Getting around on foot: Older adults' walking experiences and perspectives on neighbourhood walkability across Canada

Megan James
McGill University
Email: megan.james@mail.mcgill.ca
orcid: 0009-0003-7867-155X

Meredith Alousi-Jones
McGill University
Email: meredith.alousi-jones@mail.mcgill.ca
orcid: 0000-0003-4515-1083

Aryana Soliz
Concordia University
Email: aryana.soliz@concordia.ca
orcid: 0000-0001-5172-4947

Ahmed El-Geneidy*
McGill University
Email: ahmed.elgeneidy@mcgill.ca
orcid: 0000-0002-0942-4016

*Corresponding author

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Abstract:

Older adults' living environments are instrumental in making walking part of their daily lives, as we strive to promote healthy aging. Objective measures, such as WalkScore®, and subjective measures of walkability provide means to grasp the factors that enable or hinder frequent and enjoyable walking. However, there is limited consensus on what factors contribute to mismatch between perceptions of walkability and objective built environment measures, particularly among older adults. We interviewed fifty-eight older adults (65+) from six Canadian cities to uncover the relationship between their perceived neighbourhood walkability and objective built environment measures. We segmented our interviewee sample into four categories based on their residential WalkScore® and perceptions of neighbourhood walkability. Our thematic analysis provides insight into strategies older adults use to respond to barriers to walking in their environment and walking facilitators they experience in their neighbourhoods. The findings can be of interest to practitioners and decision-makers as they seek to improve walking environments for aging populations, ultimately contributing to older adults' long-term health and well-being.

Key words: older adults, walkability, WalkScore®, perceptions, strategies, thematic analysis

1. Introduction

People are living longer, but not necessarily in better health (United Nations, 2022; World Health Organization, 2015). As the number and proportion of older adults increase, this demographic shift has been met with concerns about the added stress to health care and social systems (World Health Organization, 2022). In response, many organizations and policies are promoting active aging (Cheng et al., 2023; Gichu & Harwood, 2023; Government of Canada, 2016), as independence, active lifestyles, and social participation are understood to enhance older adults' health and quality of life (Hooyman & Kiyak, 2010).

With the goal of improving the lives of this growing age group, the United Nations declared 2021-2030 the Decade of Health Aging (United Nations, 2022). One of the main focuses of the initiative is fostering age-friendly physical and social environments, recognizing the vital role older adults' living environment plays in their health. Age-friendly environments are expected to provide access to daily necessities, health and community services, ensure inclusive and safe public spaces, and remove barriers to older adults' participation in society. However, an environment's ability to support the needs of its older residents is complexified by their individual realities, functional capacity, and preferences (Franke et al., 2020; United Nations, 2022).

As people age, they tend to experience some level of functional decline and increased risk of chronic disease and disability (Cheng et al., 2023). Encouraging health-enhancing behaviours, such as walking, can prevent or delay these age-related conditions, contributing to older adults' long-term mobility and independence (Cerin et al., 2017; Visser et al., 2002). Older adults' living environments are key in making walking an integral part of their lives (Cheng et al., 2023; Van Cauwenberg, Clarys, et al., 2012). These environments must be conducive to walking, facilitating access to daily needs and activities on foot (Van Cauwenberg, Van Holle, et al., 2012). In addition, older people's perception of the walkability of their neighbourhood directly impacts their choice to (or not to) walk (Van Cauwenberg, Clarys, et al., 2012). A better understanding of what impacts perceived walkability and its mismatch with the built environment among older adults is needed to inform practices and policies aimed at promoting walking and healthy aging.

This paper seeks to enhance our understanding of how older adults (65+) navigate the barriers and utilize walking facilitators in their neighbourhoods to meet their needs and wants. We recruit fifty-eight interviewees across six Canadian cities (Toronto, Montréal, Vancouver, Halifax, Victoria and Saskatoon) from the 2023 Aging in Place survey (N = 3,551). We compare interviewees' WalkScores® and perceived walkability to explore differential interpretations of neighbourhood walkability among older adults. Using a segmented thematic analysis of the in-depth interviews, we identify the barriers, facilitators, and strategies shaping older Canadians' walkability perceptions and experiences.

