



Integrating neighbourhood walkability perceptions of people living with dementia in urban design and planning in British Columbia, Canada

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ABSTRACT

Urban design and planning play an important role in supporting the out-of-home activity participation of people living with dementia. Studies show discrepancies in planners' understanding of the perceptions, motivations, and needs of people living with dementia related to environmental support. This study explores 1) how people living with dementia perceive neighbourhood environmental support for outdoor walking, and 2) how the recommendations for neighbourhood environmental support made by people living with dementia are understood by municipal professionals. Sequential semi-structured sit-down and video-documented go-along interviews were conducted with ($N = 14$) community-dwelling people living with mild to moderate dementia in Metro Vancouver, British Columbia. Thematic analysis of text and video data helped generate evidence summaries that were used to conduct semi-structured interviews ($N = 4$) and a focus group ($N = 3$) with municipal professionals. Participants living with dementia recommended enhancing walkability by 1) repairing and widening sidewalks, 2) delineating separate paths for pedestrians and micromobility, 3) improving places for rest and respite, 4) augmenting visibility and safety at street crossings, and 5) maintaining distinctiveness and stability of the urban form. Thematic analysis of professionals' responses to the walkability appraisals of participants living with dementia reflected 1) empathy and understanding, 2) knowledge of existing planning measures and willingness to introduce new measures, and 3) concerns regarding feasibility and implementation. Findings underscore the need to centre research on the experiential knowledge of people living with dementia to enable planners to anticipate people's needs and experiences and make informed decisions to ensure that outdoor public spaces are dementia-inclusive.

1. Introduction

Walkability of neighbourhoods is highly relevant for older adults, not only for transportation and access to destinations, amenities, and services in the community, but also for supporting health and wellbeing (Barnett et al., 2017). The concept of walkability encapsulates environmental characteristics that render communities: 1) traversable, with suitable physical conditions to go from place to place, 2) compact, through short walking distances to places, 3) safe, by minimizing perceived harm due to crime or traffic, 3) physically-enticing, through elements of visual interest and sources of sensory stimulation, and 4) lively and social, through the provision of well-populated mixed-use and commercial spaces (Forsyth, 2015). The concept of walkability relates

more broadly to the concept of 'environmental support,' which has been applied in environment-behaviour and design research to understand how environmental design shapes people's ability to conduct and participate in activities (Sugiyama & Thompson, 2007). Outdoor environmental support is known to influence older adults' confidence in their abilities and recognition of their skills and opportunities to conduct out-of-home activities (Sugiyama & Thompson, 2007). The concept of environmental support is rooted in people's cognitive processes of environment appraisal, based on their needs, goals, capabilities, and expectations (Sugiyama & Thompson, 2007). Exploring how people process, integrate, interpret, and evaluate different aspects of their environment based on their experiences and memory is necessary to understand how environmental design aligns with individual and

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collective goals, values, preferences, and expectations (Clare & Ortony, 2013). Addressing recent calls for a more holistic understanding of walkability (Bozovic et al., 2020; Forsyth, 2015) that takes into account subjective perceptions of pedestrians with diverse lived experiences, the present study focuses on exploring neighbourhood walkability through the subjective environmental perceptions and appraisals of people living with dementia, and the value of this experiential knowledge for urban design and planning (UDP) initiatives aimed at fostering dementia-inclusivity at the municipal level.

1.1. The role of urban design and planning in supporting age-friendliness and dementia-inclusivity

Urban design and planning play an important role in supporting older adults' capacity to age in place in home and community environments that they are familiar with, without disruptions to their life and activities in their communities (Low et al., 2021; Tuckett et al., 2018). The relevance of UDP is evident in the World Health Organization's (WHO, 2007) model of age-friendly cities and communities (AFCC). Age-friendly cities and communities are defined as those that encourage "active ageing by optimizing opportunities for health, participation and security in order to enhance quality of life as people age" (WHO, 2007, p.72). Given the growing incidence of dementia among older adults and the culture of stigma and discrimination that surrounds it, a vital part of WHO's public health focus, alongside AFCC initiatives, has been the promotion of community-based dementia care and support (WHO, 2021). Similar to AFCC, the WHO's (2021) framework on dementia-friendly and inclusive communities (DFC) is centred on the implementation of actions for dementia-inclusivity in the physical and social environment through the involvement of multiple sectors, including UDP.

AFCC and DFC initiatives offer formal mechanisms for municipal governments to address concerns related to population aging in domains of housing, transportation, and services and supports (Pope et al., 2024). In the Metro Vancouver (M.V.) region in British Columbia (B.C.), Canada, the DFC framework is being integrated into local policy and practice through municipally led DFC action plans that focus on areas of community awareness and training, community participation, and environmental accessibility (City of Burnaby, 2017; City of New Westminster, 2016; City of Richmond, 2019; The North Shore Municipalities, 2017; Township of Langley, 2021). These plans delineate the role of UDP in addressing the DFC vision and highlight UDP professionals as a key stakeholder group.

Over the past two decades, a small yet significant group of studies have focused on generating evidence-based recommendations for planners and designers to address the socio-spatial needs of people living with dementia (Burton & Mitchell, 2006; Biglieri & Dean, 2021, 2022; Gan et al., 2021). These recommendations broadly cover environmental features, including mixed land-use, accessible and well-separated sidewalks, appropriate seating, traffic calming measures, proximity to activity destinations, orientational and directional cues, legible signage, clear street layout, and distinctiveness of urban form (Biglieri & Dean, 2022; Burton & Mitchell, 2006). As municipal DFC plans in M.V. get integrated into traditional planning tools, such as official community plans (OCP), bylaws, and standards (Biglieri, 2018; Seetharaman et al., 2025), there is a need to augment the body of knowledge on DFC and offer a guided approach to DFC policy integration that is grounded in the unique needs and experiences of people living with and affected by dementia.

1.2. Drawing on subjective perceptions of people living with dementia to assess environmental support and walkability

UDP research and practice have largely overlooked the diverse subjective environmental perceptions and lived experiences of pedestrians, viewing them mostly as a homogenous and undifferentiated user

group (Babb, 2014; Middleton & Spinney, 2019; Shields et al., 2023). Centring UDP on social and spatial justice, diversity, and inclusion calls for understanding the activity-related spatial needs of population groups that are susceptible to spatial exclusion from places in the community that do not meet their needs (Freeman, 2024). This knowledge gap calls for the evaluation of neighbourhood environmental support based on the lived experiences of population groups whose accessibility needs are not widely represented in UDP research and practice.

There is a paucity of research examining the neighbourhood environmental perceptions of people living with dementia, and the studies that do exist are concentrated in the UK and Sweden (Sturge et al., 2021). More recently, some studies have focused on understanding neighbourhood built environmental support through the subjective perceptions of community-dwelling people living with dementia in Eastern Canada (Biglieri & Dean, 2021, 2022). The paucity of research on this topic in the Western Canadian context, where there have been significant advancements in DFC policy, highlights opportunities for researchers to generate a localized body of knowledge based on the lived experiences of people living with dementia that can help inform and guide the implementation of DFC policy in UDP.

Kuliga et al. (2021) underscore the need to harness the lived experiences of people living with dementia and expand research on environmental support and DFC, to better equip UDP professionals with 'taking the perspective' of people with lived experience (i.e., imagining and anticipating how people living with dementia would experience the environment; p.3) and making informed decisions to address goals of dementia inclusivity. Previous research has shown a lack of awareness and knowledge among planners regarding design characteristics of dementia-inclusive neighbourhood environments, emphasizing the need for research that provides information support and guidelines that can be implemented in UDP (Przydatek, 2014; Seetharaman et al., 2025). It is necessary to engage UDP professionals in DFC research to gain a better understanding of their knowledge needs and help strategically advance their skills and efforts towards achieving dementia inclusivity in the built environment.

1.3. Focus of study

This study attempts to address the knowledge needs and gaps in understanding and implementing dementia-inclusivity in UDP through the following research questions: 1) How do people living with dementia perceive neighbourhood environmental support for outdoor walking? and 2) How are the recommendations for neighbourhood environmental support made by people living with dementia understood by municipal professionals?

Given the focus on investigating how people living with dementia interpret the supportiveness of their outdoor environments to enable UDP professionals in taking their perspective in dementia-inclusive design, the study is situated within an interpretivist paradigm, highlighting the meanings, values, and beliefs that underlie built spaces and the relationships that people living with dementia have with them (Yanow, 2015). The study acknowledges that the built environment is composed of multiple meanings, those that are intuited and cultivated by users of built spaces and those that are embedded in spaces by the decisions of UDP professionals (Yanow, 2015). In an attempt to explore these diverse sets of meanings and values, the study integrates the perceptions and interpretations of people with lived experiences and UDP professionals with regard to dementia-inclusive design of streets and outdoor public spaces.

This cross-sectional study draws from two sets of data collected sequentially with two groups of participants: people living with dementia and municipal professionals. Further, the data collected with people living with dementia informed and guided data collection with municipal professionals. This paper presents key insights from both data sources, highlighting how municipal professionals' knowledge and understanding of dementia-inclusive UDP reflect the experiential

knowledge shared by participants living with dementia.

The study was conducted as part of the first author's doctoral dissertation, which focuses on developing an understanding of the outdoor environmental accessibility needs of people living with dementia and guiding dementia-inclusive UDP in M.V.. The dissertation is partly embedded in: 1) a community-based mixed-methods exploratory research project titled [Dementia-inclusive Spaces for Community Access, Participation, and Engagement \(DemSCAPE\)](#), conducted in B. C.. This research project aimed to explore dementia-inclusive UDP through engagement with multiple stakeholders, e.g., people living with dementia and care partners, local government, dementia support and advocacy organizations, and 2) A knowledge mobilization extension of the DemSCAPE project, titled "Developing Knowledge Mobilization Strategies to Create Dementia-inclusive Spaces for Community Access, Participation, and Engagement (DemSCAPE-KM)". This project involved partnerships with two local government bodies in M.V. with the objective of developing practical tools and resources for informing dementia-inclusive neighbourhood planning and design for municipal professionals.

2. Methods

2.1. Participants

This study has two groups of participants: 1) people living with dementia (referred to as 'lived experience (LE) participants' in this paper), recruited as part of the DemSCAPE project, and 2) municipal professionals involved in development and transportation planning and engineering (referred to as 'municipal professionals' or 'planners' in this paper), recruited as part of the DemSCAPE-KM project.

Recruitment of LE participants was facilitated by local government bodies in M.V., community-based support and advocacy organizations (e.g., Alzheimer Society of British Columbia (ASBC), neighbourhood houses, dementia support groups, recreational programs), and the Clinic for Alzheimer Disease and Related Disorders (CARD) at The University of British Columbia Hospital (UBCH). Participants were included based on the following criteria: 1) self-reported experience of mild to moderate dementia or mild neurocognitive disorder (MND), 2) living in market or non-market housing (excluding assisted living and long-term care) in M.V., 3) walking outside independently or with the support of others with some level of regularity, and 4) ability to communicate in English. A stratified purposive sampling approach (Robinson, 2014) was adopted to identify participants residing in different municipalities in M.V. The sample of LE participants (see Table 1) consists of 14 community-dwelling people living with mild to

Table 1
Demographics of Participants with Lived Experience.

