

NEIGHBORHOOD LANDMARKS AS PERCEIVED BY PERSONS LIVING WITH  
DEMENTIA

A Thesis

Presented to the Faculty of the Graduate School  
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Master of Science

by

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## ABSTRACT

*Objectives:* To study how older adults with mild-to-moderate dementia perceive neighborhood landmarks and their potential as wayfinding cues.

*Methods:* The study was conducted in two phases employing mixed methods. Phase 1: neighborhood walking group for persons with mild to moderate dementia ( $N = 5$ ) using PhotoVoice and photo-elicited surveys. Phase 2: researchers and practitioners who work with older adults with and without dementia ( $N = 9$ ) using photo-elicited survey-cum-interviews.

*Results:* Public art was slightly more noticeable and attractive than historical buildings. Characteristics of strong landmarks included having a clear purpose, familiarity, strategic location within an accessible context, high visibility and contrast, appropriate relational scale, unique aesthetics, ease of comprehensibility and stability.

*Conclusions:* Further research is necessary to ascertain relative noticeability of different landmarks according to type, scale and location. Studies need to also take into account individual differences that account for diversity in the dementia experience, to understand the range of perceptions of landmarks.

*Keywords:* dementia, neighborhood, mobility, landmarks, wayfinding, cognitive accessibility

## BIOGRAPHICAL SKETCH

Kishore is a second-year graduate student in the environmental psychology concentration in the MS in Human-Environment Relations program in the department of Design + Environmental Analysis at Cornell University.

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## CHAPTER 1

### INTRODUCTION

This section introduces the phenomena that constitute the dementia experience, focusing specifically on commonly experienced symptoms and issues and coping strategies employed by community-dwelling older adults with mild to moderate dementia to overcome the same. It discusses the rationale for extending the scope of research and practice to include everyday outdoor environments as part of the dementia care setting, in order to promote and facilitate aging in place.

#### *1.1 Dementia as a social phenomenon*

Dementia is not so much a specific disease as it is an overall term used to describe wide-ranging symptoms caused by other diseases (Mitchell, Burton, & Raman, 2004). Dementia can be progressive, where symptoms start out slowly and eventually worsen. While mostly affecting older adults, a small proportion of middle-aged adults are also diagnosed with dementia. Dementia has been traditionally viewed as a biological deficit that allows for symptoms and behavior to be labeled as disruptive and abnormal, causing persons with dementia to feel marginalized (Blackman et al., 2003). On the other hand, the social model adopts a view that frames dementia as a “socially-embedded phenomenon” thus factoring in social and environmental dimensions rather than just pathology of the disease. Social identity is found to be particularly important to persons with dementia and losing one’s standing in society due to their disease can be damaging for individuals, which is why there is quite a lot of stigma surrounding dementia (Olsson, Lampic, Skovdahl, & Engström,

2013). In light of these tensions, the social model is particularly salient to consider in designing measures to maintain quality of life among persons with dementia.

### ***1.2 Stage-wise cognitive losses***

Although dementia is found to affect people differently, the progression of dementia can be broadly divided into three phases: mild/early-stage, moderate/middle-stage and severe/late-stage. While independent living is possible with mild dementia, the symptoms may pose challenges to one's ability to perform daily activities, especially in terms of memory lapses, e.g. not remembering names, forgetting information, misplacing objects, difficulty with planning etc. (Alzheimer's Association, 2018). Moderate dementia is typically the longest phase where persons slowly begin to lose the ability to perform routine tasks independently and tend to get easily confused and disoriented, thus increasing their chances of getting lost (Alzheimer's Association, 2018). Severe dementia sees persons experiencing greater difficulties communicating and further worsening of their memory and cognitive skills, thus requiring more dedicated assistance and care (Alzheimer's Association, 2018).

### ***1.3 Intervening in the early stages of dementia***

Early stages of dementia are particularly trying, since persons may or may not be aware of behavioral changes, but may have people telling them constantly that they are doing something wrong and may not know how to explain it (Phinney, Chaudhury, & O'Connor, 2007). They may have trouble making decisions and solving problems, take more time or be unable to complete tasks, experience difficulty with new

situations and become prone to getting lost easily (Steeman et al., 2006).

Getting diagnosed with dementia can be an emotionally trying and self-confrontational phase for persons causing them to struggle with not only acknowledging and coping with losses, but also to maintain their personhood (Olsson et al., 2013; Steeman et al., 2006). Any activity that is unfamiliar, confusing or overly demanding can cause persons a great deal of anxiety and fatigue, especially when it is something they need to do and cannot resolve independently (Phinney et al., 2007; Steeman et al., 2006). Even familiar routines that involve long sequences of activities may be exhausting to perform (Clarke et al., 2018; Clarke & Bailey, 2016). Having trouble with recall can be crippling when persons do not receive reassuring feedback which may leave them constantly drowning in uncertainty about whether a task was completed or not (Sandberg, Rosenberg, Sandman, & Borell, 2017).

Loss of control and the resulting feeling of incompetence may discourage persons with dementia from wanting to participate in meaningful activities and exacerbate withdrawal (Clarke & Bailey, 2016; Steeman et al., 2006). Persons with dementia have reported not being able to perform activities in the outdoors that they used to enjoy owing to memory difficulties (McDuff & Phinney, 2015). Not being able to partake in activities in the outdoors may negatively impact their health and wellbeing (Olsson et al., 2013). Due to their losses persons with dementia may feel that they are undervalued by society and perceived as burdensome (Steeman et al., 2006).

Not having the right social support system can have deleterious effects on

the psychological health of persons with dementia, and may result in feelings of disenfranchisement, marginalization, helplessness and inadequacy (Clarke & Bailey, 2016). Therefore there is a considerable emphasis on early-dementia care (Clarke et al., 2018; Steeman et al., 2006). Early intervention is thought of as being integral to the maintenance of skills and confidence (Duggan et al., 2008). It is necessary to consider what is meaningful to persons with early-stage dementia and design support systems that can help elevate their quality of life (McDuff & Phinney, 2015).

#### ***1.4 Prevalence of dementia in communities***

Only one in four people with dementia, specifically Alzheimer's, get diagnosed Alzheimer's Disease International, 2017). While the presently worldwide population with dementia is estimated at 47 million people, it is safe to assume that there are many more that this statistic does not represent (Alzheimer's Association, 2014). Studies have estimated that in 2010 there were 4.7 million older adults with dementia in the United States, and it is expected that by 2050 this number will have risen to 13.8 million (Hebert, Weuve, Scherr, & Evans, 2013). Research shows that nearly 58% of this population live in the community, 75% of whom live with someone, while the remaining live alone (Alzheimer's Association, 2017). This trend of the greater proportion of the population with dementia being in the community rather than in traditional care settings, is also reflective of dementia statistics in other countries. In the UK, 80% of the population live in the community, a quarter of which live alone (Blackman et al., 2003). In Canada, nearly 58% of this population currently lives in the community; and is estimated to increase to 62% by 2038 (Alzheimer Society, 2010). Most people with mild to moderate dementia choose to remain in the

community rather than move to care or assisted living facilities, and with the right kind of support they may be able to continue the same for a longer period (Blackman et al., 2003; Duggan et al., 2008; Lloyd & Stirling, 2015). Aging in place with dementia has been earmarked as a priority area for research and practice with much emphasis on the need to upgrade systems of home and community care for persons with mild to moderate dementia (Feldman & Estabrooks, 2017). Research on quality of life and mobility of community-dwelling older adults with dementia is imperative to ensure meaningful physical interventions that improve their accessibility, wayfinding and community engagement.

### ***1.5 Extending environmental research to the outdoors***

However the present knowledge base for community-dwelling older adults with dementia is limited. This is mostly due to the preponderance of environmental research on persons with severe dementia, located in the context of nursing homes or assisted living facilities even though majority of the population with dementia live in the community (Blackman, Van Schaik, & Martyr, 2007; Phinney et al., 2007). This means that there is a lack of neighborhood and community-based research examining the person-environment relations among older adults with mild to moderate dementia aging in place. Further research is required to fully understand the ways in which outdoor environments can enable or disable persons with mild to moderate dementia. This is a necessary step towards addressing not just physical aspects of accessibility in the field of urban design and planning, but also the cognitive aspects (Kelson, Phinney, & Lowry, 2017).

## ***1.6 Structure of thesis***

The present study dovetails with the aforementioned research movement towards realizing the broader goal of cognitive accessibility in cities. The primary aim of this study is to understand how persons with mild to moderate dementia perceive the neighborhood built environment, more specifically, how they perceive urban landmarks. Knowing which landmarks are most meaningful and attractive to this population could potentially lay the foundation for future research on how to best integrate them as navigational cues into wayfinding systems.

The remainder of the thesis is divided into 5 chapters. Chapter 2 reviews extant literature in the area of outdoor physical and cognitive accessibility for older adults with mild to moderate dementia. It describes the importance of the neighborhood context and walking outdoors, challenges encountered by persons with dementia in wayfinding and strategies employed to cope, and environmental parameters central to cognitive accessibility. Chapter 3 describes the methods and results of the first phase of the study which captures reflections of walkers from a neighborhood walking group for early-stage-memory-loss. Chapter 4 describes the methods and results of the second phase of the study which captures responses from researchers and practitioners. Chapter 5 discusses reflections on the individual methods employed as well as integrates the results from the two phases. Chapter 6 summarizes the outcomes, and discusses the limitations, and relevance of the study, as well as areas for future research.

## CHAPTER 2

### LITERATURE REVIEW

This section reviews extant literature to understand the value of outdoor walking for community-dwelling older adults with mild to moderate dementia, the issues that they encounter in outdoor wayfinding, as well as coping strategies used to overcome these issues. Articles were selected for review based on the following criteria: the study participants should include community-dwelling older adults with mild to moderate dementia; the study should have been conducted in the neighborhood setting; either the entire study or a component of the study should explicitly focus on outdoor mobility and/or wayfinding in the community. Twenty-three articles were reviewed, 12 involved qualitative research, 5 involved mixed methods research, 1 was a theoretical paper and 1 was a literature review.

#### ***2.1 Value of neighborhood context for persons with dementia***

The concept of aging-in-place, where older adults continue to live autonomously in their *community* rather than relocation to care facilities, has gained increasing attention in research and policymaking in the past decade. Research shows that nearly 87% of American older adults expressed wanting to age-in-place (Harrell, Lynott, Guzman, & Lampkin, 2014). This statistic may be explained by the important role played by neighborhoods in the process of aging. However, as discussed in the previous chapter, aging in place is particularly critical for older adults with dementia. The following section further elaborates how the context of one's neighborhood is beneficial to persons with dementia by offering a sense of familiarity and opportunities for engagement and restoration.

### *2.1.1. A familiar place beyond home*

Home is extremely important to older adults with and without dementia. It not only represents material possession, but also serves as a site for reminiscence of early place-based memories (Clarke & Bailey, 2016). Especially for those with reduced social contact, possibly in the later stages of dementia, home serves as a site of meaning and plays a significant part in preserving their personal identity (Lloyd & Stirling, 2015). However for most people with mild to moderate dementia, who may still have the opportunity to retain contact with places beyond home, the neighborhood serves as a cherished and familiar site of meaning. Aging in place over time facilitates a sense of “insidedness” within the physical and social fabric both through one’s memories through lived experience as well as continued meaningful engagement (Phinney et al., 2007). Aging in place affords older adults the possibility of getting to know their neighborhoods intimately (Lawton, 1985). In understanding dementia as a socio-spatial experience, it is important to account for the social relationships, interpersonal dynamics and interactions between persons with dementia and others (Blackman et al., 2003). This ultimately contributes to a fuller understanding of how social factors shape persons' experience of dementia.

### *2.1.2. Familiarity through social support and interaction*

While home is the site of family-dependent support, the neighborhood fosters the formation of non-family support systems, through social networks of friends, neighbors, service personnel or even everyday strangers (Gardner, 2011). Persons with mild to moderate dementia have reported the ease with which they are able to mingle and interact with neighbors as they walk outdoors, so much so that they

even claim to being ‘well-known’ in their neighborhood (Brittain, Corner, Robinson, & Bond, 2010; Duggan et al., 2008; Phinney et al., 2016). Getting to engage with others in their community during these occasions makes them feel included and bolsters their social identity. Observing public life is also a means of participation and engagement, which persons with mild to moderate dementia reportedly enjoy doing (Olsson et al., 2013; Phinney et al., 2016). Frequent observation of familiar scenarios not only provides them with intimate place-based knowledge and the ability to offer rich descriptions of their surroundings, but also serves as a means of positive distraction and immersion (Phinney et al., 2016, 2007).

Besides, persons with dementia also appreciate the neighborhood context for the social support that it offers. Persons with mild to moderate dementia appreciate receiving assistance from neighbors with completing everyday tasks, as well as in situations of crisis, and value these positive neighborly gestures (Sandberg et al., 2017; Ward et al., 2017). While these networks provide support to older adults for sustaining functional independence they also foster interdependence which in turn promotes social cohesion in later life (Gardner, 2011). Aging in place enables community-dwelling older adults with dementia, oft-portrayed by research solely as recipients of support, to engage in reciprocal acts of helping their neighbors in small yet meaningful ways (Ward et al., 2017).

### *2.1.3. Familiarity through continued engagement in meaningful activity*

Neighborhoods offer older adults with dementia several opportunities to realize their potential as social citizens and remain vital. They are afforded this possibility through the opportunity to continue practicing all those activities that have

held meaning for them through their life course (Brorsson et al., 2011). Previous research has suggested that persons with dementia who engage in meaningful activity exhibit greater sense of wellbeing than those who are not (Phinney et al., 2007). Engaging in familiar activities is often preferred since it does not impose too many barriers for persons with dementia and gives them the opportunity to retain their sense of control (McDuff & Phinney, 2015). Activities that emerge from persons' daily routine have been found to be most meaningful rather than structured activity that has no connection to their history or lifestyle (Phinney et al., 2007). Studies have shown that persons with mild to moderate dementia express the desire to autonomously engage in activities of daily living (ADL) and instrumental activities of daily living (IADL) (Duggan et al., 2008; Phinney et al., 2007). Engaging in these daily activities is suggested as a way of providing persons with a sense of normality (Clarke et al., 2018). Persons with dementia have expressed a desire to maintain these skills of everyday living for as long as they can (Clarke & Bailey, 2016).

Persons with mild to moderate dementia who live alone have reported that the duration for which they are able to rely on their own abilities and operate autonomously helps them remain in the community for as long as possible and not have to get admitted to a care facility (De Witt, Ploeg, & Black, 2010). Some persons with mild to moderate dementia have expressed needing a conducive and social environment outside their home, family, friends' circle etc. since they may not be particularly well supported by them, in order to be able to engage in meaningful activity (Clarke et al., 2018; Phinney et al., 2007).

Participating in activities in the outdoors is especially important for persons

with dementia. While being outdoors help them fulfill their everyday needs and activities, it also offers them a sense of freedom and choice (Duggan et al., 2008). Even small gestures that imply trust and grant autonomy, such as having the opportunity to engage with their grandchildren and take them to the park or the local café, without having their ability be doubted, are found to be extremely meaningful by community-dwelling older adults with dementia, as well as helping boost their confidence in going outdoors (Olsson et al., 2013). This kind of positive engagement and stimulation has been suggested as a means to slow the progress of dementia (R. Phillips & Evans, 2018).

## ***2.2 Value of outdoor walking***

### *2.2.1. Sustaining outdoor mobility*

Persons with early-stage Alzheimer's have reported being aware of the uncertainty and unpredictability of their future, which drives them to continue being active for as long they possibly can (Brorsson et al., 2011; Olsson et al., 2013). Research shows that persons with mild to moderate dementia who have practiced walking throughout their lives tend to want to continue doing so following the onset of their disease (Phinney et al., 2007; Silverman, 2017). Persons with dementia value being able to do activities on their own, which is why walking appeals to them, and have reported simplifying and structuring their daily routines in order to include walking (McDuff & Phinney, 2015). Persons with dementia have reported needing to go out on a routine basis (Brittain et al., 2010).

Outdoor walking has been shown to significantly enhance peoples' quality

of life (Duggan et al., 2008). It can offer both persons with dementia and their care partners with a much-needed outlet from their care routines and help them decompress (Silverman, 2017). Breaking the routine by not going out tends to make them feel bored and depressed (Brittain et al., 2010; Duggan et al., 2008). Walking is one activity that persons with mild to moderate dementia continue to enjoy when they are not able to perform other activities anymore (Olsson et al., 2013; Phinney et al., 2007). It is also the mode of transportation that persons with dementia have been found to continually practice, when all other modes are no longer feasible (Burton & Mitchell, 2006, p. 54).

### *2.2.2. Multi-faceted benefits of outdoor walking*

Persons with early-stage Alzheimer's have expressed an appreciation for the multi-faceted nature of outdoor walking, that it can serve many purposes simultaneously (Brorsson et al., 2011). Outdoor walking is particularly appreciated by persons with dementia for the opportunity to breathe fresh air, while maintaining a consistent walking habit is known to slow the progression of cognitive decline (Duggan et al., 2008). Persons with mild to moderate dementia have reported being drawn to walking in nature, which may range from a stroll in urban neighborhoods with abundant green space to being out by the river or in the countryside, for its restorative and calming effect (Duggan et al., 2008; Lloyd & Stirling, 2015; McDuff & Phinney, 2015; Silverman, 2017). Walking in nature has also been appreciated by persons with dementia for offering multi-sensory experiences as well as being dynamic and ever-changing (Clarke & Bailey, 2016; Olsson et al., 2013). Participants have also expressed an appreciation for the aspect of social contact that going on

walks in one's neighborhood affords (Brorsson et al., 2011; Silverman, 2017).

Research also suggests that being accompanied on a walk enabled persons with dementia to walk further, which explains why the social aspect of walks may be an enabling characteristic (McDuff & Phinney, 2015).

Outdoor walks also prompt deep reminiscence. While persons with mild to moderate dementia have acknowledged the decline of their short-term memory, they have also noticed the resurgence of long-term memories and by visiting places associated with these memories they retain personal meaning in their lives (Ward et al., 2017). These sites serve as personal landmarks, prompting persons to form routines around them (Ward et al., 2017). Images of familiar places as well as familiar objects encountered during outdoor walks have been found to trigger personal memories as well as those relating to the place (R. Phillips & Evans, 2018). Events that they witness in their neighborhood during these walks may remind persons of their own personal history, thus fostering self-continuity (Silverman, 2017).

### *2.2.3. Benefits of group walking*

Besides walking on their own or accompanied by a care partner, persons with dementia also participate in local community-based walking programs. Group walking has been found to be particularly beneficial in allowing persons with mild to moderate dementia to enact their identity as social citizens, enabling them to have equal opportunity to participate and engage in their community (Phinney et al., 2016). Group walks allows them to enjoy activities with others who share similar dementia experiences, thus providing a safe and familiar setting, but also the opportunity to meet new people and visit different places in the city they have not visited before

(Kelson et al., 2017; Phinney et al., 2016). Such programs have been found to help spread awareness of the possibility of living well with dementia in the community, simply by virtue of the group's presence in the urban landscape (Kelson et al., 2017; Phinney et al., 2016).

### ***2.3 Theoretical framework***

The following framework (Figure 1) was developed based on the review of literature to locate the various conceptual constructs that are central to outdoor mobility for community-dwelling older adults with dementia. According to the Ecological Model of Aging, various mobility and wayfinding issues discussed in literature were identified, and classified as those relating to “personal competence” and “environmental press”, as well as personal “coping strategies” employed to overcome them. The emphasis in this thesis is on the use of environmental cues as a coping strategy. Previous literature was reviewed to extract certain key characteristics of landmarks and signage. In the following sections, each of these sub-topics, relating to issues of competence and press, as well as coping strategies are discussed.

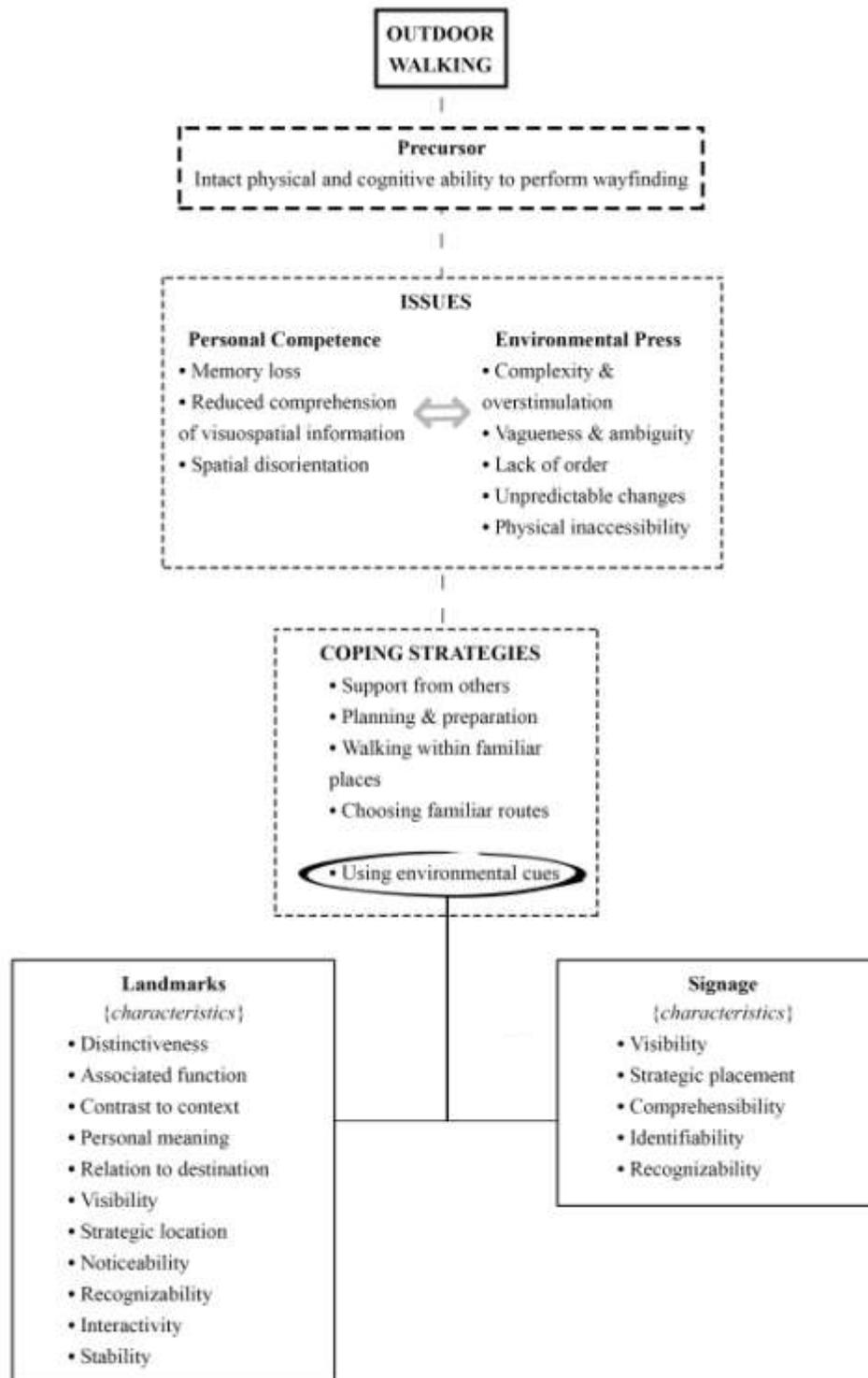


Figure 1: Theoretical framework

## ***2.4 Outdoor wayfinding challenges and coping strategies***

Wayfinding, defined as a person's ability to orient themselves and find their way between places, has been found to be a major concern for persons with dementia (Davis, Ohman, & Weisbeck, 2017). Impaired navigation has been found to be a major symptom of early-stage dementia, which gradually worsens over time, in the later stages of the disease (Bosch & Gharaveis, 2017).

Theories in the field of environmental gerontology view person-environment transactions as a temporal process that involves continual adaptation, both to external changes in the environment, i.e. environmental press, as well as internal changes in functional abilities, i.e. personal competence (Lawton & Nahemow, 1973). Changes in one's environment may have unanticipated behavioural and social consequences, prompting new processes of "cognitive restructuring" which can be stressful for older adults (Lawton, 1985, p. 508).

"The ecological change model" and "the environmental docility hypothesis" suggest that as individual competence diminishes in later life, environmental press tends to have a greater impact on behavioral outcomes (Lawton & Nahemow, 1973). Therefore environmental stressors impact cognitively impaired older adults differently than cognitively intact older adults, i.e. having impaired cognitive abilities can exacerbate the stressful impacts of environmental press (Lawton & Nahemow, 1973). While outdoor walking has a lot of benefits for persons with early-stage dementia, it may also serve as a reminder of their capabilities, causing them to reconcile with their condition (Olsson et al., 2013). The following sections identify some of these issues

explored in previous studies, relating to press and competence, encountered by persons with mild to moderate dementia as they perform wayfinding in the neighborhood environment.

#### *2.4.1. Issues relating to personal competence*

##### *2.4.1.1. Memory loss*

Going out is contingent on several preparatory activities and events done while at home, and at times the preparation itself can become an overwhelming activity that imposes excessive demands on persons' limited resources (Brorsson, Öhman, Cutchin, & Nygård, 2013; Brorsson et al., 2011). Due to issues with short-term memory, persons with dementia may often forget what they need to take with them, or even where they are going, as well as things that they need to carry with them when they step outside their homes (Brorsson et al., 2013).

##### *2.4.1.2. Reduced spatial abilities*

Cognitive skills of distinguishing between left and right, as well as different shapes and sizes, tend to decline for persons with dementia (Blackman et al., 2003). This in turn may negatively impact their spatial memory, planning, decision-making, as well as their ability to remember and use mental maps, spatial information and signage (Blackman et al., 2003). Persons with mild to moderate dementia have been found to experience difficulty in parsing the environment for critical information, comprehending environmental details, and how different details were related to one another (Sandberg et al., 2017).

##### *2.4.1.3. Spatial disorientation*

Persons with dementia experience difficulty in orienting themselves in time

and space, as a result of which they may misinterpret their surroundings and face spatial disorientation (Lloyd & Stirling, 2015; Olsson et al., 2013). Research has suggested that persons with mild to moderate dementia may be particularly aware of the risk of experiencing disorientation at any given time or place (Brittain et al., 2010). Care partners have also reported anxiety-arousing incidents where their loved ones have followed the wrong direction, with no awareness of it, and ended up in an unintended destination or an unknown place (Brittain et al., 2010; Duggan et al., 2008; Silverman, 2017). These incidents often lead to constrained mobility and the range of free movement to places that one used to be able to visit (Duggan et al., 2008).

#### *2.4.1.4. Fear and anxiety*

Fear of getting lost is all pervasive, and has been cited as an obstacle in free outdoor movement for persons with mild to moderate dementia (Mitchell et al., 2004). This feeling of anxiety is usually associated with episodes of sudden lack of recognition of their whereabouts and an unexpected onslaught of disorientation (Brittain et al., 2010; Mitchell et al., 2004; Olsson et al., 2013; Sandberg et al., 2017). It not only restricts their mobility to known, familiar areas, but it also limits the possibility of their participating in meaningful activities outside their home (McDuff & Phinney, 2015; Sandberg et al., 2017). Persons with mild to moderate dementia, who are used to conducting their daily routine independently and value being able to do things on their own, may find it difficult to come to terms with their need to depend on others for help and support (Lloyd & Stirling, 2015; Sandberg et al., 2017).

Persons with early-stage dementia have expressed concern about their future

potential to be outdoors and dread not being able to continue going outside (Olsson et al., 2013). Some persons have reported feeling compelled to refrain from going outdoors due to concern expressed by their families, while they themselves are not fearful with regard to going outside their homes (Brittain et al., 2010). It has been suggested that the fear of exposure or embarrassment due to disorientation may be another driver for persons confining themselves to their homes (Blackman et al., 2003; Duggan et al., 2008). As a result, one ends up feeling constrained and confined to their homes, which can be quite crippling, stopping persons from being active and affecting their quality of life (Duggan et al., 2008; Lloyd & Stirling, 2015).

#### *2.4.2. Issues relating to environmental press*

##### *2.4.2.1. Complexity and overstimulation*

The pace at which activities in one's vicinity are proceeding may tend to be at odds with the natural pace at which persons with dementia may be able to participate and engage in their environment (Clarke & Bailey, 2016). Public spaces can exert demands on persons with dementia that an able-bodied person may take for granted and easily negotiate. A prerequisite to successfully navigating complex, high-traffic areas is the ability to process multiple disparate sources of information all at once. This can be particularly challenging for persons with dementia, leading them to feel confused and disoriented and compromising their safety (Blackman et al., 2003; Lloyd & Stirling, 2015; J. Phillips, Walford, & Hockey, 2012). Complex street layouts and intersections have been associated with greater likelihood of persons with mild to moderate dementia getting lost (Mitchell et al., 2004). Environmental noise has also been cited as a barrier to the mobility of persons with early-stage Alzheimer's

dementia, especially due to the difficulty they experience in differentiating between noise and information (Brorsson et al., 2013). However, depending on the situation, sounds such as those of railways or motor highways may actually serve as cues that aid in wayfinding (Olsson et al., 2013)

Crossing roads has been found to be particularly stressful, for the lack of clarity owing to unwritten traffic rules and the uncertainty of not knowing whether vehicles would stop to let persons cross (Brorsson et al., 2013). Shared pedestrian and bike lanes were found to be a barrier mainly because of the unpredictability of incoming bicycles which can be stressful and impede free movement (Phinney et al., 2016). Persons with mild to moderate dementia have reported feeling less confident using transport hubs such as airports, train stations, subway and other complex environments that were once familiar, but have become incomprehensible and confusing since the onset of disease (Sandberg et al., 2017). Not knowing where to go, how to get to one's destination or how to read signs inhibits persons with dementia from being able to travel independently, forcing them to be accompanied by someone else (Sandberg et al., 2017). Viewing such barriers within the context of the total walking journey, which may involve several sequences of activities, shows that even small disruptions may have far-reaching effect and exert a significant cumulative cognitive demand (Brorsson et al., 2013).

#### *2.4.2.2. Insufficient or poorly maintained infrastructure*

Persons with early-stage Alzheimer's dementia have been found to experience difficulty negotiating obstacles along public footpaths, e.g. wet or slippery surfaces, heap of gravel or snow, which may potentially increase the risk of falls

(Brorsson et al., 2011). Lack of sufficient street lighting may exacerbate the risk experienced in such situations (Blackman et al., 2003). Persons with mild to moderate dementia have found to refrain from walking in areas with narrow sidewalks and lack of seating and public restrooms (Blackman, Van Schaik, et al., 2007; Brittain et al., 2010). Poor street connectivity and spaces with poor visual access have been associated with greater likelihood of persons with mild to moderate dementia getting lost (Mitchell et al., 2004).

#### *2.4.2.3. Inaccessibility during certain times*

Persons with early-stage Alzheimer's dementia reported feeling stressed and unsafe going outside late in the day and hence took this into consideration in planning their daily routine (Brorsson et al., 2011). Persons with mild to moderate dementia have also attributed not preferring to venture out post-sunset due to the lack of sufficient street lighting, which was perceived as a contributor to the risk of getting lost (Lloyd & Stirling, 2015). Persons with mild to moderate dementia also prefer not going to destinations like grocery stores during rush hours so as to avoid crowded situations (Brittain et al., 2010; Brorsson et al., 2011).

#### *2.4.2.4. Vagueness and ambiguity*

The environment failing to provide critical information at necessary junctures makes it difficult for persons with dementia to comprehend their surroundings and understand part-to-whole relationships (Sandberg et al., 2017). Uncertainty that arises from not being able to clearly recall a situation has been traced back to the lack of feedback and validation from one's surrounding environment (Sandberg et al., 2017). The lack of distinctiveness in one's environment, especially when streets look

identical to one another and have identical buildings without any landmark features, can exacerbate persons' disorientation (Blackman et al., 2003; Mitchell et al., 2004).

#### *2.4.2.5. Difficulty comprehending unforeseen changes*

Studies have indicated change at different levels in public spaces and destinations affecting persons' ability to successfully perform daily routines. Persons with mild to moderate dementia have been found to be less aware of changes in their local environment, wherein they may go outside expecting to find something that has been significantly altered (Mitchell et al., 2004). However, some persons with dementia have reported being aware of changes in services, e.g. bus routes in their neighborhood, and identified them as barriers to their outdoor mobility (Duggan et al., 2008).

Order is key for persons with dementia to be able to identify, recognize, comprehend and accordingly act in situations. Predictability provides comfort. Following structure in one's routine is a deliberate measure employed by persons with dementia to easily find things in certain places. Deviations from this order can be potentially disorienting and may disrupt the clear, organized way persons with dementia have devised of going about doing things. Changes within indoor public venues, such as disrupting usual arrangement of items at stores or removing art from hospital corridors, have the effect of rendering familiar places unfamiliar (Brorsson et al., 2011). Changes in landmarks that persons with dementia used to find their way around their neighborhood, even small changes such as repainted houses, may pose significant barriers to their mobility (Brorsson et al., 2011).

### *2.4.3. Understanding how persons cope with issues*

Persons with dementia display a great deal of perseverance and resilience, especially in the early stages (Burton & Mitchell, 2006). Compared to the “the ecological change model” and “the environmental docility hypothesis,” the “environmental proactivity hypothesis” offers a more nuanced framework to understand person-environment relations in the early stages of dementia (Lawton & Nahemow, 1985). A key aspect of this model is the balance between autonomy and support, which can explain why older adults use environmental resources to proactively and/or reactively cope with internal and external changes (Lawton & Nahemow, 1985).

Persons with dementia employ several self-help strategies in order to remain engaged and connected in their physical and social environment (McDuff & Phinney, 2015; Phinney et al., 2007). These strategies may be proactive and preventive in nature or reactive and intended to solve problems (Olsson et al., 2013). Research suggests that the rationale behind these strategies is often unknown to persons’ care givers and service providers which makes it all the more easy for them to discredit their behaviour (Sandberg et al., 2017). While these strategies may only provide temporary relief, it is still important to examine them in order to find intuitive solutions (Brorsson et al., 2013). Some examples of these strategies from previous studies follow.

#### *2.4.3.1. Seeking support*

Persons with dementia have reported being aware that they cannot take

outdoor walking for granted like most able-bodied persons do. They need to concentrate on how and where they are walking and consciously make the effort to stay aware and present at all times. Persons with mild to moderate dementia who live alone have reported focusing squarely on the way they place their feet on the ground to retain balance and stay close to wall or fence adjoining the path for additional support (Ward et al., 2017). Persons who live alone also cope with not having the support of a care partner during outdoor walks by reducing the distance and duration of their walks (Duggan et al., 2008). Others have reported immediately seeking help from passersby when they sense that they are losing their way and approach only the people they feel most comfortable asking for assistance (Brorsson et al., 2013). Persons with dementia have also specifically noted that they are the first ones to proactively approach passersby for help, instead of waiting to be helped by somebody (Brittain et al., 2010).

Depending on the person's cognitive skills, this may or may not be an efficient strategy, since asking for directions is contingent on remembering where one is going and being able to follow instructions given by passersby (Mitchell et al., 2004). Local businesses are a common source of assistance for wayfinding when persons feel disoriented upon taking a wrong turn (Ward et al., 2017). Persons with early Alzheimer's have also reported coping with wayfinding difficulties with the help of pets that were trained to find their way back home (Olsson et al., 2013). Persons who live with care partners depend on them for assistance in staying physically active (Duggan et al., 2008; McDuff & Phinney, 2015; Sandberg et al., 2017). Care partners have reported encouraging their loved ones to lead the way on accompanied walks,

thereby maintaining the latter's autonomy as well as facilitating the practice of familiar routes to hone their wayfinding skills (Silverman, 2017).

#### *2.4.3.2. Sustained contact with familiar places*

Persons with early-stage Alzheimer's have stressed on the importance of being familiar with the place as well as the activity, in order to be able to function independently (Brorsson et al., 2011). In order to not get lost, they have reported limiting their movement to destinations that are within walkable distance from their homes (Brorsson et al., 2013). Persons with early dementia have also reported having no issues finding their way in familiar environments (Brittain et al., 2010; Mitchell et al., 2004; Olsson et al., 2013). It has been found that familiarity of the setting helps persons with mild to moderate dementia, on the verge of losing their way, to reorient themselves by pausing and searching for familiar landmarks (Mitchell et al., 2004; Olsson et al., 2013; Sandberg et al., 2017). Taking this break has been found to be essential to their ability to reorient themselves and recognize their surroundings (Sandberg et al., 2017).

#### *2.4.3.3. Limited movement beyond familiar areas*

Persons with early Alzheimer's dementia have reported limiting their movement to areas that are unfamiliar, but in unavoidable circumstances, they travel to less-frequented places along with care partners or by utilizing specialized transport services (Brorsson et al., 2013). Care partners have reported that their loved ones tend to get stressed, disoriented and confused when they are in places that they do not know (Duggan et al., 2008). Persons with early Alzheimer's dementia have reported their

resistance to moving to new places due to potential wayfinding issues arising in the future and therefore prefer to remain in familiar neighborhoods (Brorsson et al., 2011).

#### *2.4.3.4. Planning and preparation ahead of time*

Notes containing necessary information pertaining to wayfinding and the sequence of outdoor activities serve as helpful reminders (Brittain et al., 2010; Brorsson et al., 2013). However the effectiveness of this strategy is contingent on them remembering to carry the note with them. An example of this being persons forgetting to carry their shopping list and needing to make several subsequent trips to the store in order to buy all that they need (Brorsson et al., 2013). This may also occur when persons lose their focus and get distracted, which in turn may cause them to forget to complete their shopping task (Brittain et al., 2010).

A lot of work goes into planning one's trip outside. Persons with mild to moderate dementia prefer to plan which way they are going, well in advance (Mitchell et al., 2004). Following a strict routine helps them break their trip down to smaller units that they can go about systematically completing, thereby giving them the confidence to venture out by themselves (Ward et al., 2017).

