Sustainable or same-old? An Investigation into the Communication of Green Features within Online Real Estate Listings across Five Southern Ontario Municipalities

by

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Authors 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.

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Abstract

Green features in residential houses are widely attributed to a reduction in both residential energy usage and regional greenhouse gas emissions, with prospective homebuyers well-positioned to be enablers of a low-carbon future. However, despite their potential for energy cost savings, improved dwelling comfort, and ample environmental benefits, considerations for green features in residential real estate transactions are limited. Presently, the disclosure of a home's energy consumption information remains voluntary at the time of sale. To provide insights into the information communicated to homebuyers in pursuit of a home with green features, this study will take an exploratory approach to understand the consumer experience during the first stage in the home buying experience - the online home listing review. To explore the experience of a prospective homebuyer, this research will feature e-mystery shopping of online real estate listings in three southern Ontario regions, including Hamilton, Halton, and Brant. The resulting data will identify the information on green features that is currently communicated to prospective homebuyers in the initial fact-finding stage of the home buying process. In accordance with the Customer Based Social Marketing and Marketing Mix frameworks, the study findings will discuss how online real estate listing, as a form of communication from the real estate professional, can be used as a tool to encourage the consideration and sale of energy efficient homes. Understanding the information being communicated to prospective homebuyers who are interested in green real estate is integral to the promotion and sale of homes that are natural resource efficient. The benefits of this research are two-fold; both driving the demand for homes with green features and the potential knock-on effect of retrofitting within the existing housing stock to meet a growing market demand.

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1   Introduction

Canada's built environment is a primary component of sustainability discussions across all levels of government as new construction and the ongoing operation of the building stock expends significant energy, resulting in carbon emissions (Natural Resources Canada, 2022 A). The Canadian housing stock is a key contributor to carbon dioxide (CO_2) emissions, accounting for 13% of Canada's energy usage in 2019, making it the third-highest sector of national energy use (Canada Energy Regulator A, 2022). Ontario's residential sector paints a similar picture, responsible for 18% of the province's energy usage, with many municipalities identifying residential energy efficiency within their core climate action strategies (Canada Energy Regulator B, 2022). In line with Canada's commitment to the 2016 Paris Agreement, which features plans to reduce emissions by 30% compared to 2005 levels by the year 2030, the most important benefit of green residential features is their energy-saving and carbon emission reducing capabilities (Government of Canada, 2016). With the environmental, income generation and lifestyle and comfort benefits of green residential features being well established, it is critical to develop an understanding of how sustainable features can be effectively communicated to consumers in a residential context (Gamtessa, 2013; Hoicka et al., 2014; Rowlands et al., 2004; Prabatha et al., 2020; Stieß & Dunkelberg, 2013; Uidhir et al., 2019; Wilson et al., 2015). Numerous studies suggest homebuyers are interested in, or at least curious about, real estate options that offer 'green' features (e.g., Crosbie and Baker; 2010; Gram-Hanssen; 2014), indicating that the residential real estate market is shifting towards a new era of environmentally conscious consumers (Canadian Home Builders Association, 2020). In a recent Canadian Home Builders Association survey, it was found that prospective homebuyers are seeking out properties that offer both comfort and sustainability, with nearly 59% of surveyed consumers noting sustainable features as a 'must have' for their home purchase (Canadian Home Builders Association; 2020). It is unclear whether the traditional real estate market is ready

to support this new wave of environmentally conscious homebuyers. Despite the positive impacts of, and homebuyer interest in, green features, the disclosure of a home's energy consumption information remains completely voluntary at the time of sale. By stepping into the role of a perspective homebuyer, this research seeks to develop an understanding the types of features, specifically green features, that are being presented to green-minded homebuyers when searching online for residential real estate. Moreover, this research seeks to identify ways in which online real estate listings can be leveraged to encourage the education and sale of energy efficient homes.

1.1   A Spotlight on the Ontario Real Estate Market

Shopping the Ontario real estate market in the first quarter of 2022 was a novel experience for prospective homebuyers, with a "meteoric rise" in Canadian real estate, reflected both in market activity and sale prices, with wide reaching effects most prominent in Canada's larger cities (e.g., Toronto) (RE/MAX Canada, 2022, n.p.). April of 2022 was the tail end of the market 'peak' for many Canadian cities, with a nationwide monthly sales average of $746,146 (54,894 units sold,) compared to that of $695,656 in April 2021(74,049 units sold) (WOWA Leads Inc., 2022). Real estate experts attributed the remarkable year-over-year increase, and "periods of irrational exuberance" to a multitude of factors, such as a limited number of listings available on the market throughout the COVID-19 pandemic, as well as the Bank of Canada's projected 2022 interest rate increase cycle that would gradually increase the cost of mortgaging a home over the course of the year (Fox, 2022, n.p.). As reflected in the Canadian Real Estate Association's (CREA) quarterly market forecast, the property markets in Ontario (and British Columbia) are not representative of the rest of Canada, as they experience significantly more activity than the national averages. In April 2022, the average Ontario real estate listing sold for $985,354, a 13.1% increase over that of 2022 (WOWA Leads Inc., 2022). Similar to how national averages are driven by major metropolitan real estate markets, Ontario's market is heavily influenced by the performance of the Greater Toronto Area (GTA) housing market (WOWA

Leads Inc., 2022). In April 2022, 8,008 GTA real estate transactions garnered an average sale price of $1,254,436, with surrounding GTA communities reflecting lower average sale prices, such as Hamilton at $787,737 (WOWA Leads Inc., 2022).

1.2   Consumer Home Buying Process

Historically, home shopping would involve a series of open houses in a prospective home buyer's area of interest. Long gone are the days of purchasing a home exclusively through open houses and private viewings, with the 'in-person' stage now preceded by digital, or online, home searching. Pandemic-related restrictions to in-person activities accelerated the popularity of online real estate service offerings, such as virtual staging, online floorplans and 3D virtual home tours, presenting prospective homebuyers with the opportunity to assess a home's space and suitability without physically visiting the home (Doktor, 202; McNally, 2021). Relying upon the digital home details, amidst a frenzied market that featured a high demand and limited supply of homes, many homebuyers completed their 2021 real estate transactions, sight unseen (Gavoila, 2021; McNally, 2021). Pre-pandemic, many Canadian realtors were focusing their efforts on developing their online presence and listing offerings, with the pandemic accelerating the need for comprehensive and informative online real estate communications (Doktor, 2021; McKnally, 2021).

Searchable online databases, such as Realtor.ca, are one of the main tools used by real estate professionals in the communication of real estate offerings, as they are frequented by prospective homebuyers at the beginning of their home search (Yean Yng Ling & Gee, 2010). In 2021, 81% of Canadian homebuyers used Realtor.ca in the purchase or sale of their home (Canadian Real Estate Association, 2022; Realtor.ca., 2022), demonstrating that search-savvy homebuyers are doing their own property fact-finding. Despite the independence offered by online real estate listings, market professionals- specifically, real estate agents- are key intermediaries throughout the home buying process. Real estate is one of the few consumer

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purchases that requires interaction with intermediaries to facilitate the transaction. As such, both real estate agents and real estate brokers are regulated professions within the province of Ontario, with all professionals being registered through the Real Estate Council of Ontario (RECO) (Real Estate Council of Ontario, 2021). Not only are real estate professionals responsible for, or at minimum involved in, the online communication of available home listings, they are intimately involved in the showing of homes to prospective homebuyers. These key intermediaries are part of the real estate 'ecology,' and hold roles that can directly influence the functioning of the housing market and economic market outcomes (Henneberry & Parris, 2013; Stirling & Gallent, 2021). Further, inherent in the role of a real estate professional, is the objective to work with prospective homebuyers and facilitate the real estate sale (Real Estate Council of Ontario, 2021). In the real estate ecology, the real estate agent will be the 'subject matter expert' on a particular listing, leveraging a variety of online, media and in-person communications, and the prospective homebuyer will turn to the agent to get all of the need-to-know details on their home of interest.

1.3   Adoption of Residential Green Features

National Resources Canada defines an energy efficiency retrofit as an upgrade to the "energy-consuming systems" of a house and divides the resulting upgrades into three levels; minor, major, and deep retrofits (National Resources Canada, 2019; Prabatha et al., 2020). Minor home retrofits are the upgrades that are the easiest to achieve and are often referred to as the 'low hanging fruit' of energy efficiency (National Resources Canada, 2019). These upgrades may include the sealing of windows and thresholds (with windows and doors accounting for up to 25% of a home's heat loss, proper sealing will maintain a home's indoor temperature, minimizing heating and cooling needs), increasing insulation levels (further working to retain the home's indoor temperature, minimizing heating and cooling needs) and upgrading to efficient lighting options that feature the dual benefit of decreased energy usage and increased product longevity (National Resources Canada, 2019; Natural Resources Canada 2021 B; Natural

Resources Canada, 2021 C; Natural Resources Canada, 2021 D). Progressing on the scale of complexity, a home could undergo a major retrofit, which might include upgrading to an energy-efficient HVAC system (reduce energy usage) or installing low-flow plumbing fixtures (reduce both water consumption and energy used for water heating) (Natural Resources Canada, 2021 E). A deep home retrofit project may include a complete roof replacement (to correct and prevent structural and framing problems contributing to heat leakage and condensation concerns) or upgrading to a renewable source heating and cooling system (such as a geothermal system) (National Resources Canada, 2019; Natural Resources Canada, 2021 A). Numerous studies attribute the implementation of green features to realised residential energy savings and a reduction in regional greenhouse gas emissions (Gamtessa, 2013; Hoicka et al., 2014; Rowlands et al., 2004; Prabatha et al., 2020; Stieß & Dunkelberg, 2013; Uidhir et al., 2019; Wilson et al., 2015). This opportunity for action at the residential-level has led to strategizing on a provincial and regional-level, with an emphasis on reducing the energy consuming systems of the existing housing stock.

1.4   Role of Residential Green Features

In both the realm of 'weak' and 'strong' sustainability, challenging questions surrounding the sustainable management of natural resources without compromising human well-being, have been posed at the global level (Pezzey & Burke, 2014). The third largest sector in terms of emissions (behind oil and gas and transportation) is from electricity production and buildings themselves, which accounts for approximately12% of Canada's emissions since the 1990s (Government of Canada, 2014). While the residential sector is not due all of the blame, it does presents an area of great opportunity for change at both the regional and individual levels (Gram-Hanssen, 2014). Over the last decade, the Canadian government has heavily invested in in the promotion and uptake of residential home retrofits, including an 'Energy Efficiency for Homes Rebate and Incentive Directory,' for homeowner to reference (Dyer et al,, 2022; Hoicka et al., 2013; Gamtessa, 2012). Key federal investments included home energy audit

programming to connect homeowners with knowledgeable experts and develop an understanding of their home's energy performance, as well as 250 million dollars in funding for the Oil to Heat Pump Affordability program, and an additional 250 million dollars in funding towards the Low Carbon Economy Fund's home heating program (Dyer et al., 2022; McKie, 2013). In the wake of two decades of significant increases in carbon output from the residential sector, Environment and Climate Change Canada has attributed the relative stability in residential greenhouse gas contributions to home energy retrofits (Environment and Climate Change Canada, 2013). Presently, there are federal grant opportunities available for a wide range of residential retrofits, incentivizing homeowner projects of all scales and depths (Natural Resources Canada, 2022). The stabilization in residential carbon contributions due to home retrofit implementation suggests many Canadian homes offer energy efficient, or 'green' features. Ranging from 'minor' to 'deep,' these features could be easily attainable, such as threshold sealing, or more intensive, such as the installation of an alternative power generation system (National Resources Canada, 2019; Prabatha et al., 2020). Regardless of the relative depth, or the role it may hold in a home, how a retrofit is factored into the sale of a home has not been considered in the literature.

1.5   Research Rationale and Objectives

This research seeks to establish an understanding of what green features, if any, are being presented to prospective homebuyers seeking a more sustainable home, and how residential real estate listing could be used as a tool to promote the education and sale of natural resource efficient homes. The goal of this research is to identify what green features are being communicated to a prospective 'green minded' homebuyer, by way of online residential real estate listings, and understand how this stage of the home buying process could be used to inform, educate, and promote the features of natural resource efficient homes. As such, the following research questions are presented:

1. What green messaging is being communicated to prospective homebuyers through the online real estate listing?

2. If online real estate listings lack information on a home's green features, what messaging are they sharing with prospective homebuyers?

3. What potential barriers exist for prospective homebuyers in pursuit of a home with green alternatives at the online stage in the home buying process?

1.6   Research Approach, Contributions and Structure

1.6.1   Research Approach

Employing an exploratory approach, this research investigates a sample of real estate listings posted on Realtor.ca, Canada's leading online real estate listing platform. With thousands of daily Ontario listings posted to Realor.ca, the scope of the research was narrowed down to three key regions: Hamilton, Halton (inclusive of the City of Burlington and the Town of Oakville and the Town of Milton) and Brant. Per Statistics Canada (2021), the regional population distribution is as follows; Brant (144,771,) Hamilton (569,353,) Milton (22,851,) Burlington (125,435) and Oakville (213,759,) with a combined population of 1,076,169. With a provincial population of 14,223,942, as reflected in the 2021 Statistics Canada census, the five focus regions account for a cumulative 7.5% of Ontario's population. Not only are these regions identified as 'bedroom' communities for the Greater Toronto Area, but these neighboring regions also present variations in socio-economic environments and population density. At the time of selecting the research scope, in-person (pre-pandemic) mystery shopping was considered for this study, as such, the three Southern Ontario regions were also selected due to their proximity for travel for residential open houses.

A sample of 100 listings were collected from each of the regions of Brant, Hamilton, Milton, Burlington and Oakville, resulting in a total dataset of 500 listings. Using the 'e-'mystery shopping approach, each listing was reviewed for both its overview information and written description to

develop a pre-set code in a Microsoft excel sheet. Specifically, the information on each listing was entered into the excel sheet fields as it was presented on Realtor.ca. The summary details of the listings were then analyzed by price, age, acreage, and duration of time posted on Realtor.ca. Secondly, the seller/agent's written description of the home was reviewed in its entirety, noting the first five features of the description (categorized based on the type of information shared) and further review to identify any mention of the home's green features within the greater description.

1.6.2   Contributions

This study aims to provide insight into how the real estate market communicates sustainable, or 'green' aspects of a home to prospective homebuyers during the first stage of the homebuying process (i.e., the online home listing review). Stepping into the role of a prospective homebuyer by way of 'e-'mystery shopping online real estate listings, the research also seeks to identify potential barriers to those in search of a home with green features. Clear communication on a home's green features within an online real estate listing, regardless of the 'depth' of retrofit, can have two beneficial effects; 1) these details fulfil the "must have" requirements of environmentally conscious homebuyers, and 2) the information educates all prospective homebuyers on the variety of green features available on the market which can encourage the consideration and sale of natural resource efficient homes. Stemming from these benefits is potential knock-on effect of further retrofitting within the existing housing stock to meet a growing market demand for energy efficient homes.