Participant	Age (at the time of interviews)	Gender (M: Male, F: Female)	Ethnicity	Dementia Diagnosis	Other Health Conditions	Care Partner (if applicable)
PLE01	73	F	European	Mild neurocognitive disorder (MND)	Chronic Obstructive Pulmonary Disease (COPD)	CP01; spouse
PLE02	87	M	European	Parkinson's Disease Dementia	-	CP02; spouse
PLE03	73	M	European	Lewy Body Dementia	Postural Hypotension	CP03; spouse
PLE04	71	F	European	Alzheimer's Disease	-	CP04; spouse
PLE05	80	M	European	Unknown	Osteoarthritis	N/A
PLE06	87	M	Chinese	Vascular Dementia	High Blood Pressure and Cholesterol	CP06; spouse
PLE07	80	F	Chinese	MND	Stroke	CP07; spouse
PLE08	76	F	European	Alzheimer's Disease	-	CP08; spouse
PLE09	61	M	European	MND	Chronic Fatigue, Depression, HIV	N/A
PLE10	77	F	European	Unknown	-	N/A
PLE11	82	F	European	Unknown	Osteoarthritis, High Blood Pressure, Gastroesophageal Reflux Disease (GERD)	CP11; spouse
PLE12	78	M	European	Parkinson's Disease Dementia	-	CP12; spouse
PLE13	65	F	European	MND	Neuropathy, Auto-Immune disorder, COPD	N/A
PLE14	70	M	European	Lewy Body Dementia	Stroke, Seizures	CP14; spouse

Table 2
Characteristics of Municipal Professionals.

Participant	Gender (M: Male, F: Female)	Professional Title/Role
MP01	F	Long-range policy planner
MP02	F	Social planner
MP03	F	Development planner
MP04	F	Social planner
MP05	M	Manager of Roads and Construction
MP06	F	Manager, Transportation Planning
MP07	F	Social planner

moderate dementia or MND with an age range of 61–87 years (mean age: 75.7 years). Seven participants were men, and seven were women. In terms of ethnicity, twelve participants were European, and two were Chinese. Participants were diagnosed with mild neurocognitive disorder (MND) ($N = 4$), Alzheimer's disease ($N = 2$), Parkinson's disease ($N = 2$), Lewy Body dementia ($N = 2$), and vascular dementia ($N = 1$), and the etiology for three participants was not known. Nine participants also reported living with 1–3 comorbid health conditions. Ten participants were part of spousal care dyads (eight out of the ten care partners were consistently present during the data collection sessions to support participants in research activities), and four participants lived alone. These participants lived in six municipalities, ranging in population from 21,360 to 692,310 (Metro Vancouver, 2024a), and mostly in neighbourhoods that were located in 'urban centres'. Urban centres are defined as "priority locations for higher density housing, employment and services, commercial, cultural, entertainment and institutional uses" (Metro Vancouver, 2024b, p.1). All participants walked outside their home independently or with the support of others and in varying degrees of regularity.

The second group of participants consists of seven municipal professionals (see Table 2) from two of the six M.V. municipalities where LE participants resided. These two municipalities were selected based on 1) the extent of development and implementation of AFCC and DFC plans in the municipalities, and 2) co-authors' (HC and AM) previous and ongoing research on the topics of aging, disability, dementia, and accessibility and knowledge mobilization partnerships with the municipalities. Consistent with a purposive sampling approach, the local government liaisons in both municipalities were asked to identify professionals from departments that were involved in the design and maintenance of the urban built environment and pedestrian infrastructure. The municipal professionals worked in departments of social planning ($N = 3$), long-range planning ($N = 1$), development planning

($N = 1$), transportation planning ($N = 1$), and public works ($N = 1$).

2.2. Data collection

In the DemSCAPE project, LE participants were involved in four sequential (60–90 min) in-person interviews (i.e., sit-down interview #1, sit-down interview #2, go-along interview, and sit-down interview #3) conducted approximately one week apart, from June 2022 to November 2022. This paper does not include data from sit-down interview #1, which focused on identifying where, when and how often participants walked in their neighbourhood. Details of the three subsequent interviews are presented in a previous paper (Seetharaman et al., 2023) and are summarized below:

- 1) The initial semi-structured interview (i.e., sit-down interview #2) focused on exploring the participant's experience, perceptions, and preferences of walking outside and their awareness and attitudes regarding the neighbourhood environment. Examples of questions included in the interview guide are: "How do you feel about walking outside in your neighbourhood?" and "Are there parts of your neighbourhood that are not good for walking outside?".
- 2) The go-along interview involved the participant walking with the first author on a route of their choosing and talking about their outdoor walking experiences in their neighbourhood (Carpiano, 2009). Situating the interview in outdoor walks allowed for the neighbourhood environment to trigger the participant's reflections and insights on environmental support. Examples of questions included in the interview guide are: "What do you pay attention to while you walk to your destination on this route?," "What problems do you have while you walk to the destination?," and "What could the City do to make the streets in your neighbourhood better for people living with dementia?". This interview was video-recorded by a research assistant walking a few metres behind the participant using a GoPro camera, which was either head-mounted or handheld, and paired with wireless microphones worn by the participant and the first author. Twelve participants also used another GoPro camera, worn on a hat or chest harness, to record secondary video footage that showed their point of view and what they were noticing and observing in the neighbourhood environment.
- 3) The follow-up semi-structured interview (i.e., sit-down interview #3) delved deeper into key issues discussed during the go-along interview using the video-elicitation method (Li & Ho, 2019), wherein select clips of the go-along interview video were used to trigger further discussion on participants' outdoor walking experiences and perceptions of environmental support and walkability. Each go-along interview yielded different topics for follow-up that were specific to the go-along interview data of each participant. Hence, individual follow-up interview guides were developed for each participant.

In the DemSCAPE-KM project, municipal professionals took part in semi-structured interviews ($N = 4$) and a focus group ($N = 3$) via Zoom. The single focus group was conducted as the attendees were part of the municipality's accessibility advisory committee and wished to participate in the study together. Prior to data collection, they were sent an evidence summary reporting key findings from the interviews with LE participants that highlighted a range of spatial challenges and corresponding design recommendations. In the interviews and focus group, municipal professionals were asked to identify 1) walkability issues and recommendations from the report that were relevant to understanding and adopting a dementia-inclusive approach in UDP, and 2) ways in which these recommendations could be adopted and integrated.

2.3. Data analysis

Data generated in interviews with LE participants and the interviews

and focus group with municipal professionals were thematically analyzed by the first author through an iterative and recursive process (Braun et al., 2019). Given that the study is part of the DemSCAPE project, inductive coding of the interview transcripts of three LE participants from the larger project sample was conducted by the first author collaboratively with two project team members. Interview transcripts were reviewed. Transcripts were coded line-by-line using NVivo qualitative data analysis software. Codes were reviewed, making sure they were meaningful and distinct, and were then grouped and sorted into broader, overarching themes. The themes were reviewed and refined to ensure distinctiveness and specificity. The coded data were reviewed, and descriptions of the codes were written. This process led to the development of an initial coding framework. This framework was reviewed by the project's principal investigator (HC) and co-investigators (LH, AP). Following its finalization, the first author used the coding framework independently to conduct thematic analysis of the participants' ($N = 14$) data included in this paper. The coding framework is divided into six overarching domains of codes: 1) Physical aspects of outdoor walking experience, 2) Cognitive aspects of outdoor walking experience, 3) Psychological and emotional aspects of outdoor walking experience, 4) Interpersonal and social aspects of outdoor walking experience, 5) Temporal aspects of outdoor walking experience, and 6) Advocating for and recommending improvement of outdoor environment. This paper draws from a subset of coded data within domains 1, 2, 3, and 6. Routine analysis debrief meetings were conducted with the DemSCAPE project team to review changes in the coding framework in response to subsequent coding, which informed the trajectory of data analysis (e.g., deciding which codes were salient and distinct and which codes could be collapsed).

The textual transcripts and video data from the go-along interviews of LE participants were connected using Transana qualitative analysis software. The coding framework generated through analysis of transcripts was used to re-code video transcripts (i.e., video recordings synchronized with textual transcripts). Additional codes were created to capture non-verbal cues and observations that were not evident from textual transcript analysis, and helped identify how participants observed and interpreted their surroundings and interacted with people and outdoor environmental features. These codes identified how participants 1) observed various aspects of the neighbourhood environment, 2) searched for and comprehended spatial information, 3) took stock of risk factors on the walking route, 4) maintained their gait and balance while walking on uneven surfaces, 5) conveyed their emotions (e.g., through expressions of pain, fatigue, shock, surprise), 6) interacted with other people on the street, and 7) received assistance from care partners.

The evidence summary created for municipal professionals was derived from all LE participants' data that was coded as part of the aforementioned domain in the coding framework, titled "Advocating for and recommending improvement of outdoor environment". The names of codes that were created in this domain include 1) Having adequate places to sit and rest, 2) Designating space for different road users, 3) Improving street crossing, 4) Improving sidewalk accessibility, 5) Improving traffic safety, 6) Adding or improving signage, 7) Improving landscaping and vegetation, 8) Introducing inclusive washrooms, and 9) Introducing new landmarks. The data in these codes were used to write clear and concise recommendations. For each recommendation, data exemplars were identified from as many LE participants' coded data as possible to ensure a diversity of insights from different participants. For each data exemplar, a screenshot from the video recording and a direct quote were identified to ensure that the voice of the participant was in the foreground, supporting each recommendation. These recommendations were collated into a 24-page report consisting of three main themes and 21 sub-themes that corresponded to different micro- and macro-environmental features of neighbourhoods. Each of these sub-themes consisted of 2–4 recommendations (Fig. 1 shows a page from the report). The themes and sub-themes in the evidence summary report

are listed below:

- **Sidewalk Accessibility:** 1) Width of Sidewalk, 2) Sidewalk Obstructions, 3) Visibility on Sidewalk, 4) Flat Surface, 5) Sidewalk Damage, 6) Sidewalk Buffer Space, 7) Space to Stop and Rest, 8) Level Difference, 9) Accessing Curb Cut
- **Accessibility of Street Crossing:** 1) Visibility of Crosswalk, 2) Pedestrian Visibility, 3) Stop Signs, 4) Pedestrian Signal, 5) Crossing Time
- **Walkability of Neighbourhood:** 1) Dedicated Walking Paths, 2) Public Washroom, 3) Walkable Destinations, 4) Street Layout, 5) Landmarks, 6) Signage, 7) Impact of Construction

2.4. Research ethics

The study received ethics approvals (H21-03552 and 30001949) from the institutional research ethics boards at Simon Fraser University and the University of British Columbia. This paper includes screenshots from the video recording of go-along interviews with LE participants to supplement the corresponding themes. Participants provided their consent to the use of video data in study publications and were informed that any identifying information from video data would be removed prior to use. In keeping with best practices in dementia research, a process consent approach was followed with LE participants before each of the four sequential interviews (Rivett, 2017; West et al., 2017). Written consent was obtained before all activities began, and oral consent was obtained and audio-recorded at subsequent stages (Pesonen et al., 2011; Thoft et al., 2020). LE participants were reminded of critical study details at subsequent stages and that they had the choice to decide

if they wanted to continue participating in the study (Hellström et al., 2007). Their capacity to provide informed consent was established based on their understanding of the specific research activity (Dewing, 2007; Heggstad et al., 2013). While seeking initial consent, LE participants were asked to explain the research activities in their own words and indicate that they had understood the voluntary nature of their participation and that they could withdraw from the research at any point. In interviews with dyads, the care partner played a helpful role in helping the participant understand the details presented in the written consent form.