#### *2.4.3.5. Using environmental cues like landmarks and signs*

In order to bridge their growing disconnect with place, persons with dementia have identified various features in the environment that they use as cues to help them retain a sense of coherence in their surroundings. Older people with dementia prefer using wayfinding tools that are visual cues, e.g. landmarks, rather than maps or written directions, especially because persons with mild to moderate dementia have trouble

locating their position on the map (Blackman, Van Schaik, et al., 2007; Mitchell et al., 2004).

Older adults with mild to moderate dementia have been found to consciously incorporate landmarks into their wayfinding routine unlike those without dementia who may be aware of the presence of these landmarks but do not consciously use them for wayfinding (Sheehan, Burton, & Mitchell, 2006). Findings from previous studies suggest that persons with mild to moderate dementia may use different cues for different destinations, such that the cues are logically related to the destination that they are travelling to, e.g. a post box is used as a cue to travel to the post office, signs pointing to a public restroom are used to go to the restroom (Blackman, Van Schaik, et al., 2007). Additionally, persons with early-stage Alzheimer's have reported preferring to walk in naturally mapped environments in the outdoors, such as walking trails that loop through forests since they can rest assured that they will find their way back to where they started without any uncertainty (Olsson et al., 2013).

## ***2.5 Environmental parameters for cognitive accessibility***

### *2.5.1. Characteristics of landmarks*

Urban design should enable persons with dementia to adequately read their environment using cues and information embedded in the built environment in order to orient themselves and find their way (Blackman et al., 2003). Previous research has suggested that out of all the environmental cues landmarks stand out the most to older people with dementia while performing wayfinding (Mitchell et al., 2004). Landmarks have been defined as structures or objects that act as points of reference that mark the locality they are in (Raubal & Winter, 2002). The saliency of a

landmark is not only based on its individual characteristics but also how well it contrasts with the context it is set in (Lynch, 1960). This makes being a landmark a relative property (Raubal & Winter, 2002). Some structures serve as landmarks for greater number of people because of their singularity, through clear form, contrast to background and visible location, while others tend to be more personal landmarks, possessing fewer of the above attributes (Hirtle, 2003; Lynch, 1960; Raubal & Winter, 2002).

The following section expands the scope of landmark by considering how they may be perceived by persons with mild to moderate dementia and lays down some salient characteristics that emerge from previous studies. The key characteristics of landmarks discussed here are, (i) association with purpose, (ii) visibility, (iii) strategic location, (iv) noticeability, (v) sense of familiarity, (vi) promoting engagement, (vii) balanced stimulation, and (viii) stability. Additionally, salient characteristics of signage are also discussed, which include, (i) visibility, (ii) readability, (iii) identifiability, and (iv) familiarity.

#### *2.5.1.1. Association with purpose*

Activity, function and purpose all lend identity to places, which can be extremely conducive to recognition of places. Findings from previous studies suggest that older adults with mild to moderate dementia are drawn to traditionally designed places, due to their clear communication of intended purpose (Mitchell et al., 2004). However, more recent findings suggest that the intended purpose of an object may be communicated clearly despite its departure from conventional or traditional design (Blackman, Van Schaik, et al., 2007). Formation of personal landmarks have been

found to be contingent on whether the activity or purpose associated with the place holds a special place in the person's life, e.g. persons with mild to moderate dementia being drawn to libraries where they have been a member since their childhood (Ward et al., 2017).

Places that support a range of activities have been found to sustain the interest of older adults with mild to moderate dementia and provide them with a wealth of sights and sounds to observe and engage in (Kelson et al., 2017). These open, mixed-use spaces that are informal and vibrant with several activity zones have been found to not only provide interest, but also cues that they use for wayfinding (Mitchell et al., 2004). A possible explanation for why people are drawn to such places may be explained by the fact that they are informal and not imbued with too many tacit rules that may be difficult for persons with mild to moderate dementia to intuit (Kelson et al., 2017; R. Phillips & Evans, 2018).

#### *2.5.1.2. Visibility*

Optimal distance between objects and the observer is critical to their perception as landmarks. Persons with dementia have reported using both close and distant landmarks in orientation and wayfinding (Mitchell et al., 2004). Visual access is a critical factor to be considered in planning how streets are laid out. Research has shown short streets on a non-uniform grid with forked junctions provide optimal scope for continuous sight lines (Mitchell et al., 2004). Consistent with this finding, cues placed along short and narrow streets have been found to be more visually accessible than those on long and wide streets (Mitchell et al., 2004). With regard to positioning landmarks for optimal visibility, decision points have been pointed out as critical areas

that require strong environmental cues. This is why having a landmark at T-junctions has been suggested to help with decision-making (Mitchell et al., 2004).

#### *2.5.1.3. Strategic location*

The perception of a place, building or object as a landmark is contingent on one's familiarity with the setting of the landmark (Lynch, 1960). In support of this, a recent study found that landmarks were not effective as wayfinding cues in a virtual reality simulation of an unfamiliar environment (Blackman, Van Schaik, et al., 2007). It is also important to consider the proximity of the landmark to one's place of residence. Places that are within walking distance from home have been found to be frequent destinations by persons with mild to moderate dementia as they facilitate independent mobility within a familiar setting (Brorsson et al., 2011)

#### *2.5.1.4. Noticeability*

Noticeability is considered as the stage of perception that follows visibility, i.e. whether or not something that is seen holds the person's attention. Regularly encountered and interesting structures or places have been found to catch the attention of those with mild to moderate dementia (Mitchell et al., 2004). Streets that have varied urban form and a plethora of distinctive architectural details stand out as being more interesting and useful for wayfinding rather than those that have repetitive form and look similar to each other or are lacking in distinctive features (Mitchell et al., 2004).

Recognizable cues are also highly noticeable. Regularly encountered buildings

with recognizable form, style and design have been found to be highly noticeable and act as wayfinding cues for persons with mild to moderate dementia (Mitchell et al., 2004).

Color used in landmarks helps enhance their noticeability. However, since older people tend to experience color agnosia, only some colors may stand out, e.g. colors on the red/orange spectrum rather than those on the blue/green spectrum (Mitchell et al., 2004). Rendering the pavement in a different color has been suggested as a better way of making the distinction between the sidewalk and the motorway more noticeable than by using traffic bollards (Blackman, Van Schaik, et al., 2007).

#### *2.5.1.5. Inducing sense of familiarity*

Familiar cues such as signposts, crossroads, distinctive architectural landmarks, or familiar houses in the neighborhood bolster the cognitive maps of persons with mild to moderate dementia thereby boosting their confidence to walk outdoors (Olsson et al., 2013; J. Phillips et al., 2012). Previous research has suggested that the effect of familiar environmental cues is contingent on the period of stay in the neighbourhood, thereby favoring long-term residents who are most familiar with the setting (Olsson et al., 2013).

#### *2.5.1.6. Fostering engagement*

“Engagement” is a widely-used operant in discussing the meaningful interaction of physical objects and persons living with dementia. Previous research has found that public art provides persons with dementia the opportunity to engage and participate in the community (Kelson et al., 2017). Public art commemorating local heroes and icons have been found to trigger shared memories of members of a walking

group and cause them to jointly reflect on local histories of their city or neighborhood (Kelson et al., 2017). Thus, artwork that is easily recognizable can prompt conversation and foster social cohesion and belonging. Oddity in public art is also something that persons with mild to moderate dementia pick up on, when encountered regularly (Kelson et al., 2017). These are recognized for precisely their unusual quality and are thus imprinted in people's cognitive maps as memorable cues. When public art is made to be more interactive and serve as a platform for engagement, rather than being a representation of something familiar, it has been found to elicit participation and involvement from persons with dementia, including those with impaired verbal communication (Kelson et al., 2017).

#### *2.5.1.7. Balance between stimulation and challenge*

Environments need to have just the right amount of stimulating features. Having them in excess has been suggested as potentially causing persons with mild to moderate dementia to feel overwhelmed (Brorsson et al., 2013; Mitchell et al., 2004).

#### *2.5.1.8. Stability and endurance*

Structures that are well-established and have stood the test of time tend to be the most effective landmarks (Mitchell et al., 2004). Re-establishing historic structures as landmarks may help with reigniting older adults' memories of the place (J. Phillips et al., 2012). These need not only be historic structures and buildings, but may also include small-scale artifacts that have been in the same location for an extended period (Mitchell et al., 2004).

### *2.5.2. Characteristics of signage*

In addition to landmarks, signage has also been found to help persons with dementia in performing outdoor wayfinding. Previous research findings suggest that signage may serve as a more effective wayfinding cue than landmarks, especially in unfamiliar public spaces (Blackman, Van Schaik, et al., 2007). It is important to consider the role of signage as an environmental cue in enhancing the experienced mobility of persons with mild to moderate dementia. The following are some characteristics of signage that have been identified as particularly salient in previous studies.

#### *2.5.2.1. Visibility*

Previous research has found that the orientation of signage plays an important role in determining its visibility. Signs have been found to be more visible from a distance when placed perpendicular to walls (Mitchell et al., 2004).

The height at which signage is located is also critical to its visibility. Studies have shown significant improvement in wayfinding performance among persons with mild to moderate dementia when information in signs was presented at eye-level (Blackman, Van Schaik, et al., 2007). Clear sight lines to signage are also contingent on there being no obstructions in one's field of vision (Mitchell et al., 2004).

#### *2.5.2.2. Readability and comprehension*

Signage should be simple, clear, easily understandable and contain only the most essential information for wayfinding for persons with mild to moderate dementia (Mitchell et al., 2004). Visual clutter and ambiguous directions in signage, or high density of signs in a location have been identified as contributors to disorientation

(Mitchell et al., 2004). Signs that consist of text have been found to be more useful than signs with pictures or images due to the latter's potentially confusing nature for persons with mild to moderate dementia (Blackman, Van Schaik, et al., 2007). However, familiar images have been found to be effective in certain scenarios, e.g. signs of branded products at grocery stores (Brorsson et al., 2013).

#### *2.5.2.3. Enables identification and recognition*

Signs provide useful supplementary information that helps persons with mild to moderate dementia identify and find their way to places, especially those that are non-descript, indistinctive and difficult to recognize otherwise (Blackman, Van Schaik, et al., 2007; Sheehan et al., 2006). Signage that looks familiar and is encountered on a regular basis, either traditional insignia or color or a known symbol, has been found to provide additional wayfinding assistance and oft-required reassurance that the person is indeed at the right place (Blackman, Van Schaik, et al., 2007; Brittain et al., 2010; Brorsson et al., 2011; Sheehan et al., 2006).

## **2.6 Research methodology**

### *2.6.1. Rationale for applying qualitative research methods*

Doing qualitative research helps unpack multiple constructed realities in order to broaden one's understanding of the multitudinous nature of human experience. This thesis uses mixed methods, but is mostly driven by a qualitative focus. Studying real world situations by doing field-based research allows situations to unfold naturally and is ideal for an inductive approach, which is vastly different from the framework of a-priori thinking and hypothesis-testing in experimental research design.

Because of the dearth of knowledge in the subject area of this thesis, the

inductive approach was considered to be most suitable, where insights and observations lead to the development of theory. Adopting this approach was especially important, owing to the relative dearth of literature on the relationship between the neighborhood built environment and community-dwelling older adults with mild to moderate dementia. Furthermore qualitative research methods were desirable to help the researcher think critically and reflexively of his position in the field and through interactions with participants, especially considering the researcher's lack of expertise in the lived experience of dementia. The methods employed were chosen so as to promote participants' involvement in structuring their narrative and harness insights from their lived experience.

Previous research on outdoor environments for persons with dementia has emphasized that qualitative research findings be translated into hypotheses that can be tested through quasi-experiments so as to develop a sound evidence-base for dementia-friendly urban design recommendations (Blackman, Van Schaik, et al., 2007). Therefore, the study uses mixed methods to not only triangulate results but also to sort through the anecdotal evidence generated by interviewing participants and arrive at testable hypotheses to support future empirical research in this area.

Ethnographic research is a qualitative research method that allows researchers to put together textured descriptions of human-environment relations by combining observations of "field situated user activity" and informants' perspectives . Rapid or mini- ethnography has been advocated as an alternative to its traditional counterpart for the purpose of conducting more focused studies in shorter durations of time. Mobile methods such as mobilized ethnography and post-hoc interviews or focus

groups facilitate data-collection on the move (Fincham, McGuinness, & Murray, 2009). The research knowledge that is co-created by means of movement is also influenced by the place it occurs in. This study is an attempt at harnessing this place-based knowledge through participatory research conducted in the field, which is explained in further detail in the next chapter.

#### *2.6.2. Why include persons with dementia as co-researchers?*

Think about people living with dementia for a moment; conjure up someone in your mind. Where is this person in your mind's eye? Chances are you have probably pictured someone sitting in a chair in a day-care facility, or at home on their own or lying in bed in a long-stay care home. Chances are you did not picture someone walking around a park marvelling at the beauty of the flowers. This is because of our assumptions and expectations about what people with dementia can and cannot do and how this has been portrayed in our culture. (Mapes, 2010, pp. 25-26)

Previous research has highlighted the lack of involvement of disabled older persons in any kind of long term process of creative engagement in research and design of their spaces (Boys, 2014). Spatial design decisions involving them are made almost entirely based on the rhetoric of standards-compliance or misguided assumptions based on half-truths. The lack of inclusion of voices and engagement with persons with dementia in design research as well as practice has been identified as a reason for architects' lack of nuanced insights into their complex life-worlds (Van Steenwinkel, Van Audenhove, & Heylighen, 2017).

In order for spaces to be inclusive, it is imperative that the designer starts from disability, “rather than treating it as an afterthought” (Boys, 2014, p. 4). To bridge the gap in knowledge about cognitive accessibility in public space, it has been suggested that persons with dementia be involved as active participants rather than passive end-users of designs that are conceived and developed in isolation, devoid of user-involvement (Blackman et al., 2003, p. 365). It has also been suggested that involving persons with dementia in decisions that concern them influence their sense of control and quality of life (Clarke et al., 2018).

In order to undo the power imbalance inherent in calling professionals and scholars on the subject as “experts” and acknowledge the legitimacy of the expertise acquired through lived-experience, persons with mild to moderate dementia, who participated in the first phase of this study, are referred to as “experts-by-experience” and researchers and practitioners, who participated in the first phase of this study, are referred to as “experts-by-profession” (Corstens, Longden, McCarthy-Jones, Waddingham, & Thomas, 2014).

### *2.6.3. Participation and empowerment through PhotoVoice*

Research with vulnerable populations has the tendency to establish uneven power relations between the researcher and researched. By enabling persons with dementia to be co-researchers, previous studies have successfully used ‘creative analytic practices’ and positioned them as experts of their own experience (Wiersma, 2011). By empowering participants to co-create their narrative, they are able to paint a fuller picture of the complex ways in which they make meaning (Wiersma, 2011).

One such participatory method is PhotoVoice, where participants take pictures

and then discuss the meanings in those pictures with the researcher through interviews or focus groups (Wiersma, 2011). Photography can broaden the scope of things that merit people's attention, as well as reframe things that one can or cannot rightfully observe (Sontag, 1977). Photos serve as communicative ramps that democratize participant conversations (Aaltonen, Arminen, & Raudaskoski, 2014). Photos have also been demonstrated as useful memory aids that evoke familiarity and reminiscence for persons with dementia (McPherson et al., 2001).

Previous research has successfully adopted PhotoVoice to understand the interrelationships between the effects of physical and social aspects of the neighborhood built environment on active living, through community-dwelling older adults' lens (Mahmood et al., 2012). However, this method has not yet been used with community-dwelling older adults with dementia to understand how they perceive the neighborhood built environment. This method is expected to have a lot of potential to not only facilitate participatory research, but also inform the growing field of cognitive accessibility in urban design and planning.

Through early conversations with the community partner for this research, this method was deemed a good fit for the group of walkers with whom this research was conducted, owing to a precedence of taking photos during earlier walks. The participatory visual methods were also met with enthusiasm from the participants at the time the project was introduced to them; months before the study was conducted.

## CHAPTER 3

### PHASE 1: PHOTOVOICE WITH EXPERTS-BY-EXPERIENCE

This chapter discusses the first phase of the study that was conducted using a participatory approach with community-dwelling older adults with mild to moderate dementia who are members of a neighborhood group walking program in Seattle, USA. The purpose of this phase was to examine the mobility patterns and active living choices made by community-dwelling older adults with mild to moderate dementia, examine how the built environment influences their choices, and specifically explore the role played by landmarks in their experience of outdoor mobility. Section 3A will discuss the research questions in this phase of the study, details about the participants, walking program and setting, and finally, the research design and procedure. Section 3B will discuss the results of this phase of the study.

#### ***3A Methods***

##### *3A.1. Research questions*

- RQ1. What drives community-dwelling older adults with mild to moderate dementia to walk in their neighborhoods?
- RQ2. What role does the neighborhood built environment, specifically urban landmarks, play in enabling or disabling community-dwelling older adults with mild to moderate dementia in their practice of active living?
- RQ3. What are the different urban landmarks that community-dwelling older adults with mild to moderate dementia notice during a group walk in an unfamiliar neighborhood?

RQ4. What are the different ways in which urban landmarks, observed during a group walk in an unfamiliar neighborhood, convey meaning to community-dwelling older adults with mild to moderate dementia?

RQ5. What are some salient characteristics that made certain urban landmarks stand out to participants during the group?

### *3A.1. Participants*

The study was conducted with eight members of a neighborhood walking group for persons with early-stage memory loss in Seattle, USA. The group consisted of five older adults (4 male, 1 female) with mild to moderate dementia, aged over 60 years, and three care partners, all spouses. Two persons with dementia lived alone and therefore did not have a care partner present. Persons with dementia were the primary participants, and will be referred to as “participants” in following sections, while their care partners were secondary participants, and will be referred to as “care partner”.

### *3A.2. Context*

The Dementia Friendly America initiative (DFA) is a national effort that prepares local communities to support persons with dementia and their families. (Dementia Friendly America, n.d.). The initiative strives to bring into effect interventions that can integrate persons with dementia and care-partners with the wider community including fellow-residents, local businesses and other organizations, in order to develop a holistic model of support, engagement and recreation. Since the inception of DFA, many local organizations have been expressing interest to spearhead outdoor dementia-friendly walking programs in their communities.

Presently there are a handful of walking programs in the United States that are

distinct and different from each other based on whether they are offered only to persons with dementia or also their care partner, and on the type of environments that they walk in i.e. natural or urban, amongst other contextual particularities that set them apart.

While DFA is a more recent phenomenon, several thriving grassroots movements that predate the DFA have been making major strides in sensitizing the community to the experiences of persons with dementia. Momentia is the name of one such movement that is based in Seattle which empowers persons living with dementia and their care partners to continue to be involved in their communities. The movement began with representatives from community groups and local businesses joining forces to see how services could be reframed or developed anew to engage with persons living with dementia. The result of this is a multi- dimensional cultural, recreational and therapeutic experience stewarded by local museums, theaters and music groups, day care centers, cafes, markets and local government agencies in Seattle.

Seattle Parks and Recreation, also a proponent of Momentia, has been offering dementia-friendly recreation programs to communities in Seattle. One of these programs, “Out & About,” is a neighborhood group walking program for persons living with early-stage memory loss. It happens to be the only walking program in the country, at present, that conducts walks in urban built environment. A walk is typically 2-3 miles, along a predetermined route through a neighborhood in Seattle, and typically lasts 1-1.5 hours. Members walk periodically; twice every month. The three volunteers guiding the group make sure members are safe and stay together. At predetermined points of interest along the walking route, the walk leader shares

information about the neighborhood, its history and stories associated with it. The end of the walk is marked by lunch at a local cafe or restaurant where the group gets to informally socialize.

### *3A.3. Site*

The walk featured in this study was conducted in Columbia City (Figure 2), a neighborhood in South Seattle, on September 22, 2017. This diverse neighborhood is home to people of many racial and ethnic minority groups, who constitute the majority of the neighborhood population (Statistical Atlas, n.d.). This is also reflected in the variety of local businesses and establishments found in the commercial core of the neighborhood. The neighborhood also houses the Columbia City Landmark District, a dense, mixed-use historic district, evoking a sense of a small town atmosphere (Seattle Neighborhoods, n.d.). It earns its status because of the City's interest in preserving its unique character and rehabilitating public space and local businesses (Seattle Neighborhoods, n.d.).

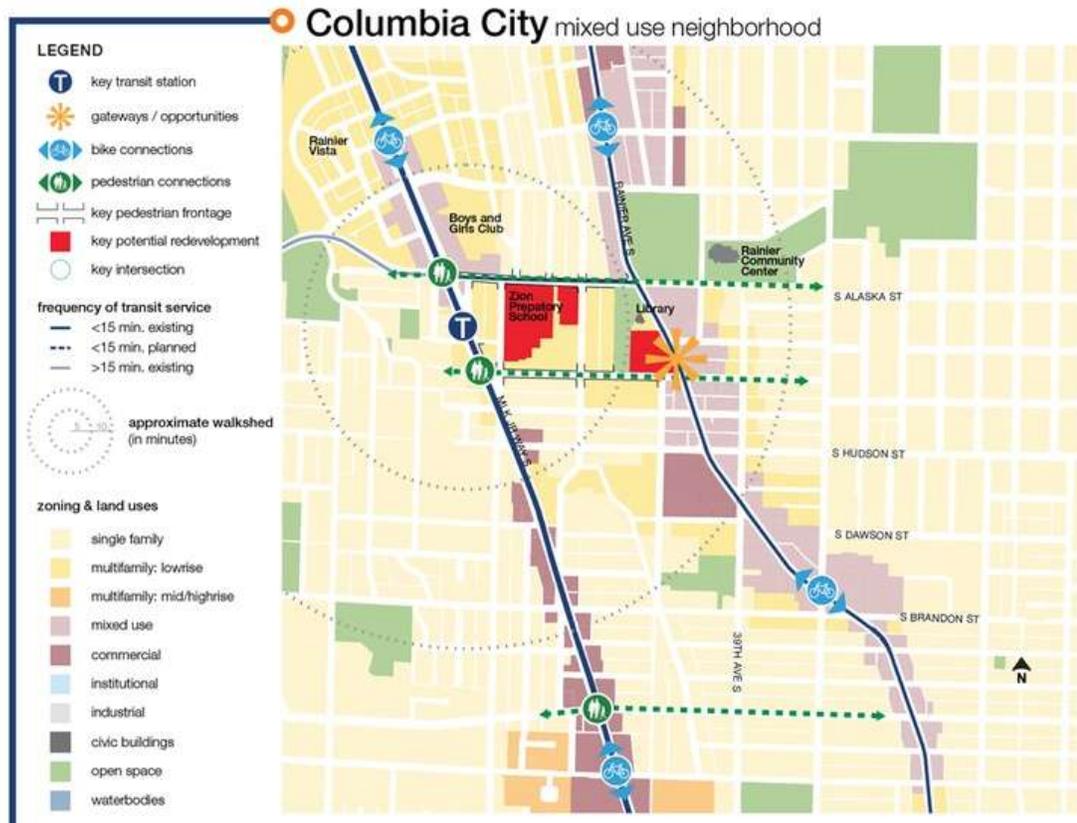


Figure 2: Land use map of Columbia City. Source: City of Seattle

However amidst this move for preservation of local character there continues to be waves of changes, transforming the urban fabric of the neighborhood. Members of minority groups have reported how recent developments led by gentrification in the community have been causing a shift in the socioeconomic characteristics in the neighborhood as well as a transformation of the physical environment (Chang, 2015). The neighborhood is also connected by the Light Rail transit corridor. However, the corridor is located along a state highway, nearly six blocks away from the Landmark District (Lindblom, 2009). This part of the neighborhood has been re-zoned in order to accommodate transit-oriented housing development, some that have been implemented and some that are still in the offing, because of which areas in the

immediate vicinity of the transit corridor are sparsely populated, thus having a less dense fabric (Scigliano, 2013).

The walking route for the group walk looped around all these different parts of the neighborhood, including the mixed-use landmark district, residential pockets, as well as the area around the transit corridor. Thus, the members of the group were exposed to vastly differing settings and stimuli, which set the stage for a variety of views and perceptions to emerge. There were 19 points of interest that were markers of the history of Columbia City as well as its present-day identity, had been identified by the walk leader for the portion of the walk that involved the guided tour, however three points of interest were excluded from the walk due to time constraints. Given below (Figure 3) is a route map of the walk in Columbia City, highlighting all 19 landmarks.



**Figure 3: Route map of the “Out and About” walk in Columbia City, showing pre-determined points of interest**

### *3A.4. Design and procedure*

The first phase of the study was designed to be inductive and exploratory, using mixed methods. The purpose of this phase was to capture the insights of experts-by-experience to generate relevant concepts, which will inform more-focussed studies in the future. This phase consisted of three sub-parts: 1) photo-walk, 2) focus group and 3) post-walk survey. They were co-led by the community partner, Cayce Cheairs, who is the Dementia-Friendly Recreation Specialist at Seattle Parks and Recreation. The following sections lay out the design of each of these three parts and the respective procedures involved.

#### *3A.4.1. Photo-walk*

The objective of this part of phase 1 of the study was to have persons with mild to moderate dementia in the “Out and About” walking program take photographs of landmarks as they walk together in the neighborhood of Columbia City. The methods used in this phase were borrowed from the PhotoVoice method, discussed in the previous chapter.

Members of the walking group arrived independently, or along with their care partner at the Rainier Community Center, which served as the meeting place as well as the venue for the focus group, following the walk. Each person with dementia, or in the case of a dyad, both the person with dementia as well as their care partner, was asked to read and sign consent forms (see Appendix C for consent form) and were given a Polaroid camera that they were trained to operate. These consent forms indicated that participation would be voluntary and sought participants’ permission to use the photos generated through the study in the final report, ensuring all responses

would be de-identified. At this point Ms. Cheairs gave the group a broad orientation to the study, and specifically on the definition of landmarks and what constitutes landmarks (see Appendix D for the script for the photo-walk). Participants were not given a rigid set of criteria to follow in picking landmarks rather they were encouraged to self-determine what constituted a landmark.

The walk began at approximately 10:30 AM PST. Early in the walk, at points of interest along the route, Ms. Cheairs provided the following prompt: “...take a photo of a landmark that is of interest to you...” After the first two points of interest, the participants were able to instinctively take photos; when they saw an interesting landmark, they did not require a further prompt from Ms. Cheairs. Once the person with dementia took a picture, the photo was numbered with help from their care partner or a volunteer and was stored in an envelope that was carried by the latter along the walk. Care partners and volunteers were also instructed to ask the persons with dementia why they thought the landmark was interesting to them, soon after they would take the picture. The researcher assisted with reloading cameras with new film as and when needed. Care partners were asked to wear audio-recorders around their neck as they walked with their loved one, in order to record conversations that they had as they photographed landmarks during the walk. Due to technical issues encountered while transferring audio files, the audio data was unable to be included in the analysis.

#### *3A.4.2. Focus group*

The walk spanned approximately 2 miles and ended at 12:30 PM PST. The

group re-convened at the Rainier Community Center for a brief lunch break. This was followed by an hour-long focus group discussion with persons with dementia and their care partners. Initial questions focused on participants' daily walking routines and preferred walking destinations, as well as the importance of landmarks in their lives (see Appendix D for the focus group guide). Following this, participants were asked to go through the photos they had taken during the walk and select 3-5 photos that particularly stood out to them at that moment. They were then asked to explain why they found these chosen landmarks to be interesting and what about the landmarks caught their attention. Care partners were also asked to recall conversations had during the walk to further supplement what the participants had to say about the landmarks. Before closing the discussion, participants were asked about the role they thought landmarks had to play in their experience of the neighborhood.

#### *3A.4.3. Survey*

Approximately three weeks later, participants were sent a Qualtrics survey (see Appendix E for the survey form) consisting of photographs taken by the group during the walk. Upon initial analysis of the content of the photos, majority of the landmarks seemed to fall under two broad categories: (i) historic buildings, and (ii) public artwork. For the purpose of triangulation, it was decided that the survey would present pairs of photos of landmarks from each category, in order to verify participants' preference for either category. Upon early analysis, it was apparent that there was a predominance of historic building and public art landmarks. In order to further examine the relative preference for either category, landmarks presented in the survey were paired such that there was one historic building and one public artwork in each

pair. The criterion for selection of photos for the pairing was simply that they unambiguously belonged to these categories. In the first half of the survey participants were asked to pick which of the two landmarks stood out to them the most. They were asked to explain why they chose the same. Five such pairs were administered. In the second half of the survey, participants were presented with the photos that they picked during the first half of the survey and asked to rank them on the basis of their appeal.

### *3A.5. Data analysis*

Polaroids of all landmarks photographed during the walk were digitized and categorized based on three criteria: 1) type of landmark (public art/historic buildings/signage), 2) source (pre-determined point of interest by walk leader/self-determined, i.e. not a point of interest in the walk), 3) selected during the focus group or not. These were then graphically represented on a map of the neighborhood to visualize the spread and density of the observed landmarks.

The analysis of the data from the focus group was based on the “general inductive approach” (Thomas, 2006). The transcript was read closely so as to become familiar with and develop a sense for emergent themes. Categories were derived, in line with the research questions, after having read the text multiple times. The text was then loaded on to Atlas.ti qualitative analysis software where initial line-by-line coding was done to explore the breadth of concepts that could be associated to the source text. A second process of coding was done to check for redundancies in categorization and refining the allotment of quotes to categories. This helped distill the analysis to three broad families of concepts, each consisting of anywhere between three to eight concepts.

The survey responses were analysed using descriptive statistics on Minitab statistical software to assess participants' relative preferences between historical and public landmarks, based on noticeability and appeal.

### *3A.6. Ethical considerations*

The protocol in this phase was reviewed and approved by the Cornell Institutional Review Board.

Steps were taken at various points in time to remind the participants of the study and make them aware of its requirements. The coordinators of the "Out and About" program made sure to let members of the group know via email as well as in person that participation in the study was not mandatory and that they were free to choose to walk with the group and not take photos or participate in the focus group. Persons with mild to moderate dementia signed consent forms along with their care partners before commencing the walk. Those who did not have a care partner read and signed consent forms themselves. Effort was taken to ensure that participants were fully informed and that they gave consent freely. Care partners were extremely helpful in ensuring that their loved ones understood clearly what the study entailed and what was expected of them. Ms. Cheairs who facilitated the study, reminded participants at regular intervals that their participation was entirely voluntary and that they were free to withdraw from the walk or the focus group at any point during the study.

### 3B Results of photo-walk with experts-by-experience

This section includes all 32 landmarks that were photographed by participants

during the walk at Columbia City (see Appendix J for map with photos of landmarks). Participants took a total of 66 photos of these landmarks. Each photo was differentiated by the following categories: (i) type of environmental landmarks, (ii) participants who took a photo of the same feature, (iii) whether the landmark was pre-determined or self-determined. The types of landmarks that were photographed were subdivided into seven categories that included: (i) historical buildings (*H*), (ii) signage (*S*), (iii) artwork (*A*), (iv) objects of practical importance (*P*), e.g. recycle bin, notice board, etc., (v) local businesses (*L*), (vi) residential (*R*), (vii) natural elements (*N*). Figure 4 shows the proportion of each sub-category of landmarks to the total number of photographs. The most frequently photographed landmarks were public art (43.07%), followed by historic buildings (21.53%).

Figure 5 shows the proportion of each type of landmark photographed by each of the five participants (identified by participant ID's D1, D2, D3, D4 and D5).

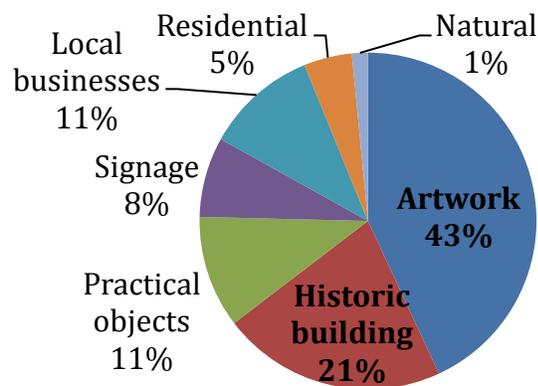
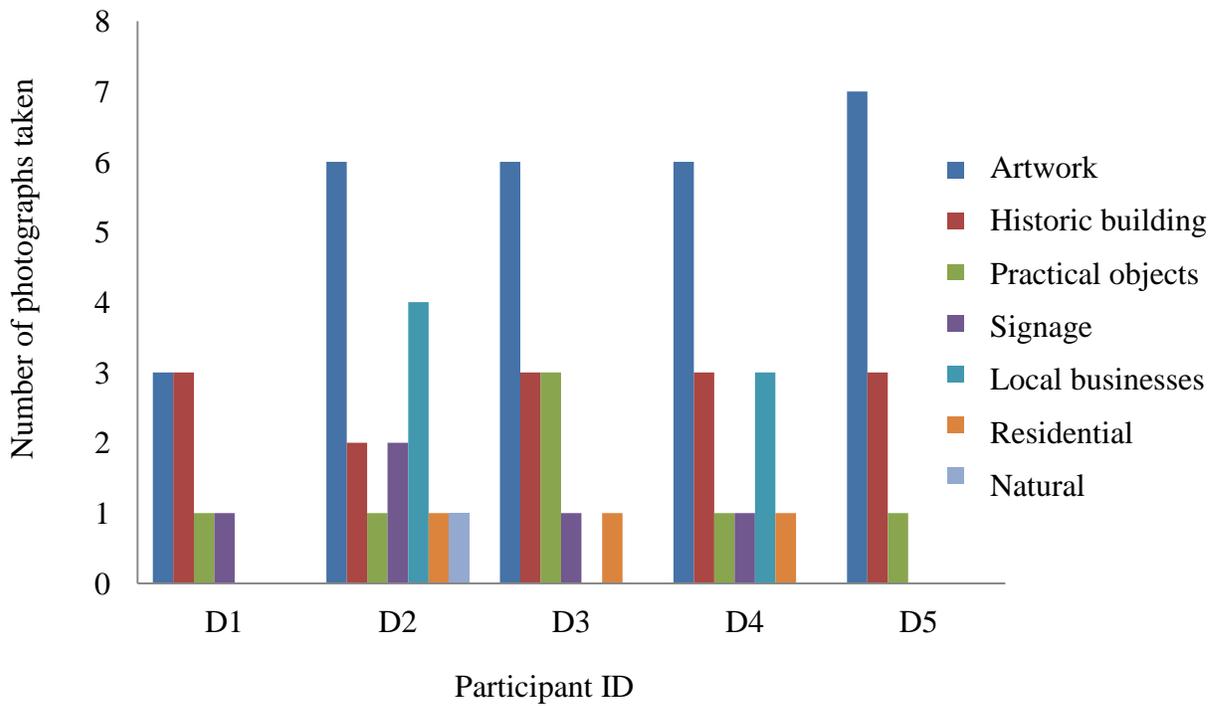
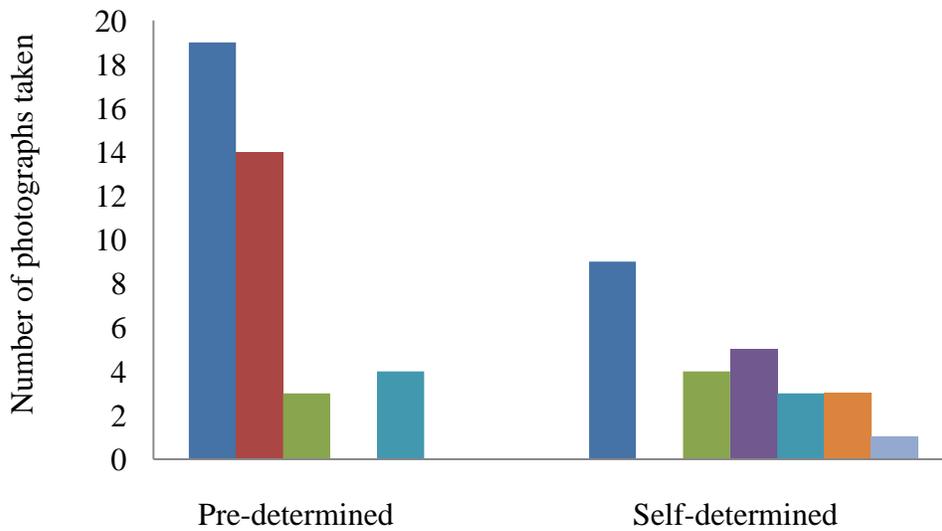


Figure 4: Proportion of types of landmarks photographed



**Figure 5: Participant-wise proportion of types of landmarks photographed**

Figure 6 shows the difference in these proportions across the different types of landmarks. The proportion of photographs of pre-determined (P) landmarks (61.53%) exceeded that of self-determined (S) landmarks (38.47%).



**Figure 6: Pre-determined and self-determined landmarks by different types**

The following photographs of these 32 landmarks are arranged in the order in which they were taken during the walk.