2. Literature review

Walkability can be defined as the extent to which an environment is pedestrian-friendly and conducive to walking (Habibian & Hosseinzadeh, 2018). Common built environment features associated with frequent walking are access to amenities such as grocery stores and parks, adequate pedestrian infrastructure, and road connectivity, among others (Arellana et al., 2020; Cervero & Kockelman, 1997; Fonseca et al., 2021). WalkScore®, a popular measure of objective walkability, estimates local accessibility and walking potential (Hall & Ram, 2018). However, the predictive power of this measure for diverse trip purposes or for walking rates among different sociodemographic groups is not exact (Habibian & Hosseinzadeh, 2018; Herrmann et al., 2017; Manaugh & El-Geneidy, 2011a; Rodrigue et al., 2024). Like other age groups, older adults tend to walk more in urban areas compared to suburban ones (Alidoust et al., 2018; Van Cauwenberg, Clarys, et al., 2012). They enjoy proximity to destinations and areas attractiveness, but accord particular importance to availability of seating and safety from crime, injury, and road traffic when choosing to walk (Michael et al., 2006; Van Cauwenberg, Clarys, et al., 2012; Van Cauwenberg, Van Holle, et al., 2012). They tend to walk less or avoid walking entirely in inclement weather or in areas where pedestrian infrastructure is poorly maintained (uneven paths, poor lighting, etc.) (Clarke et al., 2017).

Objective measures, though informative, do not fully capture walking experiences, which are highly subjective (Rodrigue et al., 2022). The relationship between objective and perceived walkability is gaining attention as a more accurate understanding of walking behaviours is desired. Built environment assessments at smaller scales are useful and provide insight into the potential reasoning behind perceptions of walkability (Rodrigue et al., 2022; Sallis et al., 2015). However, observed mismatch between objective, perceived walkability and walking behaviour remains (Fonseca et al., 2021). A pedestrian's walking experience is dependent on their perceptions of the built environment as well as personal preferences, abilities, and characteristics. De Vos et al. (2023) explore the potential disagreement between perceptions and environment. Though walking is greatly impacted by objective walkability, they suggest that perceptions are the stronger predictor. When people's perceptions match their environment, their walking behaviour can be predicted with some level of confidence (i.e., people tend to walk more in highly walkable areas that they perceive to be highly walkable, and vice versa). However, when there is dissonance between perceived and objective walkability, the expected behaviour is unclear. People living in less walkable areas but who have positive perceptions can employ adaptive strategies to overcome the barriers to walking they are confronted with, whereas people living even in highly walkable areas may avoid walking altogether if they believe their environment to be non-conducive to walking or not adapted to their needs and abilities (Močnik et al., 2022). This is particularly relevant for older adults, as they have singular mobility needs and perceptions (Zhao et al., 2024).

If we are to encourage walking among older adults to contribute to their healthy aging, it is crucial that we better assess how their residential environment and their perception of its walkability support positive walking experiences. Though the impact of the built environment on older adults'

walking behaviour is well understood (Cerin et al., 2017; De Vos et al., 2023), the ways in which they assess their environment in response to walking barriers and facilitators are less explored (Mitra et al., 2015; Močnik et al., 2022). In this study, we attempt to address this gap by combining objective measures, i.e., WalkScore®, with older Canadians' perceptions of walkability collected through interviews to understand how older adults choose to adapt their walking in their environment.

3. Methods

3.1 Data and Recruitment

This research recruited participants for interviews from the Aging in Place survey data (Alousi-Jones, 2024). The online bilingual survey was administered in Winter 2023 to capture daily travel experiences of older adults (aged 65 and older) across six Canadians CMAs (Figure 1). Multiple recruitment methods were used to ensure adequate sample size for the survey (Dillman et al., 2014), including distribution of fliers at senior and community centres, social media advertising, and recruitment through Léger, a firm specializing in public opinion surveys. Post data collection, a thorough cleaning procedure yielded a final sample size of 3,551 respondents (Alousi-Jones, 2024). Survey respondents who indicated their willingness to partake in further research were invited to participate in follow-up in-depth interviews. We used a stratified purposeful approach to selecting interviewees to maintain a balanced sample in terms of gender, age, income, disability status, and residential location.

Figure 1 Map of the six Canadian cities

The researchers conducted fifty-eight semi-structured interviews, each between 20 and 30 minutes, across the six Canadian cities in Spring 2024. The interviews focused on a range of topics related to participants' daily mobility, wellbeing, and the walkability of their neighbourhoods. We drew

from a phenomenological approach to in-depth interviewing, a method focused on understanding the diversity of lived experiences associated with a given phenomenon (Patton, 2014), in this case, walkability.

3.2 Objective and Perceived Walkability

We choose WalkScore® to quantify objective neighbourhood walkability as it has been repeatedly tested in land-use and transport literature (Hall & Ram, 2018), and shows some reliability in predicting active travel patterns (Manaugh & El-Geneidy, 2011b). The WalkScore® index is determined through a gravity-based assessment of amenities accessible within a 30-minute walk from a location (Walk Score, 2022), considering several types of amenities, including grocery stores, parks, and restaurants. WalkScore® ranges from 0 to 100, where higher values indicate a more "walkable" area, i.e., from which more amenities are accessible on foot. In this study, the WalkScore® of each survey respondent was obtained for their home locations, and then respondents were categorized into their corresponding WalkScore® quartile, the first quartile (Q1) comprising the lowest WalkScores® and the fourth (Q4) comprising the highest.