Research processes were reviewed with LE participants periodically to detect barriers that limited their meaningful engagement and adopt strategies to reduce or eliminate barriers to participation (Webb et al., 2020). In the semi-structured interviews with LE participants, guided conversation techniques were used to “guid[e] [participants] towards certain issues” using targeted probes to encourage them to build and expand on insights, stay engaged in the interview, and express themselves freely (Dewing & Pritchard, 2004, p. 188). The technique of turn-giving was applied to facilitate extended pauses during conversations to let participants form and organize their response (Sabat, 1991a, 1991b). The technique of indirect repair was used to paraphrase what participants said and confirm with them if the paraphrase was consistent with their intended response (Sabat, 1991a, 1991b).

Talking during go-along interviews is intended to access LE participants' experiential knowledge of their environment and understand the relationships between people and places (Springgay & Truman, 2017). However, the emphasis on talking during the go-along interview needed to be adjusted for some participants, e.g., 1) who experienced exacerbated breathlessness from walking and talking at the same time due to chronic obstructive pulmonary disease (COPD), and 2) who preferred not to talk while walking during the interview due to their hearing disabilities. Facilitating LE participants' comfort during go-along interviews meant supporting them to decide where to walk and how far to walk based on their individual physical-cognitive needs (e.g., being in familiar surroundings and close to home, using the washroom frequently, seeking reprieve from the afternoon heat).

3. Findings

The findings are presented in the following five themes that encapsulate recommendations made by LE participants for enhanced walkability in the neighbourhood environment: 1) Addressing sidewalk maintenance, 2) Dedicating sidewalk to pedestrians, 3) Augmenting places of comfort in the outdoors, 4) Augmenting safety at street crossing, and 5) Enhancing identifiability and recognizability of surroundings. These themes also include the perspectives of municipal professionals on the recommendations made by LE participants. Table 3 summarizes examples of these recommendations and the corresponding perspectives of municipal professionals.

3.1. Addressing sidewalk maintenance

LE participants' perceptions of environmental support and walkability were linked to the maintenance of sidewalks in their neighbourhoods. Uneven sidewalks challenged outdoor walking by imposing physical and cognitive demands. Emphasizing the cognitive demand of constantly paying attention to unevenness on sidewalks, one participant said, “One thing about this [neighbourhood] that is quite hard to navigate is that there is a lot of bumps and uneven pavement. [...] I often look down. I often look down to make sure I can see my footing” (PLE13). This participant described how motor difficulties caused by neuropathy made it difficult to periodically change her position and maintain stable footing around damaged portions of the sidewalk: “It is difficult when the sidewalk's uneven and I have to keep changing my positions. Because my legs don't work as fast. Because I don't have the—the reaction time” (PLE13).

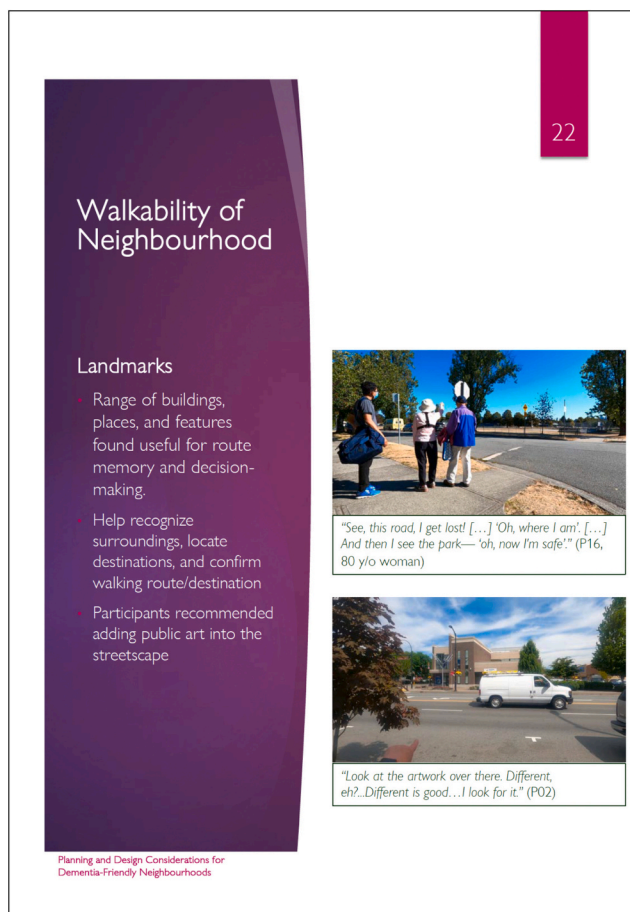


Fig. 1. A page from the evidence summary report created for municipal professionals.

Table 3
Summary of Strategies to Improve Neighbourhood Environmental Support for Dementia-Inclusivity.

Themes	Recommendations from Interviews with Participants with Lived Experience	Municipal Professionals' Responses
Addressing sidewalk maintenance	Renovate sidewalks and manage tree growth causing damage	Ongoing efforts to repair damaged sidewalks and replace trees
	Dedicating sidewalk to pedestrians	Enforce better regulation of sidewalk use and prohibit entry of micromobility
Augmenting places of comfort in the outdoors	Ensure consistent tree cover to facilitate comfort while walking on familiar streets	Acknowledge the importance of shaded streets for wayfinding
	Provide bench with armrests and transfer pole at regular intervals, and flat level surface adjoining sidewalk for people to park their walker	Ongoing efforts to improve frequency of benches
Augmenting safety at street crossing	Build centrally located, permanent, and accessible outdoor washrooms	Acknowledge need for public washrooms and addressing maintenance issues
	Improve detectability of curb letdowns	Recognize the need to maximize visual contrast to support depth perception
Enhancing identifiability and recognizability of surroundings	Make pedestrian-focused modifications to street crossings (e.g., introduce scramble crosswalks and leading pedestrian interval, replace traffic circle with four-way stops)	(No response)
	Assign distinctive street labels to avoid confusion and support wayfinding	Understand and empathize with the need for distinctive street labels
	Provide accessible signs with wayfinding prompts for key destinations	Acknowledge need for pedestrian-oriented signs and consistent design
	Expand the integration of public art in cities	Unaware of the importance of landmarks; suggest highlighting it in planning tools. Ongoing efforts to improve distinctiveness of urban form and architectural complexity of new builds
	Provide clear and accessible paths around construction sites	Acknowledge need for alternative and accessible paths of travel and consistent implementation
	Prevent the loss of neighbourhood landmarks in neighbourhoods undergoing rapid redevelopment	Recognize wayfinding difficulties posed by ongoing environmental changes

To improve walkability in her neighbourhood, the above participant recommended renovating the sidewalks and reducing the density of trees causing sidewalk damage: “I haven’t seen [the City] fix some of the tree roots. But the sidewalks gotta be pretty... almost turned right over [...] They need to cut down some of these trees [...] they sure cause a lot of mess” (PLE13). Highlighting the misfit of the species of trees planted

along sidewalks in his neighbourhood, another LE participant with a background in landscape architecture recommended that municipal authorities should consider planting more suitable varieties of trees: “Go to another type of tree. Crabapple or something like that... that’s not a big tree. Their roots aren’t aggressive. These guys (pointing at trees)... that’s a bloody oak! [...] [They] have big roots” (PLE05).

One municipal professional responded to the recommendations for enhanced sidewalk maintenance by acknowledging the city’s history of unregulated tree planting in neighbourhoods and its impacts on current sidewalk conditions and highlighting ongoing efforts to repair damaged sidewalks and replace trees:

A lot of the things that happen like this is in the asphalt section of the walk here [...] because of the trees—the wrong trees. A great majority of the trees in [city] were planted by developers back in the 70s and 80s. Entire neighbourhoods. So, the trees—yes, are the wrong trees [...] we are out there repairing the sidewalk annually [...] to look for the asphalt to be heaved. (MP05)

3.2. Dedicating sidewalk to pedestrians

This theme represents participants’ perceptions of environmental support to walk without interference from cyclists or other users of ‘micromobility’ (i.e., refers to human-powered and electric vehicles, such as bicycles, e-bikes, kick scooters, e-scooters, skateboards; Oeschger et al., 2020). LE participants residing in M.V. urban centres (i.e., where there is a higher concentration of cycling infrastructure; Translink, 2024) frequently encountered micromobility users on sidewalks, which contributed to their negative appraisals of safety. One participant said, “[Cyclists] don’t have their own lanes. They’re on the sidewalk. [...] You have to be careful of the cyclists because you’re walking” (PLE04). Difficulty detecting cyclists was often reported as a key issue that generated feelings of anxiety while walking in the neighbourhood. One participant recalled how the low detectability of cyclists contributed to her collision with a cyclist in her neighbourhood and subsequent unfavourable perceptions of cyclists:

We were walking and chatting, and this bike...these two young women on bikes [...] they bumped me and the woman next to me into me and they went around. And I said, “Hey, you guys ran into us.” And she said, “Well, I...I honked at you.” [...] So, it was my fault (laughs) that I got hit on the sidewalk, because she warned me that she was going to go around me. That—that’s the attitude. (PLE08)

Issues with cyclists were also experienced by LE participants residing outside urban centres in M.V.. One such participant reflected on cyclists’ lack of consideration for older pedestrians as she recalled encountering a cyclist on a narrow unpaved pathway during her go-along interview (see Fig. 2): “No respect...for [older adults] [...] People are very inconsiderate. [...] we had to make room for them. And I think it’s the younger people. [...] It’s not the old people” (PLE04).

