downtown Kitchener and Uptown Waterloo are designated as *Urban Growth Centres* with 2031 density targets of 200 residents and jobs combined per hectare (Ontario Ministry of Public Infrastructure Renewal [MPIR], 2006). Meanwhile, a minimum density target of 55 persons and jobs combined per hectare is expected for the *Designated Greenfield Areas* in Kitchener and Waterloo, which are areas with land available for development located outside the *Built Boundary* but within the *Countryside Line* (City of Kitchener, 2011; City of Waterloo, 2012b). Lands beyond the *Countryside Line* (designated by the Region) are meant to be conserved, and are not intended for development under the current plans (City of Kitchener, 2011).

The Region is known for prioritizing its environmental policies and for its proactive approach to high-density development (Hare, 2001; ROW, 2010a). For instance, the Regional Plan included environmentally sensitive protection areas as of 1976 – long before similar requirements existed in the Provincial Policy Statement (Hare, 2001). The Region was also a leader in smart growth land use planning through its 2001 Regional Growth Management Strategy (prior to the 2006 Growth Plan), with aims to preserve agricultural lands beyond the *Countryside Line* by encouraging Transit Oriented Development (TOD), brownfield re-use, and overall intensification and residential densification (Millward, 2006). The Regional Transportation Master Plan outlines transit plans until 2031, with goals to obtain environmental sustainability and urban vitality by promoting cycling, walking, and use of transit; and to better connect Waterloo, Kitchener, and Cambridge through an expanded bus network and new Light Rapid Transit (LRT) system (Region of Waterloo, 2011). The estimated $818-million rapid transit system should be running by 2017 (Desmond, 2013; Region of Waterloo, 2011), and will significantly impact future planning.

3.7 History and Future of Development

According to the 2011 Census of Canada, Waterloo has a greater percentage of low-density dwellings (single-detached houses) than Kitchener, but is nearly on par with Ontario (Statistics Canada, 2012 a,b,c; Table 2). Meanwhile, Kitchener has a greater percentage of high-density dwellings (apartments) than Waterloo, and surpasses both Waterloo and Ontario in its percentage of apartment buildings with fewer than five storeys. Taller-storey apartments, however, make up a greater percentage of dwellings across Ontario than in either of Kitchener or Waterloo. That being said,

since many high-density dwellings in Waterloo are occupied by students who have permanent residences elsewhere in Canada, such residents would not be included in the data.

Table 2. Structural types of dwellings occupied by private households (made up by usual residents) in Kitchener, Waterloo, and Ontario from the 2011 Census of Canada (Statistics Canada, 2012 a,b,c).

	Kitchener (%)	Waterloo (%)	Ontario (%)
Total – Structural type of dwelling	100.0	100.0	100.0
Single-detached house	49.9	57.9	55.6
Semi-detached house	6.3	5.2	5.7
Row house	11.3	12.1	8.5
Apartment, building that has five or more storeys	14.2	10.7	16.2
Apartment, building that has fewer than five storeys	15.2	11.2	10.2
Apartment, duplex	3.0	2.3	3.3
Other single-attached house	0.1	0.1	0.2
Movable dwelling	0.0	0.5	0.3

The variation in dwelling types between Kitchener and Waterloo may be associated with average household incomes and housing prices, which are both about 20% less in Kitchener than in Waterloo. According to FP Markets Canadian demographics (2011), the 2011 average household income estimate for Kitchener was $79,920, while it was $100,236 for Waterloo (as cited in BMA Management Consulting Inc., 2011, p.23). Similarly, the average price of a single detached dwelling is considerably lower in Kitchener ($270,701) than in Waterloo ($334,429) (Ontario, 2013). Property taxes in Waterloo are also greater than in Kitchener, which has some of the lowest property taxes relative to other large cities in Ontario (City of Kitchener, 2010b).

Kitchener is increasingly becoming a more desirable place in which to live and work, partially due to Downtown revitalization initiatives and the development expected to accompany scheduled LRT lines. Nearly a decade ago, Downtown Kitchener set up an economic development investment fund, including a $110 million budget directed at projects that would prompt private-sector investment and contribute to Downtown revitalization (Metroland News Service, 2013). In 2012, nineteen

restaurants were added to the Downtown, with Duke Street as a popular area for such growth (located near the planned King-Victoria LRT hub) (Metroland News Service, 2013; Figure 11). In addition, the vibrancy of King Street has been enhanced through its $10.8-million streetscape reconstruction project, which occurred during 2009 and 2010, and was meant to draw more pedestrians to the Downtown. Improvements include 120 new street trees, planter beds that filter storm water, improved lighting, additional bike racks, new patio furnishings in Civic Square and streetscape furnishings along King Street (City of Kitchener, 2010f).

Figure 11. An area of revitalization in Downtown Kitchener located on Duke Street between Queen and Frederick Streets.

Downtown Kitchener is divided into the City Centre, Market, Civic, and Innovation (formerly Warehouse) Districts (City of Kitchener & Downtown Kitchener BIA, 2012). The new LRT and GO Train extension to Kitchener sparked the plan for the Innovation District, where the planned LRT hub may create upwards of 15,000 jobs, attract 4,000 residents (Pender, 2011), and contains reurbanized industrial buildings (City of Kitchener & Downtown Kitchener BIA, 2012). Meanwhile, small-scale housing exists amongst the Victorian homes in the Market District, and high-density buildings will continue to be concentrated in the City Centre District. In addition, further residential development is being considered in the Civic District to enhance its cultural atmosphere (City of Kitchener & Downtown Kitchener BIA, 2012).

Since the 2011 Census, additional development has also occurred in Waterloo. The skyline has changed considerably, as an abundance of student apartments and other high-density residences have been constructed. In accordance with the City of Waterloo OP, intensification has also begun around the Uptown Waterloo Urban Growth Centre and Major Transit Station Areas (City of Waterloo, 2012b). Development in the city has been steady despite the 2008 economic recession, partially because of a city policy to waive development charges for development in the city core (which ended in Waterloo at the beginning of 2010; Pender, 2010). One of the most recent and significant brownfield redevelopment projects in Waterloo is the Barrel Yards, a large complex (5.1 hectares) situated across from the Seagram Lofts, CIGI building, Perimeter institute, Waterloo Park, and Uptown Waterloo Town Square (Figure 12). The project will include a hotel, condominiums, apartments, a seniors' residence, live-work units, townhouses, office space over retail, a park and an underground-parking garage (Pender, 2010).

Figure 12. Construction of the Barrel Yards development located near Uptown Waterloo.

Despite efforts by both cities to intensify their cores and built up regions, a major decision was recently made by the Ontario Municipal Board (OMB) to expand the land budget laid out in the ROP (in accordance with the Growth Plan for the GGH) from 75-85 hectares to 1053 hectares, based on an appeal from local developers (OMB, 2013; ROW, 2009). The current land budget states that a "sufficient capacity exists within the residential *Designated Greenfield Area* to accommodate

forecasted population growth to the year 2029", and indicates that there is no existing justification to expand the *Urban Area* (ROW, 2009, p.32). If upheld, the OMB decision will likely increase the difficulty of meeting density targets, reduce the amount of undeveloped green space throughout the Region, and challenge the enforceability of the Ontario Growth Plan. Therefore, the provincial government has taken an interest in the case and has agreed to support the Region in its goals to reverse the decision (as of April, 2013; Jackson, 2013). This thesis is particularly relevant to this discussion, as it broadly explores the potential for Kitchener and Waterloo residents living in low-density homes to move to more compact homes in the future, which would reduce the need for additional developable land.

3.8 Conclusion

Kitchener and Waterloo are known for their resiliency to market changes, transforming over the past century from cities first dominated by agriculture, then by manufacturing, and now by technological innovation. They are growing cities with planning strategies that aim to create high-density, vibrant communities suitable for their diverse populations. Nevertheless, to create liveable neighbourhoods that establish a sense of place and welcome new residents, the following study should provide an understanding of Kitchener-Waterloo household attitudes toward compact development and green space. Study results will also be related to the recent OMB decision, regarding whether an expansion of developable lands is an appropriate approach to accommodate growth.

Chapter 4: Research Methods

4.1 Introduction

This project was a modified follow up to previous survey studies that were conducted in 1994 and 2004, through the School of Planning at the University of Waterloo. In 2012, to investigate residential property and neighbourhood characteristics that could be important in creating desirable real estate, a survey was conducted across a random sample of households in Kitchener and Waterloo, Ontario, Canada, who were living in homes with private outdoor space. The study was cross-sectional in design, with each participating household acting as a *case*, and the combination of cases forming the *sample* (Newing, 2011). Within each study year, demographic data (e.g. age, sex, birthplace, education level, household size, household income, etc.) were collected as independent variables that may influence the dependent variables of attitudes, preferences, and behaviours. Although this thesis focused on only the 2012 results, the broader study was longitudinal in design, with many of the questions consistent between the 1994, 2004, and 2012 surveys so that changes could be identified (as done in the 2004 thesis study).

Several questions required participants to rate variables on a scale of one to five (Likert-type scale) based on their level of agreement with particular statements, or the level of importance or preference they associated with given situations. The quantitative results were then presented using both descriptive and inferential statistics. A detailed description of the research methods is outlined in this chapter, along with a discussion of potential limitations. The complete questionnaire is included in Appendix C.

4.2 Survey Design

The original 1994 questionnaire was derived from an early 1990's 'Omnibus' survey, which was instigated from the 'Green Plan Strategic Research' initiative supported by the Tri-council secretariat and the University of Waterloo (R. Suffling, personal communication, March 15, 2012). The 1994 survey had 45 questions divided into ten sections, and was designed by Dr. Roger Suffling in the School of Planning at the University of Waterloo. The questions focused on environmental attitudes of households in Kitchener and Waterloo, and how they designed, managed and used their private outdoor spaces. A modified version of the 1994 survey was used in the 2004 study, which had 40 questions spread across 11 sections and was conducted by Peter Ellis, under the supervision of Dr. Suffling (Ellis unpublished, 2006). Minor re-phrasing and other modifications were again made for

the 2012 survey (major modifications outlined in Appendix C). Two questions related to water costs and usage were removed for the 2012 study, while one question related to wildlife and two questions related to maintenance were added. Another nine questions were added to address the theme of Smart Growth, mainly relating to property size and location preferences. Moreover, an additional photo was added to each landscape style for questions 21 to 26 to give the participant a better idea of the range of yard designs that may fit into each landscape style. With kind permission from Dr. Joan Nassauer and her colleagues at the University of Michigan, questions 8, 9, 10, 34, 35, and 42 were taken directly, or modified, from their Michigan survey. While this study does not focus on any Michigan results, the overlapping questions were designed to allow for future comparative analysis. Similarly, although not all questions on the 2012 survey were utilized in this thesis, some questions from the previous 1994 and 2004 Kitchener-Waterloo surveys remained on the 2012 survey to maintain a longitudinal record of attitudes and behaviours. Overall, the 2012 survey had nine sections and 54 questions, as described below:

- 12 questions on yard maintenance
- 9 questions to describe the household's property
- 7 questions to provide demographic information on the residents
- 7 questions on landscape preferences
- 6 questions on property size preferences
- 6 questions on yard usage
- 2 questions asking why respondents chose their particular property and neighbourhood
- 2 questions on environmental attitudes
- 1 question on neighbourhood green space
- 1 question on private property
- 1 question asking if respondents had participated in the previous 1994 and/or 2004 surveys

While the past surveys were conducted solely through the mail, addresses from the 2012 sample first received invitations in the mail to access an online version of the survey. The web-survey was created and deployed using Sensus Web version 4.2.44 (Sawtooth Technologies, Inc., 2011), a web-survey provider that hosted surveys on the University of Waterloo servers. Mail invitations notified households of their specific survey code, which gave them access to the web-survey, allowed them to work on the survey at various times, and was used to track when they completed their survey or

declined participation. The code was also related to the IDs from the 1995 and 2004 sample addresses to allow for future comparative analysis.

An early draft of the survey was reviewed by the University of Waterloo Survey Research Center. To aim for valid and reliable results, survey questions were scrutinized for 'leading questions' (which encourage a particular answer), ambiguity, and 'double-barreled' questions (which ask two questions in one) (Newing, 2011). Some informal pretesting was also conducted to catch errors; however many questions had been pre-tested through previous survey studies. Before conducting research, the survey, mail documents, and phone call scripts received clearance from the University of Waterloo Office of Research Ethics.

4.3 Sampling Methodology

Surveys were sent to a total of 1,014 and 1,147 residential addresses in Kitchener-Waterloo in 1994 and 2004, respectively. The household addresses surveyed in 1994 were randomly selected by a consulting agency that used city tax rolls and property assessment information as a sampling frame, excluding commercial properties, large apartments, and other areas without yards. The sample was limited to residents of Kitchener and Waterloo over the age of 18 and living in homes with at least some type of private outdoor space (i.e. yard or private patio). While approximately equal amounts of surveys were delivered in both Kitchener and Waterloo during the 1994 study, 513 were sent in Waterloo and 634 were sent in Kitchener during the 2004 study. The same 1994 sample was used for the 2004 study, making some changes based on rezoning, renumbering, inappropriate dwelling addresses, dwellings without yards, and other discrepancies. Moreover, to account for development between 1994 and 2004, a 2004 Kitchener and Waterloo urban road map was overlapped with a similar map from 1993 to identify new roads built. This extended the sampling frame so that additional surveys could be sent to a random sample in those areas (Ellis unpublished, 2006). A similar methodology was followed for establishing the 2012 sample, in which data from a Regional Municipality of Waterloo (2010) Geographic Information System (GIS) address layer provided the sampling frame for the addresses.

4.3.1 Determining the 2012 Target Sample Size

A total of 1272 addresses throughout Kitchener-Waterloo were included in the 2012 target sample (the set of addresses who received invitations to participate). Apartment addresses were apparently removed from the 1994 address list when creating the 2004 address list, and replaced with a random

sample of nearby residential dwelling unit(s) (Ellis unpublished, 2006, p. 37). Therefore, the 634 Kitchener addresses and 512 Waterloo addresses who received invitations to participate in the 2004 sample were again included in the 2012 invitation list. To increase external validity (a measure of how well the study results represent the actual population) (Newing, 2011), it was important to account for residential growth since 2004. Consequently, an additional 29 addresses in Waterloo and 96 addresses in Kitchener were added to 2012 invitation list. These numbers were derived by first calculating the growth rate of dwellings likely to have private yards (i.e. all dwellings excluding apartments, duplexes, and mobile homes) for both Kitchener and Waterloo. To estimate the 2011 total number of dwellings with yards (single-detached houses, semi-detached houses, row houses/townhouses, and other single-attached houses), annual building reports were obtained from both cities. The net increase in each type of dwelling between mid-2006 and 2011 was added to the total number of the corresponding dwelling type indicated in the 2006 census "Structural Type of Dwelling" tables for both the City of Kitchener (Statistics Canada, 2011a) and City of Waterloo (Statistics Canada, 2011b). The increase since approximately mid-2006 was calculated because the 2006 census was conducted in mid-May (Statistics Canada, 2009) and, therefore, was assumed to have captured approximately half of the units in the 2006 data. The 2011 estimates and the total values from the 2006 census data were then used in growth rate calculations, using 5.5 years as the timeframe, to determine the growth rate in both cities (approximately 0.0070 dwellings with yards/year for Waterloo, and 0.018 dwellings with yards/year for Kitchener). These growth rates were then put into the same growth rate formulas, this time using the 2004 total survey quantities and a timeframe of eight years to determine the total quantity of surveys that should be included in the 2012 study, for both Kitchener and Waterloo. The difference between the 2012 and 2004 total quantities represented the number of additional surveys to distribute in each city, which was 29 surveys for Waterloo and 96 surveys for Kitchener. Further details about the calculations are outlined in Appendix A.

4.3.2 Determining the 2012 Target Sample Location

The sample locations were similar across study years; however, the 125 additional invitations for the 2012 survey were sent to areas of new development, which were determined based on where new roads were built since 2004. Road development was identified by exporting the attribute tables of a 2006 ARC GIS road layer of Kitchener and Waterloo and a 2011 GIS road layer into Microsoft Office Excel 2007 ("Excel"). The roads were then compared using the "MATCH" function. Roads

that appeared in the 2011 layer but not the 2006 layer were assumed to represent areas of new development. The 2006 road layer had to be used because it was the earliest layer available since 2004, when the last study was conducted. Since this method did not indicate as many developed roads as expected, a visual comparison of hard-copy road maps from 2004 (Rand McNally Canada Inc., 2004) and 2006 (Peter Heiler Ltd., 2006) was undertaken to determine a more reasonable list of new roads since 2004. Some of the roads listed on the 2011 ARC GIS layer did not appear on GoogleMaps, so a 2012 Kitchener-Waterloo hard-copy road map (Canadian Cartographics Corporation, 2012) was also referenced to determine whether certain areas were potentially still under construction (as indicated by a dotted road line).

A list of all addresses on the roads developed since 2004 was compiled using a 2010 Region of Waterloo ARC GIS layer attribute table, since there was no 2011 address layer available (Regional Municipality of Waterloo, 2010). This list was made in Excel and then custom sorted by arranging the streets alphabetically and then by street number. Next, the "RAND()" Excel function was used to assign each address a random number greater than or equal to zero and less than one. The addresses were then sorted from least to greatest based on their associated random numbers. Finally, the first 29 addresses in the Waterloo list and the first 96 addresses in the Kitchener list were added to the 2012 target sample.

4.3.3 Final Sample Size

After all invitations were sent, mail from 46 addresses was returned and labelled as "no such address", "moved/unknown", or "incomplete address", so these addresses were excluded from future contact. Some reasons for receiving such mail included vacant homes, non-residential addresses, or no unit listed. Seven households replied indicating that they did not have a private yard, so were unable to complete the survey, and five households who filled out the survey were disqualified since they did not have a private outdoor space. Furthermore, six surveys were returned after the deadline, so were not included in the survey sample. In the end, a total of 206 responses were appropriate for analysis. Unfortunately, only 40 of the 206 participants returned surveys with an answer to every question, so the number of respondents varied for each question analysed. Forty-six of the 54 questions were answered by over 90% of the 206 participants, five questions were answered by between 80% and 90% of participants, and only three questions were answered by less than 80% of participants. Table 3 outlines the basic sampling methodology across the survey years, along with information about the responses.

Table 3. Summary of sampling methodology and response data for surveys conducted in 1995, 2004, and 2012.

Sample Year		1995	2004	2012
Administration		Mail	Mail	Internet & Mail
Number of questions		45	40	54
Study population		Households[1] in the Cities of Kitchener and Waterloo, Ontario		
Sample unit		Residential addresses (excluding large apartments but including small apartments)	Residential addresses (excluding all apartments unless the residents were the same as in 1994)	Residential addresses (excluding all apartments; no addresses were deleted/replaced from 2004 study)
Sample frame		City tax rolls and property assessments	Same as 1995 plus additional random sample of addresses on new roads, taken from tax rolls	Same as 2004 plus additional random sample of addresses on new roads, taken from 2010 GIS Regional Municipality of Waterloo database
Sampling strategy		Random		
Target Sample Size (# of invitations distributed)	**Waterloo**	≈ 500 (49.3%)	513 (44.7%)	542 (42.6%)
	Kitchener	≈ 514 (50.7%)	634 (55.3%)	730 (57.4%)
	Total	1014 (100%)	1147 (100%)	1272 (100%)
Sample size (# of returned & analysed surveys)	**Waterloo**	150 (45.2%)	146 (43.6%)	93 (45.1%)
	Kitchener	174 (52.4%)	186 (55.5%)	113 (54.9%)
	Anonymous	8 (2.4%)	3 (0.9%)	0 (0%)
	Mail	332 (100%)	335 (100%)	77 (37%)
	Internet	NA	NA	129 (63%)
	Total	332 (100%)	335 (100%)	206 (100%)
Non-respondents (and un-analysed surveys)	**Non-reachable addresses**	208 (30.5%)	63 (7.8%)	46 (4.3%)
	Unanswered	80 (11.7%)	35 (4.3%)	12 (1.1%)
	Unaccounted	394 (57.8%)	714 (87.9%)	997 (93.5%)
	Disqualified	NA	NA	5 (0.5%)
	Returned too late	NA	NA	6 (0.6%)
	Total	682 (100%)	812 (100%)	1066 (100%)
Response rate[2]		41.2%	30.9%	16.8%

Note: [1] Household refers to the occupant(s) residing in the sample address, and does not exclude temporary residents.

[2] Response rate was calculated by dividing the (total sample size) by the (total target sample size minus the non-reachable addresses), since non-reachable addresses did not receive invitations.

4.4 Conducting the Survey

In general, the Tailored Design Method laid out by Dillman (2000) was followed wherever practical. Dillman (2000) suggests including five key elements to achieve high response rates: "(1) a respondent-friendly questionnaire, (2) up to five contacts with the questionnaire recipient, (3) inclusion of stamped return envelopes, (4) personalized correspondence, and (5) a token financial incentive that is sent with the survey request" (p. 150). Although this method was referenced as a guide, time and monetary restraints resulted in divergence from the ideal method. In addition, the methods of contact for the thesis differed slightly from the procedures by Dillman (2000), mainly in that there was no pre notice letter, only one mailing of the paper questionnaire, and an option to complete the survey online. Meanwhile, similarities included the cover letter, thank you postcard, and inclusion of a different mode of contact (phone calls).

Invitations to participate were mailed to households of the target sample addresses on March 2, 2012. The enclosed letter described the study and informed householders of their personal survey code, which gave them access to the online survey. Participants also had the option to request a paper survey package. Due to a lack of contact information available on Canada 411, tax rolls that were not user-friendly and overall time constraints, all bulk mail was addressed "To Resident(s)". Attempting to compensate for the lack of addressee personalization, real postage stamps were used on outgoing mail and, as suggested by Dillman (2000); high-quality University of Waterloo envelopes and letterhead were used. Postal codes for the new addresses were determined using the Canada Post Corporation (2012) website.

After about a month and a half, on April 16, 2012, reminder postcards were mailed to the sample addresses that had not yet responded. At this point, the response rate was low, so each postcard was signed by hand to increase personalization, as recommended by Dillman (2000). Then, from May 2 to 22, 2012, phone calls were made to households who had not yet responded. Only 643 (56.6%) of the 1136 non-respondents were contacted, since not all phone numbers were listed on Canada 411. Each number was phoned once, and a message was left if possible. While the reminder phone calls may have encouraged participation from those who answered their phone; calls may have been less effective than a second reminder postcard (which was used in 1994 and 2004 studies), because phone numbers were only available for about 57% of non-respondent households. Additionally, since phone numbers were called only once, only 307 (47.7%) of the 643 households who were phoned were actually spoken with (Table 4).

Table 4. Phone call response summary.

Phone call response	Quantity of non-respondent households	Percent (%) of total non-respondent households that were phoned
Asked for an email with information to complete online	62	10
Asked for a paper copy	19	3
They have the info and will likely complete it	16	2
Not interested	210	33
Left message	253	39
No answer or message machine	83	13
Total	**643**	**100**

Note: Phone calls were made between May 2 and May 22, 2012. Contact information was only available for 643 (about 57%) of the 1136 non-respondent households.

Finally, on June 15, 2012, a paper-copy questionnaire package was mailed to the remaining addresses that had not yet responded. This accounted for members of the sample without internet access, and further encouraged a response. The package included a cover letter (with hand-written signature), the paper-copy questionnaire, a poster with landscape images to accompany survey questions, and a self-addressed return envelope (with postage pre-paid). The respondents were encouraged to respond by July 16, 2012, and were informed that any extensions would be posted online. On July 12, 2012, the website was updated to say that the survey should be completed (online or sent in the mail) by July 23, 2012, but indicated that further extensions were possible if requested. To account for households that may have been away during the summer, mail surveys were accepted until August 1, 2012, at which point analysis commenced. In the months to follow, six additional surveys were received, but were not analysed. A data collection timeline and response log is provided (Table 5).

Table 5. Data collection and response timeline

Date (2012)	Time since original mailing	Number and per cent of total responses to-date						Description	Number of addresses contacted	Details
		Mail		Internet		Sum (mail + web)				
		Responses since previous date	**Total to date (% of total)**	*Responses since previous date*	**Total to date (% of total)**	*Responses since previous date*	**Total to date (% of total)**			
March 2	0 days	*0*	**0 (0%)**	*0*	**0 (0%)**	*0*	**0 (0%)**	Mailed letter invitation to participate online	1272	Real postage stamps, University of Waterloo envelopes and letterhead
April 16	45 days	*0*	**0 (0%)**	*54*	**54 (26%)**	*54*	**54 (26%)**	Mailed reminder postcard	1178	Real postage stamps, hand-written signature
May 2	61 days	*2*	**2 (1%)**	*28*	**82 (40%)**	*30*	**84 (41%)**	Phone calls	643	Only non-respondent numbers available on Canada 411 were contacted; phoned once and left message if possible (Completed May 22)
June 15	105 days	*9*	**11 (5%)**	*39*	**121 (59%)**	*48*	**132 (64%)**	Mailed paper-copy package: cover letter, questionnaire, poster with landscape images, pre-paid return envelope	825	Real postage stamps, pre-paid postage on return envelope, hand-written signature
August 1	152 days	*66*	**77 (37%)**	*8*	**129 (63%)**	*74*	**206 (100%)**	Survey closed; analysis begins	N/A	To account for vacations away, 47 days were allowed for returning paper copy

4.5 Methods of Analysis

Data were organized and descriptive statistics were determined using Excel, while inferential statistics based on Chi-square tests were derived using RStudio (R Development Core Team, 2011; version 0.96.331). Further detail about analysis is outlined at the beginning of Chapter 6.

4.6 Reasons for Low Response Rates

Newing (2011) notes that non-response rates for web- or mail- surveys "may be well over 50 per cent" (p.79), and research by Sinclair, O'Toole, Malawaraarachchi, and Leder (2012) indicates that survey response rates have been declining. While decreasing willingness to participate may be widespread, reasons why the response rate in 2012 was lower than in 2004 and 1994 may include:

1. **Procedures and timelines for inviting participants differed across the years**. In 1994 and 2004, research began by sending paper-copy packages of the surveys to all respondents, while in 2012, the study began with an invitation to go online and complete the survey. In 1994, two reminder postcards were mailed within a month after the first mailing of the survey package and, in 2004, one was mailed four weeks after the first mailing and one was mailed after nine weeks. In 2012, one reminder postcard was sent about six and a half weeks after the original invite, and the second reminder postcard was replaced with reminder phone calls (made between about nine and twelve weeks after the first invitation). Furthermore, in the 2012 study, the first (and only) paper copy package was mailed 15 weeks after the original invitation, whereas a second paper copy package was mailed after five weeks for the 1994 study. Overall, the 2012 study timeframe was longest, spanning nearly 22 weeks compared to just over seven weeks in 1994 and 12 weeks in 2004. Lengthening the gaps between dates of correspondence may have led to a lower response rate.
2. **Methods of addressing potential participants differed across years**. Real stamps were used on the return envelopes in both 1994 and 2004, while business reply mail (postage pre-paid) was used in 2012. Also, invitations in 2012 were generically addressed "To Residents", whereas previous studies addressed specific people.
3. **Procedures for administrating the surveys differed across the years**. Mailed questionnaires were used in the 1994 and 2004 studies, and both internet and mailed

questionnaires were used in 2012. According to research by Sinclair et al. (2012), response rates for internet surveys tend to be lower than those of postal surveys.

4. **Questionnaire lengths differed across years**. The 2012 study had 54 questions (some with multiple parts) compared to only 40 questions in 2004 and 45 questions in 1995. From phone calls, it was clear that time was a major constraint to completing the survey.

4.7 Limitations

Before proceeding to analysis, the limitations of questionnaire studies should be acknowledged. Particularly when low response rates are recorded, response bias must be considered, which occurs when a substantial shift in study results would have occurred if non-respondents had participated (Creswell, 2009). This would likely occur if a notable difference existed between the characteristics of non-respondents and those of respondents, meaning the results may not be generalized to the overall population, which would decrease external validity (Creswell, 2009; Newing, 2011). Furthermore, since many questions from the survey were repeated from previous survey years (either from the Kitchener-Waterloo survey or the Michigan survey), and all new questions were also subjected to pre-testing, conclusions should be backed by reasonably good internal and content validity (as defined by Creswell, 2009; Newing, 2011). However, because some participants made comments regarding the vagueness of the first survey question, it was removed from analysis. Similarly, since it appeared difficult for participants to estimate the percentage of their yard space occupied by various landscape items, question 20 was removed from analysis.

To address overall issues of validity and response bias, and to identify imbalances between the study sample and the populations of Kitchener and Waterloo, the analysis section begins with a focus on the descriptive statistics of respondent households and residence characteristics.

Chapter 5: Analysis

5.1 Introduction

This chapter presents the results of the study for survey questions that pertain to the research objectives. After a brief description of how the analysis was conducted and how it should be interpreted, the body of the chapter begins by outlining characteristics of respondents and their dwellings. The next section presents data on property and neighbourhood attributes that encouraged respondents to choose their current homes. Keeping in mind that spacious yards will be uncommon in intensified landscapes, the sections that follow outline residence and yard sizes that participants would prefer if they were to move, and what styles of yard landscapes would be most and least appealing. To understand how the findings may pertain to upcoming real estate markets, the length of time respondents were planning to remain in their current home is also included. The value of private yards is further explored in the remaining sections, which focus on the importance of yard appearance and privacy; the functionality of yards; and how much time and money residents tended to devote to their yards. The final section investigates important elements of public green spaces, since such landscapes will likely have greater value to citizens as open spaces become scarcer. The sections of this chapter are broken into smaller subsections where comparisons are made between subgroups.

5.2 Analytical Approach

Many survey questions asked participants to provide responses on a Likert-type scale of 1 (negative response) to 5 (positive response), based on their level of agreement with various statements; the importance they placed on given property and neighbourhood characteristics; their preference for dwellings and yards of various sizes; or how much they liked or disliked landscape designs. Such questions provided insight into how respondents would behave if they were to move to a new home. Chi square tests of independence were used for statistical analysis since Likert-type scales are ordinal and discrete in nature (Clason & Dormody, 1994), making analysis of means inappropriate. Nevertheless, most bar graphs within this chapter have been ordered by mean values (located above the bars) to make trends more apparent. Tables of percentages have also been included, with rows that sum to 100% and asterisks (*) placed beside categories with statistically significant trends. All percentages have been rounded to the nearest whole number. For chi square tests, the null hypothesis (H_o) was that categorical variables were independent, whereas the alternative hypothesis (H_a) was that variables were related (dependent). Chi square analysis was conducted based on the following

equation, with *O* as the observed frequency and *E* as the expected frequency (given the null hypothesis) that would be found in each cell of a contingency table:

$$X^2 = \sum(O-E)^2/E$$

The expected frequency for each cell of the chi square contingency table was calculated by:

$$E = \frac{\text{row total x column total}}{\text{sample size}}$$

Critical values were determined based on an $\alpha=0.05$ and

degrees of freedom = (number of rows-1) x (number of columns -1)

Statistically significant relationships were then explained based on standardized residuals, which were calculated with the equation:

$$R = \frac{\text{observed-expected}}{\sqrt{\text{expected}}}$$

Standardized residuals with absolute values closest to 2 were considered to be the drivers of the statistical significance.

To explore potential market trends, responses were compared across couples with and without children, respondent age groups, employment statuses (employed or retired), household incomes, and the amount of time respondents planned to remain in their current home. Unfortunately, the number of respondents in each subgroup was often too small for chi square tests. Based on recommendations from Yates, Moore and McCabe (1999, p. 734; as cited in Weaver, 2009), chi square analysis was not used when any expected values were less than one, or when over 20% of the expected values in a contingency table were below five. As a caution, an asterisk (*) was placed beside any reported *p* value that was calculated from a contingency table with at least one expected value below five. Since expected values tended to be low when five-point scales were analysed, they were reduced to three-point scales (e.g. "not at all preferable/not preferable"; "neutral"; "preferable/very preferable") for chi square analysis. Therefore, throughout this analysis when respondents are described to "prefer" or have "preference for" a feature, it means that their survey response was either "preferable" *or* "very preferable" (unless a particular response like "very preferable" is specified). Since significance values were linked to 3-point scales, figures and tables were provided to depict the full spectrum of responses. Tables of all statistical results are available in Appendix B.

5.3 Survey Respondents

This section provides background on the respondents and their homes. To ensure all participants had private outdoor space, anyone who skipped question 11 ("please indicate the type of outdoor space your residence has") or had only a common outdoor space, was not included in the analysed sample. With such respondents excluded, a total of 206 survey responses were used in analysis. Thus, "participants" refers here to those 206 who completed the questionnaire, but "respondents" refers to those answering a particular question. For example, only 195 *respondents* of the total 206 *participants* may have answered any given question. The number of respondents for a question is represented by its "*n*" value, and the difference between 206 and the *n* value represents the total number of participants who left the question blank or incomplete. When recruiting participants, 542 (43%) of the invitations were sent to Waterloo, and 730 (57%) were sent to Kitchener (as explained in Chapter 5). Although response rates were low, a similar proportion was maintained in the actual number of participants, with 93 (45%) from Waterloo, and 112 (55%) from Kitchener. In addition, based on a visual analysis of GIS data points, sample properties appeared to be well spread across the two cities, located within the city cores and outward toward the periphery.

5.3.1 Demographic Profile of Respondents and Their Households

To interpret results, one should consider the demographic profile of participants. Such information has been outlined alongside regional (and sometimes national and provincial) statistics to understand how well the study sample represents the overall population. Canada is commonly characterized by its aging population of baby boomers (Statistics Canada, 2010a), and attention has been focused on whether people will remain in houses or downsize as they age (OMB, 2013). Statistics Canada (2012d) classifies the population of Canada into seven demographic generations: "1918 and before", "parents of baby boomers" (1919-1940), "World War II generation" (1941-1945), "baby boomers" (1946-1965), "baby busters" – otherwise referred to as Generation X (1966-1971) , "children of baby boomers" – often referred to as Generation Y or echo boomers (1972-1992), and "generation Z" or Internet generation (1993-2011). Generation Z was not included in the sample because survey participants were required to be over the age of 18. Of those 178 respondents who provided their age, none were aged 93 or over, and most were around the age of 50 (mode =47, median =51, mean=50; Table 6). Since survey participants may have responded as early as March 2012, they were likely still the same age as they were in 2011. Therefore, the "ages as of 2011" used by Statistics Canada and

outlined in Table 6 were also used to categorize respondents into generational age groups, as year of birth was unknown.

Table 6. Canadian population and survey respondent age generations (*n*=178)

Generation name	Birth years	Ages as of 2011	2011 Canadian population	2011 Canadian population excluding generation Z	Survey population (using ages as of 2012 survey)	
			%	%	%	#
≤1918	Pre 1919	93 and over	0.3	0.3	0.0	*0*
Parents of baby boomers	1919-1940	71-92	9.2	11.8	6.7	*12*
World War II generation	1941-1945	66-70	4.3	5.5	5.6	*10*
Baby boomers	1946-1965	46-65	28.6	36.6	53.4	*95*
Baby busters/ GenX	1966-1971	40-45	8.4	10.8	11.8	*21*
Children of baby boomers	1972-1992	19-39	27.3	35.0	22.5	*40*
Generation Z	1993-2011	18 and less	21.9	0.0	0.0	*0*

Note: Category "percentage excluding generation Z" was calculated based on a total Canadian population of 26,139,330, which excluded the Generation Z population ineligible to complete the survey. Canadian statistics and generation categories obtained from Statistics Canada (2011c).

Figure 13 and Figure 14 show the proportions of people within each five-year age category beyond the age of 19, comparing the percentages of the city population to those of the survey sample. City percentages were determined based on a total population over the age of 19, calculated from data available from the 2011 Census (Statistics Canada, 2012a,b). Relative to the 2011 city population, the Kitchener age groups that were most over-represented in the survey sample were ages 40 to 44, 55 to 59, and 70-74 (Figure 13). In Waterloo, notably higher percentages of survey respondents were between the ages of 45 and 54, and 60 to 69 compared to the 2011 city population (Figure 14). Thus, many survey responses likely reflected the opinion of individuals considering retirement, or already retired. In fact, 25% of the 182 respondents who indicated their employment status were retired. No one over the age of 85 responded, and generations below the age of 30 were generally under

represented. Such a finding is expected, as young generations often live in apartments or do not yet own homes, and older generations may live in apartments or retirement homes, so these groups were less likely to be included in the target sample of households with private yards.

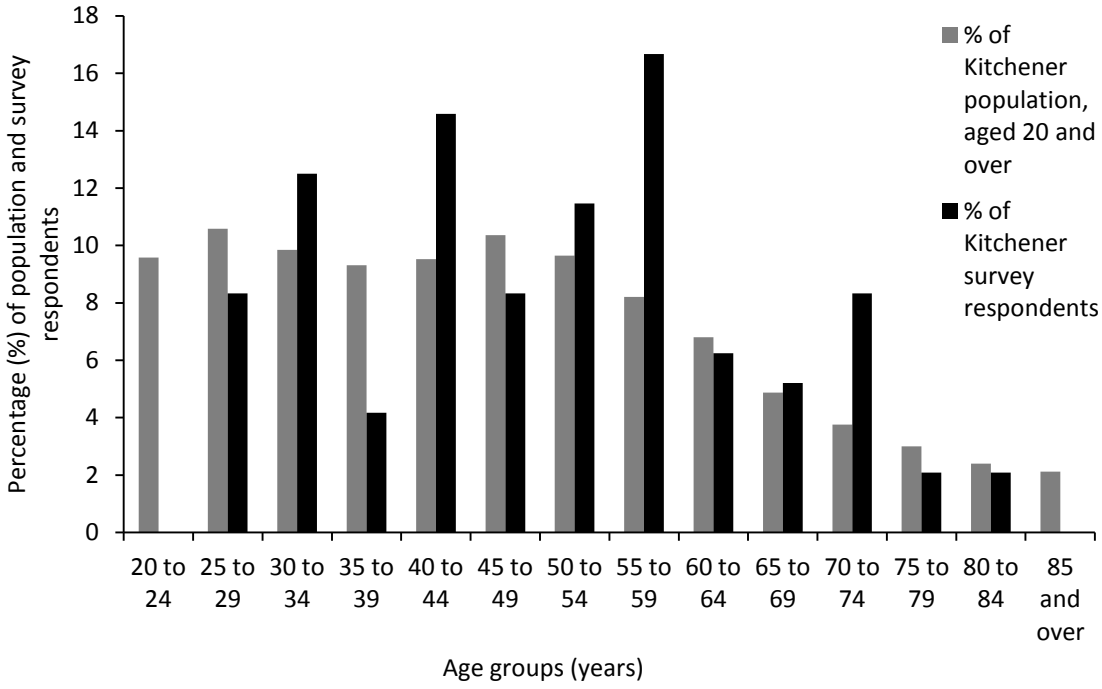

Figure 13. Percentage of people in each age group from City of Kitchener and survey sample population (*n*=96)

Note: Total Kitchener population over the age of 19 = 166,490. Kitchener data retrieved from Statistics Canada (2012a).

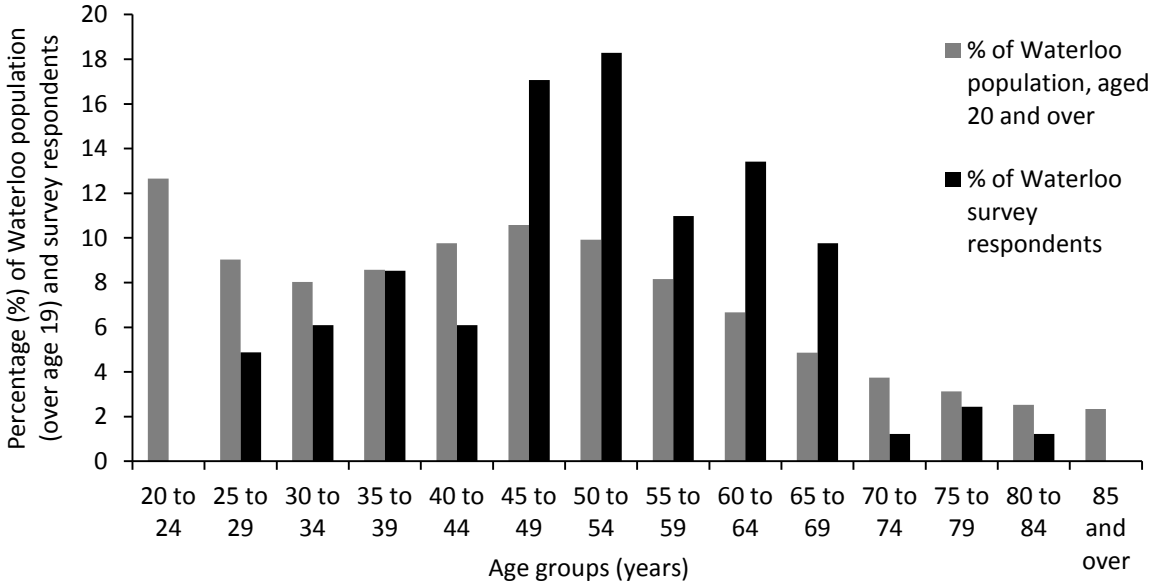

Figure 14. Percentage of people in each age group from the City of Waterloo and the survey sample population (*n*=82)

Note: Total Waterloo population over the age of 19 = 74,775. Waterloo data retrieved from Statistics Canada (2012b).

Most people who filled out the questionnaire were born in Canada (81%, *n*=198), of which 87% indicated they were from Ontario. Of those 37 participants who were born outside of Canada (Figure 15), 76% were from countries where English is not the primary language. This suggests that some participants may have had English as a second language. Germany was the most common birthplace outside of Canada, consistent with the characteristic German culture throughout Kitchener and Waterloo. The questionnaire asked only for the birthplace of the respondent, so birthplaces of other residents in the household were unknown.