This research will add to a small body of literature surrounding sustainability in the real estate sector and an even smaller subset of literature focusing on the homebuying experience. To date, there has been limited information presented on the identification of real estate listings as a tool for sustainable communication and the impact this medium could have on prospective homebuyers. As such, this research aims to challenge the conventional rhetoric of the real estate industry, specifically the information shared on available homes, to enhance

communication that is inclusive of climate goals for stakeholders at all levels. The awareness and demand of Canadian homebuyers is increasing, with efficiency features being on, and even towards the top of, their home "wish lists." Should the communication within the real estate industry fail to fulfill this ever-evolving demand, a barrier could be presented to those prospective homebuyers interested in homes with green features. Further, drawing upon the principles of the Marketing Mix and the Customer Based Social Marketing theories, this research aims to highlight the online real estate listing could be an ideal tool for green communications.

1.6.3   Structure

The thesis is comprised of five main chapters, with the information presented as follows:

Chapter 2 presents a literature review of key studies focusing on the importance, adoption, and identification of residential green features as it relates to the real estate market. This chapter also presents how the present communication of the real estate market relates to the key tenants of the proposed marketing frameworks. Chapter 3 provides an in-depth description of the methodology employed in this research, including the research design and two-stage data collection process. Chapter 4 offers an analysis and summary of data results, framed within the two-stage listing review process. Lastly, Chapter 5 draws conclusions and presents opportunities for future research in this area of study.

2   Literature Review

The literature review will establish an overview of existing research into the prevalence and presentation of green features within real estate, the information being shared with prospective homebuyers, the theoretical frameworks within which the study is situated as well as the barriers and enablers faced by green minded homebuyers.

2.1   Residential Resource Consumption

Society's mounting energy demand is directly related to an increase in greenhouse gas emissions and, consequently, climate change (Vandeweghe & Kennedy, 2007). The evidence of global warming is indubitable, pointing towards the correlation between global greenhouse gas emissions and the 'tipping point' of the Earth's delicate biosphere (O'Riordan, 2013; Pezzey & Burke, 2014; Vandeweghe & Kennedy, 2007). Regardless of the lens (corporate, social, ecological), recent research speaks to a collective sustainability 'tipping point' (Kiron, 2012; O'Riordan, 2013; Hochstetler& Milkoreit, 2015). The wide-reaching impacts of this precarious situation has resulted in a 'call to action' at all levels of society, encouraging actions to reduce greenhouse gas output from the federal level to the individual, and all actors in between (Pezzey & Burke, 2014; Vandeweghe & Kennedy, 2007). In 2018, the global building sector accounted for 28% of CO_2 emissions and 30% of final energy consumption (Jia et al., 2020). Of this global total, the building sector is responsible for 70% of the final energy consumption (Jia et al., 2020). Questions about natural resource efficiency are indicative of critical concerns that have deep roots in the global collective and are being felt at the national level (Hochstetler & Milkoreit, 2015).

Residential energy consumption is widely regarded as a culprit for a staggering proportion of Canada's greenhouse gas output (Gamtessa, 2012; Hoicka et al, 2013; National Resources Canada, 2020; Prabatha et al., 2020; Rowlands et al., 2004). Ranking as the third-highest sector of national energy use and accounting for 12% of Canada's energy usage in 2017, the

Canadian housing stock is identified as an area of urgent environmental action (National Resources Canada, 2020; Prabatha et al., 2020; Vandeweghe & Kennedy, 2007). Similarly, the performance of Ontario's residential sector leaves ample room for opportunity to reduce CO_2 emissions within the sector. In 2017, Ontario's residential sector accounted for 18% of the province's energy usage (ranking above the national average), with single detached homes accounting for 55.8% of Ontario's housing building types (Canada Energy Regulator, 2022; Consumers Council of Canada, 2018). This area of improvement was outlined in Ontario's 2017 Long-Term Energy Plan, a twenty-year roadmap wherein the province committed to expanding home energy audit and retrofit programming, providing information, smart tools for energy usage data, and increasing the accessibility of energy efficiency financing (Ministry of Energy, 2017). More recently, Ontario's Green Energy Act (2009) and the supporting Climate Change Action Plan (2016), were set to require home energy audits and mandatory energy efficiency disclosures for every home at the time of sale (Aaron, 2018). The benefits of the government's proposed home energy rating and disclosure program included using "the home's energy consumption information to help a homebuyer assess the home's value when setting a price or making a buying decision," and "to improve awareness on operating costs in relation to energy use" (Consumers Council of Canada, 2018, p. iv). Despite these intentions, changes in provincial government led to Bill 34, The Green Energy Repeal Act, 2018, which removed the mandatory home energy audit initiatives before they began in Ontario (Aaron, 2018). Thus, the disclosure of a home's energy consumption information, green features, or lack thereof, remains completely voluntary at the time of sale.

2.2   Categorization of Green Features

While the literature presents ample discussion on the topic of green features, the definitions are rather limited within the context of a single-family home. For this reason, the research turned to sustainable home certification programs and supporting organizations to further identify and refine the natural resource saving features of a home. Certifications such as Passive House, Built

Green and the R-2000 Standard not only address design and construction standards, they also promote efficiency features that can be incorporated into home renovations. Despite having shared sustainability principles underlying their promoted building standards, each home certification program offers a unique perspective on the definition of a sustainable home and presents different green features for consideration. Some certifications, such as LEED V4 Residential: Single-Family Homes, have a wide lens, considering all types of efficient features, from those related to energy and water savings to green building materials (USGBC, 2014). Passive House has a narrower lens, focusing on energy efficiency and comfort by way of emphasizing natural heating and cooling recovery options, specifically reducing the energy demand of a home's space heating system (Passive House Institute, 2015). The WELL Building Standard focuses on how people's health and wellbeing can be maximized by their built environment. Referring to both the relevant academic and grey literature a summary of commonly noted green features is categorized within Table 2.2.1.a.

Table 2.2.1.a: Green features identified in relevant literature

Category	Green Feature	Cited In
Temperature and HVAC	Home Insulation *(Beyond Building Code requirements)*	*Bond, 2015; CHBA, 2020; Eves, Kippes, 2010; Passive House, 2022; Natural Resources Canada (R-2000), 2012; USGBC (LEED), 2014*
	Window Glazing	*Bond, 2015; CHBA, 2020; Eves, Kippes, 2010; Built Green 2020; EnerGuide, 2022; Natural Resources Canada (R-2000), 2012; International Passive House Association, 2022; USGBC (LEED), 2014*
	Air Sealing	*Bond, 2015; Built Green 2020; EnerGuide, 2022; International Passive House Association, 2022; Natural Resources Canada (R-2000), 2012*
	Directional Aspect/Orientation *(natural climate regulation)*	*Eves, Kippes, 2010; Yean Yng Ling & Gunawansa, 2011; Passive House Association, 2022*
	Air Leakage Rate *(low)*	*Natural Resources Canada (R-2000), 2012; USGBC (LEED), 2014*
	Tight Air Ducts	*NGBS, 2021; USGBC (LEED), 2014*
	Air Exchange System	*CHBA, 2020; Built Green 2020; Natural Resources Canada (EnerGuide), 2021*
	HE Furnace/HVAC System	*Eves, Kippes, 2010; Natural Resources Canada (EnerGuide), 2021; USGBC (LEED), 2014*

	Heat Recovery Ventilator	Built Green, 2020; International Passive House Association, 2022
	Refrigerant Management	USGBC (LEED), 2014
	HVAC Moisture Control	USGBC (LEED), 2014
Renewables and Energy Sources	Geothermal	CHBA, 2020
	Solar PV	Hodgson, 2016; CHBA, 2020
	Solar Thermal	Hodgson, 2016; CHBA, 2020
	Conductive Flooring	Hodgson, 2016
	Home Energy Storage	CHBA, 2020
	Renewable Energy	USGBC (LEED), 2014
Lighting-Related	CFL Lighting	CHBA, 2020
	LED Lighting	CHBA, 2020
	ENERGY STAR Fixtures	USGBC (LEED), 2014
Water Management Systems	Tankless Water Heater	CHBA, 2020, Built Green, 2020; EnerGuide, 2022
	Low-Flow Toilets	CHBA, 2020; Natural Resources Canada (R-2000), 2012
	Dual flush Toilets	CHBA, 2020; Natural Resources Canada (R-2000), 2012
	Drain water Heat Recovery Unit	Built Green, 2020
	Greywater Reuse System	USGBC (LEED), 2014
	Rainwater Harvesting System	USGBC (LEED), 2014
	High Efficiency Fixtures	Ling & Asanga, 2011; R-2000; USGBC (LEED), 2014
	Efficient Hot Water Distribution	USGBC (LEED), 2014
Other Green Features	Size of Home	Bond, 2015
	Power 'Zones'	Hodgson, 2016
	Location Efficiency	Borth & Summers, 2017
	Incorporates Recycled Materials	CHBA, 2020
	Energy Star Rating	CHBA, 2020
	HE Appliances	USGBC (LEED), 2014
	Environmentally Preferable Building Materials	USGBC (LEED), 2014
	Combustion Venting (if applicable)	USGBC (LEED), 2014
	Exterior Paint Colour	International Passive House Association, 2022
	Material-efficient Framing	USGBC (LEED), 2014
	Smart thermostat	Consumers Council of Canada, 2018

2.3   Proposed Framework

The framework for this research aims to identify the potential barriers faced by homebuyers pursuing green alternatives in the real estate market and will specifically focus on the messaging of homes with green features to discern whether, and how, green features are promoted to prospective buyers through the online home advertisement.

2.3.1   Marketing Mix Framework

The Marketing Mix is a foundational principle for translating a marketing approach into practice, which has been subject to a fifty-year evolution (Goi, 2009). The framework has undergone changes to remain reflective of the ever-present marketing developments within organizations and their consumer landscapes (Goi, 2009). The conceptual theory was coined by Neil Borden in the late forties, and formally presented in 1965 as a marketing approach rooted in the singular 'P' of microeconomic theory, 'price' (Borden, 1964). From here, McCarthy (1960,) presented the key elements, or four 'P's' that form the foundation of the modern-day Marketing Mix. According to McCarthy, marketers must manage the variables of price, promotion, product, and place, when devising an appropriate mix for a successful marketing plan. Despite the many criticisms and additions over the years, as extensively compared by Goi (2009), the Marketing Mix framework has remained a key tool for the practical application of marketing planning across many industries.

One of landmark criticisms came from Constantinides (2006), which primarily addressed the framework's lack of consideration for the customer construct – including customer behavior, relationship building, and experiences – suggesting that the Mix incorrectly emphasizes the role of the marketer, whereas an effective marketing approach must focus upon the consumer. This assessment echoed that of earlier criticisms which deemed the Mix to be far too internally focused, prompting a discussion about the true goals of marketing strategy, beyond those of the corporation (Robins, 1991). Lauterborn (1990) similarly asserted that the Mix is too product-

centric, lacking a comprehensive understanding of the customer, and in turn suggested the four

Cs: customer wants/needs, cost, convenience, and communication. Following this iteration,

Lauterborn encouraged marketers to go beyond the 'product' and put the customer first by

evaluating their wants and needs, thus creating a product that responds to the consumer,

instead of expecting the consumer to respond to the product. Moreover, 'price' should be

reframed as the cost that is presented to the customer to satisfy their needs, which may not

always be the lowest price. Further, the element of place is challenged by convenience,

specifically, how to bring the product to the customer, or make the purchasing experience

easier for the consumer. Lastly, if the good/service meets the customers' wants and needs, the

cost is reflective of the value presented to the customer, and the purchasing process is

convenient, the final element simply requires that these aspects be communicated to the

customer- no promotion required. As the Marketing Mix is a widely accepted tool for the

effective marketing of goods and services, with recent iterations focusing on the interests of the

consumer, it is conceivable that it be employed in the promotion of real estate. This study will

draw upon the principles of the Marketing Mix framework as they may influence the prospective

homebuyer experience and how they may be leveraged within the online real estate listings.

2.3.2   Customer Based Social Marketing Framework

Overview

The Community-Based Social Marketing (CBSM) framework focuses on encouraging behavioural

change by emphasizing both the behavioural action that is to be promoted (similar in approach

to the predecessor theories), as well as understanding and addressing the behaviour that is to

be discouraged (McKenzie-Mohr, 2011). Stemming from the underpinnings of the Attitude

Behaviour Approach and the Economic-Self Interest Approach to sustainable actions (profiled

below) the CBSM framework seeks to develop a comprehensive understanding of the

associated behaviours as they relate to the sustainable action.

The Attitude Behaviour Approach operates on the assumption that specific behavioural actions can be encouraged by increasing an individual's education and knowledge of a topic (McKenzie-Mohr, 2011). For example, if an individual holds a comprehensive understanding of the environmental detriments of keeping their home at the same temperature all day, following the Attitude Behaviour Approach, this information will translate into the action of turning down the thermostat before leaving the house. This approach hinges on the assumption that information will translate into action; however, this assumption is not always an accurate reflection of sustainable behaviours (Duffy & Verges, 2009, Geller, 1981, Geller et al, 1983 and O'Neill & Blanck, 1980). Further, the Attitude Behaviour Approach posits that the only (or primary) barrier to action would be an individual's lack of knowledge on the topic, which is not always accurate (McKenzie-Mohr, 2011). A preliminary component of the CBSM framework is to develop a comprehensive understanding of the many barriers underlying the desired action, thus acknowledging that a multitude of barriers could factor into a single sustainable action (McKenzie-Mohr, 2011).

The Economic Self-Interest Approach operates on the assumption that an individual will evaluate a sustainable behaviour and proceed with the action that serves to further their personal economic interests (McKenzie-Mohr, 2011). Following this theory, a program should financially incentivize an action, leveraging an individual's economic self-interest as a means to act. Like the Attitude Behaviour Approach, this theory is criticized for asserting that financial incentives are the only (or primary) benefit driving a sustainable action (McKenzie-Mohr, 2011). This approach also places excessive focus on the calculation of an action and little emphasis on the 'human' aspect of the behaviour (McKenzie-Mohr, 2011). Acknowledging that numerous benefits could drive a sustainable action, a preliminary component of the CBSM framework is to develop a comprehensive understanding of the many benefits at play.

Building from the shortcomings of the Attitude Behaviour Approach and the Economic-Self Interest Approach, the CBSM framework takes an informed approach to influencing behaviour.

The framework addresses "a behaviour that is to be encouraged as well as a behaviour that is to be discouraged, by identifying the barriers and benefits to the desired action and effectively increasing the benefits of the behaviour and minimizing the barriers to action" (McKenzie-Mohr, 2011 p.4).

Environmental Outcome

In line with the CBSM Framework and the qualifications of an end-state behaviour, the desired environmental outcome of the behaviour must be considered (McKenzie-Mohr, 2011). In the context of this study, the sustainable behaviour to be encouraged would be the act of prospective homebuyers purchasing a home with green features. Understanding the barriers and benefits to this action is key to the successful promotion and sale of natural resource efficient homes. The environmental outcome of this action may result in an increased demand for homes with green features, which could translate to greater levels of residential retrofitting within the existing housing stock to meet the market demand.