One LE participant called for enforcing better regulation of sidewalk use and prohibiting micromobility users from entering sidewalks:

It’s very hard to walk. [...] It was not like this before. Especially with COVID, with these food delivery, they don’t care. They just go and go [...] And it’s dangerous for me. [...] There should be a sign that says ‘Sidewalk. No bikes’— [...] indicating there’s a fine if you’re driving a bike on the sidewalk. (PLE14)

Highlighting the value of dedicated spaces for pedestrians and cyclists, one LE participant appraised her experience of walking on a street in her neighbourhood that had recently been made an exclusive cycling route, leading to the sidewalk becoming free of cyclists: “You could not walk on [street] without being run over by a bike on the sidewalk until they did that. It was really dangerous. [...] Totally different experience! You can go on a walk instead of ‘where are they?’” (PLE08). The need for dedicated sidewalks and paths away from vehicular traffic was also



Fig. 2. “If [cyclists] are in their lane, it’s fine. But if they’re on the same lane as me, I don’t like it. I think it could be dangerous” (PLE04).

linked to challenges with traffic noise and maintaining focus and concentration while walking in busy areas. One participant said, “If I hear fire trucks, or a police alarm, or whatever it is. [...] Noise...disturbs me” (PLE14). His care partner (CP14) mentioned that the overstimulating nature of walking in noisy and crowded areas in their neighbourhood prompted them to walk in quieter side streets, even though these streets had a greater share of uneven sidewalks: “The only problem with that [route] is the sidewalks are much more irregular. You have to really watch your step there. But still, you don’t have quite the same amount of people” (CP14).

One municipal professional responded to LE participants’ recommendation for separating sidewalks and micromobility lanes by indicating overlaps with existing UDP policy while acknowledging gaps in implementation:

Ideally, cyclists should be separated from pedestrians, and that’s something in our transportation plan [...] We don’t actually delineate it on shared paths [...] It’s just a big open—bikes share this space, cyclists, mobility, scooters, everything using the same. [...] they are quite dangerous for pedestrians and especially for older—or people with young children. (MP01)

Municipal professionals also mentioned that widespread implementation of dedicated spaces for different uses was limited by the timing and fragmented nature of new private development in high-growth urban neighbourhoods, resulting in inconsistencies in infrastructure:

[The updated transportation plan] includes that certain streets have separated bike and pedestrian paths. [...] But the rollout is really slow because it depends on redevelopment generally of individual properties. So, there might be half a block that has this really beautiful public space [...] It’s not consistent yet. (MP03)

3.3. Augmenting places of comfort in the outdoors

This theme captures LE participants’ perceptions of outdoor environmental supports for rest and respite with regard to the 1) Presence of shade on walking routes, 2) Places that accommodate different seating requirements, and 3) Presence of public washrooms.

3.3.1. Presence of Shade on Walking Routes

Outdoor walking was typically preferred by LE participants on days when the weather was favourable. Participants who could not access private transportation or public transit (e.g., due to motion sickness) did

not always have this choice. One participant recalled walking on a street in her neighbourhood with minimal tree cover during a heatwave in B. C.. Her search for shade led her to a street nearby that she was not familiar with, which caused her to feel disoriented. It was not until she arrived at a familiar and recognizable location in the neighbourhood that the participant was able to find her bearings.

Acknowledging this participant’s experience of walking on unshaded streets, a planner spoke about amending design standards to prioritize tree planting in new developments in the city: “Walking routes should have shade potential. [...] something that we’re definitely trying to do with the new developments as part of whatever street standard there is. There’s usually a front boulevard that includes street trees, which will hopefully provide shade” (MP03).

3.3.2. Places that Accommodate Different Seating Requirements

A key environmental feature that LE participants looked for to feel comfortable while walking outside was seating. One participant with postural hypotension needed to take frequent sitting breaks while walking outside. Not having the option in his neighbourhood to sit down to recover from dizziness meant that this participant had to resort to alternative coping techniques without the support of the neighbourhood environment: “When I do any kind of physical stuff, I have to stop. Either bend over, sit down. [...] There’s nothing (seating) in here” (PLE03).

In response to the issue of inadequate outdoor seating, a planner cited recently updated municipal accessibility guidelines that would help augment outdoor seating opportunities: “We created a recommendation around providing seating opportunities every hundred meters, minimum, in public spaces, along the walking route [...] so that people can stop and rest along the way” (MP07).

Going beyond conventional outdoor seating, walker users reported unique outdoor accessibility needs to stop and rest on the sidewalk. One LE participant used the seat on her walker to cope with arthritic pain during outdoor walks. She highlighted certain locations (see Fig. 3) on her walking route where she preferred to park her walker to sit: “I just pull into these places and [...] put my brake on, and I just sit for five minutes. Nobody says anything. [...] If I’m tired, I’ll just sit down in somebody’s driveway” (PLE11).

For another walker user (PLE12), sitting on outdoor benches or the seat of his walker was not feasible due to gait and balance issues caused by Parkinson’s disease. The participant needed armrests and a transfer pole to sit comfortably and get on and off the seat without falling, which were not available to him in outdoor spaces in the neighbourhood. His care partner (CP12) described his reliance instead on the support provided by respite workers accompanying him on outdoor walks:

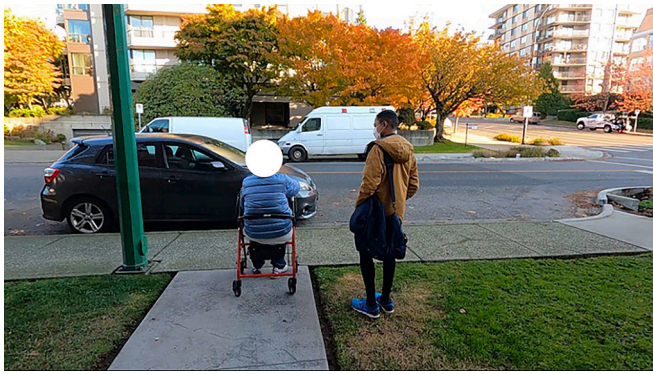


Fig. 3. “I stop over here at this driveway or whatever you call that...Then I just sit down” (PLE11).

When [PLE12] tries to sit on his walker, he has a tendency [to] slide out of the chair. [...] I’m always afraid he’s going to end up on the ground. [...] [Respite workers] would probably have to assist [PLE12] in getting back up again. [...] If it was on a bench, probably they’d have to give him a boost. (CP12)

3.3.3. Presence of public washrooms

The frequent need to use the washroom was an important factor that influenced LE participants’ outdoor walking route selection. Some LE participants planned their walking routes around washrooms in local business venues that they knew were accessible. One participant said, “[Washroom] is a big, big problem. [...] I know where they all are now. The few that we have. So, I can plan accordingly” (PLE12). However, this participant also expressed the desire to extend his walks to a green space in his neighbourhood that was not on his walking route, nor was it near places with washrooms that he knew of. Expressing the need for a permanent and accessible washroom at this location that would meet his physical needs, he said, “I’m assuming [the City is] gonna build a washroom [...] a proper washroom and everything you need for a disabled person would be there. [...] That’s a big wish” (PLE12).

Recognizing the need for standalone public washrooms that were not connected to commercial spaces, one municipal professional said:

We don’t really address [public washrooms]. A plan might include maybe a community center that would have a public bathroom or commercial stores [...] you might need to ask for a key [...] or feel like you need to purchase something, which kind of sucks. It should just be something you can do. (MP03)

Another municipal professional reported the challenge of addressing the costs of ongoing maintenance and protecting washrooms from vandalism, which dissuaded local government from implementing public washrooms more widely:

We’ve got the policy structure largely in place. It’s the implementation of [public washrooms], which is hard. [...] There is a norm of public washrooms being free and therefore, because they’re free and open and not staffed, they’re often vandalized [...] Even when you build them, they often end up being locked, and so you lose this resource. (MP04)

3.4. Augmenting safety at street crossing

This theme includes LE participants’ perceptions of environmental support in relation to safety issues at the street crossing, more specifically, 1) Detectability of curb letdown, 2) Inclusivity of pedestrian signals, and 3) Regulating and streamlining traffic flow.



Fig. 4. “Here no step and then here it’s higher. That’s why I fell down” (PLE07).

3.4.1. Detectability of curb letdown

Crossing the street safely required LE participants to accurately detect and distinguish the location of the curb letdown from the curb edge. Low detectability of these features exacerbated the risk of tripping and falling. Recalling how an unmarked curb edge and letdown played a part in her fall (see Fig. 4), an LE participant said, “I didn’t notice I have the step. [...] And then I fell down right away” (PLE07).

The participant suggested widening the curb ramp and improving visual contrast to support depth perception and minimize the risk of tripping on the curb edge: “Put the yellow signing. [...] [reflective] signing. [...] Otherwise, I try over there (curb edge)” (PLE07). Another LE participant also recommended improving visual contrast of bollards at the curb letdown (see Fig. 5) to support her with locating the letdown: “The bollards would be so much more noticeable if they were painted the same as the yellow (tactile strips) [...] [the black] just sort of melds into [the surroundings], doesn’t it?” (PLE01).

Municipal professionals acknowledged the need for visual contrast at the curb letdown as a relevant design modification. One planner recalled similar insights learned from citizen engagement that highlighted the importance of rendering environmental features with brighter colours:

One man on the [advisory committee] [...] said that sometimes black can seem—they don’t like to use black as something for people living with dementia because they see it as a hole [...] So, I see that having those bollards a brighter colour might be better. (MP01)

3.4.2. Inclusivity of Pedestrian Signals

A commonly reported issue by LE participants regarding the inclusivity of the pedestrian signal at street crossings was the sufficiency of time allotted to cross the street. A care partner (CP06) pointed out that the insufficiency of crossing time was particularly problematic for her spouse (PLE06), who used a walker and crossed the street at a slow pace:



Fig. 5. “These (bollards) really help people know where to step off onto the road.” (PLE01).

“[PLE06] can hardly go from green light to red light. By the time he reaches it, it's already stopped. [...] he can hardly make it” (CP06). One LE participant recommended the scramble crosswalk design (i.e., giving pedestrians exclusive access to street intersections by stopping vehicular traffic on all sides; [Bechtel et al., 2004](#)) as a strategy to enhance pedestrians' ability to cross the street more freely within the time allotted: “You can go any which way you want when the lights go. That's such a good idea. As you could go kitty-cross and be there in the same time that it would take you to go across” (PLE01).

3.4.3. Regulating and streamlining traffic flow

Turning vehicles were frequently cited as a safety issue by LE participants while crossing the street. One participant said, “There is a right-turning car [...] onto the crosswalk. [...] on more than one hand where, where I can count [...] car's still coming. I don't know what the hell they're doing. I can't believe it. Don't they see me?!” (PLE13). Such problematic encounters with turning cars exacerbated participants' anxiety about crossing the street and made them feel overly cautious about their personal safety. However, turning vehicles were found to be better regulated with the introduction of a leading pedestrian interval (LPI) in the pedestrian signal (i.e., giving pedestrians exclusive right-of-way to cross the street within the allotted time while stopping cars from turning and entering the crosswalk; [Van Houten et al., 2000](#)), significantly improving another participant's crossing experience:

We had problem here before. And we talked to the City. But right now, what they're doing is [...] when they change the light, there'll be a walk light and these people here (points to the left) won't be able to turn right away. It's to save us. [...] this is the best way to do it. (PLE14)

The challenge of safely crossing the street was also exacerbated by traffic circles (i.e., raised islands in the centre of street intersections in residential areas that are installed to reduce the speed of vehicles and collisions; [City of Vancouver, 2025](#)) in some neighbourhoods. While it was intended as a traffic calming feature in residential areas, the traffic circle placed increased cognitive demand and stress on one LE participant, who said, “Those are hard to navigate sometimes [...] I just have to slow right down. And really—and really pay attention to what I'm doing” (PLE13). Another participant attributed the issue to a lack of visibility (see [Fig. 6](#)) of pedestrians crossing the street: “[Drivers] can't see pedestrians at the roundabout. They're looking at other cars. And so, I've often got halfway through, and then a car goes through without stopping” (PLE09). This participant recommended replacing the traffic circles with four-way stops for greater visibility.