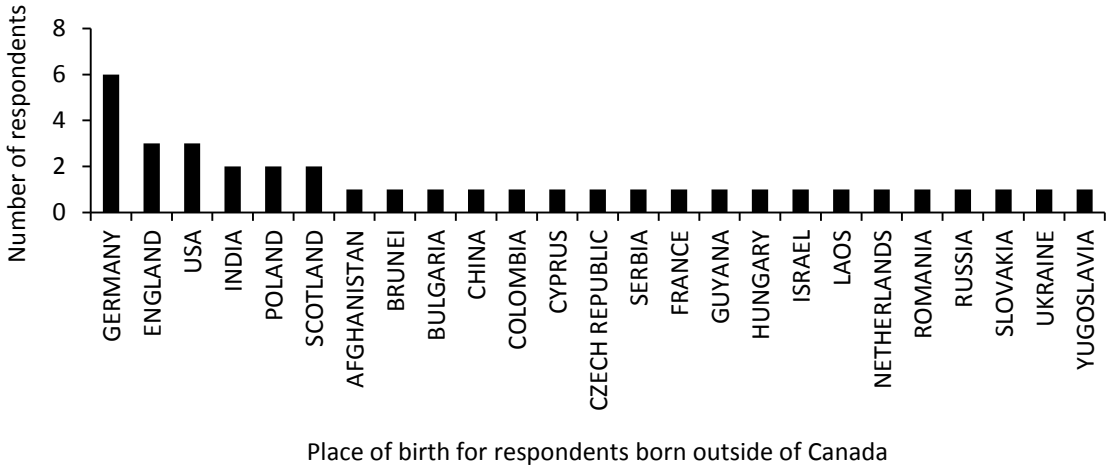

Figure 15. Place of birth for respondents born outside of Canada (*n*=198; 37 born outside of Canada, 161 born within Canada)

Only 186 participants indicated their gender, but of those respondents, 56% were female and 44% were male. In comparison, as of the 2011 Census, 51% of both the Kitchener and Waterloo populations were female, while 49% were male (Statistics Canada, 2012 a,b). Moreover, 84% (*n*=196) of the respondents said that they had attended some form of university, college, vocational, or technical school (opposed to finishing their education in elementary school or high school). Unfortunately, only 68% of all participants indicated their household income bracket, but of those who provided this information, 69% had household incomes between $50,000 and $149,999 (Figure 16). This roughly corresponds with the 2011 average household income estimate of $79,920 for Kitchener and $100,236 for Waterloo (FP Markets Canadian demographics, 2011, as cited in BMA Management Consulting Inc., 2011, p.23).

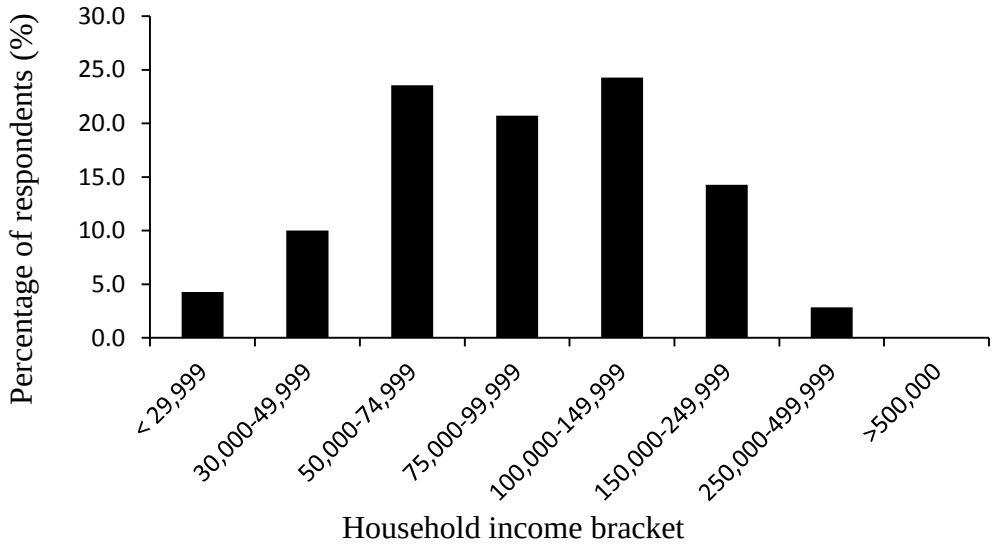

Figure 16. Respondent household incomes (*n*=140)

The survey asked respondents what type of household they lived in; either “individual living alone”, “couple”, “couple with children”, “single head of household with child/children”, or “other combinations of related or unrelated individuals”. Most respondent households were comprised of couples, with “couple” and “couple with children” representing 41% and 40%, respectively (*n*=198; Table 7). When asked about their landscape and property preferences, it was expected that couples with adult “children” may respond with little consideration for their children or with the thought that their children may move out. Therefore, in some (specified) cases, couples whose children were all 18 years of age or older (or who did not provide the ages of their children) were excluded from analysis. Compared to the percentage in Canada, Ontario, and Kitchener and Waterloo, there was an over-representation of couple families – both with children and without – within the survey sample. It should be noted that the total number of respondents who indicated their household was a "couple with child/children" was used to compare to the Statistics Canada category "couple-family with children aged 24 and under at home". Furthermore, there was a low proportion of respondents living in a one-person household or as a lone-parent, perhaps because large percentages of these groups could have been living in dwellings without yards (e.g. apartments), which would exclude them from participating. It is also likely that lone-parents were too busy to complete the lengthy survey.

Table 7. Respondent household types organized by census categories (*n*=198)

Household type	Kitchener			Waterloo			Kitchener & Waterloo			Ontario	Canada
	Survey		Census	Survey		Census	Survey		Census[1]	Census	Census
	#	%	%	#	%	%	#	%	%	%	%
Total private households	*108*	100	100	*90*	100	100	*198*	100	100	100	100
Couple-family with children at home[3]	*45*	42	28	*34*	38	32	*79*	40	29	29	27
Couple-family without children at home[3]	*44*	41	28	*38*	42	28	*82*	41	28	29	30
Lone-parent family	*8*	7	11	*3*	3	9	*11*	6	10	11	10
One-person	*9*	8	27	*10*	11	24	*19*	10	26	25	28
Multiple family[4]	*N/A*	N/A	2	*N/A*	N/A	1	*N/A*	N/A	2	3	2
Other[2]	*2*	2	4	*5*	6	6	*7*	4	5	4	4

Notes:

[1] Census percentages for "Kitchener & Waterloo" column were derived by adding values of each household type from Kitchener + Waterloo, obtained from Statistics Canada. Due to rounding, the total Kitchener & Waterloo households do not add to the sum of the Kitchener + Waterloo totals.

[2] According to Statistics Canada (2012a, Note(s) section), "other households: refers to two or more people who share a private dwelling, but who do not constitute a census family". A "census family: refers to a married couple (with or without children), a common-law couple (with or without children) or a lone parent family", and "multiple-family households: refers to a household in which two or more census families (with or without additional persons) occupy the same private dwelling" (Statistics Canada, 2012a, Note(s) section). The survey did not include a separate category for "multiple family", so these may have been embedded in the survey category "other".

[3] Couple-family "with children living at home" and "without children at home" included children of all ages (all under age 37) for the survey, but only included children aged 24 and under for the census.

[4] Category not included on survey, therefore considered N/A.

Other notes: Data was organized into census categories that most closely matched the five survey categories of: "individual living alone", "couple", "couple with child/children", "single head of household with child/children", and "other combinations of related or unrelated individuals". Census data was obtained from Statistics Canada (2012a,b).

5.3.2 Residence Characteristics

Almost all respondents owned their homes (96%; *n*=205), although as of the 2006 census, about 36% of dwellings in Kitchener were rented, as were 28% in Waterloo (Statistics Canada, 2010b,c). It is likely that few renters responded to the survey since many may have been living in dwellings without private yards, or may have felt the survey was directed at homeowners. Most respondents (71%) had resided in their homes for 20 years or less, with an overall mean of 15.4, median of 13, and mode of 2 years (*n*=190, Figure 17). Furthermore, 74% of respondents lived in dwellings that were built more than 20 years ago (*n*=204, Figure 18), suggesting that many were not the first owners of their homes.

Figure 17. Number of years respondents had resided in their current home (*n*=191).

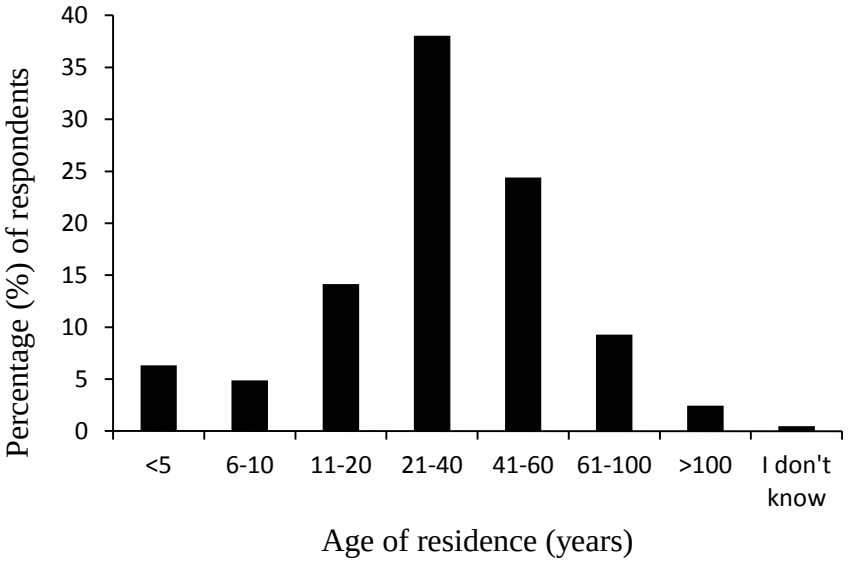

Figure 18. Percentage of respondents living in residences of given ages (*n*=205).

One respondent lived in a condominium four storeys or lower (listed under "apartment with <5 storeys" in Table 8, while all other respondents lived in houses. Single-detached houses represent the greatest proportion of dwellings in both Kitchener (50%; Statistics Canada, 2012a) and Waterloo (58%; Statistics Canada, 2012b); however, the proportions represented in survey responses were much higher, with Kitchener at 88% and Waterloo at 86% (*n*=205; Table 8). Such high proportions were expected, as apartments and duplexes were only included in the sample if they had a private yard. Furthermore, the proportions of semi-detached houses and row houses (including town houses) were somewhat under-represented in comparison to the Kitchener and Waterloo combined population, but were closer to the proportion across Ontario and Canada. According to estimates by respondents, their homes ranged from a market value of $150,000 to over $600,000, with the majority between $200,000 and $400,000 (*n*=204; Figure 19).

Table 8. Respondent residence types, organized by census categories (*n*=205).

Structural type of dwelling	Kitchener			Waterloo			Kitchener & Waterloo			Ontario	Canada
	Survey		Census	Survey		Census	Survey		Census[1]	Census	Census
	#	%	%	#	%	%	#	%	%	%	%
Total[3]	*112*	100	86	*93*	100	89	*205*	100	87	83	89
Single-detached house	*98*	88	50	*80*	86	58	*178*	87	52	56	55
Semi-detached house	*6*	5	6	*3*	3	5	*9*	4	6	6	5
Row house	*6*	5	11	*8*	9	12	*14*	7	12	9	6
Apartment building with < 5 storeys[2]	*0*	0	15	*1*	1	11	*1*	0	14	10	18
Apartment duplex	*2*	2	3	*1*	1	2	*3*	1	3	3	5

Notes:
[1]Census totals for Kitchener & Waterloo section were derived by adding values of each structural type of dwelling from each city, obtained from Statistics Canada (2012a,g).
[2]Condominiums were considered apartments for the purpose of this table.
[3]Census totals do not add to 100% because census categories of: "apartment building with >4 storeys", "other single-attached house", and "movable dwelling" were removed.
Other notes: The survey category of duplex house (with upper and lower unit in same house) was listed under "apartment duplex"; town houses were included under "row house"; and condominium in a building of 4 storeys or lower was listed under "apartment building with <5 storeys". No respondents indicated living in a condominium in a building of 5 storeys or higher, an apartment, or room(s) within a house or apartment. Census data was obtained from Statistics Canada (2012a,g).

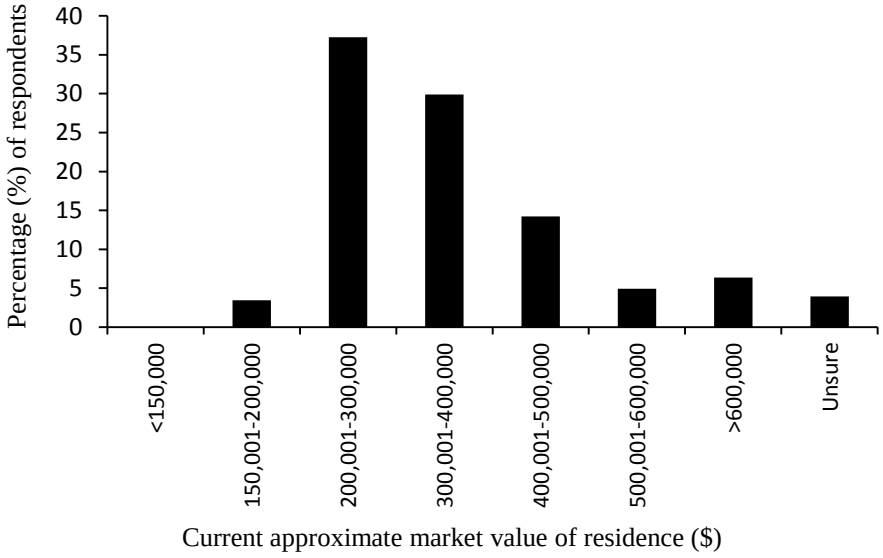

Figure 19. Current approximate market value of respondent homes as estimated by respondents (*n*=204)

Using the measurement conversion table (Table 9) to define residence sizes, most respondents (77%) indicated their homes were medium-sized (*n*=203; Table 10). Employed and retired respondents did not significantly differ in their current residence sizes; however, a greater proportion of respondents with household incomes between $100,000-249,999 were living in large homes compared to those with household incomes between $50,000-99,999, X^2 (2, *n*=116) = 9.56, *p*=0.008 (asterisks on tables indicate statistical significance). Too few respondents were living in small homes for chi square analysis to be used to compare couples with and without children, or resident age groups (see Appendix B). Each row of the percentage tables provided throughout the analysis sum to 100%.

Table 9. Residence size conversion table provided in questionnaire.

Residence Size	Square Feet	Square Meters
Small	less than 1000	less than 93
Medium	1001 - 2500	93 - 232
Large	greater than 2500	greater than 232

Table 10. Percentage of respondents with residences of each size, organized by respondent and household characteristics.

Respondent or household characteristic		Current residence size:		
	n	Small (%)	Medium (%)	Large (%)
Total sample				
All respondents	*203*	8	77	15
Couples with or without children				
Couples with children	*79*	6	75	19
Couples without children	*81*	5	81	14
Age group				
25-45	*61*	13	75	11
46-55	*50*	8	72	20
56-65	*44*	2	77	20
66 and older	*22*	9	82	9
Employed or retired				
Employed	*126*	10	77	13
Retired	*44*	7	73	20
***Household income bracket**				
$50,000-99,999	*62*	13	84	3
$100,000-249,999	*54*	6	74	20

Participants were also asked to estimate the size of their yard, based on a chart they were given (i.e. columns 1,2,3 and 5 of Table 11; refer to Appendix C), which was used throughout the survey. If they did not know the dimensions of their yard, they were asked to imagine how many single car garages could fit into the area of their total yard space (area of front yard + side yard + back yard + driveway/paved land, combined). The average size of a single car garage was assumed to be about 264 square feet or 25m^2. Yard size estimates by respondents were compared to "actual" yard sizes, obtained by subtracting building footprints (i.e. area of house plus other buildings such as garage or shed) from parcel area (i.e. total lot size) using ArcGIS data for Kitchener and Waterloo (see Appendix E for references). Overall, 23% of respondents classified their yard sizes correctly, whereas 77% gave incorrect estimates. In general, estimated yard sizes were classified by respondents as smaller than they should have been. For instance, many people indicated that they had a small yard even though their yard was greater than 100m^2 (the smallest measured yard was 106m^2). Therefore, actual mean areas attributed to the yard size classifications given by participants are provided within Table 11. Mean values exclude 10 addresses, which did not have measurable private yard sizes (i.e. parcel sizes that included an entire townhouse complex rather than individual lot size).

Table 11. Yard size conversion table provided in questionnaire with comparisons to mean actual yard sizes calculated using GIS.

Yard size classification	**Number of single car garages that would fit in yard**	**Square Feet** (provided on survey)	**Mean Square Feet** (GIS actual)	**Square Meters** (provided on survey)	**Mean Square Meters** (GIS actual)
Small	0-4	0-1056	3197	0-100	297
Medium	5-9	1057-2376	4327	101-225	402
Large	10-16	2377-4224	6308	226-400	586
Very Large	17 or more	4225 or more	6889	401 or more	640

Using the size ranges given on the survey (i.e. columns 3 and 5 from Table 11), Figure 20 depicts the distribution of yard sizes as they were estimated by respondents compared to how they would have been classified if respondents knew their actual yard size (based on GIS data). Seven "actual" small yards were counted by assuming properties on complexes (e.g. townhouse complex) were actually small. Such a measurement was not possible to obtain from GIS data since the parcel size included the entire complex; therefore, in reality such yards may have actually been larger in size.

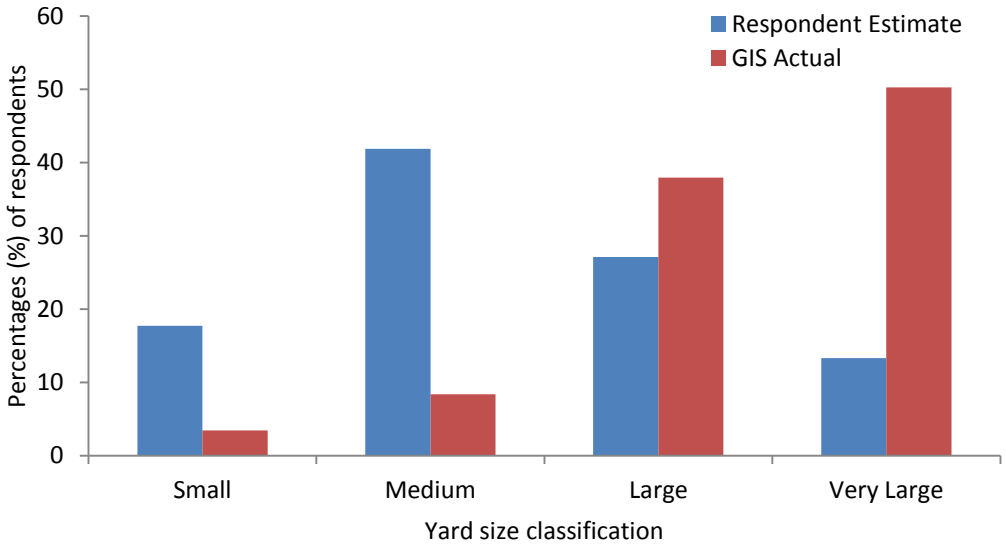

Figure 20. Distributions of yard sizes based on estimations by respondents compared to actual calculated sizes from GIS data (*n*=203).

Appendix E provides tables and figures of how estimated yard sizes would have been classified if they were based on the sizes obtained from GIS. In addition, Appendix F provides visual comparisons of the yard size distribution from the survey compared to yard sizes across Kitchener and Waterloo. On the whole, although perceptions of yard sizes were not well-aligned with the measurement tool provided in the survey, the actual distribution of respondent yard sizes was comparable to the distributions of yard sizes across Kitchener and Waterloo. Therefore, conclusions should be relatable to the population.

For the remainder of analysis, yard sizes are discussed based on how survey respondents classified their yards. Trends in property size preferences should remain relevant, as responses still indicate whether or not there is interest in increasing or decreasing yard size. Nevertheless, actual mean values may be referenced to give a more realistic idea of what respondents imagined to be small, medium, large, and very large yard sizes, keeping in mind that respondents generally pictured a small yard to be larger than what was defined in the survey.

According to results, respondents had yards of all sizes, with medium yards the most common (Table 12). Yard sizes did not significantly differ between couples with and without children, across age groups, between employed and retired respondents, or between household income groups of $50,000-99,999 and $100,000-249,999 (see Appendix B).

Table 12. Percentage of respondents with yards of each size, organized by respondent and household characteristics.

Respondent or household characteristic	*n*	Current private yard size: Small (%)	Medium (%)	Large (%)	Very large (%)
Total sample					
All respondents	*203*	18	42	27	13
Couples with or without children					
Couples with children	*78*	18	46	21	15
Couples without children	*82*	16	40	32	12
Age group					
25-45	*59*	25	44	17	14
46-55	*50*	14	46	30	10
56-65	*45*	13	36	33	18
66 and older	*22*	18	32	32	18
Employed or retired					
Employed	*126*	20	43	23	14
Retired	*43*	14	37	35	14
Household income bracket					
$50,000-99,999	*62*	13	55	23	10
$100,000-249,999	*54*	19	41	31	9

Excluding the 19% of respondents who did not know how long they would stay in their homes, 55% of respondents expected to move within the next 25 years, while 26% believed they would stay in their current residence indefinitely (*n*=204, Figure 21).

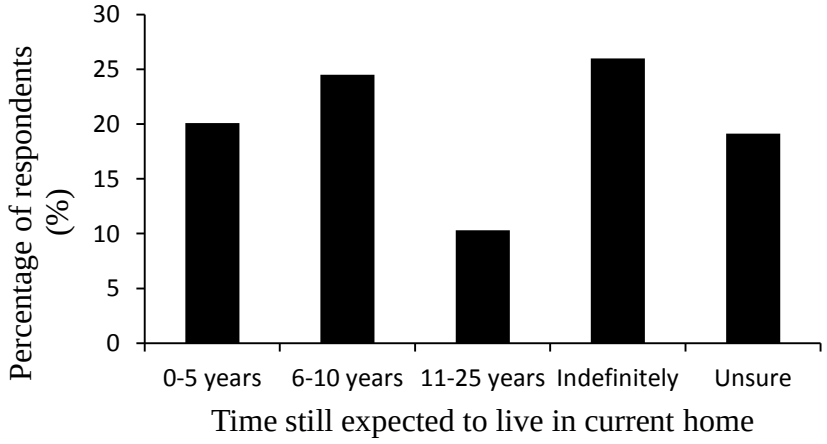

Figure 21. Length of time respondents expect to still remain in their current home (*n*=204).

The amount of time residents were planning to stay in their current home was also organized by subgroups in order to estimate the types of households who may be searching for new homes in the future, and to investigate whether residents were planning to age in place (Table 13). For these comparisons, couples were broken into a group without children and a group with at least one child under the age of 18, since couples with older children may behave like couples without children. In general:

- **Couples with at least one child under the age of 18, and couples without children:** No statistical differences were detected between these groups, X^2 (4, n=133) = 3.14, p=0.535.
- **Age groups:** When all age groups were compared, chi square results were not statistically significant, X^2 (12, n=176) = 20.80, p=0.053. However, when the age group of 66 and older was excluded (due to low response rates), differences across age groups were significant, X^2 (8, n=154) = 15.79, p=0.045. In general, those between the ages of 46 and 55 were planning to stay in their current home longer than other age groups, as they represented the greatest portion planning to remain in place for 11-25 years, and the smallest portion planning to move within 5 years. Conversely, of those between the ages of 25 and 45 and wanting to move, few were planning to wait another 11-25 years.
- **Employed and retired respondents:** A greater percentage of retired respondents were planning to stay in their homes indefinitely compared to employed respondents, while none of the retired respondents were planning to move in 11-25 years, compared to 14% of employed respondents, X^2 (4, n=169) = 13.98, p=0.007.
- **Household income groups:** Respondents with household income brackets of $50,000-99,999 and $100,000-249,999 did not significantly differ in their plans for moving or staying in place, X^2 (4, n=115) = 9.33, p=0.053.
- **Size of current home:** Data were not appropriately spread for chi square analysis since most respondents were living in medium sized homes. From the data, it appears that about a quarter of residences of all sizes may be on the market in 6-10 years.
- **Size of current yard:** The length of time respondents expected to stay in their current homes significantly varied by the size of their current yards, X^2 (12, n=201) = 21.32, p=0.046*. In particular, few respondents with small yards were intending to stay for another 11-25 years or indefinitely.

Table 13. Percentage of respondents who plan to stay in their current homes for given time range, organized by respondent and household characteristics.

Respondent or household characteristic	*n*	Time planning to stay in current home				
		0-5 years (%)	6-10 years (%)	11-25 years (%)	Indefinitely (%)	I don't know (%)
Total sample						
All respondents	***204***	20	25	10	26	19
Couples with or without children						
Couples with at least one child under age 18	***53***	19	21	15	26	19
Couples without children	***80***	21	30	9	28	13
***Age group**						
25-45	***59***	25	27	5	22	20
46-55	***50***	8	20	22	30	20
56-65	***45***	27	16	9	33	16
66 and older	***22***	18	41	5	23	14
***Employed or retired**						
Employed	***125***	22	22	14	21	21
Retired	***44***	16	27	0	43	14
Household income bracket						
$50,000-99,999	***61***	20	30	5	31	15
$100,000-249,999	***54***	22	26	22	17	13
Size of current home						
Small	***16***	31	25	6	6	31
Medium	***155***	19	24	9	26	21
Large	***30***	17	27	20	33	3
***Size of current yard**						
Small	***36***	28	31	3	14	25
Medium	***83***	14	24	12	37	12
Large	***55***	16	27	15	16	25
Very large	***27***	30	15	7	26	22

As this section concludes, a few points can be made about the sample characteristics. Specifically, a large proportion of the sample:

- was of the baby-boomer generation (aged 46-55)
- had attended some form of university, college, vocational, or technical school
- was from Ontario, Canada
- had a household income between $50,000-249,999
- was living as a couple (similar percentages of couples had children as did not have children)
- owned their home (very few were renting)
- had been living in their home for 20 years or less
- was living in a single-detached house
- was living in a medium-sized home
- had a yard that was medium or large in size
- was planning to move within the next 25 years

Many of the sample characteristics were expected since participants had to be living in a home with a private yard. Nevertheless, the conclusions of this study may not generalize to residents who are young; have low levels of education; were born outside of Canada; have a low household income; rent their home; live alone, in a single-parent household or other arrangement; or are living on a small property.

5.4 Influential Factors in Choosing Current Home

The following section outlines the property and neighbourhood characteristics that influenced respondents as they chose their current home.

5.4.1 Neighbourhood Characteristics

When asked how important a variety of characteristics were in deciding to move to their neighbourhood, safety of the neighbourhood was marked as very important by more respondents (50%) than any other characteristic (*n*=189; Figure 22). Other notably important features included housing costs and value in the neighbourhood; school quality and closeness to schools; and neighbourhood appearance and spaciousness. In addition, over half of the respondents indicated that being close to natural areas and parks or recreation were important factors.

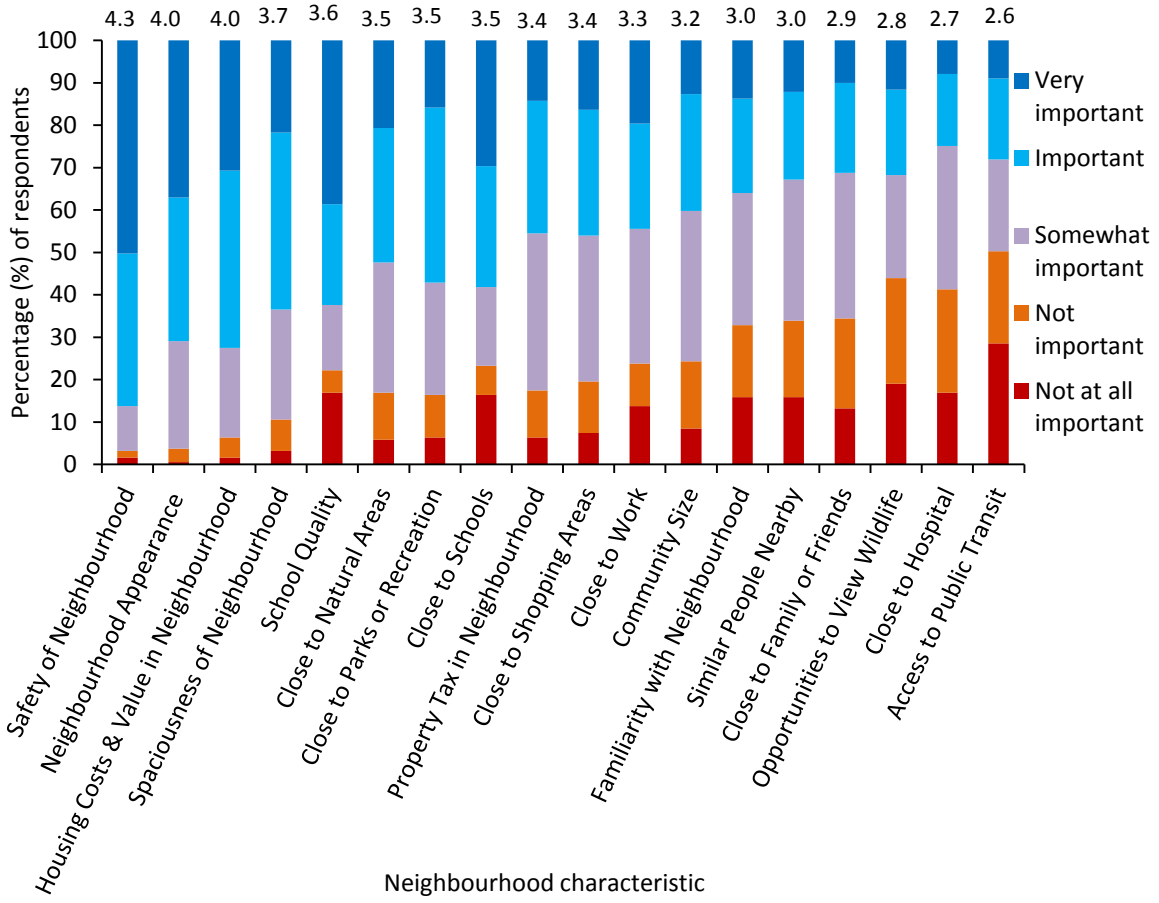

Figure 22. Importance of various characteristics in respondents' decisions to move to their current neighbourhood (*n*=189).

Note: Mean values for each characteristic appear above bars and are based on a scale of 1 (not at all important) to 5 (very important).

5.4.1.1 Comparison: Couples With and Without Children

When deciding to move to their current neighbourhood, safety held top importance for couples with and without children. Analysis of this question included couples with children of all ages, keeping in mind that children would have been younger (or unborn) when couples bought their homes. The two groups significantly differed in the importance they placed on school quality, X^2 (2, *n*=147) = 12.53, *p*=0.002, and being close to schools, X^2 (2, *n*=147) = 12.50, *p*=0.002. Although school quality was important/very important to a fairly large percentage of couples without children (50%, *n*=73), a greater proportion of couples with children (73%, *n*=74) felt this way. Correspondingly, school

quality was not important/not at all important to 33% of couples without children, but to only 9% of couples with children. Closeness to schools was rated as important/very important by 64% of couples with children and 52% without children; while it was rated as not important/not at all important by 11% of those with children and 34% of those without children. For couples with children, quality of schools was rated as important/very important by 10% more respondents than was closeness of schools. No significant differences existed between couples with and without children for all other investigated neighbourhood characteristics (where chi square tests were applicable; Appendix B).

5.4.1.2 Comparison: Age Group of Respondents When They Moved to Their Home

To determine how old respondents were when they moved to their current home, the number of years they had lived in their home was subtracted from their age. Responses were then grouped by respondent ages of 20 to 29 (n=40); 30 to 39 (n=68); and 40 to 65 (n=46). The importance of school quality significantly differed across these age groups, X^2 (4, n =154) = 14.97, p=0.005, as did the importance of being close to schools, X^2 (4, n =154) = 14.04, p=0.007. In general, respondents of child-bearing ages when they bought their homes were most concerned with schools. School quality was important/very important to 60% of those between 20 and 29; 76% of those between 30 and 39; and 43% of those between the ages of 40 and 65. Conversely, school quality was not important/not at all important to 23% of those between 20 and 29; 13% of those between 30 and 39; and 41% of those between 40 and 65. Similarly, being close to schools was important/very important to 60% of those between 20 and 29; 69% of those between the ages of 30 and 39; and only 41% of those between 40 and 65. Meanwhile, closeness to schools was not important/not at all important to 23% of those between 20 and 29; 13% of those between 30 and 39; and 43% of those between the ages of 40 and 65. No significant differences existed across age groups in the importance placed on all other neighbourhood characteristics when they bought their homes (where chi square tests were applicable; Appendix B).

5.4.2 Property Characteristics

Respondents were also asked how important various attributes were when deciding to buy or rent their particular property. Cost and value of property was very important to more respondents (45%; n=193) than any other characteristic (Figure 23). Most variables were more than "somewhat important" to over 50% of respondents, while factors that were generally unimportant included the opportunity for a food garden or the opportunity to view wildlife.

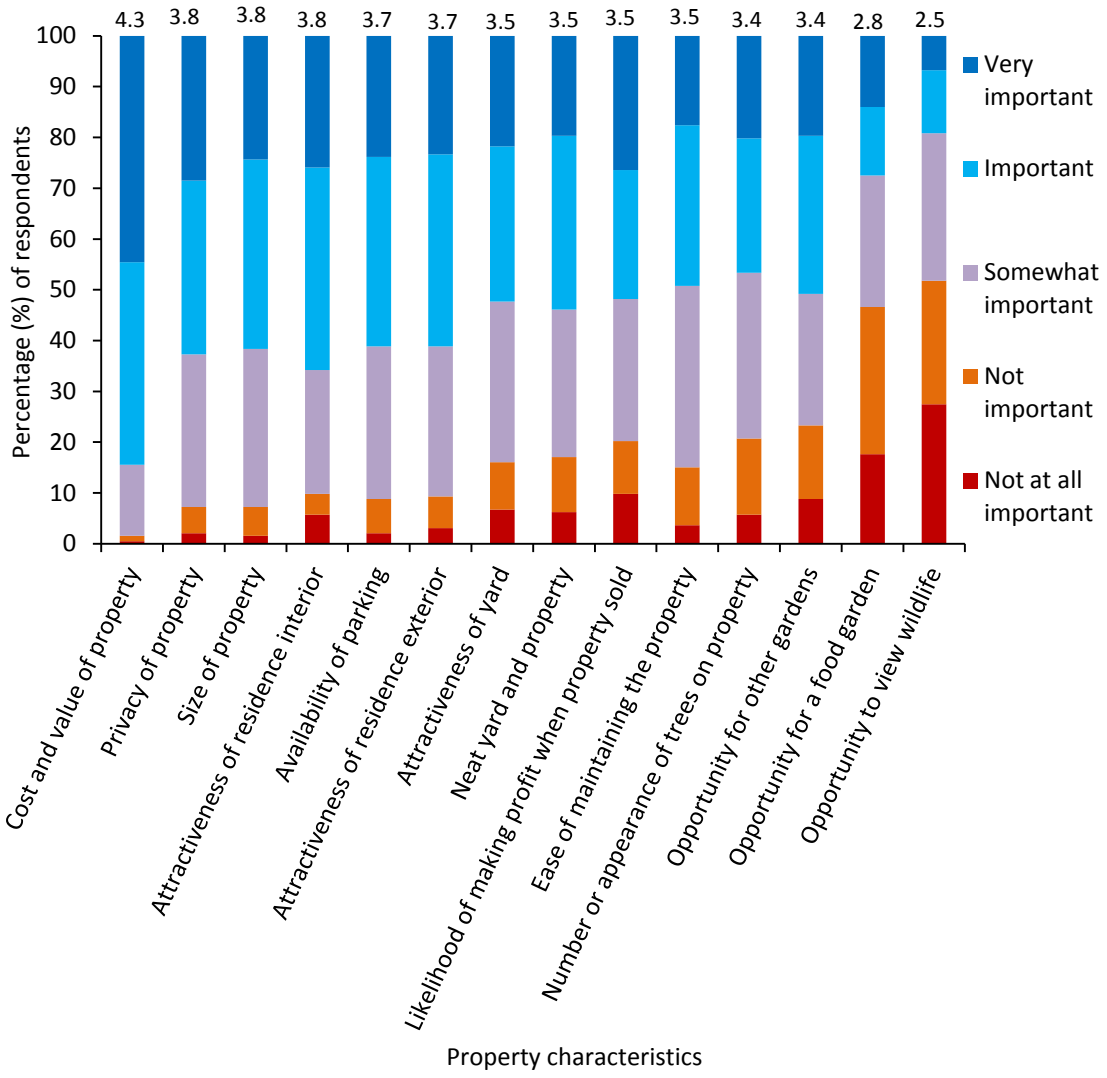

Figure 23. Importance of various property characteristics in respondents' decisions to buy or rent their current property (*n* =193).

Note: Mean values for each characteristic appear above bars and are based on a scale of 1 (not at all important) to 5 (very important).

5.4.2.1 Comparison: Couples With and Without Children

Couples with and without children did not significantly differ in their importance ratings of property characteristics (where chi square tests were applicable; Appendix B).

5.4.2.2 Comparison: Age Group of Respondents When They Moved to Their Home

The importance of each property characteristic was also analysed by age groups at which residents moved to their homes. When respondents chose their current homes, the importance of having the opportunity for a food garden differed by age group, X^2 (4, n =156) = 11.68, p=0.020. It was important/very important to 43% of those between the ages of 20 and 29 (n=44); but to only 21% of those between 30 and 39 (n=66) and 17% of those between 40 and 65 (n=46). Meanwhile, it was not important/not at all important to 59% of those between 40 and 65; 47% of those between 30 and 39; and only 30% of those between 20 and 29. No significant differences existed across age groups in the importance placed on all other property characteristics (where chi square tests were applicable; Appendix B).

Overall, most respondents placed relatively high importance on the property and neighbourhood characteristics that were investigated in this study, regardless of their age or whether they were living as a couple with or without children.

5.5 Influential Factors in Choosing a Hypothetical Future Home

The following section explores respondent preferences for dwellings and yards of various sizes, and factors that may encourage them to live on a small lot.

5.5.1 Residence Size Preferences

Participants were asked how preferable various residence sizes would be if they had to move, considering their household size, finances, health, etcetera. On the whole, houses were more preferable than condominiums and apartments, which were not at all preferable to 57% and 71% of respondents, respectively (n =168; Figure 24). Nevertheless, when preferable and very preferable percentages were combined, small houses and small to medium condominiums were each preferable/very preferable to 23% of respondents. Overall, medium houses were most favourable, selected by 40% of respondents as very preferable.

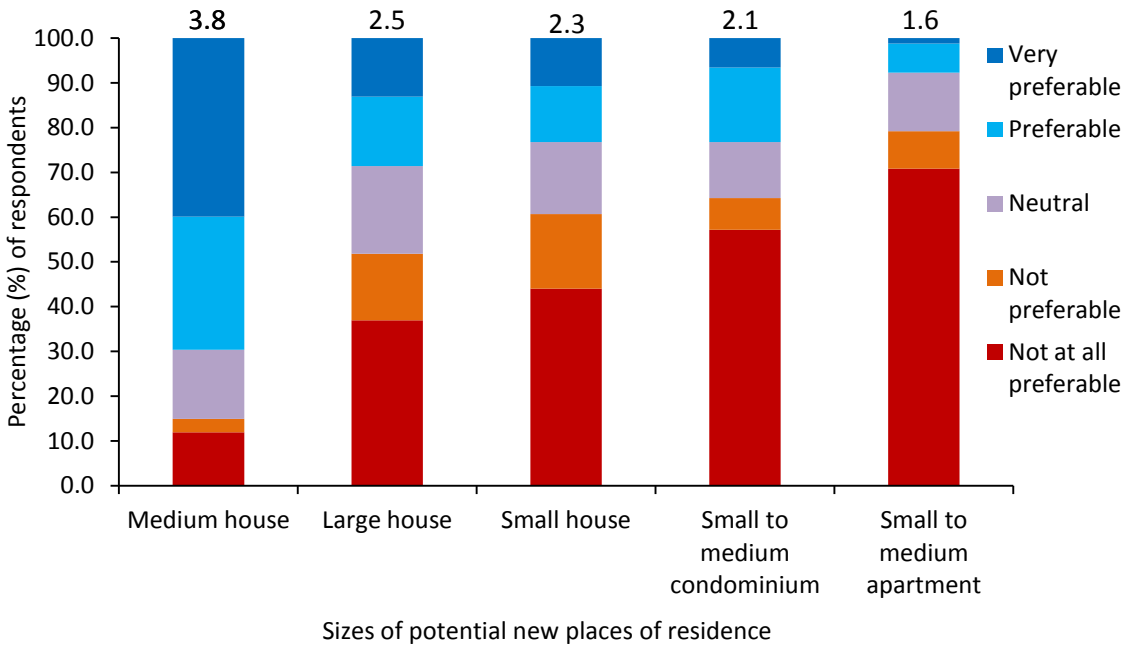

Figure 24. Dwelling size preferences (*n*=168).