Impact

When determining the impact of the behaviour, it is important that both the action itself and the greater environmental outcome are evaluated (McKenzie-Mohr, 2011). Encouraging a homebuyer to consider, and buy, a home with green features is important in and of itself, as it fosters a growing group of eco-conscious homebuyers whose wishes go beyond the traditional square footage and aesthetics of a dwelling. In accordance with the laws of supply and demand, an increased demand for green homes within the local real estate market may, in time, impact the supply (Gale, 1955). As prospective homebuyers add green features to their home buying 'wish-lists,' homeowners may be further encouraged to implement green retrofits throughout their residence, with the assurance that a retrofit will both increase the short-term efficiency and livability, while also providing a long-term return on investment by way of

decreased utility costs and an increased resale value (Crosbie & Baker 2010; Garcia et al., 2017; Gram-Hanssen, 2014)

Probability

As prescribed by McKenzie-Mohr, 2011, one must consider the probability of the target audience engaging in the desired behavior. The annual report prepared by the Canadian Home Builders Association (CHBA) on Canadian Homebuyer Preferences offers insights into which sustainable features homebuyers are looking for and their interest level in each. The 2020 report was based on a survey of 27,674 new homebuyers spanning eight provinces noting that the probability of a prospective homebuyer purchasing a home with green features are as follows:

- 58.9% of respondents deemed a home's 'overall' energy efficiency to be a 'must have' for purchase, with 30.7% noting it to be something they 'really want' in a home. Energy efficiency was the third highest requested feature among those surveyed.

- 53% of respondents stated their motive to incorporate energy efficiency was to reduce utility costs.

- 16.2% of respondents would spend an extra $10,000 on a home if it meant that they could buy an energy efficient home.

- Energy efficient appliances were the number one ranked 'overall feature' of importance to homebuyers, with 64% of respondents noting it as a 'must have.'

- In reference to the penetration of sustainable behaviour, 42.6% of respondents paid extra to achieve energy efficiency in their current home.

The findings from the survey indicate that homebuyers would engage in the desired sustainable behaviour of purchasing a home with green features, as this was identified as one of the top three selling points in their consideration of a new home. Further, and in line with Lauterborn (1990), the CBHA's survey results effectively refine one of the 'C's' within the revised Marketing Mix, namely key information on the 'customer'. A customer's specific wants and needs should

be prioritized over that of the 'product' or the 'price,' customer preference studies are important to refine which green features (if any) a prospective homebuyer may be looking for, and how this 'wish list' can be met by the market.

2.4   Barriers Faced by 'Green-minded' Homebuyers

2.4.1   Information Barrier

The 'energy paradox,' presented by Jaffe and Stavins (1994), speaks to 'informational failures' on the availability of 'economically superior technologies,' specifically that of sustainable features within homes, resulting in an individual's aversion to act upon them. Similarly, it is widely cited that homebuyers are lacking the information on green features required to make an informed decision and, thus, hold a knowledge gap on this home buying consideration (Bond, 2015; Gee, 2010; Judge et al., 2019; Lakic et al., 2021). Berker and Risholt (2013) asserted that, "every engagement with the building that doesn't include energy efficiency improvements is a missed opportunity," and there is no reason why this should not include residential real estate transactions (p. 1022).

Home buyers can also be underinformed or misinformed on the topic of green features by key actors in the home buying process, which can present an additional barrier to decision-making. As outlined in Bently (et al., 2015), and reiterated by the CREA, misinformation or a lack of education may be a systemic concern, with the real estate professionals requiring further education on the identification and valuation of a property's sustainable features (Canadian Real Estate Association, 2021). In addition to mandated training on residential green features for real estate appraisers, comes the assertion that the current searchable real estate databases (such as the former MLS listings database) simply exclude the information required to make conclusive determinations on a property's green features (Bently et al., 2015). Specifically, "if reliable property database is not designed, implemented, and maintained, we may see a perpetual exclusion of sustainable features going forward" (Bently et al., 2015, p. 126). While

searchable online databases are one of several tools used by real estate professionals, they are also frequented by prospective homebuyers and are one of the main steps in their home search (Yean Yng Ling & Gee, 2010). In 2021, 81% of prospective Canadian homebuyers used the online REALTOR real estate listing platform for the purchase or sale of their home, with 111 million webpage visitors in 2021 (up 53% from 2020) (Canadian Real Estate Association, 2022; Realtor.ca., 2022). In 2020, 97% of all prospective American homebuyers relied on the internet in their home search. If this primary platform does not highlight a listing's green features (regardless of the magnitude of the features themselves), how does a prospective homebuyer in pursuit of a sustainable home overcome this knowledge gap?

Influence of the Marketing Mix

Moving away from the one-way communication track of 'promotion,' Lauterborn (1990) identified 'communication' as a shared dialogue between company and consumer. Effective communication – both between the 'seller' and the 'buyer' – and the on-going sharing of information amongst the key actors in the home buying process is integral to addressing the systemic knowledge gap on green features (Bond, 2015; Gee, 2010; Judge et al., 2019; Lakic et al., 2021). Identifying where real estate information is shared and reviewed by customers (such as online listing databases) presents an area of communicative opportunity and a place to begin the conversation on a home's green features. Should an online listing present key information on a home's green features, a prospective homebuyer can review these details in their consideration process, establishing a two-way dialogue with the real estate professional to understand the home's comprehensive offerings, fulfilling the new age of marketing communications (Lauterborn, 1990).

2.4.2   Economic Perspectives

When searching for a home, the affordability and associated costs of the transaction are a key element in the consideration process of a prospective homebuyer, with many buyers filtering

their home search through a predetermined budget (Eves & Kippes, 2010). Similarly, any features of the home that may increase the homebuyer's upfront capital investment, such as green features, require further evaluation and consideration (Bond, 2015; Eves & Kippes, 2010; Judge et al., 2019). Prospective homebuyers often associate green features with an increased purchase price and, as such, these features may be limited to buyers within higher income brackets (Eves & Kippes, 2010). As identified in Judge et al. (2019), prospective homebuyers are conflicted in their perception of the affordability of a home's green features. When asked to provide 'free associations' with sustainable housing, negative associations (including cost) were expressed in 1.3% of the responses. Conversely, 'affordability' (likely, long-term) was noted in 6.3% of the 'first thoughts' that came to the respondents' minds. These conflicting associations could be in response to the type, or rather, the depth of green feature the homebuyer has in mind. As outlined in the Canadian Home Builders Association 2020 survey, power generation (i.e., solar, electric, and geothermal), while tending upwards in terms of homebuyer importance, is indicated to be wanted 'if affordable'.

Despite a potentially higher purchase price, prospective buyers remain interested in buying a home with green features. This interest to spend incrementally more on a home with green features is established in numerous studies on the homebuyer's 'willingness to pay' (Eves & Kippes, 2010; Goodwin, 2011; Judge et al., 2019; Lakic et al., 2021; Patel & Chugan, 2016; Yean Yng Ling & Gee, 2010). This finding was reiterated in the Canadian Home Builders Association 2020 survey, whereby 16.2% of respondents would spend an extra $10,000 if it meant that they could buy an energy efficient home, with 42.6% of respondents paying extra to ensure that these features were in their current home. In the case of making an additional capital investment on a home with energy efficiency features (such as heating controls), homebuyers may heavily discount future energy savings, or miss expected costs within their calculations, as a means of justifying an additional large investment (Lakic et al., 2021).

The cost-benefit analysis of a homeowner's green retrofit decision making is well documented, whereby homeowners are encouraged by the forecasted payback on their capital investment (de Wilde & Spaargaren, 2018; Jia et al., 2020; Wilson et al., 2015). Likewise, the energy cost savings can be framed as a barrier, given that homeowners would be reluctant to have delayed gains on their retrofit technology investment (Wilson et al., 2015). The literature has identified the importance of clearly outlining the costs and corresponding benefits (both financial and otherwise) of a home's green features to allow potential homebuyers to accurately weigh the options of investing (Bently et al., 2015; Garcia & Mollaoglu, 2017; Lakic et al., 2021); however, it also notes that the industry is lacking tools to develop a cost-benefit analysis (Borth & Summers, 2017).

While studies outlining the real and perceived costs provide insight into a prospective homebuyer's sustainable behaviour, it is unclear whether these findings are indicative of the Canadian market. The socioeconomic and cultural values of homebuyers, as well as the local economic factors, vary between Canada and each of the countries in which this foundational research has taken place (e.g., United States, Greece, United Kingdom, Netherlands, Australia, New Zealand, Singapore, and India). While these studies have been used to examine how real and perceived cost can be a barrier to a prospective homebuyer's sustainable action, the valuation of green features may not be reflective of a Canadian setting.

Influence of the Marketing Mix

As outlined in Lauterborn (1990), the 'cost' of a customer's wants and needs extend beyond the associated price tag, with a similar theme being reflected in McKenzie-Mohr's (2011) criticism of the Economic Self-Interest Approach. When evaluating the barrier of cost, one must approach the acquisition in question (i.e., the purchase of a home with green features) from the customer's perspective. In doing so, the customer's perception of cost may be greater than the increased sale prices outlined above and could also include the system maintenance and replacement costs, the time investment and learning required to understand the operation and

upkeep of a new system, as well as the potential behavioural or lifestyle adjustments that could be required to live with a new system/technology.

2.5 Motivations for 'Green-Minded' Homebuyers

A favourable cost-benefit analysis is not the only motivating factor in a prospective homebuyer's consideration process. Relevant literature has also identified that a prospective homebuyer can be positively influenced by the lifestyle and comfort factors that are associated with owning an energy efficient home.

2.5.1 Liveability

Economic incentives, such as lower utility costs, may be a key driver when purchasing a home, but relevant literature suggests that the decision to buy a home with green features goes beyond the Economic Self-Interest Approach or cost-benefit analysis. Crosbie and Baker (2010), and later, Gram-Hanssen (2014), discuss how inhabitants of an efficient home will benefit from social and lifestyle impacts of green features, including increased comfort levels and the aesthetic value of the dwelling. These influences on lifestyle are further reflected in Judge et al.'s (2019), 'free expressions,' with 6.1% of the respondents' associations speaking to a home with green features being 'long-lasting' and 4% of the associations speaking to it being 'livable'.

While some studies speak to the aesthetic benefits of an efficient home (Hodgson, 2016; Sunikka-Blank & Galvin, 2016), the literature emphasizes the increased comfort offered by a home with green features (Bond, 2015; Consumers Council of Canada, 2018; Crosbie and Baker, 2010; Gram-Hanssen, 2014; Romanach et al., 2017). Comfort, specifically thermal comfort, is a key consideration in the Passive House model. Regardless of the regional climate, the Passive House model uses energy efficient planning and design principles to achieve thermal comfort all year round, while maintaining optimal efficiency (Grove-Smith & Bosenick, 2018).

While the existing body of literature on the prevalence and communication of green features within the real estate market is notably limited, there was a considerable amount of information

on the types of green features available within home- from which a master list was populated. The literature-driven 'barriers' and 'enablers' to the consideration and purchase of a home with green features were reviewed in line with the principles of the CBSM and Marketing Mix frameworks to identify how the barriers might be minimized and the enablers might be maximized to promote the desired sustainable action. This study will establish if and how the identified barriers, such as minimal or miscommunication on green features and perceived costs, or the enablers, such as revenue-driven information on green features and home comfort, are realized by a green-minded prospective homebuyer during the online stage of their home search process.

3   Methodology

3.1   Research Design

This research investigates the marketing and availability of green features within a segment of the Ontario residential real estate market- a topic, and geography, which were unstudied within the literature. The research aims to identify if a residential dwelling's green features are marketed within the online real estate listing, and if so, which green features are communicated to prospective homebuyers. Alternatively, if the home listing was not being used as a tool to communicate the green features that a home had to offer, the research sought to determine what features *were* being marketed to prospective homebuyers. Through the lens of the CBSM and Marketing Mix frameworks, this research aims to understand what barriers and benefits may be faced by a prospective homebuyer looking for green home features, and how the market may be improved to promote the successful marketing and sale of natural resource efficient homes.

As outlined in Section 2.4.1, prospective homebuyers are turning to online home listings as the pivotal first stop in their home shopping experience, with many buyers using online listings to identify which properties meet their purchase criteria or 'wish list.' An analysis of online residential home listings provided insight into the types of communication being advertised to prospective homebuyers during this pivotal stage in the home purchasing process.

With limited existing research on this topic, the study featured an exploratory approach whereby online residential real estate listings were reviewed on Realtor.ca. Garnering over 111 million webpage visitors in 2021, Realtor.ca (formerly Multiple Listing Service, MLS) is the online real estate platform used by the majority of Canadian homebuyers and sellers (Realtor.ca., 2022). Through the lens of a 'green minded' homebuyer, qualitative data was collected from the online real estate listings using an exploratory e-mystery shopping technique.

Beginning in financial services, and progressing to the retail and tourism industries, covert, or mystery shopping has evolved into a tool to gauge consumer satisfaction and identify areas of opportunity in the customer experience (Anderson et al., 2001, Erstad, 1998; Wilson, 1998). The Mystery Shopping Professionals Associations (MSPA,) is the largest global trade organization of anonymous resources, with a mission to "connect and support the businesses that influence customer experiences through managing, quantifying, interpreting, enhancing and re-defining the customer experience" (MSPA Americas, 2021, n.p.). Taking a qualitative approach to the complete customer experience, effective mystery shopping requires two key elements: 1) A seemingly ordinary, but covertly well-trained, shopper to observe and engage in the pre-determined shopping behaviours and, 2) a sampling tool within which the shopper's experiences are being measured against the pre-determined criteria, allowing for future ranking and analysis (Medhipour, 2021). A growing e-commerce market, across a variety of industries (from retail to automotive sales,) has resulted in the rise of online mystery shopping, or 'e-'mystery shopping. E-mystery shopping has also been used as a tool to identify the 'green' marketing of a product or service, and the ways in which a consumer's sustainable purchasing decision may be encouraged, or discouraged (Matthews et al., 2017; Medhipour, 2021; My Sustainable Canada, 2013).

3.2   Data Collection

The research featured two stages of data collection, with the goal of simulating the two-stage home search process employed by prospective homebuyers (see Section 1.2). In the online-era, prospective homebuyers are beginning their home search using online listing searches, with Realtor.ca being among the most trafficked home listing database in Canada (Realtor.ca., 2022). Realtor.ca allows prospective buyers to filter the available home listings by a vast range of criteria within a targeted geographical area to meet their specific search criteria. Prospective homebuyers commonly use the online home listing review stage to digitally view a variety of properties that meet their criteria and identify a subset of homes that are worth further

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consideration or in-person viewing (Canadian Real Estate Association, 2022). To simulate this first stage of the home buying process, online real estate listings were collected from Realtor.ca and reviewed against set parameters, as outlined below.