**Figure 7: Columbia Funeral Home**  
#1- Type: Historic Building  
Photo taken by: D1, D2, D3, D4  
Pre-determined



**Figure 10: Seattle Public Library**  
#4- Type: Historic Building  
Photo taken by: D1, D2, D3  
Pre-determined



**Figure 8: Sculptures at Columbia Park**  
#3- Type: Public Art  
Photo taken by: D3  
Self-determined



**Figure 11: Igimo Artstation sign**  
#5- Type: Signage  
Photo taken by: D2, D3  
Self-determined



**Figure 9: Columbia City Landmark District Sign**  
#2- Type: Signage  
Photo taken by: D1, D2, D3  
Self-determined



**Figure 12: Ark Lodge Cinema**  
#6- Type: Historic Building  
Photo taken by: D4, D5  
Pre-determined



**Figure 13: Public notice board**  
#7-Type: Object of practical importance  
Photo taken by: D5  
Self-determined



**Figure 15: Local Café**  
#9-Type: Commercial establishment  
Photo taken by: D4  
Self-determined



**Figure 14: Street Clock**  
#8-Type: Object of practical importance  
Photo taken by: D1, D2, D4  
Pre-determined



**Figure 16: Sidewalk art installation**  
#10-Type: Public Art  
Photo taken by: D5  
Pre-determined



**Figure 17: Local bar**  
#11-Type: Commercial establishment  
Photo taken by: D2, D4  
Pre-determined



**Figure 18: Family Services Center**  
#12-Type: Historical Building  
Photo taken by: D1, D5  
Pre-determined



**Figure 19: Local pizzeria**  
#13-Type: Historical Building  
Photo taken by: D2  
Self-determined



**Figure 20: Local club**  
#14-Type: Historical Building  
Photo taken by: D2, D4  
Pre-determined



**Figure 21: Columbia City Mural**  
#15-Type: Public Art  
Photo taken by: D2, D3, D4  
Pre-determined



**Figure 22: Garage**  
#16-Type: Practical object  
Photo taken by: D3  
Self-determined



**Figure 23: Graffiti**  
#17-Type: Public Art  
Photo taken by: D2, D3  
Self-determined



**Figure 26: Bird figurine outside house**  
#20-Type: Art  
Photo taken by: D1, D2  
Self-determined



**Figure 24: Bike rack**  
#18-Type: Public Art  
Photo taken by: D3  
Self-determined



**Figure 27: Purple House**  
#21-Type: Residential  
Photo taken by: D2, D4  
Self-determined



**Figure 25: Residence-under-maintenance**  
#19-Type: Residential  
Photo taken by: D3  
Self-determined



**Figure 28: "Sound of Light" mural**  
#22-Type: Public Art  
Photo taken by: D2, D4, D5  
Pre-determined



**Figure 29: Owl figurine outside house**  
#23-Type: Art  
Photo taken by: D1  
Self-determined



**Figure 32: "Pride" sculpture 3**  
#24c-Type: Public Art  
Photo taken by: D4, D5  
Pre-determined



**Figure 30: "Pride" sculpture 1**  
#24a-Type: Public Art  
Photo taken by: D1, D2, D4, D5  
Pre-determined



**Figure 33: Metal Artwork**  
#25-Type: Public Art  
Photo taken by: D4  
Self-determined



**Figure 31: "Pride" sculpture 2**  
#24b-Type: Public Art  
Photo taken by: D1, D2, D4, D5  
Pre-determined



**Figure 34: Chevrolet Corvair**  
#26-Type: Object of practical  
importance  
Photo taken by: D5  
Self-determined



**Figure 35: Sculptures at Residence**  
#27-Type: Art  
Photo taken by: D5  
Self-determined



**Figure 38: Columbia Public School**  
#30-Type: Historic building  
Photo taken by: D5  
Pre-determined



**Figure 36: Tree**  
#28-Type: Nature  
Photo taken by: D2  
Self-determined



**Figure 39: Ceiling artwork**  
#31-Type: Public Art  
Photo taken by: D5  
Pre-determined



**Figure 37: Bench outside house**  
#29-Type: Residential  
Photo taken by: D3  
Self-determined



**Figure 40: Rainier Arts Center**  
#32-Type: Historic building  
Photo taken by: D3  
Pre-determined



**Figure 41: "Spirit of Washington" monument**  
#33-Type: Public Art  
Photo taken by: D2, D3, D4, D5  
Pre-determined

### ***3C Results of focus group with experts-by-experience***

The results of the focus group are clustered and organized in accordance with the research questions to which they correspond. In order to maintain confidentiality of participant responses, the following ID's have been assigned:

Dyad 1 - D1.1 - person with dementia

D1.2 - care partner

Dyad 2 - D2.1 - person with dementia

D2.2 - care partner

Dyad 3 - D3.1 - person with dementia

D3.2 - care partner

Dyad 4 - D4.1 - person with dementia (no care partner)

D4.2 – “Out and About” volunteer

Participant 5 - D5 - person with dementia (no care partner)

CC – facilitator

### *3C.1. Differences in active living choices, patterns and destinations*

The following section comprises participant insights in response to the first research question, i.e. “*What drives community-dwelling older adults with mild to moderate dementia to walk in their neighborhoods?*” There were some broad differences in how participants explicated their purpose for walking in the neighborhood and the routines that they had developed around it, based on whether they lived alone or with a care partner. This theme was broken down into six subtopics.

#### *3C.1.1. “Attending to my survival:” a pragmatic approach to outdoor mobility*

Walking was cited as an essential activity by a participant who lived alone, owing to his personal history of stroke. He reported having to walk out of necessity to attend to his daily needs. He perceived walking at leisure as a “luxury”. He felt that he did not have as much time or opportunity to walk at leisure, because he had to attend to his daily needs by himself. However attending recreational walking programs for persons with dementia enabled him to partake in walking as a focused activity and found the structure of these programs to be beneficial. He felt that the amount of walking he did was insufficient and therefore made the most of opportunities provided by these programs:

Yeah, so, since I don't have a car, basically I have to walk everywhere. I take the bus to it. And so a lot of my walking is just attending to my survival.

There's things like going grocery shopping. I walk with Out & About and Zoo walk and....mainly for the exercise, we walking... having been a stroke patient,

walking is essential for me, so...I don't have that much opportunity to, just, you know, walk for the pleasure of walking (D5)

*3C.1.2. "I'm my own caregiver": coping through order and structure*

Another participant, who lived alone, reported being dependent on order and structure at home so as to know where to find something without wasting time or effort, before going outside. Maintaining order was also particularly essential in her life since she lived alone and did not have anyone to assist her with daily activities:

I don't have a spouse or a child who lives with me, so I'm my own caregiver. And that's why I just, really....you know, really nitpicky on myself to make sure that I'm doing it right. (D4.1)

She also mentioned how she had structured her neighborhood walking routine around walking her dog three times a day. Their last walk of the day was organized around a ballfield in her neighborhood. The ballfield served as a reference for the distance covered which she used as a rule of thumb in deciding to walk more or less on a given day, e.g. walking twice around the field as opposed to just once.

Following order and simplifying the activity gave her more room for choice:

I live at Bitter Lake. And there is a ballfield that is about, it's about, a quarter of a mile, and...so I take my dog once a day... well I take him out three times a day, but at the end of the day we go around the quartermile, well twice (D4.1)

*3C.1.3. "There's all kinds of things where we live": connectivity, convenience and choice*

A participant, who lives with his care partner, described how neighborhood walkability has contributed to his residential satisfaction. According to him, having walkable destinations for everyday needs as well as leisure and recreation ensured a balanced and wholesome living experience. Particular emphasis was placed on the fact that it took very little time for him and his care partner to walk to these destinations, which made it all the more compelling to embrace an active lifestyle:

Well, we're kind of fortunate because we live...we live in Fremont, and we're really close to shopping, you know, there's a PCC co-op, that's like a 15 minute walk to get to. So that's not a big struggle if you've run out of something, you go buy it. Plus there's a whole lot of bars in our neighborhood too [laughs]. The access to...the library is close by...the food choices are nearby, lots of restaurants (D3.1)

Just as he was appreciative of the local co-op at his neighborhood being located within a walkable distance from his home, he reflected once the walk had ended, how a franchise of the same co-op chain at Columbia City had recently relocated to the central core, making it all the more accessible to residents. In addition to enhancing the convenience of shopping close to home for local residents, he also felt that this was a strategic business move for the owners of the co-op:

the current PCC co-op is in a much better location...it was a much smaller store and...it used to be five or six blocks east of there I think. And they chose to move to the really cool part of Columbia City. It was a good business thing to do, but also practical (D3.1)

A care partner mentioned how she walked with her husband to the doctor's and the drugstore, located within walking distance from their home, "we can walk to our doctor's polyclinic in seven minutes. And we walk to the drugstore up the other way. I mean there is all kinds of things where we live, of course" (D1.2). They seemed to value the opportunity to be able to walk as much as possible on a regular basis. The presence of walkable destinations in their neighborhood supported them in this endeavor.

*3C.1.4. "we really like it, it's a long walk:" walking at leisure*

Besides walking to places central to daily living that were within walking distance from their home, a care partner explained, "every now and then we walk, I don't know how far it is, but all the way to Pike Place Market which is an interesting place to be" (D1.2). It seemed like this destination while being interesting was not necessarily in the close proximity to their home. It was characterized as a leisure walk to an interesting destination. Another participant also mentioned how he and his care partner take their dogs out on long walks to a destination that they have always liked to walk to.

*3C.1.5. "we change it sometimes:" flexibility of route-selection*

A care partner also mentioned how she and her husband walked along a familiar route. Their walking route was cited as being flexible and tended to change from walk to walk, based on whether they had time to spare:

[We] walk some almost every day .... we live in, right... almost in the Downtown area and we've got this particular number of blocks, that is sort of our usual, our regular, although we change it sometimes (D1.2)

*3C.1.6. “natural areas are still valuable to us”: walking in urban vs. natural environments*

Besides walking in urban environments, a care partner mentioned that walking in natural environments was important to her and her husband. She spoke about their walking routine along a trail around a local lake, and how over the years the length and duration of their walks around the lake had grown shorter:

getting to the natural areas are still valuable to us, not just walking in the city... we walk around Green Lake, or we walk part-way around. We used to walk all the way around. Now we turn around and come back after a while, and really like that (D1.2)

The members of the group also appreciated getting to walk through green space in Columbia City, and emphasized the importance of greenery as visual relief amidst built forms.

*3C.2. Differences in wayfinding strategies: environmental cues vs. technology*

This section comprises participants’ insights in response to the second research question, i.e. *“What role does the neighborhood built environment, specifically urban landmarks, play in enabling or disabling community-dwelling older adults with mild to moderate dementia in their practice of active living?”* Findings suggested that participants found landmarks that were memorable to be particularly helpful in wayfinding and navigation. Care partners spoke about the issue of change brought about by redevelopment in neighborhoods that results in the loss of familiar landmarks, causing familiar areas to look unfamiliar. They also spoke of the issue of

density of development creating obstruction in views of distant landmarks that used to serve as orientation cues. A participant who lives alone spoke about how she depended on GPS technology to help her get around, and did not mention being dependent on environmental cues as much.

### *3C.2.1. Memorable landmarks in unfamiliar settings*

A participant spoke about his history with landmarks and how important they were to him in his professional life prior to the onset of dementia. He mentioned how his profession resulted in him often travelling to unfamiliar places, where he used landmarks to better orient himself in space. He emphasized that his habit of using landmarks was not necessarily connected to having dementia, but was just a practice that he had always found useful. He spoke about the importance of memorability of landmarks and felt that they would stand the test of time and be retained in his cognitive map of a place. He also mentioned how he used this as a general principle in choosing landmarks to photograph during the walk in Columbia City:

I have a lot of experience being in strange cities and landmarks were...are...have always been important to me for that fact because I'd constantly be in a foreign environment and to remember, you know, which way I was going... couple of years later still may be able to connect to that and have a feeling of what was what based on that so...Yeah. Landmarks are kind of important and that's what I was...when I was... today, selecting photos, I was looking at things that I would recog--you know, if I had just been plopped down here (D5)

### *3C.2.2. Loss of familiar landmarks: shifting urban form*

A care partner discussed the importance of having landmarks that are stable in one's neighborhood. She mentioned how disconcerting it was to witness change within the neighborhood where she and her husband live. Shifting urban form was found to be disruptive to one's familiarity with their neighborhood environment. Retention of stable iconic landmarks helped reinforce one's moorings in the neighborhood. Newer additions of public art and sculptures were also found to be advantageous in lending distinctiveness to certain places within the neighborhood:

obviously things have changed but they are changing really rapidly now...So now all of a sudden I'm like, "Is that the street?" [laughs] ... I can't make reference to things I used to make reference to. The businesses are gone. The public art though...the Rapunzel neon is still on the Fremont bridge, the bridge is still the bridge... The new buildings are putting up new sculptures, and so we try to notice all that all the time (D3.2)

She went on to talk about how problematic it was for her and her husband to not be able to rely on the presence of familiar local business venues as neighborhood landmarks, since they went through organizational changes as well as frequently transformed the look of their establishment. This seemed to have disrupted their walking routine as well as their intimate familiarity with the neighborhood and the way they were used to knowing, identifying and recognizing places:

the fact there are new buildings is kinda...annoying, so we really can't make references to restaurants or bars or places of business anymore, 'cause not only do they change hands, the building completely disappears or turns into

something else that is four storeys high or whatever...that's changed the walks and we just never had to know place names before (D3.2)

Another care partner spoke about how her reliance on distant landmarks for orientation had been disrupted since the density of new development in the Downtown area rendered them invisible:

I've just really noticed how disoriented I am in terms of direction. Because I was used to seeing the water...and where I am now I don't see the mountains and so I even forget which streets are going north and west, north and south, and which are going, what, east and west (D1.2)

### *3C.2.3. "I have to use the GPS": Staying on course with assistive technology*

A participant who lived alone and continued to drive her car spoke of her dependence on assistive technology, and not environmental cues as much, for orientation and wayfinding. She cited the GPS on her car as an indispensable navigation aid. It enabled her to stay on track and not get disoriented. She particularly liked that the technology gave her auditory directions to follow as she drove without being interrupted by visual information

### *3C.3. Perceptions of landmarks in Columbia City*

The following section comprises participants' insights in response to the third, fourth and fifth research questions, i.e. "*What are the different urban landmarks that community-dwelling older adults with mild to moderate dementia notice during a group walk in an unfamiliar neighborhood?*"; "*What are the different ways in which urban landmarks, observed during a group walk in an unfamiliar neighborhood,*

*convey meaning to community-dwelling older adults with mild to moderate dementia?” and “What are some salient characteristics that made certain urban landmarks stand out to participants during the group?”*

Although the group walked through the historic landmark district at Columbia City and even took pictures of historic landmarks, there seemed to be a greater surplus of photographs of public art work that participants selected at the focus group. A potential explanation for this was offered by a participant who chose to talk about the photos of landmarks that stood out as whimsical, unusual and quirky, despite having taken pictures historic buildings, which he confessed having a personal fondness for:

I certainly have noticed all the classic buildings and the library, the wonderful solid architecture and all that, but I kind of parked that and went in a different direction, just because... for no particular reason, but I just thought that the whimsy (D3.1)

The photos that follow are of landmarks that were selected by participants as being most interesting to them at the time of the focus group. Participants selected twelve landmarks in all, The Pride sculptures (Figure 44) were the most frequently selected landmarks by participants, followed by the Spirit of Washington monument (Figure 46), as well as the street clock (Figure 43). Five out of twelve landmarks were pre-determined while the rest were self-determined by participants



Figure 42: Frieze outside Seattle Public Library



Figure 43: Street Clock



Figure 44: Pride installation



Figure 45: Sculptures at residence

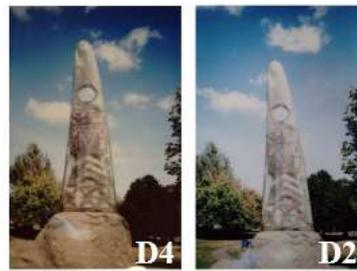


Figure 46: Spirit of Washington monument



Figure 47: Sound of Light mural



Figure 48: Tree at Columbia City



Figure 51: Chevrolet Corvair



Figure 49: Recycling container



Figure 52: Sign of Igimo Artstation



Figure 50: Bike rack



Figure 53: Graffiti at Columbia City

This section lays out some characteristics that were identified as salient to these landmarks. Concepts that emerged from participants' insights included (i) stability of historic buildings, (ii) importance of public art, (iii) landmarks that prompt recall of other similar landmarks, (iv) landmarks with emotional content, (v) multi-sensoriality, (vi) perceived scale, (vii) association of landmarks with definite purpose. In addition to landmarks, a final concept that emerged indicated the relevance of interesting signage.

### *3C.3.1. Stability and endurance of historic buildings*

One of the topics that participants discussed was the stability of historic buildings and how they may contribute to the character and perceived identity of the neighborhood. Buildings with historical significance were seen as buffers to the fast-changing identity of the neighborhood. These buildings were perceived as being stable and contributing to the credibility of Columbia City. This appreciation for historical landmarks was further supported by the sharing of local history by the walk leader at various points of interest:

D3.1: I'm kind of into architecture...so I got a kick of that, just observing those buildings....the backstory of all these...old buildings, and what a thriving, little town this was and is, is again. And yet there were all these really old buildings that had been there a long time...bank and libraries and stately structures that feel like they're sort of protecting and giving credibility to the neighborhood.

Another participant extended this argument to the far superior quality of historic buildings compared to that of modern construction. He criticized the shift in attitudes

from stability and durability to one of ‘use-and-throw’ disposability, as reflected in new development and construction:

what I would tell developers... to build quality...100 years ago when they put up the library or something, they weren’t thinking...well, now, they’re just thinking of, “this building will last 20 years and we’ll tear it down and build another one” (D5)

### *3C.3.2. Providing visual relief to the urban form through public art*

There was an equal appreciation for public art and how they served as distinctive and unique landmarks. A participant valued being able to see colorful artwork in the neighborhood and photograph them from various angles. She explained, “I really enjoyed the artwork and...took a lot of pictures, from different angles...kind of like a left brain thing...and the colors...and some of the mosaics were wonderful” (D4.1). When the group stopped at the Seattle Public Library, which was one of the designated points of interest on the walk, she noticed a frieze (Figure 42) located on the plinth section of the building façade. She considered it to be quite a unique architectural detail, and made a real effort to get down on her knees and document it up-close, at eye level. When asked during the focus group why the frieze stood out to her, she said, “I don’t know how to describe it...It’s got a medallion but it also has shadows and lines, light lines” (D4.1).

Similar examples of public art are discussed in following sections. Artwork was found to be unique in a way that participants did not have a direct frame of reference to define what the artwork stood for. Despite this, their high distinctiveness

caused participants' to be drawn to them and leave lasting imprints on their mind. Artwork was also thought of as providing interest by punctuating homogenized built environments and were also more likely to get noticed. A care partner explained how seeing the artwork was central to the experience of Columbia City and made it stand out from other neighborhoods that the group walked in:

how would I experience Columbia City if it didn't have those things that were kind of unique to it...the artwork and the things that were unusual or something about them that struck you? It would be so blah, so soulless...It would be nothing except buildings that you don't ever notice even. (D1.2)

Participants also showed an awareness and concern for the issue of city-mandated artwork in neighborhood redevelopment. They discussed how developers may be required to include a proportionate amount of art in every new development. A participant discussed the possibility of having artwork be featured not only within buildings but also outside the buildings, e.g. on the sidewalk. Another participant related the scale of redevelopment projects to the amount of artwork and public space that might be required of developers. The issue of compliance to this regulation was also raised.

### *3C.3.3. Landmarks that remind walkers of similar landmarks elsewhere*

Landmarks appeared to be familiar in a few interesting ways to participants. The street clock (Figure 43) appeared to be quite familiar to the group because participants remembered seeing similar-looking landmarks in different neighborhoods of Seattle.

Participants were also able to draw comparisons between multiple landmarks

in Columbia City, spotted during walk. During the focus group, a participant presented a photo of a pair of sculptures (Figure 45) that he found to be similar to an installation witnessed earlier in the walk, called “Pride” (Figure 44), comprising two plazas by the Light Rail station, populated with triads of similar sculptures of Chinese temple guards. This also happened to be a point of interest on the walk designated by the walk leader.

Moreover, both these landmarks were spotted in quick succession, one after the other, since they were located in close proximity, approximately 100 m away from each other. He indicated that the sculptures were quite hard to see and were not part of public space, yet was observant enough to notice it. He also reported being surprised on finding them located within the compound of a house, owing to his knowledge of the sculptures’ high market value:

First we walked through the lions and then...about a block away, there was somebody that had a set of lions in their yard. That’s very unusual ‘cause they are...even imitations of these...they are hard to come by and expensive. I would imagine each one of these costs about 500 bucks a piece and that’s just the imitations. If they were real, it would be much more...It’s unusual, you know, for a private residence to have lions, so, anyway...just to see all at one go (D5)

#### *3C.3.4. Deriving different meanings from landmarks with emotional content*

Certain landmarks resonated with participants through universal meanings and metaphors, but they were also able to relate to them at a deeply personal and emotional level. A participant associated a few landmarks with her personal struggles

and triumphs encountered along her Alzheimer's journey. While discussing "Pride", she said, "this photo (Figure 44) is of a statue [Pride], and it's a, I think it's a lion...a lion to me...this lion is about strength...It's about being strong in this Alzheimer's journey that I am on" (D4.1). As is often the case with artwork, the observer is often left wondering about the intent of the artist and trying to guess what the artwork stands for. This participant, on the other hand, did not feel constrained by the need to decode the intended value or meaning of the artwork. She felt free to inscribe her own interpretation and meaning onto the artwork thus rendering it deeply personal, and potentially, memorable.

Because the entire installation comprised six different sculptures spread across two different plazas (although, participants photographed landmarks exclusively at one plaza) participants tended to be drawn to different sculptures for different reasons. One participant was drawn to one particular sculpture out of the group (Figure 44) and found it to be unique owing to its overt cultural influences. In addition to trying to intuit its cultural, stylistic and aesthetic underpinnings, he was also able to form an impression of its relative age as well as the material that it was made of:

There were several of them...it's probably about a dozen of them...this one I found the most unique. From the looks of it, it's probably the oldest...I'm not an expert on it. But, yeah, it's bronze, probably Eastern, Thailand, maybe India. But that one in particular caught my attention (D5).

Another walker was undecided about whether this particular sculpture looked "pretty" or "ugly", but nevertheless was drawn to it. The discussion that ensued following his

opinion about its aesthetics indicated how different participants were drawn to the same landmark for different reasons.

A participant mentioned that the street clock (Figure 43) prompted her to confront the reality of her situation. It reminded her of the value of time and the fact that aging with Alzheimer's meant she had to reconcile with the inevitability of losing the ability to age healthily. In addition to facilitating confrontation, the clock also seemed to serve as a beacon of hope, prompting her to strive and sustain her ways of living for as long as she could and appreciate the value of the same:

the clock....It's, it's like.... time is passing by... And it's passing so fast!...that's why I picked this shot...because, we're getting, I'm getting older and I'm also...declining and this just reminds me that I need to cherish every single minute that I've got left (D4.1)

She had a similar, perhaps more provocative, reaction to a different public art landmark, called "Spirit of Washington" (Figure 46), which was a "cast-bronze monument depicting an orca's fin engraved with a stylized figure of a Northwest tribal member" (Rainier Valley Historical Society, 2012, p. 126), located in the middle of a green space in the heart of Columbia City. Pointing at the photograph of the landmark, she said, "I don't know what this [Spirit of Washington] is, but this to me is a middle finger... to the world... living life to the...to the most that...you know, enjoy every second that I've got left" (D4.1).

### *3C.3.5. Landmarks that facilitate multi-sensorial stimulation*

A few landmarks spotted along the walk presented the opportunity for

multi-sensorial stimulation. Speaking of the frieze located on the façade of the Seattle Public Library (Figure 42), a participant said, “It [Frieze] feels warm. The sun is shining...on the brick. But then there is dark, because there are shadows there” (D4.1). While the frieze itself did not contain affordances for multi-sensorial stimulation, it was the interplay of light and shade across its surface that seemed to convey a sense of warmth.

Another participant’s insights shed light on the direct relationship between the attractiveness of landmarks and the quality of material that they were made of. He admitted to liking materials with a certain quality. He identified multiple landmarks during the focus group that had used different materials with a similar visual and textural quality, which he thought made the landmarks more memorable for him. He explained how the quality of material was instrumental in drawing his attention to the “Spirit of Washington” monument (Figure 46):

I like the fact that the disc is glass and...that’s something that’s attractive to me. So, that’s why I chose that [Spirit of Washington]...if I was drawing the city, that would be something that I would remember and use that as a landmark, in terms of navigating my way around. (D5)

He had a similar comment about a different landmark called “The Sound of Light” (Figure 47), which is an installation made of three layers of bicycle reflectors laid over angled planes of a two-block long retaining wall adjacent to the Light Rail corridor (Americans for the Arts, 2014). He took particular notice of how brightly colored translucent reflectors had been repurposed to be used in this landmark:

If I was driving around a city that I didn't know, I would definitely, you know...that [The Sound of Light] would definitely make an impression in my mind and the next time I saw it, you know, I would recognize it again. So...that's why I took the picture. I did sort of like that it was made out of reflectors ... The fact that it was a material that was for actually a different function, repurposed. (D5)

### *3C.3.6. Perception of scale in landmarks*

Landmarks also stood out to participants based on their scale. There were two instances in which participants attributed the attractiveness of landmarks to their scale, particularly because they thought that it was unusual for the object to be as big as it was, as though their scale was exaggerated. This seemed to augment the noticeability of these landmarks. A care partner mentioned how her husband found the street clock (Figure 43) to be “surprisingly tall for a clock” (D1.2). Another participant described a tree (Fig. 7) that he had photographed at Columbia City as being “enormous” for a tree and even associated a “foreboding” quality to it:

this is #16 [referring to the photo]...for me...this is a powerful picture, of a tree. Huge. Dark. Light. It's just...enormous in terms of a tree. The tree is not going to want me to go up the tree. The tree is going to allow itself to tell me, “Don't go up! I'll kill ya.” If you look at this picture you'll see it. (D2.1)

### *3C.3.7. “Because people use it”: landmarks with purpose*

Participants' insights suggested that objects of practical importance as well as

functional destinations can serve as landmarks because of the strong sense of purpose attached to them. Speaking of a recycling container (Figure 49) that stood out to her, a participant said, “recycling, ‘cause I’m kind of like an environmentalist, and so this is the recycle cans, all say “cups and papers”.... I like the colors...of the blue” (D4.1). She cited it as supporting her choice to engage in pro-environmental behavior. Additionally, the color of the bin as well as the legible signage also seemed to stand out to her.

Another object of practical importance that was photographed by a participant was a bike rack (Figure 50) that was located adjacent to the sidewalk in a largely residential part of Columbia City. He seemed to be particularly struck by the balance between its functionality and artistic quality in the design of the bike rack, which was meant to resemble an actual bike. However, it was not an exact replica, owing to a certain level of abstraction of the features of the bike. The abstract design did not seem to hinder the recognizability of its form or the fact that it was a bike rack, both of which the participant picked up on instantly.

The participant prefaced his response by stating that he was an avid biker. Earlier in the discussion he spoke about going on bike rides around the city every now and then, and it may be speculated that this particular bike rack was unlike any that he had seen in other neighborhoods, which made it stand out to him all the more. The fact that this landmark was not only aesthetically appealing but was also functional seemed to be emphasized quite a lot:

It’s [Bike Rack] just a place to lock up your bike. But I do a lot of biking and that’s just a nice, modern art-kind of presentation of a bicycle...It’s just fun to

look at. And its solidity... And one interesting thing about this, besides the two wheels, and what almost looks like an exhaust pipe, which is an oxymoron if you have a bicycle (D3.1)

A participant's insights on the Seattle Public Library (Figure 42) raised an interesting point regarding the landmark-quality of functional destinations with well-defined purpose. He highlighted the role played by libraries in his professional life as a lawyer. Although he did not select the landmark during the focus group, his care partner mentioned that the fact that it was a place "used by people" was what drew his attention to it, prompting him to take a picture of it during the walk:

he took a picture of the library and I asked him what he liked about the library he said that it was because people use it. Young people, old people, everybody can use it... and I thought that was pretty cool (D2.2)

This suggests the importance of the functional aspects of landmarks and their associated meanings for individuals, based on personal and professional history. Buildings with a well-defined purpose communicate a clear message to people and may help leave a more lasting imprint in people's memory.

### *3C.3.8. Unconventional landmarks*

A participant spoke of his passion for classic cars, which informed his decision to photograph a Chevrolet Corvair (Figure 51), a model from 1960-1969, when he saw one parked on the street at Columbia City. He noted the importance of the Corvair both in terms of personal history and passion as well as shared history of all those in his generation, i.e. members of the walking group.

### *3C.3.9. Creative signs that evoke curiosity and surprise*

In addition to landmarks, participants also displayed interest in signs that they saw during the walk in Columbia City. Pointing to the photo of a sign (Figure 52) that piqued his curiosity, a participant said:

Curious about Igimo Art Station... This one was pure whimsy... Large apartment building, but in the foreground was this goofy little business... There seem to be some businesses... I wasn't at all interested in the apartment building behind. It was all about this cool sign. (D3.1)

The sign indicated to him that the neighborhood had several hubs of activities, which symbolized local cultural vitality, in this case, by fostering the arts. He also explicitly stated the signage caught his attention, despite the presence of a huge apartment building in the background, which seemed immaterial, compared to the value that the sign held personally for him.

Seemingly transient objects also seemed to draw participants' attention. An instance of this was when participants noticed objects of graffiti (Figure 53) during the walk. They seemed to resonate with participants particularly due to the implied humor of the text as well as their incongruity. One participant was particularly struck by where the graffiti were located. He also noticed that unlike most graffiti, this particular example did not use the building as its canvas, and appreciated it as being a creative alternative expression:

These signs hanging from... from the stanchion that holds up a telephone pole, and then somebody... somebody had to have taken a ladder out there... to put up these... these signs saying "Sex" which were sort of graffiti-like. But they didn't

graffiti the building, they just hung them from a utility which I thought was kind of creative and proper way to do things (D3.1)

The graffiti resonated with another walker which prompted him to take a photo of the same, as well as talk about it at the focus group. He mentioned experiencing difficulty reading the text since it wasn't legible and was placed at a height above the eye level. But upon looking carefully he was able to make out what was written:

Well, let me start with the funniest one. I looked up this brick building and it had, and it 'has', some writings...up on top. And I looked up, and I couldn't tell, figure out what it says, but I looked closely, enough to see that it says, "Sex. Sex. Sex."... that's what caught my eye. (D2.1)

#### *3C.4. Summary of focus group*

Participants reported going outside for several reasons ranging from catering to daily needs to exercise and leisure. There were differences in the outdoor walking patterns of persons living alone and those who lived with care partners. Outdoor walking patterns were found to be facilitated and challenged by the neighborhood environment in various ways. Participants even reported using environmental cues, some of which included nearby and distant landmarks in order to fulfil orientation and wayfinding. The loss of these cues had disabling effects on participants' familiarity with their neighborhood environment.

Participants photographed a greater number of public art landmarks than historical landmarks at Columbia City. A preponderance of the former was also found in the group of landmarks that were found to be interesting during the focus group.

Historic landmarks were appreciated for their stability and endurance, while public art was seen as adding viewing interest to homogenized landscapes. Landmarks stood out to participants for various interconnected reasons that include:

- (i) *Eliciting familiarity and meaning:* Participants drew associations between different landmarks within Columbia City as well as those in other neighborhoods of Seattle that they had seen or were familiar with. Associations were also drawn with participants' life experience, and specifically their dementia experience, which was found to generate unique meaning in relation to different landmarks. Certain landmarks also resonated with participants owing to their links to personal hobbies and activities they were passionate about.
- (ii) *Physical characteristics:* Tactile qualities and being made of specific materials rendered landmarks unique and attractive. Participants attributed the noticeability of certain landmarks to their scale. Contrast and incongruity also rendered landmarks more noticeable.
- (iii) *Associated purpose:* Landmarks with a well-defined function, as well as signs that were linked to a definite purpose were identified and recognized with relative ease and seemed to be more memorable.

### ***3D Results of survey with experts-by-experience***

#### ***3D.1. Descriptive statistics***

These results correspond to the first half of the survey where participants were asked to pick which of the two landmarks, historic building or public art, stood out the most. In the second half of the survey participants were presented with the photos that they selected during the first half and asked to rank them on their appeal. The five pairs of photos of landmarks presented in the survey follow.

Pair 1:



**Figure 54: Sound of Light mural**

ID#1



**Figure 55: Rainier Arts Center**

ID#6

Pair 2:



Figure 56: Spirit of Washington monument

ID#2



Figure 57: Ark Lodge Cinema

ID#7

Pair 3:



Figure 58: Seattle Public Library

ID#8



Figure 59: Pride sculpture

ID#3

Pair 4:



**Figure 60: Columbia City Mural**

ID#4



**Figure 61: Columbia Funeral Home**

ID#9

Pair 5:



**Figure 62: Bike rack**

ID#5



**Figure 63: Columbia City Theater**

ID#10

Figure 64 shows the number of times different participants (denoted by ID# 1,2,3,4 and 5) chose the two landmark types, i.e. historical buildings and public art as noticeable. Figure 65 shows the number of times individual landmarks (ID# 1-5: public art, 6-10: historic building) were chosen as noticeable.

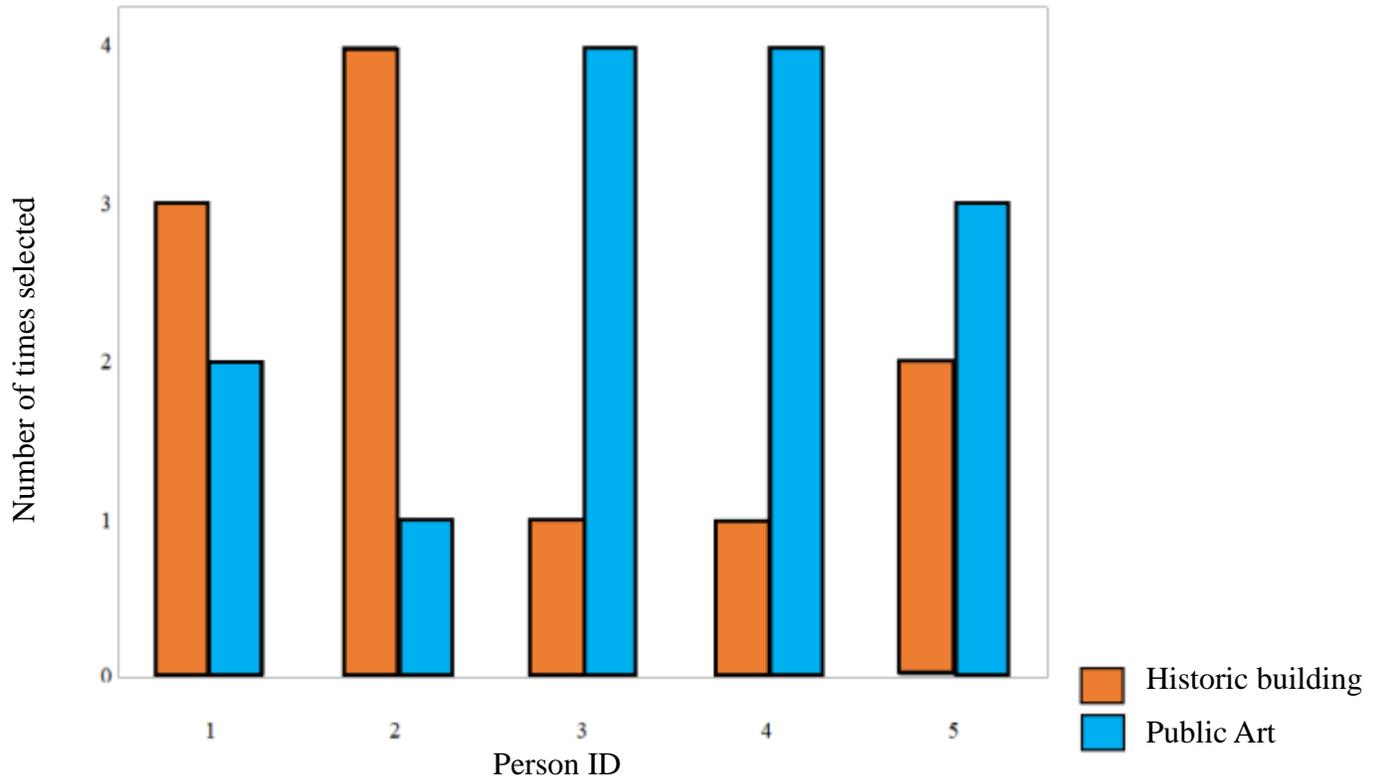


Figure 64: Bar chart showing noticeability of landmark categories for individual participants

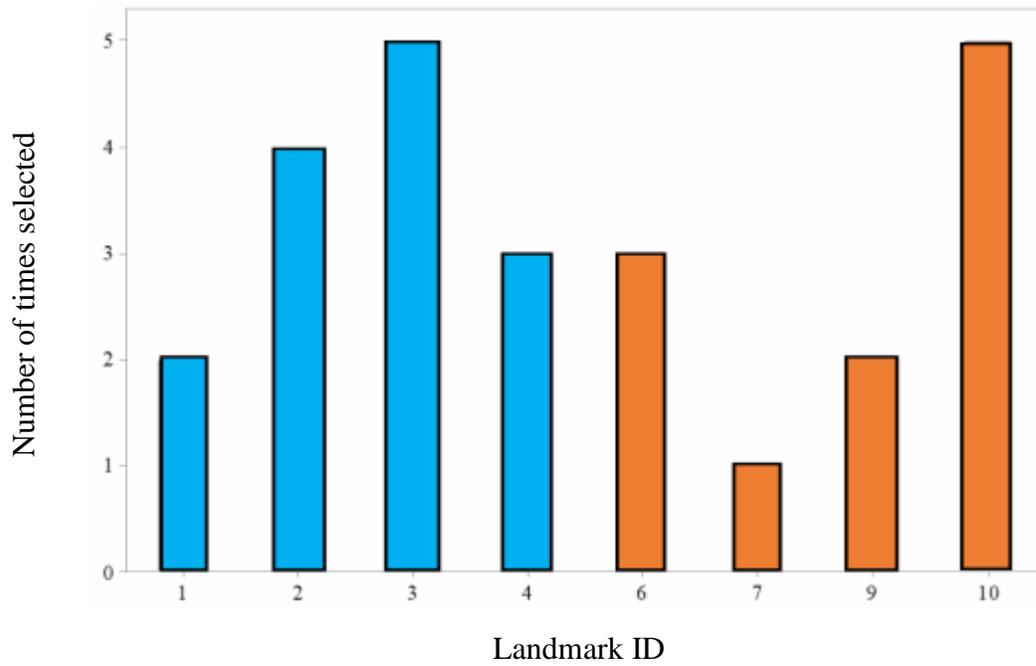


Figure 65: Bar chart showing noticeability of individual landmarks

Fifty-six percent of the total responses indicated that public art was found to be noticeable, while 44% of the total responses suggested that historic buildings were found to be more noticeable (see Appendix K for survey data). Two participants (D1.1, D2.1) seemed to prefer historic landmarks over public art landmarks, the proportion of noticeable landmarks selected by them that were historic buildings being 60% and 80% respectively. The other three participants seemed to favor public art over historic buildings to varying degrees. D3.1 and D4.1 both had similar responses with regard to which landmarks they found noticeable, 80% of which included public art landmarks, while 60% of the responses of D5 consisted of public art landmarks.