3.5. Enhancing identifiability and recognizability of surroundings

This theme reflects LE participants' appraisals of supportive features

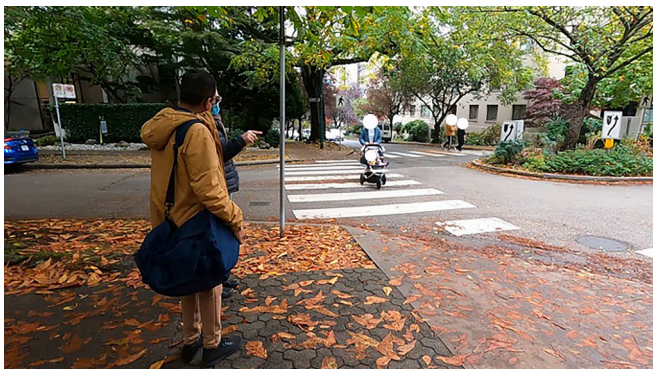


Fig. 6. “That's the corner (points at traffic circle) where it can be pretty bad.” (PLE09).

that provided cues to identify and orient themselves to their surroundings and recommendations related to the 1) Legibility of street layout and signage, and 2) Providing spatial anchors and maintaining stability of environments.

3.5.1. Legibility of street layout and signage

Deciding where to walk in the neighbourhood was an intentional process that depended on LE participants' familiarity with routes to get to/from these locations. One participant described how knowing which way to go to reach her destination was a pre-requisite in deciding to walk independently in the neighbourhood: “I don't come unless I absolutely know where I've been or where I [...] have to go back. I wouldn't leave [care partner] if I didn't know how to get home.” (PLE11). Understanding the neighbourhood street layout was seen as a precursor for orientation and wayfinding while walking outside, particularly in less-frequented, unfamiliar places. Most LE participants lived in neighbourhoods where streets were laid out on a uniform grid. Depending on the system of labelling streets in the city, street labels were perceived as aids for orientation and wayfinding. One participant described using street numbers (e.g., ‘22nd Avenue’) that followed a sequential grid pattern to understand the neighbourhood layout: “I couldn't go back down into [unfamiliar location]...I would be lost. [...] if the streets go 1–2–3–4, I could figure that out. [...] But if I start seeing ‘Brown Street’ and ‘Green Street’, I wouldn't know where I was” (PLE11). This participant preferred numbers over names for labels of streets that ran east to west (E-W) in her neighbourhood. The labels of E-W streets were distinguishable from those of avenues running north to south (N-S), as the latter were assigned names. An LE participant who resided in a suburban neighbourhood laid out on an irregular grid was challenged by both N-S and E-W streets being labelled with numbers: “I still often get [street number] and [avenue number] confused because one is a street and one is an avenue, so I sometimes get them backwards” (PLE03).

One municipal professional empathized with LE participants' challenges with understanding and remembering the street layout and acknowledged the importance of intuitiveness and distinction between labels of intersecting streets:

I find those places that have ‘numbers and numbers’ super confusing, too. [In MP03's municipality], a lot of it is ‘names and names’ always. [...] I think the way [neighbouring municipality] does it is pretty good because at least the avenues are numbered, and the streets have names. So, if you're lost and you look up, chances are that at least one of the streets will have a number, and then you can count that way. (MP03)

Street signs helped LE participants ascertain their location when they were unsure of their location and required confirmatory cues. To improve the design of street signs in her neighbourhood, one participant recommended locating street signs at the eye-level for pedestrians and providing destination-specific cues to enhance wayfinding support:

It would be wonderful to have a map at the park that showed you where, if I was walking down here, I needed to find a biffy, for instance, and I had no idea. So, sort of a major city center sign, ‘churches this way, rec center this way, main street here.’ (PLE01)

Municipal professionals acknowledged gaps in the provision of street signs for pedestrians, citing inconsistencies in existing street signage design: “I think everybody's challenged with finding their way around, sometimes finding street signs. There just doesn't seem to be any consistency in the provision of street signs. And they're all different sizes and different fonts” (MP01).

3.5.2. Providing spatial anchors and maintaining stability of environments

Public art features were perceived by LE participants as landmarks that helped them understand the street layout and identify and orient themselves to their surroundings. During the go-along interview, one participant singled out a public art feature (see [Fig. 7](#)) at a street



Fig. 7. “Look at the artwork over there. Different, eh?...Different is good...I look for it.” (PLE01).

intersection in her neighbourhood and spoke about its dual role of adding visual interest and distinctiveness, as well as becoming a spatial anchor over time. She credited this landmark for helping her identify and recognize the location of a street intersection:

I more or less am aware of streets by what's on the corner. [...] When I really think about it, it's not by street [label] other than [two familiar streets in neighbourhood]. It's all by landmarks of some type. [...] [Building] actually has that piece of artwork. [...] So that kind of is a backup for me. (PLE01)

The above participant advocated for the integration of more public art, saying, “Having a piece of art in many places within the city would be wonderful” (PLE01).

The emphasis on public art was seen as a valuable recommendation by municipal professionals. One planner appreciated learning about the multi-solving potential of public art to serve both aesthetic purposes, as well as functional purposes, such as providing orientation and wayfinding support: “So public art serves more than just to beautify [...] it also serves as an anchor for people's orientation. That's really fascinating!” (MP01). The planner suggested the possibility of integrating the recommendation to augment public art into long-term UDP policy directions for placemaking:

We're working on our official community plan (OCP) at the moment. [...] We look at [placemaking] to try to have neighbourhood identity and places for people to be out and about. But I think that knowing now that to many people it's an anchor for them to help orient themselves [...] it might appear—some reference to this—in the OCP [...] to being a more inclusive area, being more accessible. (MP01)

Municipal professionals also discussed other UDP strategies to enhance the distinctiveness, identifiability, and recognizability of the neighbourhood environment. One planner emphasized the need to ensure that private development proposals accounted for architectural distinctiveness at the design review stage: “When we look at development proposals, we try to encourage the buildings to be a little bit unique from each other. [...] We started an urban design review panel a couple of months ago that will hopefully help” (MP03). This planner discussed strategies to promote distinguishability of the built form and character of neighbourhoods with varying scales, densities, and land-use patterns:

[A couple of neighbourhoods in the city] have very large towers or can potentially have very large towers. [...] We're revisiting our [plan for smaller, mixed-use areas in the city]. We want that architecture to be distinguishable. [...] What we expect to see there isn't

the tower-podium thing. We want to see more terraced-off elements with a height limit. [...] there might be a really big development, say, over a whole block [...] we might try to suggest, ‘can you please make it look like three separate buildings instead of one building that's all being treated the same architecturally?’ Just to give it a bit more interest. I'm not sure how that would help dementia patients, but it's a little bit more variety in the streetscape. (MP03)

While new developments created opportunities for upgradation of pedestrian infrastructure in the future, LE participants also perceived challenges with accessibility, orientation, and wayfinding in the interim, i.e., during construction. One participant highlighted the disruption to sidewalk use and confusion in finding alternative paths caused by construction sites: “Sometimes when I go to walk home from downtown, I get a little bit... uncomfortable, because I'm not exactly sure where I'm supposed to be walking, because sometimes they close the sidewalks” (PLE01). Municipal professionals also took stock of the widespread environmental changes due to massive rezoning and development in their cities and the potential impacts of these changes on the mobility of citizens living with dementia. One planner highlighted existing UDP policy to provide accessible paths around construction sites, but cited unresolved implementation challenges:

The ongoing issues with providing an accessible path around construction, of which there is a lot in [the city]—that's our main challenge. Technically, we have a policy on the books which requires ones. It could be likely updated from a dementia perspective, but nonetheless, it's enforcement, which is the issue [...] They are inconsistently implemented. (MP04)

In the context of environmental changes, LE participants stressed the importance of the stability of landmarks in their neighbourhoods and feared the loss of stable landmarks for redevelopment. One participant expressed apprehension about her ability to remember and stay oriented to her changing surroundings in the future:

My short-term and long-term memory is challenged, as it is. So, what memories I do have, I have to really hold onto. When [places are] actually gone out of sight, as well, then that just...that just makes it even more...will I ever be able to recall...recall back those—those times. [...] it's gonna be harder and harder for me to—remember a past. (PLE13)

Municipal professionals acknowledged LE participants' orientation and wayfinding concerns and challenges in light of massive redevelopment in the city. Acknowledging the lack of attention to the importance of the stability of urban form in UDP, one planner said:

If you have dementia or another type of disability, I imagine it's almost impossible in certain areas where there's multiple big developments happening in a single block. We have a challenge with that general issue of things changing all the time. [...] it must be extremely difficult to find your way around if your landmarks are changing all the time. (MP04)

4. Discussion

4.1. Highlighting dementia-inclusivity in walkability research and practice

This study underscores the importance of integrating the perceptions of people living with dementia into UDP research and practice, specifically in relation to walkability. The focus on walkability in this study is consistent with the social model of disability (Oliver, 1981), in that the study emphasizes identifying how the neighbourhood built environment of people living with dementia should be modified to address the needs, abilities, and goals of people living with dementia. Highlighting the role of UDP in enhancing the liveability of communities, our study extends the social model of disability by centring neighbourhood characteristics such as walkability on understandings of how the walking environment supports and inhibits the walking choices and behaviour of people with disabilities. The findings suggest that walkability is constituted not only in objective characteristics of the outdoor environment but also through people's perceptions, needs, preferences and relationships with their environment. While the findings align with extant empirical evidence on older adults' walkability-related perceptions of micro-level built environmental features (Georgescu et al., 2024; Hanson et al., 2013; Ståhl et al., 2008), they also advance this area of research by providing insights into the supportive environmental features that are unique to the outdoor walking experiences of people living with dementia. The findings highlighted points of overlap with existing accessibility strategies (e.g., sidewalk maintenance, separation of pedestrian areas from vehicles and micromobility) practised in the two municipalities in M.V., they also indicated that there were significant points of distinction (e.g., street layout legibility, wayfinding signs with directions to destinations, public art features, architectural complexity, overall neighbourhood distinctiveness) that marked a departure from existing strategies. These points of distinction were perceived as alternative strategies by municipal professionals that were exclusive to addressing dementia-inclusivity. The two broad areas discussed below are environmental supports related to 1) combating overstimulation and 2) cueing identification, recognition, and wayfinding.