3.2.1   Sample Area

The research examined three regions of Hamilton, Brant, and Halton (inclusive of Oakville, Burlington and Milton). The profiled regions include a wide range of communities and presented a large selection of residential real estate listings for a prospective homebuyer. Please refer to the map presented below (Figure 3.2.1) for a visual listing of the communities included within the sample regions. The regions of Hamilton and Halton are situated within popular Greater Toronto and Hamilton Area (GTHA), with Brant offering a more rural locale situated just outside of the GTHA 'bubble'. The regions offer a diverse range of property types (from large farm acreages to small suburban lots), a variety of socio-economic environments, as well as a mix of low- and high-density urban areas. The Ontario real estate market has been notably 'hot' in recent years, with the GTHA being the epicentre of the real estate action (Fox, 2022).
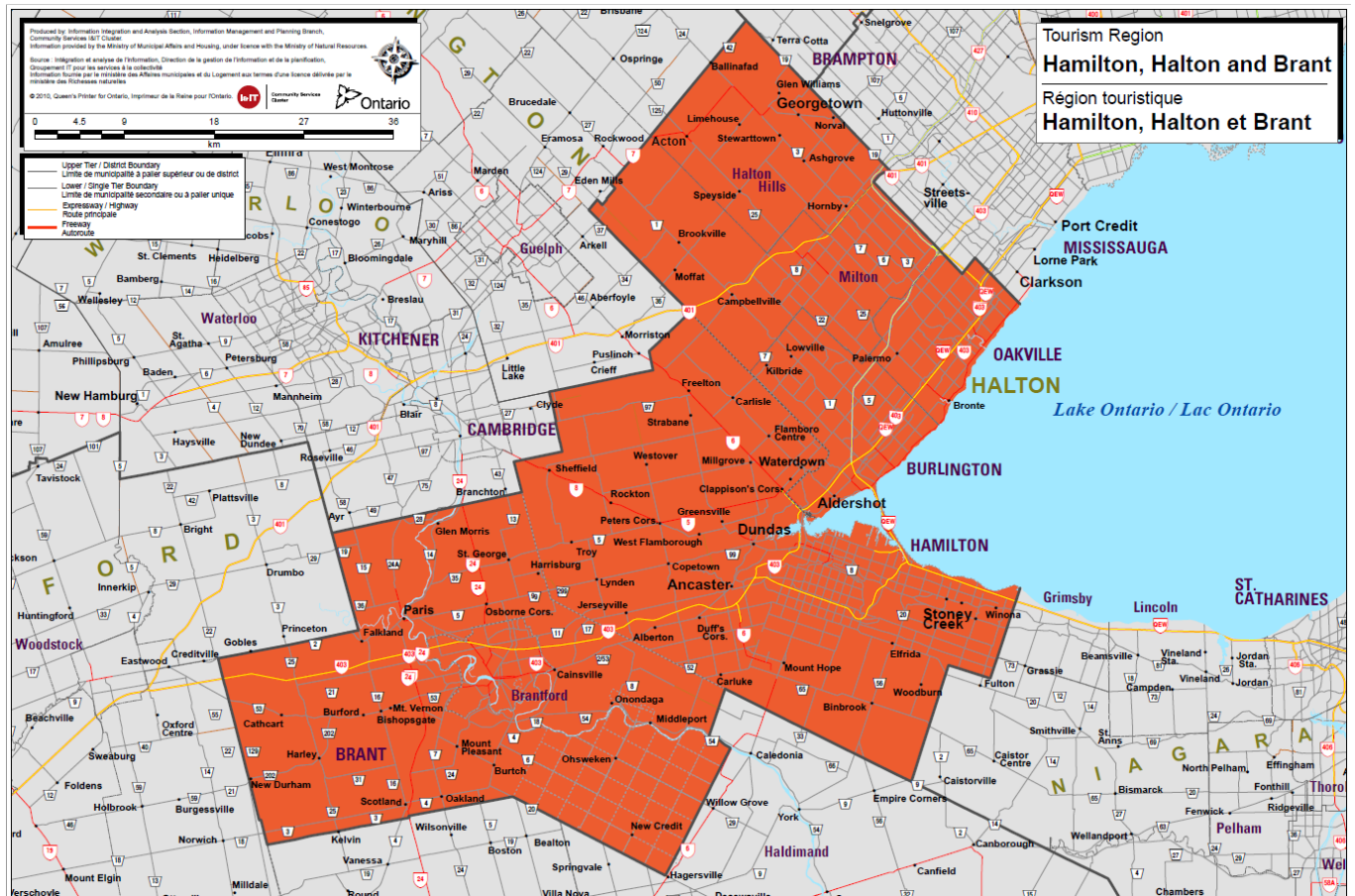
Figure 3.2.1: *Map of Hamilton, Halton and Brant Regions (Government of Ontario, 2022)*

3.2.2   Coding of Online Real Estate Listings

Online real estate listings from each of the Hamilton, Halton and Brant Regions were collected from Realtor.ca, with 500 property listings reviewed between March 20, 2022, and May 26, 2022 (i.e., nine weeks). The National Association of Realtors (NAR,) 2021 homebuyer profile places the average home search at eight-weeks, with 95% of buyers leveraging online search tools throughout their search. This timeline is reflective of the average home search, with the majority of the listings being sampled in the first two weeks of the data collection window and more listings being sampled as new offerings became available on the market.

Search Filters

The first stage of the data collection involved the collection of online real estate listings from Realtor.ca, and, specifically, Real estate listings were filtered to include residential properties only (i.e., did not include commercial properties). Setting up the search, the desired region was typed into the engine's search bar (e.g., Hamilton, Ontario) which was further confirmed by selecting the appropriate location as it appears in the automatic drop-down menu. Next, the available real estate listings were filtered by the following criteria:

1. Property Type: **"Residential"** – To exclude other property types such as, agriculture and vacant lots.

2. Transaction Type: **"For Sale"** – This research focused on the information shared during the home buying process, as such this filter excluded properties that were listed for lease/rent.

3. Building Type: **"House"** – As to exclude other building offerings (row/townhouse, apartment, duplex, triplex, fourplex, garden home, mobile home manufactured home, special purpose, residential/commercial mix, commercial apartment, two apartment house, park mobile home and float homes.)

4. Building Style: **"Detached"** as the only selection. This research focused on the green features that were being offered of a listing's building envelope and property. As the building envelope of a detached house can be clearly defined, detached homes were selected to be the focus of this research.

5. Ownership/Title: **"Freehold"** – This research focused the information being shared with prospective homebuyers, as such this filter only included real estate listings that were seeking complete ownership.

The complete filter selection inputted into Realtor.ca is presented within Figure 3.2.2.a, below.
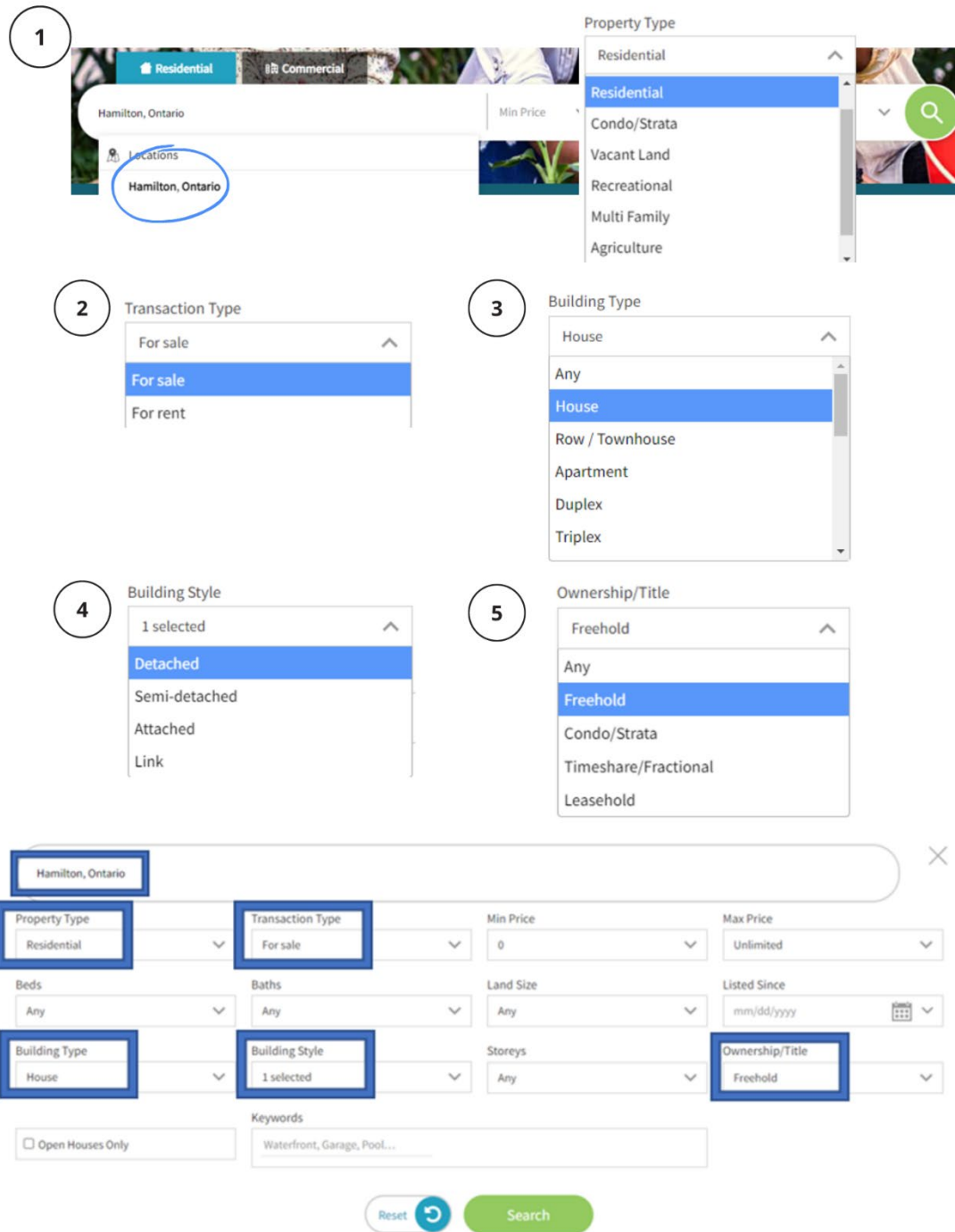
Figure 3.2.2.a: *Inclusions Selected on Realtor.ca Search Filters*

The resulting search provided a map overview of the listings that matched the filter criteria both

within the area of focus (the boundaries which were outlined in red,) as well as the surrounding

listings for the homebuyer's consideration. As this study required an exclusive focus on the listings within the regional boundaries, the map was further tailored by selecting "search within boundary," and then toggling the search display to "list" view.
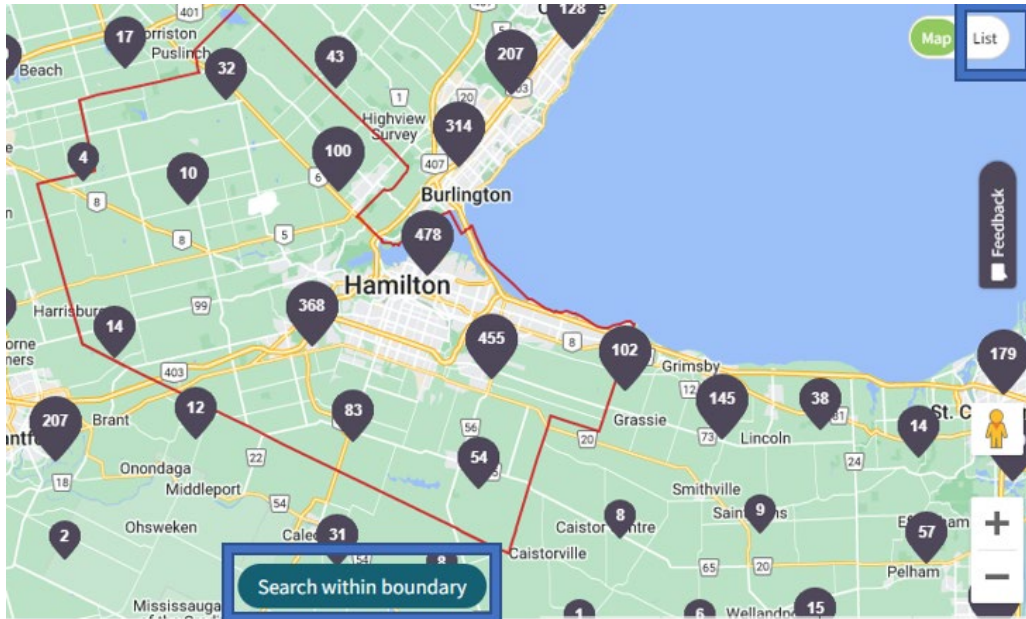
Figure 3.2.2.b: Regional Search Results- Map View

When the search process was complete, the Realtor.ca search engine generated a collection of real estate listings, with a thumbnail icon (outlining the main photo, price, address, and number of beds/baths) for each. From here, the prospective homebuyer could sort the home listings by the date listed (newest) and price (high to low and low to high). As this research aimed to get a representative sample of the current listings available in each region, including the variety of listing price points, the listings were sorted by date instead of price.
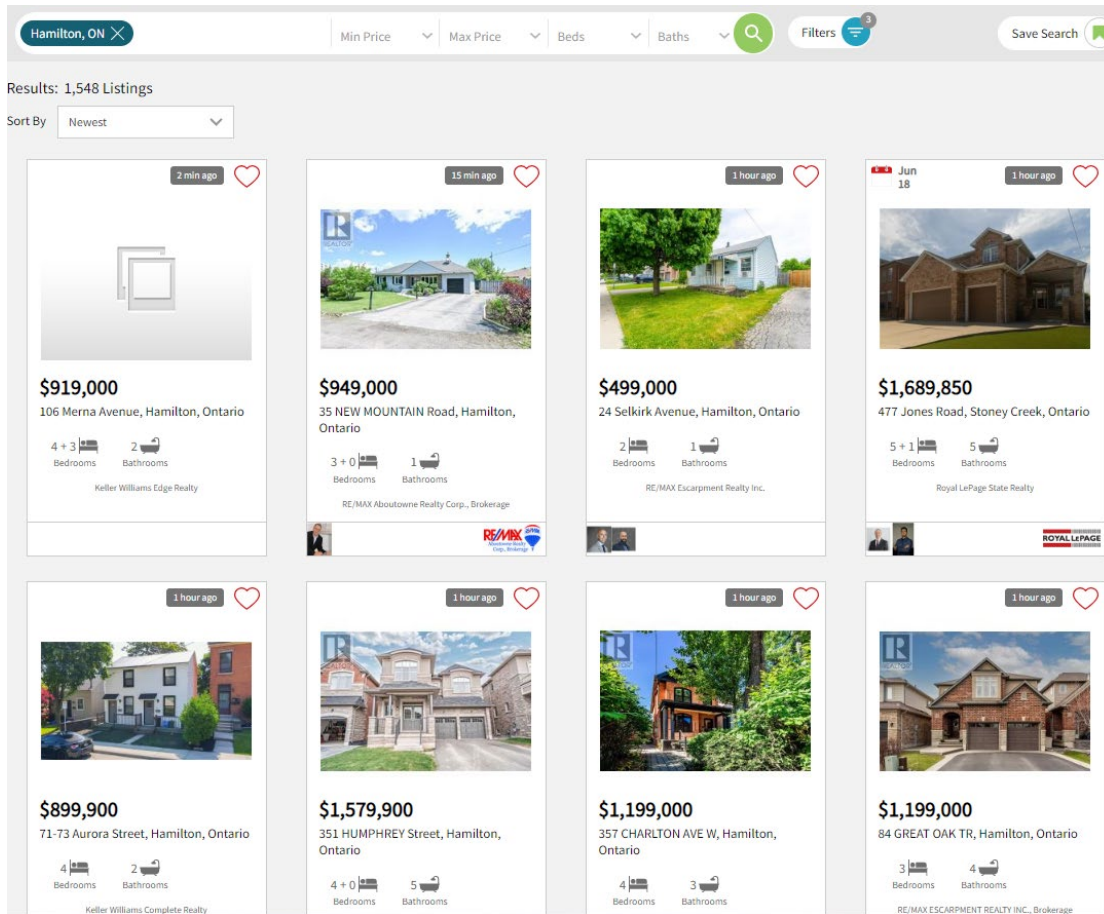
Figure 3.2.2.c: *Regional Search Results- List View*

A number of filter options were not utilized for the purposes of data collection, including the minimum and maximum price which aids prospective homebuyers with refining the listings on a budget-based criteria. By leaving the price range fields blank, the search captured the full price range of the regional market since green features is not necessarily restricted by budget. The number of beds and baths, storeys, and land size, were similarly not filtered in order to generate a data sample with a variety of different properties, reflective of regional offerings at that time. Further, the 'listed since' filter was left blank, as the real estate listings were systematically sampled throughout a nine-week e-mystery shopping period.