For subjective measures, all survey respondents were asked to assess their agreement with the following statement: "I can comfortably walk from my home to my desired destinations or to public transport." Responses were reported on a five-point Likert scale (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree). For simplicity, the scale was reduced to a three-point scale, grouping 'Strongly Disagree' and 'Disagree' into 'Disagree', and 'Strongly Agree' and 'Agree' into 'Agree'.

3.3 Thematic Analysis

We situated the different perspectives of neighbourhood walkability in various Canadian contexts through a segmented thematic analysis of transcribed interviews. Our analytical method draws from Guest et al. (2012) adapted qualitative analysis approach to applied thematic analysis (ATS). We opted for an exploratory approach surrounding any mention of walking for utilitarian or leisure purposes in the semi-structured interviews, followed by a comparative assessment of emerging themes.

To ensure trustworthiness and methodological rigour (Braun & Clarke, 2019; Nowell et al., 2017), we conducted a thorough systematized exploratory analysis. Data familiarization was undertaken by at least two researchers followed by peer debriefing with the entire team to compare the evolution of categorization systems and ensure the significance of emerging themes. A codebook was developed and consolidated to systematically sort observed meanings and define boundaries for text segmentation and coding (Guest et al., 2012). Finally, direct quotes were integrated into the paper to illustrate larger patterns and the prevalence of themes. The thematic analysis was first conducted in aggregate before segmenting respondents according to findings from the quantitative analysis described above.

4. Results

4.1 Comparison of perceived and objective walkability

Comparing subjective and objective measures provides a basis to explore differential understandings of neighbourhood walkability among participants. Figure 2 showcases the proportion of interviewees in each WalkScore® quartile (defined based on the full survey sample) that agree or disagree that they can comfortably reach their desired destinations by walking for our sample. Higher proportions of older adults consider their neighbourhoods sufficiently walkable among higher WalkScore® groups. However, a sizeable percentage (15%) report that they cannot access their desired destinations by walking, even in supposedly highly walkable environments. Similarly, 35% of respondents in low WalkScore® communities state they can comfortably access desired destinations or public transit.

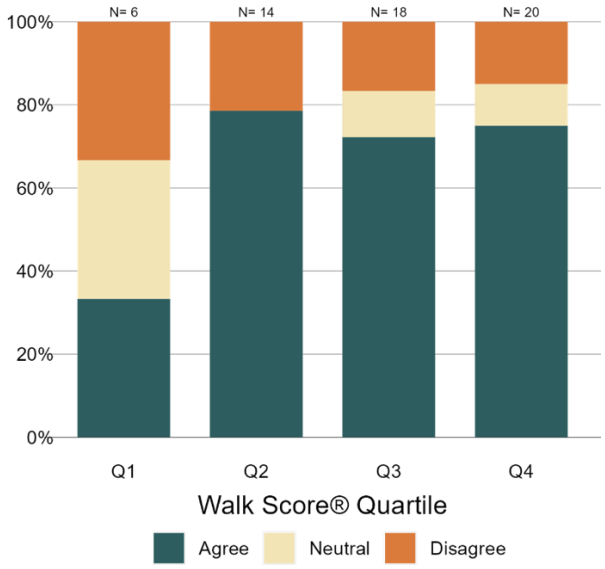

Figure 2 Interviewees' agreement with the statement "I can comfortably walk from my home to my desired destinations or to public transport" [colour]

We split interviewees into four groups according to their WalkScore® and subjective opinion of walkability (Figure 3). We combine the first and second quartiles to identify low WalkScore® areas (Bad Environments – B) and the third and fourth quartiles to define high WalkScore® areas (Good Environments – G). Drawing from De Vos et al. (2023) findings on the interplay between perceived and objective accessibility on older adults' travel behaviours, particular attention is paid to the agreement and disagreement between perceived and objective walkability. Interviewees that believe they can comfortably walk from their home to their desired destinations or to public transport are classified as comfortable (C) whereas those who do not agree with the statement are considered uncomfortable (U). Those with a neutral opinion (N) on their neighbourhood's walkability (N=6) are considered in aggregate analyses but were not compared to other subgroups in the discussion.

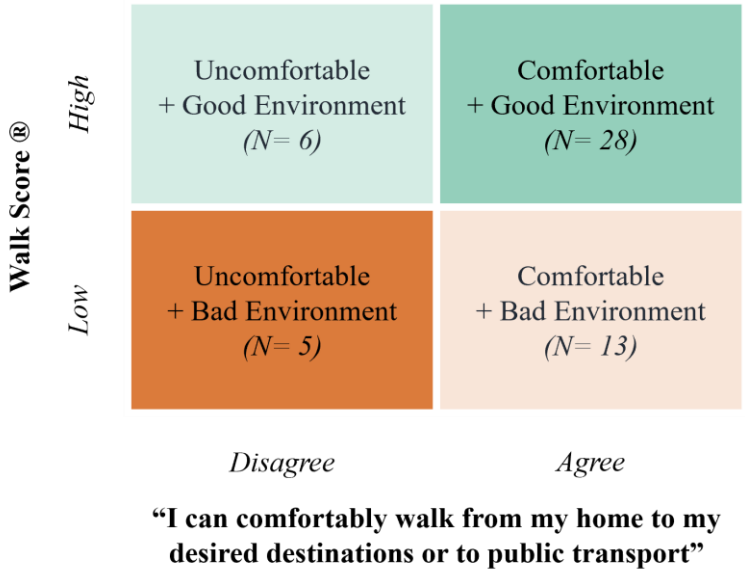

Figure 3 Segmentation of Interview Respondents [colour]