Note: Participants were asked to select preferences as if they were choosing a new home, and to consider the size of their household, finances, health, etc. Mean values for each residence size appear above bars and are based on a scale of 1 (not at all preferable) to 5 (very preferable).

5.5.1.1 Comparison: Couples With and Without Children

Couples with at least one child under the age of 18 (*n* =53) and couples without children (*n* =58) did not significantly differ in their preferences for most potential future home sizes (where chi square tests were applicable; Appendix B), although small to medium condominiums were more preferable to couples without children than to those with children, X^2 (2, *n* =111) = 8.90, *p*=0.012 (Table 14). A similar trend was found for small houses; however, differences were not quite significant, X^2 (2, *n* =111) = 5.79, *p*=0.055 (Appendix B).

Table 14. Dwelling size preferences according to couples with at least one child under the age of 18 (*n*=53), and couples without children (*n*=58).

Couples with at least one child under age 18 or couples without children	Not at all preferable (%)	Not preferable (%)	Neutral (%)	Preferable (%)	Very preferable (%)	*Mean*
Small house						
Couple with child(ren)	58	17	13	9	2	***1.8***
Couple without child(ren)	40	17	14	17	12	***2.4***
Medium house						
Couple with children	8	4	11	30	47	***4.1***
Couple without children	19	5	14	31	31	***3.5***
Large house						
Couple with children	26	13	15	25	21	***3.0***
Couple without children	41	19	12	12	16	***2.4***
Small to medium apartment						
Couple with children	77	4	15	4	0	***1.5***
Couple without children	62	9	16	12	2	***1.8***
***Small to medium condominium**						
Couple with children	74	4	13	8	2	***1.6***
Couple without children	52	5	10	24	9	***2.3***

Note: Participants were to rate their preference for each dwelling size on a scale of 1 (not at all preferable) to 5 (very preferable) if they had to move, considering the size of their household, finances, health, etc.

5.5.1.2 Comparison: Current Age Groups of Respondents

Dwelling size preferences were also investigated by respondent age group, although the group over age 66 (*n*=11) was not included in chi square analysis due to low response rates. Preference ratings for large houses and small to medium condominiums differed by age groups of 25 to 45 (*n*=61), 46 to 55 (*n*=46), and 56 to 65 (*n*=34) (where chi square tests were applicable; Appendix B). Preference for large houses decreased with age, as 49% of those between ages 25 and 45 said that large houses were preferable, compared to only 12% of those between ages 56 and 65, X^2 (4, *n* =141) = 20.98, *p*<0.001. Meanwhile, preference for small to medium condominiums increased with age, X^2 (4, *n* =141) = 21.95, *p*<0.001*. Only 7% of those between ages 25 and 45 indicated preferences for condominiums compared to 27% of those between ages 46 and 55, and more than 40% of those between ages 55 and 65. Preference for small to medium apartments also appeared to increase with age; however, expected values were too low for chi square analysis (Table 15). Trends specific to each group are listed below:

- **Age 25 to 45:** Most respondents preferred medium or large houses, and had low preference for small houses, condominiums, and apartments.

- **Age 46 to 55:** Most respondents preferred medium houses, and a greater portion preferred small houses than preferred large houses. However, at some point in this age interval, people became more interested in condominiums than people in the 25-45 age group.
- **Age 56 to 65:** Most respondents (68%) had preference for medium houses, although few had preference for large houses and about 40% had preference for small homes or condominiums.
- **Age 66 and older:** Forty-five percent of respondents showed some degree of preference for small houses and for condominiums, although small houses were rated as "very preferable" more often than condominiums. Medium houses and apartments were preferable to the same proportion of people; and large houses were not preferable.

Table 15. Dwelling size preferences according to respondents in age groups 25-45 (*n*=61), 46-55 (*n*=46), 56-65 (*n*=34), and 66 and older (*n*=11).

Age group	Not at all preferable (%)	Not preferable (%)	Neutral (%)	Preferable (%)	Very preferable (%)	*Mean*
Small house						
25-45	49	21	16	7	7	***2.0***
46-55	39	13	15	24	9	***2.5***
56-65	47	9	15	12	18	***2.4***
66 and older	36	0	18	9	36	***3.1***
Medium house						
25-45	7	2	10	38	44	***4.1***
46-55	9	4	15	28	43	***3.9***
56-65	18	0	15	21	47	***3.8***
66 and older	36	9	36	18	0	***2.4***
Large house*						
25-45	16	15	20	26	23	***3.2***
46-55	46	20	13	11	11	***2.2***
56-65	53	15	21	6	6	***2.0***
66 and older	82	9	9	0	0	***1.3***
Small to medium apartment						
25-45	85	8	5	2	0	***1.2***
46-55	65	11	17	4	2	***1.7***
56-65	62	6	18	12	3	***1.9***
66 and older	45	0	36	18	0	***2.3***
Small to medium condominium*						
25-45	77	8	8	7	0	***1.4***
46-55	46	9	20	20	7	***2.3***
56-65	41	6	12	26	15	***2.7***
66 and older	45	0	9	27	18	***2.7***

Note: Participants were to rate their preference for each dwelling size on a scale of 1 (not at all preferable) to 5 (very preferable) if they had to move, considering the size of their household, finances, health, etc.

5.5.1.3 Comparison: Employed and retired respondents

Retired and employed respondents did not significantly differ in their preferences for moving to small houses, small to medium apartments, or small to medium condominiums (Table 16; see Appendix B). Although moving to a medium house was the most frequently preferred option for both employed and retired respondents; medium houses were more often considered not preferable/not at all preferable by respondents who were retired than by those who were employed, X^2 (2, n =143) = 16.87, p=0.0002. Preference for large yards was also affected by retirement, with 77% of retired respondents rating them as not preferable/not at all preferable compared to only 47% of employed respondents, X^2 (2, n=143) = 8.86, p=0.012. Trends specific to each group are listed below:

- **Employed:** Most respondents preferred medium houses and more preferred large houses than small houses. Only 20% showed some preference for condominiums.
- **Retired:** Most respondents preferred medium houses, while small houses and condominiums were equally preferable. Both were more preferable than large houses.

Table 16. Dwelling size preferences according to employed (n=113) and retired (n=30) respondents.

Employed or retired	Not at all preferable (%)	Not preferable (%)	Neutral (%)	Preferable (%)	Very preferable (%)	*Mean*
Small house						
Employed	47	15	19	7	12	***2.2***
Retired	43	3	20	20	13	***2.6***
***Medium house**						
Employed	7	2	12	36	43	***4.1***
Retired	30	3	23	23	20	***3.0***
***Large house**						
Employed	31	16	21	18	14	***2.7***
Retired	67	10	13	3	7	***1.7***
Small to medium apartment						
Employed	70	11	12	5	2	***1.6***
Retired	63	3	20	13	0	***1.8***
Small to medium condominium						
Employed	57	9	14	15	5	***2.0***
Retired	53	0	13	20	13	***2.4***

Note: Participants were to rate their preference for each dwelling size on a scale of 1 (not at all preferable) to 5 (very preferable) if they had to move, considering the size of their household, finances, health, etc

5.5.1.4 Comparison: Household Incomes

Dwelling size preferences appeared to differ across household income brackets (Table 17); however, response rates were not adequate to support chi square analysis of all income brackets. Therefore, responses were grouped into household incomes of $50,000-99,999 (*n*=49) and $100,000-249,999 (*n*=51) to be compared statistically. Preference for moving to a large house differed by income group, with 45% of those with a household income between $100,000 and $249,999 rating large houses as preferable/very preferable compared to only 20% of those with a household income between $50,000 and $99,999, X^2 (2, *n* =100) = 8.65, *p*=0.013 (where chi square tests were applicable; Appendix B). Trends specific to each group are listed below:

- **$50,000-74,999:** Medium houses were most often preferable, followed by small houses. When "preferable" and "very preferable" ratings were combined, condominiums were more preferable than large houses or apartments, although large houses were "very preferable" more often.
- **$75,000-99,999:** Medium houses were most often preferable, followed by large houses. Almost no respondent in this group would prefer a condominium or apartment, but about 15% had some preference for small houses.
- **$100,000-149,999:** Medium houses were most often preferable, followed by large houses. Condominiums were preferable/very preferable to 22% of this group, which was more than who preferred small houses or apartments.
- **$150,000-249,999:** Large houses were most often preferable, followed by medium houses. Small houses and apartments were generally not preferable, but this group had the greatest portion interested in condominiums (31%).

Table 17. Dwelling size preferences according to respondents with household income brackets of $50,000-74,999 (*n*=29); $75,000-99,999 (*n*=20); $100,000-149,999 (*n*=32); and $150,000-249,999 (*n*=19).

Household Income Bracket	Not at all preferable (%)	Not preferable (%)	Neutral (%)	Preferable (%)	Very preferable (%)	*Mean*
Small house						
$50,000-74,999	28	21	21	21	10	***2.7***
$75,000-99,999	50	25	10	10	5	***2.0***
$100,000-149,999	50	19	16	6	9	***2.1***
$150,000-249,999	68	16	5	5	5	***1.6***
Medium house						
$50,000-74,999	14	7	7	28	45	***3.8***
$75,000-99,999	0	0	25	25	50	***4.3***
$100,000-149,999	13	3	0	38	47	***4.0***
$150,000-249,999	16	11	16	21	37	***3.5***
Large house						
$50,000-74,999	38	34	14	3	10	***2.1***
$75,000-99,999	45	10	15	30	0	***2.3***
$100,000-149,999	34	16	19	16	16	***2.6***
$150,000-249,999	11	5	16	32	37	***3.8***
Small to medium apartment						
$50,000-74,999	59	7	21	10	3	***1.9***
$75,000-99,999	80	5	15	0	0	***1.4***
$100,000-149,999	81	9	3	3	3	***1.4***
$150,000-249,999	68	11	11	11	0	***1.6***
Small to medium condominium						
$50,000-74,999	55	7	17	17	3	***2.1***
$75,000-99,999	65	5	25	5	0	***1.7***
$100,000-149,999	69	6	3	13	9	***1.9***
$150,000-249,999	53	5	11	26	5	***2.3***

Note: Participants were to rate their preference for each dwelling size on a scale of 1 (not at all preferable) to 5 (very preferable) if they had to move, considering the size of their household, finances, health, etc.

5.5.1.5 Comparison: Current Home Size and Preferable Future Home Size

An aim of this thesis was to investigate whether participants would change their residence size if they were to move. Interestingly, over 20% of respondents living in any given residence size said that small to medium condominiums would be preferable/very preferable. Too few people living in small or large houses responded to the question to allow for chi square analysis; however, trends specific to each group are listed below:

- **Respondents currently in a small home:** When asked to rate their preference for each home size, most respondents (88%) said that they would have preference for upsizing to a medium house, and half that amount (44%) said that they would have preference for a small house. Large houses and apartments were generally not preferable, and respondents in this group represented the greatest portion (31%) with preference for condominiums.
- **Respondents currently in a medium home:** Most respondents (70%) said that they would prefer a medium house; whereas large houses, small houses, and small to medium condominiums were only preferable/very preferable to 26%, 24%, and 22% of such respondents, respectively.
- **Respondents currently in a large home:** Medium houses and large houses were both preferable/very preferable to 56% of respondents; and while small houses and apartments were generally not preferable, residents in this group represented the greatest portion (12%) who rated condominiums as very preferable.

Table 18. Dwelling size preferences according to respondents currently living in small (*n*=16); medium (*n*=127); and large (*n*=25) homes.

Size of current home	Not at all preferable (%)	Not preferable (%)	Neutral (%)	Preferable (%)	Very preferable (%)	*Mean*
Small house						
Small	13	19	25	19	25	***3.3***
Medium	42	17	17	13	10	***2.3***
Large	76	12	4	4	4	***1.5***
Medium house						
Small	13	0	0	44	44	***4.1***
Medium	9	2	18	29	41	***3.9***
Large	24	8	12	24	32	***3.3***
Large house						
Small	63	25	6	6	0	***1.6***
Medium	37	15	22	16	10	***2.5***
Large	20	8	16	20	36	***3.4***
Small to medium apartment						
Small	69	13	6	6	6	***1.7***
Medium	69	7	15	8	1	***1.6***
Large	80	12	8	0	0	***1.3***
Small to medium condominium						
Small	56	6	6	25	6	***2.2***
Medium	54	9	15	17	6	***2.1***
Large	72	0	4	12	12	***1.9***

Note: Participants were to rate their preference for each dwelling size on a scale of 1 (not at all preferable) to 5 (very preferable) if they had to move, considering the size of their household, finances, health, etc

5.5.2 Yard Size Preferences

When asked how preferable various sizes of outdoor space would be if they had to move (considering their household size, finances, health, etc.), respondents generally favoured having a home with a yard of medium-to-large size (*n* =166;Figure 25). Again, the sizes of yards were based on the size chart provided (Table 11). Large yards were chosen as very preferable more frequently than any other yard type (by 22% of respondents); however, when combining preferable/very preferable responses, medium-sized yards were slightly more preferable (52%; 32%/19%) than large yards (46%). Very large yards were very preferable to 9% more respondents than were small yards; however, very large yards were also not at all preferable to 8% more respondents than were small yards. Furthermore, only 8% of respondents felt having only a patio, deck, or balcony was preferable to any degree, and only 3% felt this way towards having no outdoor space.

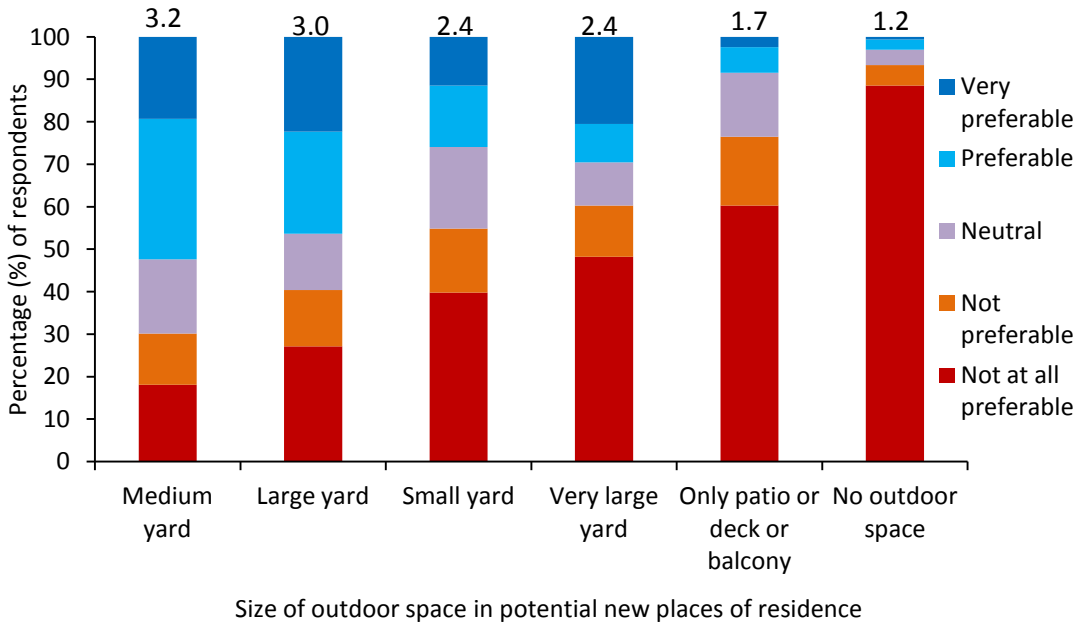

Figure 25. Preferences for various sizes of outdoor space (*n*=166).

Note: Participants were asked to select preferences as if they had to move, and to consider the size of their household, finances, health, etc. Mean values for each size of outdoor space appear above bars and are based on a scale of 1 (not at all preferable) to 5 (very preferable).

To further investigate the potential market for high density residences, respondents were specifically asked if they would ever live in a home with no private yard. Sixty percent of respondents (*n*=202) replied "no", while 11% said "yes", 30% said "maybe", and 15% said they had

done so in the past (respondents could select multiple answers). Seventy six respondents who had lived without a private yard in the past, or would (yes or maybe) do so in the future, rated the importance of certain features in encouraging respondents to live without a yard. Features most often rated as important/very important to live with no yard included having a front porch or balcony (92%), being near to a park (79%), and having a nice view from the windows (87%; Figure 26). Nearly 60% of respondents found that living within walking distance to the city centre was important/very important if they were to live without a yard. Although parks were quite important, being near to a field or playspace for children was only important/very important to 42% of respondents. Meanwhile, only 25% of respondents thought that a community pool was important to any degree. Gardening was also of lower importance, with only 33% stating that gardening in a community garden was important/very important and only 22% saying the same about gardening in a community member's yard. Other important attributes listed by some respondents included having communal green space (with trees and native plantings); being near to public green spaces and trails; being cheaper to afford (either the residence or the maintenance itself); within walking distance to amenities; having a rooftop deck; and having a garage. Other reasons listed by respondents for living without a yard included physical inability to maintain a yard (or a home that would normally have a yard); wanting a more affordable residence; and lack of time to maintain a garden (or large home).

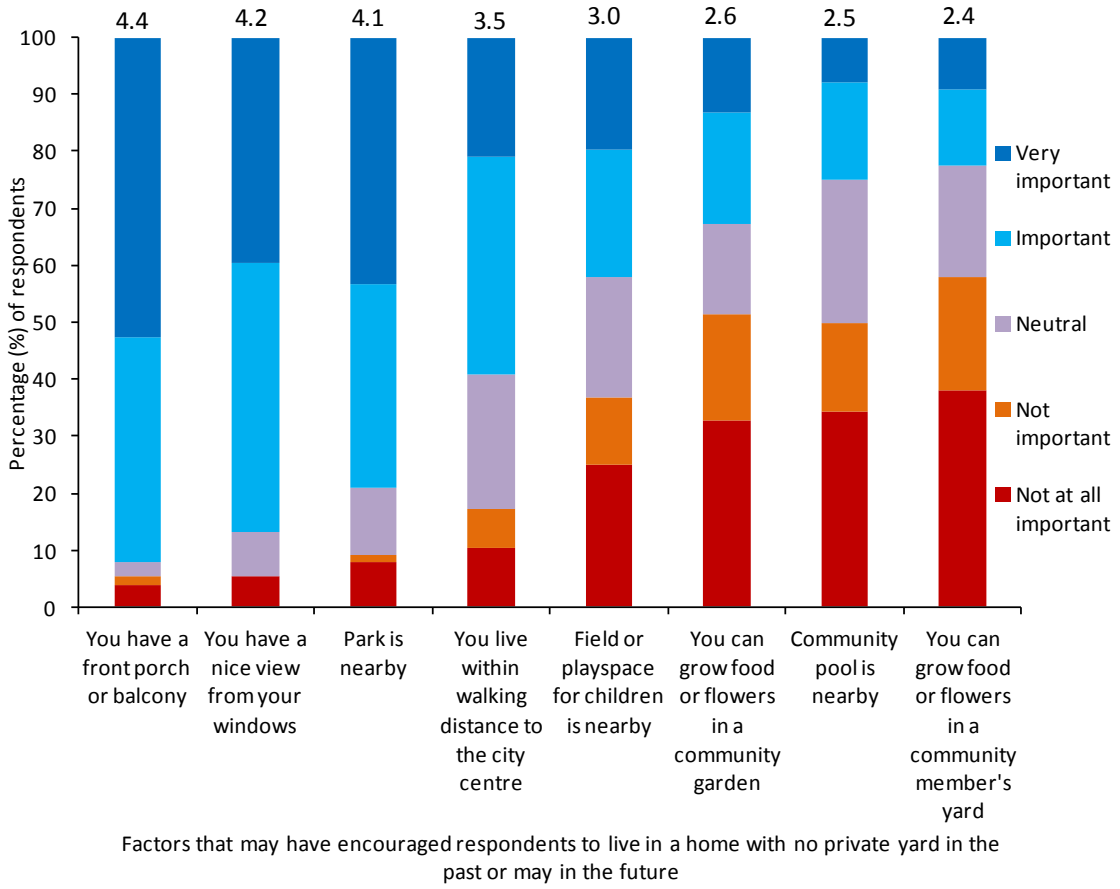

Figure 26. Factors that have encouraged respondents to live in a home with no private yard in the past or may in the future (*n*=76).

Note: Only respondents who indicated they had lived in a home with no private yard in the past or may in the future were required to answer this question. Mean values for each variable appear above bars and are based on a scale of 1 (not at all important) to 5 (very important).

Participants were also asked if they would ever choose to live in a home with a small yard. Thirteen percent of respondents (*n*=202) were currently living in a home with a small yard; 13% had done so in the past; and 26% said "yes" and 32% said "maybe" to doing so in the future (respondents could select multiple answers). Only 29% of respondents replied "no" to ever choosing to live in a home with a small yard, compared to the 60% that said "no" to living with no yard at all. When asked how important certain factors would be in encouraging them to live with a small yard, privacy between backyard neighbours was ranked very important most frequently for households that thought they may move to a house with a small yard in the future, and for those who lived in one currently (Figure 27). The most important aspects influencing a household to live in a home with a small yard

generally pertained directly to the property. Specifically, privacy between backyard neighbours, having a nice view from the yard, and having a front porch were selected as very important by 54%, 33% and 33% of respondents, respectively (*n*=126). Another important feature was having a park nearby, which was selected as very important by 37% of respondents – a greater percentage than who felt it was important to have a field or play space for children nearby (18%) or live within walking distance to the city centre (17%). Shared gardens, community gardens, or community pools were only important to a small portion of the respondents, but were not important/not at all important to 68%, 58%, and 51% of respondents, respectively. Some respondents listed other conditions that would persuade them to live in home with a small yard, which included the ability to maintain the property (physically or in terms of time or expenses); having a place for a deck, patio, bird houses, potted plants, etc.; ensuring all space is usable (i.e. not sloped); having wide frontage; and having access to a garden plot outside of the city.

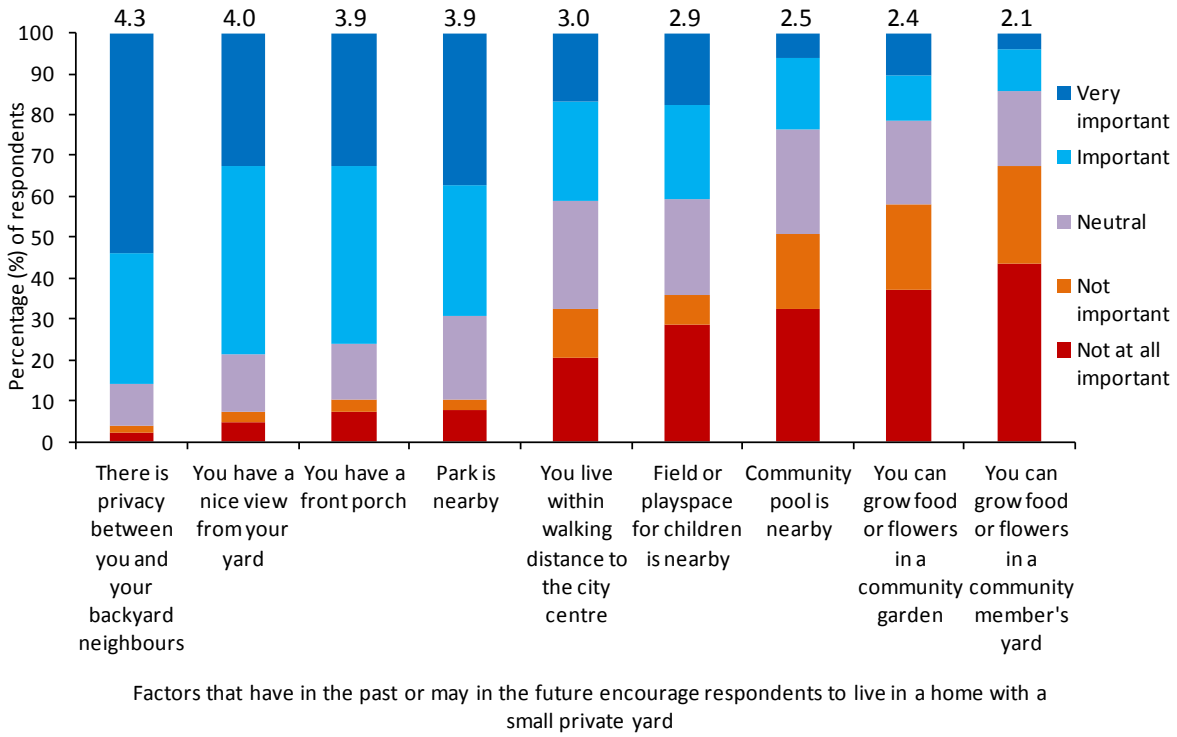

Figure 27. Factors that have in the past, or may in the future, encourage respondents to live in a home with a small private yard (*n*=126).

Note: Only respondents who indicated they had lived in a home with a small private yard in the past, currently, or may in the future were required to answer this question Mean values for each variable appear above bars and are based on a scale of 1 (not at all important) to 5 (very important).

5.5.2.1 Comparison: Couples With and Without Children

Since children may enjoy using yard space to play, size preferences for outdoor spaces were broken down by couples with at least one child under the age of 18, and couples without children. Based on the trends, couples with children had greater preference for spacious yards than couples without children (Table 19). The two groups did not significantly differ in how they rated small or medium yards, but did significantly differ in their ratings of large yards, X^2 (2, n=111) = 11.80, p=0.003 and very large yards, X^2 (2, n=111) = 7.62, p=0.022 (Appendix B). In particular, couples without children indicated that large and very large yards were not preferable/not at all preferable more often than did couples with children.

Table 19. Preferences for various sizes of outdoor space, according to couples with at least one child under the age of 18 (n=52) and couples without children (n=59).

Couples with at least one child under age 18 or couples without children	Not at all preferable (%)	Not preferable (%)	Neutral (%)	Preferable (%)	Very preferable (%)	*Mean*
Small yard						
Couple with children	56	15	17	10	2	***1.9***
Couple without children	37	19	17	14	14	***2.5***
Medium yard						
Couple with children	17	13	12	38	19	***3.3***
Couple without children	19	12	22	29	19	***3.2***
***Large yard**						
Couple with children	10	10	12	31	38	***3.8***
Couple without children	32	14	17	25	12	***2.7***
***Very large yard**						
Couple with children	29	15	17	12	27	***2.9***
Couple without children	58	10	5	8	19	***2.2***
Only a patio/deck/balcony (no additional yard space)						
Couple with children	75	10	12	2	2	***1.5***
Couple without children	58	19	12	8	3	***1.8***
No outdoor space						
Couple with children	92	0	6	2	0	***1.2***
Couple without children	86	5	2	5	2	***1.3***

Note: Participants were to rate their preference for each outdoor space on a scale of 1 (not at all preferable) to 5 (very preferable) if they had to move, considering the size of their household, finances, health, etc.

When asked directly whether they would live with either a small yard or without a yard in the future, couples with and without children both generally preferred homes with yards. Over 50% of each group said that they would not live in a home without a yard in the future; however, just over 30% of

both groups indicated that they may (i.e. "yes, in future" + "maybe") live without a private yard in the future (Table 20). "Yes" and "Maybe" responses were combined to describe general trends since there was no guarantee that those who replied "yes" would *actually* move to a home with no yard in the future. Because this question did not require respondents to consider their current household situation and answers could be based on expected future scenarios, couples with children of all ages were included in this analysis.

Table 20. Percent of couples with children (*n*=79) and couples without children (*n*=81) who would, and would not, choose to live in a home without a private yard.

Couple with or without children	Would you ever choose to live in a home with no private yard?			
	Yes, in the past (%)	Yes, in the future (%)	Maybe (%)	No (%)
Couple with children	23	9	25	58
Couple without children	4	7	25	65

Living in a home with a small private yard was a more likely option than living without a yard, with 44% of couples with children and 59% of couples without children indicating that they may live on such a property in the future. A similar amount of couples with and without children indicated that they would never live in a home with a small yard (Table 21). Of those who responded, 11% of couples without children were currently living in a home with a small yard, and 15% with children were currently living in one.

Table 21. Percent of couples with children (*n*=78) and couples without children (*n*=81) who would, and would not, choose to live in a home with a small yard.

Couple with or without children	Would you ever choose to live in a home with a small private yard?				
	Yes, in the past (%)	Yes, currently (%)	Yes, in the future (%)	Maybe (%)	No (%)
Couple with children	21	15	21	23	33
Couple without children	6	11	19	40	28

5.5.2.2 Comparison: Current Age Groups of Respondents

Yard size preferences were also broken down by age groups of 25 to 45; 46 to 55; 56 to 65; and 66 and older (age 66 and older was not included in chi square analysis; Table 22). Preference for homes with small yards increased with age, as they were preferable/very preferable to only 14% of respondents between 25 and 46, but to 43% of those between 56 and 65 , X^2 (4, n=139) = 10.88, p=0.028. Conversely, preference for large yards decreased with age, as they were not preferable/not at all preferable to only 16% of those between ages 25 and 45, but to 57% of those between ages 56 and 65, X^2 (4, n =139) = 20.27, p<0.001*. Age groups did not significantly differ in how they rated medium yards, which were generally preferable, X^2 (4, n =139) = 4.33, p=0.363. Unfortunately, chi square analysis was inappropriate for comparing other sizes of outdoor spaces. Trends specific to each group are listed below:

- **Age 25 to 45:** Large yards were preferable to the greatest portion of this group, followed by medium yards and very large yards. Few had preference for a small yard and even fewer had preference for only a patio/deck/balcony or no outdoor space.
- **Age 46 to 55:** Medium yards were preferable to the greatest portion of this group, followed by large yards and very large yards. About a quarter had preference for small yards, but almost no one had preference for only a patio/deck/balcony or no outdoor space.
- **Age 56 to 65:** Small and medium yards were preferable to similar proportions of this group, but a greater percentage indicated that small yards were "very preferable". A greater proportion had preference for having only a patio/deck/balcony than having a very large yard.
- **Age 66 and older:** Small and medium yards were most preferable to this group while no one showed preference for a large yard or very large yard. Meanwhile, 16% indicated preference for having only a patio/deck/balcony, and 8% said that having no outdoor space would be very preferable.

Table 22. Preferences for various sizes of outdoor space, according to respondents in age groups 25-45 (*n*=58), 46-55 (*n*=46), 56-65 (*n*=35), and 66 and older (*n*=12).

Age group	Not at all preferable (%)	Not preferable (%)	Neutral (%)	Preferable (%)	Very preferable (%)	*Mean*
***Small yard**						
25-45	52	19	16	9	5	***2.0***
46-55	46	11	20	17	7	***2.3***
56-65	29	14	14	20	23	***2.9***
66 and older	25	8	25	8	33	***3.2***
Medium yard						
25-45	16	14	12	34	24	***3.4***
46-55	11	11	22	33	24	***3.5***
56-65	26	11	20	29	14	***2.9***
66 and older	25	17	8	33	17	***3.0***
***Large yard**						
25-45	9	7	14	34	36	***3.8***
46-55	28	17	13	20	22	***2.9***
56-65	43	14	11	20	11	***2.4***
66 and older	67	17	17	0	0	***1.5***
Very large yard						
25-45	26	14	14	14	33	***3.1***
46-55	57	7	11	7	20	***2.3***
56-65	63	17	6	6	9	***1.8***
66 and older	92	0	8	0	0	***1.2***
Only a patio/deck/balcony (no additional yard space)						
25-45	83	10	3	3	0	***1.3***
46-55	57	17	22	2	2	***1.8***
56-65	51	20	9	14	6	***2.0***
66 and older	33	8	42	8	8	***2.5***
No outdoor space						
25-45	93	5	0	2	0	***1.1***
46-55	89	4	7	0	0	***1.2***
56-65	80	6	6	9	0	***1.4***
66 and older	92	0	0	0	8	***1.3***

Note: Participants were to rate their preference for each outdoor space on a scale of 1 (not at all preferable) to 5 (very preferable) if they had to move, considering the size of their household, finances, health, etc.

On a separate question, half of the respondents over the age of 65 indicated that they may choose to live in a home without a yard in the future, while the same was true for only 36% of those between the ages of 46 and 65, and 26% of those between 25 and 45. *When* they would choose to live in such a home was unknown, so a young respondent may have responded with old age in mind. Interestingly, nearly a quarter of those under age 56 had lived without a yard in the past, while only 5% of those 56 and older had done so (Table 23).

Table 23. Percent of respondents in age groups of 25-45 (*n*=61), 46-55 (*n*=50), 56-65 (*n*=44), and 66 and older (*n*=22) who would, and would not, choose to live in a home with no private yard.

Age group	Would you ever choose to live in a home with no private yard?			
	Yes, in the past (%)	Yes, in the future (%)	Maybe (%)	No (%)
25-45	23	5	21	67
46-55	24	8	28	56
56-65	5	11	25	64
66 and older	5	14	36	50

All groups were more likely to live with a small yard than without a yard. Interest in living with a small yard seemed to increase with age, although greater proportions of respondents in younger age groups were living with a small yard at the time of the survey, or had done so in the past, compared to those in older age groups (Table 24).

Table 24. Percent of respondents in age groups of 25-45 (*n*=60), 46-55 (*n*=50), 56-65 (*n*=45), and 66 and older (*n*=21) who would, and would not, choose to live in a home with a small yard.

Age group	Would you ever choose to live in a home with a small private yard?				
	Yes, in the past (%)	Yes, currently (%)	Yes, in the future (%)	Maybe (%)	No (%)
25-45	23	18	13	22	40
46-55	12	14	28	28	28
56-65	9	11	20	38	24
66 and older	10	10	33	48	10

5.5.2.3 Comparison: Employed and Retired Respondents

To further investigate the trends of the aging population, retired and employed respondents were compared relative to their preferences for various sizes of outdoor spaces. Generally, both groups would have similar yard size preferences if they were to move (Table 25). Significant differences existed only in their preferences for large yards, X^2 (2, *n*=144) = 19.28, *p*<0.001*, and very large yards, X^2 (2, *n*=144) = 13.66, *p*=0.001* (where chi square tests were applicable; Appendix B), which were both less favourable to retired respondents. Trends specific to each group are listed below:

- **Employed respondents:** A similar proportion of respondents would prefer medium yards as they would prefer large yards. Very large yards would be more preferable than small yards and having only a patio/deck/balcony or no yard space would generally not be preferable.

- **Retired respondents:** Small yards would be "very preferable" to the greatest proportion of respondents, but medium yards would be generally preferable to slightly more people. Interestingly, a similar portion of people would prefer a large yard as would prefer only a patio/deck/balcony.

Table 25. Preferences for various sizes of outdoor space, according to employed (*n*=114) and retired (*n*=30) respondents.

Employed or retired	Not at all preferable (%)	Not preferable (%)	Neutral (%)	Preferable (%)	Very preferable (%)	*Mean*
Small yard						
Employed	42	18	18	13	10	***2.3***
Retired	33	3	23	17	23	***2.9***
Medium yard						
Employed	15	13	18	34	19	***3.3***
Retired	27	13	13	33	13	***2.9***
***Large yard**						
Employed	19	13	17	28	23	***3.2***
Retired	67	10	3	10	10	***1.9***
***Very large yard**						
Employed	42	11	13	10	24	***2.6***
Retired	77	13	0	3	7	***1.5***
Only patio/deck/balcony (no additional yard space)						
Employed	64	16	13	5	2	***1.6***
Retired	50	13	20	10	7	***2.1***
No outdoor space						
Employed	87	6	4	3	0	***1.2***
Retired	90	0	3	3	3	***1.3***

Note: Participants were to rate their preference for each outdoor space on a scale of 1 (not at all preferable) to 5 (very preferable) if they had to move, considering the size of their household, finances, health, etc.

Furthermore, a similar portion of employed and retired respondents indicated that they may live in a home with no yard in the future, although retirees were more confident about such a decision. Consistent with the age generation trends, few retired individuals had lived without a yard in the past (Table 26).

Table 26. Percent of employed (*n*=126) and retired (*n*=44) respondents who would, and would not, choose to live in a home with no private yard.

Employed or retired	Would you ever choose to live in a home with no private yard?			
	Yes, in the past (%)	Yes, in the future (%)	Maybe (%)	No (%)
Employed	18	7	26	61
Retired	5	14	18	68

Moreover, compared to employed respondents, retired respondents seemed more willing to live with a small yard in the future, while similar percentages of each group were opposed to the idea. A greater percentage of employed respondents than retired respondents were living with a small yard at the time of the survey, or had done so in the past (Table 27).

Table 27. Percent of employed (*n*=125) and retired (*n*=44) respondents who would, and would not, choose to live in a home with a small yard.

Employed or retired	Would you ever choose to live in a home with a small private yard?				
	Yes, in the past (%)	Yes, currently (%)	Yes, in the future (%)	Maybe (%)	No (%)
Employed	18	17	18	30	30
Retired	2	7	30	36	25

5.5.2.4 Comparison: Household Incomes

Although preference for larger houses tended to increase with household income, yard size preferences were fairly mixed across income subgroups of $50,000-74,999; $75,000-99,999; $100,000-149,999; and $150,000-249,999 (Table 28). When responses were grouped into household incomes of $50,000-99,999 (*n*=49) and $100,000-249,999 (*n*=49) for chi square analysis, there were no significant differences in yard preferences (where chi square tests were applicable; Appendix B). Trends specific to each group are listed below:

- **$50,000-74,999:** Respondents seemed to have lower preference for small yards than for medium or larger yards.
- **$75,000-99,999:** Large yards and medium yards were "very preferable" to the greatest proportion of these respondents.
- **$100,000-149,999:** Medium, large, and very large yards were most preferable to this group.

- **$150,000-249,999:** Large yards were most preferable to this group, followed by very large yards and medium yards. Few would find small yards preferable.

Table 28. Preferences for various sizes of outdoor space, according to respondents with household incomes in brackets of $50,000-74,999 (*n*=29); $75,000-99,999 (*n*=20); $100,000-149,999 (*n*=30); and $150,000-249,999 (*n*=19).

Household Income bracket	Not at all preferable (%)	Not preferable (%)	Neutral (%)	Preferable (%)	Very preferable (%)	*Mean*
Small yard						
$50,000-74,999	34	14	21	21	10	***2.6***
$75,000-99,999	45	35	10	10	0	***1.9***
$100,000-149,999	43	17	13	17	10	***2.3***
$150,000-249,999	63	5	21	5	5	***1.8***
Medium yard						
$50,000-74,999	14	17	14	41	14	***3.2***
$75,000-99,999	5	20	0	45	30	***3.8***
$100,000-149,999	27	3	17	23	30	***3.3***
$150,000-249,999	32	11	21	26	11	***2.7***
Large yard						
$50,000-74,999	34	17	7	17	24	***2.8***
$75,000-99,999	10	15	15	25	35	***3.6***
$100,000-149,999	17	17	20	30	17	***3.1***
$150,000-249,999	11	0	26	21	42	***3.8***
Very large yard						
$50,000-74,999	45	21	3	10	21	***2.4***
$75,000-99,999	45	15	20	10	10	***2.3***
$100,000-149,999	47	13	7	3	30	***2.6***
$150,000-249,999	21	16	16	16	32	***3.2***
Only a patio/deck/balcony (no additional yard space)						
$50,000-74,999	62	17	10	7	3	***1.7***
$75,000-99,999	80	10	5	5	0	***1.4***
$100,000-149,999	70	17	3	7	3	***1.6***
$150,000-249,999	58	21	16	0	5	***1.7***
No outdoor space						
$50,000-74,999	90	3	3	0	3	***1.2***
$75,000-99,999	100	0	0	0	0	***1.0***
$100,000-149,999	87	3	7	3	0	***1.3***
$150,000-249,999	74	21	0	5	0	***1.4***

Note: Participants were to rate their preference for each outdoor space on a scale of 1 (not at all preferable) to 5 (very preferable) if they had to move, considering the size of their household, finances, health, etc.

When respondents were asked if they would ever live in a home without a yard, they did not appear to notably differ based on their household income group. Interestingly, a greater portion of respondents in the middle household income brackets had lived with no yard in the past, compared to those in the lowest and highest household income groups (Table 29).

Table 29. Percent of respondents in income brackets of $50,000-74,999 (*n*=33); $75,000-99,999 (*n*=29); $100,000-149,999 (*n*=34); and $150,000-249,999 (*n*=20) who would, and would not, choose to live in a home with no private yard.

Household income bracket	Would you ever choose to live in a home with no private yard?			
	Yes, in the past (%)	Yes, in the future (%)	Maybe (%)	No (%)
$50,000-74,999	9	12	21	67
$75,000-99,999	17	3	21	69
$100,000-149,999	24	12	26	53
$150,000-249,999	10	5	30	65

Respondents from the lowest household income bracket appeared most likely to live with a small yard in the future; however, differences across groups were difficult to distinguish (perhaps due to low response rates; Table 30).

Table 30. Percent of respondents in income brackets of $50,000-74,999 (*n*=33); $75,000-99,999 (*n*=28); $100,000-149,999 (*n*=34); and $150,000-249,999 (*n*=20) who would, and would not, choose to live in a home with a small yard.