4.1.1. Environmental supports to address overstimulation

Consistent with previous studies, recommendations made by LE participants highlight challenges of overstimulation, particularly in areas with heavy vehicular traffic and simultaneously attending to multiple stimuli while walking outside (Bennett et al., 2021; Brorsson et al., 2016; Rosenkvist et al., 2010). Participants' preferred outdoor walking route conditions highlight the relevance of enhanced separation of pedestrians and micromobility, which calls for the regulation of the use of existing spaces (e.g., enforcing the use of existing dedicated lanes, prohibiting sidewalk use) and creation of new dedicated lanes (McQueen et al., 2021). Local governments in M.V. are being encouraged to redesign streets with multimodal lanes for micromobility users, which holds promise for walkability in the future (Translink, 2022). Programs across M.V. created during the COVID-19 pandemic have focused on reallocating road space to create pedestrian and cyclist-friendly streets with wider sidewalks, outdoor seating, and urban gardens (City of Burnaby, 2025; City of North Vancouver, 2021; City of Vancouver, 2024). These programs could be expanded to attend to the mobility needs and experiences of different subgroups of pedestrians, including people living with dementia.

LE participants residing in M.V. urban centres also attributed

overstimulation to environmental noise. Previous UDP research has highlighted environmental noise management strategies that involve rezoning, traffic management, and physical modifications in public spaces (Bild et al., 2016). While municipal DFC plans address noise management through 'quiet spaces' in public facilities and events, the logic underlying this strategy should be extended to different parts of the urban environment to ensure a comfortably stimulating walking environment. To aid this endeavour, future UDP research should further explore relationships between pedestrians and the acoustic characteristics of the neighbourhood environment and help guide solutions addressing noise-related overstimulation.

4.1.2. Environmental supports to cue identification, recognition, and wayfinding

Recommendations shared by LE participants around wayfinding are consistent with previous evidence-based recommendations for dementia-inclusive UDP that highlight the importance of environmental features that enhance legibility and distinctiveness of the outdoor environment (Biglieri & Dean, 2022; Burton & Mitchell, 2006). Municipalities in M.V. are at different points in the development of wayfinding plans, with one municipality in the process of finalizing its community wayfinding strategy that outlines recommendations on community wayfinding support for people living with dementia that are aligned with the study findings (City of Richmond, 2024). The findings emphasize the importance of maintaining stability and spatial anchor points amidst environmental changes due to new builds and development. Wood et al. (2022) have emphasized the need to examine the impact of environmental changes in neighbourhoods on the place-relations of older adults. Our study extends this focus to DFC research and practice by underscoring the impacts of neighbourhood environmental changes on place memory, orientation and wayfinding—factors that are germane to the out-of-home activity of people living with dementia. These issues warrant focused attention in future research to better understand how changing urban form is perceived by people living with dementia and find ways to maintain stability in fast-changing neighbourhoods.

4.2. Relevance of experiential knowledge for dementia-inclusive urban design and planning

Our study eschews deterministic notions or attributions of causality to environmental support (e.g., 'changing the built and social environment will produce greater out-of-home activity') (Blacksher & Lovasi, 2012; Ewing, 2005; Luka, 2023). This study characterizes environmental support as a relational and context-sensitive concept that varies according to situational specificities (Rapoport, 2024; Ward et al., 2021). Our findings point to differences in participants' perceptions of environmental support based on variations in 1) age-related changes, dementia symptoms, and comorbid conditions, 2) activity goals and preferences, 3) activity support from care partners, 4) periods of residence and familiarity of neighbourhood, and 5) land-use, accessibility and infrastructure in neighbourhood and city. Future research should aim to explore how environmental support is perceived differently by people with differing abilities, perceptions, and activity patterns to avoid fostering reductive views on aging, disability, and health in UDP (Freeman, 2024).

Despite the growing number of municipal policies on age- and dementia-inclusive communities and calls for increased engagement of people living with dementia, few studies have focused on engaging people living with dementia in urban design and planning (Biglieri, 2021). The social model of disability implicates UDP professionals in 1) recognizing how built spaces deprive people with disabilities of the capability to participate in society, and 2) catering to biopsychosocial diversity and creating urban environments free of stigma and discrimination (Pineda, 2020; Pineda et al., 2023; Salmistu & Kotval, 2023). A people-centred and strengths-based approach is required in UDP to

foster understandings of people living with dementia as “perceptive, critical, and deliberative in their interaction with the built environment” (Blacksher & Lovasi, 2012, p.173). This study highlights the role that people living with dementia could play in dementia-inclusive planning, in terms of 1) identifying outdoor environmental accessibility issues in neighbourhoods, and 2) expanding awareness, understanding, and empathy among UDP professionals. Most of the recommendations reported in this paper were also made by LE participants to local authorities in their respective cities through participation in advisory councils and phone calls requesting maintenance of neighbourhood infrastructure and amenities. Facilitating the meaningful engagement of people living with dementia in UDP processes requires:

- Dissemination of knowledge and initiatives related to DFC across different departments of local government to make local accountability systems dementia-inclusive (Houston et al., 2020; Seetharaman et al., 2025)
- Involvement of community centres and organizations serving older adults and people living with dementia to augment clients' capacity to advocate for themselves and their community (Saha et al., 2021)
- Creating opportunities for co-design as found in recent DFC-UDP initiatives, such as the “Find Your Way” wayfinding initiative implemented in public transit hubs in Singapore and the “Public Inconvenience” project on public washroom design in Scotland (Ong et al., 2024), and “Finding My Way Home” wayfinding mural project in public housing in Singapore (Dementia Singapore, 2021).

4.3. Municipal professionals' responses to experiential knowledge

This study addresses the dearth of research focused on the implementation of municipal DFC action plans and policy in M.V. (City of Burnaby, 2017; City of New Westminster, 2016; City of Richmond, 2019; The North Shore Municipalities, 2017; Township of Langley, 2021), specifically actions that hold UDP professionals responsible for fostering dementia-inclusive streets and outdoor public spaces. The study makes a unique contribution to the sparse yet growing body of UDP practitioner-focused research aimed at enhancing professionals' ability to anticipate the spatial perceptions, needs, and responses of people living with dementia and design spaces that enhance dementia-inclusivity in the community (Kuliga et al., 2021). The study findings enabled UDP professionals to 1) understand how people living with dementia experience the neighbourhood environment, and 2) make informed decisions about implementing UDP-relevant actions outlined in the action plans (e.g., improving street signage, landmarks in public spaces, safety at street crossings, accessibility of transportation services, and public washrooms). The action plans do not provide guidelines or standards that inform UDP professionals about the accessibility needs unique to people living with dementia, and the resources available to professionals tend to offer high-level guidance rather than detailed and concrete directions on addressing the physical, cognitive, and sensory needs of people living with dementia (Seetharaman et al., 2025). The present study harnesses lived experience-based insights to anchor principles of dementia-inclusive planning in the everyday realities of people living with dementia and provide UDP professionals with various scenarios and examples that could be usefully employed in implementing the municipal action plans.

Municipal professionals' responses to the environmental support needs and recommendations of LE participants were favourable and did not reflect resistance to the adoption or implementation of dementia-inclusive UDP. The favourable nature of their responses may be attributed to different reasons. Previous research attributes bureaucrats' responsiveness to the nature of citizens' demands on the basis of whether they are based on existing rights and legal/policy frameworks (Joshi & McCluskey, 2018). Municipal professionals cited overlaps between participants' recommendations and existing policies, e.g., sidewalk maintenance related to tree growth, improving shade potential on

walking routes, and increasing the frequency of outdoor seating. However, professionals also acknowledged UDP policy gaps in addressing LE participants' recommendations for environmental support, e.g., ensuring lane separation for pedestrians and cyclists in shared multi-use paths, and outdoor public washrooms. Through these responses, professionals highlighted the need for policy changes to facilitate more effective and sustainable implementation of environmental supports that were presently lacking. Their responses also reflected moments of surprise and their becoming aware of aspects of dementia-inclusive UDP that were hitherto unfamiliar to them, e.g., the unique value of environmental supports for orientation and wayfinding for people living with dementia. Further emphasizing their understanding of the importance of these measures, professionals identified opportunities to integrate related actions in policies and tools. Their favourable responses could also be attributed to finding parallels with their own personal experiences of navigating and negotiating the neighbourhood environment.

Paine et al. (2018) highlight the value of dissemination of experiential knowledge to municipal planners “in a way that a decision-maker can see, or more to the point feel, themselves in that situation” (p.155) and call for facilitating planners' “direct personal felt-experience” (p.161) of community members' concerns. While our study is aimed at enhancing UDP practitioners' know-how for implementing dementia-inclusivity, we caution against moves to standardize or generalize approaches to augment environmental support for people living with dementia. It is important for UDP responses to take stock of the heterogeneity of lived experiences of dementia and reflect the uniqueness and specificity of the local context. Professionals should turn to best practices in adopting a culturally informed and participatory approach to yield innovative UDP responses that are uniquely tailored to the needs, values, and aspirations of the local community of people living with dementia (Dementia Singapore, 2021). It is also important to acknowledge that the extent to which professionals can cultivate empathy, care, and attentiveness in UDP practice depends on how far they are empowered by local government (e.g., through policies, resources, cultural norms, general staffing, specialized staff roles who champion DFC and AFCC initiatives), placing the onus on local and provincial governments to prioritize a caring culture that facilitates the well-being of diverse groups of community members (Nelischer et al., 2024).

4.4. Limitations

This study focuses on environmental support for walkability in the urban and suburban context. The findings do not adequately represent the breadth of needs of people living with dementia in a rural context, where the physical environment and out-of-home activity patterns are significantly different (e.g., long distances to services and amenities, reliance on driving/being driven to places) (Roberts et al., 2024). Future research should explore the needs and gaps in outdoor environmental support, specifically for people living with dementia in rural settings. Further, the study focuses on environmental support primarily in the context of the outdoor walking routines of LE participants. However, participants conducted out-of-home activities and accessed places of amenities and services through other modes of travel, as well (e.g., public transit, paratransit, driving themselves/being driven by a care partner). Lanthier-Labonté et al. (2024) have identified the need for more research on the perspectives of people living with dementia regarding the availability, accessibility, affordability, and quality of transportation services, as well as the design of transportation hubs in urban and rural areas. Future research should focus on environmental support in the context of streets, outdoor spaces, and pedestrian infrastructure, as well as other transportation networks and infrastructures, to generate a holistic view of the outdoor environmental support needs of people living with dementia. A comprehensive understanding of the outdoor mobility experiences of people living with dementia across different transportation contexts is necessary to inform the development

of UDP policies on transportation and accessibility.

5. Conclusion

By prioritizing experiential knowledge, municipal UDP professionals can augment their understanding of walkability considerations to support community mobility and participation of people living with dementia. Multi-pronged efforts to augment outdoor environmental support for people living with dementia have implications for their health and well-being. The supportiveness of places in the community is critical to enable people living with dementia to participate in life outside their homes and maintain agency, autonomy, belonging, and identity. This study makes a case for examining the subjective perceptions of people living with dementia to ensure that the neighbourhood environment adequately supports them to participate in places of activities aligned with their desires, needs, and goals.