The filtered real estate listings were presented in a list-format on Realtor.ca, and from which listings were systematically sampled for an e-mystery shopping review. In line with the practises of

systematic data sampling, the resulting set of listings were filtered by date posted and, beginning at the first available property, every second listing presented within the filtered list was selected for an e-mystery shopping review (Creswell & Creswell, 2018). While it was uncommon for an incorrectly filtered property to be listed within the search engine's results, there were numerous vacant lot properties that featured a projection of a residential dwelling, or a structure that the property was permitted for. In the absence of a built structure, these listings were excluded from the sample. Further, the filtered list suggested that a realtor could post the same property on multiple different dates, a marketing tactic that may be used to yield greater listing traffic. This practise resulted in the same real estate listing appearing multiple times, over the course of multiple dates, within the search engine results. In the event that the systematic sampling methodology resulted in the selection of a listing that did not meet the criteria (inaccurately filtered,) or a duplicate listing, the listing that appeared next within the filtered list would be selected, and the systematic sampling process would continue. A total of 500 listings were reviewed.

E-mystery Shopping Process

This section will outline the e-mystery shopping process of each sampled real estate listing, including the home features reviewed and the types of data gathered from each. The information collected during the e-mystery shopping process was entered into a customized excel spreadsheet for ease of data analysis. Additionally, a .pdf file of each sampled listing was saved for future review. Each sampled listing was reviewed using a four-step process, ensure sampling consistency and replicability, with the information being collected as follows:

3.2.3   Listing Overview Information

General information was collected on each listing, to provide differentiating facts on the property as well as inform a regional baseline, for further analysis. These general listing features

include the property's price, address, Multiple Listing Service (MLS) number and the number of days the property has been listed for sale.

Figure 3.2.3.a: *Listing Overview Information*

Continuing down the online listing, further details are gathered to inform the listing overview, including the year the house was built (if available) and the acreage size accompanying the home (if available). Should listings not offer the age or acreage of the property, select listings were cross referenced on the HouseSigma online real estate tool (housesigma.com) to confirm the year the home was built and the corresponding lot size. Lastly, the listing description was copied into the data sheet for further coding and analysis.

Description

Charming 2 story detached family home in sought after west mountain location. Previous builder's model home conveniently closed to schools, parks, meadowlands shopping district, community center and easy highway access. Over 100K on upgrade including gourmet kitchen with high-end cabinet & crown modeling, granite countertop, under cabinet lighting. 9 ft ceiling in main floor. Great room has hardwood floor & fireplace. Hardwood spiral staircase towards second floor offer you 3 spacious bedrooms, laundry and loft area with hardwood floor(2016)throughout. Master bedroom contains 5 pics ensuite bathroom with separate shower & jet tub and walk-in closet. Professionally finished basement provide extra living space with recreation room & 3pc bath. Private backyard has concrete patio for summer entertaining. Easy maintained concrete double driveway and double garage. Lots of pot lights, crown modeling, rough-in central vacuum, garage door(2019), new washer & dryer(2020),prewired speaker system, California knock-down and much more! Move in ready home waiting for your quick action! (28288214)

Location Description

URBAN

Property Summary

Property Type	Building Type	Storeys
Single Family	House	2

Title	Land Size	Built in
Freehold	40.03 x 101.71|under 1/2 acre	2007

Annual Property Taxes	Total Parking Spaces	Time on REALTOR.ca
$6,163.70	4	2 days

Figure 3.2.3.b: *Listing Description Information*

								Listing Overview	
Recovery Date	Region	Address	MLS #	Build Year	Acreage	List Price (CAD)	Time on REALTOR.ca	Description	
3/20/2022	Hamilton	8 Sunbeam Drive Hamilton, Ontario L9B2X9	H4129280	2007	< 0.5	1,199,000	2 days	Charming 2 story detached family home in sought after west mountain location. Previous builder's model home conveniently closed to schools, parks, meadowlands shopping district, community center and easy highway access. Over 100K on upgrade including gourmet kitchen with high-end cabinet & crown modeling, granite countertop, under cabinet lighting. 9 ft ceiling in main floor. Great room has hardwood floor & fireplace. Hardwood spiral staircase towards second floor offer you 3 spacious bedrooms, laundry and loft area with hardwood floor(2016)throughout. Master bedroom contains 5 pics ensuite bathroom with separate shower & jet tub and walk-in closet. Professionally finished basement provide extra living space with recreation room & 3pc bath. Private backyard has concrete patio for summer entertaining. Easy maintained concrete double driveway and double garage. Lots of pot lights, crown modeling, rough-in central vacuum, garage door(2019), new washer & dryer(2020),prewired speaker system, California knock-down and much more! Move in ready home waiting for your quick action! (28288214)	

Figure 3.2.3.c: *Corresponding Excel Datasheet Entry*

3.2.4 Listing Description Analysis

The description of each sample listing was subject to an in-depth review, with a focus being placed on the beginning of the listing description. In line with the first 'P' of the Marketing Mix, it is important that the seller understand who may want the product, and why, highlighting the product's best qualities to meet the consumer's needs. As such, the first step of the listing description analysis focused on the top five, or most important, features that were being communicated to the prospective homebuyer. After the entire listing description was entered into the datasheet, the first five features mentioned within the description were categorized and recorded into the data sheet for further analysis. The description field of a real estate listing provides the real estate agent with an opportunity to communicate property highlights to a prospective homebuyer beyond what could be conveyed through standard property filters. Commonly, the description field is used to 'draw' prospective buyers in, with a description that compliments the photos of the home. As Realtor.ca does not provide a dedicated section for a property's green features, it was anticipated that these details would be shared in the listing's description.

A preliminary review of 25 listings was performed to identify trends in the type(s) of information being shared in the real estate listing descriptions. The preliminary review informed the creation of the comprehensive data sheet, including the criteria collected in the listing overview (outlined above), as well as the categorization of information commonly shared in the listing descriptions. The common themes identified in the home listing description fields are categorized in Table 3.2.4.a.

Table 3.2.4.a: Listing Description Categorization Examples

Description Category	Definition	Example Listing Descriptions *(Quoted directly from the listings)*
Structure Type/Size	Reference to the type of structure, build, square footage, builder reference	• Solid Brick 3 Bedroom Bungalow • Brand New 36Ft Carousel Model Losani Built Detached Home • Built by Empire Homes in 2018, one of the biggest models at the time.

		• Rare Gem Of A Raised Ranch-Style Bungalow • Bright & Spacious 4-Level Backsplit
Neighbourhood/ Location	Reference to the locale, neighbourhood perks, proximity to locations, school districts, reference to parks/greenspace.	• Great Location Within Walking Distance To Gage Park, Stadium And Future Lrt Stop. • A Brantford Gem Tucked Away In The Beautiful ""Cedarland"" Community • This Ideal Family Home Is On A Quiet Cul-de-sac, Steps Away From Walking Trails, Schools and Playgrounds • Nestled In The Coveted South Oakville Community Of Bronte Village • Have you been looking to live the life of peace & tranquility in a fabulous location snuggled in amongst trees with views of open fields & sunsets. • Located On Quiet Cul-De Sac Is Within Walking Distance To The Beautiful Grounds Of Appleby College, Lake Ontario, Ymca, Parks And Minutes Drive To The Heart Of Downtown Oakville. • Backing Onto Greenspace & Facing The Escarpment. • It is located close to schools, shopping and highway access.
Garage Structure/Parking	Reference to the driveway size, garage size, permitted vehicle parking, shop outbuildings.	• No Side-Walk (6 Parking Spots In Total) • Large Double Wide Private Driveway With 5 Car Parking Including A Single Car Garage With Side Door Entrance • Garage With Inside Access, Parking For 6 • Garage is perfect for car enthusiasts.
Property Upgrades	Reference to the investment in upgrades, dates of replacement/ installation, emphasis on 'new' features	• Updates Since 2014: Roof, Landscaping, Patio, Furnace, A/C, Kitchen, Bsmt & More • This 2 storey home was built in 2007 but has been incredibly updated that it's practically a new home. • Over $100K In Upgrades. • Furnace & Ac 2018, Roof 2020. • Wow 2 Basement Apartments
Lot Size/ Features	Reference to the property on which the home is situated, acreage, property features (pools, sheds, decks etc.)	• The 132' deep lot provides additional yard space for the family! • On Huge 211' Long Lot! • Oversized Pool W/ Ample Size Yard. • The backyard boasts a covered porch with plenty of room for outdoor dining. • Premium lot featuring a professionally landscaped yard with a salt water POOL • The Backyard Is A Generous Size, Fenced Around, Nicely Landscaped With Extra Storage In The Shed. • The kids and pets will love the 160' deep lot with loads of space. • Nestled On A 70'X209' Manicured, Setting With, Salt Water Inground Gunite Pool (19) (20X40), Custom Pool House With Kitchen, Change Room, & Storage

		• The huge 62-ft by 170-ft lot features a fully fenced rear yard with a large patio for outdoor entertainment.
Aesthetic Features	Reference to home style, designs, tastes, finishes and details.	• Freshly Painted. 9 Ft Ceiling On Main Flr. New Laminate Flr On Main. Chef's Delight Grand Eat-In Kitchen With Tall Cabinets, Pantry, Breakfast Bar And Breakfast Area • Featuring A Spacious And Airy Foyer With Huge Double Closets • Gorgeous Finishes And Features Such As Maple Hardwood Flooring Throughout, 9Ft Ceilings On Main And 2nd Floors, Gas Fireplace • Stunning Finishes: Hardwood, 9Ft Ceilings (Main & 2nd), O/C Layout W/ Fireplace, Potlights & Crown Moulding In Living/Dining. Quality Kitchen W/ Quartz Counters, Backsplash, S/S Appliances, Pantry & Island. • Kitchen W/Quartz Counters, Walk-In Pantry, Under Cabinet Lighting & Gas Stove
Interior Layout	Reference to the number of bedrooms, bathrooms, flow of the home, written 'walk throughs.'	• Very well loved 3+1 bedroom family home. • Walk Into The Inviting Main Floor Which Features A Cozy Sitting Room With Electric Fireplace Adjacent To A Dining Area, Currently Used As A Music Room. • It Offers 4 Bedrooms, 3.5 Baths, Great Entertaining Space And A Fully Finished Basement. • Spacious 3 Beds & Generous Sized Office On Main Floor - Can Be Used As A Family Room. Sep Dining & Living!
Inclusions	Reference to the home's features that will be included with purchase.	• EXTRAS **** All Appliances, All Lighting Fixtures • EXTRAS **** Built-In Dishwasher, Fridge, Stove, Washer, Dryer, All Elfs, All Window Coverings, C/Vac, Gdo, Workbench • EXTRAS **** All Designer Lightings, Stainless Steel Appliances (2020), Upgraded Washer/Dryer, All Window Coverings Super Quiet Garage/Remote(S), Ring Security, Projector/Speakers. • EXTRAS **** Fridge, Stove, Washer(2018),Dryer (2018).Bathroom Cabinets & Mirrors, Tool Bench In Bsmt, Armoire In Bsmt, Rain Barrel, All Window Coverings, All Elfs, Fridge In Bsmt. • Include: Fridge, Stove, Dishwasher, B/I Microwave, Washer, Dryer, Gazebo, Tv Wall Mount, Elfs, Window Coverings, Garage Door Opener + Remote, Basement Fridge, Roll Away Dishwasher, Bookcases.
Price/Rental Income	Reference to the value of the home, regional comparables, rental potential.	• Showcasing 2-2bedroom units and a fully finished basement with its own separate entrance! • Stunning up/down duplex now available • Potential To Be Converted 1 Bed Aprtmt For Rental • Priced At Market Value

| | | • This amazing multi-family country property has two homes! |
| | | • The Main home (4BDRM) plus a 2nd home (2BDRM) which is currently rented for $1600/month. |

Sample Listing Description Analysis

In the data analysis process, each home listing description was copied into the data sheet and reviewed in its entirety. The first five features of the description were categorized within the data sheet to develop an understanding of the prominent pieces of information being shared with prospective homebuyers at the beginning of the listing. Should a listing present fewer than five details about the property (i.e., short listing descriptions), the available features were noted with any remaining fields left blank. An example of the categorization process is provided in Figure 3.2.4.a.