Household income bracket	Would you ever choose to live in a home with a small private yard?				
	Yes, in the past (%)	Yes, currently (%)	Yes, in the future (%)	Maybe (%)	No (%)
$50,000-74,999	3	9	27	48	18
$75,000-99,999	14	7	14	36	29
$100,000-149,999	26	18	21	21	32
$150,000-249,999	15	10	25	35	30

5.5.2.5 Comparison: Current Yard Size and Preferable Size of Future Private Outdoor Space

To understand whether respondents would prefer to increase or decrease the size of their yard if they were to move (given their current household situations), preferences for outdoor spaces of each size were compared based on respondents' current yard sizes. No significant relationships were detected (where chi square tests were applicable; Appendix B). Trends specific to each group are listed below:

- **Small current yard:** Medium yards were preferable to the greatest portion of this group, and large yards were preferable to only a small percentage more than were small yards. Very large yards were least preferable.
- **Medium current yard:** Medium and large yards were most often preferable to respondents in this group, whereas small yards were least preferable.
- **Large current yard:** A similar percentage of this group said that they would prefer another large yard as said they would prefer a medium yard. More respondents in this group indicated that they would upsize to a very large yard than said that they would downsize to a small yard.
- **Very large current yard:** These respondents would generally prefer to keep relatively large yards, as only 15% showed any preference for small yards. Nevertheless, 43% indicated that it would be "not at all preferable" for them to move to another home with a very large yard, and 33% said the same about moving to a home with a large yard. Having only a patio/deck/balcony would be "very preferable" to a greater portion than would having a small yard.

Table 31. Preferences for various sizes of outdoor space according to respondents currently living with small (*n*=30), medium (*n*=66), large (*n*=47), and very large (*n*=21) yards.

Current yard size	Not at all preferable (%)	Not preferable (%)	Neutral (%)	Preferable (%)	Very preferable (%)	*Mean*
Small yard						
Small	30	17	20	17	17	***2.7***
Medium	39	15	21	15	9	***2.4***
Large	40	17	15	15	13	***2.4***
Very large	52	10	24	10	5	***2.0***
Medium yard						
Small	13	3	17	43	23	***3.6***
Medium	12	12	15	41	20	***3.4***
Large	23	17	19	23	17	***2.9***
Very large	29	14	24	19	14	***2.8***
Large yard						
Small	27	20	13	23	17	***2.8***
Medium	24	15	9	24	27	***3.2***
Large	28	6	21	23	21	***3.0***
Very large	33	14	10	29	14	***2.8***
Very large yard						
Small	53	10	17	10	10	***2.1***
Medium	45	14	9	11	21	***2.5***
Large	51	11	9	4	26	***2.4***
Very large	43	14	10	14	19	***2.5***
Only a patio/deck/balcony (no additional yard space)						
Small	60	13	23	3	0	***1.7***
Medium	64	18	11	6	2	***1.6***
Large	55	21	15	6	2	***1.8***
Very large	62	5	19	5	10	***2.0***
No outdoor space						
Small	87	7	7	0	0	***1.2***
Medium	91	6	2	2	0	***1.1***
Large	87	4	2	6	0	***1.3***
Very large	86	0	10	0	5	***1.4***

Note: Participants were to rate their preference for each outdoor space on a scale of 1 (not at all preferable) to 5 (very preferable) if they had to move, considering the size of their household, finances, health, etc.

Consistent with the preference ratings, the greatest percentage of respondents interested in living without a yard in the future were living with a very large yard at the time of the study (Table 32). Those living in small, medium, and large yards seemed to have similar levels of interest in living without a yard in the future.

Table 32. Percent of respondents currently living with small (*n*=34), medium (*n*=85), large (*n*=54), and very large (*n*=27) yards who would, and would not, choose to live in a home with no private yard.

Current yard size	Would you ever choose to live in a home with no private yard?			
	Yes, in the past (%)	Yes, in the future (%)	Maybe (%)	No (%)
Small	18	6	21	65
Medium	14	8	27	60
Large	11	7	28	63
Very large	22	15	30	52

While respondents living with small yards did not show apparent interest in living with a small yard again in the future, greater proportions of respondents with larger yards said that they would live with a small yard in the future. When considering the "maybe" responses, the groups living with medium and large yards had the greatest proportions with interest in living with a small yard, while those living with very large yards had the greatest proportion averse to living with a small yard (Table 33).

Table 33. Percent of respondents currently living with small (*n*=36), medium (*n*=81), large (*n*=54), and very large (*n*=26) yards who would, and would not, choose to live in a home with a small yard.

Current yard size	Would you ever choose to live in a home with a small private yard?				
	Yes, in the past (%)	Yes, currently (%)	Yes, in the future (%)	Maybe (%)	No (%)
Small	17	64	14	11	17
Medium	16	0	21	40	30
Large	7	0	26	41	30
Very large	12	0	27	23	46

Overall, the results presented in this section helped highlight a few major trends in property size preferences. If they were to move (considering their household size, finances, health, etc.), most respondents showed preference for medium-sized homes on spacious lots. However, when asked if they would ever live without a yard, 11% said they would and 30% said they may. In addition, when asked if they would live with a small yard, 26% said they would and 32% said they may. Some key factors that respondents said may encourage them to live on small properties included having privacy between neighbours, a balcony or front porch, a nice view, and living near to a park. In addition, proximity to schools and school quality were important factors as respondents chose their current homes, so may continue to be influential in the future. The following sections present results for how

respondents liked to design, maintain, and use their yards. Such information is used in the discussion chapter to suggest ways of designing attractive private and public outdoor spaces.

5.6 Yard Landscape Preferences

To identify yard designs that are likely to attract (and deter) homebuyers, this section examines yard landscaping preferences. Six landscape styles were investigated (photos in Appendix C), which were included as part of the survey. Participants were asked to indicate how much they liked each style of yard landscape on a Likert-type scale. Although leafy perennials received fewer strongly like ratings (21%) than flower gardens (30%), lawn and foundation plantings (28%), and natural gardens (27%); they received more like/strongly like ratings, combined, than all other landscapes (*n*=187; Figure 28). Meanwhile, 50% of respondents strongly disliked xeriscapes, which were liked/strongly liked by only 12% of respondents. Additionally, in a separate question that asked respondents to rate their agreement with statements on a scale of 1-5, 60% of respondents (*n*= 193) strongly agreed that they like trees in a yard, and 29% strongly agreed that a yard has to have a lawn.

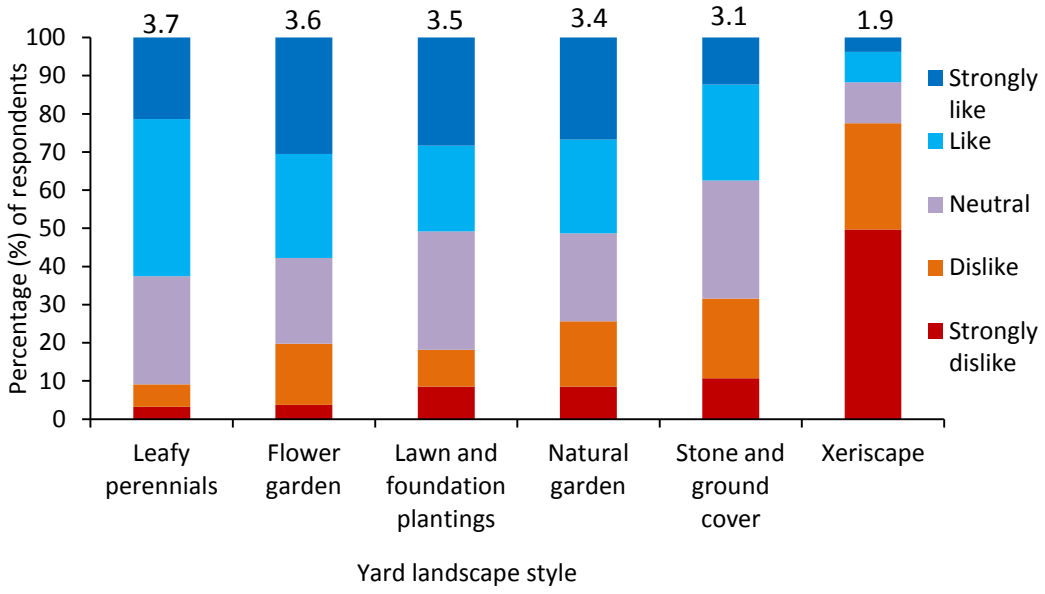

Figure 28. Yard landscape styles rated by respondents (*n*=187).

Note: Mean values appear above bars and are based on a scale of 1 (strongly like) to 5 (strongly dislike).

Participants were also asked specifically which landscape style they liked most and least. Although leafy perennials were generally liked by many respondents, lawn and foundation plantings and flower gardens were most commonly selected as favourite landscapes (Figure 29).

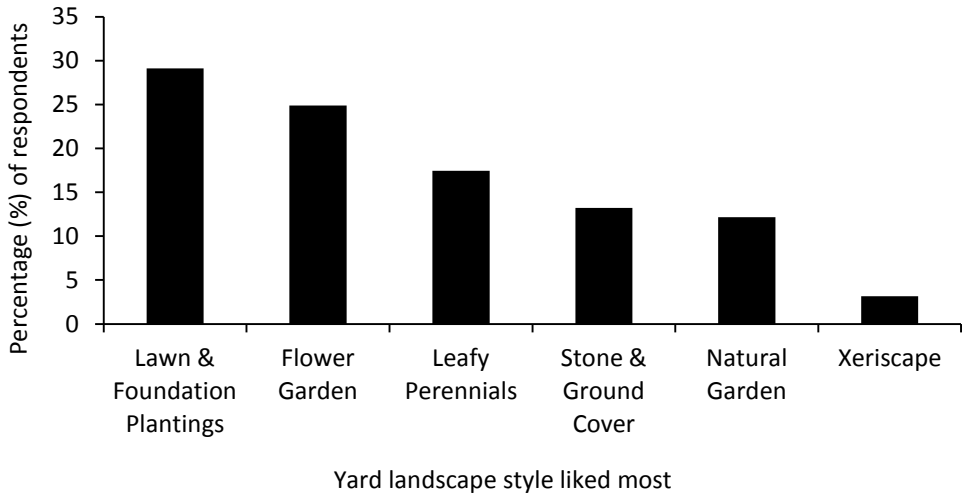

Figure 29. Yard landscape styles liked most by respondents (*n*=189).
Note: Only one most-liked landscape style could be selected by each respondent.

A follow-up question asked respondents why they liked their favourite landscapes, and it appeared that landscapes were often favoured for being practical to maintain, environmentally acceptable, and aesthetically appealing based on the colours and shapes of the plantings (Figure 30). Interestingly, the top two favourite landscapes were liked for quite different reasons, with lawn and foundation plantings commonly favoured for being practical to maintain, and flower gardens liked mostly for aesthetic reasons. The major reasons for favouring each landscape are summarized below (too few respondents favoured xeriscape for it to be included):

- **Lawn & foundation plantings:** Liked mainly for looking practical to maintain. Its clean and tidy appearance was frequently cited under the "other" category, along with comments from respondents that said they would plant more flowers to add colour
- **Flower gardens:** Liked mainly for colours and shapes of plantings. Over 50% also like flower gardens for creating a space enjoyable to use, for being environmentally acceptable, and for potentially attracting wildlife.
- **Leafy perennials:** Liked mainly for being practical to maintain, being environmentally acceptable, and for the shape of the plantings. Over 50% of respondents also like the colours and the fact that it looks like it would attract wildlife and be acceptable to neighbours.

- **Stone & ground cover:** Liked mainly for being practical to maintain and for the shape of the plantings. Over 50% of respondents liked the colours and that it is environmentally acceptable.
- **Natural garden:** 100% of respondents who chose this as their favourite liked it for being environmentally acceptable, and most liked it for being practical to maintain; over 50% also liked the colours, the fact it looked good for attracting wildlife, and looked cheap to maintain

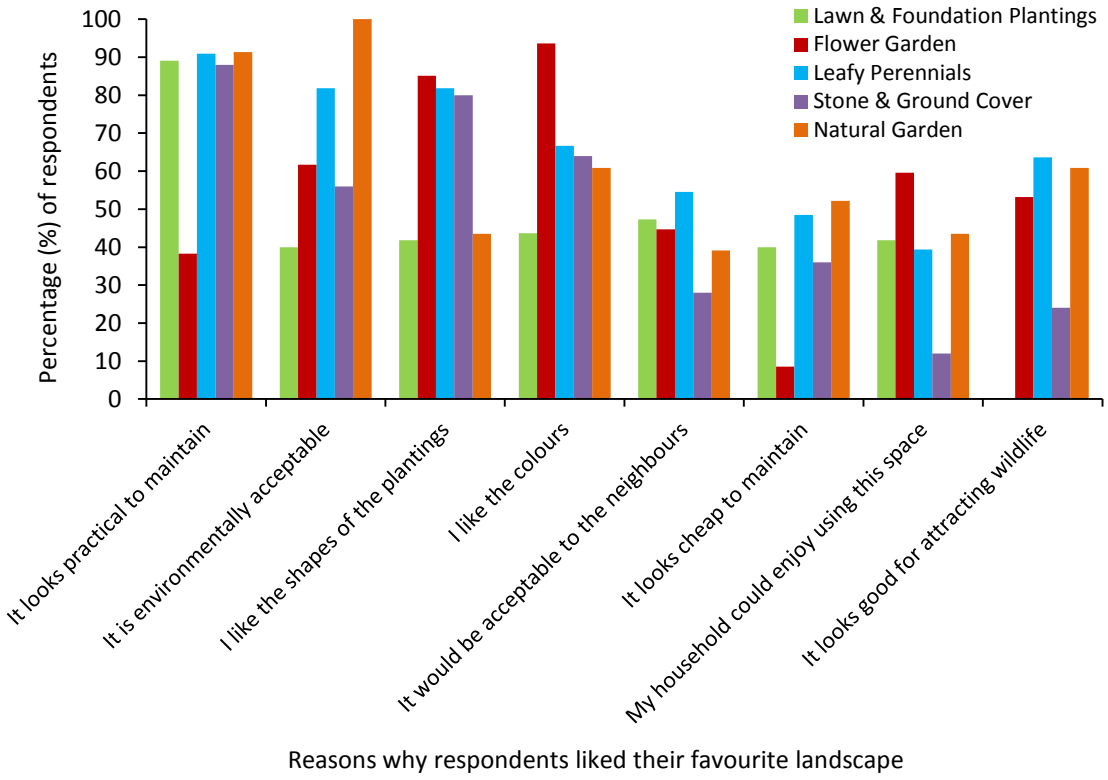

Figure 30. Reasons why respondents liked their favourite landscape.

Note: Lawn & foundation plantings (*n*=55) were selected as the favourite most often, followed by flower gardens (*n*=47), leafy perennials (*n*=33), stone & ground cover (*n*=25), and natural gardens (*n*=23). Xeriscapes (*n*=6) were selected too infrequently to include in this figure. Multiple reasons could be selected.

Consistent with the abovementioned findings, xeriscapes were selected as the least liked landscape by the majority of respondents (67%; *n* =189; Figure 31). Furthermore, only four respondents liked stone and ground cover landscapes least, and only one respondent liked leafy perennials least.

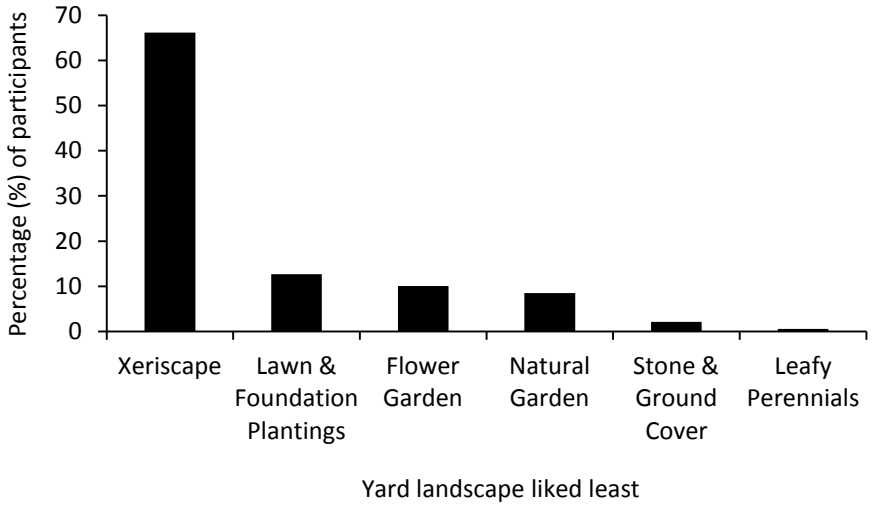

Figure 31. Yard landscapes liked least by respondents (*n*=189).

Note: Only one least-liked landscape style could be selected by each respondent.

Respondents often disliked their least favourite landscape because it looked impractical to maintain or because it did not look like a space they could enjoy using (Figure 32). The major reasons for disliking each landscape most are summarized below (leafy perennials and stone and ground cover landscapes were excluded since they were least liked by too few respondents):

- **Xeriscapes:** Disliked mainly because households could not enjoy using the space. Over 50% of respondents also disliked this landscape because it looked unattractive to wildlife and the colours were unappealing.
- **Lawn & foundation plantings:** Respondents disliked this landscape for various reasons, including being impractical to maintain, environmentally unacceptable, and unacceptable to wildlife.
- **Flower gardens:** Disliked mainly for being impractical and expensive to maintain.
- **Natural garden:** Disliked mainly for being impractical to maintain or because households could not enjoy using the space.

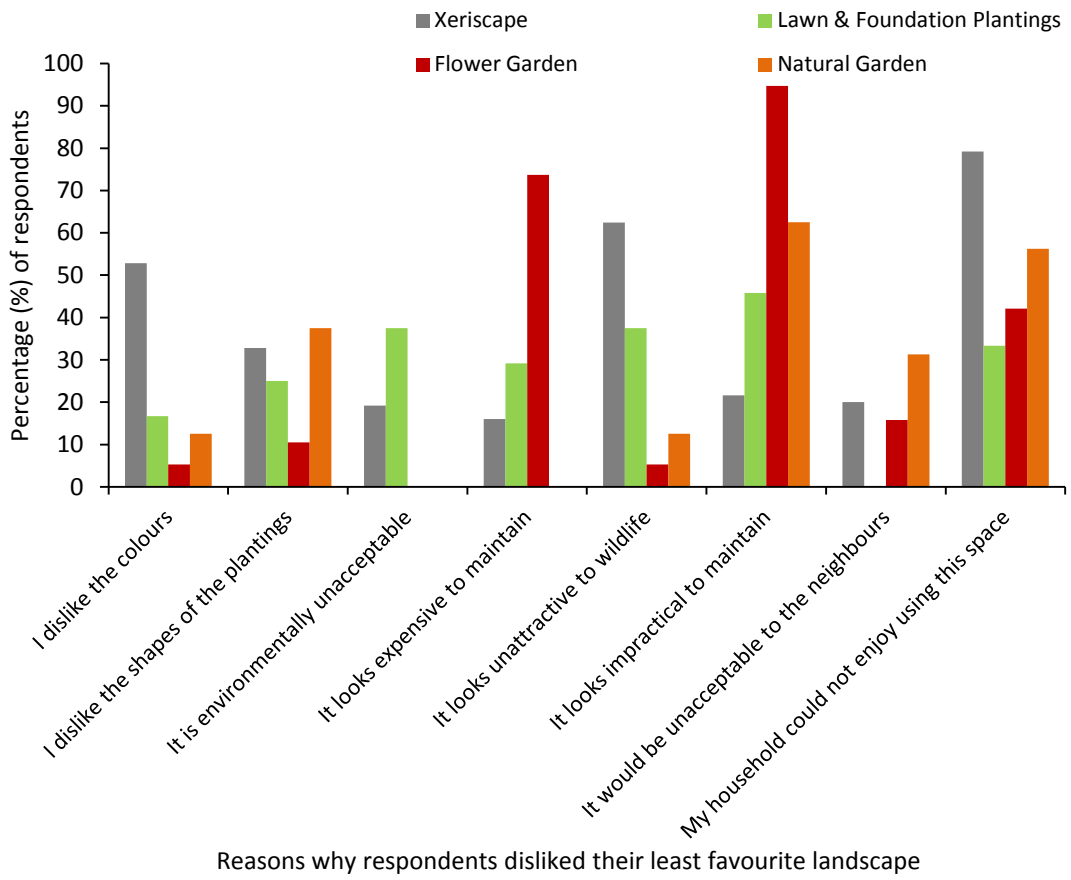

Figure 32. Reasons why respondents disliked their least favourite landscape.

Note: Xeriscapes (*n*=125) were predominantly the least favourite landscape, followed by lawn & foundation plantings (*n*=24*)*, flower gardens (*n*=19), and natural gardens (*n*=16). Stone & ground cover (*n*=4) and leafy perennials (*n*=1) were selected too infrequently to include in this figure. Multiple reasons could be selected.

When specifically asked which landscapes would encourage respondents to buy a property, the most commonly selected landscape was "leafy perennials", which would attract 63% of respondents (*n*=201; Figure 33). Conversely, xeriscape was encouraging to only 13% (*n*=201), and was selected by 73% (*n*=191) of respondents as a landscape that would discourage them from buying a property (Figure 34). Nearly 25% of respondents found each of "natural gardens", "flower gardens", and "stone and ground cover landscapes" discouraging, while only 18% and 6% of respondents felt the same for" lawn and foundation plantings" and "leafy perennial" landscapes, respectively (*n*=191).

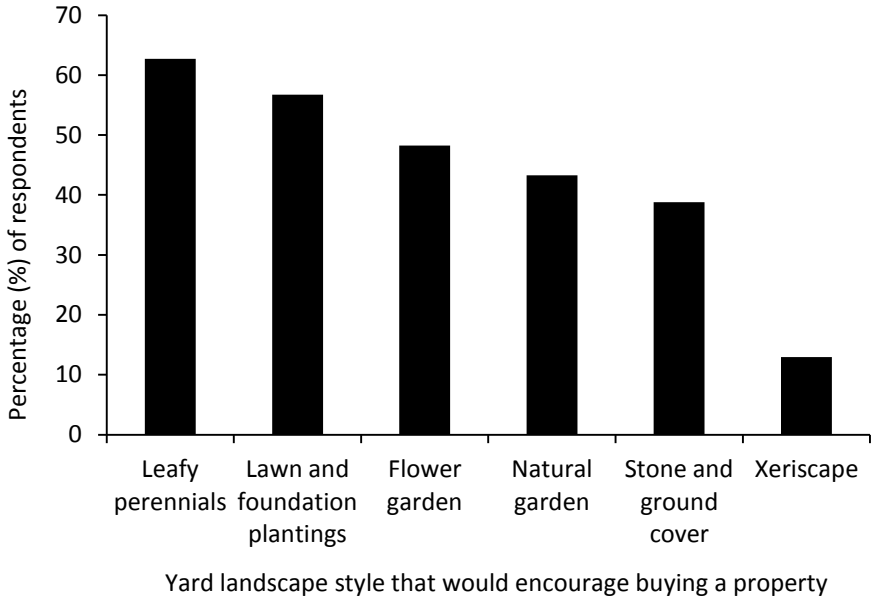

Figure 33. Yard landscape styles that would encourage respondents to buy a property (*n*=201).

Note: Respondents could select as many styles as they wished.

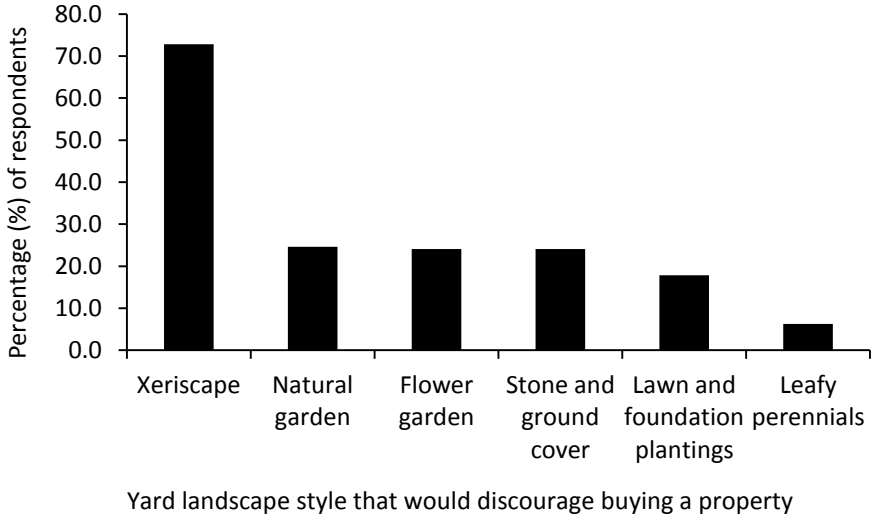

Figure 34. Yard landscape styles that would discourage respondents from buying a property (*n*=191).

Note: Respondents could select as many styles as they wished.

5.6.1.1 Comparison: Couples With and Without Children

Since a yard can be an interactive place for a child to play and be active, it was expected that couples with children would tend to like landscapes with spacious lawn area (which is relatively easy to maintain) more so than couples without children. Such expectations were not supported by results (Table 34), as landscape preferences did not differ significantly between couples with at least one child under the age of 18 and couples without children (where chi square tests were applicable; Appendix B).

Table 34. Ratings of yard landscape styles, according to couples with at least one child under the age of 18 (*n*=52), and couples without children (*n*=73).

Couples with at least one child under age 18 or couples without children	Strongly dislike (%)	Dislike (%)	Neutral (%)	Like (%)	Strongly like (%)	*Mean*
lawn & foundation plantings						
Couple with children	13	6	38	17	25	***3.3***
Couple without children	7	11	30	23	29	***3.6***
flower garden						
Couple with children	2	12	23	25	38	***3.9***
Couple without children	4	23	16	22	34	***3.6***
natural garden						
Couple with children	8	12	27	19	35	***3.6***
Couple without children	12	18	19	25	26	***3.3***
Xeriscape						
Couple with children	56	27	13	4	0	***1.7***
Couple without children	47	29	11	7	7	***2.0***
stone & ground cover						
Couple with children	6	19	42	25	8	***3.1***
Couple without children	16	15	30	29	10	***3.0***
leafy perennials						
Couple with children	0	4	31	42	23	***3.8***
Couple without children	5	8	22	37	27	***3.7***

Interestingly, when asked why they liked their most favourite landscape, a greater proportion of couples without children (*n*=77), versus couples with at least one child under the age of 18 (*n*=54), selected "it looks practical to maintain" (83% vs. 67%), "it looks cheap to maintain" (37% vs. 26%), "it would be acceptable to the neighbours" (49% vs. 33%) and "it is environmentally acceptable" (73% vs. 57%). When asked why they liked a certain landscape least, more couples without children than with at least one child under 18 selected "it looks impractical to maintain" (37% vs. 20%) and "it

looks expensive to maintain" (22% vs. 13%). A roughly equal percentage selected "it is environmentally unacceptable" (18% vs. 19%), while more couples with children (20%) than without children (15%) selected "it would be unacceptable to the neighbours".

5.6.1.2 Comparison: Current Age Groups of Respondents

Ratings of yard landscape styles were also broken down by age group to help highlight generational trends (Table 35). Likert-type ratings of landscape styles did not significantly differ across age groups of 25 to 45, 46 to 55, and 56 to 65 (where chi square tests were applicable; Appendix B). The age group over 65 was excluded from reported analysis due to generally low expected values. However, when it was included, a significant chi square value was obtained for natural gardens, X^2 (6, n=165) = 12.86, p=0.045*. In general, natural gardens were liked more often as respondent age groups increased, although this pattern halted for the group aged 66 and older, with natural gardens being liked/strongly liked by only 35% of this group, and being disliked/strongly disliked by 50%. Other interesting trends within the subgroups included:

- **Age 25 to 45:** When like/strongly like percentages were combined, leafy perennials were liked by the greatest proportion, followed by lawn and foundation plantings and flower gardens (all of which were liked by at least 50% of the group).

- **Age 46 to 55:** When like/strongly like percentages were combined, leafy perennials were liked by the greatest proportion, followed by flower gardens, natural gardens, and lawn and foundation plantings (all of which were liked by at least 50% of the group).

- **Age 56 to 65:** When like/strongly like percentages were combined, flower gardens were liked by the greatest portion, followed by both leafy perennials and natural gardens (all of which were liked by at least 50% of the group). A greater portion of this group liked/strongly liked stone and ground cover than lawn and foundation plantings.

- **Age 66 and older:** When like/strongly like percentages were combined, flower gardens and leafy perennials were liked by the greatest portion (flower gardens "strongly liked" more often), followed by lawn and foundation plantings and natural gardens (none of the landscapes were liked by at least 50% of the group).

Table 35. Ratings of yard landscape styles, according to respondents in age groups 25-45 (*n*=59), 46-55 (*n*=45), 56-65 (*n*=41), and 66 and older (*n*=20).

Age group	Strongly dislike (%)	Dislike (%)	Neutral (%)	Like (%)	Strongly like (%)	*Mean*
lawn & foundation plantings						
25-45	8	3	29	25	34	***3.7***
46-55	11	9	31	27	22	***3.4***
56-65	7	17	37	12	27	***3.3***
66 and older	10	10	40	20	20	***3.3***
flower garden						
25-45	2	24	20	24	31	***3.6***
46-55	4	7	31	24	33	***3.8***
56-65	5	7	15	41	32	***3.9***
66 and older	0	20	35	15	30	***3.6***
natural garden*						
25-45	8	17	32	15	27	***3.4***
46-55	7	20	16	33	24	***3.5***
56-65	5	15	17	37	27	***3.7***
66 and older	30	20	15	10	25	***2.8***
Xeriscape						
25-45	54	24	19	3	0	***1.7***
46-55	47	31	9	13	0	***1.9***
56-65	49	27	7	5	12	***2.0***
66 and older	60	25	5	5	5	***1.7***
stone & ground cover						
25-45	10	22	41	19	8	***2.9***
46-55	4	22	27	36	11	***3.3***
56-65	7	20	29	24	20	***3.3***
66 and older	30	15	30	15	10	***2.6***
leafy perennials						
25-45	2	7	20	47	24	***3.8***
46-55	0	7	29	42	22	***3.8***
56-65	5	2	29	37	27	***3.8***
66 and older	15	10	30	25	20	***3.3***

When asked why they liked their most favourite landscape, "it would be acceptable to the neighbours" was selected more frequently with increasing age, as was "it is environmentally acceptable", and "it looks practical to maintain". Interestingly, "it looks cheap to maintain" was selected by only 24% of those over age 65 (*n*=21), compared with 33% between 56 and 65 (*n*=45); 31% between 46 and 55 (*n*=49), and 34% between 25 and 45 (*n*=61). When asked why they liked a certain landscape least, "it would be unacceptable to the neighbours" was most often selected by those over 65, as was "it is environmentally unacceptable". Looking impractical to maintain was

selected by 38% of those over 65 and 40% of those between 56 and 65; but by only 29% of those between 46 and 55, and 33% of those between 25 and 45. Moreover, "it looks expensive to maintain" was selected by 24% of those over age 65; 27% between 56 and 65; 14% between 46 and 55; and 21% between 25 and 45.

5.6.1.3 Comparison: Household Income

Responses to the question asking why respondents liked a certain landscape most were analyzed to understand whether expenses may influence how much someone likes a landscape. It was expected that "it looks cheap to maintain" would be selected more often as household incomes decreased. No such trend was found, as it was selected by 36% of those with a household income of $50,000-74,999 (*n*=33); 28% with $75,000-99,999 (*n*=29); 41% with $100,000-149,999 (*n*=34); and 30% with $150,000-249,999 (*n*=20). On the other hand, when asked why they liked a certain landscape least, "it looks expensive to maintain" was selected less often as household income increased. It was selected by 36% of those with a household income of $50,000-74,999; 24% with $75,000-99,999; 15% with $100,000-149,999; and only 10% with $150,000-249,999.

5.6.1.4 Comparison: Employed and Retired Respondents

Reasons why retired (*n*=42) versus employed (*n*=127) respondents liked their favourite and disliked their least favourite landscapes were also investigated, mainly to see whether maintenance was an important factor. A greater percentage of retired versus employed respondents selected "It looks practical to maintain" (83% vs. 73%) as a reason they liked their favourite landscape, and "it looks impractical to maintain" (40% vs. 32%) as a reason they disliked their least favourite landscape. On the other hand, "it looks cheap to maintain" was selected by roughly equal percentages of each group (33% vs. 32%) as a reason why a landscape was liked most. However, "it looks expensive to maintain" was selected more often by retirees than employed respondents (33% vs. 17%) as a reason why they least liked a landscape. It was also interesting to note that more retired than employed respondents selected "it is environmentally acceptable" (83% vs. 57%) and "it would be acceptable to the neighbours" (69% vs. 37%) as reasons why they liked their favourite landscape; and "it is environmentally unacceptable" (26% vs. 18%) and "it would be unacceptable to the neighbours" (21% vs. 16%) as reasons they disliked their least favourite landscape.

5.6.2 Current Yard Designs

After questioning participants about their yard preferences, they were asked to indicate which yard style(s) were similar to designs within their own private outdoor space. Lawn and foundation plantings were in 64% of respondents' yards, followed by flower gardens (41%) and leafy perennials (39%; *n*=200). Based on their indicated preferences, it is not surprising that xeriscape designs were in only 3% of respondents' outdoor spaces (Figure 35).

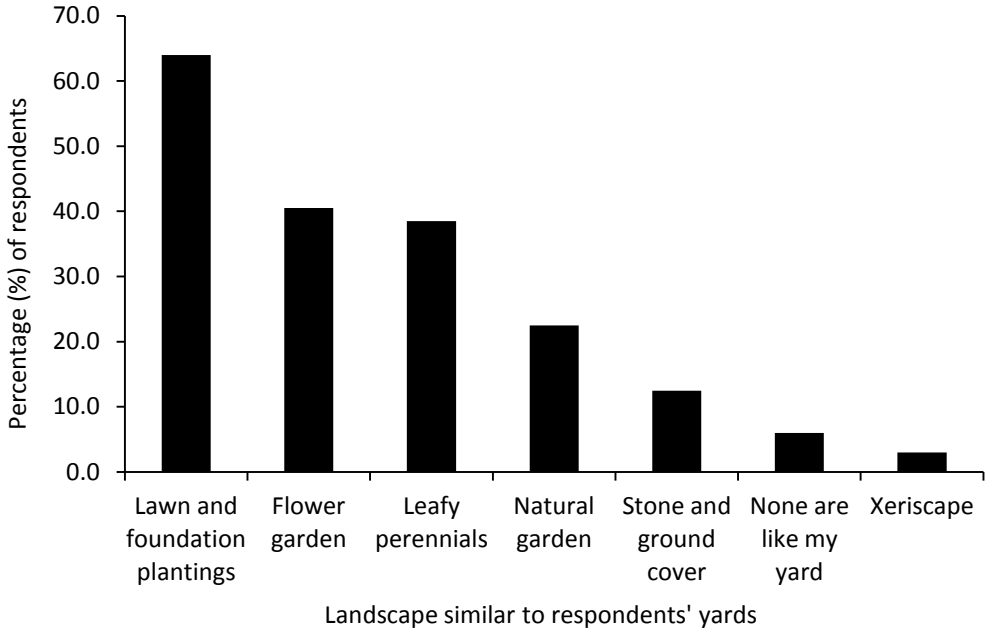

Figure 35. Landscape designs found in respondents' yards (*n*=200).

Note: Respondents used sets of photos provided within the survey to understand what was meant by each landscape style.

Overall, many respondents said they chose their favourite landscape designs for looking practical to maintain, environmentally acceptable, and for having plantings with nice shapes and colours. Meanwhile, landscapes tended to be least liked for looking like a space that the respondent household could not enjoy using, or for looking impractical to maintain. Garden elements that seemed to attract respondents included lawns, flowers, and leafy plants; whereas xeriscape landscapes were not often preferable to respondents. Such preferences were generally reflected in respondents' current yard designs.

5.7 Opinions on Yard Appearance and Privacy

Since much of the thesis was focused on private yards, the importance of privacy itself was investigated, along with respondents' expectations for how yards appear to the public (Figure 36). While 76% (*n*=183) of respondents agreed/strongly agreed with a statement that having a tidy yard is important, many respondents supported residents "doing their own thing" in landscaping their yards. In fact, when asked whether a yard or garden that looked different from most of those in the neighbourhood should conform to the majority, 76% of respondents answered "no", with only 12% answering yes, and 12% unsure (*n*=198). Nevertheless, respondents were generally more open to variety in backyard designs, as 67% of respondents agreed/strongly agreed that people should be able to do their own thing in landscaping their backyards, while only 52% said the same about front yards (*n*=198). Furthermore, 21% disagreed/strongly disagreed that people should be able to do their own thing in landscaping their front yards, but only 10% felt that way about backyards.

The importance of privacy also differed between front and backyards. Many respondents (32%) strongly agreed that privacy in backyards was important, while only 2% strongly agreed it was important in the front yard (*n*=183). Respondents were generally neutral (48%) or in disagreement (41%) with a statement that privacy is important in the front yard. Moreover, 55% of respondents agreed/strongly agreed that lot bylaws and yard policies ensure property values do not diminish, and 45% agreed/strongly agreed that yard and lot maintenance regulations contribute to community harmony. Neutral responses were common in reference to more yard and lot maintenance regulations being necessary (44%), and regarding a statement that yard regulations inhibit private yard expressiveness and diversity (46%). On the other hand, most respondents (60%) strongly disagreed with the idea that they may participate in a program allowing another community member without a yard to share space in their yard.

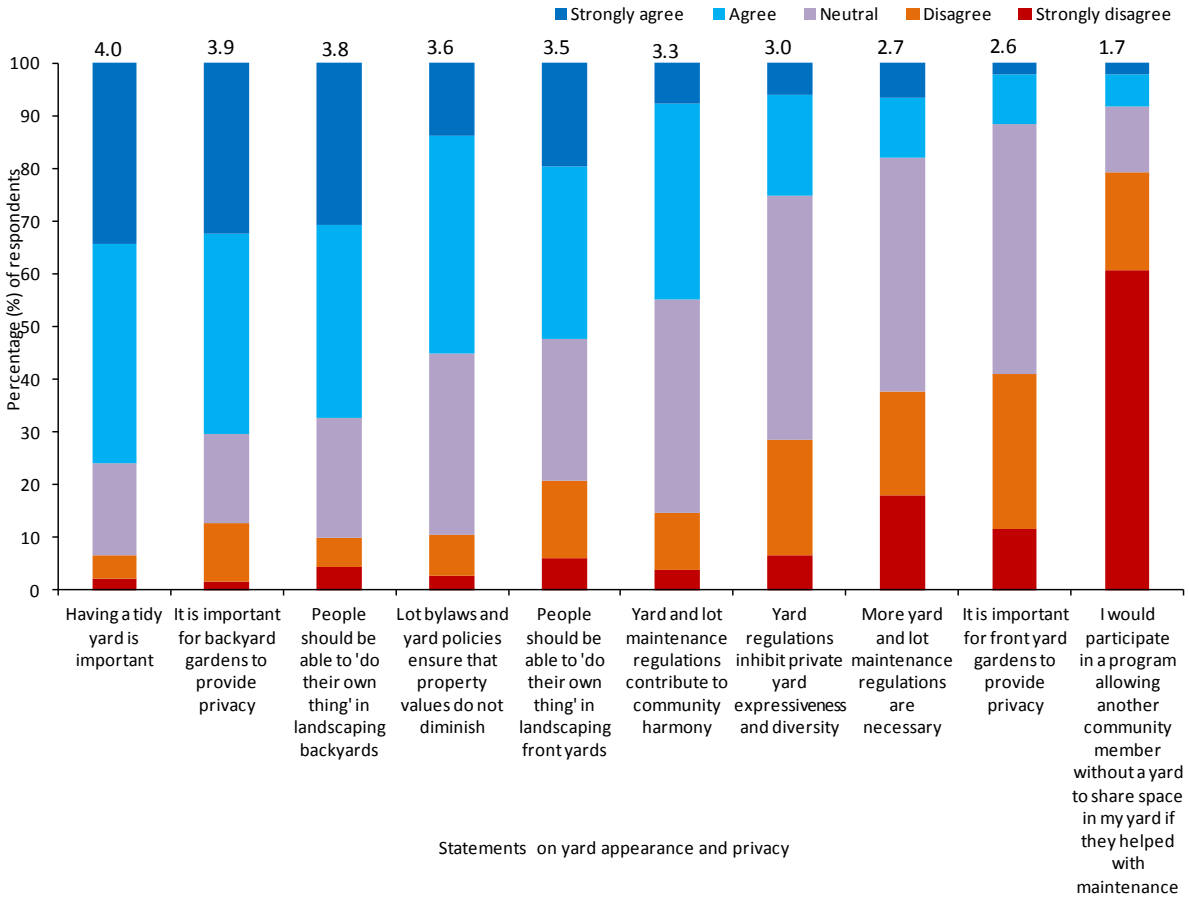

Figure 36. Respondents' level of agreement with various statements about yard appearance and private property (*n*=183).

Note: Mean values appear above bars and are based on a scale of 1 (strongly disagree) to 5 (strongly agree).

On the whole, respondents seemed to expect privacy in their backyards, and were open to neighbours designing their backyards however they desired. Although respondents were also fairly open to variety in front yard designs, most respondents placed importance on having a tidy yard, and many seemed to appreciate lot bylaws and regulations for contributing to community harmony and ensuring that property values do not diminish.

5.8 Important Yard Uses

To understand ideal ways of designing yard spaces in new developments, participants were asked to select all activities that were really important for enjoying their front and backyards. Two respondents indicated that they did not enjoy having or using their yard, so were excluded from the question. Backyards appeared to be more useful, as respondents (*n*=185) selected more uses for the backyard (total number of selections=1924) than for the front yard (total number of selections =1174). Parking, washing, and fixing vehicles were frequently checked off as important uses for the front yard (selected by 68%, 55%, and 30% of respondents, respectively), but not for the backyard (Figure 37). Such a finding likely corresponds with current lot designs that place driveways and garages in the front yard. Conversely, outdoor dining, parties (etc.), and storage were selected as important backyard uses by 88%, 74%, and 49% of respondents, respectively, but were selected by only 5%, 7%, and 4% of respondents as important front yard uses. The other activities most frequently selected as important for the front yard included relaxing (95%), reading (88%), gardening (80%), and family time (79%). In the front yard, viewing the streets was frequently cited as important (71%), as was gardening (70%), and lawn mowing (69%). Additionally, talking with neighbours was an important front yard use that was listed by three of the nine respondents who wrote their own uses under "other". Therefore, if it had it been a listed option, more respondents may have selected talking with neighbours as an important front yard use.