Some landmarks were more frequently selected as being noticeable than others (see Appendix K for survey data). Pride (Figure 59 ) and Columbia City Theater (Figure 63) were selected as noticeable by all participants. The landmarks that were paired with these, Seattle Public Library (Figure 58) and the bike rack (Figure 62), respectively, were never selected by participants. Multiple participants cited these as being difficult choices to make. Although she personally valued the library, the fact that the “Pride” installation was a work of art ultimately informed D4.1’s decision to select the latter as being noticeable. She explained, “The lion stands out more to me because it is a work of art. A lot can be said about the library because it is full of information, but the sculpture is a work of art” (D4.1). While D5 also echoed the previous comment of the library being personally significant, his decision to choose the Pride installation was owing to it being “unique” and “memorable”. He explained, “This one was hard to decide. I choose the lion because it is memorable yet unique.

But libraries are (although just another building) are important to me personally, a source of knowledge and information” (D5).

The pairing of Columbia City Theater (Figure 63) and the bike rack (Figure 62) was also cited as being difficult to choose from. Although D4.1 considered the bike rack as a piece of art, she prioritized the theater due to her relative preference for live theater. She explained, “This was a difficult decision. One was a piece of art (bicycle) and the other was a theater. I adore live theater compared to the work of art” (D4.1). This was also apparent in her evaluation of its appeal. She ranked it as the second-most liked landmark, despite it being a historic building and having selected a majority of public artwork as the most noticeable landmarks. It was clear that the landmark held more personal significance for her, and transcended the categorization of art vs. architecture. D5 found the bike rack to be “unique” and “memorable” but because of its relative scale, expected that it would merge with its surroundings, which is why he selected the theater. He explained, “The theater is somewhat dramatic and large in size and clearly marked. The bicycle is unique and memorable but could easier [sic] get lost in the crowd” (D5).

Spirit of Washington (

Figure 56) was selected by four out of five participants.

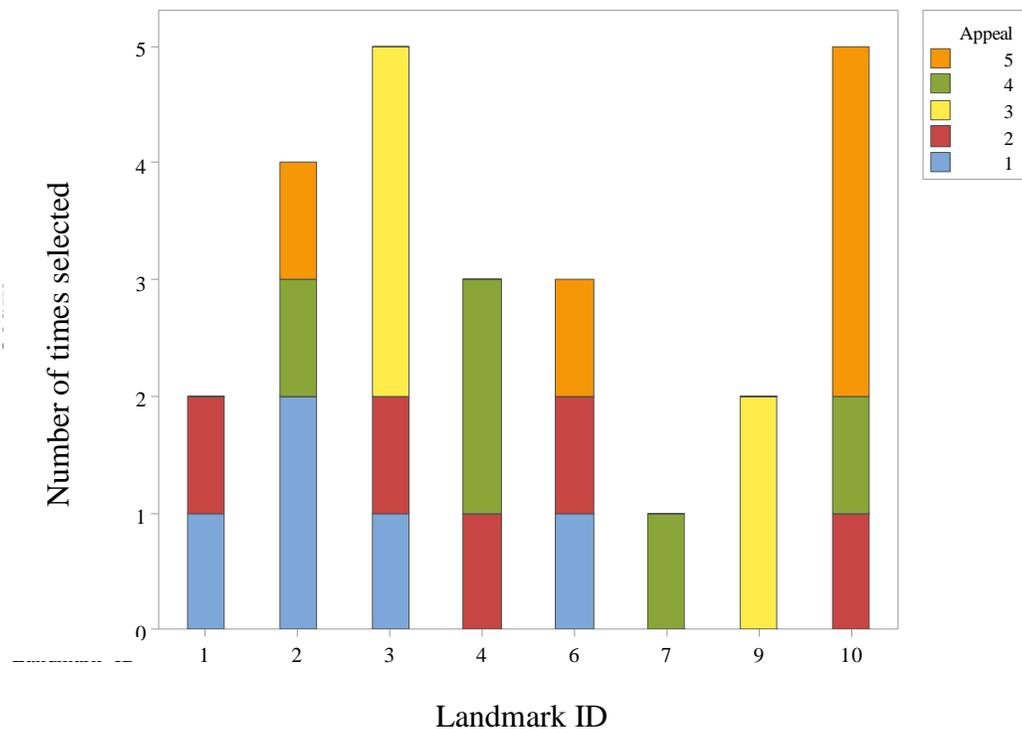
Participants described it as being “unique”, “visually pleasing”, “weird and puzzling”, “memorable”. A participant found the shape to be unusual and distinctive. He explained, “Interesting obelisk shape is attention getting, makes one want to approach it” (D3.1). Although D4.1 found it to be more noticeable than the Ark Lodge cinema (

Figure 57) she ranked it as her least liked landmark. She disliked it because “it was confusing and phallic” (D4.1).

The Columbia City mural (Figure 60) and Rainier Arts Center (Figure 55) were selected by three out of five participants, rather than the landmarks they were paired with, Columbia Funeral Home (Figure 61) and the Sound of Light mural (Figure 54), respectively, which were selected by two out of five participants. The Columbia City mural was found to be noticeable by participants mostly because of the art work and the use of bright colors. A participant explained how the mural was more distinctive and unique, while the funeral home lacked distinctiveness. He explained, “The paintings are unique and colorful. The funeral home looks like so many other ones although the sculptured plants are attention getting” (D5).

While both landmarks seemed to be visually robust and distinctive, Rainier Arts Center (Figure 55) seemed to be preferred over the Sound of Light mural (Figure 54) mainly owing to the former’s clear purpose and function. A participant explained, “The vertical words on the Arts Center are clear yet unusual and strong in contrast. But the other landmark is far more visually pleasing but not as specific in purpose” (D5). Despite having chosen the Rainier Arts Center and Columbia City Theater as noticeable, they were ranked low on appeal, thus making it clear that D5 found the public art landmarks that he selected as noticeable to be more appealing.

Figure 66 shows how different landmarks that were found to be noticeable were ranked in terms of their appeal by participants.



**Figure 66: Bar chart showing appeal of landmarks chosen as noticeable**

While the Pride installation (Figure 59) was one of the most noticeable landmarks, the results from ranking were not unanimous, since most participants ranked it in the middle of the order, except for two participants who rated it in the top two tiers. The Columbia City Theater (Figure 63) which was the other most noticeable landmark had slightly divergent ranking results. Except for D4.1, who especially liked this landmark due to her passion for live theater, most other participants ranked it in the lower tiers.

Spirit of Washington (Figure 56) which was the second most noticeable landmark received diametrically opposite appeal ratings. As was discussed earlier, D4.1 rated this landmark lowest out of her selected landmarks. However, two other participants rated it as their most liked landmark. While the Columbia City mural (Figure 60) elicited a single high rating and two lower ratings, the Rainier Arts Center

(Figure 55) received high ratings from two participants, one of whom perceived it as being “open to the community” (D2.1) while the lower rating was given by D5, who seemed to generally favor public art landmarks. Although only two participants selected the Sound of Light mural (Figure 54) as noticeable, they both gave it high ratings, attributing its appeal to the bright colors used.

### *3D.2. Chi square goodness of fit test*

Chi-square goodness of fit test for the variables of noticeability and appeal failed to satisfy the level of significance due to small sample size (see Appendix K for results of analysis).

### *3D.3. Summary of survey results*

Descriptive statistics showed that, overall, public art was found to be more noticeable than historic buildings. More participants favored public art landmarks over historic buildings, than vice versa. While some public art landmarks won unanimous favor over the historic buildings they were paired with, others were more contentious owing to personally meaningful purpose associated with the latter. Participants who chose a greater proportion of public art landmarks as noticeable were more likely to also rank them high on appeal with one exception, where a noticeable public art landmark was found to be unappealing. Historic landmarks that were found to be noticeable tended to be ranked relatively lower in terms of appeal.

## CHAPTER 4

### PHASE 2: INTERVIEWS WITH EXPERTS-BY-PROFESSION

While the previous phase was helpful in identifying the kinds of landmarks that caught the attention of persons with mild to moderate dementia and understanding the ways in which they perceived and formed meaning, it was unclear as to how effectively these landmarks would serve as wayfinding cues. Hence gathering insights from researchers and practitioners who work with older adults with and/or without dementia, i.e. experts-by-profession was seen as a necessary step in understanding the findings from the previous phase. Section 4A will discuss the methods used in this phase of the study, details about the participants, and the research design and procedure. Section 4B will discuss the results of this phase of the study.

#### ***4A Methods***

##### *4A.1. Research questions*

- RQ1. What are some external parameters that experts-by-profession consider as having influence on the way in which persons with mild to moderate dementia perceive urban landmarks?
- RQ2. What are some challenges that experts-by-profession have observed persons with mild to moderate dementia facing when they use urban landmarks for outdoor wayfinding?
- RQ3. What are some characteristics of urban landmarks that experts-by-profession consider as salient for outdoor wayfinding for persons with mild to moderate dementia?

##### *4A.2. Participants*

The invitation to participate in the study was sent to 44 researchers and/or practitioners. They were identified based on authorship and practice in the interdisciplinary area of aging, dementia and the built environment. The final study sample included nine experts-by-profession (six researchers and three research-practitioners). Seven of these participants had experience working with older adults with and without dementia, while two worked primarily with older adults without dementia. Participants came from a wide variety of fields, including architecture, psychology, environmental gerontology, gerontological nursing and horticultural therapy.

#### *4A.3. Design and procedure*

Similar to the first phase, the study's second phase also followed a similar inductive and exploratory approach, using mixed methods. The purpose of this phase was to capture the insights of experts-by-profession to further the understanding of concepts derived from the first phase. This phase consisted of two sub-parts: 1) survey and 2) interview. Participants were sent the Qualtrics survey and asked to complete it at least a day before the interview. Semi-structured interviews were conducted via Zoom software. During these interviews, participants were once again shown photos of landmarks that were presented during the survey. The following sections lay out the evolution of the research design from pilot-testing to the final tool.

##### *4A.3.1. Pilot-test*

A survey similar to that administered to persons with dementia in the first phase, with the same photos, was sent to the participant. The only difference between the two surveys was a change in wording of the prompts. Participants were asked to

choose landmarks that they thought would be noticeable to persons with dementia, and rate them in the order in which they would be appealing to them. After the survey was completed, a Zoom meeting was scheduled to conduct an hour-long interview. An interview guide similar to that of the focus group was developed (see Appendix I for interview guide). One shortcoming at this stage was the lack of contextual information in the photographs of landmarks. In order to elicit richer information relating to wayfinding for individual landmarks, a more expansive view of the landmark's setting was necessary. In order to resolve this, the author made use of Google Earth Streetview to walk the participant through the neighborhood of Columbia City, almost mimicking the walk that persons with dementia went on. The following issues were identified in the pilot phase:

1. Using Google Earth Streetview was found to be time-consuming. It was also suggested that this method may not be reliable since each participant was bound to get a slightly different view of the landmark than the other based on the way the author navigated through the streetview.
2. The photos used in the survey were found to be misleading because they gave no sense of the surroundings. The results of the survey were found to be contradictory to those of the interview. It was suggested that the survey photos be well-supplemented with contextual information.
3. Some photos in the survey were found lacking in their ability to represent the pedestrian's viewing experience from the sidewalk. This was because some of these photos were those taken by participants that had decided to walk off the sidewalk into the property where the landmark was located to take a close-up

photo. It was suggested that all photos be standardized, in that they are at eye-level, taken from the sidewalk.

#### *4A.3.2. Final survey-cum-interview*

Based on the participant's feedback in the pilot-test it was decided to dispense with the Google Earth Streetview tour. The photographs in the first survey were replaced with photo-montages for each landmark, consisting of multiple shots at eye-level, taken from different points on the street, using screenshots from Google Earth Streetview (see Appendix H for survey form). These same photo montages were also used as prompts during the interview. While this method worked successfully with seven participants, the interview was not conducted with the last participant due to schedule conflicts and was instead administered as a questionnaire.

#### *4A.4. Data Analysis*

The survey responses were analyzed using descriptive statistics on Minitab statistical software to assess participants' relative preferences between historical and public landmarks, based on noticeability and appeal.

The analysis of the data from the interviews was based on the "general inductive approach" (Thomas, 2006). The transcript was read closely so as to become familiar with and develop a sense for emergent themes. Categories were derived, in line with the research questions, after having read the text multiple times. The text was then loaded on to Atlas.ti qualitative analysis software where initial line-by-line coding was done to explore the breadth of concepts that could be associated to the source text. A second process of coding was done to check for redundancies in categorization and

refining the allotment of quotes to categories. This helped distil the analysis to three broad families of concepts, each consisting of anywhere between two to nine concepts.

#### ***4B Results of Survey with experts-by-profession***

##### *4B.1. Descriptive statistics*

These results correspond to the first half of the survey where participants were asked to pick which of the two landmarks, historic building or public art, was the most noticeable. The second half of the survey where participants were presented with the photos that they selected during the first half and asked to rank them on the basis of their appeal. The photo-montages in the following pages show the pairings of landmarks-in-context as they were presented in the survey. Each montage consisted of a photo of the landmark as an object, and was supplemented with multiple photos of the landmark in its context, i.e. from multiple points of view. A key plan was also shown to orient the participant to each view.

Pair 1:



**A**



**B**



**C**



Figure 67: Sound of Light mural

ID# 1



A

B



C



Figure 68: Rainier Arts Center

ID# 6

Pair 2:



Figure 69: Spirit of Washington

ID# 2

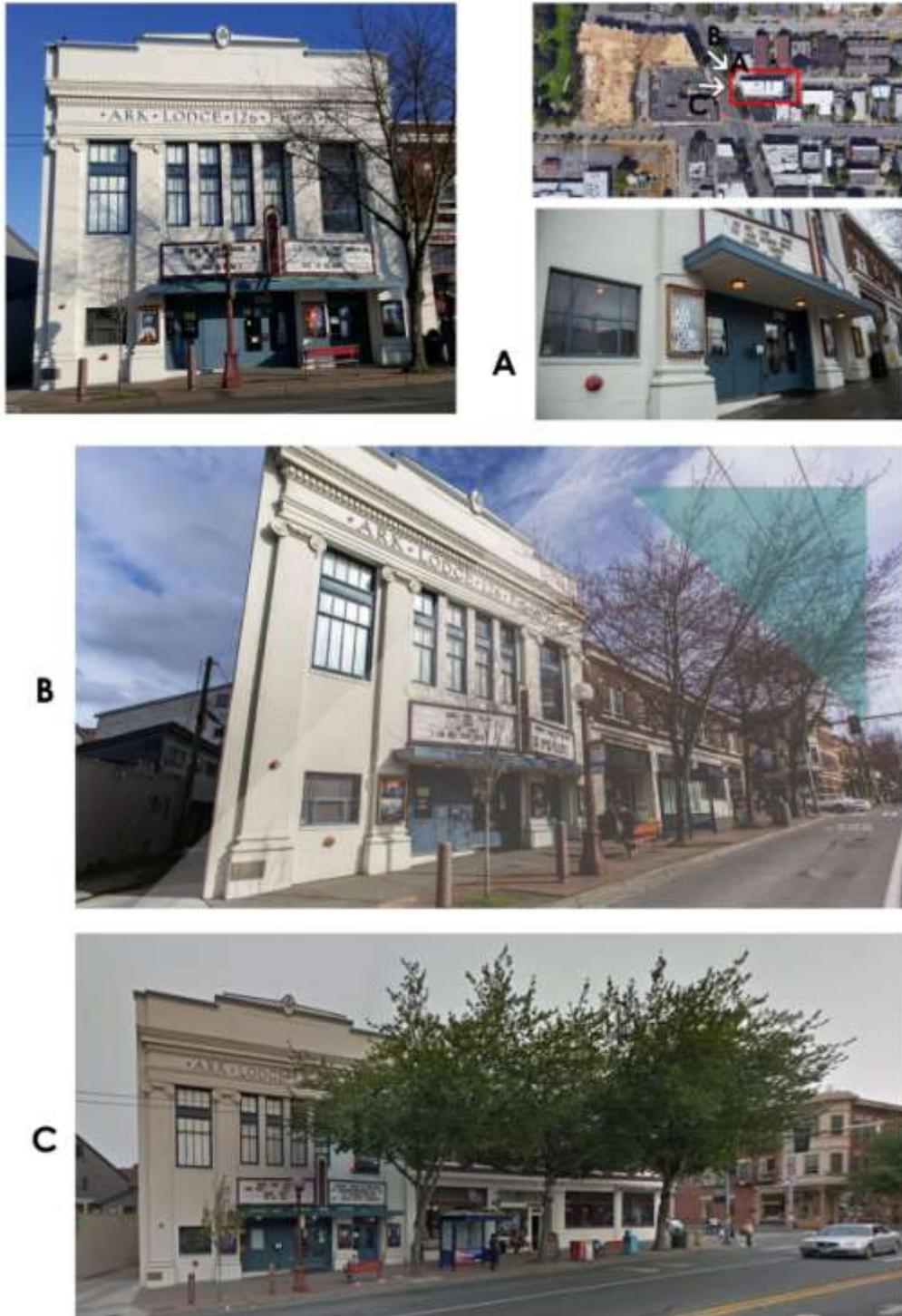


Figure 70: Ark Lodge Cinema

ID# 7

Pair 3:



A



B



C

Figure 71: Seattle Public Library

ID# 3



Figure 72: Pride Installation

ID# 8

Pair 4:



Figure 73: Columbia City Mural

ID# 4



A



B



C



Figure 74: Columbia Funeral Home

ID# 9

Pair 5:



A



B



C



Figure 75: Bike rack

ID# 5



**A**



**B**



**C**



Figure 76: Columbia City Theater

ID# 10

Figure 78 show (i) the number of times different participants (denoted by ID# 1-10) chose historical buildings and public art as noticeable, and (ii) the number of times individual landmarks (ID# 1-5: public art, 6-10: historic building) were chosen as noticeable, respectively.

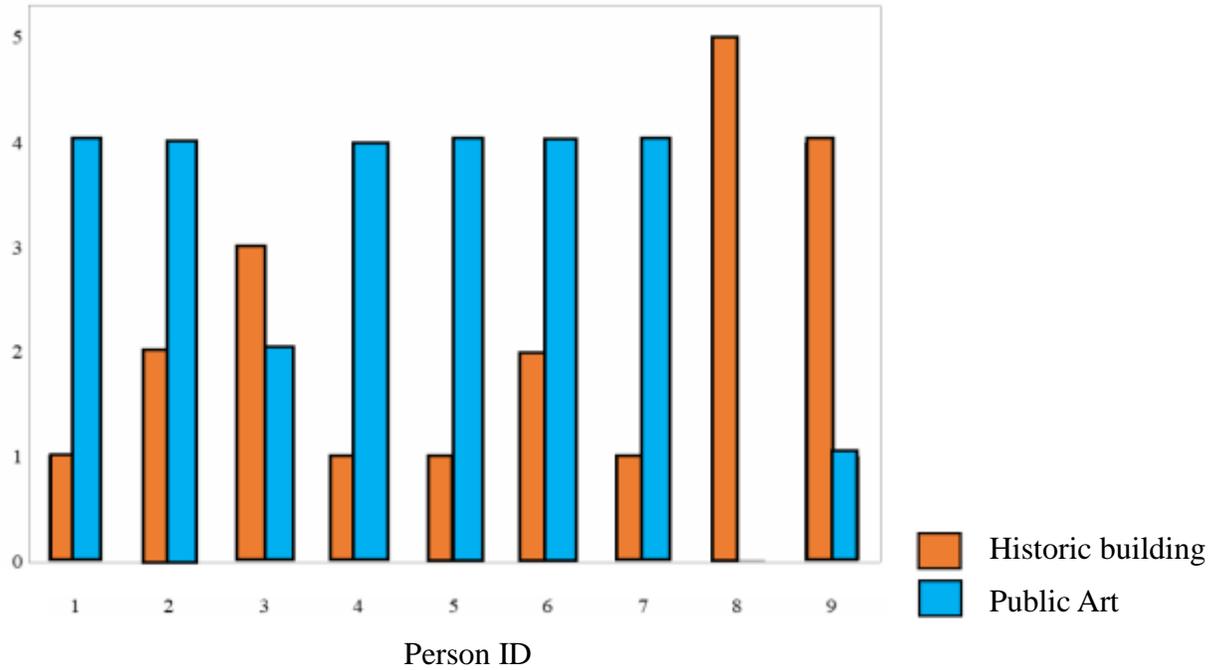


Figure 77: Bar chart showing noticeability of landmark categories for individual participants

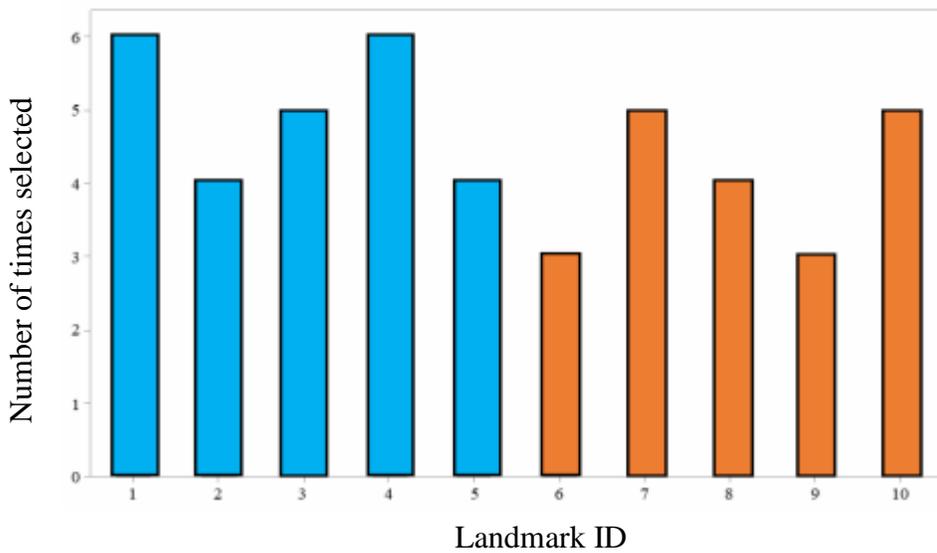


Figure 78: Bar chart showing noticeability of individual landmarks

Fifty-five-point-five-six percent of the total responses indicated that public art was found to be noticeable, while 44.44% of the total responses suggested that historic buildings were found to be more noticeable (see Appendix L for survey data). Three participants (I3, I9, I8) seemed to prefer historic landmarks over public art landmarks, the proportion of noticeable landmarks selected by them that were historic buildings being 60%, 80% and 100% respectively. The other six participants seemed to favor public art over historic buildings to varying degrees. Eighty percent of the selected landmarks included public art landmarks for three participants (I4, I5, I7), while the same was 60% for two participants (I2, I6).

Some landmarks were more frequently selected as being noticeable than others (see Appendix L for survey data). Sound of Light (Figure 67) and Columbia City Mural (Figure 73) were both most frequently selected as noticeable; by six out of nine participants. These landmarks were paired with Rainier Arts Center (Figure 68) and Columbia Funeral Home (Figure 61), respectively. Participants who chose the Sound of Light mural rather than Rainier Arts Center were mainly attracted to it due to its bright colors and inviting features. A participant suggested that despite the arts center being potentially familiar, the mural may seem more inviting:

The combination of the vibrant colours and the level of abstraction; it also seems to be more at eye level and invites someone to walk forward along the path. The building structure would be more familiar, but also more foreboding and the way towards it does not seem as obvious or inviting. (I2)

Another participant explained how both landmarks offered different kinds of information and therefore different forms of navigation support. She also suggested that each landmark had its own sets of issues. However, she felt that the mural may be more visually salient:

Both of these landmarks provide different levels of information and would support different navigation strategies. For example, A would act as a boundary landmark and provide you with global cues as to the edge of the city...A is also more salient and brighter and much more unique a landmark. B though is positioned at an intersection, which is where disorientation is more frequently reported, so may be more supportive for people with memory difficulties. (I7)

Participants found it difficult to choose between Columbia City Mural (Figure 73) and Columbia Funeral Home (Figure 74). A participant acknowledged that there were issues with both, however settled on the mural being more noticeable owing to its bright colors. She explained, “This one is questionable between the two settings. A guess that the colorful artwork would be most noticeable but the setting is confusing as is the setting around the funeral home” (I6). Another participant favored the mural over the funeral home because the potentially upsetting nature of the notion of death and dying associated with the latter. She said, “People with dementia often develop an ability in art, due to lessening inhibitions. So possibly the wall would be a better landmark. Also a funeral parlour is not a winner when you are old” (I9).

The Pride installation (Figure 72), Columbia City Theater (Figure 76) and Ark

Lodge (Figure 70) were each selected by five out of nine participants, rather than the landmarks they were paired with, i.e. Seattle Public Library (Figure 71), the bike rack (Figure 75) and the Spirit of Washington monument (Figure 69), respectively, which were all selected by four out of nine participants. Participants reported finding it difficult to choose between the Pride installation and Seattle Public Library. Despite finding the library to be quite prominent, a participant selected the installation, attributing its greater noticeability to its surrounding context:

I had a harder time with this one - the building seems to hold a good place in its surroundings. but I chose the lion because it seems so out of place in that vast swath of intersection. I could see it helping with wayfinding. (I2)

Another participant suggested that the installation would be more effective due to its location at a decision point and would better serve the purpose of navigation:

The figures in B are very unusual and as they are at a decision point, may also support navigation. Whilst the Library is a large and grand building, the signage was not that noticeable so I don't think A would have been overly noticeable for the group. (I7)

Participants found Columbia City Theater (Figure 76) to be far more noticeable than the bike rack due to the issue of the small scale of the latter, as well as its lack of contrast which was expected to reduce visibility. A participant explained, “The bike might not be clearly visible to some people with dementia due to a certain lack of contrast against the pavement and road” (I9). Participants also found ancillary objects such as the red bench, the tree and the bus shelter to add to the noticeability of the theater.

Participants who chose the Ark Lodge (Figure 70) rather than the Spirit of Washington monument (Figure 69) mainly attributed the former’s noticeability to the familiarity of it being a functional destination that may prompt reminiscence. A participant explained how the former was easier to see, while the latter would present difficulties for older adults who may not notice the details on the upper reaches of the monument:

A large light building - contrasts well with sky and ground therefore easy to see. Familiar to the older person. The first photo, given that older people often find difficulty in looking upwards, they may not notice the unusual symbol and it may not be familiar to them. (I9)

Figure 79 shows how different landmarks that were found to be noticeable were ranked in terms of their appeal by participants.

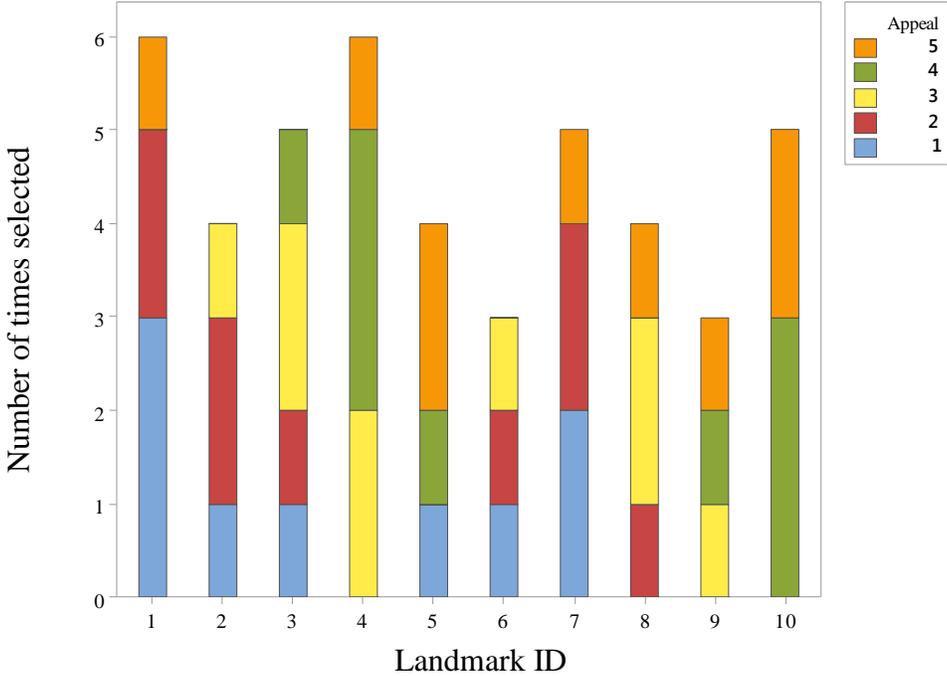


Figure 79: Bar chart showing appeal of landmarks chosen as noticeable

The Sound of Light (Figure 67) which was one of the most noticeable landmarks was also ranked highly on appeal, since most participants ranked it in the top two tiers. However, the Columbia City mural (Figure 73) which was the other most noticeable landmark was rated relatively lower on appeal, with most participants ranking it in the lower tiers. This may be attributable to the mural's location "off the beaten track" (12). The Pride installation (Figure 72) did not have a unanimous appeal rating, and was dispersed in its ranking across the scale. The Columbia City Theater (Figure 76) mostly received only low ratings, and was ranked in the lower tiers. The Ark Lodge cinema (Figure 70), on the other hand, secured high ratings from mostly being ranked in the upper two tiers.

#### *4B.2. Chi square goodness of fit test*

Chi-square goodness of fit test for the variables of noticeability and appeal failed to satisfy the level of significance due to small sample size (see Appendix L for results of analysis).

#### *4B.3. Summary of Survey results*

Descriptive statistics showed that, overall, public art was found to be more noticeable than historic buildings. More participants favored public art landmarks over historic buildings, than vice versa. There were no landmarks that were unanimously selected as noticeable. Besides, objective aspects, participants also weighed contextual factors in determining the noticeability of landmarks. Contextual factors may also be attributed to why a public art landmark that was most frequently selected as noticeable was ranked low on appeal. On average, public art landmarks tended to be ranked as more appealing than historic buildings.

#### ***4C Results of Interviews with experts-by-profession***

The previous phase of the study examined how different landmarks, when viewed in isolation of their context, were found to be objectively interesting by experts-by-experience. The purpose of this phase was to bring the context of these landmarks back into the discussion, in order to achieve a more holistic understanding of how these historic buildings and public artwork may or may not function as landmarks for persons with mild to moderate dementia. Some questions that are raised in this phase of the study include, “*How are landmarks experienced?*”, “*Where are they experienced?*”, “*When are they experienced?*” etc. In order to answer some of these questions, this phase of the study situates the inquiry of landmarks within the context of the walking journey.

Prior to discussing the results in this phase, it is important to note that while some of the buildings, artwork, etc., used in this phase of the study were consciously designed to serve as landmarks others were less intentionally meant to do so. As one participant in this phase suggested with regard to an example of public art, “perhaps its purpose isn’t to serve as a landmark. But it’s just for expression” (I8). The purpose of conducting these survey-cum-interviews was to critically re-examine the findings from the previous phase, i.e. the landmarks that walkers had identified as being interesting and attractive, by questioning how well they serve as landmarks-in-context, and their potential to do so may be enhanced. This involved reimagining them as effective wayfinding cues that would help persons with dementia as they move around their neighborhood.

#### *4C.1. Linking perception of landmarks to mobility parameters*

The results in this section contribute to answering the first research question in this phase, i.e. “*What are some external parameters that experts-by-profession consider as having influence on the way in which persons with mild to moderate dementia perceive urban landmarks?*” This section includes insights from participants that shed light on the various facets of the walking experience of a person with mild to moderate dementia, and how the question of landmarks fits in to the bigger picture of their walking journey.

##### *4C.1.1. Association between chosen mode of transport and landmarks*

A participant suggested that seeing an urban landmark is contingent on the mode of transportation chosen by the person with dementia. He also pointed out that a journey may be composed of several different modes of transportation. His contention was also to associate places that receive a lot of foot-traffic with where landmarks ought to be located, in order to increase people’s exposure to the landmark, making it more likely for it to be imprinted on one’s mind:

To what extent I can see a landmark is dependent on my mode of mobility. Am I walking? Am I biking? Am I on transit? If I am on transit or automobile, that's one way to experience this environment vs. I'm walking. So, some of your examples were mostly car-friendly neighborhoods. That's kind of a negative in a way that I may notice while driving through this neighborhood, as opposed to [when] I'm walking. (I3)

It was evident in the above response that choosing walking as a mode of transport was associated with having positive outcomes. However, participants pointed out that

one's will to walk is contingent on their practice of walking prior to the onset of dementia. Persons with dementia were expected to continue walking outside, if they had already formed a habit of it long before the onset of disease and were not beset with ancillary conditions that deterred them from walking. It was suggested that this was because learning and inculcating new habits becomes challenging as dementia progresses:

perhaps, in the earlier stages, if it's easier to go outside and exercise, there's that motivation. There's that awareness of going out for this purpose to improve my wellbeing...it would come more naturally as part of your everyday routine. But for individuals that have never really had that exercise focus or incorporated that piece into their routine, then, it's definitely more difficult later on to start and just incorporate that into your routine. (I8)

A participant also emphasized the importance of having social support in being able to remain physically active through the progression of dementia, owing to its health benefits:

If you had good, strong, healthy behavior patterns before, you're going to probably continue those. But you will need some social support to do that. If you didn't have good healthy behaviors before, it might be a little harder for the people helping to care for this person, to get them out walking everyday. (I6)

A participant also discussed the possibility of older adults with and without dementia not feeling as confident to continue driving vehicles as they once used to. In such scenarios, walking was perceived as the default mode of transportation for individuals.

The participant cited the example of a senior housing complex where the unavailability of parking spots prompted them to walk to proximal everyday destinations:

they don't drive anymore, I mean, partly it's to do with the fact that they are older and they feel less confident. But another piece is, these are seniors that moved into an affordable housing condominium...So a lot of seniors, when they moved in, had to give up their cars because of the lack of parking spaces available. So that actually encouraged them to walk more. (I8)

A participant suggested that certain modes of transportation may be more preferable than others, in terms of how user-friendly they are for persons with dementia. It was suggested that people may not prefer using public transit because it seems too complex, and may instead choose to call a cab:

people are reluctant to take the transit because they don't have the confidence in order to provide the right fare or talk with the bus driver if there is any issue of disorientation. People end up taking taxis. (I3)

Persons with dementia may choose to not travel outside as much, potentially due to reduced confidence in maneuvering through public space, or not having people to support them. In order to satisfy their daily needs, a participant cited the example of persons coping by utilizing the service of online shopping.

one way of coping, not going out as much and relying on online shopping...So they used to go out more and now they are less confident...and typically would not venture out unless they are with friends and family. (I3)

The purpose of discussing multiple modes of transport in this section, despite the fact that this study is mainly focused on the walking journey, is to be aware that walking may be interspersed between other modes of transport, i.e. multi-modal transport, and that one's chosen mode may potentially change from time to time, depending on their level of abilities, distance being traveled, level of familiarity, time constraint, etc.

#### *4C.1.2. Linking landmarks to familiar places and routes*

Home was cited as an important locus for older adults' walking routine. Staying close to home was stated as a critical factor for persons with mild to moderate dementia to feel safe and confident to walk unaccompanied. A participant cited the example of a person she worked with who limited her range of walking to the street outside her home:

I'm recalling one woman who spent most of her time at home alone. She had mild to moderate dementia. Her husband was working. But she would go out and just walk up and down the street. She lived in a suburban neighborhood.

(I2)

This also stems from persons with dementia preferring walking routes that they are familiar with. A participant suggested that these well-practiced routes are more likely to be preferred and easier to follow than seemingly easier, less-familiar routes:

So even if there is a quicker way to get somewhere they'd much rather stick to the path that they know. (I7)

Another participant echoed this thought by citing the example of multi-modal transport as a chosen mode and how persons with dementia find it necessary to follow a strict plan of travel and not deviate from the same:

If people are using transit they would go use the same bus, go to where they want to go to and then will come back on the same route, either by bus or by walking. (I3)

A participant even mentioned that navigating these routes was enabled by embodied knowledge of the place that was deeply internalized that people were able to summon quite spontaneously. It is this relative ease with which persons are able to move within familiar places that was cited as a reason for not wanting to venture out, unaccompanied, into uncharted territory:

People that go out and do the same route, kind of over and over again... When we've interviewed them they may not be able to tell us where they've gone, but if we go with them they always know where they are. Just a deep sense of familiarity (I2)

Thus it may be expected that buildings, public art and similar environmental features that are located along familiar walking routes are more likely to serve as landmarks. These landmarks may also be functional destinations located in close proximity to one's home. Thus being able to remain mobile within familiar areas is contingent on the closeness of destinations to people's residences.

While discussing a person's purpose to go outside, a participant found it useful to categorize travel destinations as 'primary', i.e. places that are essential to daily living to most people, in general, and 'secondary', i.e. destinations borne out of personal lifestyle choices, potentially relating to persons' hobbies, preferences etc.

So I think there are some...common destinations and there are secondary destinations one could identify...They are based on personal preferences and

that might be a minority compared to some of the more common ones where most people or majority would go to. (I3)

Another participant cited an example of the setting of a housing complex for seniors where all primary destinations were located in close proximity to home. Walkability and proximity to destinations within the neighborhood were suggested as providing residents the impetus to not depend on cars and rely solely, but comfortably, on walking. She also noted that this may be more likely feasible in urban centers than in rural locations:

I8: If it's in a central location, it actually doesn't really impact their ability to go out and do things. It's if it's in a remote area, I think that's where you see cases of seniors becoming socially isolated...when they no longer drive.

KS: It's contingent on the walkability of the neighborhood, I suppose?

I8: For sure. And not just the walkability, but also what community services and supports are around.