CRedit authorship contribution statement

Kishore Seetharaman: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Habib Chaudhury:** Writing – review & editing, Supervision, Methodology, Funding acquisition, Conceptualization. **Lillian Hung:** Writing – review & editing, Supervision, Methodology, Funding acquisition, Conceptualization. **Atiya Mahmood:** Writing – review & editing, Supervision. **Alison Phinney:** Writing – review & editing, Supervision. **Richard Ward:** Writing – review & editing, Supervision.

Declaration of competing interest

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Data availability

The data that has been used is confidential.

References

- Babb, C. W. (2014). *Built environment auditing, active mobility and children's wellbeing* [PhD Thesis, Curtin University]. <https://espace.curtin.edu.au/handle/20.500.11937/867>.
- Barnett, D. W., Barnett, A., Nathan, A., Van Cauwenberg, J., & Cerin, E. (2017). Built environmental correlates of older adults' total physical activity and walking: A systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity*, 14(1), Article 103. <https://doi.org/10.1186/s12966-017-0558-z>
- Bechtel, A. K., MacLeod, K. E., & Ragland, D. R. (2004). Pedestrian scramble signal in Chinatown neighborhood of Oakland, California: An evaluation. *Transportation Research Record*, 1878(1), 19–26. <https://doi.org/10.3141/1878-03>
- Bennett, C., Ackerman, E., Fan, B., Bigham, J., Carrington, P., & Fox, S. (2021). *Accessibility and The Crowded Sidewalk: Micromobility's Impact on Public Space. Designing Interactive Systems Conference 2021* (pp. 365–380). <https://doi.org/10.1145/3461778.3462065>

- Biglieri, S. (2018). Implementing dementia-friendly land use planning: An evaluation of current literature and financial implications for greenfield development in suburban Canada. *Planning Practice and Research*, 1–27. <https://doi.org/10.1080/02697459.2017.1379336>.
- Biglieri, S. (2021). The right to (re)shape the city: Examining the accessibility of a public engagement tool for people living with dementia. *Journal of the American Planning Association*, 1–15. <https://doi.org/10.1080/01944363.2020.1852100>.
- Biglieri, S., & Dean, J. (2021). Everyday built environments of care: Examining the socio-spatial relationalities of suburban neighbourhoods for people living with dementia. *Wellbeing, Space and Society*, Article 100058. <https://doi.org/10.1016/j.wss.2021.100058>
- Biglieri, S., & Dean, J. (2022). Fostering mobility for people living with dementia in suburban neighborhoods through land use, urban design and wayfinding. *Journal of Planning Education and Research*, Article 0739456X2211137. <https://doi.org/10.1177/0739456X221113796>
- Bild, E., Coler, M., Pfeffer, K., & Bertolini, L. (2016). Considering sound in planning and designing public spaces: A review of theory and applications and a proposed framework for integrating research and practice. *Journal of Planning Literature*, 31(4), 419–434. <https://doi.org/10.1177/0885412216662001>
- Blacksher, E., & Lovasi, G. S. (2012). Place-focused physical activity research, human agency, and social justice in public health: Taking agency seriously in studies of the built environment. *Health & Place*, 18(2), 172–179. <https://doi.org/10.1016/j.healthplace.2011.08.019>
- Bozovic, T., Hinckson, E., & Smith, M. (2020). Why do people walk? Role of the built environment and state of development of a social model of walkability. *Travel Behaviour and Society*, 20, 181–191. <https://doi.org/10.1016/j.tbs.2020.03.010>
- Braun, V., Clarke, V., Hayfield, N., & Terry, G. (2019). Thematic Analysis. In P. Liamputtong (Ed.), *Handbook of Research Methods in Health Social Sciences* (pp. 843–860). Singapore: Springer. https://doi.org/10.1007/978-981-10-5251-4_103.
- Brorsson, A., Öhman, A., Lundberg, S., & Nygard, L. (2016). Being a pedestrian with dementia: A qualitative study using photo documentation and focus group interviews. *Dementia*, 15(5), 1124–1140.
- Burton, E., & Mitchell, L. (2006). *Inclusive urban design: Streets for life*. Routledge.
- Carpiano, R. M. (2009). Come take a walk with me: The “Go-Along” interview as a novel method for studying the implications of place for health and well-being. *Health & Place*, 15(1), 263–272. <https://doi.org/10.1016/j.healthplace.2008.05.003>
- City of Burnaby. (2017). Burnaby Dementia-Friendly Community Action Plan. <https://www.burnaby.ca/Assets/Burnaby+Dementia-Friendly+Community+Action+Plan.pdf><https://www.burnaby.ca/Assets/Burnaby+Dementia-Friendly+Community+Action+Plan.pdf>
- City of Burnaby. (2025). Active Patio Program. <https://www.burnaby.ca/business/operating-a-business-in-burnaby/active-patio-program>
- City of New Westminster. (2016). Dementia-Friendly Community Action Plan 2016. [https://www.newwestcity.ca/database/files/library/City of New West Dementia Friendly Community Action Plan Report 2016 8 2.pdf](https://www.newwestcity.ca/database/files/library/City%20of%20New%20West%20Dementia%20Friendly%20Community%20Action%20Plan%20Report%2016%208%20.pdf)
- City of North Vancouver. (2021). Open Streets in the City. <https://www.cnv.org/Community-Environment/Open-Streets>
- City of Richmond. (2019). Dementia-Friendly Community Action Plan. [https://www.richmond.ca/_shared/assets/Dementia-Friendly Community Action Plan 201954645.pdf](https://www.richmond.ca/_shared/assets/Dementia-Friendly%20Community%20Action%20Plan%2019%2054645.pdf)
- City of Richmond. (2024). *City of Richmond Draft Community Wayfinding Strategy*. https://hdp-ca-prod-app-rchm-letstalk-files.s3.ca-central-1.amazonaws.com/7717/3209/3801/07fee870a35cfac1446b0d046c2fa80b_Richmond27s_draft_Community_Wayfinding_Strategy.pdf
- City of Vancouver. (2024). Vancouver Plan: Implementing the Plan. <https://vancouver.ca/home-property-development/vancouver-plan.aspx>
- City of Vancouver. (2025). How traffic circles work. <https://vancouver.ca/streettransportation/traffic-circles.aspx>
- Clore, G. L., & Ortony, A. (2013). Psychological construction in the OCC model of emotion. *Emotion Review: Journal of the International Society for Research on Emotion*, 5(4), 335–343. <https://doi.org/10.1177/1754073913489751>
- Dementia Singapore. (2021). Finding My Way Home—Dementia Singapore. <https://dementia.org.sg/2021/06/22/finding-my-way-home/>
- Dewing, J. (2007). Participatory research: A method for process consent with persons who have dementia. *Dementia*, 6(1), 11–25. <https://doi.org/10.1177/1471301207075625>
- Dewing, J., & Pritchard, E. (2004). Including the Older Person with a Dementia in Practice Development. In B. McCormack, K. Manley, & R. Garbett (Eds.), *Practice Development in Nursing* (pp. 177–196). Blackwell Publishing Ltd. <https://doi.org/10.1002/9780470698884.ch8>
- Ewing, R. (2005). Can the physical environment determine physical activity levels? *Exercise and Sport Sciences Reviews*, 33(2), 69–75. <https://doi.org/10.1097/00003677-200504000-00003>
- Forsyth, A. (2015). What is a walkable place? The walkability debate in urban design. *Urban Design International*, 20(4), 274–292. <https://doi.org/10.1057/udi.2015.22>
- Freeman, C. (2024). Caring for people. In I. C. Freeman, & E. Nel (Eds.), *Planning for the Caring City* (1st ed., pp. 73–106). Routledge. <https://doi.org/10.4324/9781003177012-4>
- Gan, D. R. Y., Chaudhury, H., Mann, J., & Wister, A. V. (2021). Dementia-friendly neighbourhood and the built environment: A scoping review. *The Gerontologist*, 019. <https://doi.org/10.1093/geront/gnab019>
- Georgescu, A.-I., Allahbakhshi, H., & Weibel, R. (2024). The impact of microscale street elements on active transport of mobility-restricted individuals: A systematic review. *Journal of Transport & Health*, 38, Article 101842. <https://doi.org/10.1016/j.jth.2024.101842>