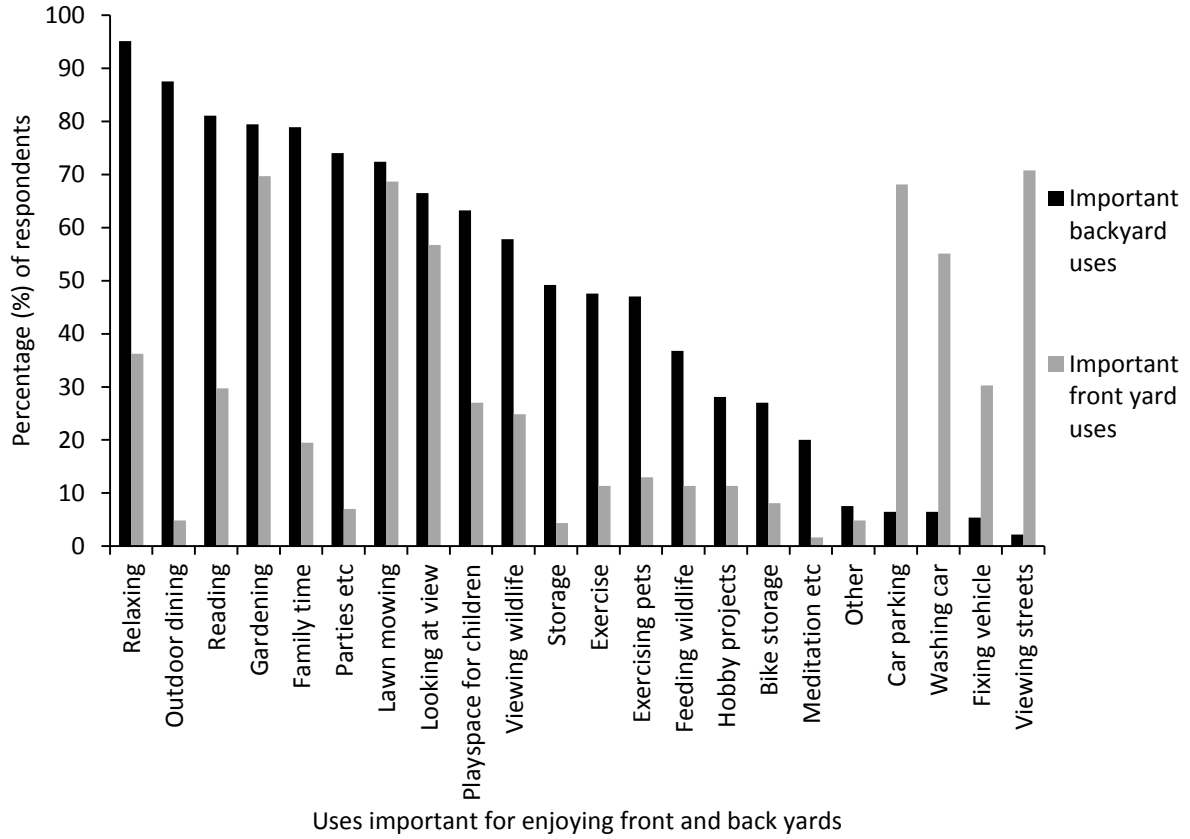

Figure 37. Percent of respondents who selected each use as important for enjoying the front and backyard (*n*=185).

Note: Respondents could select as many uses as they wished.

After selecting all important front and backyard uses, respondents were asked to select the *most* important use of their front and backyards. The majority of respondents (33%) selected car parking as the most important use of the front yard, while relaxing was selected by the greatest number of respondents (44%) as the most important use of the back yard (*n*=187; Figure 38). Talking with neighbours was listed under "other" most important uses for the front yard, while a variety of "other" uses were included for backyards, including swimming, hanging clothes outside, space for dog, open space, and privacy.

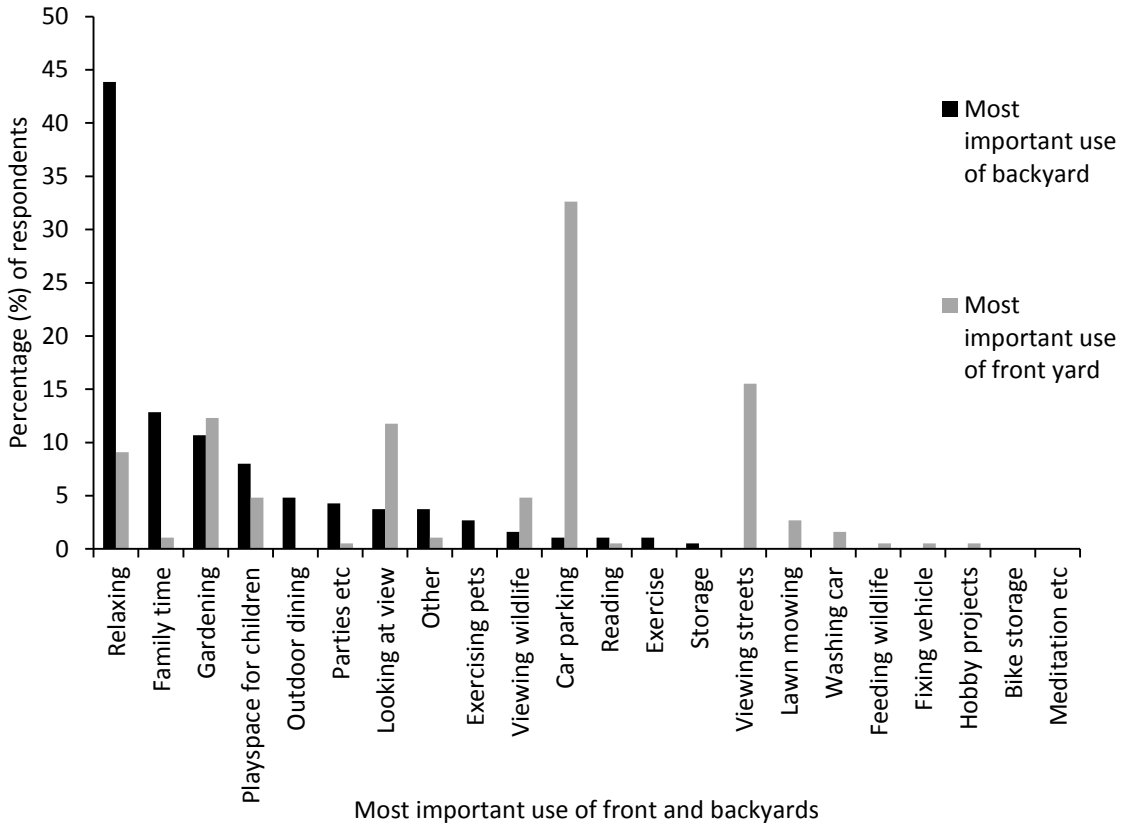

Figure 38. Most important front and backyard uses (*n*=187).

Note: For the open-ended "other" category, talking with neighbours was listed for the front yard, while a variety of uses were included for backyards, including swimming, hanging clothes outside, space for dog, open space, and privacy.

Furthermore, to understand if wild animals were important for enjoying yard space, participants were asked what they had done to attract wildlife. The majority of respondents (72%) had done at least one thing to attract wildlife, with putting out bird food as the most common practice, done by 78% of these respondents (or 56% of all respondents; *n*= 195; Figure 39).

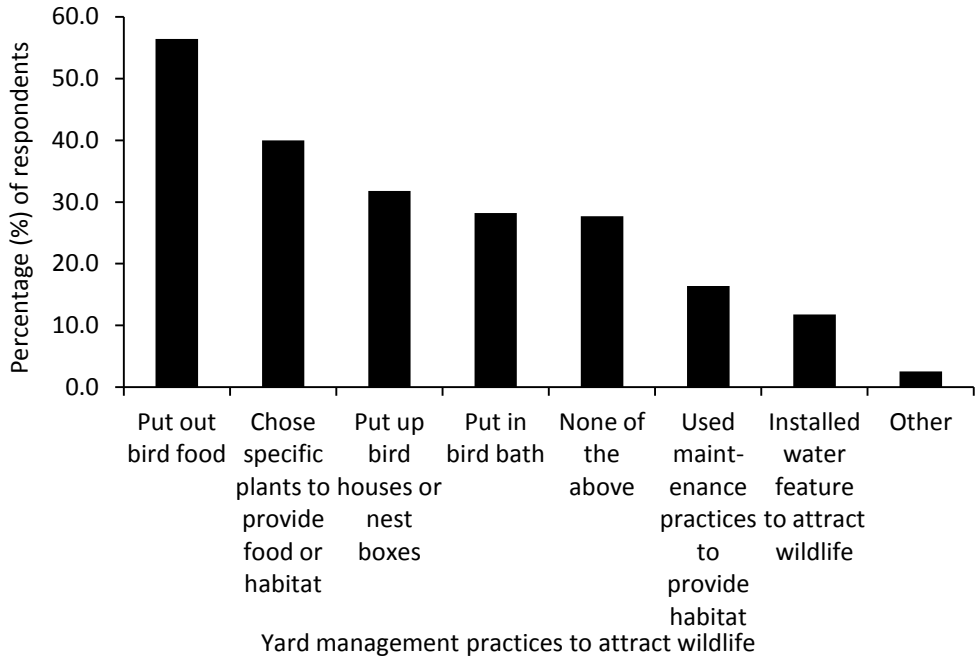

Figure 39. Yard management practices done by respondents to attract wildlife to their yards (*n*=195). **Note**: Respondents could select as many practices as they wished.

In summary, front yards were often used for vehicle-related activities, to view surrounding landscapes, or to garden; while backyards were used for various personal, social, and recreational activities. It also seemed that respondents enjoyed the natural aspect of yards, as over half enjoyed viewing wildlife and more than three quarters did something in their yard to attract wildlife.

5.9 Opinions and Behaviour Related to Yard Management

Since yards require constant care, this section explores whether respondents tended to enjoy (or not mind) yard work, and presents their management practices to understand the effort residents are willing to put into their yards. In general, yard management activities were commonly liked (or not disliked) by the majority of respondents (*n*=184; Figure 40). Most respondents disagreed/strongly disagreed that they dislike raking leaves (36%), mowing (39%), the sound of other people mowing or using power tools (40%), or the sound of their own mower or power tools (43%). Furthermore, many agreed/strongly agreed that they like to grow flowers (62%), look after a yard (61%), and grow vegetables (43%).

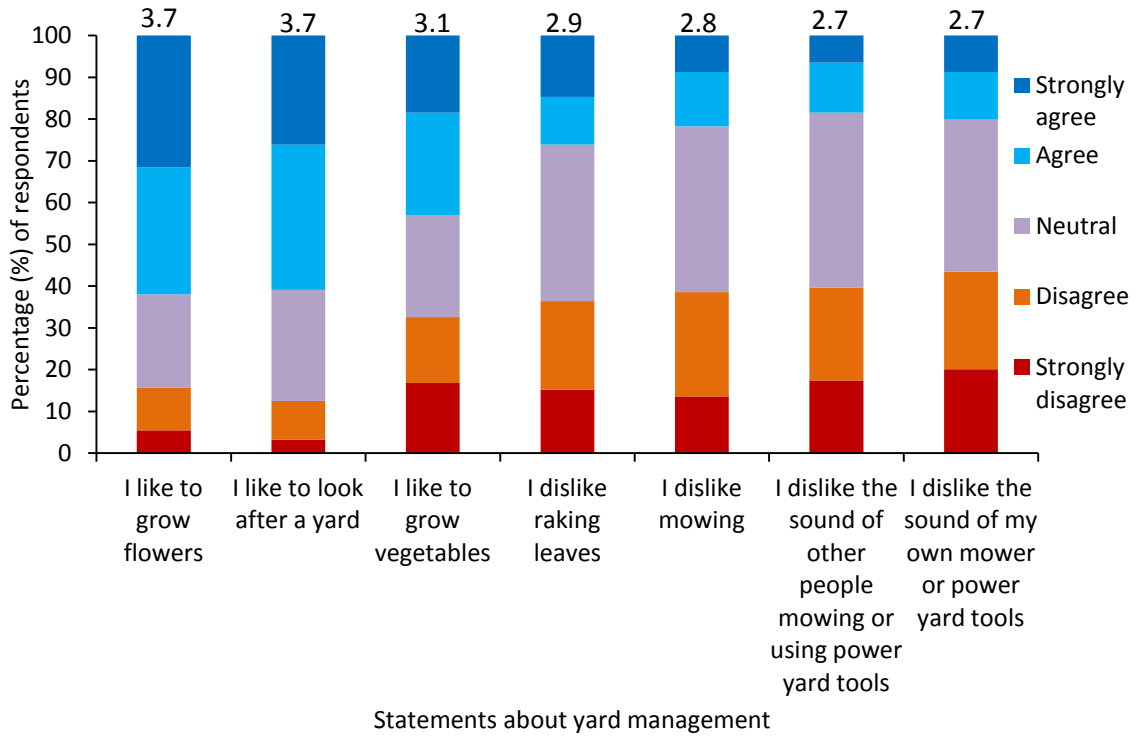

Figure 40. Respondents' level of agreement with various statements about yard use and management (*n*=184).

Note: Mean values appear above bars and are based on a scale of 1 (strongly disagree) to 5 (strongly agree).

Participants were also asked about using yard chemicals to understand what they may do to attain attractive yards. It should be noted that an Ontario Cosmetic Pesticide Ban was adopted in 2009 to reduce unnecessary chemical input that may harm the health of the environment, humans, and pets (Ministry of the Environment [MOE], 2010). Forty-six percent of respondents agreed/strongly agreed that "people should not be allowed to use pesticides on their yards", and 44% agreed with a similar statement about herbicides (*n*=197; Figure 41). Moreover, 30% of respondents indicated that they use herbicides and 29% indicated that they use pesticides, although almost no respondents said that they use such chemicals on a regular basis (*n*=143; Figure 42; 25 respondents were excluded from answering this question because they were not responsible for doing or paying for outdoor maintenance). Lawn fertilizer and weed and feed products were used slightly more frequently. Since

there are negative legal and environmental connotations associated with lawn chemicals, those who use chemicals may not have admitted to doing so in the survey.

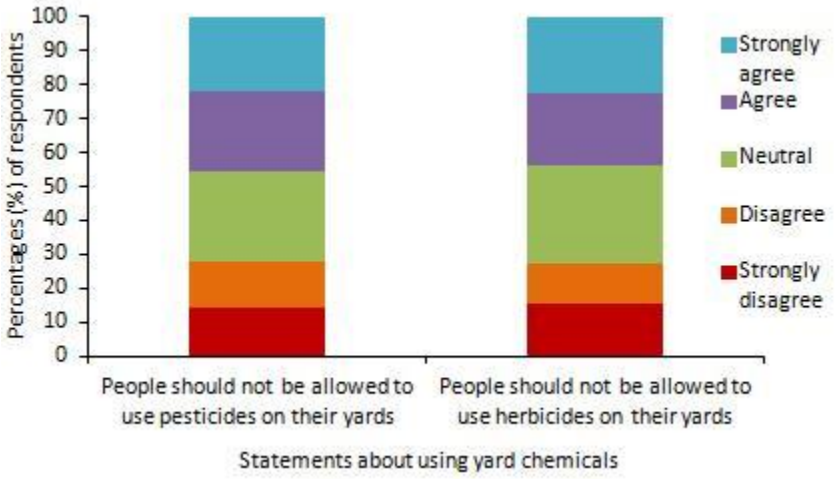

Figure 41. Respondents' level of agreement with statements about using yard chemicals (*n*=197).

Note: Mean values appear above bars and are based on a scale of 1 (strongly disagree) to 5 (strongly agree).

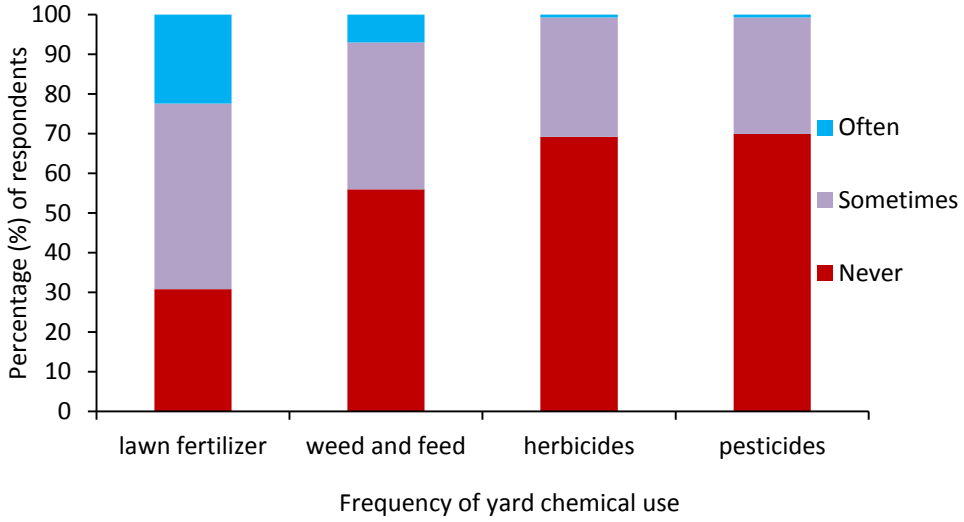

Figure 42. Frequency of yard chemical use (*n*=143).

Note: Twenty-five participants were excluded from answering this question because they were not responsible for doing or paying for outdoor maintenance.

5.9.1 Time Devotion to Yard Management

Twenty-five respondents indicated that they were not responsible for doing or paying for outdoor maintenance, so were excluded from the following questions related to yard maintenance. Respondents (*n*=169) were asked how many hours they were willing to spend looking after a yard per week (excluding time for mowing the lawn), and how many hours they actually spent. Most respondents (70%) were *willing* to spend between zero and five hours per week looking after a yard (with only four respondents selecting zero hours), and 77% of respondents *actually* spent this amount of time (n=169). Forty-one percent of respondents reported spending exactly the number of hours they were willing to spend, and 52% spent even less than what they were willing. Only 7% of respondents spent more than what they were willing.

Similar questions were asked regarding time devoted to mowing the lawn. The majority (92%) were willing to spend up to two hours a week mowing, which was the amount of time actually spent by 93% of respondents (*n*=165). Only 6% of respondents spent more time mowing the lawn than what they were willing to spend, while 26% were willing to spend more time than they actually did.

5.9.1.1 Comparison: Current Yard Size and Hours Devoted to Yard Maintenance

Despite current yard size (as estimated by respondents), the average maximum number of hours per week households were *willing* to spend mowing their lawns and taking care of their yards were generally higher than the hours they *actually* spend. Less than 10% spent more time than they were willing to look after their yard, and the same was true for mowing the lawn. The only exception pertained to households with very large yards, who on average spent more hours than they were willing to mow their lawn. Furthermore, the average time households were willing to spend and actually spent mowing their lawns and taking care of their yards increased with yard size, although time dedicated to mowing the lawn was fairly similar for households with yards smaller than very large (Table 36).

Table 36. Average maximum hours per week respondent households are willing to spend and actually spend on lawn mowing and looking after their yard (excluding mowing) (*n*=160).

Current yard size	*n*	Average hours per week for looking after yard		Average hours per week for mowing lawn	
		maximum willing to spend	actually spend	maximum willing to spend	actually spend
Small yard	***21***	3.4	2.3	1.1	1.0
Medium yard	***68***	4.1	3.3	1.4	1.1
Large yard	***48***	6.0	5.1	1.4	1.3
Very large yard	***23***	8.0	5.5	1.9	2.7

5.9.2 Yard Costs

Participants were asked how much they would be willing to pay annually for someone to maintain their yard. Again, the 25 respondents who were not responsible for doing or paying for yard maintenance were excluded. Most respondents (58%; *n*=166) were unwilling to pay anything, while 22% were willing to pay between $1 and $499, 15 % were willing to pay between $500 and$900, and 5% would pay $1000 or more.

Moreover, of the 70 respondents who indicated that they would pay for yard maintenance, 48 indicated whether or not they would purchase specific services. Respondents were less willing to pay for garden maintenance (i.e. growing vegetables, looking after flower bed and ground covers) than for more specialized services (i.e. soil aeration, dethatching, fertilization, weed control, insect control, and fungus control; Figure 43). Each service had been purchased by at least one respondent (with the exception of growing vegetables), and every service had some respondents willing to pay for it.

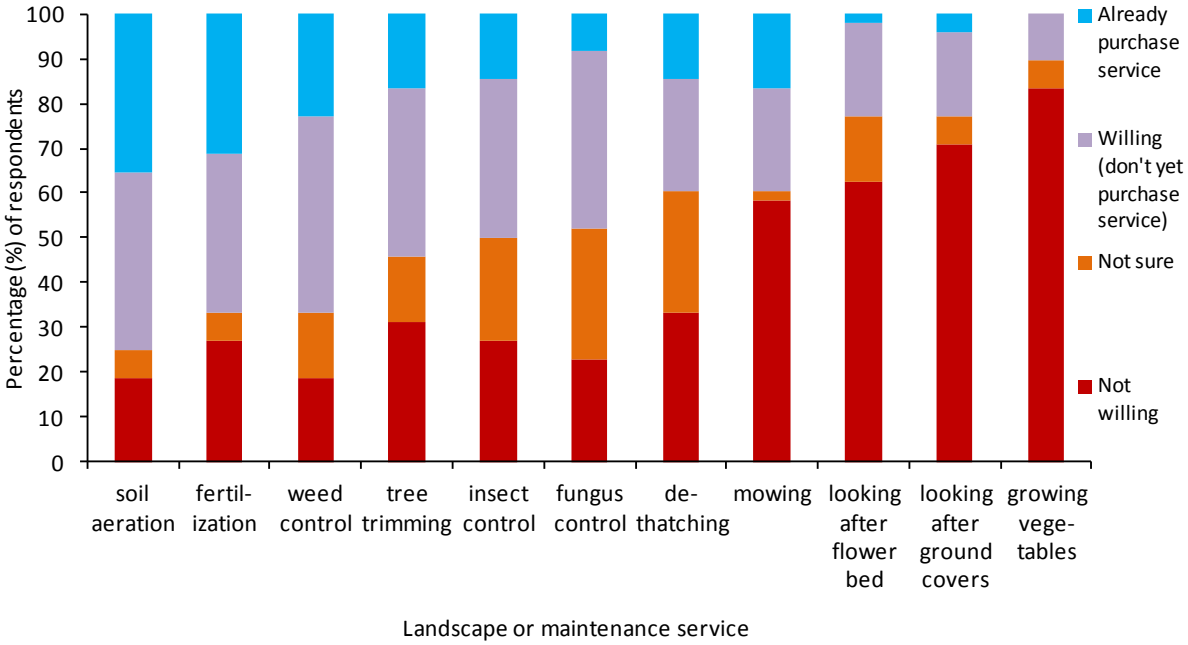

Figure 43. Yard services for which respondents would be willing, and not willing, to pay (*n*=48).

Note: Only respondents who indicated they would be willing to pay for some kind of yard maintenance were included.

Participants were also asked how much they would be willing to pay a landscape company for landscape design and installation in a newly occupied dwelling. In general, more respondents were willing to pay for landscape installation (66%) than for design (56%; *n*=167; Figure 44, Figure 45). Of those who were willing to pay for installation (110 respondents), 87% were willing to pay between $1401 and $7000, with only 13% willing to pay more. Meanwhile, only 8% of those willing to pay for design (93 respondents) were willing to pay more than $1400.

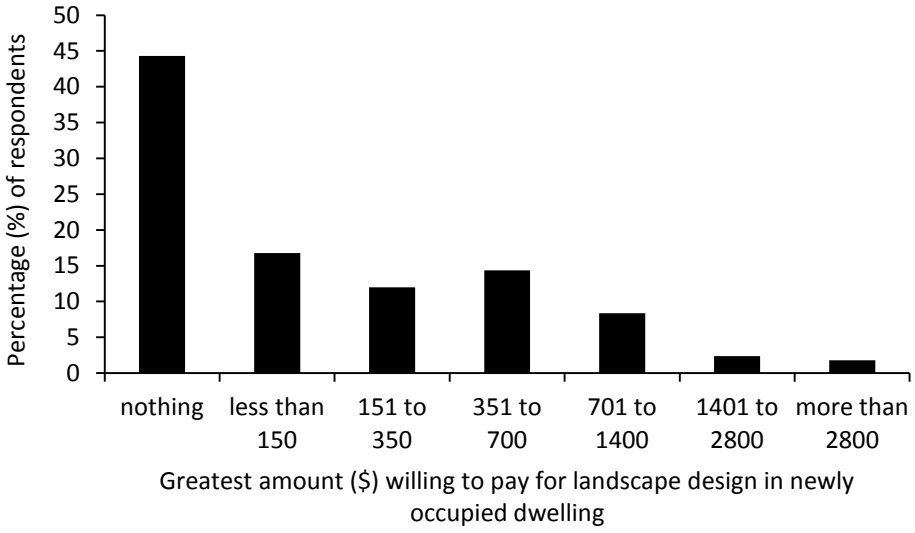

Figure 44. Greatest amount (CAD$) respondents were willing to pay a landscape company for landscape design in a newly occupied dwelling (*n*=167).

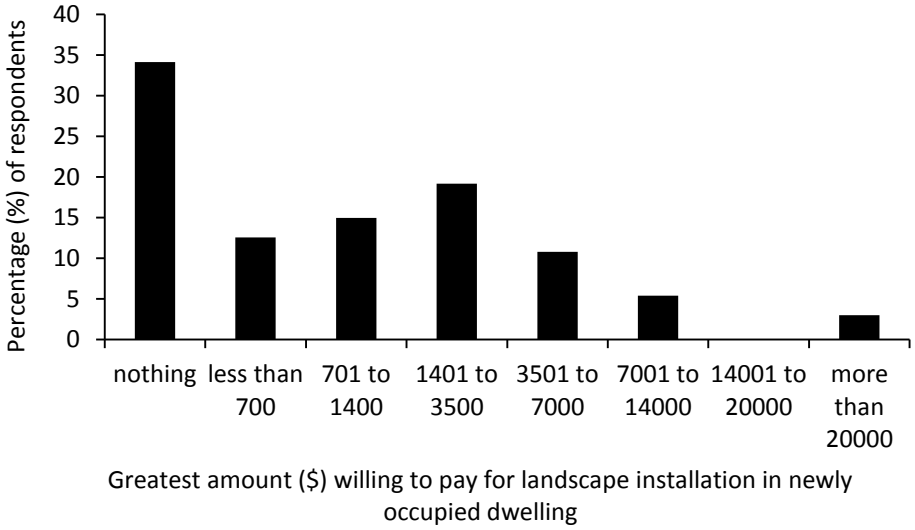

Figure 45. Greatest amount (CAD$) respondents were willing to pay a landscape company for landscape installation in a newly occupied dwelling (*n*=167).

Overall, respondents generally enjoyed yard management. They did not seem overburdened by yard care, as they generally spent less time than they were willing to look after their yards, and

seemed to be willing to pay for hired maintenance, but mainly for uncommon tasks that may require special tools or skills that may be difficult for homeowners to do themselves.

5.10 Neighbourhood Green space

In general, respondents had strong positive opinions towards neighbourhood green space (Figure 46). Liking to see a variety of kinds of trees in the neighbourhood was strongly agreed to by more respondents than any other statement (51%; *n*=189). Moreover, 43% of respondents strongly agreed with the statement that they like having woodlots in their neighbourhood, and 38% strongly agreed that it is important that green space, parks, and woodlots are linked by corridors. When combining disagree/strongly disagree responses, parks needing groomed lawns and gardens received the greatest level of disagreement (21%), followed by liking to have picnics in parks (19%).

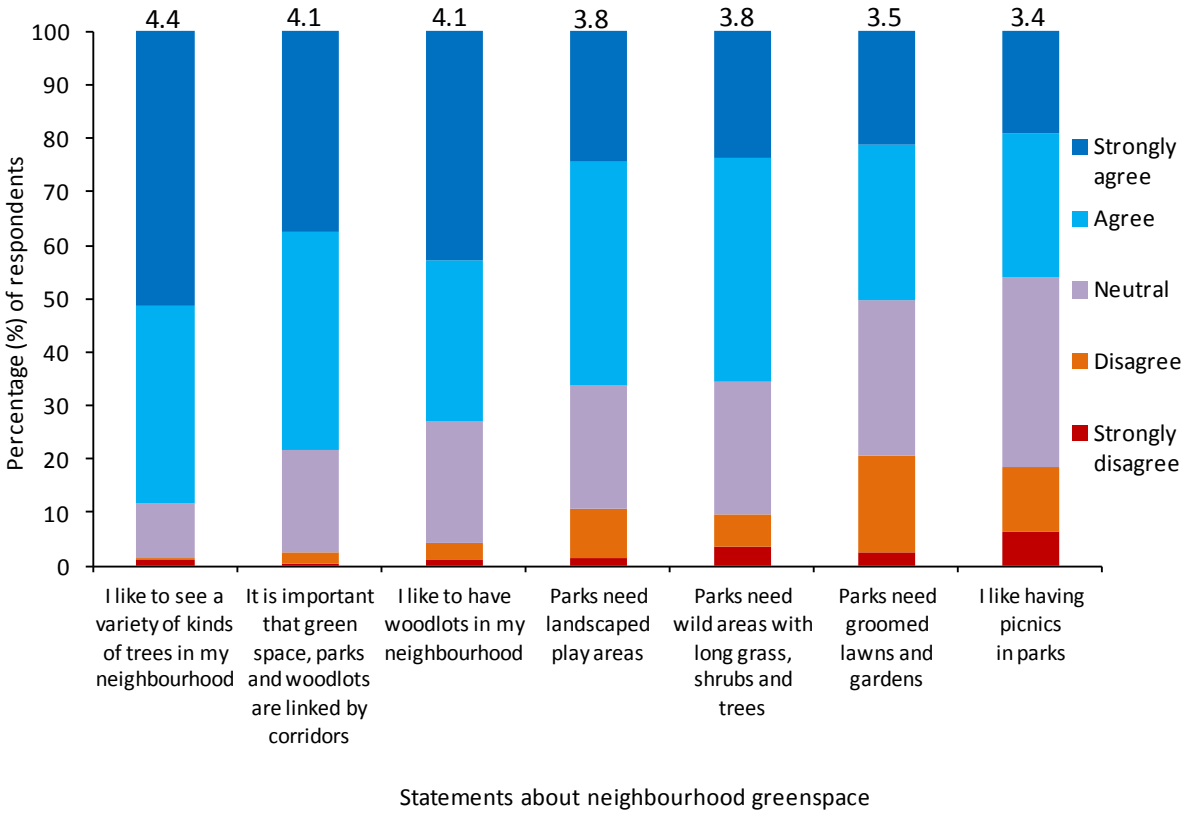

Figure 46. Respondents' level of agreement with various statements about neighbourhood green space (*n*=189).

Note: Mean values appear above bars and are based on a scale of 1 (strongly disagree) to 5 (strongly agree).

In general, it seemed that respondents enjoyed both groomed and natural public green spaces, so appropriate designs would likely differ depending on the use of the landscape.

5.11 Conclusion

This chapter has highlighted important uses of outdoor spaces, yard management practices, and major trends in property preferences as they relate to the entire sample and major subgroups. The concluding chapters will discuss how the findings relate to other studies, and how they may be helpful in designing residential landscapes in the future.

Chapter 6: Discussion

6.1 Introduction

Until recently, mid-sized Ontario cities have been characterized by low-density residential landscapes with spacious lots. Now, planning principles promote land-use intensification to preserve natural and agricultural lands while improving city vibrancy (Ontario Ministry of Municipal Affairs and Housing, 2005). In response to the 2006 Growth Plan for the Greater Golden Horseshoe and the Official Plan for the Region of Waterloo, urban growth boundaries and density targets have been incorporated into the Official Plans for the Cities of Kitchener and Waterloo (City of Kitchener, 2011; City of Waterloo, 2012c). Since an increase in residential density leaves little space for private residential yards, outdoor space in new developments will more commonly be limited to balconies and shared green space. Consequently, households looking for spacious lots will have to rely mainly on the turnover of older houses. Therefore, this study investigated how residents currently living in homes with yards value private and public outdoor space, and how green space and other neighbourhood factors may influence homebuyer decision-making. Such information can be used to target high-density developments to specific market groups, as suggested within a report about reurbanization in the Region (MKI, 2010).

This chapter connects thesis findings to the objectives, which appear in bold at the start of each major section. Wherever possible, trends in property preferences are discussed relative to the sample as a whole, as well as subgroups such as couples with and without children; resident age groups; retired and employed residents; household income groups; and groups planning to move within the next 5 years, 6 to 10 years, and 11 to 25 years.

6.2 Target Markets for High- and Low-Density Dwellings

This section explores resident subgroups in terms of their home and yard sizes and their preferences for future homes and outdoor spaces to address the first objective:

Objective 1: To determine if residents currently living in homes with private yards may move to more compact dwellings, and to describe the types of residents who are most, and least, likely to do so.

Inferences are made into which groups would have interest in “high-density” or “compact” dwellings (referring to small houses, small-to-medium condominiums, or small-to-medium apartments that have

a small private outdoor space, or no private outdoor space), and "low-density" dwellings (referring to medium and large houses and yards). Table 9 and Table 11 presented in the results chapter give specific size dimensions.

Property size was at least "somewhat important" to over 90% of residents when they chose their current home. Since participants were required to have a private yard, most respondents were living on low-density properties at the time of the study, with almost 80% living in medium-sized homes (mostly single-detached houses) and less than 20% having small yards (as estimated by respondents; even fewer had small yards when using GIS estimates). When they were asked what property sizes they would prefer if they had to move, given their current household size, finances, health, etc. ("*current household situation*"), medium houses and medium yards were preferable to the greatest proportion of respondents, while many fewer respondents showed preference for small homes or condominiums. When subgroups were examined, however, a market for the shift from low- to high-density was evident for groups around retirement age. Although groups that showed preference for condominiums tended to prefer apartments more than those without preference for condominiums, apartments were generally not preferable across all groups. Since apartments tend to be affordable options and are often rented, it is expected that preference for apartments would have been greater if the sample included more renters. Apartments are not further discussed within this section.

When asked about their property preferences *if they had to move* considering their *current household situation*, respondents generally showed preference for medium or large yards; however, when asked if they would *ever* choose to live in a home without a yard or a small yard in the future, about 40% of all respondents indicated that they may live without a yard, and almost 60% said that they may live with a small yard. The disparity between the low *preference* ratings for high-density dwellings and the fairly high reported *likelihood* of actually living in such residences in the future may have existed because residents' *preferences* were based on their current household situation (e.g. young children in household, working incomes, etc.). Conversely, respondents may have answered with the future in mind (e.g. retirement) when they were asked if they would *ever* live in a home with no yard or a small yard. Thus, the *preferences* discussed within this paper apply mainly to the near future.

Below is a breakdown of preferences by respondent subgroups. Each section begins with a summarized comparison of the subgroups, and is followed by subsections that outline patterns of individual subgroups (with the exception of household incomes). The heading of each subsection indicates the type of target market that the subgroup represents.

6.2.1 Comparison: Couples With and Without Children

At the time of the study, the majority of couples with children and without children (of all ages) were living in medium homes with medium yards. When asked about their preferences if they were to move (given their current household situation), couples whose children were all 18 years of age or older were excluded from analysis, assuming such couples could base their preferences on moving without their children. A subgroup of couples with children over 18 could not be included in analysis due to low response numbers.

Compared to couples with at least one child under age 18, couples without children had greater preference for condominiums and greater dislike for large and very large yards. Couples with children were more inclined to choose spacious properties, whereas couples without children showed greater variety in their property size preferences. Since couples without children may include young couples planning for children as well as older empty nesters, the diversity in preferences may be partially explained by age (discussed later in this section).

6.2.1.1 Couples with Children: Major Target Market for Low-Density

Three quarters of couples with children (of all ages) were living in medium homes at the time of the survey, with almost 20% in large homes. In general, if they were to move (given their current household situation), couples with at least one child under the age of 18 said that they would prefer to live in a medium or large house. Meanwhile, few said that they would have preference for a small home or small to medium condominium. Although few said that they would have preference for moving to a home without a yard or with a small yard, about 35% of couples with children (of all ages) said that they may live in a home without a yard in the future, and almost 45% said that they may live in a home with a small yard in the future. It is likely that many of the respondents willing to live with smaller outdoor spaces in the future were thinking of their preferences once their children move out. Overall, couples with children under 18 years of age did not show interest in compact dwellings, so they are considered a target market for low-density dwellings. Since roughly 20% of such couples were planning to move within 5 years, and another 20% were planning to move in 6 to 10 years, their preferences should be useful in looking at the upcoming market.

6.2.1.2 Couples Without Children: Target Market for High- and Low-Density

Similar to couples with children, about 80% of couples without children were living in medium homes at the time of the survey, with nearly 15% in large homes. If they were to move (given their

current household situation), most indicated that medium houses would be preferable, but there would be some tendency to prefer small houses and condominiums. Furthermore, the majority said that they would prefer a property with a medium yard, although this group seemed to have preferences for yards of all sizes. Mixed preferences were evident, likely because some couples without children could be planning to have children and want a spacious property, whereas some may be aging and looking to downsize. Like couples with children, just over 30% indicated that they may live in a home without a yard in the future, but nearly 60% said that they may live in a home with a small yard in the future. Thus, couples without children represent a market for most dwelling types. It seemed likely that target markets could differ by the age of the homeowners. Therefore, preferences by age group are discussed below. Overall, the findings regarding couples without children should be relevant to the upcoming market since about 20% were planning to move within 5 years, and 30% were planning to move in 6 to 10 years.

6.2.2 Comparison: Age Groups

When property preferences were compared across age groups, large houses and large yards were preferred more often by younger groups, whereas condominiums and small yards were preferred more often by older groups. Therefore, older age groups would be less inclined to choose low-density homes and more inclined to choose high-density homes than would younger age groups.

6.2.2.1 Age Group 25-45: Major Target Market for Low-Density

At the time of the study, 75% of respondents between the ages of 25 and 45 were living in medium homes, with roughly equal amounts in small and large homes. Given that residents in this age group would be most likely to have (or want) children, it is not surprising that most would have preference for medium houses if they were to move (given their current household situation). Correspondingly, most would prefer a spacious yard and would be unlikely to live in a condominium or apartment. Although less than 5% indicated current preference for living with no outdoor space, or only a patio, deck, or balcony; 26% said they may live with no yard in the future. Similarly, only 14% indicated current preference for a small yard, while 35% said they may live with a small yard in the future. Thus, residents of this age group are a major target market for low density residences; however, smaller properties will likely be more appealing to this cohort as they age. Results should be relevant to upcoming markets since 25% of this group was planning to move within 5 years and 27% was planning to move in 6 to 10 years.

6.2.2.2 Age Group 46-55: Target Market for High- and Low-Density

Nearly three quarters of the respondents between the ages of 46 and 55 were living in medium homes at the time of the survey, and 20% were living in large homes. Unlike residents of the other age groups, those between 46 and 55 were happier to stay in place longer, with only 8% looking to move within 5 years, 20% planning to move in 6 to 10 years, 22% planning to move 11 to 25 years, and 30% planning to stay indefinitely. Therefore, it seemed this group had interest in moving in retirement years. Given their current household situation, most of these residents indicated preference for moving to a medium house, but slightly more indicated preference for a small house than indicated preference for a large house. In addition, about one quarter of this group had preference for condominiums; however, condominiums may be less preferable in reality since almost no one in this group had preference for living with only a patio, deck, or balcony, and most had preference for medium or large yards. Nevertheless, when asked about the future, 36% indicated that they may live without a yard and 56% indicated that they may live with a small yard. Thus, a fraction of this group would have potential for high-density living, but the greatest proportion would be interested in low-density dwellings. Considering their desire for smaller living spaces but preference for outdoor space, some residents within this age group may be well-suited to townhouses or units with ground-level yards (such as on the first floor of a condominium). Overall, this group would be mainly targeted towards low-density residences, although a segment would make up a market for high-density development. Since many did not plan to move for at least another six years, such preferences may change (likely in favour of downsizing) by the time many residents of this age group move.

6.2.2.3 Age Group 56-65: Target Market for High- and Low-Density

Similar to those between the ages of 46 and 55, most respondents in the group between ages 56 and 65 were living in medium homes at the time of the study, with almost none in small homes. According to survey results cited within a Canadian Mortgage and Housing Corporation (CMHC) report from 2008, at least 85% of those over 55 planned to “age in place”, remaining in their current homes until their later years of life regardless of any changes to their health. Results from this thesis send a slightly different message, as just over 40% of those between 56-65 were planning to move within ten years, and only 33% were planning to stay indefinitely. As discussed in later sections, when the age groups of 56-65 and 66 and older were combined, about 48% were planning to move within 10 years and 30% were planning to stay indefinitely. Medium houses were again the most preferable choice for many residents in the age group 56-65 if they were to move (considering their

current household situation), but very few would consider moving to a large house. While only 2% of respondents in this group were living in small homes during the study, about 30% had current preference for moving to a small house and about 40% had preference for moving to a condominium. In addition, the majority had preference for moving to a home with a small or medium yard, while a smaller percentage had preference for properties with large yards and only 15% had preference for very large yards. Although less than 10% had interest in living without a yard, about 20% had preference for living with only a patio, deck, or balcony. When asked about the future, 36% said that they may live without a yard, and 58% said that they may live with a small yard. Therefore, while medium-sized properties were generally preferable to residents between the ages of 56 and 65, the likely trend would be to downsize from larger homes to smaller houses or condominiums. Thus, a portion of this group would constitute a target market for high-density development, perhaps because they desire homes with less maintenance as they age, or because some households would decrease in size as children move out.