Besides preferring to walk along familiar routes to destinations in close proximity, persons with dementia have also been known to benefit from walking in naturally mapped environments, which a participant defined as, "one in which all the information you need to navigate the environment is in the environment" (I5). It was noted that these environments were intuitive and, as another participant explained, "anticipated the needs of people with dementia" (I6) and not needing them to problem-solve. Examples of these were found in participant's account of a group of persons with dementia that walked along a consciously designed nature trail in an urban area, framed by green space and blue space. The trail was designed to eliminate decision-

making, allowing persons with dementia to simply follow the path that they know can be relied upon to take them to the desired end-point without the fear of losing their way:

Pathways that people follow...people are out walking in a group, and they need to keep kind of together, but it's also a very natural kind of thing, they're not walking in a regimented way, because they are walking along a path. And the water is on one side and the green park land is on the other. So there's something about the way that it's constructed that takes advantage of the natural boundaries of the seaside (I2)

While for the most part participants walked along familiar routes within familiar areas, group walks facilitated the opportunity for them to walk within an unfamiliar area.

Participating in group walking programs was found to help persons with dementia walk beyond the range of familiar walking destinations and explore other areas in the city. A participant cited the example of a walking group she worked with that walked in an unfamiliar neighborhood that had grown to become familiar through repeated exposure:

I'm thinking about a group that's here in Vancouver that I've done research with that meets in the Downtown core, so, in quite an urban area of Downtown Vancouver. And so, it isn't their home neighborhood, but perhaps you may think of it as their second home neighborhood because they are there two or three times a week and part of what that group does is go out on walks as a group. (I2)

She went on to explain how getting to the neighborhood where the group meets to walk itself may be an experience filled with unfamiliar faces and places. However once with the group, it was suggested that the group-setting may render the experience of walking in an unfamiliar place more enjoyable and safe:

there is a difference between the walking experience of groups vs. independent walking, just because of the kind of being at ease, being with people in their own neighborhood... While there are some members of that walking group, there's always maybe one member who is maybe able to make it home on their own. They can take the bus and walk home. But most of them, they don't live nearby. They are coming by a shuttle bus or something into a downtown core, and are likely not all that familiar with it. So, the group itself, I expect, becomes quite important to their feeling of being comfortable. They wouldn't be comfortable, I expect, going out on their own. (I2)

The fact that persons with mild to moderate dementia walk regularly with groups in unfamiliar neighborhoods goes to suggest that there is a strong likelihood of associating landmarks with these places.

While the above insights included some common reasons to go outside as reported by older adults living with mild to moderate dementia, it remains unclear how the purpose of one's outdoor journey may impact the perception of landmarks. A participant stressed the importance of understanding the interrelationship between what motivates someone to walk outside, e.g. walking destination and the active use of landmarks en route. He suggested that the likelihood of persons with dementia taking

notice of a visually attractive landmark would be predicated on the purpose of the walk:

a tree in Fall with lots of red and yellow colors next to a boring building might be [more engaging]...but on the other hand if the person wants to go to the store and the building is the store, he might not even notice the tree. (I5)

#### *4C.1.3. Landmarks formed through social engagement*

In line with the discussion on secondary destinations, participants suggested that places that promote social interaction are found to be more engaging and preferred by persons with dementia. A participant cited the example of a local, open, multi-use space that participants with dementia had found to be quite engaging, particularly because of the familiar nature of activities being performed by people they knew:

There's place where there is a dog run. And it's not fenced in but it's a big open space. There's [sic] benches where people can sit down and rest. There's just a lot of activity happening. But I think there's enough space there and it's a real social kind of activity. So it's not confusing. And it's really engaging because people are there doing everyday kinds of activities and engaging with the neighbors really. They come to know the people quite well. (I2)

She shared another example of how a gelateria had grown into a landmark for a walking group through repeated engagement. Through their routine of going there every time to interact over ice cream, the establishment had been transformed into a “social landmark”. The fact that the gelateria was located along the walking route also seemed to work in its favor in its role as a landmark; owing its constant place in the

group's routine, and also as something that walkers look forward to. These factors, together, may potentially enhance the place's memorability as a landmark:

they stop and have an ice cream at the gelato place every day when they go for a walk, they stop at the same place...visually it kind of doesn't stand out very much...it becomes this kind of marker that the walk is over, and they'd stop and they'd sit down and have this social event. It's nothing that 's all that special from a built environment perspective, but it becomes an important kind of 'social landmark' almost, in a sense... a "social-mark", I don't know if there's such a thing. (I2)

#### *4C.1.4. Landmarks at pause points along the journey*

However, the walking journey to a destination was not simply 'going from place A to place B'. Participants spoke about how the journey may be broken into smaller parts, punctuated by intermediate pause-points. Based on her experience working with a walking program for persons with mild to moderate dementia, a participant noted how walkers would tend to pause at certain points as they walk along the city's waterfront in order to observe and engage with their surroundings. She explained, "They kind of have a sense of what the next place is where they can stop and take a rest...moving from one place that's familiar to the next. And that's why the public art stuff has really stood out" (I2). Additionally, knowing where to pause seemed to depend on their familiarity with the place.

The need to consider pause points along walking routes is particularly

important given that older adults with dementia may need to pause frequently for a moment's rest along the walking route. Well-designed seats along walking routes that are located in a setting with ample viewing interest were suggested by many participants as a way to prompt persons with dementia to take a break from their walking routine:

if the bench is just so available, so comfortable, sometimes that can be enough of a cue that people will sit down. A lot of time when we're working with people with moderate dementia..."Come over and let's sit on this nice bench." or "Come over and let's sit on this bench in the shade under this tree because it's too hot to be out here."...frequent resting places that are comfortable that would be benches with full backs, benches with appropriate arms, benches with appropriate kick-off space underneath. And those benches would be strategically placed for the view that would be an activity. (I6)

It was noted by multiple participants that not having places to rest along the walking route could potentially be a barrier to sustaining independent outdoor mobility:

A pathway that does not have any place to sit down and rest; for somebody who needs to rest every so often, is just as much of a barrier to use, having nothing to do with the cognitive, but having to do with the ancillary challenges the person faces. (I5)

If there's nowhere to just take a break, every time they go out it feels like this daunting task. 'Cause a lot of older people require air supplement, so they have their air tanks, which they have to push in a walker. So you need to have places where people can sit and take a break. (I8)

Besides seating, a participant highlighted the value of having environmental supports that facilitated standing. Based on what she had seen at a dementia care facility, she felt similar measures could be applied to facilitate pause and interaction with landmarks in outdoor public spaces:

it was a small pond in the middle...with some wetland plants, but I think the idea was not necessarily that they needed the handrail in order to not just fall down, but to stop and look at something if they really wanted to appreciate a view...having something at their waist, by their body, that they could put one or two hands on, would allow them to pause and relax, and enjoy looking, watching a bird or trying to see a flower that is maybe 10 feet away... (I1)

A participant's response tied together the concepts of 'pause' and 'exposure to landmark' by hypothesizing that co-locating pause points and landmarks may increase the effective amount of time persons with dementia get exposed to the latter, thus enhancing their potential to be memorable:

A hypothesis could be that the more I spend time around that landmark because of other functions, that are directly connected with the landmark or are available in the vicinity would likely make that landmark more memorable...functions or other activities...that could draw people there...would increase the value of the landmark (I3)

Bus shelters were found to serve as rest points and when situated next to landmarks facilitated orientation. Bus shelters were also found to be distinctive structures that were easily recognizable and allowed clear views of the surroundings. A participant explained, "the bus stop stands out because it's a bright blue, fairly

bright blue, and it's right next to the walkway... the context of the land opens up here, in this corner, I can see into the park" (I1).

Multiple participants cited toilets as being pit stops that persons with dementia look for when they walk with their care partners or with a group. These were suggested as being "functional landmarks" that form an integral part of a bigger journey. A participant suggested that the location of a public restroom can serve as an important point of spatial and temporal reference for persons with mild to moderate dementia who need to know how far they have walked or how much longer it would take until they reach someplace:

Particular buildings that are known to have public bathrooms will be another kind of 'landmark'...if they are on a regular kind of walk and there's a place to stop and go to the bathroom, that becomes a sense of knowing how long you've been out, like, "Oh, we're kind of half-way there."(I2)

Another participant linked the importance of well-located public restrooms to an initiative of the dementia-friendly campaign to encourage local businesses to offer free access to persons with dementia needing to use their restroom. In doing so, she highlighted its benefits not only for persons with dementia, but also for the businesses themselves:

There's also 'access to community toilets'. It's not so much to do with landmarks. But all these aspects feed into what makes a community dementia-friendly and accessible and usable for people with dementia...They are trying to have schemes here in the UK called "Use our Loo" where shops put a little image of the toilet in their windows, so that people with dementia, when they

are out in town they don't need to be planning, "When am I going to go home to use the toilet." ... having an accessible toilet that people can use and feel that they are not being an inconvenience (I7)

#### *4C.1.5. Barriers to accessibility in public space*

It must be noted that persons with dementia encounter several barriers along the way as they walk between destinations. These are likely to influence how landmarks are perceived. A participant spoke about the complexity of the environment posing as a potential deterrent to person's mobility, focus and safety. Walking with a group and being guided by volunteers was seen as a way of enabling walkers to parse such complex environments:

People with dementia are often older, and even people who are younger will tend to be slower. It just takes longer. They're just slower. So, traffic patterns, the duration of traffic lights... the group that's walking in the downtown urban core. These people would never be able to do that on their own... it is such a complex environment that the group leaders are constantly worried that someone will, as they say, wander away and become lost or become distracted by something and lose the group. And they have had it happen. So there's a perception by the group leaders in that case that it's a very risky environment, but at the same time it's a very positive environment. (I2)

Another disabling factor in this environment that she pointed out was the issue of lanes that served the dual purpose of walking and biking. The lack of clear

demarcation between the two lanes often put walkers in harm's way, in turn disrupting their mobility:

bike lanes...these guys are going fast, they're not where you expect them. The encounters with bicycles is also an issue for that urban group that I've talked about, that path that goes along the sea side, and the park land on one side and the water on the other, is divided in half, and half is supposed to be for cyclists and half for walkers. But you can well imagine that sometimes they encounter each other and it's often a point of tension. (I2)

A participant emphasized that the environment ought to be supportive of dyads that engage in outdoor activities together. She stressed that all outdoor areas, at the very least, should provide amply wide walkways to allow them to walk side by side. This was suggested as a design strategy that would help foster the social aspect of outdoor walking:

we have to maintain those social relationships too, it's usually with one other person that are going out on this walk. But, looking at pathways being at minimum five feet, so that there is the social connection and socialization is supported. So they can walk together. And then sit together. And engage in the environment together. (I6)

#### *4C.2. Using urban landmarks for wayfinding*

This section includes participants' responses to certain challenges that may be faced by persons with dementia when they incorporate landmarks into their daily outdoor journeys, especially to navigate their way between destinations. The results in

this section contribute to answering the second research question in this phase, i.e.

*“What are some challenges that experts-by-profession have observed persons with mild to moderate dementia facing when they use urban landmarks for outdoor*

*wayfinding?”* The most pressing wayfinding challenges seemed to occur due to

persons having to grapple with memory loss. Two different strategies used by persons with dementia to employ landmarks in wayfinding were also discussed.

#### *4C.2.1. Challenges to imprinting landmarks on cognitive maps*

A participant explained that persons may rely on their mental maps of places in order to perform wayfinding. He suggested viewing these maps as being composed of networks of landmarks that acted as spatial anchors along routes between destinations:

Landmarks are essential. My understanding of a cognitive map is that it is not actually a plan of a place you're walking. But it's a series of landmarks. So we say we'll go from my house to the corner, from the corner, to the store, from the store, to the traffic light, from the traffic light to the school, from the school back to my house. Those are all landmarks. (I5)

However, for persons with dementia, this reliance on mental maps is fraught with difficulties posed by memory loss. Owing to declining episodic memory, remembering and completing sequences of tasks to be done in the outdoors, as well as learning and retaining new routes can be particularly challenging for persons with dementia.

Because of this, it was considered essential for persons with dementia to have learned and practiced critical routes and landmarks before the onset of dementia:

if they've learned landmarks, if they've learned a path. If they've learned a trail or a way they can often maintain that... But I think they have to have

learned that before...when I am working with dementia clients, they don't remember in 15 minutes that we just planted a tomato and a raised bed. They certainly don't remember the next day...it has to be a pretty significant well-defined landmark and they have to have learned it before the dementia process.

(I6)

A participant further explained why practicing routes and landmarks before the onset of disease is essential by linking it to the issue of exposure and needing time to imbibe spatial information into one's wayfinding routine:

We know that older adults who are aging healthily, it's significantly harder for them to learn a new environment. To remember the route, they need to see the route many more times, they need much more exposure to the environment.

This becomes even harder if the person is experiencing types of dementia, and particularly Alzheimer's related dementia, because that affects the part of the brain to do with our spatial memory. (I7)

Based on her work, she added that while persons with dementia may seem to be getting along just fine, successfully performing wayfinding, but may have a sudden lapse of memory in the middle of a journey, causing them to become disoriented and not know where they are headed:

What happens with dementia is that the more recent memories that first start to go. It's the little tasks...forgetting where you've put things, and then it becomes more progressive... depending on the length of the route, some of the participants have completely forgotten mid-route, they've had mind blanks of where they're actually going. So they sometimes could get what the destination

is at the end, but sometimes they can still remember the directions through the route. (I7)

While one part of maintaining independent mobility and wayfinding was contingent on the retention of well-practiced routes in one's memory, the other was successfully applying these mental maps at the right time and place, i.e. in sync with one's daily routine. A participant cited the example of a person with dementia who followed a deeply "ingrained" route to an intimately familiar destination, in complete discord with his daily routine:

It quite often is that people have learned a route. It's very well practiced. It's habitual. And then they end up somewhere else. I know of a report in my local town. So a gentleman woke up in the night. He had dementia...He just walked the route to the beach and just stood by the beach...And his family didn't know where he was. But they knew he loved the beach and they found him there. So it's an ingrained route. (I7)

In order to retain these deeply ingrained and familiar routes, it was considered essential for the neighborhood setting to remain fairly unchanged. This implied that the community ought to offer persons stable landmarks that may be relied upon as wayfinding cues during periodical outdoor walking journeys. It was suggested that disorientation may be exacerbated by unexpected change in the urban form, especially with the disappearance of well known, familiar landmarks:

If there's a town that... they've knocked buildings down, they've changed the road system, I can imagine that would be quite challenging for somebody with

dementia. If it is a town that has had lot of change, finding ways to really make sure that people with dementia become as familiar as possible. (I7)

#### *4C.2.2. Wayfinding strategies using landmarks*

A participant explained two systematic strategies that are followed by persons with dementia in incorporating landmarks into their wayfinding patterns. One wayfinding strategy which combines landmarks and directional information is known as the associative cue strategy. However, it was suggested that the effectiveness of this strategy would be contingent on the intactness of person's spatial abilities and cognitive skills, particularly one's ability to associate landmarks with the direction they need to turn, which is impaired due to dementia:

There is a navigation strategy that we use called the 'associative cue strategy'. And that is where we combine the landmark information, say, "the church" and turning left at the church. So you remember by, "When I'm at the church I turn left" ...people showing early signs, those earlier signs of atypical aging, so cognitive impairment and dementia, that ability significantly decreases...to associate and combine those directional and landmark information. (I7)

An interviewee recalled working with an older adult with mild to moderate dementia who used a similar strategy when she would routinely walk in a vast urban park, and used a distant landmark as a cue to prompt her when and where to turn:

So this woman would go to...a really big urban park. She couldn't tell me at all where she was but she knew a particular lake was a kind of landmark for her

and she knew when she approached the lake which way to turn so that she could follow the path around the lake. (I2)

Another strategy, known as the beacon strategy, does not employ directional information, rather involves using a more embodied approach in moving towards one's destination:

There's another strategy called 'beacon strategy' which is where you remember, "Ok, I head towards the church." Rather than associating the direction explicitly with the landmark, you just remember, "I head towards that, that's my goal."... It also relates to that global landmark. If there's a landmark that you can see, like the London Eye. I know if I want to go to the River Thames I just walk towards that because it's acting as a beacon and it's a global landmark. (I7)

#### *4C.3. Salient characteristics of urban landmarks at Columbia City*

The following results specifically pertain to the photographs of landmarks at Columbia City in Seattle, USA that were included in the survey-cum-interview. The findings delineate various characteristics of urban landmarks that were cited as being important to persons with dementia for wayfinding. The results in this section contribute to answering the third research question in this phase, i.e. "*What are some characteristics of urban landmarks that experts-by-profession consider as salient for outdoor wayfinding for persons with mild to moderate dementia?*" Some of the constructs that were identified as criteria to determine the saliency of landmarks included visibility, location, noticeability, identifiability, recognizability and

ultimately memorability. A participant suggested a four-step model of perception that he followed in order to determine how effectively a historic building or public artwork would serve as a landmark. The points that he included were, “1) Sensation: impact on the retina, 2) Attention: noticing something is there, 3) Discrimination: noticing what it is, and 4) Recognition, understanding its meaning, i.e. comprehension” (I5).

#### *4C.3.1. Functionality of landmarks*

It was emphasized that while landmarks may be objectively effective, it is just as important for the context of the landmark to complement the object or building’s role as a landmark. The fit between the landmark and its context was thought as being integral to their function as wayfinding cues. Context was cited as being especially important in complementing the person’s ability to recognize objects as landmarks. A participant noted how persons with dementia that she has worked with identify landmarks as being helpful cues when they are out walking in the community, but may not necessarily be able to recall them out of context:

[landmarks] actually are really important and it’s not going to necessarily be in the form of declarative knowledge...being able to identify a particular landmark outside of the context. But when we hang out with people and go for walks with them, when we're out with them, I see it as being really important (I1).

In line with the point made about the importance of context in discussing landmarks, a participant suggested the potential of associating the landmark with a clearly defined and meaningful purpose, which in turn could draw people’s attention to it as well as augment its recognition:

function is a really important element in making landmarks... one could argue for distinct obelisk type landmarks and tower type landmarks rather than those. But I think we need to do more work in including or integrating landmarks with public functions and civic functions, to make these more usable, more frequented and by virtue of that more memorable. I think there are different ways of thinking of landmarks. (I3)

He went on to explain how one might extend the conception of landmarks as being external to walkers, thus proposing an alternative view to the extant understanding of landmarks as a “type of point-reference... [that] the observer does not enter within...they are external” (Lynch, 1960, p. 48). The participant suggested that one might imagine landmarks to simultaneously operate as walking destinations:

it’s also important to think about landmark as destination...we can think of landmark just as a landmark... I recognize that. I use that as an orientation device in my cognitive understanding of the space...but could be a destination; I think that could add [to] the value of a landmark. (I3)

Places that were everyday functional destinations that served purposes central to persons’ daily routine were found to be some of the most frequently cited as landmarks:

landmarks that they usually talk about, are the key known places in the city which would be the shopping mall, the senior center, the city hall and the airport...But for each of them there is a specific purpose or functionality. You go to the city hall to get access services. You go to the shopping mall to have

lunch or to socialize. You go to the senior center to engage in senior's activities. (I8)

When the building housed a function that was particularly meaningful or familiar to older adults, it was expected to enhance its potential as a landmark. Participants predicated the attractiveness of the historic Ark Lodge Cinema (Figure 70) on the fact that its function would be considered as familiar and memorable by persons with mild to moderate dementia, and potentially prompt reminiscence:

It's [Ark Lodge] a movie theatre...they're more likely to remember that as a functional aspect, that "this is a building that I have been to"...It's more likely to work as an important anchor in one's cognitive map. (I3)

Another participant suggested that the combined effect of having a familiar function housed in a building that had preserved its original form and aesthetics, would render it memorable as well as stable.

people always share experiences of film for example, as not only an activity but also a marker of historical events. This one in particular, you see that it maintains, almost an original...classic look to it...it's again about that sense of familiarity. For a person that's lived in this particular neighborhood for years, they would know this particular marker... "the local cinema." (I8)

The participant had a similar interpretation for the Columbia City Theater (Figure 63) which was a historic landmark shown in the survey and interview. She suggested that the theater would serve as a landmark, owing to the personal meaning implicit in watching plays for persons with dementia:

I know that a lot of older people enjoy going to the theater [Columbia City Theater]. They watch little plays. ‘Cause when you think about it...a lot of older people didn’t have the television...when they were growing up. The local theater is like watching television... It would be something that people know about, just because they enjoyed going to watch plays in the theater (I8)

However, another participant suggested that landmarks that had secondary activities associated with them were more likely to resonate with persons with dementia, based on whether they had a personal connection or interest in the activities supported by these landmarks (I4). She suggested that the Ark Lodge historic cinema (Figure 70), for instance, may stand out a lot more for persons who are interested in watching movies, or the Seattle Public Library (Figure 71) may create an impression on someone who has spent a lot of time reading in the library and the bike rack for someone who is passionate about biking.

Not knowing exactly what purpose public artwork represented was highlighted as an issue when discussing the potential of their becoming landmarks. The potential ambiguity surrounding public artwork, from not being able to read its meaning, was suggested as being a potential deterrent to how well older adults with dementia may be able to identify or recognize the public art, which may reduce its potential as a landmark:

I8: it [public art] doesn’t link to a particular purpose. So it’s something that might look nice, but what would you describe it as? So, if people were to say, “It’s near that thing that’s really colorful on the side.” People won’t know what it is.

A participant compared the Spirit of Washington monument (Figure 69) to functional landmarks that serve as destinations with a definite purpose attached to them, and suggested that the former's lack of well-defined purpose could be a drawback:

it's [Spirit of Washington] not a functional landmark. For example, there's a cinema or a town hall. So those functions have got purposes. So people would be going there explicitly for that purpose. So this one I'm not quite sure (I7)

Having a description that accompanies the artwork was thought of as being a way to enable people to familiarize themselves with what the artwork represents which could potentially evoke certain associations or reminiscence, thereby facilitating recall:

if the municipality wants to use it as a landmark then they should have maybe a description, "this is by so-and-so" and it's meant to describe this, or "it links to this particular time point" ... Then people would know, "Oh, there's this thing. It's nearby this thing." (I8)

Including the aspect of multi-functionality in public art, in order for it to multiple functional purposes, was suggested as a strategy for strengthening the identity of the landmark as a functional object:

have different things to serve different purposes...a landmark could serve as a bench. It could also serve as somewhere where you could have kids play on...and also as a place to lock your bike. It would be really helpful to have landmarks that serve dual functions, or multiple functions. (I8)

Participants suggested that the bike rack (Figure 62) could potentially be further supplemented with multi-functionality and interactivity through creative and

innovative design. Doing this was expected to make the landmark's affordances more apparent and intuitive, rather than it seeming ambiguous and unclear:

It's a little high...It could be more interactive. You could make it so that it's a seat that actually is comfortable and if you're carrying a bag, you can put the bag someplace. (I5)

#### *4C.3.2. Fit between landmark and context*

There were a few landmarks that were appreciated objectively, but were situated in questionable contexts, which was expected to affect their potential to be seen and utilized as wayfinding cues by older adults with dementia. One such example is that of the art installation called "Columbia City Mural" (Figure 73) consisting of a series of panels that depict scenes of the past, present and future of the neighborhood of Columbia City. While participants thought that the landmark itself was quite noticeable, they cited its location in a parking lot as being problematic. Some of the issues that were voiced included lack of safety, cleanliness, greenery and no defined pathway or place to rest:

not a safe place for older people to be...If that mural [Columbia City Mural] had been painted next to a sidewalk, that people move right past, that would be a little more appealing because they can stop and look at the details. (I1).

A participant also suggested that the mural could have been continued around the corner of the blank wall, in order for walkers to be able to view the mural from multiple angles:

it [Columbia City Mural] was off the beaten track. Unless you're going into that car-park and say, "I'm going to the car-park with this artwork," I'm not quite sure how much that would stand out, maybe if it was continued and made a bit bigger. (I7)

On a similar note, the "Pride" public art installation (Figure 72) was perceived as a strong landmark on its own. However viewing it within the surrounding context of the traffic intersection seemed to raise a red flag, owing to its complexity and the potential barriers it posed to pedestrian accessibility:

That's [Pride] a really cool landmark...and yet, a really big scary space. I would see that intersection as perhaps being quite a significant barrier. So is there something about the way in which the landmarks are in fact situated in the broader environment that becomes really, really important to consider. (I2)

The presence of multiple stimuli owing to the busy motorway as well as the Light Rail corridor may result in overstimulation for persons with dementia. Alternatively, if the landmark had been located in a context that offered more balanced stimulation, it was expected that persons with dementia may be able to form more positive associations:

When you have to process four lanes of traffic and the light rail, adding any more stimuli is probably not a good idea. I think these [Pride] are ill-placed. If they were over on the other side of the greenscape. (I6)

The surrounding context of the Columbia City Theater (Figure 76) was also considered to be overstimulating:

I think adding anything else would make this [Columbia City Theater] even more complex and harder for a person with moderate dementia to figure out.

There's so much signage. There's so much going on...But for people with moderate dementia, this is too complex and unsafe. (I6)

#### *4C.3.3. Visibility*

Visibility of landmarks was critical for older adults with dementia to be able to see the landmark, which was thought of as a precursor to recognition and eventually tactile contact, "viewing is going to be the first...They need to see it and recognize it before they are ever going to go walk towards it, touch it" (I6).

However, aging related visual deficits were suggested as complicating visibility of landmarks for older adults with and without dementia. Participants pointed out that the cone of vision shifts downwards in later life making it difficult to see things in the built environment that occupy the area above their cone of vision. Because of this, it was suggested that all the critical information in the visual landscape should be incorporated at the eye level or further down. With regard to the Rainier Arts Center (Figure 68) a participant explained, "[the] building that was up high, had very Roman or Grecian columns...I don't think older people can see it" (I1).

A participant suggested that features of a landmark are more likely to be visible to older adults if they are located at eye level. A participant noticed that the surplus of architectural details was located higher up in the facade of the Ark Lodge historic cinema (Figure 70). She suggested that critical information be displayed at the eye-level for someone walking on the pavement alongside the cinema to be able to find easily:

Making sure that the lower part of the building [Ark Lodge], the pavement have got landmark information is really important. This building is beautiful but if you were to look up you would see how unique it is (I7)

In addition to older adults' visual deficit, participants also indicated how environmental barriers may compromise visibility of landmarks. While discussing the bike rack (Figure 75), vehicular and pedestrian traffic were cited as potential hindrances to a clear line of sight. A participant suggested that the object's slender profile may also prevent it from being easily perceived from afar:

The problem with this [Bike Rack] is from across the street it could be entirely hidden by a parked car. And if you're walking down the street and there's other pedestrians around they could be easily between you and it, and you wouldn't notice it. (I1)

Parked vehicles posed a physical, as well as visual barrier for persons to access the Columbia City mural (Figure 73). In addition to being blocked by vehicles, because there was no well-delineated walking path alongside the mural, there was little opportunity for persons to potentially be able to observe the landmark more closely, if they wished to. A participant thought this setting to function very poorly in terms of offering a "viewing place" to observe landmarks from:

It looks like there is so much hardscape and so many opportunities for cars and there's not an opportunity for people...The cars are parked at the mural. There isn't even a walking path in front of the mural...you want people to enjoy it and remembering that a person with moderate dementia might tire easily...So,

every one of these landmarks needs resting places and viewing places and places to engage. (I6)

Scale of the landmark was expected to impact figure-ground perception, i.e. how distinctive the landmark was from its background. In the example of the Spirit of Washington monument (Figure 69), the slender profile of the sculpture in the vast green space seemed to denote visual imbalance, causing the monument to almost “disappear into the background” (I2), which is why participants felt that it was not clearly visible at a distance.

A similar observation was made about the Rainier Arts Center (Figure 68), a performance space housed within a Neo-Palladian building located adjacent to the vast green space of Columbia park. Unlike the Spirit of Washington monument the building was found to have an imposing façade that was expected to stand out from its surroundings. However, participants found its main façade to be located too far away from the sidewalk, because of which its visibility was compromised.

In addition to external visibility of landmarks, being able to easily see through windows on the street front was also noted as a salient feature of historic landmarks. While discussing the potential of the Columbia City Theater (Figure 76), a participant suggested enabling clear lines of sight into the building in order to augment the landmark. She said, “It isn't clear...how much people can see in [Columbia City Theater]...Those windows are really the big feature that might serve to distinguish it...there's potential with the windows to make this quite good” (I2). This improvement may have been expected to add to the number of eyes on the street and

potentially improve perceived safety and create a welcoming and engaging atmosphere.

#### *4C.3.4. Strategic location and orientation*

A participant emphasized that in order for landmarks to have maximum impact, they need to be suitably located. A participant explained the rationale for strategically locating landmarks along paths of circulation or in close proximity to functional destinations. He explained, “has to be within certain strategic location, within the circulation path or next to destinations that people frequent more or that might be more relevant” (I3).

Furthermore, positioning landmarks at decision points was thought of as a strategy to alleviate any confusion that persons with dementia are likely to encounter when presented with multiple route options to choose from:

The ones that create more challenges are things like...forks in the road which are equal in decision with no knowledge about what leads where... So seeing the landmark, seeing the destination, is important... (I5)

The location of the Spirit of Washington (Figure 69) monument adjacent to the walking route was found to be conducive for visibility and noticeability. A participant expected that persons with dementia would potentially remember the presence of the landmark by associating it with where it was located along the route:

It's [Spirit of Washington] alongside a route, which is good... 'cause people will know, “Ok, I head towards that sculpture.” It's in a good position... it's visible from quite a few perspectives... So people can see, “Ok, if I want to go that way, I go along the path that goes past the sculpture.”... (I7)

Certain decision points have been known to be particularly problematic for decision-making at these points, such as street intersections. Therefore, having a landmark at these points was considered to promote wayfinding and bolster one's ability to choose the right path of travel. It is for this reason that some landmarks at Columbia City, such as Columbia Funeral Home (Figure 74), and the Pride (Figure 72) art installations were considered beneficial, because of their location at intersections.

It was previously discussed that persons with dementia may or may not be able to employ the associative cue strategy due to their impaired cognitive skills. Regardless of whether or not they would be able to successfully employ this strategy, a participant advocated for the inclusion of landmarks at decision points:

Given where it's [Pride] positioned it's at a decision point. Even though I have said that the ability to associate landmarks with directions is quite difficult for people with dementia. It's much better that there are landmarks at those decision points than not have them there. (I7)

A participant also appreciated the distinctiveness of Spirit of Washington monument (Figure 69), owing to its location in the midst of a vast green space and being devoid of other competing elements in the proximal visual landscape. The setting of the landmark afforded clear sight lines, allowing it to be viewed from different points. According to her, persons with dementia could "see that landmark [Spirit of Washington] from most places in this well-defined environment within this perimeter" (I6). She went on to suggest that they could "wander in many ways but find [their] way back to that landmark".

Orientation was found to be a major determinant of visibility of certain components in the Sound of Light mural (Figure 67). The artist created it on south-facing staggered planes of a retaining wall, rendering it visible only to pedestrians and drivers moving northward along the highway; the drivers less so because of a greater separation between the motorway and the mural, than the adjacent sidewalk. A participant suggested that the blank faces of the staggered planes also be filled with similar artwork in order for it to be visible to persons walking southward:

If you were to take it and wrap it around the corner, do another piece the same size, facing the street, then you could see it from walking the other direction and you can see it from across the street (I1)

Another participant had a different perspective to offer in that repeating the same pattern on the blank faces could potentially disorient persons with dementia walking back and forth alongside the mural. Her suggestion was to adapt a slightly altered version of the existing pattern for the blank panels, in order to maintain some level of distinction between the two facing ends of the staggered wall planes:

if you didn't want the potential for confusion, in that people got confused which way they were going, you could put a different pattern on those grey panels [Sound of Light]... rather than have the patterns going upright, have a pattern that goes across. (I7)

According to her, the potential of the redesigned mural to support wayfinding would be contingent on whether the older adult with dementia is able to associate the presence or absence of artwork with their direction of movement.

The orientation of the Columbia City mural (Figure 73) was also found to

limit its visibility. While it appeared to be quite noticeable from one position, it did not seem as effective from other positions:

you cannot see it [Columbia City Mural] coming the other direction at all...from the other side of the street you can see it a little bit, but that's a fairly small mural, but still, you could catch a glimpse of it, it might help. (I1)

#### *4C.3.5. Noticeability*

A participant suggested that in order for landmarks to be noticeable, relational scale ought to be considered, so as to understand how the scale of the landmark may be perceived by a person on the street. This way of articulating 'scale' helped justify the potential of small-scale landmarks being just as valid as large-scale landmarks:

I think you want to argue for...working with big scale landmark that could be more prominent and dominant in the setting so that people would easily notice and potentially use that as a landmark... It could be a huge building or a huge tower, but that may not work at the human scale on the pedestrian level. (I3)

Participants commented on how the proximal relationship between the observer and the landmark, may characterize the perception of landmarks of differing scales. The distance of the landmark from the sidewalk seemed to be a significant in determining whether or not the Seattle Public Library (Figure 71) would be noticed by older adults with dementia walking past:

For people with dementia, I'm not sure whether or not they can pay attention to something in the distance. That [Seattle Public Library] is probably 100-200 feet from the sidewalk... If it's close and touchable, it's in their line of

sight....whether or not when they look far... can remember something in the distance. (I4)

This seemed to be a bigger issue for small-scale landmarks, the bike rack (Figure 75) being a case in point. Participants criticized the landmark for being too small and not standing out as much. It was suggested as being noticeable under very specific circumstances that would require the walker to be in close proximity to it. A participant noted, “It’s [Bike Rack] not that visual if you’re not walking along that path. But if you are walking along it towards a location, I think it would be quite important” (I7). Another participant suggested a way to make it more noticeable would be to increase their frequency and have them more spread out across the sidewalk. She said, “If you keep repeating the same thing along the street, that could be a characteristic of this street, people could remember, especially for people with dementia” (I4).

While large-scale was typically favoured in landmarks, the Sound of Light mural (Figure 67) presented a more complex issue. It was considered an inadequate wayfinding cue because of its sheer length, since it continuously spanned two blocks, and lacked focus. Emphasizing the importance of having a single clear visual, a participant explained, “a very clear visual is going to be key, so that means one clear visual, not many around it that look similar” (I6). In order for it to aid in wayfinding participants suggested that it be more compact and less spread-out:

I don’t see this [Sound of Light] as a wayfinding tool, but I do see it as attractive and I do see it as something somebody would remember walking

down the street....It doesn't look very well as a wayfinding tool because it's half a block long (I5)

On the other hand, another participant appreciated the continuous stretch of the mural for delineating the boundary of the path:

you're walking along that route and if you're viewing it from that angle in the first picture, it's a very important landmark, because firstly it is unusual. It also acts as a boundary landmark (I7)

Scale also appeared to be a critical factor in evaluating the noticeability of landmarks situated in dense urban settings. The Columbia City Theater (Figure 76) was found to merge with several other shopfronts in the vicinity because they all were of a more or less similar scale. This relates to the idea that having multiple points of interest in close proximity may reduce the distinctiveness of the individual parts.

It [Columbia City Theater] was so embedded in this streetscape that I wouldn't notice it as being anything special. The Ale House looks very interesting. And there's the theater. If it's one of many things along the street, I don't see why they would pick that out as especially important or interesting. (I2)

However another participant offered a slightly different interpretation on having multiple proximal points of interest by examining the part-to-whole relationship. He suggested that having many points of interest within a block or a street front may render the entire section a joint identity as a landmark. To address the lack of distinctiveness of the parts would therefore require localized design modifications that highlight and accentuate certain features that may set them apart from the other buildings in the same row:

if on a given block all the shops are having awnings and interesting things with the storefronts that they may not be the best approach...But within a block...adding elements to the existing infrastructure, like storefronts, can create landmark effect. (I3)

Participants' insights regarding noticeability of landmarks seemed to suggest that they favored some parts of the landmark more than others. An example of this was the Rainier Arts Center (Figure 68), where the facade on one side seemed to be more attractive than the other:

I think something more on the side... the building [Rainier Arts Center] in the front looks so grand and then this looks like nothing. It actually looks like it could be two different buildings; so, something more on the side there to indicate that this is the same space. (I2)

Of the photos showing the individual sculptures that constituted Pride (Figure 72), one particular sculpture was appreciated for being strategically positioned, which afforded high visibility from multiple points. It was found to be the most noticeable of all the sculptures as well. Due to its relative prominence, it was also suggested that this particular sculpture would prompt walkers in making spatial decisions.

It's a big intersection and as a landmark though, the way that one lion [Pride] sits out in front, I think that really works well...It's unusual, bright, it's large, the lines of vision, you could see it from almost anywhere (I1)

Colors were suggested as appearing pale to the older adult's eye, due to the thickening and yellowing of the eye lens. This is why bright colors stood out more and were expected to render landmarks more noticeable.

Bright colors can help make things much more attractive...makes you look at it...reds and yellows and brighter colors are often much more appealing and again it might go back to the lens of the eye becoming thicker and yellower, so it looks pale. (I1)

Additionally, the participant explained that older adults' increased light sensitivity causes elements in the outdoors to look quite dark and merge with the surrounding, thus further necessitating the use of bright colors:

things look much, much darker to older people than younger people...a glare makes everything else appear darker... and blend in together, because the eye cannot adjust to the two different light levels (I1)

Landmarks such as the Columbia City mural (Figure 73) and the Sound of Light mural (Figure 67) were appreciated for their bright colors, which made them more noticeable amidst their surroundings. However some landmarks were perceived as being less attractive owing to dull colors, which not only undermined the appearance of the landmark but also influenced its contrast with its surroundings. While discussing the Spirit of Washington monument (Figure 69) a participant noted that the effect of the dull color was exacerbated when the landmark was viewed from a distance. A participant said, "it could be perceived as difficult to see from a distance....especially given its color and that it's quite difficult to differentiate it" (I7). A similar issue was raised while discussing the bike rack (Figure 75). Participants suggested that due to its dull color, the object was not noticeable and was recommended that it be rendered in a different color.