4.2 Summary Statistics

Table 1 reports the sociodemographic characteristics of the interviewees. Those living in higher WalkScore® areas and who feel comfortable walking from their home to destinations or public transit (CG, N = 28) are overrepresented by Victoria residents when compared to the full sample. Most of these CG respondents do not have a disability that limits their mobility (79%). Their counterparts, i.e., those living in higher WalkScore® areas but who feel uncomfortable (UG, N = 6), are mostly women and with higher income.

A majority of those living in lower WalkScore® areas but who feel comfortable walking from their home to destinations or public transit (CB, N = 13) reside in Toronto or Vancouver, and close to half of the group has a disability that limits their mobility (46%). In contrast, those living in lower WalkScore® areas and feel uncomfortable walking from their home to destinations or public transit (UB, N = 5) are older, mostly men, with lower income. Four of the five interviewees of this group have a disability that limits their mobility. On the whole, interviewees living in high WalkScore® environments are less likely to have access to a car when compared to their lower WalkScore® counterparts.

	Interview Sample	Comfortable + Good Environment (CG)	Uncomfortable + Good Environment (UG)	Comfortable + Bad Environment (CB)	Uncomfortable + Bad Environment (UB)
	Mean	Mean	Mean	Mean	Mean
	N = 58	*N = 28*	*N = 6*	*N = 13*	*N = 5*
Age	76.1	75.9	77.3	74.5	82.4
Gender					
Man	45%	43%	33%	46%	60%
Woman	55%	57%	67%	54%	40%
Other	0%	0%	0%	0%	0%
Region					
Greater Halifax	12%	7%	17%	15%	40%
Greater Montréal	21%	36%	17%	8%	0%
Greater Saskatoon	7%	4%	17%	0%	20%
Greater Toronto	21%	18%	17%	38%	0%
Greater Vancouver	21%	14%	17%	31%	40%
Greater Victoria	19%	21%	17%	8%	0%
Income (in CAD)					
Below $60K	41%	36%	33%	38%	60%
Above $60K	46%	46%	67%	54%	40%
Prefer Not to Answer	12%	18%	0%	8%	0%
Disability					
No	61%	79%	50%	54%	20%
Yes	34%	21%	50%	46%	80%
Prefer Not to Answer	0%	0%	0%	0%	0%
Access to a Car					
No	29%	32%	33%	23%	20%
Yes	66%	68%	67%	77%	80%

Table 1 Summary of respondents' sociodemographic information

4.3 Thematic Analysis Results

Table 2 displays the summary of the thematic analysis conducted of the in-depth interviews. Themes are organized into three components of walkability: the barriers, facilitators, and strategies that participants encounter and engage with in navigating active travel in their communities. Subthemes must have a minimum benchmark of a 5% overall respondent engagement to be retained. As recommended for larger ATS datasets, we included this quantification in our data-reduction methods to improve findings' validity and support analytical rigour (Hannah & Lautsch, 2011). The breadth of conversational interviews justifies the choice of this benchmark, as interviews were semi-structured with limited directionality.

4.2.1 Barriers

Four types of barriers emerged from conversations with interviewees. Environmental barriers to walking, especially ones linked to the Canadian context like ice (19%) and snow (22%), were frequently discussed by interviewees. Nearly half of respondents (47%) cited weather as a considerable deterrent to occasional or seasonal walking patterns. Hills (17%), puddles (5%), and wildlife (5%), were other common environmental barriers. Although these barriers emerge from environmental conditions, several interviewees noted that they have strong infrastructural and policy dimensions, including, for example, inadequate snow-clearance and de-icing policies.

Infrastructural and maintenance issues were highly discussed. The (in)adequacy of built environment components of walking trips, such as lighting, sidewalks, and crosswalks, impede ease and comfort of walking for many older Canadians (59%). This extends to concerns about construction (19%) and lack of maintenance (29%), like timely snow removal, which interrupt access to reliable walking routes. Furthermore, 36% of respondents cited a land use-related concern, such as limited green space, undesirable or unaffordable destinations, or lengthy indirect routes to desired amenities.