Overview	Top 5 Features Mentioned Within Description				
Description	First	Second	Third	Fourth	Fifth
Charming 2 story detached family home in sought after west mountain location. Previous builder's model home conveniently closed to schools, parks, meadowlands shopping district, community center and easy highway access. Over 100K on upgrade including gourmet kitchen with high-end cabinet & crown modeling, granite countertop, under cabinet lighting. 9 ft ceiling in main floor. Great room has hardwood floor & fireplace. Hardwood spiral staircase towards second floor offer you 3 spacious bedrooms, laundry and loft area with hardwood floor(2016)throughout. Master bedroom contains 5 pics ensuite bathroom with separate shower & jet tub and walk-in closet. Professionally finished basement provide extra living space with recreation room & 3pc bath. Private backyard has concrete patio for summer entertaining. Easy maintained concrete double driveway and double garage. Lots of pot lights, crown modeling, rough-in central vacuum, garage door(2019), new washer & dryer(2020),prewired speaker system, California knock-down and much more! Move in ready home waiting for your quick action! (28288214)	Structure Type/Size	Neighborhood/ Location	Property Upgrades	Aesthetic Features	Interior Layout

Figure 3.2.4.a: *Sample Listing Description Analysis and Coding*

Green Feature Attributes

The final stage of the listing description analysis was a review for any mention of a home's green features. If the listing contained no mention of green features, this section of the data sheet

would calculate a total of '0' which was programmed to format the cell as 'red/bad'. If the listing mentioned the property's green features, they were identified and categorized in line with the key features identified in the literature review. The green feature categories captured within the datasheet are outlined as follows:

- **Heating/Cooling/HVAC- Related Features**
  - Home Insulation
  - Window Efficiency/Glazing
  - Air Sealing (windows and doors)
  - High Efficiency Furnace
  - Air Exchange System
  - Heating/Cooling/HVAC Other

- **Lighting- Related Features**
  - LED Lighting
  - CFL Lighting
  - ENERGY STAR Fixtures
  - Lighting Other

- **Water-Management Related Features**
  - Tankless Hot Water Heater
  - Low flow or Dual Flush Toilets
  - Low Flow Fixtures (I.e., Faucets, Showerheads)
  - Rainwater Harvesting System
  - Water Management Other

- **Renewable Energy Features**
  - Solar Photovoltaic (PV) System
  - Solar Thermal System
  - Geothermal System

- o Conductive Flooring

- o Renewable Energy Other

- **Other Green Features**

  - o High Efficiency Appliances

  - o Environmentally preferable building materials

  - o Energy Star Rating

  - o Other (unlisted)

Any mention of green features was entered into the corresponding category, using the drop-down menu feature in Excel. Should a listing mention multiple green features, the data sheet was structured to report up to three features mentioned within each category, with the total number of listing features being calculated as the final stage in the listing review process.

Heating/Cooling/HVAC-Related			Lighting-Related			Water-Management Related			Renewable Energy			Other Green Features?			TOTAL # GREEN FEATURES
First	Second	Third	First	Second	Third	First	Second	Third	First	Second	Third	First	Second	Third	
						Tankless Hot Water Heater									
						Low flow or Dual Flush Toilets									
						HE Fixtures (Faucets, showerheads)									
						Rainwater Harvesting Sytem									
						Other									

Figure 3.2.4.b: Sample Green Features Entry into Datasheet

Sample Summary

The complete dataset included 500 real estate listings, wherein 100 listings were systematically sampled from each region of focus (Brant, Hamilton, and Halton, which included the sample areas of Milton, Burlington, and Oakville). This study considered two approaches to sample size: 1) proportionate sampling to the population size or quantity of available online listings or 2) a larger pre-set sample size that was consistent across the regions. A proportionate sample based on the population size would have resulted in the region of Milton (with a population of 22,851),

having a fraction of the listing consideration in comparison to Hamilton (with a population 569,353). Further, the erratic real estate market behaviours at the time of sampling on Realtor.ca, along with the unknown number of duplicate listings within the filtered list made proportionate sampling based on the quantity of available online listings unachievable over the nine-week "shopping" window. As this research aimed to both analyze the data sample as a whole, as well as draw a comparison between the regional datasets, a pre-set sample size that was consistent across all regions was employed to make it statistically possible to compare the results of each region.

Each listing was documented in the data sheet, whereby a minimum of 15 attributes were collected for further analysis. Beyond the mandatory 15 attributes, each listing was reviewed for the presence of green features, with all green features being further documented in 1-5 additional categories and the total number of green features listed for each.

Table 3.2.4.b: Summary of Information Captured Per Listing

Listing Overview (Mandatory Fields)	Listing Description (Mandatory Fields)	Green Features (Optional Fields)	Total Green Features
Recovery Date Region Address MLS # Build Year Acreage (Range) Price (CAD) Time on Realtor (Days)	Top 5 features of mention categorized as: • Structure Type/Size • Neighbourhood/Location • Garage/Parking • Property Upgrades • Lot Size/ Features • Aesthetic Features • Interior Layout • Inclusions • Price/Rental Income	The green features mentioned within the listing categorized as: • Heating/Cooling/ HVAC • Lighting-Related • Water-Management Related • Renewable Energy Features • Other Green Features	Minimum input value= 0 Maximum input value= 15

3.2.5   Study Limitations

As outlined in Section 3.2.1, the five sample Regions present a diverse range of real estate offerings, property types and socio-economic demographics. While 100 listings sampled from each region is reflective of the regional real estate market during the data collection window, with the complete dataset being representative of the GTHA market, the sample size is too small

to make assumptions beyond that of the regional level. Further, the e-mystery shopping technique presents its own set of limitations. When handling, reading, and performing an analysis on large datasets there is a possibility for informational bias and a mystery shopper will, inherently, hold their own unique perspective in their interaction with the data which can extend to the observation and analysis of the information presented to them (Creswell & Creswell, 2018). For instance, in the context of this study, a home's aesthetic features were defined as a 'non-necessity,' but what is deemed aesthetic (especially as it relates to utility,) could vary based on the perspectives held by the e-mystery shopper (i.e., the feature of 10-foot ceilings.)

3.3   Data Analysis

As outlined within Chapter 3, the data was first collected by way of random sampling via the online Reatlor.ca real estate listings that were generated after applying the search filters in line with the study parameters. The listing information was copied into the excel coding sheet (as outlined in Section 3.2.3), in preparation for the analysis stage, with each online listing file being saved for further validation and reference. The second stage of the data analysis involved the coding of the listing description that was written by the seller, to identify the first five features of mention, as well as the presence of green features within each listing in line with the methodology presented in Section 3.2.4.

To maintain qualitative validity during the coding process, a 'test' dataset of 25 home listings (comprised of five listings from each study region), was coded in accordance with the processes outlined in Chapter 3, with the results reviewed by the research supervisor. This 'test' coding process was leveraged to identify opportunities for improvement within the excel coding sheet, (to ensure all relevant listing information was addressed), as well as barriers to replicability and was further leveraged to confirm the analysis was consistent was consistent across multiple viewpoints.

4   Results

The results outlined below is reflective of the 500 online real estate listings that were reviewed, which is comprised of 100 data points sampled from each of the five (5) sample regions. For the streamlined communication in this analytical section, the abbreviations GF and CF will be used to convey the terms green features and conventional (non-green) features, respectively.

Specifically, the following points of analysis will be considered of the complete dataset (all five regions):

- Highest priced region (on average)
- Lowest priced region (on average)
- Total number of GF listings
- Total number of GF presented within each category of analysis
- Examples of features captured within the "other" GF category
- Number of 'minor,' 'major,' and 'deep' GFs
- Average duration on the market for GF listings
- Average age of GF homes
- Average length of CF descriptions
- Average length of GF descriptions

Specifically, the following points of analysis will be performed of each of the five regions, individually:

- Average price
- Price range (low-high)
- Total number of GF listings
- Average price a home with GFs
- Prevalence of GFs within the top 5 listing features
- Number of explicitly noted GFs

- Number of exceptions (non-explicitly noted GFs)

The results have been organized in line with the two main stages of data collection, with key points of analysis for each, as outlined below:

Listing Overview Statistics- including an analysis of the average price, acreage ranges and the listing's duration on Realtor.ca, for both the dataset as well as each individual sample region.

Listing Description Analysis- including an analysis into prevalence of green features within the dataset as well as each individual sample region. Further, specific characteristics of the GF listings will be reviewed including the list price, description length, the mention of GFs within the top five property features, and the types of GF mentioned (by category.)

4.1   Prevalence of Green Features

Of the data sample, green features were explicitly noted within 27 real estate listings, or 5.4% of the sample. One listing did not make explicit mention of green features within the listing overview or description, rather this information was plainly visible in the photographs of the property. The region of Milton presented the largest number of GF listings, with nine listings marketing 11 different green features across all five GF categories. The region of Oakville presented the second largest offering of GF listings, with four listings marketing seven different green features across three of the five GF categories. Burlington presented the third largest offering of GF listings, with six listings marketing six different green features across three of the five GF categories. The regions of Brant and Hamilton each offered four GF listings of the 100 properties sampled. Across all regions, green features were mentioned within the listings 32 times, with some GF listings offering up to three distinctive features on the property.
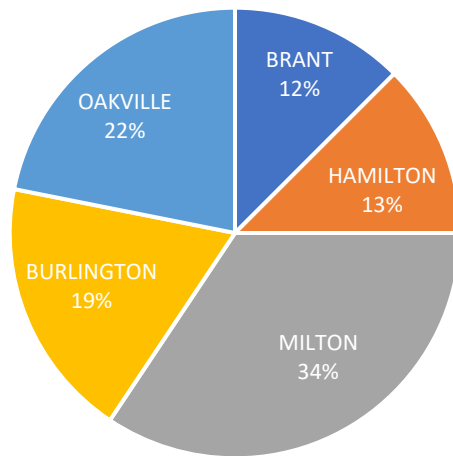
Figure 4.1: *Distribution of Green Features Mentioned, by Region*

4.2   Listing Overview Statistics

Prior to an analysis of the information communicated within the listing description, baseline data was collected on each listing by way of the standard listing fields (outlined in Section 3.2.3). The data and corresponding analysis presented below are reflective of the information collected during the first stage of data collection, which predominantly focused on the general listing attributes presented on Realtor.ca.

4.2.1   Price

Listing price was a critical point of analysis within this study as a home's affordability, specifically increased upfront capital expenditures, was identified as main consideration within a prospective homebuyer's evaluation process (Bond, 2015; Eves & Kippes, 2010; Judge et al., 2019). The average listing price across all five (5) regions was $1,598,279, with the average listing prices in Milton, Burlington, and Oakville each exceeding this dataset average. Hamilton was exceedingly noted as the most affordable Region, with the regional average being $1,060,896, coming in below the dataset average. While each region had varying high and low-price

points, the lowest (most affordable,) property was listed in Hamilton for $349,900 and conversely, the highest (most expensive) property was listed in Milton for $6,500,000, with all of the other properties falling within this $6,150,100 range. The pricing distribution for each Region, along with the regional and dataset averages is presented in Figure 4.2.1.a.
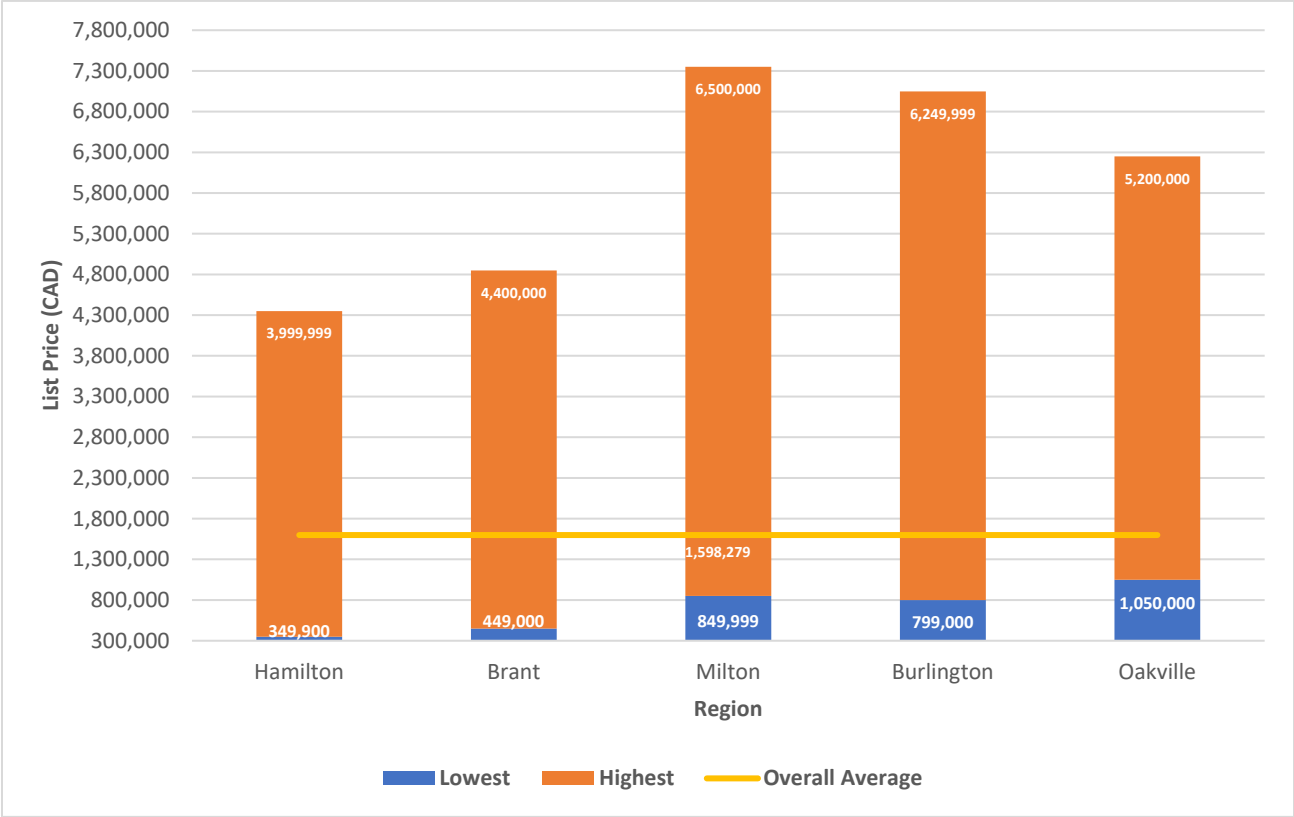