Participants also suggested that some color palettes may evoke negative associations and feelings among older adults with or without dementia. It was suggested to refrain from these color combinations and instead use warm and bright colors that do not have such connotations. This was noted by a participant in the colors seen on the façade of the Ark lodge cinema (Figure 70):

In terms of the front, maybe a bit brighter. It kind of looks a bit institutional from the top with the windows. So yeah, anything that makes a building look less institutional...places that trigger that memory of hospitals or reminds them of hospital settings, it's not a place that they'd particularly like or want to think about. For example, the mint-greenness alongside the white, it kind of has this hospital-type feel to it...if it was orange, instead of that green, I think it would probably draw a lot more attention. (18)

The importance of color was also discussed with reference to the walking surface. A participant emphasized the importance of not including patterns that involved dark-colored shapes on the walking surface due to issues relating to visual distortion. It was suggested that older adults with dementia tend to misconstrue dark shapes on the walking surface as holes and tend to get disoriented by them. Shadows were expected to have a similar effect:

there are dark holes or dark squares, they can be perceived as holes by people with dementia. Here, in our supermarkets, the black mat that you have when you first walk in. A lot of people would find that quite intimidating. The shadows from the trees could be quite possibly problematic, because shadows aren't very good. People perceive them as holes as well. But you can't prevent

these kinds of things. There's only so much you can do...People might avoid walking to look at those landmarks, they might be outside to avoid going in there, because it looks like that path has been cut off. (I7)

Unique architectural aesthetics were found to lend distinctiveness to landmarks. A participant considered some of the components of the architectural composition in the façade of the Seattle Public Library (Figure 71) to be noticeable:

It is [Seattle Public Library] a tall enough building. You can see it. It has repeating patterns with the windows. It has a high pitched roof. There's nothing else around it that has the same architecture. It isn't like rowhouses. (I6)

A participant highlighted the importance of considering not just the design of the landmark but also the design of surroundings. Landmarks were found to be less attractive due to the sameness of colors or textures between the landmark and the paving around it. While the sculptures that formed a part of the Pride installation (Figure 72) themselves were found to be quite noticeable, the setting of the plaza did not seem to complement their distinctiveness as much. By clearly delineating its surroundings, it was suggested that the noticeability of the installation may be enhanced:

I'm also thinking about the surroundings, give a platform for the sculptures [Pride]. I like that they grouped them together...Define some platform for this group of sculptures...Well-defined corner...Think about surface. Use some colorful bricks to define the surface for these sculptures. Give them a home. (I4)

A participant felt there was further scope for improvement in the setting of the Spirit of Washington monument (Figure 69) to not only enhance its noticeability but also provide explicit prompts for people to pause and interact with the landmark:

if there were a bump-out, a little niche where people could get over to that...they could spend more time learning about that important landmark [Spirit of Washington] that helped them get through the park (I6)

Participants mentioned how greenery may be used to frame and ground landmarks, making them more noticeable. Green space at the front of the Seattle Public Library (Figure 71) was found to serve the additional purpose of delineating the edge of the path leading up to its entrance, thereby doubling as guiding elements for older adults with dementia:

It's a small green space with one or two easily comprehended paths. So you don't feel like you're going to get lost...you can see the green space. To me, that's the grounding element...green space is anchoring... I think it has a stand of large trees that can help wayfinding, but not too much. It's not like going in to a deep forest. (I6)

#### *4C.3.6. Recognizability: familiarity vs. abstractness*

Participants recommended that landmarks be simple in order for persons with dementia to be able to easily recognize them. Participants suggested that landmarks that are not too complex are easily comprehended and perceived by persons with dementia. Having something that is fairly straightforward, like the bike rack (Figure 75), was expected to have a comforting and reassuring effect on them. A

participant found the Spirit of Washington monument (Figure 69) to induce a sense of familiarity owing to its comprehensibility and ease with which one may potentially be able to identify it:

I thought it [Spirit of Washington] was a good landmark in that park...very easily comprehended. "That's a rock and I know rock"...It's not too abstract either. It needs to be familiar and comforting instead of going, "What on earth is this?" or "What on earth were they thinking?" or "I can't figure this out."

(I6)

Historic buildings were found to be especially recognizable because of their architectural style and detail. It was suggested that older adults would be drawn to this aesthetic for its familiar quality. It also helped if the structures around the landmark did not share a similar aesthetic, which made the latter stand out all the more. While discussing the style of the Columbia Funeral Home (Figure 74), a participant noted how some of its distinctive features were rare to come by in this day and age, which in turn were expected to prompt reminiscence:

I think [persons with dementia] would notice it [Columbia Funeral Home] more than ordinary home. I think the architecture is unusual. It's got two little dormers on the upper floor. It's got a sign in old-fashioned writing which you don't see very often....The red tiled roof and those little green awnings...old-fashioned, you don't see them anywhere (I1)

The Rainier Arts Center (Figure 68) was expected to have an impact on older adults due to the recognizability of the style, owing to its timeless quality:

The landmark is clearly identifiable by its architecture. That's a form we've seen for hundreds of years...that building [Rainier Arts Center] probably might have been built in the twenties. I think it's a very good landmark...It has long meaning in our architectural history. People who now have dementia, probably in their 70's, 80's and 90's (I6)

Participants noted that landmarks with overt stylistic and cultural leanings may be associated with neighborhoods that have a corresponding cultural composition. A participant suggested that persons, who are familiar with or belong to Chinese culture, may find the Pride art installation familiar (Figure 72) and presume that its presence implies that the neighborhood, i.e. Columbia City, is a hub for Chinese culture:

I wonder if it [Pride] also carries meaning as to where it is in the city, if there is a Chinatown nearby, for example...people here would look at that and think that it would actually carry meaning, that there might be something related to Chinatown or the Chinese community nearby. (I2)

Another participant suggested that because the sculptures weren't actually located in a neighborhood like Chinatown, the installation would potentially stand out more as a landmark, because it is distinctive and unlike any other form in its surroundings:

This particular lion [Pride] is a very prominent statue in Chinese culture. If it was in Chinatown you wouldn't need to pinpoint it because these would be everywhere. (I8)

Part of the discussion on identifiability and recognizability of landmarks focused on the tension between abstraction and literal representation in public art. Part of this involved determining the degree to which abstraction is admissible for artwork to

serve as landmarks for older adults with mild to moderate dementia. It was felt that especially when public art or sculptures were designed as being artistic representations of things in real life, flora or fauna, or even prominent personalities, they would need to stay as close to the actual form of its source as possible. This was considered important for inducing identification, recognition and familiarity among persons with mild to moderate dementia.

A participant explained how persons in the later stages of dementia tend to gravitate towards objects that are more deeply rooted in their long-term memories, which tend to be animate and familiar objects:

If you can't describe something it wouldn't have meaning. It would make you feel more anxious. That's why so many people in late-moderate to full on dementia, late stages, pick up baby dolls, because they can remember that, it's familiar. They pick up the kitchen apron because that's familiar. They pick up a magazine because that's familiar. They don't pick up abstract art. They don't pick up Rubix cube...stuff that they'd have to process... unambiguously positive and easily comprehended...absolutely nothing abstract. (I6)

A participant suggested how the sculptures at the Pride installation (Figure 72) all clearly resembled an animal, which would help persons with dementia identify the sculpture when they see it, thus enhancing the likelihood of it being remembered. She explained, "because it [Pride] also looks like a type of animal, I think it might work as well, because it's quite specific. It's quite unique in its look and where it's located."

Some participants thought that the bike rack (Figure 75) would serve as a familiar cue to a person with dementia walking down the street, and that there was just enough abstraction to render it quirky, artful and unique. A participant said, “I think someone would look at it and say, ‘That’s a bicycle, but it’s not a bicycle’ ...And it’s a piece of art...It’s amusing. It has a kind of humor to it” (I6). Another participant considered it to be easily identifiable, yet creative. She thought the limited abstraction helped retain its identity as a bike rack resembling a bicycle:

I think it’s easily identifiable. I think more than anything, it’s just a great little piece to stop and engage about, “Isn’t that fun?” or “Isn’t that cute?” or “Isn’t that just a fun way to do something? Isn’t that a fun way to make a bike rack”...If it had square wheels, somebody just went too far...Things need to be realistic...unambiguously positive. (I6)

Other participants believed that there was little in the way of distinction between the landmark and an actual bicycle. They believed that observers would not necessarily be able to tell the difference between the two. One participant even thought that it would not stand out because of the ubiquity of bicycles in Seattle, owing to it being a bike-friendly city:

It [Bike Rack] looks a bicycle someone parked there... you see bike racks everywhere...they aren't very unusual. Bicycles are parked everywhere in Seattle...because it’s a bicycle city (I1)

In discussing the merits of abstraction, a participant suggested that not being able to make sense of what something meant may evoke curiosity, urging persons with dementia to think and talk about it with people around them. She speculated that in

some circumstances having the freedom to form one's own individual impression, of what a landmark meant to them, may be relished by persons with mild to moderate dementia. She went on to suggest that persons with mild to moderate dementia may potentially find the search for meaning in abstract public art to be quite engaging:

there is something about the curiosity, the inability to parse it, that does in some circumstances become a really, I think there's real pleasure that people obtain from that...I might imagine, with dementia sometimes it can be hard to make sense of a lot of things. But I think there is a freedom that people feel in looking at an abstract kind of artwork...and say, "What the hell is that? That's strange!" In a sense knowing that there's not a right answer here. (I2)

#### *4C.3.7. Emotional content: personal meaning and narrative*

Certain landmarks were found to hold considerable emotional strength. This was thought of as a strategy to encourage persons with dementia to engage and connect with the landmark at a deeper, more personal level. A participant considered the sculptures at the Pride installation (Figure 72) to have emotional associations rooted in regional tradition. He explained, "they [Pride] do have this emotional strength to them. If I'm not mistaken, they are supposed to frighten the demons away from coming into the house or the temple" (I5). However, it is quite likely that landmarks may communicate meanings that may not be positive for older adults with dementia. It was suggested that viewing the Columbia Funeral Home (Figure 74) may result in the unpleasant experience of thinking about death and dying. Because the

structure attracted quite a bit of attention, it seemed that the negative effect it would have on the person's psychological state would be amplified:

it's a funeral home. I think seniors would see it. It's quite prominent...People don't like to be reminded of death and dying, that type of thing...I think people wouldn't like to visit it, but they'll know. It's so distinct that it'll definitely be used as some sort of navigation locator (I8)

While discussing the Columbia City mural (Figure 73), a participant suggested the value of artwork that has a strong narrative with vivid and descriptive imagery for its ability to facilitate engagement:

artworks were ones that had the strong narrative, a story they could tell. Or objects they could see...the mural on the wall that was painted by some community groups in the parking lot...you could go there and see stories. Somebody is happy. Somebody is sad. Somebody is fighting. Somebody is quiet. Somebody is playing a game. I didn't look very carefully. That's narrative...having the stories to tell becomes more interesting. (I5)

#### *4C.3.8. Engagement through multi-sensorial quality*

Tactile qualities in landmarks were expected to reengage persons' senses and enable maintenance of abilities for as long as possible, before their decline:

We need to keep using all of the senses, as long as possible, and especially the senses that still are the strongest...And we need to see if we can re-engage or rebuild some of the senses that are declining. (I6)

Locating landmarks in close proximity to the sidewalk was seen as a way of enabling walkers to interact with the tactile qualities of landmarks. An interviewee cited the example of a sidewalk art installation which was small-scale, interactive and tactile that she believed would be noticeable and memorable for persons with dementia. It was suggested that landmarks that are closer to persons with dementia while they walk on the sidewalk may facilitate a closer engagement due to visual as well as tactile connection.

#### *4C.3.9. Stability and endurance*

Having stable landmarks was considered to be essential for persons with dementia. Repeated exposure to certain landmarks was expected to help them with orientation and provide reassurance, while not finding a landmark at a certain location was expected to result in disorientation:

With regard to local landmarks, again, it's all those aspects. If you're choosing a specific landmark, it's got stability to it. So it's not something that would move. Say, in the care home environment, you've got really nice table that's very bright and colorful, and the care staff decide to move it to another place of the development. That would be very disorientating (I7)

A participant suggested creating green space that has a more enduring quality by growing a specific variety of plants that would persist through seasonal changes. She explained, "it's something that would maintain through the four seasons. So it wouldn't be something that died back, like a particular perennial...that might be a summer landmark, a bed of rudbeckia but it wouldn't do you any good in December" (I6).

A participant also acknowledged how the adaptive reuse of the Rainier Arts Center (Figure 68) enabled its historic shell to endure the test of time, while simultaneously embracing change through housing a contemporary function. She explained, “you can also see that it’s turned into an Arts center. So that could mean something that’s contemporary. So it’s taking something old, but also using it for a purpose to show something that’s contemporary” (I8).

#### *4C.3.10. Combinatory effect of landmark and signage*

A participant suggested an integrated approach of looking at landmarks and signage in tandem in order to support persons with differing degrees of sensory and cognitive abilities. She explained, “Being able to have signage alongside landmarks is important because if someone’s got problems with their visual perception, the language abilities may be stronger. So reading directions may be able to compensate for their visual difficulties that they have” (I7).

Participants found the Rainier Arts Center (Figure 68) to be noticeable because of the clear signage, which was thought to make the landmark more memorable. A participant said, “What it [Rainier Arts Center] has going for it is of course the great big honkin' sign on the front. And it’s down low...that sign still stands out. If you're looking for that, that could really work” (I2). Participants felt similarly about the sign at the entrance of the Columbia Funeral Home (Figure 74) and suggested having similar signage to enhance the side facade of the building as well so as to have the sign be visible from multiple angles:

I think this [Columbia Funeral Home] stood out maybe because of the very clear signage that’s there...very easy to remember...Maybe have some signage

on the other side, where there's a canopy...so that it's quite visible from different angles, because you can see it quite well if you're walking up that hill. But if you're walking down that hill I'm not sure how well you'd see it.

(I7)

Familiar signage was also found to enhance the landmark quality of historic buildings. The marquee above Ark Lodge cinema's (Figure 70) entrance was thought of as being a familiar prompt that would evoke reminiscence of one's early years, e.g. long-term memories of going to the movies, etc. It was also connected to the idea of pursuing hobbies and passions in later life, and would particularly stand out to someone that might enjoy watching movies:

what's familiar also has an advantage...the ability to prompt real reminiscence; thinking about older memories... the movie marquee, it looked like an old movie theater [Ark Lodge]...one of those old street fronts that had the title of the movie over top, I might well imagine that something like that would allow people to harken back to when they very young (I2)

The Pride installation (Figure 72) was suggested as being especially noticeable due to its position below the street sign. She said, "And it's [Pride] right underneath what looks to be the street sign. So one could well imagine the combination of reading the name of the street along with the lion can really help. (I2)

A participant mentioned having legible signage at appropriate height as a necessity for older adults with or without dementia, especially given the likelihood of vision deficits. It was suggested to have separate street signage for older pedestrians, besides those meant for drivers, by increasing the size of text and bringing it down to

the eye level, as well as signs in multiple languages to cater to people from different linguistic backgrounds:

Interviewees mentioned having legible signage at appropriate height as a necessity for older adults with and without dementia, especially given the likelihood of vision deficits. One interviewee suggested having separate street signage for older pedestrians, besides those meant for drivers, by increasing the size of text and bringing it down to the eye level. She also suggested having signs in multiple languages to cater to people from different linguistic backgrounds. (I7)

Appropriate placement of signage was a factor that participants identified as being critical in a few historic landmarks. The signage of the Seattle Public Library (Figure 71) was found to be inadequate and ill-placed, lacking in visibility from multiple angles. It was suggested to replace the same with clear and distinct signage:

There is a sign there [Seattle Public Library]. I didn't think it was very clear...could be made bigger. And it's not visible from the other side of the road. Maybe having something which is a little bit more clear and distinct. (I7)

The height of the sign was considered as being central to the noticeability and recognition of the Columbia City Theater (Figure 76). It was suggested to lower the height of the sign to eye level that can be viewed easily from the adjacent sidewalk:

the signage was on the top. If it was a little bit clearer, lower down, because if you were to just cover up that sign, you wouldn't be able to tell that's a theater [Columbia City Theater], so, maybe having the signage a little bit further down...maybe having something on the road that says, you don't want to have

an obstacle on the footpath, but something which was a little bit more along the route that made it stand out a bit more. (I7)

While the movie marquee at the Ark Lodge cinema (Figure 70) was found be visible to pedestrians from across the street it was expected that it may not be easily visible to walkers who are closer to the street front. It was suggested to include more signage at eye level along the blank wall of the street front for pedestrians on the adjacent sidewalk to be able to notice:

If there was a smaller alternative with the names of the shows that are being shown which is at eye level I think that would be really helpful, to make sure that they can see that. Because if you're just walking along that, I know there are posters of shows, but I can't see any clear signage seeing "Cinema" or so. (I7)

In addition to information about the cinema itself, a participant suggested including informational signage that might be germane to its status as a historic landmark:

This looks like a historic building [Ark Lodge]. But I don't see any information plaque or sign or anything like that which could easily be placed in the front area, somewhere, which would make it more interesting...I might have noticed the building or liked the building but I might not know the history of the building. Historical information of the building could be added to make the place more memorable, as I know about the building more. (I3)

Similar recommendations were made for public art landmarks that lacked informational signage. This was felt to be especially important for the Spirit of Washington monument (Figure 69), since it was centrally located in the green space,

at quite a distance from the sidewalk. A participant recommended including signs at the entrance to the park, which was expected to enhance wayfinding and noticeability of the landmark:

If people are coming to visit that [Spirit of Washington] potentially, if there was a sign, with a clear kind of arrow and signage with that picture, that would be quite supportive...having that symbol on some signage which is earlier on along the route before you come in...the “Columbia” sign is tucked in a bit; if there was something that’s next to that, or an arrow, something that makes it a bit clearer (I7)

#### *4C.4. Summary of results of interview*

Participants discussed several precursors to encountering landmarks in the neighborhood built environment, such as, history of walking in the neighborhood, physical accessibility and safety, walkability and closeness of destinations to home, and familiarity with place and route. They suggested that landmarks were also constructed through a combination of meaningful activity and purpose, with special emphasis on sites that involved social contact and interaction. Association with landmarks was expected to be strengthened with increase in time and frequency of exposure. Strategies employed by participants in using landmarks for wayfinding were also discussed. Landmarks were suggested as being perceived through four stages: (i) vision, (ii) attention, (iii) discrimination, and (iv) recognition. Some characteristics that participants discussed as being constitutive of a strong landmark include:

- having a well-defined, familiar purpose associated with it; landmark as destination
- location in a context with high physical accessibility and appropriate levels of stimulation
- location at decision points in order to support decision-making and wayfinding
- high visibility from multiple viewpoints
- contrast with surroundings: distinctiveness
- appropriate relational scale
- familiar and unique architectural aesthetics
- easily comprehensible and devoid of ambiguity
- stability and endurance

Participants also discussed the benefits of having distinctive and familiar signage complement the noticeability of landmarks. They also recommended that signs be placed at eye level and suitably oriented.

## CHAPTER 5

### DISCUSSION

This section covers discussion of two broad areas: (i) the methods used in the study, with particular focus on the photo-walk and photo-elicited focus group, and (ii) integration of results from phases 1 and 2 of the study.

#### *5.1 Reflection on methods*

Participants in the walking group were predisposed to taking pictures during walks preceding this study. This was the reason PhotoVoice was considered to be a suitable study method to employ with this group as it boosted a practice that already seemed to be prevalent among its members. However those in the group who had not taken pictures previously on walks were also excited at the prospect of getting to record their views and talking about them later during the focus group. Taking photos was found to aid participants' recall of things seen during the walk. D3.1 mentioned how he did not remember taking the picture of the bike rack when he looked at it during the focus group, but was able to derive new meanings from seeing the photo through the way the photo was framed.

Having photos as elicitation tools during the focus group helped participants in the first phase make sense of why the landmark stood out for them. An example of this was when D3.1 was able to surmise, from the way his photo of the sign of Igimo Artstation was composed and framed, that the building in the background did not seem as interesting as the sign captured in the foreground. Photos helped participants articulate the rationale behind their decision by visually communicating the same.

Previous research using interview methods both with older adults with and

without mild to moderate dementia found that participants with dementia had a lower awareness of their surroundings than those without dementia and were simply forging ahead to their destination without necessarily taking stock of the environment (Mitchell et al., 2004). In contrast, participants in the first phase were vigilant and took note of several environmental details.

Care partners played a vital part in ensuring the success of the photo-walk method. In addition to aiding participant recall during the focus group, care partners frequently asked their loved ones whether they thought anything in their surroundings appeared interesting to them. This tended to happen more often at the points of interest where the group would stop to listen to the walk leader share information about the place. The facilitator had informed the group before the walk started that they did not have to limit their choice to landmarks that were part of the tour, but could choose from anything that they saw. This ensured that participants did not feel limited to only taking pictures of predetermined landmarks.

There were several instances where participants photographed landmarks seen along the way that were not part of the guided walk. Contrary to the researcher's reservations about whether the participants in the group would have the freedom to self-select landmarks beyond the structure of the group walk, results from the photo-walk show that participants were able to successfully do so. In fact there were occasions when participants would spot a landmark off the beaten track, even across the road from where the group was walking, and would excuse themselves to go and take a picture of that landmark. As a result, a wide variety of landmarks, including both self-determined and predetermined points of interest, was produced.

This phenomenon may have been a product of the PhotoVoice method, i.e. a natural outcome of being given cameras to photograph landmarks, which arguably was quite a different experience from a routine walk in their neighborhood. It is important to view findings from this study within the context of the photo-walk because of the potential differences between walking habits and patterns practiced in everyday life and patterns that are inherent to group walks.

## ***5.2 Integrating results from phases 1 & 2***

### *5.2.1 Outdoor walking patterns and preferences*

The findings from the focus group revealed potential differences in the outdoor walking patterns of persons with mild to moderate dementia based on whether they lived alone or with a care partner. Of the participants in phase 1, persons who lived alone strategically devised walking routines so as to fulfil their daily needs and relied on order, structure and consistency in their environment. The remaining participants in phase 1, i.e. those who lived with care partners, were afforded a little more flexibility in terms of route selection, owing to support from the latter. However, all participants seemed to prefer sticking to a familiar route, and walk to familiar destinations. The explanation offered by experts-by-profession was that familiarity with one's environment facilitated ease of mobility, and it was this relative ease that made familiar environments more preferable to walk in. Limiting one's walking within familiar areas has been discussed as a coping strategy employed by persons with dementia in previous research, as well (Brorsson et al., 2013; Duggan et al., 2008).

Experts-by-experience also mentioned the value of walking in nature besides walking down streets flanked by buildings within their neighborhood. D1.2 explained how she walked with her husband around the local lake periodically. Previous research has discussed how walking in naturally-mapped environments such as nature trails, where persons need not make wayfinding decisions and can simply follow the path can be restorative (Olsson et al., 2013). An expert-by-profession also mentioned how a group walking program that she worked with had a similar experience of being able to walk freely in an unregimented manner along a trail framed by blue space and green space.

### *5.2.2 Using environmental cues to cope with change*

Experts-by-experience in phase 1 of the study reported their reliance on landmarks for wayfinding and orientation, both in familiar and unfamiliar environments. They found unexpected changes in the neighborhood built environment to be extremely disorienting and detrimental to wayfinding, especially in familiar environments that were undergoing redevelopment. A possible explanation offered by experts-by-profession in phase 2 of the study, for why the stable presence of familiar cues is so critical, was the difficulty experienced in learning new route information due to episodic memory problems. According to them, for persons with dementia, remembering route information and environmental details would require greater and more frequent exposure, which is why persons with dementia were likely expected to retain memory of familiar environments owing to consistent and sustained contact.

Despite the shortcomings of rapidly changing urban form, experts-by

-experience in phase 1 of the study reported adopting coping strategies that included using stable iconic landmarks in their neighborhood, as well as newer additions of public art. One participant even mentioned relying mostly on GPS technology to find her way from place to place.

### *5.2.3 Different landmarks stand out for different reasons*

The results suggest that persons with mild to moderate dementia may have different reasons to find the same landmark noticeable and attractive, as was the case with several public art landmarks in Columbia City. But what was also apparent was the wide diversity of views, opinions and preferences for landmarks, based on people's background, interests and life-experience. During the focus group there were several instances where participants had widely differing views about the same landmark, as well as there being a range of different landmarks that only certain participants were drawn to, owing to their background or interests. This relates to the idea of diversity within the dementia experience, where there isn't necessarily just one kind of representation (Ward et al., 2017). Designers must consider individual differences when implementing dementia-friendly design in communities and ensuring heterogeneity in design concepts and solutions that cater to this diversity.

### *5.2.4 Situatedness of landmarks*

Experts-by-profession explained how landmarks that are perceived as being distinctive and noticeable on their own, when seen in tandem with the context that they are situated in, may not appear as attractive. This was an issue raised with regard to the Pride installation and the Sound of Light mural, both of which were located along a major highway, which was perceived as not being an ideal walking route for

persons with mild to moderate dementia. The Columbia City Mural was also found to be problematic due to its location off the beaten track, inside a parking lot that did not receive a lot of foot traffic. While not discussed in direct conjunction with landmarks, previous research has indicated that spaces with heavy vehicular traffic have been found to challenge persons with mild to moderate dementia, both in terms of physical as well as cognitive accessibility (Blackman, Van Schaik, et al., 2007; Brorsson et al., 2013; Duggan et al., 2008). Therefore, it is imperative to strategically locate landmarks in walkable areas that are not cognitively demanding.

#### *5.2.5 Well-defined purpose associated with landmarks*

Although some experts-by-profession in phase 2 of the study emphasized that a clear sense of purpose needs to be established within the landmark for it to be easily perceived, it was the combination of function along with form that made a landmark like the bike rack stand out to experts-by-experience. Its creative design and unique aesthetic elevated it to a noticeable and attractive piece of art, besides simply being a functional object of practical importance, which was why it caught the attention of D3.1. Multiple experts-by-profession in phase 2 suggested that a piece of art that is also functional may be appreciated by persons with dementia even more. They suggested incorporating an aspect of multi-functionality into public art in order to strengthen their identity.

Findings also indicated that the usefulness of objects may seem apparent and meaningful to participants with dementia only if it was something with which they have had prior experience. In the post-walk survey, the Columbia City Theater was selected by all five experts-by-experience as being noticeable, while only five out of

nine experts-by-profession in phase 2 selected the theater over the bike rack. Experts-by-profession thought it would not stand out as much owing to its lack of physical distinctiveness. On the other hand, experts-by-experience were drawn to it regardless of how visually attractive it was, owing to their appreciation and personal history with live theater. Findings from the focus group support findings from previous research conducted in familiar settings where participants were drawn to places that were steeped in personal history that may not necessarily have particularly striking physical form (Kelson et al., 2017; Ward et al., 2017).

#### *5.2.6 Familiar objects in an unfamiliar neighborhood*

Despite walking in a neighborhood which was mostly unfamiliar to the group, participants in the first phase were able to identify and recognize several familiar objects which had some kind of personal association or meaning for them. Experts-by-profession in phase 2 suggested that recognizing a building or an object that one has encountered before can help retain them as landmarks in one's cognitive map. There were several instances where this occurred: (i) D2.1's personal connection to the Seattle Public Library, owing to his personal history of spending his years in studying at libraries, (ii) D3.1's passion for biking led him to notice the bike rack, his knowledge of classic cars prompted his discovery of the Chevrolet Corvair, (iii) D4.1's commitment to pro-environmental behavior enabled her to identify and photograph the recycling container as a landmark, and (iv) D5's preference for a certain quality of material which drew him to landmarks such as the Sound of Light mural and the Spirit of Washington monument.

The group was also able to decipher cultural undertones in the Pride

sculptures, based on intuition or prior knowledge. When presented in the survey, only five out of nine experts-by-profession selected it as being noticeable, while the rest selected the Seattle Public Library. The latter believed that persons with dementia who were familiar with the cultural significance of the sculptures would be drawn to the landmark than others. However, in the post-walk survey all experts-by-experience selected the Pride installation as being more noticeable for its symbolic qualities, such as “strength”, “integrity” and “stability” (D3.1).

The group was also able to recall exact locations of street clocks similar to the one they encountered at Columbia City. D5 was also able to identify a set of sculptures similar to the ones that are a part of the Pride installation and found that seeing them one after the other enhanced their memorability. This is linked to the point made by experts-by-profession about finding ways to increase the person’s exposure to the landmark. To prevent homogenization and concomitant disorientation, an expert-by-profession recommended having multiple versions of the same landmark at different locations with slight tweaks, e.g. color differences. Having individually distinct features that slightly set versions of the same landmark apart from one another, was expected to support both recognizability and discriminability.

In contrast to the study by Phillips et al. (2012), where it was suggested that participants in unfamiliar environments were able to only comment on visual aesthetics of the outdoor environment and lacked depth, the findings in this study indicate that persons with mild to moderate dementia may be able to identify cues that are familiar to them for different reasons, even within unfamiliar outdoor environments. This suggests that implementing dementia-friendly design guidelines in

communities may not only facilitate outdoor mobility within one's own neighborhood, but also, potentially, in other neighborhoods too. This may be particularly helpful to help members of group walking programs such as "Out and About" feel a sense of familiarity when they go on walks in different neighborhoods in the city. However, the participants' keen eye for detail and their awareness of parallels between different landmarks in phase 1 may be attributed to the nature of the task at hand, i.e. taking photos. It is equally likely that someone who might have been intently focused on walking, during a regular walking routine, would not have noticed them at all.

#### *5.2.7 Link between landmarks and signage*

While findings from Phase 1 suggested that landmarks with well-defined purpose and function were meaningful for participants, it wasn't entirely clear if the landmark in question, say, the Seattle Public Library, was easily perceived as a library simply by looking at the building and its signage or because they listened to the walk leader introducing it to them. It would have been interesting to see how the walkers would have responded to the building without knowing anything about it. Previous research has found that buildings that did not have clear apparent sense of purpose were not identified until participants were able to see well-designed signage associated with the building (Blackman, Van Schaik, et al., 2007).

Previous research has suggested participants with dementia may be better able to integrate signs with text rather than those with images into their wayfinding routine (Blackman, Van Schaik, et al., 2007). This finding suggests that persons with mild to moderate dementia may find written information more easily comprehensible than pictorial information, which is also consistent with previous findings (Blackman,

Van Schaik, et al., 2007). This was supported by findings from the photo-walk and focus group, where participants gravitated towards signs with readable text, such as the sign of Igimo Art Station or the graffiti hanging from a stanchion.

Although D5 selected the Sound of Light mural as being interesting during the focus group, he did not select it as being noticeable during the survey. Instead, he chose the Rainier Arts Center, explaining that, “the vertical words on the Arts Center are clear yet unusual and strong in contrast” (D5). He also found this to be more compelling than the Sound of Light mural, although the latter was “far more visually pleasing”, mainly because it was “not as specific in purpose” (D5). This finding further supports the recommendation made by experts-by-profession in phase 2, i.e. landmarks with a well-defined purpose that are easily identifiable may be potentially more noticeable than abstract artwork devoid of a clear function attached to it.

While discussing the Ark Lodge Cinema, experts-by-profession suggested that while the movie marquee was visible from the other side of the street, it was too high for a person with dementia to be able to comfortably view from the sidewalk adjacent to the cinema. They recommended having an additional sign at eye-level that is easy to access for persons with dementia walking alongside the street front. Previous research has found that signs located at eye level enhanced the wayfinding performance of persons with dementia (Blackman, Van Schaik, et al., 2007). Having signs at multiple heights and scales to be seen clearly from different points is essential. In the survey, although five out of nine experts-by-profession selected the cinema as being more noticeable than the Spirit of Washington monument for its scale, distinctiveness and familiar function, only one expert-by-experience selected it as being more noticeable

than the Spirit of Washington monument, which was appreciated by most others for its uniqueness and “quirky shape.” Since the first group was only shown a single view of the cinema from across the street, not all of them may have been able to clearly identify it as a cinema, potentially due to the lack of a visually prominent sign.

#### *5.2.8 Perceiving scale*

The unusual scale of the street clock was cited as being one of the reasons why it was found to be noticeable by an expert-by-experience (D1.1) in phase 1 of the study. The concepts of relational scale, as well as proximity of landmarks to the sidewalk, as explained by experts-by-profession in phase 2, could potentially be applied to this scenario to understand why the street clock may have stood out for the participant. It is likely that the nearness of the landmark, owing to its close proximity to the sidewalk, and the unusualness of its scale together made a greater impact for the participant. However, there were also instances where experts-by-profession in phase 2 identified the scale of certain landmarks as being a hindrance to their noticeability. For example, experts-by-profession found the façade of the Rainier Arts Center to be too high for older adults with and without dementia to be able to see comfortably, due to their lowered cone of vision. The bike rack was also found to be too low by quite a few experts-by-experience, and although it was located adjacent to the sidewalk, it was perceived as hiding in plain sight and likely to be hidden by parked vehicles in the vicinity. However there were no corresponding insights from experts-by-experience to support these claims with relation to the scale of these landmarks posing hindrance to their noticeability.

Although most experts-by-experience chose the Sound of Light mural as being

noticeable and attractive, some experts-by-profession believed that it would not serve well as a wayfinding cue because of its scale. Most experts-by-profession recommended having a single clear visual instead of multiple stimuli spread over a considerable length, as in the case of the mural; however one respondent believed that the mural would serve quite well as a boundary landmark in its present state.

#### *5.2.9 High contrast enhances noticeability*

Several experts-by-experience in phase 1 mentioned being struck by the bright colors used in the Sound of light and Columbia City murals, which were cited as reasons for selecting these landmarks as being noticeable. This finding is consistent with previous research findings that point to the effectiveness of brightly colored outdoor landmarks for persons with mild to moderate dementia (Mitchell et al., 2004). This relates to the aspect of contrast being integral to the noticeability of landmarks, a criterion that experts-by-profession used in regarding the aforementioned examples as strong landmarks and the Spirit of Washington monument as a weak landmark on account of low contrast with its surroundings.

#### *5.2.10 Multi-sensorial quality*

Several landmarks, notably those within the public art domain, were appreciated for their textures, bright colors, thereby providing multi-sensorial stimulation. Previous research has found that offering visual, auditory, tactile and olfactory stimuli facilitate and enhance engagement among persons with dementia (Baker et al., 2001).

#### *5.2.11 Appeal of abstract public art*

Experts-by-experience as well as experts-by-profession considered public art

to be attractive landmarks. The survey results from both phases of the study indicated that, overall, both groups had a similar preference for public art over historic buildings.

One theme that stood out in the study was the appeal of abstraction for persons with dementia. Previous research on the aesthetic preferences of older adults with and without Alzheimer's dementia for three different styles of art, i.e. representational, quasi-representational and abstract, found no interaction between style of art and group (Halpern, Ly, Elkin-Frankston, & O'Connor, 2008). Although it was hypothesized in this study that the group with dementia would not prefer art that is difficult to describe, i.e. quasi-representational and abstract art, the findings did not produce any such clear associations and widely differed by person (Halpern et al., 2008).

In phase 2 of the present study, some experts-by-profession suggested that too much abstraction in outdoor landmarks would deter people from being able to identify the landmark that would in turn hinder their retention in people's cognitive maps. However, when employed judiciously and in moderation, experts-by-profession suggested that persons with mild to moderate dementia may actually find them to be quite engaging. While some of them advocated mostly for literal, figurative, and positively unambiguous images, others spoke of their experience seeing persons with mild to moderate dementia engage with abstract public art. This was also reflected in previous research where abstract public art and sculptures not only prompted conversation and recognition for their strangeness and unusualness, but were also appropriated for unintended and surprising functions (Kelson et al., 2017).

This was apparent in the choices and reflections of experts-by-experience, as seen in the results of the focus group. The abstract quality of several landmarks photographed by participants in the first phase of the study allowed them to read their own meaning into it, without having to fit their understanding of the object to predetermined, conventional categories, labels and identities from their semantic memory. Interestingly, in the example of the Sound of Light mural, although the landmark itself was abstract, unfamiliar and did not contain any immediate associations for most participants except for the bright colors that were used, D5 noticed that the mural was made using bicycle reflectors, and appreciated the repurposing of a known material for artistic purposes. Despite being an abstract piece of art, the use of a familiar material helped facilitate a sense of recognition, thus enabling it to strike a personal chord with the participant.

The notion that abstract artwork allowed for personal meanings to be imprinted was further supported by the multitude of emotional responses from participants in the first phase. This could be potentially because they were at a stage in their life filled with introspection and reflection, and therefore a greater sensitivity to things that pleased their senses or struck an emotional chord, regardless of whether or not they constituted familiar archetypes in their cognitive map. Because they were in an unfamiliar neighborhood, these abstract works of art may have allowed them to read more personal meaning, while other types of landmarks such as historical buildings may have demanded opinions to be formed on factual basis.

The reverse may be true in their own neighborhoods where they may share

deep history and intimate familiarity and where meaning is constructed through repeated experience. This was alluded to by an expert-by-profession in the interview, when she spoke about how a gelateria, which was quite a nondescript, conventional-looking building, served as a “social landmark” for persons with mild to moderate dementia who congregated there regularly at the end of a group walk.

### ***5.3 Design recommendations***

The following images were generated based on design recommendations made by experts-by-profession in order to enhance various landmarks’ potential to serve as wayfinding cues.

#### ***5.3.1 Make landmarks visible from multiple perspectives***

I1 and I7 recommended that the blank faces of the staggered retaining wall of the Sound of Light mural also be populated with panels of mosaic (Figure 80), so as to promote the landmark’s visibility in all directions.



**Figure 80: Sound of Light mural: existing (left); modified (right)**

I7 suggested extending the panels of Columbia City mural around the corner of the building in order to enhance its noticeability for pedestrians on sidewalk, which was restricted in its previous state on the blank wall facing the parking lot (Figure 81)



**Figure 81: Columbia City mural: existing (left); modified (right)**

### *5.3.2 Prove a place to rest and observe at the landmark*

I4 and I6 suggested introducing a bump-out adjoining the pathway that runs alongside the Spirit of Washington monument and adequate seating (Figure 82) in order to facilitate pause and engagement with the landmark.



**Figure 82: Spirit of Washington monument: existing (left); modified (right)**

### *5.3.3 Use bright colors to enhance contrast of the landmark*

I3 suggested enhancing the distinctiveness of the façade of the Ark Lodge

cinema by using brighter colors at the entryway (Figure 83). I7 and I8 also recommended making the sign with the text “CINEMA” more noticeable by improving its visual contrast (Figure 83).



Figure 83: Ark Lodge cinema: existing (left); modified (right)

I1, I4, I5 and I6 suggested using a brighter color to enhance the noticeability of the bike rack (Figure 84).