6.2.2.4 Age Group 66 and Older: Major Target Market for High-Density

The majority (82%) of people age 66 and older were living in homes of medium size at the time of the study, with roughly equal amounts in small and large homes. About 60% of this age group were planning to move within 10 years and, if they were to move (given their current household situation), most would prefer a small house or condominium. These findings further challenge the idea that seniors will "age in place" in their single-detached homes without downsizing first. In fact, 50% indicated that they may live without a yard in the future, and 81% said that they may live with a small yard. Regardless of their desire to downsize their residence, more would still prefer a medium or small yard compared to only a patio, deck, or balcony. Again, townhouses or ground-level condominiums may satisfy such interests, as no one in this age bracket had interest in large or very large yards. Nevertheless, since 42% were neutral to living with only a patio, deck, or balcony; a home without private green space may not be preferable, but it is unlikely to repel many householders in this age bracket. Thus, residents in this age bracket would look primarily at high-density dwellings if they were to move, and access to a small private outdoor space and spacious common green space would likely encourage homebuyers in this group.

6.2.3 Comparison: Employed and Retired Respondents

Corresponding to the trends of the older age groups, respondents who were retired tended to prefer high-density options more than those who were employed. Medium and large houses were significantly more preferable to respondents who were employed, as were large and very large yards. Conversely, retired respondents gave smaller homes and smaller outdoor spaces more preferable ratings than did respondents who were employed. It is likely that retired individuals were more accepting of smaller homes because such spaces are often associated with reduced costs and maintenance.

6.2.3.1 Retired Respondents: Major Target Market for High-Density

Of the retired respondents, 73% were living in medium homes and 20% were living in large homes at the time of the study. However, if they were to move (given their current household situation), only 43% said they would have preference for a medium house and only 10% said they would have preference for a large house. Meanwhile, 23% of this group said that small houses and condominiums would be preferable. Similarly, the percentage with preference for large or very large yards was smaller than the percentage actually living with yards of those sizes, whereas 40% showed preference for small yards compared to only 14% living with small yards at the time of the study. In addition, 17% had preference for having only a patio, deck, or balcony. Furthermore, when they were directly asked if they would ever choose to live in a home with no yard in the future, 32% indicated that they may, and 66% indicated that they may live with a small yard. Therefore, this group would be considered a major target market for high-density dwellings. The idea of aging in place was supported by the fact that 43% of retired respondents were planning to stay in their homes indefinitely; however, another 43% were planning to move within 10 years. Thus, the overall tendency to downsize is a relevant trend to plan for when considering the retired population.

6.2.3.2 Employed Respondents: Target Market for High and Low-Density

At the time of the survey, 77% of employed respondents were living in medium homes, and a similar percentage (79%) indicated preference for a medium house if they were to move (given their current household situation). Furthermore, this group generally preferred large houses more than small houses, and tended to prefer medium, large or very large yards. Nevertheless, a portion of employed respondents had interest in smaller properties, with small yards, small houses and condominiums each preferable or very preferable to around 20% of this group. Considering the trends associated with

couples and age groups, it is likely that employed respondents who were near retirement age or living in a small household (i.e. without children or with children who could move out soon) would be more interested in smaller homes than employed respondents who were young or had large households. Again, when respondents considered their future, a greater percentage indicated that they may live without a yard (31%) or with a small yard (48%) in comparison to the percentages with preference for such spaces at the time of the survey. Since employed respondents were of various ages and household types, a trend for when they planned to move from their current homes was not clear. In addition, their interest in each property size generally followed the trends of the whole sample, with the majority interested in medium or large properties, and a small portion interested in more compact options.

6.2.4 Comparison: Household Income Groups

As expected, respondent residence sizes increased with household income, with large homes more common to residents with household incomes between $100,000-249,999 than between $50,000-99,999. On the other hand, no clear trend in current yard sizes existed across the income groups. Furthermore, if respondents were to move given their current household situation, preference for large houses increased with income, while there were no detectable trends for yard size preferences. Since income groups had to be joined into only two groups ($50,000-99,999 and $100,000-249,999) for statistical analysis, minimal information was gathered about the effect of income on homeowner preferences. Therefore, a breakdown of trends in each income group is not provided.

6.2.5 Objective 1 Conclusion

On the whole, residents living in homes with private yards tended to prefer spacious properties with medium houses and medium or large yards. Nevertheless, appeal for high-density dwellings existed within specific groups. Retired and aging residents represented the strongest target market for compact living, while other survey subgroups (including couples without children and employed respondents) had portions interested in high- and low-density homes. Regardless of respondent subgroup, the idea of living in an apartment or having no outdoor space was rarely preferable. Meanwhile, low-density properties were essentially the only desirable options for couples with children and respondents between the ages of 25-45, which means these groups would be most likely to choose a home in the suburbs. Percentages of each group who said they may choose to live in a home with no yard or a small yard *in the future* was generally much higher than the percentage who

said they would have preference for small yards; having only a patio, deck or balcony; or having no outdoor space if they were to move considering their *current* household situation. Therefore, it is likely that participants of all ages and household types recognize that at some point in their life, it will be practical to own a small property. The results send the message that most residents would *like* to have a spacious property, but do not *expect* a spacious property at all stages in their life. For instance, residents may want smaller outdoor spaces to reduce maintenance later in life, or because they would like a newly-built home and recognize that many new houses come with smaller lots than older homes. Furthermore, around 20% of couples with children, respondents between the ages of 25-45, and employed respondents had lived without a private yard or with a small private yard in the past. On the other hand, a notably smaller percentage of older respondents had lived with such properties in the past, suggesting that it is now common for young households to live in high-density environments before settling into low-density environments, and that this behaviour is characteristically different from previous generations.

While this thesis study focused mainly on residents living in homes typically found in low-density neighbourhoods, Metropolitan Knowledge International [MKI] and their research team conducted surveys of residents in Waterloo Region who were currently living in reurbanized residences, or who were interested in moving to such homes. In their terms, reurbanization includes "infill, intensification, adaptive reuse, and redevelopment" (MKI, 2010, p.i), which all contribute to high-density environments. They conducted similar studies in 2005 and 2010, and found an increasing interest in reurbanized homes. As with the thesis results, the strongest target market for such development was that of the aging population, as seniors aged 70 or older accounted for 35% of current and 8% of potential reurbanization residents, and empty nesters (with no children living in their household) aged 50-69 accounted for 20% of current and 23% of potential reurbanization residents. Furthermore, the percentage of seniors and empty nesters living in reurbanized homes had increased since the previous study. Similar to the thesis results, seniors and empty nesters often said that reduced maintenance was a reason they wished to downsize. The younger population aged 18-39 consisting of singles or couples without children were also considered target market groups for reurbanization, but represented only about 15% of the current and potential residents. Even still, many young singles and couples (many of whom were looking to start a family) who were living in reurbanized homes at the time of the MKI (2010) study were interested in moving into single-detached houses within two years. Nevertheless, the findings highlight the importance of interpreting the results of this thesis project objectively, keeping in mind that young residents who already live in

homes with yards are probably more inclined to desire low-density environments than those not living such suburban lifestyles. In other words, resident groups most likely to choose high-density living may not currently live in areas captured by this thesis study, and it is vital that such target markets are investigated to create a reasonable model of supply and demand. In addition, this study did not capture residents not yet living in the area, such as first time homebuyers or immigrants. Regardless, the next section summarizes how results of this thesis can contribute to an understanding of expected housing turnover.

6.3 Expected Housing Turnover for High- and Low-Density Dwellings

This section explores whether respondents would upsize, downsize, or choose dwellings and yards similar in size to their current properties if they were to move, in order to address the objective:

Objective 2: To discuss whether the proportion of residents who may move from low-density to high-density dwellings is likely to support an ongoing demand for low-density dwellings.

Findings are put into context with the real estate market by discussing when respondents with homes and yards of each size plan to move. Since few respondents were living in small or large homes, the trends discussed are meant as a description of what may be occurring across Kitchener-Waterloo, but further studies are required to confirm conclusions. This discussion is particularly relevant in light of the recent decision made by the OMB to expand the land budget laid out in the Regional Official Plan from 75-85 hectares to 1053 hectares, based on an appeal from local developers (OMB, 2013; refer to Chapter 3).

6.3.1 Predicting Residence Size Availability

Respondents living in medium or large homes at the time of the survey were generally happy to remain in their homes longer than those in small homes, as 26% of residents in medium homes and 33% of residents in large homes were planning to stay indefinitely, compared to only 6% in small homes. Respondents living in small homes were most eager to move, as 31% said that they would move within 5 years compared to just under 20% of those living in medium or large homes. On the whole, residents living in small homes indicated that they would prefer to upsize if they were to move (given their current household situations), as about 90% said that medium houses would be preferable or very preferable. Even so, 44% had preference for moving to another small house and about 30% had preference for a small to medium condominium. Thus, although many residents in small homes would prefer to upsize to medium houses, a proportion of this group seemed to be interested in

moving to high-density homes and unlikely to move to large houses. Considering the expected turnover rate and the patterns outlined in the previous section, small dwellings may be starter homes for young households as well as retirement homes for the aging population.

Seventy percent of the respondents living in medium homes said that they would prefer a medium house if they were to move, whereas small houses, large houses, or small to medium condominiums were each preferable or very preferable to roughly one quarter of this group. Since most people in medium homes would be interested in another home of similar size, there may not be enough medium houses available to support those wanting to downsize or upsize to a medium house. Almost 20% of those currently living in medium homes were likely to move within 5 years; however, 26% planned to stay indefinitely. On the whole, results suggest that the supply of medium houses may not meet market demand unless those in medium homes are persuaded to upsize, downsize, or move to condominiums of similar size; or, those in small and large homes decide to move to houses or condominiums that are similar in size to their current homes.

Residents currently living in large houses may not exert extensive strain on the market of medium-sized homes if other options are sufficiently appealing. Respondents in large houses generally wanted to stay in their homes longer than people in smaller homes, with just over 30% planning to stay indefinitely. Since respondents living in large homes showed a similar level of interest in moving to medium or large houses, perhaps such residents may be persuaded to choose another large house rather than a medium house if they were to move. Furthermore, since 56% of respondents living in large homes expressed preference for moving to medium houses, but only 26% of respondents living in medium homes expressed preference for moving to large houses, residents could remain in large houses without hindering residents in medium homes from upsizing. In addition, 24% of respondents living in large homes expressed preference for moving to a condominium, which also suggests that large homes should be available to those wishing to upsize. Therefore, thesis findings give no indication that there is a need to increase the supply of large homes in upcoming years.

6.3.2 Predicting Yard Size Availability

Although yard sizes are not independent of dwelling sizes, this section explores whether residents would prefer to increase or decrease their yard size. Of those currently living with a small yard, most indicated that they would prefer to upsize to a medium (66%) or large yard (40%) if they were to move (given their current household situation), while 34% said that they would prefer another small yard. Furthermore, only about a quarter of those living with a medium yard showed preference for

downsizing to a small yard, yet 61% had preference for another medium yard and 51% had preference for upsizing to a large yard. Those who had a large yard had mixed preferences, as 44% had preference to again own a large yard and 30% had preference to upsize to a very large yard; however, downsizing to a medium or small yard was also preferable to 40% and 28% of this group, respectively. Moreover, many respondents with very large yards indicated they would look to downsize, as only 33% had preference for another very large yard compared to 43% with preference for a large yard and 33% with preference for a medium yard. Interestingly, having a small yard or only a patio, deck, or balcony were both preferable options to about 15% of those currently living with a very large yard.

When asked if they would *ever choose* to live in a home with no yard or with a small yard (i.e. at a time when their household situation may differ from its current state), those currently with larger yards tended to have greater interest in living with smaller outdoor space than those currently with small yards. This suggests, perhaps, that people with larger yards would like to lessen the burden of maintenance, whereas many people currently living with small yards would look to increase their area of outdoor space if conditions (perhaps affordability) were appropriate. Such explanations require a full investigation of variables that affect homeowner preferences, which is beyond the scope of this thesis. Overall, while small outdoor spaces were not commonly preferable, about 40% of respondents indicated that they may choose to live without a yard in the future and almost 60% indicated that they may live with a small yard in the future. This finding suggests that residents may change their preferences over time, or may be flexible in their property expectations and willing to make tradeoffs.

When viewing the survey sample as a whole, medium yards appealed to the greatest portion of respondents and seemed to be the most satisfying yard size, as nearly 40% of respondents with medium yards planned to stay in their homes indefinitely. As with trends in dwelling sizes, about 30% of respondents with small yards were expecting to move within the next 5 years, and almost 60% were expecting to leave within 10 years. Interestingly, 30% of those with very large yards were also planning to move within 5 years, whereas those living with medium or large yards were more likely to stay for at least another five years.

6.3.3 Objective 2 Conclusion:

Although an analysis of residents living in apartments and condominiums is needed to attain a more accurate prediction of the flow of residents between low- and high-density environments, some generalizations can be made from thesis results. Generally speaking, if residents who currently live in

homes with yards were to move, most would prefer to live in medium homes with medium-to-large yards. Residents living in small homes would be likely to move in the near future, and most would prefer a medium home, but many would also consider small houses or condominiums. A portion of respondents in large homes would also consider moving to condominiums, and a greater percentage of residents in large homes would be interested in downsizing to medium houses than the percentage in medium houses who would be interested in upsizing to large houses. Furthermore, most residents would prefer a yard at least medium in size if they were to move (given their current household situation), yet many also expect to reduce the size of their outdoor space in the future. While the findings suggest that an expansion of land may be necessary to accommodate additional medium-sized houses, there is also an indication that potential homebuyers may be interested in more than one property size. Furthermore, results of this study are based on how respondents would ideally behave, but their actual decisions may differ based on their life situation (e.g. health or finances), or perhaps due to an increase in the range of dwellings options or shifts in dwelling costs as landscape patterns change. Thus, if the Region and provincial government wish to keep a land budget of 75-85 hectares, it is important that planners and developers work together to create condominiums and small homes that are affordable and have attributes that persuade residents to move from low-density neighbourhoods into more compact living environments. Therefore, the remaining sections of this chapter explore features of private and public outdoor spaces along with property and neighbourhood characteristics that may increase the desirability of residences.

6.4 The Value and Attractive Features of Private Outdoor Spaces

Since a major focus of this thesis was to understand the potential consequences of creating high-density residential developments with minimal private outdoor space, this section explores how residents value their yards, addressing the objective:

Objective 3: To investigate if, and how, residents value private outdoor space and to determine key features of private outdoor spaces that may appeal to potential homebuyers.

To begin, yards are described in terms of how they are commonly utilized, with the ultimate aim of suggesting ways of achieving optimal functionality in small private outdoor areas and public spaces. The emphasis residents place on yard appearance is also explored to understand if yards are valued for the atmosphere they help establish around the house and the neighbourhood. Yard value is also expressed in terms of the time and money residents are willing to allocate to yard landscaping and

maintenance. To conclude, yard design preferences are explored to understand the types of outdoor spaces residents typically look for.

6.4.1 Private Yard Uses

As discussed within the literature review, the meaning attributed to outdoor spaces differs from person to person, based on education, societal expectations, or past experiences that invoke feelings of familiarity or emotional attachment to landscapes. Meaning may also be derived based the functionality, safety, or aesthetic appeal of a space (Gobster et al., 2007; Larson et al., 2009; Meinig, 1979; Yabiku et al., 2008). It seems, however, that although residents may *experience* landscapes differently, there are many commonalities in the ways they *use* their yards.

According to this thesis study, front yards were used mainly for vehicle-related activities, viewing streets or landscapes, gardening, mowing the lawn, or chatting with neighbours. The importance of vehicle parking was notable, corresponding to the fact that about 60% of respondents considered parking availability an important factor when they chose their current home. While backyards were rarely used for vehicles or viewing streets, they were overall more functional. Backyards were commonly important for peaceful activities such as relaxing and reading; social activities such as outdoor dining, family time, and parties; storage; recreational activities involving personal exercise or exercise for children or pets; and for yard activities such as gardening, mowing the lawn, and viewing surroundings. Privacy was also an important function of backyards, whereas respondents did not generally expect privacy in front yards.

To increase the appeal of compact living, developers should consider the most important uses of yards and incorporate such functionality into outdoor spaces available in high-density environments. Based on study results, it would be best for condominium-style residences to include parking, offer aesthetic views, and include a balcony or small private outdoor space where noise levels are kept to a minimum. In addition, space for storage (such as bicycles) may be an asset. Moreover, common spaces that could be rented or shared (such as rooftop terraces), may act as appropriate locations for social events; whereas open fields, nearby trails, and community gardens may be appropriate places for family time, meeting community members, exercising, and gardening.

6.4.2 Yard Appearance

If a private yard is treated like an extension of the home and as a representation of the household itself (see Nassauer, 2011), it is logical for yard appearance to be important to residents. Such a theory was

supported by this study, as most respondents agreed that having a tidy yard was important, and over half of the respondents indicated that the attractiveness and neatness of the yard and property were important factors when choosing their current home. In addition, when asked about their favourite landscape design, some respondents based their choice on whether it was acceptable to the neighbours and whether it was environmentally acceptable. Interestingly, older respondents based their choices on such factors more often than younger respondents, suggesting that older generations may have been brought up to have greater concern with conformity and public opinion than younger generations. It is also possible that *all* groups tend to have greater concern with such factors as they age, or as they become more established within their home and community. Furthermore, consistent with the literature (see Fraser & Kenney, 2000; Larsen & Harlan , 2006; Nassauer et al., 2009; Zmyslony & Gagnon, 2000), a greater portion of respondents were open to people "doing their own thing" in backyards (away from the public eye) than in front yards. Still, only about 20% of respondents were against the idea of people "doing their own thing" in front yards, and three quarters of respondents believed yards did not need to conform to the majority. Nevertheless, most respondents seemed to appreciate (or were indifferent to) having yard regulations, as over half agreed that lot bylaws and yard policies ensure property values do not diminish, and just under half agreed that yard and lot maintenance regulations contribute to community harmony. In fact, nearly 20% thought that more regulations were necessary. That being said, roughly a quarter of respondents agreed with the statement that regulations inhibit private yard expressiveness and diversity.

To summarize, it seems most residents would accept seeing a variety of yard landscape designs in their neighbourhood, provided such landscapes look neat and do not threaten property values of nearby homes. Since respondents were generally happy with having yard regulations and policies, it suggests that residents of condominium-style residences may also appreciate the regulations that ensure common spaces are enjoyable. In addition, respondents liked a variety of outdoor space designs, which is important when people live in close quarters and share outdoor areas.

6.4.3 Time and Money Devoted to Yard Maintenance and Landscaping

Considering the importance of yard appearance, residents should be willing to dedicate time and money to yard upkeep and landscaping if they enjoy the aspect of owning a yard. In fact, less than 15% of respondents disliked managing a yard. In addition, only about 35% disliked raking leaves or mowing. Furthermore, almost all respondents indicated being *willing* to spend more time on yard maintenance and mowing the lawn than they *actually* spent. The notable exception came from those

who said they had very large yards, who on average spent more time mowing their lawns than they would have preferred. Perhaps because they were not overwhelmed by yard upkeep, most respondents said they were unwilling to pay for annual yard maintenance, and the majority who were willing to pay would not go beyond $1000. In general, services for which people were willing to pay involved specific tasks, such as soil aeration or fertilization, which may require special tools or techniques. Around 20% of respondents said they would be willing to pay for at least one of lawn mowing, looking after flower beds, or looking after ground covers; however, 17% were already paying for lawn mowing while less than 5% were paying for either looking after flowers or ground covers. Even fewer people said they would be willing to pay for a service to grow vegetables, and no one was already paying for such maintenance. People may be less willing to pay for garden maintenance than lawn mowing because lawns are more common and often much larger than gardens. In addition, those who choose to have gardens often enjoy caring for their plants.

Although few respondents were interested in paying for yard upkeep, just over 50% said they would be willing to pay for landscape design ideas and just over 60% said they would be willing to pay for landscape installation if they were to move to a newly occupied dwelling. For landscape installation, most respondents said they would be willing to pay between $1401-$7000, whereas most of those willing to pay for design would not exceed $1400. Overall, respondents' willingness to invest in outdoor improvements suggests that they value their yards.

Residents may enjoy owning land because, as they design their landscape, they consider how easily they can care for their yards. For instance, when asked to choose their favourite landscape style, greater proportions of respondents focused on how practical a space would be to maintain than on how expensive it would be to maintain. Unsurprisingly, the practicality of a landscape was important most often to those over age 56 and to retired individuals. That being said, only a slightly smaller portion of employed compared to retired respondents focused on practicality, likely because employed individuals tend to have time constraints. Perhaps due to a decrease in income, retired respondents were also slightly more likely to dislike a landscape because it looked expensive to maintain, compared to employed respondents. While respondents did not generally choose their favourite landscape based on how cheap it looked to maintain, those in lower income groups tended to dislike a landscape if it looked too expensive to maintain.

On the whole, it seems that residents are willing to pay for yard services when needed, but that most households enjoy yard work and are not overwhelmed by maintenance, so are willing to complete most tasks themselves.

6.4.4 Appealing and Unappealing Private Yard Landscapes

Residents may enjoy having a yard because they have designed it according to the ways they like to use it, and based on the amount of maintenance they are willing to accept. To suggest ways of designing both private and public outdoor spaces to appeal to target markets, this section describes favourable (and less favourable) landscape styles, and relates preferences to resident subgroups, where appropriate.

Respondents were asked to rate how much they liked six different yard landscape styles (Appendix B), including "lawn and foundation plantings" (lawn with some shrubs and flowers that line the house); "flower gardens" (flowers and shrubs, either with or without lawn); "natural gardens" (leafy plants and some flowers typical of forest understory, with little or no lawn); "xeriscapes" (small rocks interspersed with some small shrubs, flowers, or lawn); "stone and ground cover" (large boulders and mulch with small trees and shrubs); and "leafy perennials" (combination of bushes, flowers, small trees, lawn, and/or mulch or small rocks). Of all the landscape styles, leafy perennials were generally liked by the largest percentage of respondents, and were very rarely disliked. Meanwhile, lawn and foundation plantings and flower gardens were more often *strongly* liked than leafy perennials, and were the top two most favourite landscapes. Such results are aligned with a recent study conducted by the Husqvarna Group (2013), in which yards with flowers and "well-trimmed" lawns were the top two most impressive garden features for Canadians, rated as impressive by 64% and 57% of respondents, respectively. Furthermore, although leafy perennials were most commonly liked by thesis respondents, and would likely attract the greatest number of homebuyers, they were not as common in respondents' yards as were lawns, and were slightly less common than flower gardens. Lawn and flower gardens were perhaps more common since they can be incorporated into a yard fairly easily, whereas leafy perennials may require more landscape design. Meanwhile, xeriscape was clearly the most disliked landscape style, and very few respondents had incorporated such landscapes into their current yard.

Based on the reasons why respondents chose their most and least favourite landscapes, suggestions can be made about designing both private and public outdoor spaces to appeal to target markets. Although participants used their yards for various activities, a greater percentage of respondents

chose their favourite landscapes for being practical to maintain, environmentally acceptable, and aesthetically pleasing, than the percentage who chose them based on how enjoyable they would be for their households to use. If the research by Arnold and Lang (2007) holds true for Kitchener and Waterloo households, residents may be more concerned with yard design and neatness than functionality since they spend more time viewing than using their yards. Nevertheless, if a landscape specifically looked like it could not be enjoyed, it was a reason to dislike it. This was particularly the case for xeriscapes, but some people also disliked natural gardens, flower gardens, and lawns for the same reason. Despite evidence that respondents cared about yard appearance, being acceptable to the neighbours was not a major reason to favour a landscape, nor was being unacceptable to neighbours a major reason to dislike a landscape. Furthermore, residents seemed to value the connection to nature that yards provide, as many favoured landscapes for being environmentally acceptable and attractive to wildlife. Natural gardens, flower gardens, and leafy perennials were most often favoured for such reasons, while fewer said this about lawn and foundation plantings. Being practical to maintain was the major reason why respondents favoured lawn and foundation plantings. Another major reason residents favoured a landscape was for its aesthetics (i.e. the colours and shapes of the plantings); however, it was a less common reason to dislike a landscape. Unsurprisingly, many respondents favoured flower gardens for such aesthetics, but shapes of plantings were also common reasons why respondents favoured leafy perennials and stone and ground cover landscapes.

When subgroups were compared, couples with children (with at least one child 18 years or younger) and couples without children did not significantly differ in their landscape preferences. Respondents without children liked (and disliked) landscapes for reasons similar to those of the older age groups, focusing on required maintenance and how acceptable a landscape would be to neighbours and the environment. Furthermore, as expected, findings for older age groups were generally aligned with retired respondents. The only significant difference in how age groups rated landscape styles pertained to natural gardens, which were disliked more often by those over 65. Natural gardens were often disliked for looking impractical to maintain, which may explain why they were less appealing to the oldest age group. Moreover, respondents in lower income brackets and age groups over age 56 were more likely to dislike landscapes for being expensive to maintain.

On the whole, it appears that residents generally prefer colourful vegetation and natural elements more than the rocks and boulders associated with xeriscapes and stone and groundcover. Interestingly, compared to lawn and foundation plantings, flower gardens were more often favoured

because households believed they could enjoy using the space. This is surprising given that there is generally less space for activities in flower gardens than on lawns. Thus, perhaps such households enjoy being in the natural environment of flower gardens, or enjoy the act of gardening itself. Furthermore, while various studies refer to the importance of lawn landscapes (see Blaine et al., 2012; Feagan & Ripmeester, 1999; Henderson et al., 1998), findings of this study suggest that residents quite often prefer alternative designs. Many studies also discuss how neighbourhood opinions and landscaping trends can influence how a household designs their yard. While this study could not prove or disprove such an impact, neighbourhood acceptability was not a major reason why respondents liked a landscape most or least. Moreover, despite the 'wild' appearance of natural landscapes, less than 30% of the respondents disliked natural gardens, which were more often disliked for being impractical to maintain or not enjoyable to use than for being unattractive or unacceptable to neighbours. Nassauer et al. (2009) found that yard landscaping norms within a neighbourhood were influential on how homeowners would prefer to design their yards if they were to move to such a neighbourhood. Considering that most respondents to this thesis study supported people "doing their own thing" in front yards, believed that yards did not need to conform to the majority, and were not opposed to natural gardens; many neighbourhoods within Kitchener and Waterloo may be ideal environments in which to affect landscape change on a neighbourhood level, as suggested by Nassauer and her colleagues (2009). Such a shift has already been occurring for over two decades, as the City of Waterloo was a leader in promoting the use of natural vegetation in commercial, industrial, and institutional landscape designs since 1989 (Evergreen, 2001), and both Waterloo and Kitchener currently have initiatives to increase the amount of naturalization throughout the cities, such as in parks and storm water management areas (City of Kitchener, 2011; City of Waterloo, 2012c). Therefore, it is likely that naturalized landscapes would also be appropriate in common areas surrounding high-density residences. Furthermore, many respondents agreed that they like trees in a yard. Trees may be important features because they increase privacy, provide shade, attract animals, and add to the feeling of being in nature. Although trees may not be easily incorporated into small yards, including trees within community green spaces (such as those within townhouse complexes) may increase desirability of neighbourhoods. Such a thought is expanded upon in the next section.

Overall, if a homeowner wanted to update the outside of their home to make it more appealing on the real estate market, it would be best to include an area of lawn in order to reduce maintenance requirements, but also to include a section with colourful flowers, plants with interesting shapes, and

a tree or two if possible. Similarly, high-density residences would likely be more attractive if they included a mixture of landscape designs in their common green spaces. For instance, condominiums may have grassy areas for recreational space, groomed flower gardens around the building for aesthetic appeal, and be surrounded by forested or naturalized garden landscapes.

6.4.5 Objective 3 Conclusion:

It is clear that most residents value private yards for many reasons. Private outdoor spaces provide places to relax, socialize and connect with nature, and provide an environment that is pleasant, which can make maintenance enjoyable. Moreover, with the exception of xeriscapes, residents are generally open to most yard landscape designs, which means a variety of designs may be used in common areas of high-density residences, provided they are generally neat in appearance. Despite the positive aspects of yards, about 40% of respondents said they may live in a home with no yard in the future, likely recognizing that aging may leave them physically or financially incapable of maintaining such space. Therefore, it is important to understand whether public outdoor space is also valued by residents and whether access to such space can increase the appeal of high-density residences, particularly for the aging population.

6.5 The Value and Attractive Features of Public Outdoor Spaces

As landscapes become intensified, space for private yards in new developments will be scarce, and open space across cities as a whole may decrease due to infill development. Consequently, public green space may become more valuable to residents living in both high- and low-density environments. Therefore, this section investigates if, and how, public green space has been influential in encouraging residents to live in their current homes, and whether it may encourage them to live in high-density developments in the future. The associated objective is:

Objective 4: To investigate if, and how, residents value public outdoor space and to determine key features of public outdoor spaces that may appeal to potential homebuyers.

Such information can help planners push for the preservation of natural lands that may otherwise be slotted for construction, and perhaps indicate the need for additional resources to revitalize green spaces already in existence.

Results of the thesis study were generally aligned with those of the 2013 Husqvarna *Global Green Space Report* described in the literature review, in that respondents look to live in areas where they can easily enjoy nature and the outdoors. Two of the top most important or very important attributes

that influenced respondents to live in their current homes included neighbourhood appearance and spaciousness of the neighbourhood. Elements that contribute to perceived spaciousness may include the amount of yard space between neighbouring houses, size of boulevards, road width, and size and quantity of public open spaces in the community. In addition, being close to parks or recreation, or to natural areas, were considered important or very important to 57% and 52% of the respondents, respectively. Such portions were slightly greater than the amount who said being close to work or being close to shopping areas was important or very important. Having a park nearby was also generally more important than being close to the city centre for those who would consider living without a yard or with only a small yard in the future, or had done so in the past. Thus, like participants in the Husqvarna study, some respondents placed access to green space above access to work and amenities. This finding is somewhat intuitive, as it is evident in suburbs of the GTA where residents live with private yards and access to public green space but often commute to cities, such as Toronto, for work and entertainment. Furthermore, more than 20% of respondents indicated that the ability to garden in either a community garden or in a community member's yard would encourage them to live in a home with no yard.

6.5.1 Appealing Landscape Designs for Public Outdoor Spaces

According to this study, most respondents agreed that they like to see a variety of kinds of trees in their neighbourhood, and most agreed that they like having woodlots in their neighbourhood. Furthermore, respondents generally agreed that green spaces should be connected by corridors, and that parks need wild areas with long grass, trees and shrubs. Such a finding emphasizes that residents tend to value natural environments, and also suggests that residents may be interested in supporting initiatives to preserve wild landscapes and incorporate naturalized vegetation into public open spaces. Conversely, about half of the respondents agreed that parks need groomed lawns and gardens, so it is likely that residents enjoy having some wild and some groomed parkland. In addition, it was evident that residents like to *use* parks because over 60% indicated the need for landscaped play areas in parks, and just less than 50% indicated that they like having picnics in parks. Consequently, landscape designs should be determined based on the unique functions of each individual green space. Conclusions are based on very broad statements, so public engagement in park design may be useful to design effective spaces.

6.5.2 Objective 4 Conclusion:

Based on findings from this thesis study and other research available publicly and throughout the literature, it can be concluded that public green spaces are enjoyed for their functionality as well as their inherent values including their scenery, peaceful environment, and ability to provide a connection to nature. To create ideal outdoor spaces, trees should be dispersed throughout neighbourhoods, and community forests should be created or preserved. Moreover, parks should have both wild and groomed areas, and be designed according to their functions. Access to such areas should be facilitated by incorporating pathways into naturalized corridors that connect green spaces.

6.6 Sway Factors to Encourage High-Density Living

With an understanding of high- and low-density dwelling preferences and how residents value and enjoy private and public outdoor space, this final section discusses how other property and neighbourhood characteristics factor into homebuyer decision-making, under the objective:

Objective 5: To identify other property and neighbourhood attributes that may act as "sway factors" to encourage homebuyers to choose a property in a high-density environment.

Using such information, residential developments and communities can be developed to include attractive features and amenities, which may act as "sway factors" to encourage homebuyers who have interest in both houses and condominiums to choose the high-density option.

When respondents chose their current homes, the cost and value of the property was the most important attribute, as 45% said it was *very* important and 40% said it was important. In addition, just over 50% considered the likelihood of making a profit when selling the property an important or very important factor. Therefore, housing affordability can be a major influence in directing the real estate market towards high-density homes. Furthermore, the way a home is decorated may impact decision-making, as the attractiveness of the residence interior was important or very important to 66% of respondents when they chose their current home. In addition, the general interest in condominiums and lack of desire for apartment buildings suggests that ownership is of key importance for those currently living in homes with private yards. Nonetheless, it is possible that if more respondents had been renting their homes, interest in apartments may have been evident.

Moreover, neighbourhood features that respondents commonly listed as important when they chose their homes included safety, spaciousness and appearance of the neighbourhood, costs and values of

homes, and closeness to quality schools. Not surprisingly, couples with children generally placed higher importance on school quality and location than did those without children. That being said, about half of those without children also placed importance on school location and quality, perhaps because such residents were planning to have children. Supporting the idea that school is most important to homeowners of childbearing age is the finding that school quality and location were less important for those over the age of 40 when they bought their home. Since school quality was slightly more important than living close to schools, it is important that schools meet the expectations of community members. Interestingly, the importance of accessing public transit and being close to hospitals did not significantly vary with age; however, results were based on how old respondents were when they moved to their homes, so the oldest age group investigated was age 40-65.

It must be remembered that this study focused on residents already living in homes with yards. Since increased accessibility – either by walking or through public transit – is often a key feature of high-density residential neighbourhoods, it is expected that people looking to downsize in the future may place greater emphasis on accessibility than they had when they chose their current homes. For instance, the MKI (2010) study found that young (age 18-39) current and potential residents of reurbanization projects gave distance to work high importance. Meanwhile, many respondents in the thesis sample group were living in suburban neighbourhoods and would most likely have already adjusted to a commute or made a decision that location to employment was not of top importance. Moreover, by surveying residents in homes with yards, this study examined people with a predisposition to want access to outdoor space. Those homeowners or renters who have never wanted a home with a yard and are content to live in compact homes were not captured in this study, so inferences about the real estate market are meant only to describe trends of those already accustomed to living in low-density dwellings.

6.6.1 Objective 5 Conclusion:

Although over 90% of respondents said that property size was at least somewhat important in their decision to choose their current home, its level of importance was very similar to many of the other property and neighbourhood characteristics mentioned throughout this discussion. Therefore, to encourage residents to move to high-density environments, dwellings of interest should be affordable, close to quality schools, and located in safe neighbourhoods with access to public green spaces.

6.7 Conclusion

If study results are relatable to the households of Kitchener and Waterloo who are currently living in homes with private yards, the aging population represents the target market for high-density living. Nevertheless, compact dwellings with small yards or balconies and access to public outdoor space will likely be more valuable than those without such features, and may encourage residents who have preference for both high- and low-density residences to choose the high-density option. To increase appeal, landscapes should be designed with colourful vegetation, trees, and perhaps natural wild growth, provided neatness is maintained. It is also important that planners ensure homes are affordable and are located in safe neighbourhoods with good-quality schools and spacious landscapes. Overall, it is vital that the importance of connecting residents to nature is not overlooked as landscapes are intensified, and that effort goes into designing landscapes to provide the functionality and serenity associated with private yards. To encourage planners, developers, and landscape architects to utilize the results of this study, the final chapter displays major findings in a summary table and offers recommendations.

Chapter 7: Conclusions and Recommendations

7.1 Introduction

This chapter summarizes the findings of the thesis, presents recommendations based on the findings, and provides suggestions for future research.

7.2 Summary

Below is a summary table that outlines the key findings of study research questions. Since subgroup results have been discussed in detail, the table generally highlights findings as they pertain to the sample as a whole. As indicated in the analysis chapter, respondent numbers were low for many subgroups (such as household income groups). Therefore, this table is meant to give an indication of trends that may exist in the Kitchener-Waterloo population, but further analysis may be conducted for subgroups of interest.

Table 37. Research questions and summary of findings.

Research Question	Summary of Findings
1. To determine if residents currently living in homes with private yards may move to more compact dwellings and to describe the types of residents who are most, and least, likely to do so.	
What are the current residence and yard sizes of the total sample?	• Medium-sized home • Single-detached house • Medium-large yard
How would resident subgroups differ in their residence and yard size preferences if they were to move to another home (considering their current household size, finances, health, etc.)? *(Low Density was defined mainly as medium or large houses and medium, large, or very large yards; High Density defined mainly as small houses or small to medium condominiums and small yards)*	**Interest in Low Density:** • Couples with children under age 18 • Age group 25-45 • Household income $75,000-99,999 **Interest in Low and High Density:** • Couples without children • Age group 46-55 and 56-65 • Employed respondents • Household income $50,000-74,999; $100,000-149,999; and $150,000-249,999 **Interest in High Density:** • Age group 66 and older • Retired respondents

Research Question	Summary of Findings
What proportions of the total sample are likely to move in 0-5 years; 6-10 years; and 11-25 years?	• 0-5 years: 20% • 6-10 years: 25% • 11-25 years: 10% • Indefinitely: 26% • Unsure: 19%
2. To discuss whether the proportion of residents who may move from low-density to high-density dwellings is likely to support an ongoing demand for low-density dwellings.	
What are the potential trends in upsizing and downsizing property sizes, according to the size of homes and yards residents currently have and the sizes they would have preference for if they were to move?	Residents in small homes • Plan to move sooner than those in medium and large homes; small homes likely to have high turnover • Most prefer to upsize to medium home • Some preference for small houses or small to medium condominiums Residents in medium homes • About a quarter plan to stay in their homes indefinitely • Most plan to move within 10 years • Most prefer another medium home Residents in large homes • Plan to stay longer than those in smaller homes • Most prefer large or medium house Residents with small yards • would prefer a medium or large yard Residents with medium yards • would prefer another medium or large yard Residents with large yards • had mixed preferences, with a tendency to prefer medium or large yards Residents with very large yards • would downsize to a large yard
When do residents living in each home size plan to move?	**<u>Small home:</u>** • 0-5 years: 31% • 6-10 years:25% • 11-25 years:6% • Indefinitely: 6% • Unsure: 31%

Research Question	Summary of Findings
	<u>Medium home:</u> • 0-5 years: 19% • 6-10 years: 24% • 11-25 years: 9% • Indefinitely: 26% • Unsure: 21% **<u>Large home:</u>** • 0-5 years: 17% • 6-10 years: 27% • 11-25 years: 20% • Indefinitely: 33% • Unsure: 3%
3. To investigate if, and how, residents value private outdoor space and to determine key features of private outdoor spaces that may appeal to potential homebuyers.	
How important were yard characteristics when residents chose their current home? *(percentage who said the attribute was "important + very important")*	• Privacy of property: 63% • Size of property: 62% • Attractive appearance of exterior: 61% • Availability of parking: 61% • Neat appearance of yard and property: 54% • Attractiveness of yard: 52% • Opportunity for other gardens: 51% • Ease of maintaining the property: 49% • Number or appearance of trees on property: 47% • Opportunity for a food garden: 27% • Opportunity to view wildlife on property: 19%
What are the important ways that residents use their yards? *(all uses listed were "important + very important" to >50% of respondents)*	**<u>Front Yards:</u>** • Viewing streets • Gardening • Lawn mowing • Car parking • Looking at view • Washing car **<u>Back Yards:</u>** • Relaxing • Outdoor dining

Research Question	Summary of Findings
	• Reading • Gardening • Family time • Parties, etc. • Lawn mowing • Looking at view • Playspace for children • Viewing wildlife
How important is yard appearance? *(percentage who "agreed + strongly agreed" to statements given)*	• I like trees in a yard: 92% • A yard has to have a lawn: 62% • A lawn is mainly to look at, not to use: 5% • Having a tidy yard is important: 76% • People should be able to 'do their own thing' in landscaping *front yards*: 52% • People should be able to 'do their own thing' in landscaping *backyards*: 67% • If a yard looked different from most yards in respondents neighbourhood, only 12% said it should conform to the majority
How much time and money are residents willing to devote to their current yards?	• Residents generally *willing* to spend more time than they *actually* spend on yard maintenance • 58% were unwilling to pay for yard maintenance companies • 66% would pay for landscape installation • 56% would pay for landscape design
What types of yard landscapes generally appeal, and do not appeal, to residents, and why?	**<u>Landscapes liked by >50% of total sample:</u>** • Leafy perennials • Flower gardens • Lawn and foundation plantings • Natural gardens **<u>Landscape disliked by >50% of total sample:</u>** • Xeriscapes **<u>Most appealing landscape characteristics:</u>** • Looks practical to maintain • Environmentally acceptable • Aesthetically pleasing (nice planting shapes and colours)

Research Question	Summary of Findings
	<u>Most unappealing landscape characteristics:</u> • Looks impractical to maintain • Household could not enjoy using the space
4. To investigate if, and how, residents value public outdoor space and to determine key features of public outdoor spaces that may appeal to potential homebuyers.	
What do residents like to have in public outdoor spaces? *(percentage who "agreed + strongly agreed" to statements given)*	• Variety of trees in neighbourhood: 88% • Green spaces, parks, and woodlots linked by corridors: 78% • Woodlots in neighbourhood: 73% • Parks with landscaped play areas: 66% • Parks with wild areas (grass, shrubs, trees): 66% • Parks with groomed lawns and gardens: 50%
How important was public outdoor space when residents chose their current home?	• Neighbourhood appearance: 71% • Spaciousness of neighbourhood: 63% • Close to parks or recreation: 57% • Close to natural areas: 52% • Opportunities to view wildlife: 32%
How important would public outdoor space be in encouraging residents to live with no private yard or a small private yard in the future? *(percentage who said the attribute was "important + very important")*	**<u>No yard:</u>** • Nice view from windows: 87% • Nearby park: 79% • Field or playspace for children is nearby:42% • Can garden in community garden: 33% • Nearby community pool: 25% • Can garden in community member's yard: 22% **<u>Small yard:</u>** • Nice view from yard: 79% • Nearby park: 69% • Field or playspace for children is nearby: 40% • Nearby community pool: 24% • Can garden in community garden: 21% • Can garden in community member's yard: 14%

Research Question	Summary of Findings
5. To identify other property and neighbourhood attributes that may act as "sway factors" to encourage homebuyers to choose a property in a high-density environment.	
What property and neighbourhood attributes encouraged residents to choose their current homes? *(all factors listed were "important + very important" to >50% of respondents)*	**Property attributes:** • Cost and value of property • Attractiveness of residence interior • Privacy of property • Size of property • Attractiveness of residence exterior • Availability of parking • Neat appearance of yard and property • Attractiveness of yard • Likelihood of making a profit when the property is sold • Opportunity for gardens (other than food gardens) **Neighbourhood attributes:** • Safety of neighbourhood • Housing costs & value in neighbourhood • Neighbourhood appearance • Spaciousness of neighbourhood • School quality • Close to schools • Close to parks or recreation • Close to natural areas
What characteristics do residents suggest may encourage them to live with a small yard or no yard in the future? *(all factors listed were "important + very important" to >50% of respondents)*	**No yard:** • Front porch or balcony • Nice view from windows • Nearby park • Live within walking distance to city centre **Small yard:** • Privacy between backyard neighbours • Nice view from yard • Front porch • Nearby park

7.3 General Recommendations

The findings from this study have implications for planners, developers, realtors, and government agencies. Examples of how this research can be put to use is provided below with a series of recommendations related to land use, development and landscape design.