Figure 4.2.1.a: *Average Listing Prices, by Region*

Understanding that prospective homebuyers commonly associate a home's green features with an increased list price, and more broadly, sustainable homes with larger investments, this study compared the GF listing prices to the regional averages to confirm or deny this commonly held perception (Eves & Kippes, 2010; Judge et al., 2019). Comparing the average price of a listing with green features to that of the dataset average resulted in a listing price difference of $120,037, with GF listings being more expensive than the average listing price. Conversely, the average price of home with green features in Burlington, and Oakville, reported a lower average price that of their corresponding regional average, making green listings more

affordable in these areas. Listings with green features were marginally more expensive ($13,336) than that of the Brant regional average, with an even narrower margin in Hamilton ($6,292). Milton was the only region in which the listings with green features were exceedingly more expensive than the dataset average, with a $167,311 difference in average price. Milton was also the region with the highest average listing prices, and featured one green listing priced at $5,880,000, which may have inflated the averages of green listings within the region.
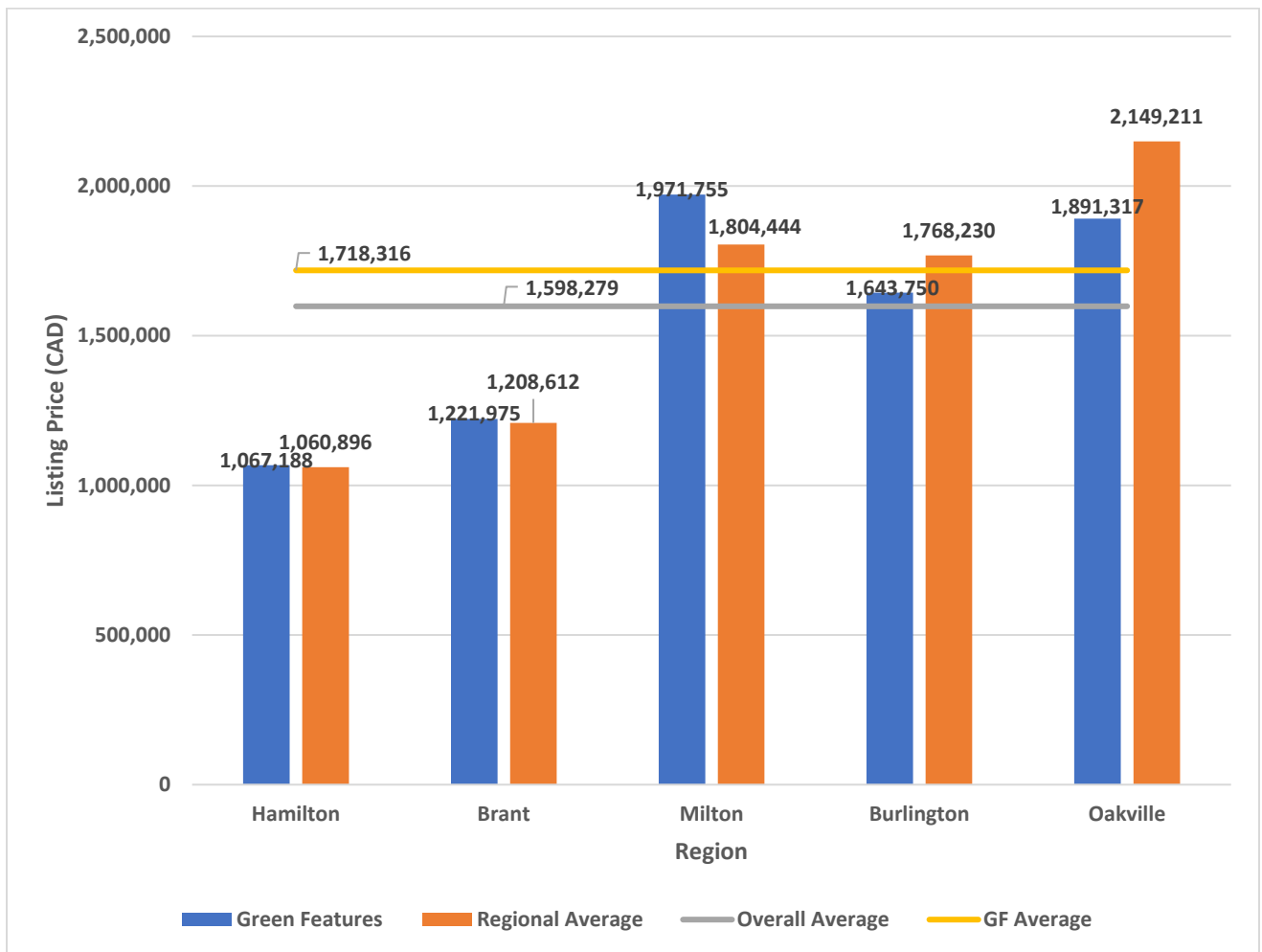

Figure 4.2.1.b: *Average GF listing prices compared to Regional Averages*

4.2.2 Age

The majority of listings reviewed did not provide the home's age within the listing overview information, despite Realtor.ca having a dedicated field for this information. Only 111 listings within the complete dataset gave any indication of the home's age, with many including this information in passing within the listing's written description. As outlined in Section 3.2.3, the subset of GF listings was cross-referenced with HouseSigma.com, to ascertain the age of each property. Through the two-stage age verification process, the age was confirmed for 17 of the 27 GF listings, with nine listings remaining unknown. Accordingly, the average age of a home with green features is 32.5 years old, being built in the late 1980s.

4.2.3 Acreage

The majority of listings reviewed did not provide the home's acreage/lot size within the listing overview information, despite Realtor.ca having a dedicated field for this information. Only 180 listings within the complete dataset gave any indication of the home's lot size, with many including this information in passing within the listing's written description. Of the available acreages, 163 listings reported lot sizes less than 0.5 acres. As outlined in Section 3.2.3, the subset of GF listings were cross-referenced with HouseSigma.com, to ascertain the acreage of each property. Through the two-stage age verification process, the acreage was confirmed for 25 of the 27 GF listings, with 2 listings with unknown lot sizes (beyond what was visible to the prospective homebuyer by way of property photos). Accordingly, the average acreage of a home with green features is 1.8 acres in size, making these lots larger than the dataset mode.

4.2.4 Time on Realtor

Each listing's 'time on Realtor' was populated by the website as the number of hours or days relative to the present time in which the listing is being viewed. This field provides prospective homebuyers with information on how long a listing has been sitting on the market, however, this function could be negated by a real estate agent taking a listing 'off the market' and then

relisting it mere hours or days later, to make the listing look newer (hence the importance of scanning for duplicates throughout the data collection process.) The dataset average 'time on Realtor,' was 7.6 days, further reinforcing that the time of data collection was an exceptionally peak time for the GTHA real estate market.

The average days on the market (DOM) between March 2022 and May 2022 were both 12 and 15 days, respectively, based on local GTHA market indicators (Machan, 2022). To further establish market movement, the GF listings were cross-referenced with HouseSigma.com to identify which the properties sold, and how long they were on the market before the time of sale. Of the 27 GF listings, seven listings were removed from the market (no sale), with the remaining 19 properties being sold within an average of 11 days – closing quicker than the market averages for this timeframe.

4.3   Listing Description Analysis

The data analysis presented below is reflective of the second stage of data collection, an analysis of the information presented within the listing's 'description' field on Realtor.ca.

4.3.1   Green Features of Mention

Of the 500 real estate listings reviewed, across five regions, 27 listings included green features. Within these listings, green features were distinctively mentioned 32 times. The discrepancy between the number of GF listings and the number of identified green features is best explained by the Milton home listing presented in Figure 4.3.1.a.

Description

Heathwood <mark>Energy Star</mark> 3 Bed 4 Bath Home W Over $100K In Upgrades. Upgraded Colour Windw Frames To Match Exterior. All But 2 Windws Replaced W Crank Low Eargon Windws, <mark>5 Front Windws Triple-Pane</mark> Sound-Reducing. Extra Windw Added To Liv. Updatd Eat-In Kit W Stone Countrs, Glass B/S, S/S Appl & W/O To Fenced Yard W Stone Patio/W/Way, Shed W Windw, Maple Trees, 2 Concrete Pads For Shed & Hottub (Both W Electrical) & Gazebo. California Shutters Thru'out.**** EXTRAS **** Updatd Powder Rms. 9 Ft Ceil. Hardwd In Liv/Din. Family W G/F, B/In Shelv & Hardwd. Mastr Feat W/In Closet W B/Ins & Ensuite. Low Lev Rec & 2 Pc. Flagstone Upgrade To Front Porch & W/Way, Railings W Tinted Glass. A/C 2020. <mark>Tankless Hwt 2019</mark> (29701766)

Figure 4.3.1.a: *Milton Listing Example, Multiple Green Features of Mention*

This single listing presented the prospective homebuyer with three different green features that the home had to offer, within the "Other," "Temperature and HVAC," and "Water Management" categories, respectively. This example was one of three GF listings that distinctively mentioned multiple green features about the home within the description field. A detailed summary of the green real estate listings was developed to formulate an understanding of which green features are being highlighted in the online listings and, further, what green messaging is being communicated to prospective homebuyers through the platform of online real estate listings. The GF listings were reviewed against both the main categories of green features outlined in Section 3.2.4, as well as the depth of the green features, as presented herein.

In line with National Resources Canada's (2019,) levels of energy efficiency retrofits, the 31 mentioned features were categorized by the depth of the upgrade being presented (minor, major, and deep). As outlined below, the 56% of the green features described in the listings were that of a 'minor' efficiency upgrade, presenting a home with the 'entry-level' efficiency features. Comparatively, 22% of the green features described were upgrades of major and deep levels, respectively.
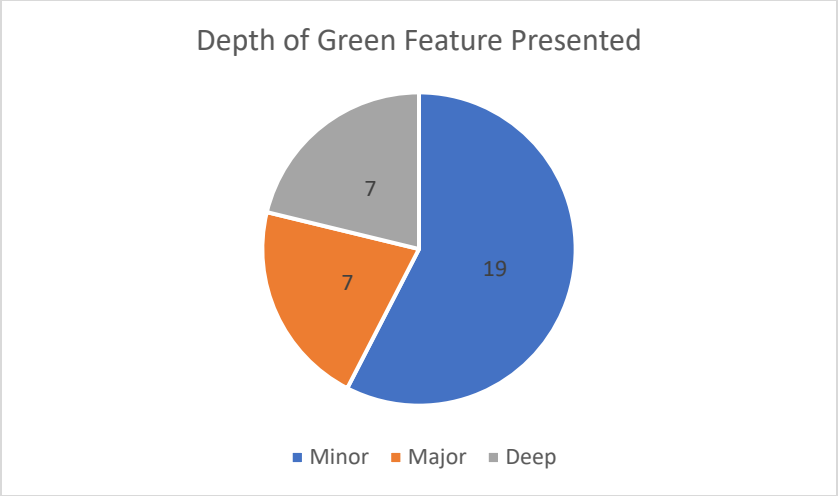
Figure 4.3.1.b: *Depth of Green Features Presented, as defined in National Resources Canada,*

2019

As outlined in Section 2.2.1, the green features commonly cited within the relevant literature

were categorized as follows; Temperature and HVAC, Renewables and Energy Sources, Lighting-

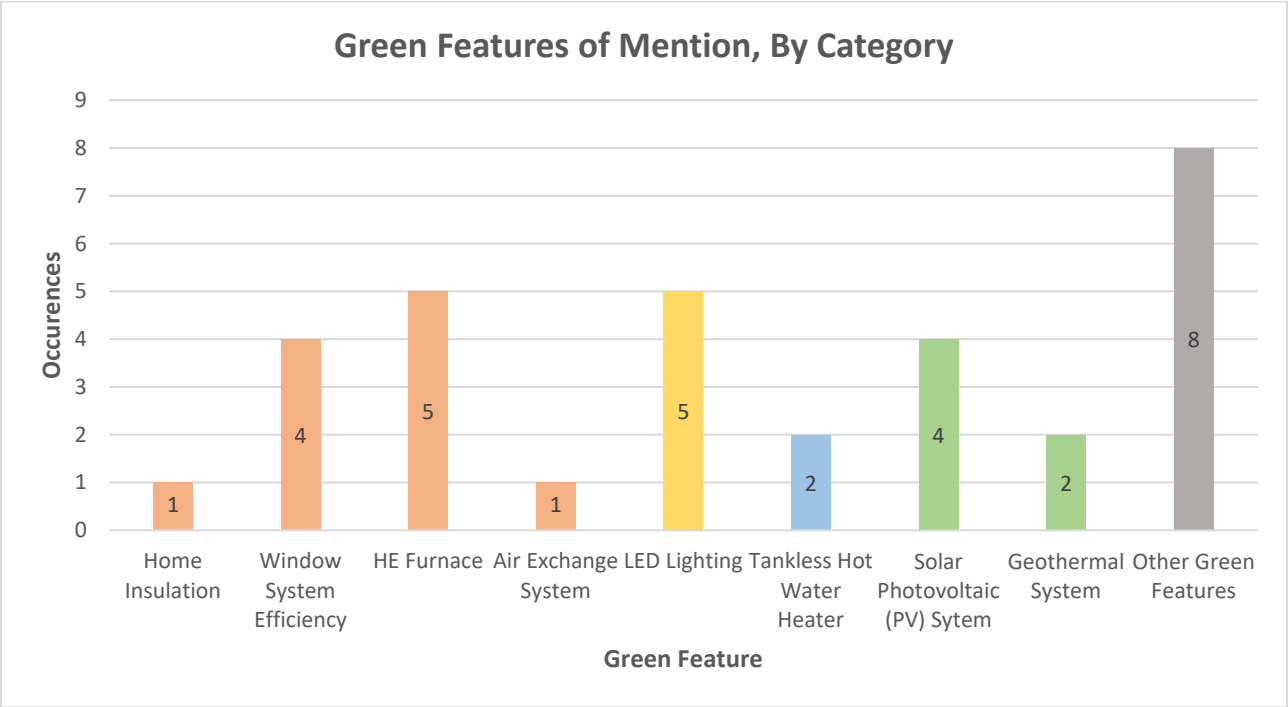Related, Water Management Systems, and Other Green Features.

Figure 4.3.1.c: *Green Features of Mention within the Listings, by Category*

Each GF category was represented within the 32 green listing features, with Temperature and HVAC being the most mentioned, at a count of 11 (denoted in orange above). Commonly noted features within the Temperature and HVAC category included high efficiency furnaces, windows (triple paned and sealing,) as well as statements of home insulation and air exchange systems.

The second most mentioned GF category captured the "Other," features, namely, those that were not otherwise included in the Temperature and HVAC, Renewables and Energy Sources, Lighting- Related, Water Management Systems categories. The 8 features of mention within the other category included mention of high efficiency appliances, energy-star, 'smart' thermostats, and R-value (denoted in grey above).

Green features within the Renewables and Energy Sources category were the third most mentioned, with a count of 6 (denoted in green above). Four real estate listings discussed the home's Solar Photovoltaic (PV) Systems, with three of the listings mentioning the current or future income generated by the solar panels. Additionally, two listings, one from both Milton and Burlington mentioned the home's geothermal system. Lastly, 5 listings referred to LED lighting, and an additional two listings mentioned a tankless hot water heater.

4.3.2   Tone of Green Listings

Acknowledging that the tone of the listing's description is a rather subjective point of analysis, an analysis of 500 listing descriptions presented a variety of written tones ranging from objective, technical-style communication to subjective storytelling. Similar to how an in-person mystery shopper would note their experience with a salesperson based on the communication they experienced (i.e., hurried, thorough, responsive, etc.,) how a listing is written can influence a prospective homebuyer's level of interest in a property. An analysis of the GF listings presented both objective and technical-leaning descriptions as well as subjective, storytelling-leaning descriptions, an example of both is presented below.