Health and personal barriers were of particular importance for many older adults. Respondents frequently cited limited ability to carry groceries (24%) or fears of falling (14%) as walking deterrents. General health concerns, both age- and disability-related, were often mentioned (38%) by respondents as key determinants of their walking patterns.

Concerns centred around interactions with other travellers were also quite important to interviewees. Whether cycling or vehicular traffic (41%), other pedestrians (24%), or general feelings of unsafeness (19%), interactions with other road-users and community members often provoked concern.

Themes	Sub-Themes	Overall	Comfortable + Good Environment (CG)	Uncomfortable + Good Environment (UG)	Comfortable + Bad Environment (CB)	Uncomfortable + Bad Environment (UB)
		N= 58	*N= 28*	*N= 6*	*N= 13*	*N= 5*
Barriers						
Environmental Barriers	Hills	17%	11%	17%	23%	0%
	Ice	19%	21%	0%	23%	0%
	Puddles	5%	7%	0%	8%	0%
	Snow	22%	21%	17%	31%	20%
	Weather	47%	57%	33%	31%	20%
	Wildlife	5%	4%	0%	15%	0%
Infrastructure & Maintenance Issues	Construction	19%	21%	0%	15%	0%
	Infrastructure	59%	57%	33%	69%	40%
	Land Use	36%	32%	50%	31%	40%
	Maintenance	29%	32%	17%	23%	40%
	Lacking Rest Stations	7%	0%	17%	0%	20%
Health & Personal Concerns	Carrying	24%	25%	17%	38%	20%
	Falling	14%	14%	17%	8%	20%
	Health	38%	32%	100%	15%	20%
	Pandemic	9%	11%	0%	0%	20%
Interaction-Based Concerns	People	24%	25%	33%	23%	20%
	Safety	19%	11%	33%	31%	20%
	Traffic	41%	32%	33%	69%	20%
Facilitators						
Essential Infrastructure	Accessibility	78%	86%	83%	62%	80%
	Green	66%	68%	33%	69%	40%
	Infrastructure	52%	46%	67%	46%	40%
	Maintenance	14%	11%	0%	15%	20%

	Traffic Calming	14%	11%	0%	31%	0%
Environmental Comfort	Comfort	17%	21%	17%	23%	0%
	Flat	5%	4%	0%	8%	20%
	Quiet	19%	14%	17%	23%	0%
	Weather	12%	14%	0%	0%	0%
Social Factors	Dog	17%	18%	33%	8%	0%
	People	33%	29%	17%	46%	20%
Strategies						
Avoiding or Reducing Walking Trips	Doing Less	40%	46%	17%	38%	0%
	Different Mode	50%	43%	67%	54%	40%
	Online Alternatives	14%	11%	17%	15%	40%
Changing Logistical Aspects of Walking Trips	Different Crossing	12%	7%	0%	23%	20%
	Different Destination	10%	4%	17%	8%	20%
	Different Route	22%	18%	0%	15%	40%
	Different Travel Pattern	28%	18%	33%	54%	20%
	Indoor Walking	9%	14%	0%	0%	0%
	Road Instead of Sidewalk	14%	14%	0%	15%	20%
Using Assists	Help from Person	10%	11%	17%	0%	40%
	Equipment	24%	14%	50%	23%	40%
	Multimodal	19%	18%	0%	23%	20%
Adapting to Walking Trips	Advocacy	12%	14%	0%	15%	0%
	Practice	16%	18%	17%	15%	0%
	Caution	33%	36%	17%	38%	0%

Table 2 Prevalence of themes mentioned in interviews by walkability perspective

4.2.2 Facilitators

The interviews revealed three main factors that promote or facilitate walking trips (Table 2). All segments of respondents recognized suitable infrastructure as a main facilitator to walking. This includes perceived proximity by walking to destinations of interest, such as shopping or community centres (78%), as well as access to green spaces and natural amenities (66%), and reliable infrastructure (52%). Effective maintenance (14%) and traffic calming measures (14%) were also discussed. The prominence of these facilitators is in line with findings in the literature (Mitra et al., 2015; Zhao et al., 2024)

Another emerging facilitator is environmental comfort, namely, familiarity and comfort with a walking area (17%), quiet neighbourhoods (19%), and mild weather (12%) and slopes (5%). Finally, interviewees described social factors wherein animal (17%) and human companions (17%) encourage more frequent, longer, or enjoyable walking trips.

4.2.3 Strategies

Throughout the interviews, respondents frequently reflected on the impact of their environment on their travel habits and were eager to share how they navigate the barriers and use the facilitators to walk in their neighbourhoods. Walking trip avoidance or reduction, whether partial, periodic, or total, is common among older adults in a range of neighbourhood settings (40%). This strategy is often tied to seasonal conditions and select types of trips. For older adults, walking may be substituted other modes such as car, bicycle or public transit (50%). Several interviewees talked about changes in their travel behaviour post-COVID-19 pandemic, especially as online shopping options and social activities became available and integrated into their routines (14%).