Figure 84: Bike rack: existing (left); modified (right)

*5.3.4 Use clear signage to indicate the function and identity of the landmark*

I7 and I8 suggested introducing more prominent signage at the Seattle Public library in order to enhance its noticeability and identifiability (Figure 85).



**Figure 85: Seattle Public Library: existing (left); modified (right)**

## CHAPTER 6

### CONCLUSION

By virtue of being an exploratory study, the findings open up a vast array of possible questions for future studies. The following section outlines some potential research topics and hypotheses that may be tested to gain a better understanding of the how neighborhood landmarks are perceived by persons with mild to moderate dementia. Limitations of the research are also discussed here.

#### ***6.1 Limitations***

##### *6.1.1 Photo-walk*

Dyads were asked to work as a team while taking pictures on the walk, which meant that they would need to walk side-by-side at all times. But the nature of the program was such that members were free to walk at their own pace and along with others as they pleased, due to which some participants and their care partners were seldom together, except at points of interest where everyone regrouped. Because of this participants were able to converse with their care partner about why certain pre-determined landmarks stood out to them, while they were not able to have similar conversations about some of the self-determined landmarks that were photographed. Previous research has demonstrated the benefits of using mobile applications custom-designed for citizen science and similar participatory approaches, e.g. MapLocal, Stanford Discovery Tool, etc., which allow participants' spatial experiences to be recorded simultaneously through visual, audio and GPS-based information (Jones, Layard, Speed, & Lorne, 2015; King et al., 2016). Although these studies were not conducted with older adults with dementia, using similar applications for the photo-

walk in the present study may have helped overcome the aforementioned limitation. However, the researcher and community partner jointly favored incorporating Polaroids, as it allowed participants to immediately see the results of their photography. This was considered to be more preferable than using digital technology which was regarded as being potentially too complex to operate for older adults with mild to moderate dementia.

Working with 10-print Polaroid film was challenging. Participants were extremely enthusiastic and went on to take a large number of pictures. At several points during the walk they may have identified a landmark that they wanted to photograph, but could not because they ran out of film, and had already moved on to walking with the group before the researcher could assist with replacing film. A better organized and streamlined system could be devised for future studies that employ this method.

While PhotoVoice facilitated instant access to prints and participants were able to successfully use the Polaroid cameras for the most part, there were some issues raised about lack of functionality. D3.1 pointed out not having the zoom function on the Polaroid camera, like in digital cameras, as a disadvantage to being able to accurately capture aspects of the landmark that one saw as being noteworthy. He also cited not having an LCD screen to preview the photograph as a drawback. The process of taking a picture and waiting for the print to develop to see if they captured what they wanted to prevented some participants from being able to keep up with the group. Future research that employs similar visual methods would need to consider the relative benefits and drawbacks of using either Polaroid or digital cameras.

If a researcher decides to use Polaroid cameras, then it is advisable that they

conduct a workshop with participants in order to help them become familiar with the functionality of the camera. Although this was not a major problem in the present study, where the participants were able to quickly grasp how the camera worked, it may pose issues for other groups of participants.

### *6.1.2 Interviews*

There were several instances during the interviews with experts-by- profession when it was hard to distinguish between participants' personal preferences for landmarks and how they thought persons with dementia would perceive the same. A way of resolving this could have been to ask interviewees to clarify their response soon after, to ascertain the subject of their statement. However, in the interest of time, seeking further clarification was avoided. This may be a threat to the validity of participants' responses. In future interviews with experts-by- profession, questions could be framed so as to emphasize that the participant respond strictly in relation to how the person with dementia would perceive certain aspects of landmarks.

A few experts-by-profession pointed out that their opinions may have been biased by the nature of photographs that were presented to them in the survey and interviews, since they did not have the added advantage of walking in Columbia City and seeing landmarks for themselves, as participants in the first phase did. Photo quality, as well as aspects such as color, lighting, when the photo was taken, could have influence how participants perceived the landmarks. Future research using similar protocol could ensure that the photographs for the second phase of study be taken during the photo-walk in the first phase, in order to maintain consistency in presentation of landmarks.

These interviews capture only a small segment of insights and experience by focusing on researchers and practitioners. A broader set of responses may have been collected by involving social workers, care providers and outdoor recreation program coordinators in the study.

### *6.1.3 Survey*

The fact that the same pairs of historic buildings and public art landmarks were administered to all participants in both phases 1 and 2 may have biased their responses. This could have been avoided by incorporating permuted pairing within the design of the survey instrument, hence disentangling the effect of pairing from participants' selections.

### *6.1.4 Sample size*

While, the small sample size was ideal for the qualitative component of the study, it was a limitation for the quantitative component involving surveys. Since the first phase was predominantly a field study that employed visual methods, this was an appropriate sample size. It is commonly held that for statistical power in quantitative analysis a minimum of  $N=25$  is essential (McHugh, 2008). This was lacking in this study since both phases had a smaller sample size than the minimum;  $N=5$  and  $N=9$  in phases 1 and 2 respectively. Moreover, since these findings pertain to a specific geographic location, they may not be generalizable to other locations.

However, conducting the photo-walk with all five members of the group simultaneously did not allow the researcher to be able to observe individual behavior, choices and interactions. This shortcoming could have been avoided by seeking the help of research assistants.

Besides using the site of the neighborhood purely as a source for prompts (photos) to elicit responses in later exchanges (focus group), alternative place-based methods, such as one-on-one walking interviews with persons with mild to moderate dementia, may have been employed in order to engage in deeper in-situ conversation and make the most of being outside during data collection.

## ***6.2 Future research***

### *6.2.1 Public art as landmarks*

While there were several categories of landmarks that emerged from the results of the photo-walk and the focus group, public art seemed to be the most salient of them all. Randomized control studies may be performed in the future to further ascertain whether or not public art is indeed a more noticeable landmark than, say, historic buildings. In order to compare the effectiveness of historic buildings and public art landmarks as wayfinding cues, virtual reality simulation studies may be conducted, similar to the methods followed in previous research (Blackman, Van Schaik, et al., 2007).

While there were some more figurative and representational public art landmarks that experts-by-experience were able to readily recognize, such as the street clock, there were some more abstract examples such as the Spirit of Washington, where participants were not sure of what was being represented, although some guessed what it could possibly mean. On the other hand, the bike rack seemed to strike a balance between representation and abstraction of the form of a bicycle, which was not only readily identified by D3.1, but was also appreciated by an expert-by-profession for its measured use of abstraction. Focused studies may be designed

around examining whether public art landmarks that are figurative in nature are more or less noticeable than those that are abstract. It may be hypothesized that public art landmarks that have a good balance of both representational and abstract characteristics may be most easily perceived by persons with mild to moderate dementia.

#### *6.2.2 Optimizing the scale of landmarks*

There was a lack of consensus on whether the scale of the Sound of Light mural would complement its role as a wayfinding cue, with some experts-by-profession in support of it and others unsure of its effectiveness. A simulation study could be designed where older adults with mild to moderate dementia are exposed to conditions where the mural is presented in its existing length and another where it is more compact and provides one clear visual. It may be hypothesized that the more compact version of the mural would better support wayfinding than the extended version. However, as was noted by an expert-by-profession in relation to the bike rack, a hierarchy of landmarks ranging from small to large are essential and co-constitute the total wayfinding system. The findings may indicate that landmarks of different scales may provide different kinds of visual and directional information, and may be used to perform different wayfinding tasks.

#### *6.2.3 Locating landmarks*

While care partners in the focus group mentioned using distant landmarks as orientation cues, the results of the photo-walk indicated a preponderance of nearby landmarks. This may have been due to the unfamiliar context and suggests a possible relationship between familiarity of context and distance at which landmarks are

identified and recognized. An expert-by-profession suggested that further research may be required to ascertain how persons with mild to moderate dementia differentially perceive nearby and distant landmarks and to see if there is a preference for either. Future research can use digitally-simulated environments to manipulate the distance between the sidewalk and the landmark as a variable that may impact visibility and noticeability of landmarks. Based on points expressed by experts-by-profession, it may be hypothesized that nearby landmarks may be more visible, noticeable and interactive than those that are distant.

An expert-by-profession suggested using simulated environments to compare the wayfinding efficiency of landmarks located at decision points vs. those placed along the route. Based on previous research, she suggested that decision points are harder for persons with mild to moderate dementia to perform decision-making and wayfinding. Therefore, it may be hypothesized that wayfinding would be more significantly improved by placing landmarks at decision points rather than along the outdoor walking route.

Further research is also required to examine the correlation between landmark characteristics and wayfinding strategies employed by persons with mild to moderate dementia. An interviewee suggested that the deficit in spatial abilities to distinguish between left and right may hinder persons from being able to effectively use the associative cue strategy with landmarks. It may be hypothesized that older adults with mild to moderate dementia would be less successful at combining visual information from the landmark and directional information pertaining to route selection.

#### *6.2.4 Conducting the study in familiar vs. unfamiliar environments*

As noted earlier the findings from the first phase of the study, i.e. the photo-walk may have differed from the events of a routine walk that participants went on by themselves or along with a care partner. Further mixed-methods research is required to understand how landmarks are perceived by persons during regular walking routines in and around their neighborhood. An expert-by-experience suggested that the way landmarks are perceived may be contingent on how familiar they are with the setting. Therefore a comparative study that examines the differences between perception of landmarks of different types across settings with varying levels of familiarity, ranging from very familiar to unfamiliar, would be valuable to further understand how level of familiarity with the setting influences the way landmarks are perceived. As discussed in the previous section, it may be hypothesized that persons with dementia may find public art landmarks more noticeable and meaningful in unfamiliar neighborhoods and the same for historic buildings in familiar neighborhoods.

This would involve looking at landmarks within the context of persons' total journey to and from destinations. A previous study suggested that landmarks that served as wayfinding cues were logically related to the destination, e.g. a postbox serving as a cue to find one's way to the neighborhood post office (Blackman, Schaik, et al., 2007). While previous research as well as the findings from this study show that persons with dementia and their partners choose different walking routes for different reasons, it is important to examine how different landmarks may be used as cues for different journeys.

Part of this endeavor would also be to include variables that relate to the

background and demographic of the person with dementia. As an expert-by-profession suggested, more focused studies could examine how landmarks are perceived and used for wayfinding differently by older adults with differing types of dementia, as well as differences in age, gender, race and ethnicity, education, profession and whether they live alone or with a care partner. Previous research and findings from the focus group have already hinted at potential differences in how older adults with dementia living alone may respond differently to environmental cues for wayfinding than those living with care partners. This would need to be expanded in future research in order to examine the differences among participants with a range of background characteristics.

### ***6.3 Statement of relevance***

The Dementia-Friendly Communities initiative recognizes the significance of the built environment for community-dwelling older adults with dementia (Alzheimer Society, 2016). Based on literature review and community engagement through surveys etc., local governments are developing “dementia-friendly community action plans” consisting of several broad strategies to make the physical environment more accessible to persons with dementia (City of New Westminster, 2016). Some of these strategies include (i) erecting clear directional signage and points of interest to facilitate orientation and wayfinding, (ii) providing safe and accessible sidewalks and pathways for pedestrians, (iii) creating a universally accessible transit system, and (iii) recognizing the importance of heritage buildings and public art as landmarks for wayfinding (City of New Westminster, 2016). Different local government departments

and agencies have been identified to implement the aforementioned strategies including Parks, Culture and Recreation, Planning Division, Engineering, Civic Buildings and Properties etc. (City of New Westminster, 2016).

While consulting and engaging with persons with dementia is central to the mission of the Dementia-Friendly Communities initiative, a more concerted effort is required in order to translate evidence based knowledge, i.e., people's perceptions, lived-experiences, concerns and recommendations, into design guidelines for accessible and supportive environments. This thesis presents participatory design research as a viable approach that may be undertaken by local government departments and agencies during the process of implementation of action plans for dementia-friendly communities.

The mixed methods approach adopted in this study helps elicit different kinds of information from participants which can help generate testable hypotheses for devising successful built environmental interventions that enhance quality of life for people with dementia. In addition to addressing local dementia-friendly community initiatives, this research also contributes to the substantive empirical knowledge of the interrelationships of the neighbourhood environment and community-dwelling older adults with dementia. The evidence from this research may potentially help inform the development and execution of built environment strategies as part of dementia-friendly community action plans.

In addition to widening the scope for design research for dementia-friendly neighborhoods, this study is situated within the unique context of a neighborhood group walking program. "Out and About" presents an interesting contrast to the oft-

discussed notion of walking with dementia, which is most often associated with natural settings, by situating the experience in urban neighborhoods of Seattle. The findings from this thesis may help spread awareness of the value of walking as a group in urban neighborhoods for persons with dementia and help other cities to adopt a similar framework for their local dementia-recreation programming. This is particularly relevant given the wide-reaching impact of the Dementia Friendly America (DFA) initiative.

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## APPENDICES

### A. Cornell University Institutional Review Board, letter of approval for phase 1



Cornell University  
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#### Institutional Review Board for Human Participants

#### NOTICE OF EXPEDITED APPROVAL

**To:** Kishore Rajaram Seetharaman  
**From:** Carol Devine, IRB Chairperson *Carol M. Devine*  
**Protocol ID#:** 1707007307  
**Protocol Title:** Impact of Neighborhood Walking on Persons Living with Memory Loss  
**Approval Date:** August 04, 2017  
**Expiration Date:** August 03, 2018

Cornell University's Institutional Review Board for Human Participants (IRB) has reviewed and approved the inclusion of human participants in the research activities described in the protocol referenced above. This approval shall remain in effect until **August 03, 2018**.

The following personnel are approved to perform research activities on this protocol:

- Kishore Rajaram Seetharaman
- Cayce Cheairs
- Mardelle Shepley

This approval by the IRB means that human participants can be included in this research. However, there may be additional university and local policies that apply before research activities can begin under this protocol. It is the investigator's responsibility to ensure these requirements are also met.

Please note the following important conditions of approval for this study:

1. All consent forms, records of study participation, and other consent materials **must** be held by the investigator for **five years** after the close of the study.
2. Investigators must submit to the IRB any **proposed amendment** to the study protocol, consent forms, interviews, recruiting strategies, and other materials. Investigators may not use these materials with human participants until receipt of written IRB approval for the amendment. For information about study amendment procedures and access to the Amendments application form, please refer to the IRB website: <http://www.irb.cornell.edu/forms>.

3. Investigators must promptly report to the IRB any **unexpected events** involving human participants. The definition of prompt reporting depends upon the seriousness of the unexpected event. For guidance on recognizing, defining, and reporting unexpected events to the IRB, please refer to the IRB website: <http://www.irb.cornell.edu/policy>.

If the use of human participants is to continue beyond the assigned approval period, the protocol must be re-reviewed and receive continuing approval. As the Principal Investigator it is your responsibility to obtain review and continued approval before the expiration date. Applications for renewal of approval must be submitted sufficiently in advance of the expiration date to permit the IRB to conduct its review before the current approval expires. Please allow three weeks for the review.

**Any research-related activities -- including recruitment and/or consent of participants, research-related interventions, data collection, and analysis of identifiable data -- conducted during a period of lapsed approval is unapproved research and can never be reported or published as research data.** If research-related activities occur during a lapse in the protocol approval, the activities become a research compliance issue and must be reported to the IRB via an unexpected event form ([www.irb.cornell.edu/forms](http://www.irb.cornell.edu/forms)).

For questions related to this application or for IRB review procedures, please contact the IRB office at [irbhp@cornell.edu](mailto:irbhp@cornell.edu) or 255-6182. Visit the IRB website at [www.irb.cornell.edu](http://www.irb.cornell.edu) for policies, procedures, FAQs, forms, and other helpful information about Cornell's Human Participant Research Program. Please download the latest forms from the IRB website [www.irb.cornell.edu/forms/](http://www.irb.cornell.edu/forms/) for each submission.



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**Institutional Review Board for Human Participants**

**NOTICE OF EXPEDITED AMENDMENT APPROVAL**

**To:** Kishore Rajaram Seetharaman  
**From:** Carol Devine, IRB Chairperson *Carol M. Devine*  
**Protocol ID#:** 1707007307  
**Protocol Title:** Impact of Neighborhood Walking on Persons Living with Memory Loss  
**Approval Date:** September 19, 2017  
**Expiration Date:** August 03, 2018

Cornell University's Institutional Review Board for Human Participants (IRB) has reviewed and approved the following change(s)/modification(s) to the previously approved protocol referenced above:

Please note the following:

- Addition of audio recording for discussions during guided walk.
- Minor update to consent form to reflect change noted above.

This approval shall remain in effect until **August 03, 2018**.

If you requested modifications to consent form(s), please use the attached revised/new consent form for any future subject enrollment.

If you submitted revised/final versions of interview guides, questionnaires, standard operating procedures, or any other research materials, you have approval to use those materials.

All other study procedures/instruments are to remain unchanged.

The following personnel are approved to perform research activities on this protocol:

- Kishore Rajaram Seetharaman
- Cayce Cheairs
- Mardelle Shepley

Please note the following important conditions of approval for this study:

1. All consent forms, records of study participation, and other consent materials **must** be held by the investigator for **five years** after the close of the study.
2. Investigators must submit to the IRB any **proposed amendment** to the study protocol, consent forms, interviews, recruiting strategies, and other materials. Investigators may not use these materials with human participants until receipt of written IRB approval for the amendment. For information about study amendment procedures and access to the Amendments application form, please refer to the IRB website: <http://www.irb.cornell.edu/forms>.
3. Investigators must promptly report to the IRB any **unexpected events** involving human participants. The definition of prompt reporting depends upon the seriousness of the unexpected event. For guidance on recognizing, defining, and reporting unexpected events to the IRB, please refer to the IRB website: <http://www.irb.cornell.edu/policy>.

If the use of human participants is to continue beyond the assigned approval period, the protocol must be re-reviewed and receive continuing approval. As the Principal Investigator it is your responsibility to obtain review and continued approval before the expiration date. Applications for renewal of approval must be submitted sufficiently in advance of the expiration date to permit the IRB to conduct its review before the current approval expires. Please allow three weeks for the review.

**Any research-related activities -- including recruitment and/or consent of participants, research-related interventions, data collection, and analysis of identifiable data -- conducted during a period of lapsed approval is unapproved research and can never be reported or published as research data.** If research-related activities occur during a lapse in the protocol approval, the activities become a research compliance issue and must be reported to the IRB via an unexpected event form ([www.irb.cornell.edu/forms](http://www.irb.cornell.edu/forms)).

For questions related to this application or for IRB review procedures, please contact the IRB office at [irbhp@cornell.edu](mailto:irbhp@cornell.edu) or 255-6182. Visit the IRB website at [www.irb.cornell.edu](http://www.irb.cornell.edu) for policies, procedures, FAQs, forms, and other helpful information about Cornell's Human Participant Research Program. Please download the latest forms from the IRB website [www.irb.cornell.edu/forms/](http://www.irb.cornell.edu/forms/) for each submission.

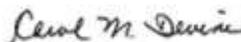


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## Institutional Review Board for Human Participants

### NOTICE OF EXPEDITED AMENDMENT APPROVAL

**To:** Kishore Rajaram Seetharaman  
**From:** Carol Devine, IRB Chairperson   
**Protocol ID#:** 1707007307  
**Protocol Title:** Impact of Neighborhood Walking on Persons Living with Memory Loss  
**Approval Date:** November 29, 2017  
**Expiration Date:** August 03, 2018

Cornell University's Institutional Review Board for Human Participants (IRB) has reviewed and approved the following change(s)/modification(s) to the previously approved protocol referenced above:

Please note the following:

- Addition of academic researchers who study issues of dementia to study population.
- Addition of revised interview guide and consent form for new study population.

This approval shall remain in effect until **August 03, 2018**.

If you requested modifications to consent form(s), please use the attached revised/new consent form for any future subject enrollment.

If you submitted revised/final versions of interview guides, questionnaires, standard operating procedures, or any other research materials, you have approval to use those materials.

All other study procedures/instruments are to remain unchanged.

The following personnel are approved to perform research activities on this protocol:

- Kishore Rajaram Seetharaman
- Cayce Cheairs
- Mardelle Shepley

Please note the following important conditions of approval for this study:

1. All consent forms, records of study participation, and other consent materials **must** be held by the investigator for **five years** after the close of the study.
2. Investigators must submit to the IRB any **proposed amendment** to the study protocol, consent forms, interviews, recruiting strategies, and other materials. Investigators may not use these materials with human participants until receipt of written IRB approval for the amendment. For information about study amendment procedures and access to the Amendments application form, please refer to the IRB website: <http://www.irb.cornell.edu/forms>.
3. Investigators must promptly report to the IRB any **unexpected events** involving human participants. The definition of prompt reporting depends upon the seriousness of the unexpected event. For guidance on recognizing, defining, and reporting unexpected events to the IRB, please refer to the IRB website: <http://www.irb.cornell.edu/policy>.

If the use of human participants is to continue beyond the assigned approval period, the protocol must be re-reviewed and receive continuing approval. As the Principal Investigator it is your responsibility to obtain review and continued approval before the expiration date. Applications for renewal of approval must be submitted sufficiently in advance of the expiration date to permit the IRB to conduct its review before the current approval expires. Please allow three weeks for the review.

**Any research-related activities -- including recruitment and/or consent of participants, research-related interventions, data collection, and analysis of identifiable data -- conducted during a period of lapsed approval is unapproved research and can never be reported or published as research data.** If research-related activities occur during a lapse in the protocol approval, the activities become a research compliance issue and must be reported to the IRB via an unexpected event form ([www.irb.cornell.edu/forms](http://www.irb.cornell.edu/forms)).

For questions related to this application or for IRB review procedures, please contact the IRB office at [irbhp@cornell.edu](mailto:irbhp@cornell.edu) or 255-6182. Visit the IRB website at [www.irb.cornell.edu](http://www.irb.cornell.edu) for policies, procedures, FAQs, forms, and other helpful information about Cornell's Human Participant Research Program. Please download the latest forms from the IRB website [www.irb.cornell.edu/forms/](http://www.irb.cornell.edu/forms/) for each submission.

## B. Recruitment poster for experts-by-experience

### Would you like to help me with my thesis?

Hello! My name is Kishore.

I am a masters student at Cornell University.

My research focuses on ***"the impact of neighborhood walking on persons living with memory loss."***

My research interest aligns perfectly with your walking program, "Out & About".

Your group has the unique experience of walking together in different neighborhoods of Seattle. On these walks you may see several landmarks that seem interesting, and even familiar to you.

I would like to know what these landmarks are, and why they stand out among others.

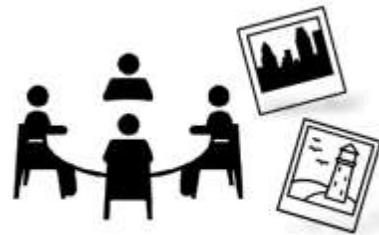


### How does the study work?

On one of your group walks, I will have you and your care-partner take photographs of landmarks in the neighborhood that attract your attention. We will use Polaroid cameras which will make instant color prints of your photographs as you walk.

After the walk we will get together over lunch to talk about the landmarks you have photographed. You and your care-partner will have the opportunity to discuss why they were of interest to you.

Following this, a link to an online survey will be sent to you via email. It will consist of a few questions and should take about 5 minutes to complete.



### Does this sound interesting to you?

I would be grateful for your participation. Your insights and expertise will add value to my research and provide information that will be of benefit to persons living with memory loss.

## C. Consent form for experts-by-experience

We are asking you and your care partner to participate in a research study. This form is designed to give you information about this study. We will describe this study to you and answer any of your questions.

**Project Title:** Impact of Neighborhood Walking on Persons Living with Memory Loss

**Principal Investigator:** Kishore Rajaram Seetharaman  
Masters Student  
Design and Environmental Analysis  
Cornell University  
ks2267@cornell.edu

**Faculty Advisor:** Mardelle McCuskey Shepley  
Professor  
Design and Environmental Analysis  
Cornell University  
mms449@cornell.edu

### What the study is about

Previous studies show that landmarks enable people living with memory loss to move freely through unfamiliar environments. The present study will explore how landmarks in the neighborhood of Columbia City are perceived by persons with memory loss in the Out & About walking group.

### What we will ask you to do

You will be the primary participant in this study.

During the Out & About walk in Columbia City you will be given polaroid cameras to photograph landmarks that are of interest to you. The walk should last for over an hour.

After the walk we will get together over lunch to talk about your photographs. This discussion should last for over an hour.

After the walk and focus group are over, a link to an online survey will be sent to you via email. This survey should take about 5 minutes to complete.

### What we will ask your care partner to do

Your care partner will be the secondary participant in this study.

Your care partner will help you, as needed, to take photographs and briefly discuss the landmarks with you, while you photograph them.

During the post-walk discussion your care partner will be asked to share insight from your conversations during the walk. Your care partner will also assist with accessing and completing the follow-up online survey.

### Risks and discomforts

We do not anticipate any risks for both you and your care partner from participating in this research.

### Benefits

You will receive no direct benefit from this study.

This research will help promote the Out & About walking program and the benefits of neighborhood walking for persons with memory loss.

### Compensation for participation

You will be provided with a catered lunch, courtesy of Dementia Friendly Recreation, Seattle Parks and Recreation

### Audio Recording

Discussion during as well as after the walk will be audio recorded. This is vital for the researcher's analysis, following which all copies of the recording will be deleted.

1

Cornell Institutional Review Board  
Approved: 09/19/2017  
Expires: 08/03/2018

**Authorization to use photographs**

You are requested to permit the use of photographs you take during the walk in the study report.

**Privacy/Confidentiality**

You will not be asked to provide any personal information.

**Taking part is voluntary**

Participation in this study is voluntary. You may refuse to participate before the study begins, discontinue at any time, or skip any questions that may make you feel uncomfortable during the study.

**If you have questions**

The main researcher conducting this study is Kishore Rajaram Seetharaman, a graduate student at Cornell University. If you have questions, you may contact Kishore at [ks2267@cornell.edu](mailto:ks2267@cornell.edu) or at (607) 379 7943.

If you have any questions regarding your rights as a participant in this study, you may contact the Institutional Review Board (IRB) for Human Participants at 607-255-6182 or access their website at <http://www.irb.cornell.edu>.

You may also report your concerns through Ethicspoint online at [www.hotline.cornell.edu](http://www.hotline.cornell.edu) or by calling 1-866-293-3077. Ethicspoint is an independent organization that serves as a liaison between the University and the person bringing the complaint so that anonymity can be ensured.

You will be given a copy of this form to keep for your records.

**Statement of Consent**

I have read the above information, and have received answers to any questions I asked. I consent to take part in the study.

*Primary participant*

Your Signature \_\_\_\_\_ Date \_\_\_\_\_

Your Name (printed) \_\_\_\_\_

*Secondary participant*

Your Signature \_\_\_\_\_ Date \_\_\_\_\_

Your Name (printed) \_\_\_\_\_

Signature of person obtaining consent \_\_\_\_\_ Date \_\_\_\_\_

Printed name of person obtaining consent \_\_\_\_\_

## **D. Script for phase 1: photo-walk and focus group**

### *D.1 Photo-walk*

At the beginning of the walk there will be a brief orientation given by Ms. Cheairs. At certain pause points along the walk Ms. Cheairs will provide the prompt: “...take a photo of a landmark that is of interest to you...”, after the walk-leader is done sharing their information about the neighbourhood at that point. Persons with ESML will identify landmarks upon receiving the prompt to take photos. Depending on the number of Polaroid cameras, they will take turns to photograph their landmark of choice. Ms. Cheairs suggested that 2-3 polaroid cameras may be ideal. This way the three volunteers can carry the cameras and avoid burdening the group with equipment throughout the walk. The cameras will be passed around at each pause point for each person to take their photo. Persons with ESML may be provided with easy to carry pouches to put their photos in, and carry with them. The care partner will assist persons with ESML in handling the Polaroid camera, taking photos etc. They will engage in informal conversation with their loved ones around the landmarks they spotted and why they chose to photograph them. The care partner may be provided with a sample prompt to start the conversation eg. “...why is this landmark of interest to you?...” as per the following script.

#### *D.1.1 Facilitator’s script for photo-walk*

(Before the walk begins, at the start-point) Good morning everyone. I hope all of you are well. My name is Cayce Cheairs. I am the coordinator for dementia-friendly recreation at Seattle Parks & Rec. We will shortly begin our walk. Before that I would like to go over some of the salient points of the research project that today’s walk and

its activities will fall under. KS is a masters student at Cornell University. He is interested in studying the impacts of neighborhood walking on persons with memory loss, which is also what his master's thesis is about. This research will explore how you perceive landmarks that you see as you walk today through Columbia City. During the walk you may see several landmarks that seem interesting and even familiar to you. We would like to know what these landmarks are; why they stand out among others and why they are relevant to you. At certain points during the walk I will be asking you to take photographs of landmarks that attract your attention. We have polaroid cameras for you to take your photographs with and make instant color prints as you walk. Your care partner will be there to support you and discuss with you about your choice to photograph a certain landmark. After the walk we will get together over lunch to discuss the landmarks that you photographed; why they were of interest to you. To finish the study you will be asked to finish an online survey which will be sent to your email later. I will be facilitating parts of today's walk that are specific to this research.

Here are the consent forms that were also sent to you in the email last week for your perusal. Please take the time to read through it once again, if you wish. Participation in this study is voluntary. You may refuse to participate before the study begins, discontinue at any time, or skip any questions that may make you feel uncomfortable during the study. Photographs that you take during today's walk may be used in the final study report.

Do you have any questions? Do you and your care partner give your consent

to participate in this study? If the contents of the consent form seem agreeable to you, we request you and your care partner to sign below. Please find two copies, one that you will return to me, and one that you will keep for your record.

Research shows that landmarks can be helpful for people to overcome feelings of uncertainty and orient themselves in unfamiliar environments. Landmarks that people can identify and recognize help produce lasting positive impressions of neighborhoods and make it easier for people to move through them. Landmarks typically are stationary and stand out from their surroundings. They may have distinctive physical features, historical significance or even symbolic importance. Landmarks can be either natural or man-made. Natural landmarks may include trees, mountains, and water bodies. Man-made landmarks may include buildings like unique houses, churches, hotels, libraries, concert halls, banks, city hall, factories, store fronts and markets. Man-made landmarks, other than buildings, include public squares, statues, big advertising signs, subway entrances and newstands. A landmark needn't necessarily be a large object. It could be either a dome or a brightly colored door, or even a doorknob; as long as it stands out in the scene and catches your attention. Here are some sample photographs of landmarks for you to look at.

At certain points on our walk today, I will ask you to take photos of landmarks that draw your attention. They may stand out to you for whatever reason. Let your instinct guide you; if you feel positive about a certain landmark, then go with it. Please don't overthink it. Also there is no right or wrong. We are interested in the range of ideas and thoughts that emerge from our walk today, so feel free to do what you think is best. Our volunteers will be carrying polaroid cameras that you can take

photographs with, and get instant color prints from. Your care partners will assist you with taking photographs. They will also engage you in brief conversation about why you found a certain landmark to be interesting. You will be given these pouches to carry your photos as you walk.

The walk will take approximately an hour to complete. After this we will move to a community center nearby for lunch, and to have a discussion about the photographs you've taken. You have been given handouts with our walking route for the day and points of interest that our walk leader will talk to you about along the route. Now, before we commence our walk, we would like to show you how to operate the Polaroid camera and let you take a photograph to see how it works.

(At a pause-point) Now, I'd like you to take a moment and look around you. See if any landmarks here seem interesting to you and draw your attention. When you're ready, please let us know and we will hand you a polaroid camera so that you can take your photograph of a landmark of your choice. Remember, don't think too hard. Go with your gut. Again, there is no right or wrong. All your ideas, thoughts and visions are welcome. Please also feel free to talk to your care partner why you chose to photograph a certain landmark.

I will be walking along with the group, observing their interactions and making note of important exchanges. I will observe how long persons with ESML stop at pause-points to take notice of landmarks around them before they form their opinion about which landmark seems to stand out to them the most. I will also observe what their reactions are when they are noticing landmarks around them and after they've made their decision. I would also like to see if during these moments they interact or

consult with their care partner or with fellow-group members. Finally I will see if persons with ESML observe others and take a cue from the landmarks they've chosen or make their own choices independently. A matrix will be developed to check off any of the above observations when they occur. I will make an effort to not be conspicuous in taking notes lest participants feel distracted or self-conscious.

### *D.2 Focus group*

An hour-long focus group will be conducted immediately after the walk. Ms. Cheairs offered to reserve space and organize a catered lunch in a community center in Columbia City, where the walk will take place. As the group proceeds to get food, the pouches with photos will be collected from the persons with ESML. I will take photos of each participant's set of photos on my smartphone and assign codes to them. This will be helpful while taking notes during the focus group. Once this is done, the pouches with photos will be returned to the group. These photos will serve as prompts for the discussion facilitated by Ms. Cheairs. This discussion will be audio-recorded. It was also suggested by Ms. Cheairs that the persons may develop a sense of belonging to the color prints of photographs taken. Therefore they will be given the choice to take the pictures with them after the discussion is complete. The following section includes the script for the focus group.

#### *D.2.1 Facilitator's script for focus group*

##### Opening

Intent: Introduction of members of group, facilitators and researcher; to know where the participants live in Seattle

Script: Good afternoon everyone. Hope you're enjoying the food. I thank all of you for taking part in the walk and being here today. Earlier during the walk you photographed landmarks that seemed interesting to you. We will now have a discussion to talk about why some of these landmarks stood out to you. I'd like to tell you what you can expect from today's session. We'll be here for about an hour. During that time I will ask a series of questions pertaining to our walk today, and the photographs you've taken.

I would like to stress that there are no right or wrong answers to these questions. We consider you to be experts, which is why we're here to learn from you about your experiences. We're interested in hearing all your different points of view. So, even if your opinion might differ from the rest of the group, please feel free to share. You can also talk directly to others in your group; you don't need to only respond directly to me. I request you to speak one at a time, so that everyone can hear what the other person is saying. If you're not comfortable responding to any of the questions, please feel free to say "pass". Your opinions are important to us, and we value your being here. So, thank you once again!

You will not be asked to provide any personal information. This discussion will be audio recorded to help KS analyze your conversations. I would like to remind you that participation in this study is voluntary. You have the right to leave the study at any time or skip any questions that may make you feel uncomfortable during the study. Do you have any questions? Do you and your care partner give your consent to participate in this discussion?

### *Introduction*

Intent: To know participants' preferred places for walking outdoors.

Script:

1. I'd like to start by asking you how often you walk outdoors per week?
2. Where do you prefer to take a walk in the outdoors? Down your street? In a nearby park? Elsewhere in your neighborhood? Outside your neighborhood?

### *Transition*

Intent: To know if and how important landmarks are to participants while walking outdoors, as well as how familiar the participants are with Columbia City.

Script:

1. Today on our walk, we noticed many landmarks. Have you thought about landmarks when you go on your own walks?
2. Are there certain landmarks that you notice during your walks? If so, please name a few.
3. How important are these landmarks to your experience of walking outdoors?
4. Now let's talk about today's walk. First, can I get a show of hands from those of you that were familiar with Columbia City prior to today's walk? If so, how? Have you visited this neighborhood before? Have you walked here before?

### *Key Questions*

Intent: To have participants choose photographs of landmarks that stand out to them the most, and why the chosen landmarks stand out to participants the most.

Script:

1. Now I'd like you to look through the photographs that you took during today's walk in Columbia City. Please choose 3-5 photographs of landmarks that stand out to you the most right now. Please put photos that you haven't chosen aside. We shall continue talking about these 3-5 photographs when everybody is done choosing.
2. Please show us your photographs and tell us what landmarks you see in them.
3. Why did you choose these landmarks?
4. What about these landmarks first drew your attention to them when asked to choose the photographs of landmarks?

Questions for primary participant:

- 4.1. Was it something about their physical appearance?
- 4.2. Size? Did the landmark seem bigger in size than everything else in the photograph?
- 4.3. Color? Did the color of the landmark stand out to you in the photograph?
- 4.4. Was it something about where they were located?
- 4.5. Do these landmarks look familiar to you? If so, how?
- 4.6. Do they look similar to other landmarks? If so, where?
- 4.7. Do you know these landmarks, or heard of them before? If so, how?

Question for care partner:

4.8. Please feel free to share any thoughts that came up during your conversation with your loved one during the walk, when they chose to photograph this particular landmark.

### *Ending Questions*

Intent: To see how the landmarks identified on the walk may impact participants' decision to walk in Columbia City

Script:

1. Was it helpful to think about landmarks while walking in Columbia City? If so, how?
2. How comfortable would you feel taking a walk in Columbia City in the future?
3. How helpful are landmarks while walking in unfamiliar neighborhoods?

### *Conclusion*

Intent: To share with the group (i) why this study is important; (ii) how this helps us understand what persons with ESML see when they walk around relatively less familiar parts of the city; (iii) the benefits of neighborhood walking; and (iv) how promoting “Out and About” and the findings from this study could encourage more cities to take up dementia-friendly programming, especially conducting walks in urban neighborhoods.

Script: This brings us to the end of our discussion. Are there any thoughts before we conclude our meeting? Before we conclude, KS would like to share some thoughts with you now:

Thank you for your time and valuable insight. We really appreciate your participation in this study. Your contribution to this research project will help promote “Out &

About” as well as the benefits of neighborhood walking for persons living with memory loss. We hope that this would encourage more cities to facilitate group walking in neighborhoods like “Out & About” by creating and maintaining supportive outdoor environments. It is also hoped that this study will enable your voices and experiences to be heard by decision makers and be integrated into discussions concerning the design and planning of the city. So, thank you for your contribution! Knowing which landmarks matter to you the most and why you felt so could help researchers and designers come up with navigation systems that help persons living with memory find their way through unfamiliar environments. In the months to come I will be reporting the findings from our walk and talk today. I will also share the study report with us. Until then, if you have any questions regarding the study, please feel free to contact me; my contact information can be found in your copies of the consent forms. The last thing I’d like for you to do is take an online survey. A link to this survey will be sent to you in a couple of days via email by Ms. Cheairs. It will consist of a few questions and should take about 5 minutes to complete. Please complete the survey at your earliest convenience. If you have any questions regarding how to fill the survey please feel free to contact me. We hope you have enjoyed taking part in the study thus far. We learned so much today from your insights and experiences. Thank you once again, and have a great weekend.