Objective/Technical

Description

Investors Alert! Come see this 1.5 Storey home offering oversized living room in most popular McMaster University Area. Nice lot 32.51' x 100' Some updates include Gas, Hi Eff furnace (2019), 100 amp breaker hydro box, Side parking for 2 cars. Home now tenanted, great potential. (28277627)

Subjective/Storytelling

Description

Welcome to 39 Scott Street; a beautiful family home & entertainer's dream with no rear neighbours! This spacious 4 bed, 2 bath brick faced raised bungalow w/double garage sits on a quiet dead end street in a great neighbourhood & features an amazing backyard backing onto farmers field. The sun-soaked main level boasts an open concept floor plan complete w/a recently renovated chef s kitchen including 2 ovens, gas range, built-in wine cooler, S/S appliances, expansive island complete w/Quartz countertops, breakfast bar & ample cabinet space. A large dining area, family room, 3 bedrooms & a full bathroom complete the main level of this home. Let s head downstairs to the huge basement where you ll find a cozy theatre style recreation room complete with a gas fireplace, beautiful stone accent wall, projector & screen, newer carpet throughout & dedicated space for the savvy euchre player. Through the sliding doors you will find a 3-season sunroom equipped with a hot tub and ample space to enjoy your morning coffee or unwind with a glass of vino while taking in the picturesque and private backyard oasis lined with trees and backing onto farmers field. A fourth, bright bedroom with built-in vanity, 2 closets (including a walk in), full bathroom & laundry room complete the space. Outside you will find multiple areas perfect for entertaining including a large deck, an inviting patio area complete w/a gorgeous handmade timber-framed pergola, a fire pit, large garden with a bounty of Asparagus soon to rise and two sheds. With love for our planet, solar panels were installed on the roof seven years ago. With no cost to the owners, the panels will earn income from hydro production in 13 years. Truly a win/win for the the Earth & homeowners. Don't Miss your opportunity to soon call 39 Scott Street in the beautiful community of St.George your new home and enjoy the Santa Claus parade from your living room! (64406348)

Figure 4.3.2: *Example of an Objective/Technical Green Listing Description and an Example of a Subjective/Storytelling Green Listing Description*

Reviewing the sample green listing descriptions presented above, the objective listing is more technical and to-the-point, whereas the subjective listing description walks the reader through the home's features, establishing livability and allowing the reader to picture themselves in the home. Of the 27 GF listings analyzed, 16 of the listing descriptions (59%) were written with a story-

telling tone, establishing both the green features and the comforts and livability of the home as motivators for the homebuyer.

4.3.3   Length of Green Listings

The number of characters used within a listing's description, to convey the details of the home were analyzed to identify the average listing length. The average listing length for the complete dataset was 782 characters per listing, with many listings using abbreviated language in reference certain areas or details of the home (i.e., B/I – built in, sq ft- square foot, WHT- water, heater, ELFs- electric lighting fixtures, D/W- dish washer etc.) Comparatively, the average number of characters used in a GF listing description was 913, making the descriptions of the homes with green features notably longer than that of the average listing.

4.3.4   Top Five Listing Attributes

The primary stage of the listing description analysis was to identify the first five features being presented to a prospective homebuyer. More specifically, this data informs the narrative of 'if a prospective homebuyer was just glancing at a property listing, what are the most important details of the home that the ad must convey?' If a listing presented green features, was this information marketed to the prospective homebuyer within the first five details of the property, or was it presented in the middle-to-end of the listing description amongst other details of the home? Further, an analysis of the first five attributes seeks to establish an understanding of what information is being marketed to prospective homebuyers in the absence of information on a home's green features?

Of the 27 GF listings, 11 listings provided details of the home's green feature(s) within the first five details shared within the listing description with the remaining listings noting the green features further along within the properties. The region of Milton presented 9 GF listings, of which 5 included information on the green features within the first five listing details. An analysis of the complete regional sample identified the majority of Milton's listings marketing information on a

home's aesthetic (85 occurrences,) interior layout (83 occurrences,) lot size/features (68 occurrences,) and neighbourhood/location information (67 occurrences,) at the beginning of the listing descriptions. The region of Burlington presented 6 GF listings, of which 4 included information on the green features within the first five listing details. An analysis of the complete regional sample identified the majority of Burlington's listings marketing information on a home's neighbourhood/location (97 occurrences,) lot size/features (82 occurrences,) and aesthetics and interior layout (79 occurrences each,) at the beginning of the listing descriptions.

The region of Brant presented 4 GF listings, of which 1 included information on the green features within the first five listing details. An analysis of the complete regional sample identified the majority of Brant's listings marketing information on a home's neighbourhood/location (88 occurrences,) interior layout (86 occurrences,) and the type/size of structure (84 occurrences,) at the beginning of the listing descriptions. The region of Hamilton presented 3 GF listings, of which 1 included information on the green features within the first five listing details. An analysis of the complete regional sample identified the majority of Hamilton's listings marketing information on a home's neighbourhood/location (95 occurrences,) interior layout (74 occurrences,) and the type/size of structure (66 occurrences,) at the beginning of the listing descriptions. Lastly, the region of Oakville presented 4 GF listings, none of which included information on the green features within the first five listing details. An analysis of the complete regional sample identified the majority of Oakville's listings marketing information on a home's neighbourhood/location (95 occurrences,) interior layout (74 occurrences,) and the type/size of structure (66 occurrences,) at the beginning of the listing descriptions.

As the majority of GF listings failed to provide details of the home's green feature(s) at the beginning of the listing, the complete dataset was further reviewed to identify which types of information were being presented to prospective homebuyers. Table 4.3.4 captures the number of times each category of description analysis appeared within the first five listing features in each region, as well as the total number of occurrences across all regions.

Table 4.3.4: *Occurrences of home description categories within the first five features of mention, by Region*

REGION	Structure Type/Size	Neighbour hood/ Location	Garage/ Parking	Property Upgrades	Lot Size/ Features	Aesthetic Features	Interior Layout	Inclusions	Price/ Rental Income
Milton	77	67	29	63	68	85	83	9	9
Burlington	70	97	14	60	82	79	79	9	2
Brant	84	88	33	44	74	73	86	4	5
Hamilton	66	95	21	54	56	63	74	19	16
Oakville	84	106	12	43	72	91	79	13	1
TOTAL OCURRENCES	**381**	**453**	**109**	**264**	**352**	**391**	**401**	**54**	**33**

The neighbourhood and location in which a property is situated was the most commonly shared detail within a listing's first five features of mention, with the Oakville listings presenting the most details about a listing's locale. As outlined in Section 3.2.4, these details commonly included the name of the community or development, identifying the school district, and proximity to a variety of different amenities, from parks and wildlife to shopping plazas and restaurants. Information on the home's interior layout, was also commonly shared within the first five details, with the Brant listings placing the most emphasis on the number of bedrooms/bathrooms and interior flow of the home. A property's aesthetic details were a commonly shared within the first five details of the listings across all regions, and specifically highlighted within the Oakville listings. This category captured details that went beyond functionality, and commonly included specific design choices such as type of flooring, luxury countertops, beyond standard ceiling height, and high-end appliances. The price (i.e., statements of affordability,) and potential rental income (i.e., statements of investment potential and additional units,) were among the least common details shared within the first five listing details, with the region of Hamilton promoting the greatest number of price or rental driven features.

4.4   Gaps Identified in the Literature

This study drew upon the existing studies related to sustainability within the real estate industry and applied the e-mystery shopping approach and grounded the research in key elements of the CBSM and Marketing Mix frameworks to present a new angle within the current body of literature. Studies and reports have identified barriers faced by a 'green minded' homebuyer, such as knowledge gaps and affordability (Bond, 2015; Gee, 2010; Judge et al., 2019; Lakic et al., 2021), with key motivations for homebuyers in search of a sustainable home including income generation, long-term cost savings, and the comfort and livability of a home with green features (Bond, 2015; Consumers Council of Canada, 2018; Crosbie and Baker, 2010; Gram-Hanssen, 2014; Romanach et al., 2017). Equipped with a general idea of the barriers and motivators faced by prospective homebuyers, this study opted to focus on the established 'first step' of a prospective homebuyer's journey, the online real estate search, to identify what green features, if any, are being presented to prospective homebuyers seeking a more sustainable home, employing an 'e-'mystery shopping methodology. The exploratory approach of mystery shopping has been used to establish the 'green' marketing of a product or service, and, more specifically, how a consumer's sustainable purchasing decision may be encouraged, or discouraged within a particular setting, however, it has not been applied within the real estate market (Matthews et al., 2017; Medipour, 2021; My Sustainable Canada, 2013). Moreover, a homebuyer's experience within the stages of the home buying process, online searching, in-person open houses, or otherwise, have not currently been observed through the lens of the CBSM or Marketing Mix frameworks. Lastly, this study seeks to explore how residential real estate listings can be used as a tool to promote the education and sale of natural resource efficient homes. While the role of a real estate agent has been identified as an intermediary for the transfer of information, the literature review could not identify any studies that focused on the online real estate advertisement as a tool for communication, neither sustainable nor otherwise.

5 Discussion and Conclusions

5.1 Overview

In this Chapter, the outcomes of the data analysis are presented as they respond to the following questions:

1) What green messaging is being communicated to prospective homebuyers through the online real estate listing?
2) If the online real estate listings lack information on a home's green features, what features of the home are they presenting to prospective homebuyers?
3) What potential barriers exist for prospective homebuyers in pursuit of a home with green alternatives at the online stage in the home buying process?

Stepping into the role of a prospective homebuyer in pursuit of a home with green features, the study analyzed 500 online real estate listings across 5 prominent southern Ontario regions using an 'e-'mystery shopping approach to identify: The presence of listings with green features, whether, and how, green features are promoted to prospective buyers through the online home advertisement and, lastly, any barriers to pursuing a green home within the online home search process. To fully investigate the research questions outlined above, each question was framed to a notable marketing and behaviour framework, with the first two questions being analyzed through the lens of the Marketing Mix, and the third question being observed through the Customer Based Social Marketing Framework.

5.2 Sustainable or 'Same-old?'

One of the first points of analysis was to confirm the presence of 27 'green' real estate listings, which represented a mere 5.4% of the dataset. Of the subset of listings that explicitly presented sustainable features within the home description, 32 distinct green features were mentioned across the main categories of analysis, Temperature and HVAC, Renewables and Energy

Sources, Lighting- Related, Water Management Systems, and Other Green Features. Of the 27 GF listings, only 11 listings deemed the details of the home's green feature(s) important enough to be included within the 'first five' details shared within the listing description, with most listings burying this information towards the middle to end of the description.

When a green-minded homebuyer, is looking for a product (house), they may be specifically looking for a product that is energy efficient, a purchasing choice that may be driven by personal, psychological, or environmental factors. This same prospective homebuyer (or in the case of this study, e-mystery shopper), looking for an energy efficient home within Hamilton, Halton or Brant region would be dismayed with the resulting sample of homes, as less than 6% would meet their personal purchasing criteria. With energy efficiency being the among the top features coveted by Canadian homebuyers in 2021, and commonly identified as a 'must have' feature, it has been established that most homebuyers are considering sustainable qualities of a home when making their purchasing decision. The limited presence of green features within the online residential listings sampled in this study suggests that two of the Marketing Mix framework's four C's, namely, customer wants and needs, and communication may be falling to the wayside with regards to energy efficiency. Should a home offer green features (that fall anywhere within the minor-to-deep spectrum,) newer iterations of the Marketing Mix state that real estate agents, or those preparing the online home listings, should endeavour to go beyond stating the basic 'product' qualities and put the homebuyer's wants and needs first, thus creating a listing that is responsive to the interests of their customers. In practise, this might look like a realtor identifying the growing interest of Canadian homebuyers in energy efficiency features (a detail of their customer that is widely referenced within realtor-facing resources,) and engaging the homeowners in a discussion on the topic of their home's energy efficiency considerations to ensure these details can be highlighted within the online home listing. In an additional effort to maximize the benefits of a home's green features, as a selling point to encourage homebuyer action (in line with the principles of the CBSM framework), the realtor could communicate the

feature(s) as they would benefit the home buyer (e.g., "income generating solar panels make this home one of a kind!" as referenced in a Hamilton listing).By analyzing both the presence of green features within the listing description, as well as their placement in the first five descriptive features, this study sought to go beyond inclusion and understand if the information on a home's green features were being prioritized within the description. This analysis established that the regions of focus predominantly employed traditional real estate rhetoric when presenting details of a home, with only 5% of listings meeting a homebuyer's green demands. It is widely accepted that effective communication between the 'seller' and the 'buyer,' the key actors in the home buying process, is integral to addressing the systemic knowledge gap on residential green features. With a subset of the real estate listings offering any information on green features, and these attributes rarely being 'featured,' by definition, within the listing description, it is apparent that the listings are misaligned with the customer's priorities. In the absence of green features, conventional aspects of the product (such as the home's location, interior layout, and aesthetic features) are commonly highlighted as a home's main selling features Perpetuating the promotion of conventional residential real estate details serves to reinforce the fact that homebuyers can be underinformed or misinformed on the topic of green features, resulting in a barrier to their sustainable decision-making.

The online real estate listings lacked information on a home's green features, however, this study sought to establish a baseline of features that were being presented to prospective homebuyers. One of the primary points of analysis within the listing overview, and one of the most widely accepted principles across all iterations of the Marketing Mix, was that of 'price'. The listing price is the first piece of information presented to a prospective homebuyer upon opening an online listing on Realtor.ca. Confirming both the societal perceptions and findings within the relevant literature, the average price of a listing with green features was $120,037 greater than that of the dataset average, making green listings in fact more expensive than the

average home listing, reinforcing the economic barriers to homebuyers considering a home with green features.

Resultingly, the barriers faced by green-minded homebuyers identified within the literature review, namely that of information, and affordability were reinforced by the findings of this study. A limited number of listings (27,) presented green features for the homebuyer's consideration, with one listing even offering a green feature (per the listing photograph of a home with a rooftop solar panel system,) but opting to exclude this information from the listing overview and written description within the advertisement. Conversely, the motivators faced by green-minded homebuyers identified within the literature review, specifically that of the financial returns and the livability of a sustainable home were also reinforced by the findings of this study. The messaging within the listing descriptions for 'deep' green features, specifically that of Solar Photovoltaic (PV) Systems, presented current or future opportunities for income generation associated to the solar panels, effectively reinforcing the benefit of the green feature and encouraging the prospective home buyer's action (to buy the 'green' home). Further, 59% of the green feature listing sample employed a subjective, storytelling tone within the home's listing description, that worked to communicate both the green features and the comforts and livability of the home as motivators for the homebuyer.

5.3   Opportunities for Future Research

There are ample opportunities for interested researchers to pursue further investigation into this topic, with an appropriate next step being an investigation into the communication of green features within the second stage of the homebuying process, the in-person open house. The open house stage of the home buying process was an intended point of focus for this study, but continued pandemic restrictions presented added complexity to the in-person viewing processes. Future research could visit a randomly selected set of open houses advertised on Realtor.ca, employing an in-person mystery shopping methodology, and ask each real estate

professional a pre-set list of questions about the home's green features. The information

communicated by the real estate professionals at the open house would build upon the details

shared within the online home listing, providing a comprehensive understanding of the green

features shared with prospective homebuyers throughout the complete, two-stage,

homebuying process.

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