Modifying logistical aspects of walking trips, whether by choosing a different route (22%), destination (10%), or road crossing (12%), was a common method that many older adults adopted. Some older adults report having a degree of flexibility in their travel and exercise routines and can choose to take paths with fewer barriers. Changing the timing of trips (28%), whether by chaining errand trips to reduce the number of excursions, avoiding busy traffic periods, or accommodating personal limits when carrying groceries, help many older adults maintain important aspects of their desired lifestyles as they get older. For those who share that walking is a high priority, switching to walking indoors was a mentioned alternative (9%).

Mobility aids like prosthetics, walkers, and wheelchairs are integral elements of many interviewees' daily lives. For some, physical impairments that may otherwise limit access to neighbourhood amenities are partially surmountable with the use of mobility aids and other implements (24%). However, poor walking path maintenance and unreliable infrastructure can impede effective usage of these mobility aids. Community support from friends, family, and neighbourhoods is critical when walking conditions are subpar (10%). Partial trip replacement with other modes was another strategy employed by several interviewees (19%). Some

respondents talked about driving to more walkable areas or to outdoor venues for hikes, and others use public transit for more strenuous parts of planned walking trips.

Many older Canadians are exercise caution in the face of potential hazards, like heavy traffic or cracked sidewalks (33%). While the importance of being alert while travelling in perceived riskier areas was repeatedly emphasized by respondents, this strategy was often accompanied by significant stress and anxiety. Many health-related challenges were dealt with through practice (16%). Setting walking goals and exercise regimes helped many interviewees increase their physical fitness and walking distance thresholds. Several older adults (12%) advocated for better walking conditions by petitioning local representatives. Upon noticing potential hazards, for either themselves or other older adults, many took immediate action, such as notifying municipalities. Overall, strategies discussed by older adults in the face of a range of challenges were highly person- and context-specific, meriting further attention and comparison.

5. Discussion

Our thematic analysis explored how older adults navigate self-reported barriers and facilitators to walking. The diversity of their adaptative problem-solving behaviour across the four interviewee subgroups enriches our understanding of how older Canadians respond to agreement or mismatch between their perceived and objective walkability.

5.1 Understanding Consonance

Older adults who have consonant perspectives of their neighbourhood walkability include interviewees residing in high WalkScore® areas who agree that they can comfortably reach destinations on foot, as well as interviewees living in low WalkScore® areas who concur that they cannot comfortably reach their desired destinations by walking.

5.1.1 Comfortable + Good Environment

The facilitators most frequently reported by consonant and comfortable walkers closely reflect the WalkScore® criteria. Having access to a combination of basic needs and interesting activities within reasonable walking distance is a key driver of interviewees making walking part of weekly or daily routines.

Even though this subgroup is generally satisfied with the walkability of their neighbourhoods, they still face minor setbacks and inconveniences. For example, comfortable walkers were more prone to discuss weather-related challenges that created periodic or minor impediments to walking behaviours than any other subgroup.

> *"Well, I looked out the window this morning and I didn't go out for breakfast because it was raining […] I'm a little bit more reclusive when the weather is bad." (NRC_F_1374, CG)*

When this subgroup chooses to "do less," it tends to involve a slight reduction in outdoor walking time due to temporary and uncontrollable circumstances, such as inclement weather or street closures. Walking is still an ideal mode most of the time for this subgroup:

"And in the end, we made the decision to live on the peninsula, and that's one we've never regretted because, we hardly ever drive downtown unless the weather's bad. We almost always walk because we can normally do anything by walking. And about the same time it would take to find a parking place." (NRC_F_1865, CG)

The interviews brought to light disruptions to walking in objectively walkable areas that are not reflected by WalkScore®. Significant construction-related issues and non-universally accessible pedestrian infrastructure can pose safety concerns and detract from older Canadians' enjoyment of walking trips. Nevertheless, how comfortable participants reported responding to infrastructure, construction, maintenance, and safety concerns demonstrated a stronger capacity to adapt to their environment compared to their uncomfortable peers. Older adults in this subgroup are going to walk no matter what and do not find the need to rely on adaptive strategies. They are, generally, able to make the most out their amenity-dense neighbourhoods on foot.

5.1.2 Uncomfortable + Bad Environment

Conversely, among respondents for whom there was agreement between perceived and objective measures of (un)walkability, the barriers discussed were often permanent and inflexible. The top barriers for this subgroup mirror the facilitators for consonant, comfortable interviewees: poor access to destinations, unsuitable or missing infrastructure, and unreliable maintenance are critical complaints. As one Saskatoon participant reports, food deserts and sprawl often make car trips the default option in objectively unwalkable neighbourhoods:

"There's no grocery store in downtown Saskatoon. And so, people that, you know, live in condos in the city have to go elsewhere. […] Yeah, yeah, it's less than optimum in that regard." (NRC_F_1187, UB)

The absence of influential facilitators is notable, with very few respondents citing environmental comfort or social factors as drivers of regular walking habits (Table 2). The facilitators discussed tend to be limited and minimally influential on day-to-day behaviours. Even when there are accessible amenities, some respondents suggest stand-alone destinations might not warrant a walking trip.