- Hanson, H. M., Schiller, C., Winters, M., Sims-Gould, J., Clarke, P., Curran, E., ... Ashe, M. C. (2013). Concept mapping applied to the intersection between older adults' outdoor walking and the built and social environments. *Preventive Medicine*, 57(6), 785–791. <https://doi.org/10.1016/j.ypmed.2013.08.023>
- Heggestad, A. K. T., Nortvedt, P., & Slettebø, Å. (2013). The importance of moral sensitivity when including persons with dementia in qualitative research. *Nursing Ethics*, 20(1), 30–40. <https://doi.org/10.1177/0969733012455564>
- Hellström, I., Nolan, M., Nordenfelt, L., & Lundh, U. (2007). Ethical and methodological issues in interviewing persons with dementia. *Nursing Ethics*, 14(5), 608–619. <https://doi.org/10.1177/0969733007080206>
- Houston, A., Mitchell, W., Ryan, K., Hullah, N., Hitchmough, P., Dunne, T., Dunne, J., Edwards, B., Marshall, M., Christie, J., & Cunningham, C. (2020). Accessible design and dementia: A neglected space in the equality debate. *Dementia*, 19(1), 83–94. <https://doi.org/10.1177/1471301219874220>
- Joshi, A., & McCluskey, R. (2018). The art of 'bureaucraft': Why and how bureaucrats respond to citizen voice. In *Making All Voices Count Research Briefing*. Chicago: Brighton: IDS.
- Kuliga, S., Berwig, M., & Roes, M. (2021). Wayfinding in People with Alzheimer's Disease: Perspective Taking and Architectural Cognition—A Vision Paper on Future Dementia Care Research Opportunities. *Sustainability*, 13(3), Article 3. <https://doi.org/10.3390/su13031084>
- Lanthier-Labonté, S., Chaudhury, H., Wong, J., & Hung, L. (2024). Dementia-friendly transportation services: A scoping review. *The Gerontologist*, 64(7), Article gnae047. <https://doi.org/10.1093/geront/64.7.gnae047>
- Li, B. Y., & Ho, R. T. H. (2019). Unveiling the unspeakable: Integrating video elicitation focus group interviews and participatory video in an action research project on dementia care development. *International Journal of Qualitative Methods*, 18, Article 1609406919830561. <https://doi.org/10.1177/1609406919830561>
- Low, G., von Humboldt, S., Kalfoss, M., Wilson, D. M., & Leal, I. (2021). Aging in Place. In D. Gu, & M. E. Dupre (Eds.), *Encyclopedia of Gerontology and Population Aging* (pp. 284–289). Springer International Publishing. https://doi.org/10.1007/978-3-030-22009-9_72
- Luka, N. (2023). Walking beyond the city? On the importance of recreational mobilities for landscape planning, urban design, and public policy. *Mobilities*, 18(5), 789–804. <https://doi.org/10.1080/17450101.2023.2242001>
- McQueen, M., Abou-Zeid, G., MacArthur, J., & Clifton, K. (2021). Transportation transformation: Is micromobility making a macro impact on sustainability? *Journal of Planning Literature*, 36(1), 46–61. <https://doi.org/10.1177/0885412220972696>
- Metro Vancouver. (2024a). Regional Data Projections | Metro Vancouver. <https://metrovancover.org/443/services/regional-planning/regional-data-projections>
- Metro Vancouver. (2024b). Urban Centres | Metro Vancouver. <https://metrovancover.org/443/services/regional-planning/urban-centres>
- Middleton, J., & Spinney, J. (2019). Social inclusion, accessibility and emotional work. In *Social inclusion*.
- Nelischer, C., Loukaitou-Sideris, A., & Wendel, G. (2024). Caring public space: Advancing justice through intergenerational public space design and planning. *Journal of Urban Affairs*, 0(0), 1–20. <https://doi.org/10.1080/07352166.2023.2291074>
- Oeschger, G., Carroll, P., & Caulfield, B. (2020). Micromobility and public transport integration: The current state of knowledge. *Transportation Research Part D: Transport and Environment*, 89, Article 102628. <https://doi.org/10.1016/j.trd.2020.102628>
- Oliver, M. (1981). A new model of the social work role in relation to disability. *The Handicapped Person: A New Perspective for Social Workers* (pp. 19–32).
- Ong, E., Robertson, M., Frost, D., Chaudhury, H., & Fleming, R. (2024). The voice of people with dementia at the core of environmental design. In *Creating Empowering Environments for People with Dementia* (pp. 57–68). Routledge. https://library.oapen.org/bitstream/handle/20.500.12657/92412/1/9781040110195.pdf?trk=public_post_comment-text#page=78
- Paine, G., Thompson, S., Randolph, B., & Judd, B. (2018). Learning from lived experience for the improvement of health-supportive built environment practice. *Cities & Health*, 2(2), 151–162. <https://doi.org/10.1080/23748834.2018.1464254>
- Pesonen, H.-M., Remes, A. M., & Isola, A. (2011). Ethical aspects of researching subjective experiences in early-stage dementia. *Nursing Ethics*, 18(5), 651–661. <https://doi.org/10.1177/0969733011408046>
- Pineda, V. S. (2020). *Building the Inclusive City: Governance, Access, and the Urban Transformation of Dubai*. Springer International Publishing. <https://doi.org/10.1007/978-3-030-32988-4>
- Pineda, V. S., Catalano, S. L., & Sorensen, E. (2023). Building Cities for All: Amplifying Advocacy, Access, and Equity in the Urban Century. In M. H. Rioux, J. Viera, A. Buettgen, & E. Zubrow (Eds.), *Handbook of Disability* (pp. 1–16). Springer Nature Singapore. https://doi.org/10.1007/978-981-16-1278-7_10-1
- Pope, N. E., Greenfield, E. A., Keyes, L., & Russell, E. (2024). A review of public sector engagement in age-friendly community initiatives. *Journal of Aging & Social Policy*, 0(0), 1–29. doi:<https://doi.org/10.1080/08959420.2024.2376934>
- Przydatek, M. (2014). *Remembering Community Settings: Exploring dementia-friendly urban design in British Columbian municipalities* [Thesis, University of Victoria]. <https://dspace.library.uvic.ca/handle/1828/5540>
- Rapoport, A. (2024). Some thoughts on people, place and development. In A. Awotona & N. Teymur, *Tradition, Location and Community* (1st ed., pp. 7–26). Routledge. doi: <https://doi.org/10.4324/9781003514169-3>
- Rivett, E. (2017). Research involving people with dementia: A literature review. *Working with Older People*, 21(2), 107–114. <https://doi.org/10.1108/WWOP-11-2016-0033>
- Roberts, J. R., Windle, G., Story, A., Brotherhood, E. V., Camic, P. M., Crutch, S. J., ... Grillo, A. (2024). Dementia in rural settings: A scoping review exploring the personal experiences of people with dementia and their carers. *Ageing and Society*, 44(12), 2580–2609. <https://doi.org/10.1017/S0144686X2300003X>
- Robinson, O. C. (2014). Sampling in interview-based qualitative research: A theoretical and practical guide. *Qualitative Research in Psychology*, 11(1), 25–41. <https://doi.org/10.1080/14780887.2013.801543>
- Rosenkvist, J., Risser, R., Iwarsson, S., & Ståhl, A. (2010). Exploring mobility in public environments among people with cognitive functional limitations—Challenges and implications for planning. *Mobilities*, 5(1), 131–145. <https://doi.org/10.1080/17450100903435011>
- Sabat, S. R. (1991a). Facilitating conversation via indirect repair: A case study of Alzheimer's disease. *Georgetown Journal of Languages and Linguistics*, 2(3), 284–296.
- Sabat, S. R. (1991b). Turn-taking, turn-giving, and Alzheimer's disease: A case study of conversation. *Georgetown Journal of Languages and Linguistics*, 2(2), 161–175.
- Saha, M., Chauhan, D., Patil, S., Kangas, R., Heer, J., & Froehlich, J. E. (2021). Urban Accessibility as a Socio-Political Problem: A Multi-Stakeholder Analysis. *Proceedings of the ACM on Human-Computer Interaction*, 4(CSCW3), 1–26. doi:<https://doi.org/10.1145/3432908>
- Salmistu, S., & Kotval, Z. (2023). Spatial interventions and built environment features in developing age-friendly communities from the perspective of urban planning and design. *Cities*, 141, Article 104417. <https://doi.org/10.1016/j.cities.2023.104417>
- Seetharaman, K., Chaudhury, H., Hung, L., Phinney, A., Freeman, S., Groulx, M., Hemingway, D., Lanthier-Labonté, S., Randa, C., & Rossnagel, E. (2023). Protocol for a mixed-methods study: Dementia-inclusive streets and community access, participation, and engagement (DemSCAPE). *International Journal of Qualitative Methods*, 22, Article 160940692311573. <https://doi.org/10.1177/16094069231157350>
- Seetharaman, K., Chaudhury, H., Mahmood, A., Phinney, A., & Ward, R. (2025). Perspectives of municipal professionals on adopting a dementia-friendly and inclusive approach in urban planning and design in British Columbia, Canada. *Planning Practice & Research*, 40(2), 369–391.
- Shields, R., Gomes Da Silva, E. J., Lima, L. E., & T., & Osorio, N. (2023). Walkability: A review of trends. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 16(1), 19–41. <https://doi.org/10.1080/17549175.2021.1936601>
- Springgay, S., & Truman, S. E. (2017). A Transmaterial Approach to Walking Methodologies: Embodiment, Affect, and a Sonic Art Performance. *Body & Society*, 23(4), 27–58. <https://doi.org/10.1177/1357034X17732626>
- Ståhl, A., Carlsson, G., Hovbrandt, P., & Iwarsson, S. (2008). Let's go for a walk!: Identification and prioritisation of accessibility and safety measures involving elderly people in a residential area. *European Journal of Ageing*, 5(3), 265–273. <https://doi.org/10.1007/s10433-008-0091-7>
- Sturge, J., Nordin, S., Sussana Patil, D., Jones, A., Légaré, F., Elf, M., & Meijering, L. (2021). Features of the social and built environment that contribute to the well-being of people with dementia who live at home: A scoping review. *Health & Place*, 67, Article 102483. <https://doi.org/10.1016/j.healthplace.2020.102483>
- Sugiyama, T., & Thompson, C. W. (2007). Outdoor environments, activity and the well-being of older people: Conceptualising environmental support. *Environment and Planning A: Economy and Space*, 39(8), 1943–1960. <https://doi.org/10.1068/a38226>
- The North Shore Municipalities. (2017). Dementia-friendly North Shore Action Plan. <https://www.cnv.org/city-services/planning-and-policies/initiatives-and-policies/dementia-friendly-north-shore-action-plan>
- Thoft, D. S., Ward, A., & Youell, J. (2020). Journey of ethics – Conducting collaborative research with people with dementia. *Dementia*, Article 1471301220919887. <https://doi.org/10.1177/1471301220919887>
- Township of Langley. (2021). Age- and Dementia-friendly Action Plan. <https://www.tol.ca/en/the-township/resources/plans-reports-strategies/Action-Plans/Age-and-Dementia-friendly-Action-Plan.pdf>
- Translink. (2022). Moving Towards a Major Bikeway Network. <https://www.translink.ca/plans-and-projects/strategies-plans-and-guidelines/transit-and-transportation-planning/regional-cycling-strategy>
- Translink. (2024). State of Cycling in Metro Vancouver 2024. <https://www.translink.ca/-/media/translink/documents/riding-guide/cycling/reports/translink-state-of-cycling-in-metro-vancouver-2024.pdf>
- Tuckett, A. G., Banchoff, A. W., Winter, S. J., & King, A. C. (2018). The built environment and older adults: A literature review and an applied approach to engaging older adults in built environment improvements for health. *International Journal of Older People Nursing*, 13(1), Article e12171. <https://doi.org/10.1111/ohn.12171>
- Van Houten, R., Retting, R. A., Farmer, C. M., & Van Houten, J. (2000). Field evaluation of a leading pedestrian interval signal phase at three urban intersections. *Transportation Research Record*, 1734(1), 86–92.

- Ward, R., Clark, A., & Phillipson, L. (2021, September 15). Can dementia-friendly initiatives improve people's lives?. In *Transforming Society*. <http://www.transformingsociety.co.uk/2021/09/15/can-dementia-friendly-initiatives-improve-peoples-lives/>.
- Webb, J., Williams, V., Gall, M., & Dowling, S. (2020). Misfitting the Research Process: Shaping Qualitative Research "in the Field" to Fit People Living With Dementia. *International Journal of Qualitative Methods*, 19, Article 1609406919895926. <https://doi.org/10.1177/1609406919895926>
- West, E., Stuckelberger, A., Pautex, S., Staaks, J., & Gysels, M. (2017). Operationalising ethical challenges in dementia research—A systematic review of current evidence. *Age and Ageing*, ageing, Article afw250v1. <https://doi.org/10.1093/ageing/afw250>
- Wood, G. E. R., Pykett, J., Daw, P., Agyapong-Badu, S., Banchoff, A., King, A. C., & Stathi, A. (2022). The role of urban environments in promoting active and healthy aging: A systematic scoping review of citizen science approaches. *Journal of Urban Health*, 99(3), 427–456. <https://doi.org/10.1007/s11524-022-00622-w>
- World Health Organization. (2007). Global age-friendly cities: A guide. <https://www.who.int/publications-detail-redirect/9789241547307>.
- World Health Organization. (2021). *Towards a dementia-inclusive society: WHO toolkit for dementia-friendly initiatives (DFIs)*. <https://apps.who.int/iris/handle/10665/343780>.
- Yanow, D. (2015). How Built Spaces Mean. In D. Yanow & P. Schwartz-Shea (Eds.), *Interpretation and Method* (2nd ed., pp. 368–386). Routledge. doi:<https://doi.org/10.4324/9781315703275-24>.