<u>Recommendation 1</u>: Aim to restrict Region land budget to 85 hectares (versus expanding to 1053 hectares)

Context: Findings from this thesis indicate potential for the aging population to downsize. Although only small percentages of the older and retired residents were living in small homes at the time of the study, they showed the greatest interest in downsizing to condominiums or small houses. Such a movement would open up medium and large homes to younger generations. The thesis findings are generally inconsistent with arguments presented during the OMB discussion on Regional land budget expansion. Within such discussions, aging in place was defined as "a person's choice to remain in his or her home, and neighbourhood, well into their later years of life" (OMB, 2013, p.14). Based mainly on past trends, developers (referred to as the "Landowners" by the OMB) argued that aging in place would continue, whereas the Region took the stance that lifestyles would change in accordance with the growth plan, with more seniors moving from their current homes into apartment-style dwellings.

Two publications were referenced by the developers, with the first from a CMHC February 2008 report, which was used to highlight a survey result that "at least 85% of those over 55 said that they planned to remain in their present home for as long as possible even if there were changes to their health" (p. 2; as cited in OMB 2013, p.14). The results of this thesis send a slightly different message, although the dataset and categories from this thesis are not directly comparable to the study discussed by the CMHC. Specifically, of the thesis respondents, only 30% of those over the age of 55 planned to stay in their current homes indefinitely, while 24% planned to move within 5 years and another 24% planned to move within 6 to 10 years. The second document referred to by the developers was from the Canadian Housing Observer, 2011, which noted that seniors over 65 moved from their homes at significantly lower rates than non-seniors between 2001 and 2006. More specifically, the report stated that mobility rates for non-seniors was 44%, while "about 20% of households with maintainers aged 65 and over moved in the five years preceding the 2006 Census. Of households with maintainers aged 75 and over, only about 17% moved between 2001 and 2006" (as cited in OMB 2013, p.14). Although this thesis study investigated slightly different age groups and looked to the future rather than the past, the percentages of respondents over age 55 (i.e. age

group 56-65 + age group 66 and older) who were planning to move in each time interval (i.e. 0-5, 6-10, and 11-25 years) were similar to the percentages of the group between ages 25-45 planning to move in each timeframe.

The thesis results are based on what residents *plan* or *prefer* to do, whereas the results presented to the OMB were based on *historical record*. While self-reported plans for the future may not always come to fruition; basing future decisions on past events can also be misleading, particularly in the context of the Growth Plan, which was specifically designed to change trends going forward. Thus, based on thesis findings and the principles of planning, evidence for the need to expand the land budget is lacking. Additional studies may be required to confirm trends for aging in place, with a greater focus on aging baby boomers than on the population of seniors existing today or in the past.

Involved agencies: Ontario Municipal Board [OMB], Region of Waterloo, Developers in the Region

Recommendation 2: **Market high-density dwellings to the aging population**

Context: To encourage older residents to downsize, high density dwellings should be marketed as having the comforts of single-detached homes. In the past decade, the Government of Ontario has implemented initiatives that support seniors aging at home, including the *Seniors Strategy* (Sinha, 2013). Such directives encourage seniors to remain in their single-detached homes. Therefore, other incentives should also be used to encourage residents to downsize to condominiums as they age, and make their condominium the home at which they "age in place". In Kitchener-Waterloo, such incentives may come from the residence location itself, such as being near green space (parks) and the city centre. Access to LRT and other public transit may also encourage older residents to downsize, but further research is needed to determine the impact of transit. Another potential incentive could come from additional access to healthcare in high-density buildings (for instance, mixed-use development may place apartments above pharmacies). Furthermore, wheelchair accessibility may be important to consider when designing homes for the aging population. Such ideas are beyond the scope of this thesis, but it is important that the goals of planners, developers, and government agencies align to encourage the aging population to downsize, thereby allowing younger populations into the existing low-density housing market.

Involved agencies: Developers, Planners, Government of Ontario, Region of Waterloo, City of Waterloo, City of Kitchener

<u>Recommendation 3</u>: To encourage residents to move from low-density to high-density dwellings, accommodate common yard uses in private and public outdoor spaces of high-density residences.

Context: Many of the ways that respondents commonly use their yards can be accommodated by apartment-style residences if:

- barriers (such as trees) are incorporated outside balconies to help increase privacy and reduce noise for a relaxing atmosphere
- balconies and small yards are designed to provide maximum privacy
- views are relatively unobstructed and are pleasing for residents
- balconies are adequately large or common outdoor areas (such as terraces) can be rented for outside dining and social events
- parking is available (and potentially includes washing stations to clean vehicles)
- gardening is accommodated (since community gardens would not be very influential in encouraging residents to live in high-density dwellings, it may be more important to have access to a balcony for flower pots, but this point needs further investigation)

Involved agencies: Developers

<u>Recommendation 4:</u> Preserve urban forests, neighbourhood trees, parks, and natural landscapes.

Context: Being close to parks and natural areas attracted residents to their homes in the past, and would encourage them to live in a home without a yard or a small yard.

According to the thesis, residents like to have:

- a variety of trees in their neighbourhood
- woodlots in their neighbourhood
- green spaces, parks, and woodlots linked by corridors
- parks with landscaped play areas, wild areas, and groomed lawns and gardens

Furthermore, considering the importance residents placed on having nice views, preserving natural landscapes around residences may also increase appeal, even if they are relatively unusable spaces. Thus, as Jim (2008) suggests, important urban forests and natural areas should be identified and preserved as intensification occurs. A method for preserving trees in the Southern Ontario urban fringe can be found by Dorney et al. (1984). In addition, planting sites should be increased along urban roads, and incentives may be provided to encourage developers to introduce trees on the streets (Jim, 2008).

Involved agencies: Developers, Region of Waterloo, City of Kitchener, City of Waterloo, Ontario Government (re: Planning Act)

Recommendation 5: To increase the appeal of a low- or high-density homes, ensure outdoor space is kept neat, is environmentally acceptable, is practical to maintain (for private yards), is aesthetically pleasing, and incorporates landscape elements such as perennials, flowers, lawns, and natural gardens.

Context: Based on the results of this study, landscape designs that would encourage homebuyers include:

- Leafy perennials
- Flower gardens
- Lawn and foundation plantings
- Natural gardens
- Trees on property

In addition, including features, such as bird feeders, to attract wildlife may increase appeal. Such elements may be incorporated into private yards or common areas of high-density dwellings.

Involved agencies: Developers, landscape architects, homeowners, Real Estate agents looking to increase the marketability of a home, City of Kitchener, City of Waterloo

7.4 Challenges, Limitations and Suggestions for Future Research

From a research standpoint, the biggest challenge of this thesis was to increase response rates. Unfortunately, subgroups of individuals living alone, single parent households, household income groups, and resident cultural backgrounds were generally too small for analysis. Some respondents

indicated that questionnaire length was a major deterrent to completing the survey, so breaking down complex surveys to be completed over more than one time interval may help increase response rates. In addition, this research emphasizes the importance of having mandatory surveys, so it is recommended that the extended Canadian Census become mandatory once again. Using mail or web-based surveys did not seem to produce large differences in response rates, but choosing to send a paper copy as a final means of encouraging participation was a relatively successful procedure.

A lesson to be learned from this survey is that when estimating yard sizes, respondents are either more likely to respond according to their own perceptions, or have difficulty using simple measurement tools (i.e. the table provided in the survey to estimate yard sizes based on the number of single car garages imagined to fit in one's yard). Therefore, it is suggested that estimates be done using GIS or another concrete measurement tool, or that additional tools be provided for respondents to more accurately provide estimates (such as example photographs of each yard size, with yard elements such as sheds or play sets to further establish scale). Furthermore, it is important that researchers base their size categories on actual distributions to ensure results are meaningful, and hopefully help align measurement tools with respondent perceptions.

Many market trends discussed in this thesis were based on respondent preferences or intentions for the future; however, there was no way of knowing how respondents would actually behave. Therefore, longitudinal studies could help track intentions and actual behavior, and could provide a means to explore how residents alter their residence preferences as they age, as society changes, and as the Growth Plan is implemented.

Recommendations for future research are to:

- Investigate tradeoffs on how much indoor space homebuyers would sacrifice to gain outdoor space and how much front yard area they would sacrifice to increase backyard area
- Determine the relationship between residence market value and the area of private and public green space nearby
- Conduct studies with more detail on dwelling and yard sizes and with more detail on building structure, such as low-rise, mid-rise, or high-rise condominiums
- Focus on preferences of the aging population (particularly baby boomers) and what design elements and amenities may encourage them to downsize
- Investigate populations who are not yet homeowners in Kitchener-Waterloo (i.e. first-time homebuyers, students, young workers, immigrants)

- Monitor changes in residential preferences using longitudinal studies as references as Growth Plan initiatives are realized (e.g. improved transit through LRT) and are challenged (e.g. regarding the OMB decision)
- Encourage collaboration across research teams to create comprehensive models of market trends

7.5 Conclusion

To support the intensification and density targets for Kitchener and Waterloo, planners and developers may focus on ways to encourage the aging population to move from their low-density, medium-sized houses to higher-density condominiums or townhouses. It is clear that offering at least some private outdoor space (balconies or small yards) and easy access to public green space is of utmost value if residents living in homes with yards are to accept living in more compact environments. Consequently, it is important that green space preservation be considered as development occurs, and that an increase in greenery be considered for areas lacking natural elements. The desire for green space may mean considering ways to increase density outside the urban core. Opportunities to construct townhouse complexes within established neighbourhoods may be investigated as ways of increasing density while providing some ground-level options for those hesitant to live without yard space. Furthermore, since respondents appeared to value the natural aspects of their private yards (e.g. valuing trees and wildlife; enjoying views and the relaxing atmosphere of yards; having greater preference for landscapes with natural elements than those with rocky designs; and having some preference for natural gardens), it is important that community green space and areas surrounding balconies are designed to replicate yard atmospheres rather than simply offering a large area of lawn. On the whole, a conundrum exists since residents want access to green space, but it is unclear whether they would be willing to pay a high price for such space as land value increases, especially in core areas targeted for intensification. Therefore, follow up studies that explore tradeoffs between the amount of private and public green space available and willingness to pay is vital research to conduct.

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Appendix A: Sample Size Calculations

For the following calculations, "yard-dwellings" include single-detached houses + semi-detached houses + townhouses/row houses + other single-attached houses. Other dwelling categories not considered "yard-dwellings" (and therefore omitted from the calculations) included apartment buildings, movable dwellings, and duplexes/triplexes. Values were based on Statistics Canada 2006 Census "Structural Type of Dwelling" data and Annual Building Reports for the Cities of Kitchener and Waterloo.

Both the standard compound annual growth rate (CAGR) and the percent change calculations were used to determine the growth rate of "yard-dwellings" in Kitchener and Waterloo. The final increases in survey numbers for 2012 were based on the averages between these two calculation methods.

General Formulas:

Compound annual growth rate (CAGR):

Ending Value = Beginning Value $(1 + r)^n$ r = annual growth rate n = number of years

Percent growth:

% growth = (ending value – beginning value) / (beginning value) *100

% growth per year = % growth / number of years

% growth since the 2004 survey = (% growth per year)*(2012-2004)

Increase in surveys = (2004 survey quantity)*(% growth since the 2004 survey)/100

Number of additional surveys for 2012 target sample:

Additional surveys = (CAGR increase in surveys) + (% Growth increase in surveys)/2

Kitchener:

Total "yard-dwellings" from 2006 census "Structural Type of Dwelling" tables = 52745

Increase in "yard-dwellings" from mid-2006 to December 2011 Building Reports = 5420

Estimated 2011 sum total of "yard-dwellings" ≈ 52745+5420 ≈ 58165

CAGR Calculations:

Annual growth rate of "yard dwellings" = $[5.5\sqrt{(58{,}165/52{,}745)}] - 1 \approx 0.018$ yard dwellings/year

(Note: n = 5.5 because it represents the difference in total "yard-dwellings" from Mid-2006 to December 2011)

2012 survey total = $634\ (1+0.018)^{8} \approx 731$ surveys

Note: n = 8 because it represents difference from 2004 (previous survey year) to 2012 (current survey year)

Increase in surveys = 731-634 = 97

Percent growth calculations:

% growth from mid-2006 to December 2011= [(58165-52745)/52745] *100 = 10.27585553%

% growth per year = 10.27585553 / (2012-2006.5) = 1.868337369 %

% growth since the 2004 survey = (1.868337369)*(2012-2004) = 0.14946699 %

Increase in surveys = (0.14946699)*(634) ≈ 95

Number of additional surveys for 2012 target sample:

Additional surveys = (97 + 95)/2 = **96**

Waterloo:

Total "yard-dwellings" from 2006 census "Structural Type of Dwelling" tables = 27230

Increase in "yard-dwellings" from mid-2006 to December 2011 Building Reports = 1053

Estimated 2011 sum total of "yard-dwellings" ≈ 27230+1053 ≈ 28283

CAGR calculations:

Annual growth rate of "yard dwellings"= $[5.5\sqrt{(28{,}283/27{,}230)}] - 1 \approx 0.0069$ yard dwellings/year

(Note: n = 5.5 because it represents the difference in total "yard-dwellings" from Mid-2006 to December 2011)

2012 survey total = $513\ (1+0.0069)^{8} \approx 542$ surveys

Note: n = 8 because it represents difference from 2004 (previous survey year) to 2012 (current survey year)

Increase in surveys = 542-513 = 29

Percent growth calculations:

% growth from mid-2006 to December 2011= [(28283-27230)/28283] *100 = 3.867058391%

% growth per year **=** 3.867058391 / (2012-2006.5) = 0.703101526 %

% growth since the 2004 survey = (0.703101526)*(2012-2004) = 0.056248122 %

Increase in surveys = (0.056248122)*(513) ≈ 29

Number of additional surveys for 2012 target sample:

Additional surveys = (29+29)/2 = **29**

Appendix B: Statistical Comparisons

The following tables summarize the results of chi square tests that were run to compare responses of various subgroups derived from the survey sample. Unless otherwise noted, all likert scales were reduced from 5-point scales to 3-point scales to increase the expected values for chi square analysis. For example, "strongly disagree" (1), "disagree" (2), "neutral" (3), "agree" (4), "strongly agree" (5), would have been reduced to "disagree/strongly disagree" (responses 1 + 2), "neutral" (3), "agree/strongly agree" (responses 4+5). Chi square results were not used within the thesis if more than 20% of the expected values in a contingency table were below five, or if any were below one. Thus, combining the scale values, a greater number of questions were appropriate for chi square analysis. Significant outcomes of chi square tests were based on α=0.05.

Comparisons: Couples with and without children

Table 38. Comparisons between couples with and without children, on questions of interest.

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
Compare **Q. 52** couples with and without children to **Q 8.** How much longer do you expect to live in your current home? Couples with at least one child under the age of 18: (*n*=53) Couples without children (*n*=80)	133	4	3.1359	0.5354	NO
Compare **Q 47:** Couple with children versus couple without children to **Q 9:** How important was each of the following in your decision to move to the neighbourhood where you live now? Couples with children (of all ages) *n*=74 Couples without children *n*=73					
9. a) appearance of the neighbourhood	147	2	0.6408	0.7259	NO *unusable because >20% of the expected values were <5
9. b) community size	147	2	2.7646	0.251	NO
9. c) people nearby are similar to my household	147	2	2.1103	0.3481	NO

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
9. d) familiarity with neighbourhood	147	2	0.9802	0.6125	NO
9.e) openness/ spaciousness of neighbourhood	147	2	2.458	0.2926	NO
9.f) safety of the neighbourhood	147	2	0.4432	0.8012	NO *unusable because >20% of the expected values were <5
9.g) quality of schools in decision to move to neighbourhood	147	2	12.5322	0.0019	**YES**
9.h) living close to schools	147	2	12.4974	0.001933	**YES**
9.i) living close to work	147	2	1.5428	0.4624	NO
9.j) living close to shopping areas	147	2	0.8373	0.6579	NO
9. k) living close to family/friends	147	2	0.6103	0.737	NO
9. l) living close to hospitals	147	2	3.6671	0.1598	NO
9. m) access to public transit	147	2	3.0044	0.2226	NO
9.n) living close to parks or rec. opportunities	147	2	1.1571	0.5606	NO
9.o) living close to natural areas	147	2	0.1011	0.9507	NO
9. p) opportunities to view wildlife	147	2	0.096	0.9531	NO
9.q) housing costs and value in the neighbourhood	147	2	3.6407	0.162	NO *unusable because >20% of the expected values were <5
9. r) property tax levels in the neighbourhood	147	2	2.6568	0.2649	NO
Compare **Q 47:** Couple with children versus couple without children to **Q 10:** How important was each of the following in your decision to buy or rent your particular property? Couples with children (of all ages) *n*=78 Couples without children *n*=73					
10.a) attractiveness of the yard (not including residence)	151	2	2.9482	0.229	NO
10.b) attractive appearance of the exterior of residence	151	2	0.9688	0.6161	NO
10.c) attractive appearance of interior of residence	151	2	0.1654	0.9206	NO

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
10.d) number or appearance of trees on property	151	2	5.4414	0.06583	NO
10.e) neat appearance of yard and property	151	2	0.7006	0.7045	NO
10.f) opportunity to view wildlife on the property	151	2	0.8042	0.6689	NO *unusable because >20% of the expected values were <5
10.g) size of property (reduced scale)	151	2	0.2947	0.863	NO
10.h) cost and value of property	151	2	3.5763	0.1673	NO *unusable because >20% of the expected values were <5
10.i) likelihood of making a profit when property is sold	151	2	2.4653	0.2915	NO
10.j) privacy of the property	151	2	2.8958	0.2351	NO *unusable because >20% of the expected values were <5
10.k) availability of parking	151	2	4.4333	0.109	NO
10.l) opportunity for a food garden	151	2	3.666	0.1599	NO
10.m) opportunity for other types of gardens	151	2	3.1666	0.2053	NO
10.n) ease of maintaining the property	151	2	2.163	0.3391	NO
12. What is the approximate total area of your private yard (using scale provided of small, medium, large, and very large) Couple with children *n*=78 Couple without children *n* =82 Total *n* =160	160	3	2.6319	0.4519	NO
12. What is the approximate total area of your private yard (using scale provided of small, medium, large, and very large) Couple with at least one child <18 *n*=53 Couple without children *n* =80	133	3	2.9867	0.3937	NO
13. What is the approximate size of your residence (using scale provided	160	2	1.0937	0.5788	NO *unusable because >20% of the

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
of small, medium, and large) Couple with children *n*=79 Couple without children *n* =81					expected values were <5
13. What is the approximate size of your residence (using scale provided of small, medium, and large) Couple with at least one child <18 *n*=54 Couple without children *n*=79	133	2	0.9097	0.6345	NO *unusable because >20% of the expected values were <5
Q. 14. If you had to move how preferable would each of the following residences be when choosing a new home, considering your household, finances, health, etc.? Couple with children (with at least one child under the age of 18) *n*=53 Couple without children *n* =58 Total *n* =111					
14.a) small house	111	2	5.7853	0.05543	NO
14.b) medium house	111	2	3.5925	0.1659	NO
14.c) large house	111	2	4.9515	0.0841	NO
14.d) small to medium apartment	111	2	3.4883	0.1748	NO *chi square may be incorrect due to expected values <5
14.e) small to medium condominium	111	2	8.9013	0.01167	**YES**
Q. 15. If you had to move how preferable would each of the following yard sizes be when choosing a new property, considering your household, finances, health, etc.? Couple with children (with at least one child under the age of 18) *n*=52 Couple without children *n* =59 Total *n* =111					
15.a) small yard	111	2	4.4027	0.1107	NO
15.b) medium yard	111	2	2.3334	0.3114	NO
15.c) large yard	111	2	11.7956	0.002745	**YES**

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
15.d) very large yard	111	2	7.6206	0.02214	**YES**
15.e) only patio/deck/ balcony but no additional yard space	111	2	2.4342	0.2961	NO *unusable because >20% of the expected values were <5
15.f) no outdoor space	111	2	2.7223	0.2564	NO *unusable because >20% of the expected values were <5
Q. 23. Please indicate how strongly you like or dislike each style of landscaping represented by the pictures. Couple with children (with at least one child under the age of 18) *n*= 52 Couple without children *n* =73 Total *n* =125					
23. a) lawn & foundation plantings	125	2	1.2608	0.5324	NO
23. b) flower gardens	125	2	3.7006	0.1572	NO
23. c) natural gardens	125	2	2.2826	0.3194	NO
23. d) xeriscape	125	2	3.4384	0.1792	NO*chi square may be incorrect due to expected value <5
23. e) stone and ground cover	125	2	1.995	0.3688	NO
23. f) leafy perennials	125	2	4.0048	0.135	NO*chi square may be incorrect due to expected value <5

Comparisons: Age groups of respondents

Table 39. Comparisons across respondent age groups, on questions of interest.

Note: When comparing respondent age groups, responses to questions 9 and 10 were broken into four age groups (20-29; 30-39; 40-65) based on the age of respondent when they moved to their home, which was calculated by subtracting the years they had been in their home from their age. All other comparisons were based on respondents' current ages, which were broken into age groups of 25-45; 46-55; 56-65; and 66 and older. Group aged 66 and older was often not included in chi square analysis due to low response rates and expected values.

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
Compare **Q. 52** respondent age to **Q 8.** How much longer do you expect to live in your current home? **Note:** chi square analysis did not include group age 66 and older due to low response numbers Age 25-45: (*n*=59) Age 46-55: (*n*=50) Age 56-65: (*n*=45) Age 66 and older: (*n*=22)	176	12	20.7993	0.0534	NO *chi square may be incorrect due to expected values <5
Compare **Q. 52** respondent age to **Q 8.** How much longer do you expect to live in your current home? **Note:** chi square analysis did not include group age 66 and older due to low response numbers Age 25-45: (*n*=59) Age 46-55: (*n*=50) Age 56-65: (*n*=45) Total *n*= 154	154	8	15.7919	0.04546	**YES**
Compare age that respondents were when they first moved into their current home (**Q. 52** respondent age – **Q. 3** time in home) to **Q.9**: How important was each of the following in your decision to move to the neighbourhood where you live now? Age groups include: Age 20-29 (n=40) Age 30-39 (n=68) Age 40-65 (n=46) Total (n=154)					
9. a) appearance of the neighbourhood	154	4	1.3507	0.8527	NO *unusable because >20% of the expected values were <5

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
9. b) community size	154	4	1.934	0.7479	NO
9. c) people nearby are similar to my household	154	4	3.411	0.4915	NO
9. d) familiarity with neighbourhood	154	4	1.4384	0.8375	NO
9. e) openness/ spaciousness of neighbourhood	154	4	0.9395	0.9188	NO *unusable because >20% of the expected values were <5
9. f) safety of neighbourhood	154	4	10.3329	0.03518	YES *unusable because >20% of the expected values were <5
9. g) quality of the schools	154	4	14.9679	0.004768	**YES**
9. h) close to schools	154	4	14.0368	0.007178	**YES**
9. i) close to work	154	4	1.5223	0.8227	NO
9. j) close to shopping areas	154	4	7.8131	0.09867	NO
9. k) close to family/friends	154	4	8.3493	0.07959	NO
9. l) close to hospital(s)	154	4	4.0696	0.3967	NO
9. m) access to public transit	154	4	4.8076	0.3076	NO
9. n) close to parks or recreational opportunities	154	4	1.2872	0.8635	NO
9. o) close to natural areas (woods, streams, etc.)	154	4	5.0231	0.2849	NO
9. p) opportunities to view wildlife	154	4	5.6501	0.2268	NO

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
9. q) housing costs and value in the neighbourhood	154	4	5.6434	0.2274	NO *unusable because >20% of the expected values were <5
9. r) property tax levels in neighbourhod	154	4	4.6568	0.3244	NO
Compare age that respondents were when they first moved into their current home (**Q. 52** respondent age – **Q. 3** time in home) to **Q.10**: How important was each of the following in your decision to buy or rent your particular property? Age groups include: Age 20-29 (n=44) Age 30-39 (n=66) Age 40-65 (n=46) Total (n=156)					
10. a) attractiveness of the yard (not including residence)	156	4	6.5255	0.1632	NO
10. b) attractive appearance of exterior of residence	156	4	7.8002	0.09918	NO *unusable because >20% of the expected values were <5
10. c) attractive appearance of interior of residence	156	4	6.7197	0.1515	NO *unusable because >20% of the expected values were <5
10. d) number or appearance of trees on property	156	4	5.1169	0.2755	NO
10. e) neat appearance of yard and property	156	4	4.9342	0.2941	NO
10. f) opportunity to view wildlife on property	156	4	2.9648	0.5637	NO
10. g) size of property	156	4	3.4634	0.4835	NO *unusable because >20% of the expected values were <5
10. h) cost and value of property	156	4	1.3212	0.8578	NO *unusable because >20% of the expected values were <5

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
10. i) likelihood of making a profit when property is sold	156	4	4.8736	0.3005	NO
10. j) privacy of the property	156	4	3.5877	0.4647	NO *unusable because >20% of the expected values were <5
10. k) availability of parking	156	4	4.4522	0.3482	NO *unusable because >20% of the expected values were <5
10. l) opportunity for a food garden	156	4	11.6819	0.01988	**YES**
10. m) opportunity for other types of gardens	156	4	3.1041	0.5406	NO
10. n) ease of maintaining the property	156	4	0.986	0.9119	NO
12. What is the approximate total area of your private yard (using scale provided of small, medium, large, and very large) Age 25-45: (*n*=59) Age 46-55: (*n*=50) Age 56-65: (*n*=45) Age 66 and older: (*n*=22)	176	9	8.5358	0.4812	NO *chi square may be incorrect due to expected values <5
13. What is the approximate size of your residence (using scale provided of small, medium, and large) Age 25-45: (*n*=61) Age 46-55: (*n*=50) Age 56-65: (*n*=44) Age 66 and older: (*n*=22)	177	6	6.2915	0.3913	NO *unusable because >20% of the expected values were <5
Compare **Q52.** respondent age to **Q. 14.** If you had to move how preferable would each of the following residences be when choosing a new home, considering your household, finances, health, etc.? **Note:** chi square analysis did not include group age 66 and older due to few responses					

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
Ages 25-45 *n*=61 46-55 *n*=46 56-65 *n*=34 66 and older *n*=11 Total *n* =152 Total *n* without group 66 and over = 141					
14.a) small house	141	4	6.6298	0.1568	NO
14.b) medium house	141	4	3.1021	0.5409	NO *unusable because >20% of the expected values were <5
14.c) large house	141	4	20.9849	0.0003189	**YES**
14.d) small to medium apartment	141	4	12.4189	0.01449	YES *unusable because >20% of the expected values were <5
14.e) small to medium condominium	141	4	21.952	0.0002049	**YES** *chi square may be incorrect due to expected value <5
Compare **Q52.** respondent age to **Q. 15.** If you had to move how preferable would each of the following yard sizes be when choosing a new property, considering your household, finances, health, etc.? **Note:** chi square analysis did not include group age 66 and older due to low response numbers Ages 25-45 *n*=58 46-55 *n*=46 56-65 *n*=35 66 and older *n*=12 Total *n* =151 Total *n* without group 66 and over = 139					
15.a) small yard	139	4	10.8825	0.02792	**YES**
15.b) medium yard	139	4	4.3297	0.3632	NO
15.c) large yard	139	4	20.2734	0.000441	**YES** *chi square may be incorrect due to expected value <5
15.d) very large yard	139	4	15.7061	0.00344	YES *unusable because >20% of the expected values were <5

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
15.e) only a patio/ deck/ balcony	139	4	18.5503	0.000963	YES *unusable because >20% of the expected values were <5
15.f) no outdoor space	139	4	9.5194	0.04935	YES *unusable because >20% of the expected values were <5
Compare **Q52.** respondent age to **Q23.** Please indicate how strongly you like or dislike each style of landscaping represented by the pictures on the poster (ignoring houses in background). Ages 25-45 *n*=59 46-55 *n*=45 56-65 *n*=41 66 and older *n*=20 Total *n* =165 Total *n* without group 66 and over = 145					
23. a) lawn & foundation plantings	145	4	4.7477	0.3142	NO
23. b) flower gardens	145	4	8.1715	0.08549	NO
23. c) natural gardens	145	4	6.7292	0.1509	NO
23. c) natural gardens **[analysis included group over age 65]**	165	6	12.8633	0.04526	**YES** *chi square may be incorrect due to expected value <5
23. d) xeriscape	145	4	8.1146	0.08747	NO *unusable because >20% of the expected values were <5
23. e) stone and ground cover	145	4	5.2374	0.2638	NO
23. f) leafy perennials	145	4	1.4391	0.8374	NO * unusable because >20% of the expected values were <5

Comparisons: Employed and retired respondents

Table 40. Comparisons between employed (part or full time) and retired respondents, on questions of interest.

Note: Those who indicated they were in school or unemployed were not included in analysis.

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
Compare **Q 52.** employed or retired to **Q 8.** How much longer expecting to remain in current home? Employed *n*=125 Retired *n*=44	169	4	13.9772	0.007368	**YES** *chi square may be incorrect due to expected value <5
12. What is the approximate total area of your private yard (using scale provided of small, medium, large, and very large) Employed *n*=126 Retired *n*=43	169	3	2.5896	0.4593	NO
13. What is the approximate size of your residence (using scale provided of small, medium, and large) Employed *n*=126 Retired *n*=44	170	2	1.3821	0.501	NO *chi square may be incorrect due to expected value <5
Compare **Q. 52** respondent work status to **Q. 14.** If you had to move how preferable would each of the following residences be when choosing a new home, considering your household, finances, health, etc.? Employed (*n*=113) Retired (*n*=30)					
14.a) small house	143	2	3.0038	0.2227	NO
14.b) medium house	143	2	16.8724	0.0002169	**YES**
14.c) large house	143	2	8.8613	0.01191	**YES**
14.d) small to medium apartment	143	2	2.6736	0.2627	NO
14.e) small to medium condominium	143	2	2.2985	0.3169	NO *chi square may be incorrect due to expected value <5

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
Q. 15. If you had to move how preferable would each of the following yard sizes be when choosing a new property, considering your household, finances, health, etc.? Employed (*n*=114) Retired (*n*=30) Total (*n*=144)					
15.a) small yard	144	2	5.3716	0.06817	NO
15.b) medium yard	144	2	1.6738	0.4331	NO
15.c) large yard	144	2	19.2758	6.521e-05	**YES** *chi square may be incorrect due to expected value <5
15.d) very large yard	144	2	13.664	0.001079	**YES** * chi square may be incorrect due to expected value <5
15.e) only patio/deck/ balcony but no additional yard space	144	2	4.0573	0.1315	NO *unusable because >20% of the expected values were <5
15.f) no outdoor space	144	2	1.1997	0.5489	NO *unusable because >20% of the expected values were <5

Comparisons: Household income groups

Table 41. Comparisons across household incomes of $50,000-99,999 and $100,000-249,999, on questions of interest.

Note: No respondents indicated their household income was $500,000 or over, and too few respondents had household incomes of less than $29,999; $30,000-49,999, and $250,000-499,999 for these subgroups to be included in chi square analysis. When asked about household income, 47 respondents selected "decline to answer" and another 19 did not respond.

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
Compare **Q 53.** Household income to **Q 8.** How much longer expecting to remain in current home? Household income: $50,000-99,999 (*n*=61) $100,000-249,999 (*n*=54)	115	4	9.3299	0.05336	NO
12. What is the approximate total area of your private yard (using scale provided of small, medium, large, and very large) Household income: $50,000-99,999 (*n*=62) $100,000-249,999 (*n*=54)	116	3	2.6357	0.4513	NO
13. What is the approximate size of your residence (using scale provided of small, medium, and large) Household income: $50,000-99,999 (*n*=62) $100,000-249,999 (*n*=54)	116	2	9.5625	0.008386	**YES**
Compare **Q. 53** household income to **Q. 14.** If you had to move how preferable would each of the following residences be when choosing a new home, considering your household, finances, health, etc.? Household income: $50,000-99,999 (*n*=49) $100,000-249,999 (*n*=51)					
14.a) small house	100	2	2.7716	0.2501	NO
14.b) medium house	100	2	2.6151	0.2705	NO*chi square may be incorrect due to expected value <5
14.c) large house	100	2	8.6484	0.01324	**YES**

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
14.d) small to medium apartment	100	2	3.7615	0.1525	NO *unusable because >20% of the expected values were <5
14.e) small to medium condominium	100	2	5.6658	0.05884	NO
Q. 15. If you had to move how preferable would each of the following yard sizes be when choosing a new property, considering your household, finances, health, etc.? Household income: $50,000-99,999 (*n*=49) $100,000-249,999 (*n*=49) Total (*n*=98)					
15.a) small yard	98	2	0.064	0.9685	NO
15.b) medium yard	98	2	3.3986	0.1828	NO
15.c) large yard	98	2	4.33	0.1147	NO
15.d) very large yard	98	2	1.7679	0.4132	NO
15.e) only patio/deck/ balcony but no additional yard space	98	2	0	1	NO *unusable because >20% of the expected values were <5
15.f) no outdoor space	98	2	0.7101	0.7011	NO *unusable because >20% of the expected values were <5

Comparisons: Current residence and yard sizes to preferable sizes of future property

Table 42. Comparisons between current residence and yard sizes, and preferable sizes of a potential future property.

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
Compare **Q 13.** current residence size to **Q 14:** If you had to move how preferable would each of the following residences be when choosing a new home, considering your household, finances, health, etc.? Current residence sizes: small (*n*=16) medium (*n*=127) large (*n*=25) **Note**: Since most respondents lived in medium-sized homes, data was not appropriately spread-out for chi square analysis.					
Compare **12.** current yard size to **Q 15:** If you had to move how preferable would each of the following yard sizes be when choosing a new property, considering your household, finances, health, etc.? Current yard sizes: small (*n*=30) medium (*n*=66) large (*n*=47) very large (*n*=21)					
12. to 15.a small yard	164	6	3.305	0.7697	NO * chi square may be incorrect due to expected value <5
12. to 15.b medium yard	164	6	10.9006	0.0915	NO * chi square may be incorrect due to expected value <5
12. to 15.c large yard	164	6	5.0994	0.5311	NO * chi square may be incorrect due to expected values <5
12. to 15.d very large yard	164	6	2.6845	0.8473	NO *unusable because >20% of the expected values were <5
12. to 15.e only a patio/deck/ balcony but no additional yard space	164	6	4.8666	0.561	NO *unusable because >20% of the expected values were <5
12. to 15.f no outdoor space	164	6	7.4275	0.2831	NO *unusable because >20% of the expected values were <5

Comparisons: Time planning to stay in current home compared across variables

Table 43. Comparisons based on how long residents plan to stay in their current homes.

Question of comparison	*n*	d.f.	X^2	*p* value	Sig.Dif. at α=0.05?
Compare **Q 13.** current residence size to **Q 8.** How much longer expecting to remain in current home? Current residence sizes: small (*n*=16) medium (*n*=155) large (*n*=30)	201	8	12.9685	0.1129	NO *unusable because >20% of the expected values were <5
Compare **Q 12.** current yard size to **Q 8.** How much longer expecting to remain in current home? Current yard sizes: small (*n*=36) medium (*n*=83) large (*n*=55) very large (*n*=27)	201	12	21.3212	0.04587	**YES** * chi square may be incorrect due to expected values <5

Appendix C: Questionnaire

Question colour code legend:

Green = taken or modified from Michigan study by Nassauer and colleagues

Blue = only on the 2012 survey (in addition to the green questions)

Pink = only on the 2004 and 2012 surveys

Red = included on 2012 survey but not utilized in analysis

No colour = same (or had minor modifications) across 1994, 2004, and 2012 surveys

Survey of Yard Landscaping and

Maintenance Practices and Property Preferences

School of Planning
University of Waterloo
2012

Please fill in this questionnaire if you live in a **RESIDENCE WITH A**

PRIVATE OUTDOOR SPACE.

This includes:

- a yard around a house
- a private patio; or
- a private yard in a condominium or apartment complex/block

*It does **not** include a garden plot away from the residence.

This questionnaire should be filled out by the person in the household who does most of the yard work.

By participating, you are also ensuring that you are over the age of 18.

Thank you very much!

Have you or other members of your household participated in any of the previous Surveys of Yard Landscaping and Maintenance Practices conducted by my research group?

☐ Yes, the 1995 survey

☐ Yes, the 2004 survey

☐ Yes, both the 1995 and 2004 surveys

☐ I don't know

☐ No

Part A: Environmental Issues

1. Please indicate how serious you feel environmental problems are on a scale of 1-5, for each of the areas identified below.

Area	Not at all Serious		Neutral		Extremely Serious
a) Your neighbourhood	1	2	3	4	5
b) Your city	1	2	3	4	5
c) The Region of Waterloo	1	2	3	4	5
d) Ontario	1	2	3	4	5
e) Canada	1	2	3	4	5
f) North America	1	2	3	4	5
g) The World	1	2	3	4	5

2. Below are general statements about current conditions. Please indicate, on a scale of 1-5, how much **you agree or disagree** with each statement.

	Statement	Strongly Disagree		Neutral		Strongly agree
a)	Plants and animals exist primarily to be used by humans	1	2	3	4	5
b)	Rapid economic growth often creates more problems than benefits	1	2	3	4	5
c)	The balance of nature is very delicate and easily upset	1	2	3	4	5
d)	To solve some of society's problems it will be necessary to place restrictions on individual behaviour	1	2	3	4	5
e)	We should know if something new will work before taking a chance on it	1	2	3	4	5
f)	Humans should live in harmony with nature in order to survive	1	2	3	4	5
g)	The earth is like a spaceship with only limited room and resources	1	2	3	4	5
h)	Canadians will have to drastically reduce their level of consumption in the next few years	1	2	3	4	5
i)	Among the fundamental rights in this country is the use of one's property without interference	1	2	3	4	5
j)	Through science and technology we can continue to raise our standard of living	1	2	3	4	5

Part B: Your Home

3. How many years have you lived in your current residence? _____.
   (If you have lived in your residence less than one year, please write "0").