Throughout the interviews, this subgroup's participants tended to share walking-avoidant strategies, such as using a different mode (e.g. driving) or online alternatives to meet their needs. Particularly in the post-COVID-19 context, online alternatives have helped some older adults maintain social and civic involvement without having to leave their homes:

"But I must say, zoom has made a big change. Because now quite a few of the meetings, regular groups that I'm involved in, the meetings are both by zoom or in person. So, you know, more often I guess now we're doing them by zoom. On winter nights, you know." (NRC_F_1012, UB)

Almost none of the consonant uncomfortable respondents mentioned employing advocacy, practice, or caution as adaptive strategies, not seeing these as practical strategies for overcoming unconducive walking environments.

5.2 Understanding Dissonance

Dissonance refers to the mismatch of the objective and subjective walkability measures for two respondent subgroups: interviewees residing in high WalkScore® areas who cannot comfortably reach destinations or public transit by walking, and interviewees living in low WalkScore® areas who perceive they can.

5.2.1 Uncomfortable + Good Environment

Participants in this subgroup recognize high accessibility to services and amenities, as well as relatively reliable pedestrian infrastructure in their neighbourhood as strong facilitators for walking. However, unlike their consonant counterparts, they identify insurmountable barriers in their high WalkScore® areas that interfere with their ability to comfortably reach desired destinations or public transit by walking.

Physical health issues, including mobility disabilities, illness-related setbacks, sedentary lifestyles, and low energy, are the leading barriers reported among this subgroup. Physical limitations restrict acceptable distances to walk to a destination, reducing the destinations this subgroup can "comfortably reach," even in an amenity-dense area. Furthermore, as described by this Victoria resident, segregated land uses mean a range of amenities might be available, but not conducive to trip-chaining or short walking trips:

"Here, residential is residential. Commercial is commercial. And industrial is industrial. […] And even to go out with for a coffee with a friend, you have to go for me to walk to the main street is 20 minutes." (NRC_F_4226, UG)

Although respondents in this subgroup overwhelmingly report using a different mode for longer and more challenging trips, several interviewees expressed a wish to be able to walk for more of their daily activities. Opportunities for socialization would help many respondents re-incorporate active travel into their lifestyles, including one Toronto interviewee and his friends:

"And I think, you know, post-Covid, I've become a little too comfortable just staying home. […] I notice most of most of my friends, most of the people that I used to hang out with and go places with have also kind of pulled in their antennae even if they don't have physical mobility issues." (NRC_F_3011, UG)

5.2.2 Comfortable + Bad Environment

Comfortable, dissonant interviewees consider their low WalkScore® neighbourhoods as subjectively walkable. They recognize the barriers along walking routes, adapt their behaviours accordingly, and see potential for improvement. As such, this subgroup relies heavily on adaptative techniques like advocacy, practice, and caution when faced with challenges.

Inconsistent infrastructure is a substantial barrier for many interviewees, like one Victoria resident, who notes that pedestrian infrastructure is only partially universally accessible, and advocates for more wheelchair-accessible curb ramps:

"I used a wheelchair since 1970. And so, I have certain things that I need, which are, curb ramps and things like that to get around my community […] the curb ramps in that intersection are problematic for me. I've had the district come out and do piecemeal changes to them. But it is problematic. It's not perfect yet." (NRC_F_234, CB)

High traffic volumes, especially along major thoroughfares, are also deterrents for many CB participants. They frame these barriers as opportunities to improve pedestrian safety through traffic calming measures, like this Halifax elder:

"It feels hazardous because where you cross the street, where the off ramp from the highway comes […] There can be a lot of aggressive traffic drivers there. But I guess they're experimenting with different street light systems to give pedestrians some dedicated time to cross, but I don't know how long that will last." (NRC_F_1874, CB)

These older adults identify several aspects of their neighbourhoods that facilitate frequent and enjoyable outdoor walking trips. As might be expected in low WalkScore® areas, proximity to destinations is not the main motivator for these respondents. Rather, quiet and comfortable neighbourhood conditions, whether due to familiarity with the built environment, strong social bonds, or pleasant green spaces, are most important:

"And in the residential areas it's lots of shady streets and pleasant, surroundings that I can walk around for is no shortage of areas where I can walk and enjoy being outside" (NRC_F_2364, CB)

Many older adults in this subgroup are mindful of when they walk, avoiding nighttime travel and peak commuting times for safety reasons. When certain areas are less conducive to pleasant walking, they shift their activities to quieter streets and green spaces:

"I live near two busy streets. But I just walk into the residential area. I'm near a park." (NRC_F_3621, CB)

Interviewees commonly discuss social walking groups and active partners who help cultivate ongoing enjoyment with walking.

"I joined walking groups, and so I'm able to do that, but also, just I love walking here. I love being out and about, and it makes me happy and keeps me fit." (NRC_F_263, CB)

Overall, this subgroup overcomes objective (un)walkability by choosing aspects of their neighbourhood to take advantage of or avoid when incorporating walking into their daily lives. However, although many interview participants effectively cultivated methods to enhance their health through walking, some of these strategies were accompanied with unwanted stress or hardship. These issues reaffirm the need for comprehensive solutions to enhance walkability for an aging population.

6. Conclusion

Understanding walkability and its implications for older adults is crucial for identifying the subjective characteristics and contextual factors that facilitate lifelong walking. To this end, our qualitative analysis explored to what extent older Canadians can comfortably reach their desired destinations or public transit by walking, revealing alignment and misalignment of subjective and objective walkability. Our thematic analysis of interviews provided nuance to these dissonant and consonant perceptions of walkability for older Canadians living in low- and high-WalkScore® areas. A comparison of themes for four subgroups of older adults underscored key barriers and facilitators that shape their perceptions of neighbourhood walkability and the strategies they employ when negotiating their living environments.

WalkScore® can give policymakers and transport planners a starting point for improving the active participation of older adults in their neighbourhoods. However, our analyses reveal that older Canadians' diverse physiological, subjective, and contextual characteristics require targeted interventions and engagement to better promote more frequent and enjoyable walking. That said, our conversations with older adults highlight that consistent, comprehensive, universally accessible, and well-maintained pedestrian infrastructure is bound to improve walking experiences for all.

Mediating and minimizing interruptions to this infrastructure is a priority for older adults in objectively walkable areas. CG respondents have suggested improved signage, detour paths for construction activities, and proactive seasonal maintenance. When considering dissonant older adults in high WalkScore® areas, introducing facilitators that can extend mobility-impaired adults' "comfortable reach" is critical. Creating opportunities for lifelong socialization through community building, walking groups, and communal green spaces can help ease perceived barriers and promote age-inclusive pedestrianism.

Our findings show that older adults rely on many strategies to navigate challenges in their built environment and meet their daily needs. Our recommendations for policymakers and transport planners are to support older adults' resiliency and agency by creating environments that support favourable, active adaptation strategies and reduce the need for burdensome strategies, like trip reduction or mode replacement. CB interviewees share that better-maintained greenery and traffic

calming measures can minimize stressors and maximize their neighbourhood's potential for walkability. Finally, to help older adults living in areas with low subjective and objective walkability (UB), distance to amenities should be given added attention: policymakers and community leaders should ensure basic needs like grocery stores, pharmacies, and health care services are within reasonable walking distance from concentrations of older adults.

Though the findings contribute to our understanding of older adults' lived and perceived walkability, we recognize some limitations of our study. Firstly, though the overall interviewee sample size is adequate, the smaller number of participants in each region makes it challenging to conduct finer analyses at the city level. Moreover, WalkScore®, used in this study, is a well-established measure of local accessibility, efficiently describing walking environments. However, other measures of walkability could help identify the factors that contribute to potential mismatch between perceptions of walkability and objective built environment measures. A more systematic and comprehensive approach to compare objective measures and perceived walkability for older adults could be of value for further studies.

The suggested targeted and age-inclusive policy recommendations based on the findings of this study can support lifelong resilience and walking for older adults. By promoting favourable walking environments and reducing the need for demanding coping strategies, these interventions provide practical guidance for creating age-friendly environments that support healthy aging.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Author Contributions

The authors confirm contribution to the paper as follows: Study conception and design: James, Alousi-Jones, Soliz, & El-Geneidy; Data collection: Alousi-Jones, Soliz, & El-Geneidy; Analysis and interpretation of results: James, Alousi-Jones, Soliz, & El-Geneidy; Draft manuscript preparation: James, Alousi-Jones, Soliz, & El-Geneidy. All authors reviewed the results and approved the final version of the manuscript.

CRediT authorship contribution statement

Megan James: Conceptualization, Methodology, Validation, Formal Analysis, Data Curation, Writing – original draft, Writing – review & editing. **Meredith Alousi-Jones**: Conceptualization, Methodology, Validation, Formal Analysis, Data Curation, Investigation, Writing – original draft, Writing – review & editing. **Aryana Soliz**: Conceptualization, Methodology, Validation, Formal Analysis, Data Curation, Investigation, Writing – original draft, Writing – review & editing. **Ahmed El-Geneidy**: Conceptualization, Methodology, Validation, Formal Analysis, Data Curation, Writing – original draft, Writing – review & editing, Project administration, Resources, Supervision, Funding acquisition.

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