4. How old is this residence?

☐	Less than 5 years	☐	41-60 years
☐	6-10 years	☐	61-100 years
☐	11-20 years	☐	More than 100 years
☐	21-40 years	☐	I don't know

5. Do you own or rent this residence?

☐ Own ☐ Own as a condominium ☐ Rent ☐ Other arrangement

6. The structure of this residence is best described as:

☐ Single detached house

☐ Semi-detached house

☐ Duplex house (with an upper and lower unit in same house)

☐ Town house/ row house

☐ Apartment in a building of 4 storeys or lower

☐ Apartment in a building of 5 storeys or higher

☐ Condominium in a building of 4 storeys or lower

☐ Condominium in a building of 5 storeys or higher

☐ Room(s) within a house or apartment

7. The current approximate market value of this residence is:

☐	Less than $150,000	☐	$400,001-500,000
☐	$150,001-200,000	☐	$500,001-600,000
☐	$200,001-300,000	☐	More than $600,000
☐	$300,001-400,000	☐	I don't know

8. How much longer do you expect to live in your current home?

- ☐ 0-5 years
- ☐ 6-10 years
- ☐ 11-25 years
- ☐ Indefinitely
- ☐ I don't know

Please note the following definitions for the remainder of the survey:

***Yard**: All outdoor space on the front, side, and back of your property. This includes:*

- *All greenspace (gardens, lawn, etc.)*
- *Pools and Hot tubs*
- *Ponds*
- *Sitting areas (decks, patios, gazebos etc.)*
- *Driveways*
- *Other paved areas*

***Property**:The combination of yard and residence space.*

***Residence**: Your house, duplex, town house, apartment, or condominium.*

9. How important was each of the following in your decision to move to the **neighbourhood** where you live now?

	Not at all important		**Somewhat important**		**Very important**
a) Appearance of the **neighbourhood**	1	2	3	4	5
b) Community size	1	2	3	4	5
c) People nearby are similar to my household	1	2	3	4	5
d) Familiarity with neighbourhood	1	2	3	4	5
e) Openness/ spaciousness of neighbourhood	1	2	3	4	5
f) Safety of the neighbourhood	1	2	3	4	5
g) Quality of the schools	1	2	3	4	5
h) Close to schools	1	2	3	4	5
i) Close to work	1	2	3	4	5
j) Close to shopping areas	1	2	3	4	5
k) Close to family/friends	1	2	3	4	5
l) Close to hospital(s)	1	2	3	4	5

Question 9 continued:

		Not at all important		Somewhat important		Very important
m)	Access to public transit	1	2	3	4	5
n)	Close to parks or recreational opportunities	1	2	3	4	5
o)	Close to natural areas (woods, streams, etc.)	1	2	3	4	5
p)	Opportunities to view wildlife	1	2	3	4	5
q)	Housing costs and value in the neighbourhood	1	2	3	4	5
r)	Property tax levels in the neighbourhood	1	2	3	4	5

10. How important was each of the following in your decision to buy or rent your particular **property**?

		Not at all important		Somewhat important		Very important
a)	Attractiveness of the yard (not including the residence)	1	2	3	4	5
b)	Attractive appearance of the exterior of the residence	1	2	3	4	5
c)	Attractive appearance of interior of the residence	1	2	3	4	5
d)	The number or appearance of trees on the property	1	2	3	4	5
e)	Neat appearance of yard and property	1	2	3	4	5
f)	Opportunity to view wildlife on the property	1	2	3	4	5

Question 10 Continued:

	Not at all important		Somewhat important		Very important
g) Size of property	1	2	3	4	5
h) Cost and value of property	1	2	3	4	5
i) Likelihood of making a profit when the property is sold	1	2	3	4	5
j) Privacy of the property	1	2	3	4	5
k) Availability of parking	1	2	3	4	5
l) Opportunity for a food garden	1	2	3	4	5
m) Opportunity for other types of gardens	1	2	3	4	5
n) Ease of maintaining the property	1	2	3	4	5

11. Please indicate the type of outdoor space your residence has **(check one only)**:

☐ A yard which only your own residence uses, with no common outdoor space (e.g. fenced backyard).

☐ A combination of a common outdoor space and private outdoor space (e.g. a fenced area within a condominium complex)

*****IF YOU CHOOSE THIS OPTION, PLEASE ANSWER THE SURVEY QUESTIONS CONSIDERING YOUR **PRIVATE YARD ONLY**.

☐ A common outdoor space **only** (e.g. around an apartment building)

***If you choose this option, we now have all of the information we need from you since you do not have private outdoor space. Please discontinue the survey and send it back. Thank you for your input!**

Part C: Property Preferences

RESIDENCE AND YARD SCALES

For the next questions, please refer to the following dimensions:

Note: For **residence size**, please **do not include basement area**.

Residence Size	Square Feet	Square Meters
Small	less than 1000	less than 93
Medium	1001 - 2500	93 - 232
Large	greater than 2500	greater than 232

Please refer to the table below to help you estimate **yard size**. First, consider the area of a typical single car garage. Then, estimate how many times you think the area of that garage could fit in the total yard space (total area of front + side + back yard + driveway/paved land, combined). The number of times the single car garage may fit corresponds to the yard size, as indicated in the table. The table also includes measurements if you already know total yard area.

Yard size classification	Number of single car garages that would fit in yard	Square Feet	Square Meters
Small	0-4	0-1056	0-100
Medium	5-9	1057-2376	101-225
Large	10-16	2377-4224	226-400
Very Large	17 or more	4225 or more	401 or more

12. According to the scale above, what is the approximate **total** area of your current private **YARD** (**front+back+side yard area**), including paved areas like driveway?

- ☐ Small (area of 0-4 single car garages)
- ☐ Medium (area of 5-9 single car garages)
- ☐ Large (area of 10-16 single car garages)
- ☐ Very Large (area of 17+ single car garages)

13. According to the scale on the previous page, what is the approximate size of your current **RESIDENCE**? (not including basement area)

- ☐ Small
- ☐ Medium
- ☐ Large

14. If you had to move, how preferable would each of the following residences be when choosing a new home? As you make your selections, consider the size of your household, finances, health, etc. Refer to the chart on the previous page for residence sizes.

	Not at all preferable		**Neutral**		**Very preferable**
a) Small house	1	2	3	4	5
b) Medium house	1	2	3	4	5
c) Large house	1	2	3	4	5
d) Small to medium apartment	1	2	3	4	5
e) Small to medium condominium	1	2	3	4	5

15. If you had to move, how preferable would each of the following yard sizes be when choosing a new property? As you make your selections, consider the size of your household, finances, health, etc. Refer to the chart on the previous page for yard sizes.

		Not at all preferable		**Neutral**		**Very preferable**
a)	Small yard	1	2	3	4	5
b)	Medium yard	1	2	3	4	5
c)	Large yard	1	2	3	4	5
d)	Very large yard	1	2	3	4	5
e)	Only a patio/deck/ balcony but no additional yard space	1	2	3	4	5
f)	No outdoor space	1	2	3	4	5

16. Would you ever choose live in a home with **no private yard**? Please check as many as apply.

☐ Yes, in the past I lived in a home with no private yard

☐ Yes, in the future ☐ No ☐ Maybe

*If you answered "**No**", please **skip to question 18**.*

17. Please indicate how important each of the following factors were/would be in **encouraging** you to live in a home with **no private yard**.

		Not at all important		Neutral		Very Important
a)	A park is nearby	1	2	3	4	5
b)	A field or playspace for children is nearby	1	2	3	4	5
c)	A community pool is nearby	1	2	3	4	5
d)	You can grow food/flowers in a community garden	1	2	3	4	5
e)	You can grow food/flowers in a community member's yard	1	2	3	4	5
f)	You live within walking distance to the city centre	1	2	3	4	5
g)	You have a nice view from your windows	1	2	3	4	5
h)	You have a front porch/balcony	1	2	3	4	5

If they were not listed, please indicate any other conditions that would encourage you to live in a home with **no private yard**:

_____

_____.

18. Would you ever choose to live in a home with **a small yard**? (remember, this is an area less than that of 4 single car garages – including the area for the driveway). Please select as many as apply.

☐ Yes, in the past I lived in a home with a small yard

☐ Yes, I already live in a home with a small yard

☐ Yes, in the future ☐ No ☐ Maybe

*If you answered "**No**", please **skip to question 20**.*

19. Please indicate how important each of the following factors were/ would be in **encouraging** you to live in a home with a **small yard**.

	Not important		Neutral		Very Important
a) A park is nearby	1	2	3	4	5
b) A field or playspace for children is nearby	1	2	3	4	5
c) A community pool is nearby	1	2	3	4	5
d) You can grow food/flowers in a community garden	1	2	3	4	5
e) You can grow food/flowers in a community member's yard	1	2	3	4	5
f) You live within walking distance to the city centre	1	2	3	4	5
g) You have a nice view from your yard	1	2	3	4	5
h) You have a front porch	1	2	3	4	5
i) There is privacy between you and your backyard neighbours	1	2	3	4	5

If they were not listed, please indicate any other conditions that would encourage you to live in a home with a **small yard**:_____

Part D: Landscaping Preferences

20. Please place a checkmark beside each type of space that is present in your yard. Next, do your best to estimate the percent (%) area that each type of space takes up on your **total yard space** (total for front, side, and back yard combined, including driveway).

Type of Space	✓	**% of my yard occupied by this space**
a) Concrete		
b) Asphalt		
c) Hard surfaces that let water through (e.g. gravel, wooden decks, pavers, interlocking stone, etc.)		
d) Lawn		

Question 20 continued:

Type of Space	✓	% of my yard occupied by this space
e) Flower garden		
f) Shrubs and trees		
g) Vegetable garden		
h) Swimming pool		
i) Ground covers		
j) Storage, dumping areas, compost, etc.		
k) Others (please describe):		
TOTAL		**100**

For the remainder of Part D, please refer to the poster provided in your mail package or online at:

http://www.environment.uwaterloo.ca/u/edefield/

If you did not receive a poster and cannot access the internet, please skip to ***question 27 (Part E)***

and leave the rest of Part D blank.

PLEASE IGNORE THE HOUSES IN THE BACKGROUND OF THE PICTURES!

21. On the enclosed poster are sets of photos that represent **six different styles of landscaping**. Imagine you are looking for a new property to buy or rent. You look at properties with these six different landscape styles. Ignoring the houses, which of the landscaping styles would **attract** you to choose a dwelling for rental or purchase? (circle as many as you wish)

    a b c d e f

22. Given the same situation as in question 21, which of the yard landscapes would **discourage** you from renting or purchasing a dwelling? (circle as many as you wish)

    a b c d e f

23. Please **indicate how strongly you like or dislike each style of landscaping** represented by the pictures on the poster by circling one of the numbers on each line below (ignoring houses in background).

	Strongly Dislike		Neutral		Strongly Like
Photo set a)	1	2	3	4	5
Photo set b)	1	2	3	4	5
Photo set c)	1	2	3	4	5
Photo set d)	1	2	3	4	5
Photo set e)	1	2	3	4	5
Photo set f)	1	2	3	4	5

24. a) Please choose the yard landscape style you **like most**, and write the corresponding letter here: ____.

b) Now please explain **why** you **<u>like it most</u>** (checkmark as many reasons as you wish):

- ☐ I like the colours
- ☐ I like the shapes of the plantings
- ☐ It looks practical to maintain
- ☐ My household could enjoy using this space
- ☐ It looks good for attracting wildlife
- ☐ It would be acceptable to the neighbours
- ☐ It's environmentally acceptable
- ☐ It looks cheap to maintain

Other (Please describe):_____

25. a) Please choose the yard landscape style you **like least**, and write the corresponding letter here: ____.

b) Now please explain **why** you **<u>like it least</u>** (checkmark as many lines as you wish):

- ☐ I dislike the colours
- ☐ I dislike the shapes of the plantings
- ☐ It looks impractical to maintain
- ☐ My household could not enjoy using this space
- ☐ It looks unattractive to wildlife
- ☐ It would be unacceptable to the neighbours
- ☐ It's environmentally unacceptable
- ☐ It looks expensive to maintain

Other (Please describe):_____

26. Please select the style(s) of landscapes that are most like your own private outdoor space **(choose as many styles as there are in your yard):**

☐ a) ☐ b) ☐ c) ☐ d)

☐ e) ☐ f) ☐ g)-none of the pictures are like my yard

Part E: Yard Maintenance

27. Please indicate how strongly you agree or disagree with the following statements.

		Strongly Disagree		Neutral		Strongly Agree
a)	I like to look after a yard	1	2	3	4	5
b)	I like to grow flowers	1	2	3	4	5
c)	I like to grow vegetables	1	2	3	4	5
d)	A yard has to have a lawn	1	2	3	4	5
e)	I like trees in a yard	1	2	3	4	5
f)	I dislike raking leaves	1	2	3	4	5
g)	I dislike mowing	1	2	3	4	5
h)	People should not be allowed to use herbicides (weedkillers) on their yards	1	2	3	4	5
i)	People should not be allowed to use pesticides (insecticides, fungicides) on their yards	1	2	3	4	5
j)	A lawn is mainly to look at, not to use	1	2	3	4	5
k)	Having a tidy yard is important	1	2	3	4	5
l)	It troubles me to water the yard when there is a regional water shortage	1	2	3	4	5
m)	I dislike the sound of **other people** mowing or using power yard tools	1	2	3	4	5
n)	I dislike the sound of **my own** mower or power yard tools	1	2	3	4	5

Question 27 Continued:

		Strongly Disagree		Neutral		Strongly Agree
o)	People should be able to 'do their own thing' in landscaping **backyards**	1	2	3	4	5
p)	People should be able to 'do their own thing' in landscaping **front yards**	1	2	3	4	5
q)	I know a lot about gardening	1	2	3	4	5
r)	When I don't know how to tackle a garden problem, I can find out about it easily	1	2	3	4	5

28. If a yard/garden looks very different from most of the yards/gardens in your neighbourhood, do you think it should conform to the majority?

Yes ☐ No ☐ I don' know ☐

29. Which of the following does your residence have?
(Please checkmark as many as apply):

a) ☐ One or more outside taps (How many?_____)

b) ☐ An in-ground sprinkler system

c) ☐ One or more water barrels or similar devices collecting water off the roof for garden use. (How many?_____)

d) ☐ A private well

e) ☐ A garden hose

f) ☐ A cistern

g) ☐ A non-hand held sprinkler that you attach to the end of a hose

h) ☐ A private swimming pool (i.e. not part of townhouse/apartment complex)

i) ☐ A private hottub (i.e. not part of a townhouse/apartment complex)

30. Is your household responsible for **doing or paying for** outdoor maintentance?

Yes ☐ No ☐

*If you answered '**No'**, please go directly to **question 39.***

31. a) The maximum number of hours per week my household is **willing** to spend looking after a yard is up to____hours per week (over the growing season, **excluding mowing)**.

b) We/I **actually** spend_____hours per week looking after a yard.

32. a) The maximum number of hours per week my household is **willing** to spend **mowing the lawn** is up to _____hours per week (over the growing season).

b) We/I **actually** spend_____hours per week mowing the lawn.

33. Please indicate how frequently your household uses the following yard items **themselves** (i.e. don't pay a landscaper to do)? (Note: **"Often"** refers to at least once every two weeks in the season)

Yard Items	Never	Sometimes	Often
a) a gas mower			
b) a push mower			
c) an electric mower			
d) a ride-on mower			
e) a leaf-blower			
f) a wood/twig shredder			
g) herbicides (weedkillers)			
h) pesticides (bug killers, fungicides, etc.)			
i) lawn fertilizer (in this case, often = 3 or more applications/year)			
j) "weed & feed" type products			
k) manual weeders (e.g. dandelion digger)			
l) pruning tools			

34. In Fall 2011, how did you dispose of leaves on your property? **(Please choose all that apply)**

- ☐ Left them in place
- ☐ Used a mulching mower
- ☐ Composted them
- ☐ Moved them to another location on my property
- ☐ Moved them beyond edge of my property
- ☐ Put them on the curb for removal
- ☐ Took them to an official leaf dump
- ☐ Burned them
- ☐ Nothing because I had very few leaves
- ☐ Unsure
- ☐ Other _____.

35. What did you do with your lawn clippings in spring/summer 2011? (**Please choose all that apply**)

- ☐ Left on lawn or mulched into lawn
- ☐ Composted them
- ☐ Moved them to another location on my property
- ☐ Moved them beyond edge of my property
- ☐ Put them on curb for removal
- ☐ I didn't have lawn clippings
- ☐ Unsure
- ☐ Other _____

36. The most that my household would be willing to pay annually for somebody to maintain the yard is $ _____.

If you answered $0.00 for question 36, please go directly to ***question 38****.*

37. How willing are you to pay a landscape or maintenance company for the following yard services? **(Place one checkmark on each line):**

Service	Willing (but I don't yet purchase this service)	Not Willing	Not Sure	I already purchase this service
a) Weed control				
b) Insect control				
c) Fungus control				
d) Dethatching				
e) Soil aeration				
f) Fertilizing				
g) Mowing				
h) Looking after flower bed				
i) Growing vegetables				
j) Looking after ground covers				
k) Tree trimming				

38. If you were setting up a yard in a newly occupied dwelling, what is the most you would be willing to pay a landscape company for:

a) **landscape <u>DESIGN</u>** (not including installation or price of materials)**:**

- ☐ Nothing
- ☐ Less than $150
- ☐ $151-350
- ☐ $351-700
- ☐ $701-1,400
- ☐ $1,401-2,800
- ☐ More than $2,800

b) **landscape <u>INSTALLATION</u>** (including the price of materials and fences, but **not including** design, driveways or any swimming pools/saunas):

☐ Nothing	☐ $3,501-7,000
☐ Less than $700	☐ $7,001-14,000
☐ $701-1,400	☐ $14,001 – 20, 000
☐ $1,401-3,500	☐ More than $20,000

Part F: Yard Uses

39. Do you enjoy having or using your yard space?

Yes ☐ No ☐

*If you answered '**No'**, please go directly to **question 43**.*

40. Place a checkmark beside the following uses that are **really <u>important for enjoying</u>** your **<u>front yard</u>** (left column) and **<u>backyard</u>** (right column) on a regular basis. **Check all that apply**.

	Important <u>front yard</u> uses	**Important <u>back yard</u> uses**
a) Viewing wildlife		
b) Feeding wildlife		
c) Sports/exercise		
d) Relaxing/lounging		
e) Outdoor dining		
f) Reading		
g) Fixing car/vehicle		
h) Storage		
i) Parties, etc.		

Question 40 Continued

	Important front yard uses	Important back yard uses
j) Hobby projects (e.g. carpentry)		
k) Playspace for children		
l) Bike storage		
m) Family time		
n) Car parking		
o) Exercising pets		
p) Viewing street		
q) Meditation/ prayer/ yoga		
r) Washing car		
s) Gardening		
t) Lawn mowing		
u) Looking at view		
v) Other (please describe)		

41. a)___ is the letter from question 40 that represents the **most important** use of my **front yard**.
b) ___ is the letter from question 40 that represents the **most important** use of my **backyard**.

42. Which of the following have you done on your property to attract wildlife? **(Please checkmark as many as apply):**

a) ☐ Put out bird food
b) ☐ Put up bird house(s) or nest box(es)
c) ☐ Put in bird bath
d) ☐ Installed water feature to attract wildlife
e) ☐ Chose specific plants to provide food or habitat
f) ☐ Used maintenance practices (e.g. leaf disposal, dead wood management, mowing schedules, pruning) to provide habitat
g) ☐ None of the above
h) ☐ Other _____.

43. a) How many dogs are in your household?___ (If none, enter 0)

44. a) How many cats are in your household?____ (If none, enter 0)

b) If you have a cat/cats, do you allow them outside?

☐ Yes ☐ No ☐ I don't have a cat

Part G: Private Property

45. Please indicate your level of **agreement** or **disagreement** with the following statements.

	Strongly Disagree		Neutral		Strongly Agree
a) More yard and lot maintenance regulations are necessary	1	2	3	4	5
b) Yard and lot maintenance regulations contribute to community harmony	1	2	3	4	5
c) Lot by-laws and yard policies ensure that property values do not diminish	1	2	3	4	5
d) Yard regulations inhibit private yard expressiveness and diversity	1	2	3	4	5
e) It is important for front-yard gardens to provide privacy	1	2	3	4	5
f) It is important for back-yard gardens to provide privacy	1	2	3	4	5
g) I would participate in a program allowing another community member without a yard to share space in my yard if they helped with maintenance	1	2	3	4	5

Part H: Greenspace in Your Neighbourhood

46. Please indicate your level of **agreement** or **disagreement** with the following statements.

		Strongly Disagree		Neutral		Strongly Agree
a)	I like to see a variety of kinds of trees in my neighbourhood	1	2	3	4	5
b)	I like to have woodlots in my neighbourhood	1	2	3	4	5
c)	It is important that green space and parks and woodlots are linked by corridors	1	2	3	4	5
d)	Parks need groomed lawns and gardens	1	2	3	4	5
e)	Parks need landscaped play areas	1	2	3	4	5
f)	I like having picnics in parks	1	2	3	4	5
g)	Parks need wild areas with long grass, shrubs, and trees	1	2	3	4	5

Part I: Background Information

This last section is useful to understand whether homeowners' background may influence their preferences. This type of information may be important to planners as the Region of Waterloo continues to grow and diversify. Remember, all study results will be summarized so that no information specific to your household is released.

47. What best describes your household? **(please checkmark one)**

☐ Individual living alone

☐ Couple

☐ Couple with child/children

☐ Single head of household with child/children

☐ Other combinations of related or unrelated individuals

48. Were you born in Canada?

☐ **Yes** ☐ **No**

*If you answered "**Yes**", go to question 49 (and skip 50). If you answered "**No**", please skip to question 50.*

49. Please **circle** the province or territory that you were born in:

a. Newfoundland
b. Prince Edward Island
c. Nova Scotia
d. New Brunswick
e. Quebec
f. Ontario
g. Manitoba
h. Saskatchewan
i. Alberta
j. British Columbia
k. Yukon
l. North West Territories
m. Nunavut

50. a) Which country were you born in? _____.

b) What year did you arrive in Canada? _____.

51. **How many years of schooling have you completed?** (Include all elementary or grade school, high school, college or university training plus time spent in vocational, technical or apprenticeship programs)

Elementary through to high school grade (or equivalent grade outside of Canada):

K 1 2 3 4 5 6 7 8 9 10 11 12 13

University/College/Vocational/Technical school (number of years equivalent to full-time study)

0 1 2 3 4 5 6 or more

52. Please describe each of your household members **(up to 6 people)**.

Relationship to you (spouse, child, lodger, etc.)	Sex		Age (years)	Employed?			Other Activity	
	male	female		full-time	part-time	N/A	attends school	retired
yourself								

*Please place a checkmark here ☐ **if there are more than 6 people** in your household

53. What was your **household income for 2011?** Household income is the total income from all sources for everybody who contributed to the running of the household in 2011. This includes salaries and wages, investment income, pensions, scholarships, social assistance, unemployment insurance payments, mother's allowance, rental income, business income etc. **Remember, your answers are kept confidential.**

My household income <u>before taxes (gross income)</u> for 2011 was:

☐ Less than $29,999
☐ $30,000-49,999
☐ $50,000-74,999
☐ $75,000-99,999
☐ $100,000-149,999
☐ $150,000-249,999
☐ $250,000-499,999
☐ $500,000 and over
☐ Decline to answer

That completes the questionnaire. **<u>Thank</u> <u>you</u> <u>very</u> <u>much</u>** for participating! Your feedback will help represent the different views of Kitchener and Waterloo residents to help us promote better neighbourhood designs.

If you have any questions or concerns, please email me at edefield@uwaterloo.ca or call the University of Waterloo at 519-888-4567 to speak with my supervisors Dr. Dawn Parker (ext. 38888) or Dr. Roger Suffling (ext. 33184). Feel free to add additional comments to the space below, and check the website for updates, summaries, and other information:

http://www.environment.uwaterloo.ca/u/edefield/

This study has been reviewed by, and received ethics clearance through, the Office of Research Ethics. If you have any concerns regarding your participation in this study, please contact Dr. Susan Sykes, Director, Office of Research Ethics at ssykes@uwaterloo.ca or 519-888-4567 Ext. 36005.

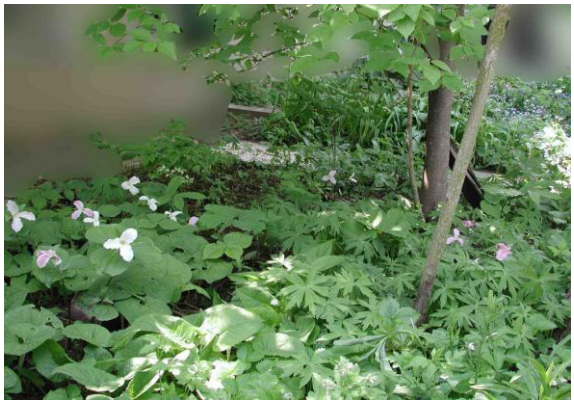
Appendix D: Survey Landscape Photos

The photo on the left side of each set was taken from the surveys conducted in 1994 and 2004, while that on the right was taken especially for the 2012 survey. The new photos were added simply to provide a better idea of what types of yards would fall under each landscape style

(A) Lawn & Foundation Plantings:


(B) Flower Garden:


(C) Natural Garden:

(D) Xeriscape:

(E) Stone & Ground Cover:

(F) Leafy Perennials:

Appendix E: Estimated and Actual Yard Size Comparisons

Respondent estimates of their yard sizes were generally inaccurate relative to the measurement tool they were given (Table 44).

Table 44. Table provided in survey for respondents to estimate their yard size.

Yard size classification	Number of single car garages that would fit in yard	Square Feet	Square Meters
Small	0-4	0-1056	0-100
Medium	5-9	1057-2376	101-225
Large	10-16	2377-4224	226-400
Very Large	17 or more	4225 or more	401 or more

Thus, respondents' estimates are compared to their actual yard sizes, both in terms of count data (Table 45) and percentage data (Table 46 and Figure 47). Overall, yard size estimates by respondents tended to be smaller than they actually were according to GIS data. For instance, someone who said they had a medium yard actually had a yard that would be classified as large or very large according to size conversions given in Table 44.

Actual yard sizes were calculated by subtracting building footprint area (which included the area of the house and sometimes the garage or shed) from parcel size (lot size) area using GIS data. GIS data were retrieved from the University of Waterloo Map Library and used data from Teranet for parcel data (2012), City of Waterloo for Waterloo building data (2011) and land use plan data (2011), and City of Kitchener for Kitchener building data (2012). Geocoding was based on the address point data (2010) from the Region of Waterloo.

Since sheds may have been included as part of the footprints but would have been located on yard area, some "actual" yard size estimates may have been slightly smaller than in reality. The 7 "actual" small yards (Table 45) were on properties that were part of a complex (such as a townhouse), so yard size could not actually be measured from GIS data. It was assumed that respondents living in these complexes may have actually had small yards; however, in reality, these yards may have been larger in size.

Table 45. Comparison of yard size estimations given by respondents to actual yard sizes based on GIS calculations (frequency data; *n*=203).

Estimated Yard Size by Survey Respondents	Actual Sizes (based on GIS)					
	# Total	# Small	# Medium	# Large	# Very Large	# Correct
Small	36	7	14	12	3	7
Medium	85	0	2	46	37	2
Large	55	0	1	15	39	15
Very Large	27	0	0	4	23	23
Total	203	7	17	77	102	47

Table 46. Comparison of yard size estimations given by respondents to actual yard sizes based on GIS calculations (percentage data; *n*=203).

Estimated Yard Size by Survey Respondents	Actual Sizes (based on GIS)				
	% Small	%Medium	%Large	%Very Large	% Correct
Small	19	39	33	8	**19**
Medium	0	2	54	44	**2**
Large	0	2	27	71	**27**
Very Large	0	0	15	85	**85**

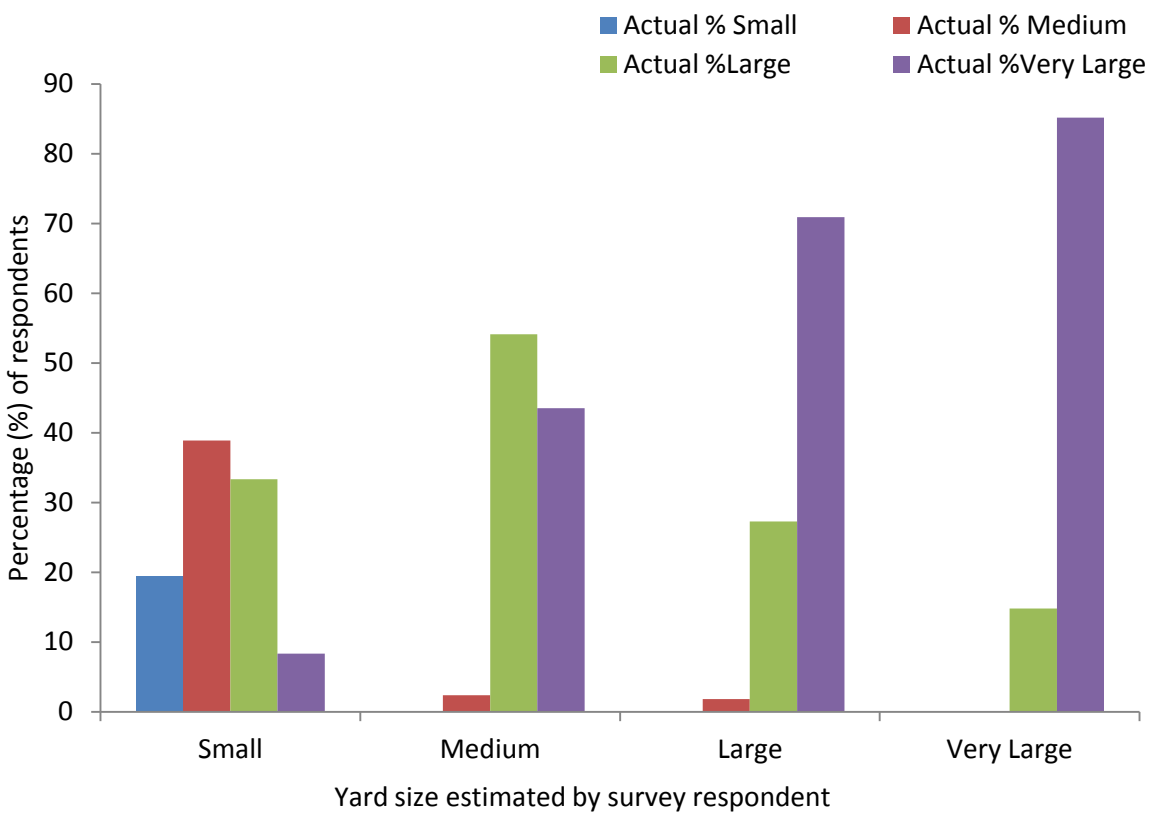


Figure 47. Comparison of yard size estimations given by respondents to actual yard sizes based on GIS calculations (percentage data*; n*=203).

Appendix F: Yard Size Distributions for Survey Respondents Compared to City Data

Figures in this appendix are meant to give perspective on how the thesis sample data compares to the low-density residential landscape of Kitchener and Waterloo. Again, GIS data were retrieved from the University of Waterloo Map Library and used data from Teranet for parcel data (2012), City of Waterloo for Waterloo building data (2011) and land use plan data (2011), and City of Kitchener for Kitchener building data (2012). Geocoding was based on the address point data (2010) from the Region of Waterloo.

When Kitchener and Waterloo survey respondent data were combined (Figure 48), the distribution was similar to the distributions of both cities; however, graphs were only somewhat similar in shape when comparing the separate Kitchener (Figure 49) and Waterloo (Figure 51) survey respondent data to the distributions of each city (Figure 50 and Figure 52).

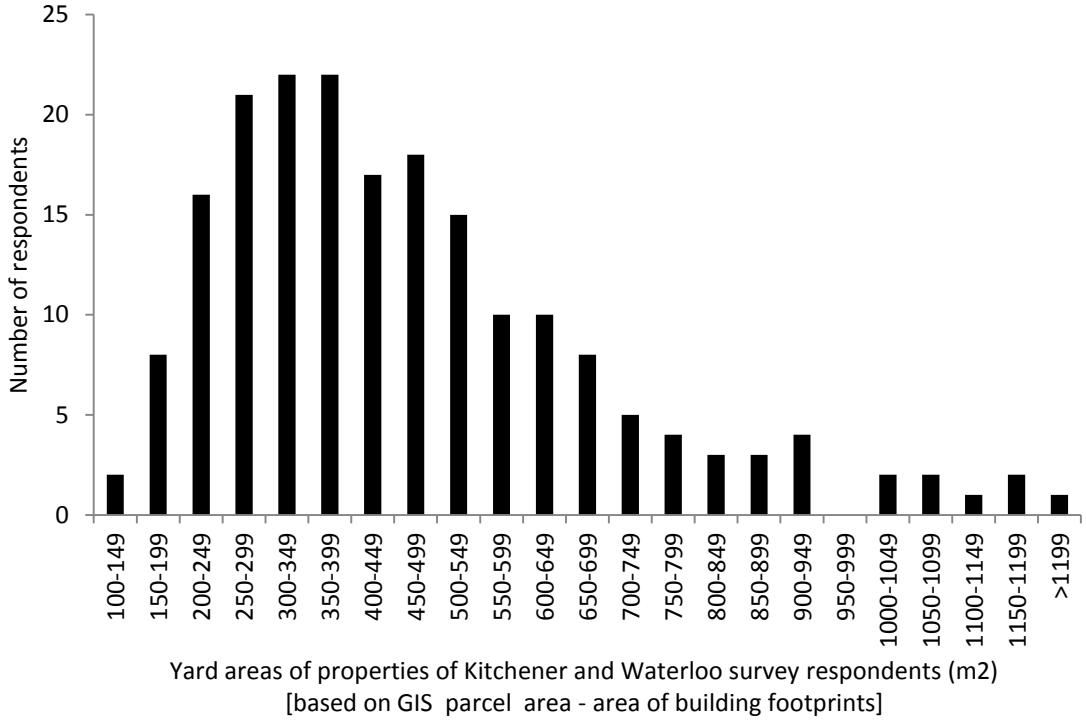


Figure 48. Yard areas (m^2) of properties of Kitchener and Waterloo survey respondents based on GIS parcel area minus area of building footprints (*n*=196).

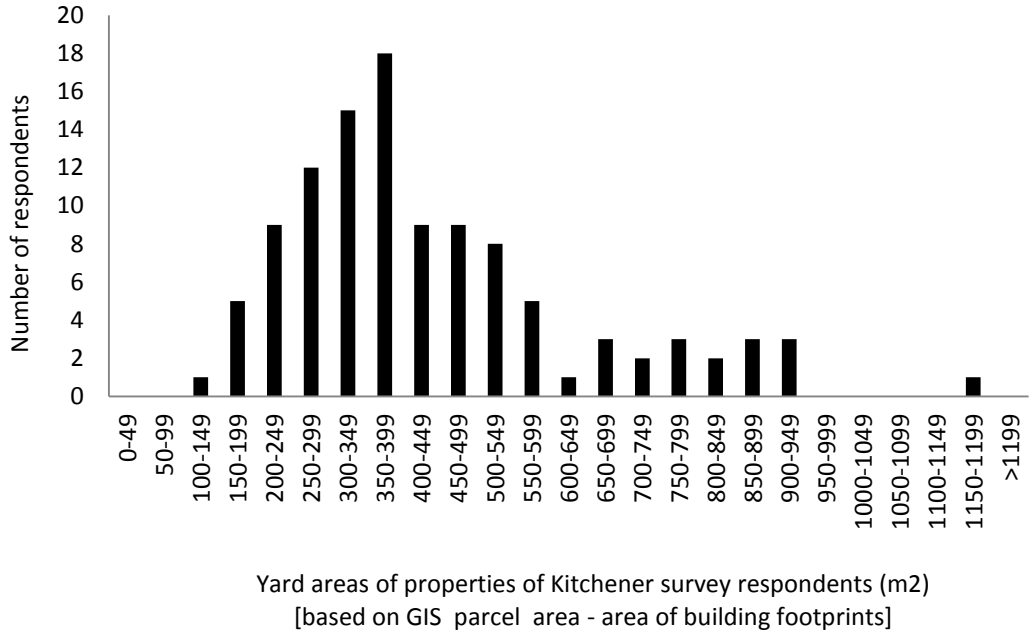


Figure 49. Yard areas (m^2) of properties of Kitchener survey respondents based on GIS parcel area minus area of building footprints (*n*=109).

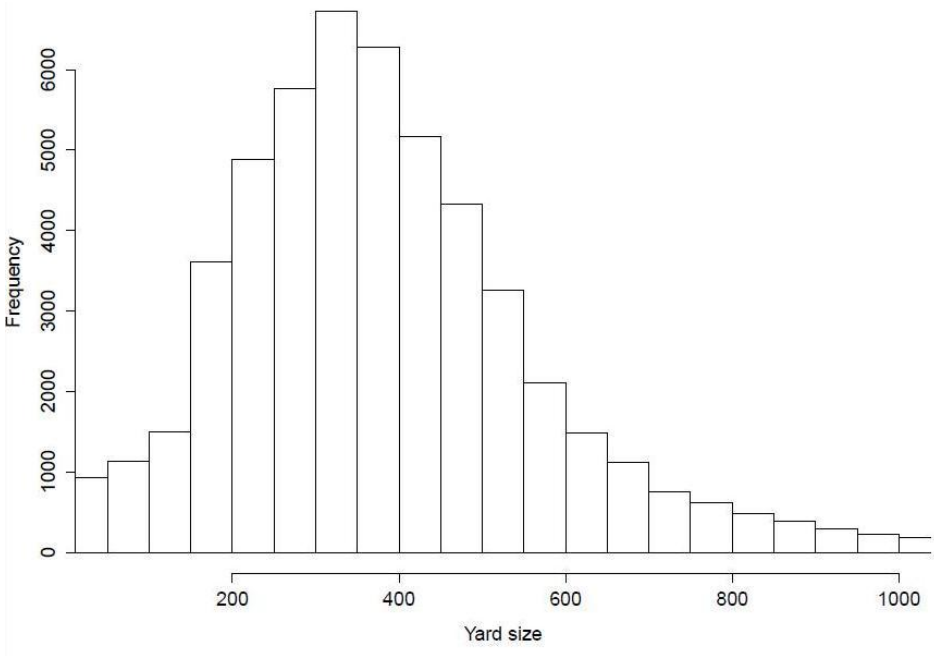


Figure 50. Yard areas (m^2) of Kitchener single-detached, semi-detached, and townhouse properties based on GIS parcel area minus area of building footprints.

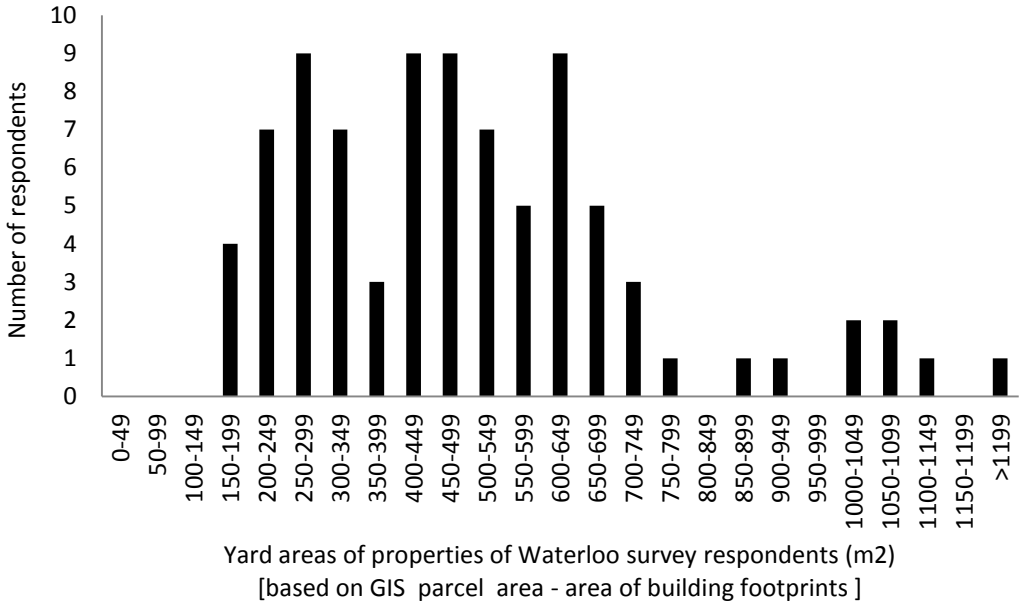


Figure 51. Yard areas (m^2) of properties of Waterloo survey respondents based on GIS parcel area minus area of building footprints (*n*=86).

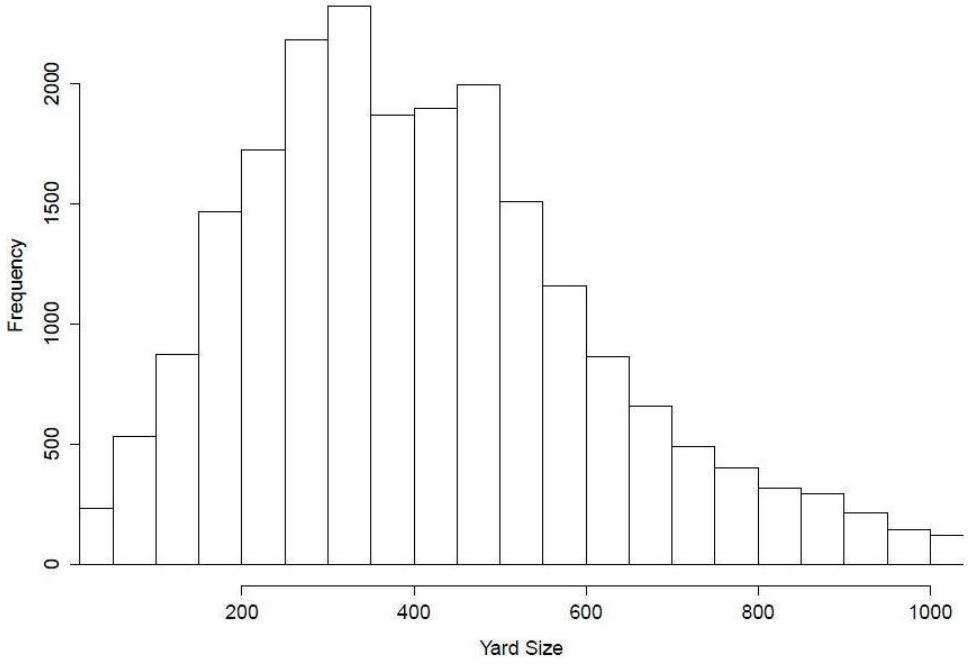


Figure 52. Yard areas (m^2) of Waterloo low-density residential properties based on GIS parcel area minus area of building footprints.