## E. Survey for phase 1



Cornell University

### Impacts of Neighborhood Walking on Persons Living with Memory Loss

In this survey there are 2 sets of questions.

In the first set:

- You will see 5 pairs of photos of landmarks.
- Please choose the landmark that stands out to you the most.

In the second set:

- You will sort through 5 photos.
- You will rank them from 1-5 (1 being “like the most” to 5 being “like the least”).

This survey shouldn't take more than 5 minutes of your time.

This study is conducted by Kishore Rajaram Seetharaman, who is a graduate student at Cornell University.

If you have questions, you may contact Kishore via email: [ks2267@cornell.edu](mailto:ks2267@cornell.edu) or via phone: (607) 379 7943.

---

Please enter your participant ID.

Survey Completion  
0%  100%



Please click on the landmark that stands out the most to you.



Please explain briefly why your chosen landmark stands out the most to you.





Click on the landmark that stands out the most to you.



Explain briefly why your chosen landmark stands out the most to you.





Click on the landmark that stands out the most to you.



Explain briefly why your chosen landmark stands out the most to you.





Click on the landmark that stands out the most to you.



Explain briefly why your chosen landmark stands out the most to you.





Click on the landmark that stands out the most to you.



Explain briefly why your chosen landmark stands out the most to you.





Please look at the following set of 5 photographs.  
Rank the photos from 1 to 5, based on how much you like the landmarks:  
1 being "like the most"  
5 being "like the least"

---

To rank the photo simply drag and drop the photo in the position you want it in. You will notice that the number next to the photo will change correspondingly.

---

Feel free to write any comments in the space below to explain why you like or do not like the landmarks shown above.



## F. Research invitation for experts-by-profession

**Invitation to participate in the research project titled:**

**“Neighborhood Landmarks as Perceived by Persons living with Dementia”**

Kishore Rajaram Seetharaman  
MS in Human-Environment Relations  
Design & Environmental Analysis  
Cornell University

**Chair**  
Mardelle McCuskey Shepley  
Professor  
Design & Environmental Analysis  
Cornell University

**Committee member**  
Corinna Loeckenhoff  
Associate Professor  
Human Development  
Cornell University

### Background

Studies conducted in participants’ neighborhoods show that going outdoors regularly can improve health and extend the period of good quality living for persons with dementia. However the needs of the individual are mostly only studied to inform residential and facility design, with little emphasis on public spaces and amenities, and consequently, their design and planning. Some studies have found that older people with dementia use public landmarks as visual cues for wayfinding in their local neighborhood. Losing reassuring landmarks from one’s local neighborhoods or familiar environments can thus be disabling. However dementia constitutes a broad spectrum of complex and varying experiences that differ from person to person, out of which I am particularly interested in studying the experience of people with early stage dementia whose mobilities are still intact. This study explores how they perceive, interact with and read meaning in landmarks that they encounter in neighborhoods that they may not be familiar with. Knowing which landmarks are most meaningful and attractive to persons living with memory loss could potentially lay the foundation for future research on how to best integrate them as navigational cues into wayfinding systems in unfamiliar environments.

This study is inductive and exploratory in nature, and employs qualitative research methods. The first part of the study was conducted in September with eight members of a neighborhood group walking program for persons living with early stage memory loss in Seattle. Participants were provided with polaroid cameras and asked to take photos of landmarks that were interesting and stood out to them as they walked in an unfamiliar neighborhood in South Seattle. A focus group was conducted immediately after the walk, using photos taken during the walk as discussion prompts. Participants responded to photos of landmarks that they found interesting at the time of the focus group. The second part of the study involved a survey using photos taken during the aforementioned walk. Participants were asked to choose photos of landmarks that stood out to them and rank them in their order of preference. In addition to the walking group mentioned above, this survey will be administered to a second group of five participants with mild to moderately severe dementia who reside in the neighborhood that the first group walked in.

**Your role in this research***Step.1*

The final part of this study involves engaging with researchers who are studying the interrelationships between dementia and the physical setting of neighborhoods. This is where your contribution comes in. There will first be an online survey akin to that which was administered to the participants with dementia. You will be asked to choose landmarks that you think persons living with dementia would be drawn to and prefer. The survey should take about 5 minutes. An email will be sent to you with the electronic link and all necessary instructions a day prior to when you will take the survey.

Please note that the photographs that will be used to elicit your responses in this survey are not the only photographs that were taken by participants during the walk. These photographs were selected based on the categories that they represented in order to conduct a comparative analysis of the landmarks.

*Step.2*

Following this survey I will set up a Zoom meeting (please have Zoom installed on your computer) with you to conduct a semi-structured photo-elicited interview to better understand your survey responses. The interview should take approximately 45 minutes to 1 hour. You will be sent a separate email shortly after you have completed the survey in Step.1 with instructions for the interview and the photos that will be used during the same.

**Your availability**

Please let me know if you are willing to participate in this study. If so, I request you to sign the consent form attached with the email and return the signed copy to me at [ks2267@cornell.edu](mailto:ks2267@cornell.edu)

Please indicate preferred dates and timeslots for both (i) the survey and (ii) the interview. Please note that completion of the survey should happen in the few days prior to the interview, so the content is fresh in your mind. I plan to collect data for my study between the second week of December and the first week of January. I would be grateful if you could find the time in your schedule during this period for my study.

I look forward to hearing from you.

Thank you.

Sincerely,  
Kishore

## G. Consent form for experts-by-profession

We are asking you to participate in a research study. This form is designed to give you information about this study. We will describe this study to you and answer any of your questions.

**Project Title:** Neighborhood Landmarks as Perceived by Persons living with Dementia

**Principal Investigator:** Kishore Rajaram Seetharaman  
Masters Student  
Design and Environmental Analysis  
Cornell University  
ks2267@cornell.edu

**Faculty Advisor:** Mardelle McCuskey Shepley  
Professor  
Design and Environmental Analysis  
Cornell University  
mms449@cornell.edu

### What the study is about

The present study explores how landmarks in the neighborhood of Columbia City are perceived by persons living with memory loss.

### What we will ask you to do

You will be asked to answer a few questions in an online survey. This survey should take about 5 minutes to complete. This will be followed by a phone interview to better understand your responses in the aforementioned survey. The interview should take approximately 45 minutes to 1 hour of your time.

### Risks and discomforts

We do not anticipate any risks for you from participating in this research.

### Benefits

You will receive no direct benefit from this study. However your contribution to the research will help advance current knowledge of the importance of urban landmarks for persons living with memory loss.

### Privacy/Confidentiality

You will not be asked to provide any personal information.

### Taking part is voluntary

Participation in this study is voluntary. You may refuse to participate before the study begins, discontinue at any time, or skip any questions that may make you feel uncomfortable during the study.

### If you have questions

The main researcher conducting this study is Kishore Rajaram Seetharaman, a graduate student at Cornell University. If you have questions, you may contact Kishore at [ks2267@cornell.edu](mailto:ks2267@cornell.edu) or at (607) 379 7943.

If you have any questions regarding your rights as a participant in this study, you may contact the Institutional Review Board (IRB) for Human Participants at 607-255-6182 or access their website at <http://www.irb.cornell.edu>.

You may also report your concerns through Ethicspoint online at [www.hotline.cornell.edu](http://www.hotline.cornell.edu) or by calling 1-866-293-3077. Ethicspoint is an independent organization that serves as a liaison between the University and the person bringing the complaint so that anonymity can be ensured.

You will be given a copy of this form to keep for your records.

1

Cornell Institutional Review Board  
Approved: 11/29/2017  
Expires: 08/03/2018

**Statement of Consent**

I have read the above information, and have received answers to any questions I asked. I consent to take part in the study.

*Participant*

Your Signature \_\_\_\_\_

Date \_\_\_\_\_

Your Name (printed) \_\_\_\_\_

Signature of person obtaining consent \_\_\_\_\_

Date \_\_\_\_\_

Printed name of person obtaining consent \_\_\_\_\_

## H. Survey for phase 2

This is a survey for the study titled:  
Neighborhood Landmarks as Perceived by Persons living with Dementia

In this survey, you will see landmarks photographed by participants of "Out & About", a walking group for persons with early-stage memory loss, during a walk in the neighborhood of Columbia City, in Seattle, USA.

These participants have mild to moderate dementia. They are not residents of Columbia City and are mostly unfamiliar with the place (have no knowledge of/ have not visited). This survey will refer to them as "participants of Group A."

You will answer 2 sets of questions.

### Section A:

- You will see 5 pairs of landmarks.
- Please choose which of the two landmarks in each pair would be most noticeable to participants of Group A.
- In the text box below the photos, please explain your rationale for choosing the landmark.

### Section B:

- You will sort through 5 photos.
- You will rank them from 1-5 (1 being "most appealing" to 5 being "least appealing") based on how appealing these landmarks may seem to participants of Group A.
- In the text box below the photos, please explain your rationale for ranking the landmarks.

This survey should take 5-10 minutes to complete.

This study is conducted by Kishore Rajaram Seetharaman, who is a graduate student at Cornell University.

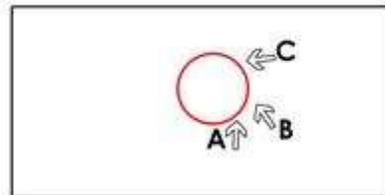
If you have questions, you may contact Kishore via email: [ks2267@cornell.edu](mailto:ks2267@cornell.edu) or via phone: (607) 379 7943.

---

Please enter your participant ID.

The landmarks will be presented in the format given below for all questions in this section.

Each question will begin with two such montages, on separate pages. The purpose of these montages is to provide you with the context where the landmark is situated. The first photo is of the landmark itself and the other photos are of the physical environment around it. Please use the zoom tool on your browser to zoom in on the context, as need be. On the third page you will see one photo each of both landmarks. You will make your choice by clicking on the landmark.



This map will show the landmark highlighted in red. "A, B, C" refer to the photos shown below. The arrows indicate the direction the photo is taken from

**A**



**B**



**C**





Question 1  
Landmark #1



A



B



C





Question 1  
Landmark #2



A

B



C





### Question 1

Please click on the landmark that would be most noticeable to participants of Group A.



Please explain why your chosen landmark would be most noticeable to participants of Group A.





**Question 2**  
**Landmark #1**



**A**

**B**



**C**





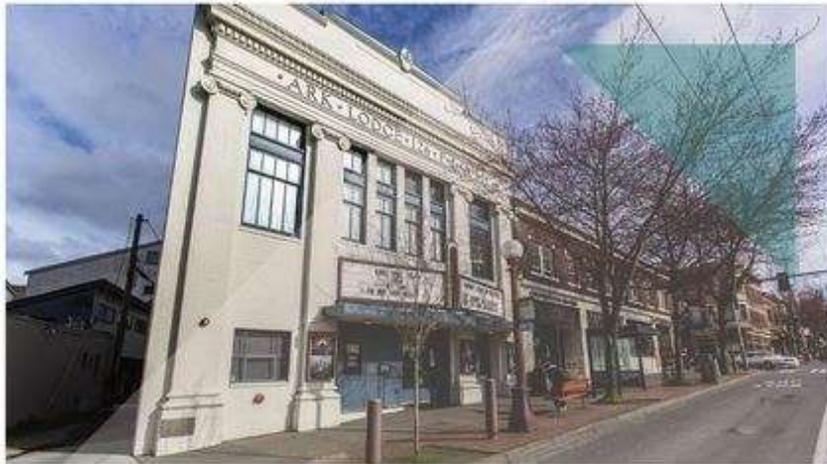
Question 2  
Landmark #2



A



B



C





**Question 2**

**Click on the landmark that would be most noticeable to participants of Group A.**



**Explain why your chosen landmark would be most noticeable to participants of Group A.**





Question 3  
Landmark #1



A



B



C



Question 3  
Landmark #2



A



B



C





### Question 3

Click on the landmark that would be most noticeable to participants of Group A.



Explain why your chosen landmark would be most noticeable to participants of Group A.





Question 4  
Landmark #1



A



B



C





Question 4  
Landmark #2



A



B



C





### Question 4

Click on the landmark that would be most noticeable to participants of Group A.



---

Explain why your chosen landmark would be most noticeable to participants of Group A.





Question 5  
Landmark #1



A



B

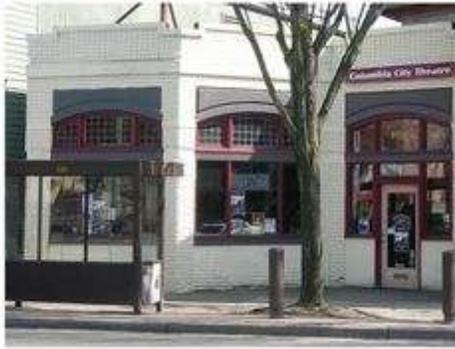


C





Question 5  
Landmark #2



A



B



C



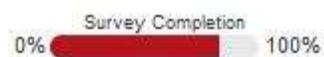


### Question 5

Click on the landmark that would be most noticeable to participants of Group A.



Explain why your chosen landmark would be the most noticeable to participants of Group A.





## Section B

Please look at the following set of 5 photographs.

Rank the photos from 1 to 5, based on how much participants of Group A would find the landmarks appealing:

1 being "most appealing"

5 being "least appealing"

---

To rank the photo simply drag and drop the photo in the position you want it in. You will notice that the number next to the photo will change correspondingly.

---

Please explain the rationale for your ranking of landmarks.



## **I. Script for phase 2: interview with experts-by-profession**

Thank you for your survey responses and for taking part in this interview.

There are seven questions in this interview. As mentioned earlier, this should take about 45-60 minutes to complete. To adhere to this timeframe please limit each of your responses to about 6-8 minutes. You may choose to draw upon your own research experience and/or the scenarios that were presented to you in the survey to illustrate your responses to the questions in the interview. I would like to begin by asking you a few broad questions regarding outdoor walking patterns, preferences and behavior for community dwelling older adults with mild to moderate dementia.

- What are some places that they prefer to walk in when they go outdoors? And what criteria would they weigh their walking destinations by?
- What are some enabling and disabling characteristics of the physical environment that influence their outdoor walking?

Now, I would like to ask you some questions regarding the relevance of landmarks when persons with mild to moderate dementia walk outdoors.

- How important are landmarks to them when they go on walks outdoors?
- What are some landmarks that they are likely to notice during a walk outdoors?
- What are some ways in which they use or interact with landmarks during a walk outdoors?
- Would any of these landmarks that we talked about be particularly favourable for navigating to the walking destinations that we discussed earlier?

Now I would like to talk briefly about your survey responses. The first five

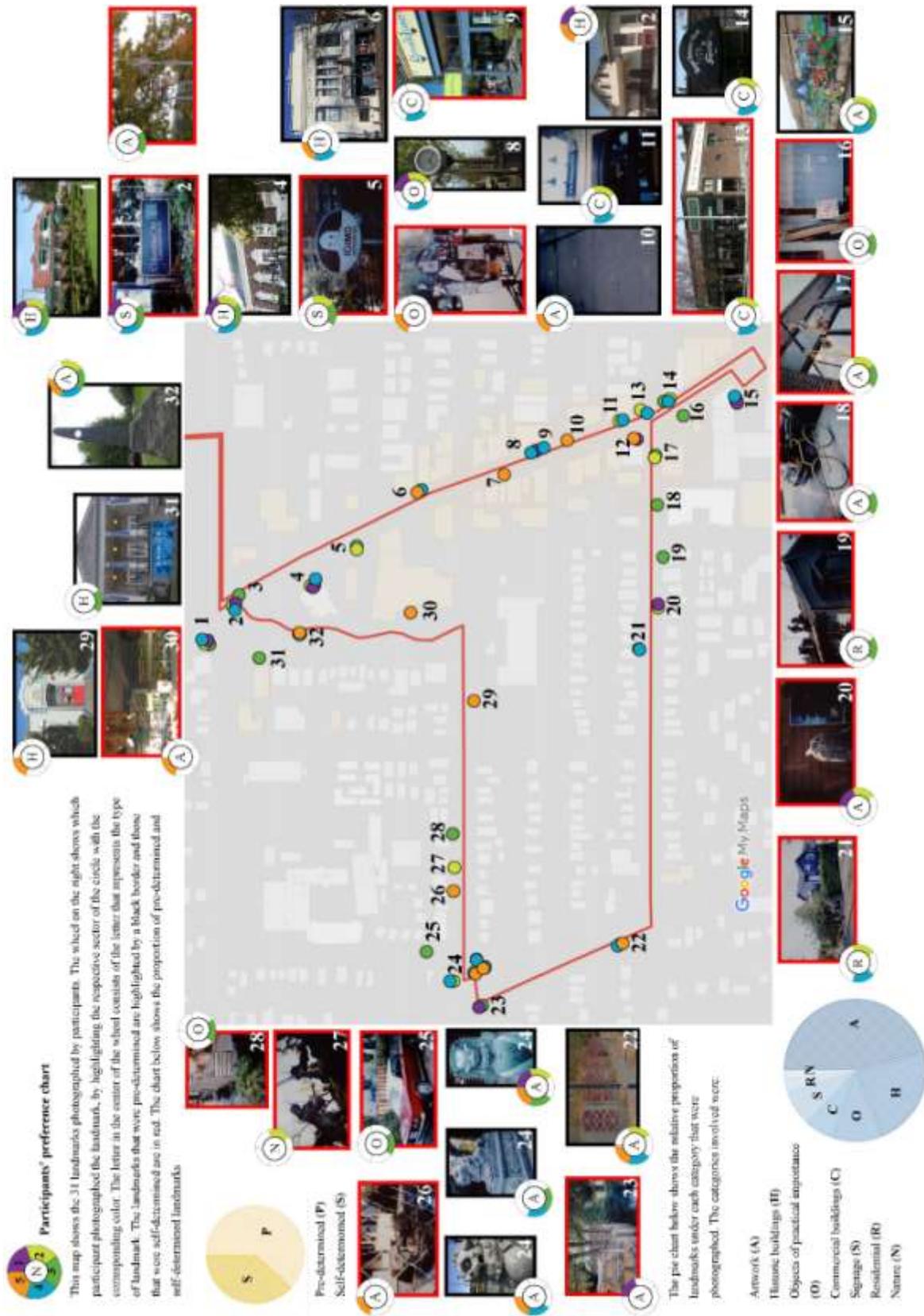
pages of the pdf, sent to you in the email earlier today, contain the five photographs of landmarks that you found to be most noticeable in descending order of appeal, as per your ranking. We will talk about each of these landmarks sequentially. I would like you to reflect on the issue of wayfinding in regard to these landmarks; how effective they are in their current state as wayfinding cues, as well as think of ways in which their design may be improved to augment their effectiveness as wayfinding tools.

- How helpful would these landmarks be as wayfinding cues for persons living with mild to moderate dementia walking in the neighborhood? Are there any suggestions that you might have to improve their potential as wayfinding cues?

The last five pages of the pdf consist of the five landmarks that you didn't select as noticeable or appealing. My final question is the same as the previous one:

- How helpful would these landmarks be as wayfinding cues for persons living with mild to moderate dementia walking in the neighborhood? Are there any suggestions that you might have to improve their potential as wayfinding cues?

## J. Phase 1: map of data from photo-walk



## K. Phase 1: raw data of survey

		D1	D2	D3	D4	D5
1A	Sound of Light			2 Wonder fresh color brightens the concrete; new and fresh; love the colors	1 Loved the colors and mosaics.	
1B	Rainier Arts Center	1 No answer	2 Looks more open to the community			5 The vertical words on the Arts Center are clear yet unusual and strong in contrast. But the other landmark is far more visually pleasing but not as specific in purpose.
2A	Spirit of Washington	4 Like it better		1 Quirky shape; Interesting obelisk shape is attention getting, makes one want to approach it.	5 It is a very weird and puzzling sculpture.	1 Unique, visually pleasing, memorable
2B	Ark Lodge		4 You go in			
3A	Seattle Public Library					
3B	Pride	2 Like it	1 It stands out more because of what it presents to the community	3 Strength, Integrity; Powerful symbol of strength and stability.	3 The lion stands out more to me because it is a work of art. A lot can be said about the library because it is full of information, but the sculpture is a work of art.	3 This one was hard to decide. I chose the lion because it is memorable yet unique. But libraries are (although just another building) are important to me personally, a source of knowledge and information. Lions are associated with the entrance to library's.
4A	Columbia City Mural			4 What is not to like of beautiful murals; The colorful murals are beautiful and fresh. Inspiring!!	4 Loved the art and colors on the panels juxtaposed with the dirty concrete wall.	2 The paintings are unique and colorful. The funeral home looks like so many other ones although the sculptured plants are attention getting.
4B	Columbia Funeral Home	3 Like it	3 The building is the strongest as a landmark			
5A	Bike Rack					
5B	Columbia City Theater	5 Like it better	5 There may be more historical things inside	5 The theatre is beautiful; I do respect and admire the past and the solidity of the buildings in the neighborhood we toured. Have an affinity for architecture!	2 This was a difficult decision. One was a piece of art (bicycle) and the other was a theater. I adore live theater compared to the work of art.	4 The theater is some what dramatic and large in size and clearly marked. The bicycle is unique and memorable but could easier get lost in the crowd.

D1	D1's ability to talk and think does not allow him to give explanations for why he liked what he chose in every instance. He did readily and easily choose which ones he liked.
D2	I like number two because it looks like it has an upfront view of what looks like a very good museum
D3	Had some trouble with ranking
D4	It was difficult for me to make these decisions. I disliked #5 because it was confusing and phallic.
D5	aesthetic order

Rows: Landmark ID Columns: Noticeablility

	0	1	All
1	3	2	5
	60	40	100
	12	8	10
	6	4	10
2	1	4	5
	20	80	100
	4	16	10
	2	8	10
3	0	5	5
	0	100	100
	0	20	10
	0	10	10
4	2	3	5
	40	60	100
	8	12	10
	4	6	10
5	5	0	5
	100	0	100
	20	0	10
	10	0	10
6	2	3	5
	40	60	100
	8	12	10
	4	6	10
7	4	1	5
	80	20	100
	16	4	10
	8	2	10
8	5	0	5
	100	0	100
	20	0	10
	10	0	10
9	3	2	5
	60	40	100
	12	8	10
	6	4	10
10	0	5	5
	0	100	100
	0	20	10
	0	10	10
All	25	25	50
	50	50	100
	100	100	100
	50	50	100

Cell Contents: Count  
 % of Row  
 % of Column  
 % of Total

Chart 1: descriptive statistics for variables 'noticeability' and 'landmark ID'

Rows: Person ID Columns: Noticeability

	0	1	All
1	3	2	5
	60	40	100
	27.27	14.29	20.00
	12	8	20
2	4	1	5
	80	20	100
	36.36	7.14	20.00
	16	4	20
3	1	4	5
	20	80	100
	9.09	28.57	20.00
	4	16	20
4	1	4	5
	20	80	100
	9.09	28.57	20.00
	4	16	20
5	2	3	5
	40	60	100
	18.18	21.43	20.00
	8	12	20
All	11	14	25
	44	56	100
	100.00	100.00	100.00
	44	56	100

Cell Contents: Count  
 % of Row  
 % of Column  
 % of Total

Chart 2: descriptive statistics for variables 'noticeability' and 'person ID'

Rows: Person ID Columns: Appeal

	1	2	3	4	5	Missing	All
1	0	1	0	1	0	3	2
	0.00	50.00	0.00	50.00	0.00	*	100.00
	0.00	33.33	0.00	33.33	0.00	*	14.29
	0.000	7.143	0.000	7.143	0.000	*	14.286
2	1	0	0	0	0	4	1
	100.00	0.00	0.00	0.00	0.00	*	100.00
	25.00	0.00	0.00	0.00	0.00	*	7.14
	7.143	0.000	0.000	0.000	0.000	*	7.143
3	1	1	1	1	0	1	4
	25.00	25.00	25.00	25.00	0.00	*	100.00
	25.00	33.33	33.33	33.33	0.00	*	28.57
	7.143	7.143	7.143	7.143	0.000	*	28.571
4	1	0	1	1	1	1	4

	25.00	0.00	25.00	25.00	25.00	*	100.00
	25.00	0.00	33.33	33.33	100.00	*	28.57
	7.143	0.000	7.143	7.143	7.143	*	28.571
5	1	1	1	0	0	2	3
	33.33	33.33	33.33	0.00	0.00	*	100.00
	25.00	33.33	33.33	0.00	0.00	*	21.43
	7.143	7.143	7.143	0.000	0.000	*	21.429
All	4	3	3	3	1	*	14
	28.57	21.43	21.43	21.43	7.14	*	100.00
	100.00	100.00	100.00	100.00	100.00	*	100.00
	28.571	21.429	21.429	21.429	7.143	*	100.000

Cell Contents:           Count  
                                  % of Row  
                                  % of Column  
                                  % of Total

Chart 3: descriptive statistics for variables ‘appeal’ and ‘person ID’

Rows: Landmark	ID	Columns: Appeal					
	1	2	3	4	5	Missing	All
1	1	1	0	0	0	3	2
	50.00	50.00	0.00	0.00	0.00	*	100.00
	20	20	0	0	0	*	8
	4	4	0	0	0	*	8
2	2	0	0	1	1	1	4
	50.00	0.00	0.00	25.00	25.00	*	100.00
	40	0	0	20	20	*	16
	8	0	0	4	4	*	16
3	1	1	3	0	0	0	5
	20.00	20.00	60.00	0.00	0.00	*	100.00
	20	20	60	0	0	*	20
	4	4	12	0	0	*	20
4	0	1	0	2	0	2	3
	0.00	33.33	0.00	66.67	0.00	*	100.00
	0	20	0	40	0	*	12
	0	4	0	8	0	*	12
5	0	0	0	0	0	5	0
	*	*	*	*	*	*	*
	0	0	0	0	0	*	0
	0	0	0	0	0	*	0
6	1	1	0	0	1	2	3
	33.33	33.33	0.00	0.00	33.33	*	100.00
	20	20	0	0	20	*	12
	4	4	0	0	4	*	12
7	0	0	0	1	0	4	1
	0.00	0.00	0.00	100.00	0.00	*	100.00
	0	0	0	20	0	*	4

	0	0	0	4	0	*	4
8	0	0	0	0	0	5	0
	*	*	*	*	*	*	*
	0	0	0	0	0	*	0
	0	0	0	0	0	*	0
9	0	0	2	0	0	3	2
	0.00	0.00	100.00	0.00	0.00	*	100.00
	0	0	40	0	0	*	8
	0	0	8	0	0	*	8
10	0	1	0	1	3	0	5
	0.00	20.00	0.00	20.00	60.00	*	100.00
	0	20	0	20	60	*	20
	0	4	0	4	12	*	20
All	5	5	5	5	5	*	25
	20.00	20.00	20.00	20.00	20.00	*	100.00
	100	100	100	100	100	*	100
	20	20	20	20	20	*	100

Cell Contents:      Count  
                           % of Row  
                           % of Column  
                           % of Total

Chart 4: descriptive statistics for variables 'appeal' and 'landmark ID'

Category	Observed	Test Proportion	Expected	Contribution to Chi-Sq
0	14	0.5	12.5	0.18
1	11	0.5	12.5	0.18

N	N*	DF	Chi-Sq	P-Value
25	0	1	0.36	0.549

Chart 5: Chi square goodness of fit test for variable 'noticeability' for public art and historical landmarks

Category	Observed	Test		Contribution to Chi-Sq
		Proportion	Expected	
1	4	0.2	2.8	0.51429
2	3	0.2	2.8	0.01429
3	3	0.2	2.8	0.01429
4	3	0.2	2.8	0.01429
5	1	0.2	2.8	1.15714

N	N*	DF	Chi-Sq	P-Value
14	11	4	1.71429	0.788

5 cell(s) (100.00%) with expected value(s) less than 5.

Chart 6: Chi square goodness of fit test for variable 'appeal' for public art

Category	Observed	Test		Contribution to Chi-Sq
		Proportion	Expected	
1	1	0.2	2.2	0.65455
2	2	0.2	2.2	0.01818
3	2	0.2	2.2	0.01818
4	2	0.2	2.2	0.01818
5	4	0.2	2.2	1.47273

N	N*	DF	Chi-Sq	P-Value
11	14	4	2.18182	0.702

Chart 7: Chi square goodness of fit test for variable 'appeal' for historic building

## L. Phase 2: raw data of survey

	1	2	3	4	5	6	7	8	9
	2	1	5	1	2		1		
1A	<b>Sound of Light</b>	Brighter colors in first image.	<p>The combination of the vibrant colours and the level of abstraction; it also seems to be more at eye level and invites someone to walk forward along the path. The building structure would be more familiar, but also more foreboding and the way towards it does not seem as obvious or inviting.</p>	<p>Location right by the road. Bright colors will catch people's attention. Spread over considerable length.</p>	<p>To visitors, Landmark A may be more noticeable since it is colorful and close to the walkway. However, to local people with light memory loss, Landmark B may make more sense.</p>		<p>Both of these landmarks provide different levels of information and would support different navigation strategies. For example, A would act as a boundary landmark and provide you with global cues as to the edge of the city - however, one problem with this landmark is that it is only visible from one direction, so would not necessarily be supportive for when people retrace the route. A is also more salient and brighter and much more unique a landmark. B though is positioned at an intersection, which is where disorientation is more frequently reported, so may be more supportive for people with memory difficulties, especially</p>		
					<p>You use the term noticeable, I choose this because it is out of the extraordinary while the other is a traditional building. Also this is more colorful.</p>				
					<p>Perception has for steps. 1- Sensation, impact on the retina, 2. Attention, noticing something is there, 3. Discrimination, noticing what it is, &amp; 4. Recognition, understanding is meaning – comprehension. I think this one is on all 4 steps.</p>				

							given that they have never visited the city before (despite not being overly unique). I think A was more noticeable (depending on walking direction) but not too sure on how supportive it was for navigation.		
IB	Rainier Arts Center					3	Provides awareness as an entry, a focus, one element to process. You are here message.	2	1
2A	Spirit of Washington	3			2	1	2		
		Very unusual form. Locals might notice the second image more, as it is easier to see, and represents more of what their previous			It is simple and clear and stands out from the surroundings.	A focus of one familiar element with limited stimulation.	Given how unusual this sculpture is, I think A was most noticeable given it's uniqueness. This said, B is a beautiful old cinema, that may be more meaningful to the older generation and those with memory difficulties. I would say that B would be more noticeable for		

		life consisted of.					those with memory difficulties who are FAMILIAR with the surroundings and frequent the cinema whilst A is more noticeable to those who are new to the surroundings.		
			2	1		5		1	2
2B	Ark Lodge	While the first landmark has the advantage of being amusing, and would prompt curiosity, I chose the second because the marquee is such a familiar sight and would potentially remind people of their past enjoyable visits to the cinema. It is also easily discernible from different angles and from a distance, while the first one disappears from afar.		Size of the structure - building versus sculpture Movie theatre - function Next to a sidewalk + street, i.e., higher visibility for cars, peds, etc.		This seems to go counter to my explanation. Except it's bigger than the other buildings, on the corner, and a familiar type of building -- movie theatre.		Again, similar to my previous answer, this building is very prominent, a main feature of the street. It's a cinema that looks like it has been there for a while with a retro feel. I think Group A, would again, be drawn to it more as it might trigger place memories.	A large light building - contrasts well with sky and ground therefore easy to see. Familiar to the older person. The first photo, given that older people often find difficulty in looking upwards, they may not notice the unusual symbol and it may not be familiar to them.
					3	2		3	5

3A	Seattle Public Library				A is bigger in size. B is interesting but hard to see due to its size.		Familiar as a typical bldg. more supportive calming green environment for the surrounding setting to process the landmark.		I picked the library landmark for reasons similar to the previous two questions; however, this one was difficult because, cultural background and context would influence my personal answer to the second option. If persons from Group A were predominantly of Chinese background / heritage then I would have picked the second option.	I mark the building - BUT this might depend on the cultural background of the people with dementia. If of Chinese culture, they might be more likely to identify with and remember the small dragon sculpture. If of white caucasian culture, the building might be more familiar. Familiarity is key.
3B	Pride	1 it is more unusual, animate, and easy to see.	3 I had a harder time with this one - the building seems to hold a good place in its surroundings. but I chose the lion because it seems so out of place in that vast swath of intersection. I could see it helping with wayfinding. It rather depends I suppose on the cultural context for each landmark, but even here in Vancouver with a large Chinese population, I think it would stand out.	2 Unique and noticeable design of the sculpture Human scale will invite people to stop and look at it more closely Location - at the corner of sidewalks and next to crossings		4 On the corner. Surely meant as a landmark. Interesting statue.		3 The figures in B are very unusual and as they are at a decision point, may also support navigation. Whilst the Library is a large and grand building, the signage was not that noticeable so I don't think A would have been overly noticeable for the group, though I could be wrong.		

		4	4		4	3	5			3
4A	Columbi a City Mural	First image is more unusual, and dynamic - even though it is a bit negative, due to the weeds and having to look across parked cars to see it...might notice it more - but it all depends on how CLOSE they were to it.	A similar answer as before - the colour and abstraction of #1 would draw more attention. Although the location of the funeral home at a corner, and the incongruity of the big "funeral home" sign on what otherwise looks like a east coast summer home by the sea but also draw attention, but I think the playfulness of the graffiti would win out.		A is kind of unusual.	Difficult because the mural is off the beaten path. But I choose it because it is like the first one -- colorful, interesting, etcetera. If by landmark you mean a landmark someone would use to (...) another person to find a place, by end the funeral home would be chosen.	This one is questionable between the two settings. A guess that the colorful artwork would be most noticeable but the setting is confusing as is the setting around the funeral home.			A hard one. People with dementia often develop an ability in art, due to lessening inhibitions. So possibly the wall would be a better landmark. Also a funeral parlour is not a winner when you are old.
4B	Columbi a Funeral Home			3				4	5	
				Well-landscaped outdoor is highly noticeable. Structure itself is unique with red tiled roof. Function – funeral home				A is much more visually salient and unique, though it's positioning wasn't very good. B was in a much more visible area and has clear signage, though less unique.	The second option for similar reasons but I would also add that it's also the location as well. The art works are more hidden so again less prominent and I think would then make it less noticeable for Group A.	
					5	3	4	5		

5A	Bike Rack			A stands out from its surroundings.	It is small yet interesting. The building is like all the others in the row.	Simple focus on familiar symbol/element.	I think A would be more noticeable for the group due to how unusual it is. The signage for the theatre is very high up and not clear so I'm not sure how many people would have taken notice of it.		
5B	Columbi a City Theater	The second image is far more noticeable, as the bicycle might be obscured by other pedestrians. I think locals might notice the bicycle more, IF they could easily get an unobstructed view of it. ALSO - another factor is that the older people are, the more their gaze tends to be directed downward, especially when walking. So any images that require looking upward might be less likely to be noticed.	The building has a lovely human scale, the colours, the way the door sits back from the street, and the display windows are all inviting features. The bicycle stand, while clever, simply hides from sight, and if someone noticed it could be confusing, but not necessarily in a fun way.	Location -- next to well travelled sidewalk and street Function -- people actually go there Seems to be a bus stop. Also the red bench. There are secondary functions nearby.				4	4
1	They are more unusual, and some have bright colors. The stone spear-like shape might look VERY different if the photo had been taken on a brighter day - the current photo makes it hard to separate the sculpture from the background, which would not really be the case if you were on the site.								
2	I just realized I ranked in order that I saw them! The first one is bright, and from the photo at least invites engagement. The movie marquee I think wins in terms of how it might prompt reminiscence. The next two are equal I think, but the lion wins because of how it is situated. The graffiti might be hidden in the car park. The final building was better than its alternative, but in the end is maybe the least noticeable of all the landmarks I chose.								

3	Rationale based on degree of exposure, uniqueness and function of the landmarks.
4	I agree with the current ranking. Many landmarks are simple, clear, clean, standing out, and make positive sense to people. However, to people with memory loss, it may depend on their type of memory loss (e.g., short-term or long-term) and their life experiences (e.g., culture, education, social-economic factors).
5	Appealing to me – not a scientific definition – means interesting, pretty, attractive, artistic, and these seem to be that from most to least. I might question my choice for first and second.
6	Less stimulation, setting to allow stopping to process-rest-enjoy, safety, familiarity
7	It's very hard to rank these landmarks as they all offer slightly different things (i.e. some support navigation more so than others, and some are more unique and salient than others). I have gone with the most unique landmarks at the top of the list.
8	I ranked them according these buildings would trigger place memories and help link to past experiences of place. The funeral home I put last as it may be the least appealing as it is a reminder of end of life.
9	1 - has lots of interest; 2 - good contrast with surroundings; 3 - unusual and very bright, artistic interest 4 - many things here to trigger memories, i.e. white building, tree, seats, bus stop; 5 - the most unmemorable of the buildings albeit of an interesting form. Of course, it might be different ranking if I were able to actually walk

Rows: Person ID Columns: Noticeability

	0	1	All
1	4	1	5
	80.00	20.00	100.00
	16.00	5.00	11.11
	8.889	2.222	11.111
2	3	2	5
	60.00	40.00	100.00
	12.00	10.00	11.11
	6.667	4.444	11.111
3	2	3	5
	40.00	60.00	100.00
	8.00	15.00	11.11
	4.444	6.667	11.111
4	4	1	5
	80.00	20.00	100.00
	16.00	5.00	11.11
	8.889	2.222	11.111
5	4	1	5
	80.00	20.00	100.00
	16.00	5.00	11.11
	8.889	2.222	11.111
6	3	2	5
	60.00	40.00	100.00
	12.00	10.00	11.11
	6.667	4.444	11.111
7	4	1	5
	80.00	20.00	100.00
	16.00	5.00	11.11
	8.889	2.222	11.111
8	0	5	5
	0.00	100.00	100.00
	0.00	25.00	11.11
	0.000	11.111	11.111

9	1	4	5
	20.00	80.00	100.00
	4.00	20.00	11.11
	2.222	8.889	11.111
All	25	20	45
	55.56	44.44	100.00
	100.00	100.00	100.00
	55.556	44.444	100.000

Cell Contents:           Count  
                                   % of Row  
                                   % of Column  
                                   % of Total

**Chart 1: descriptive statistics for variables ‘noticeability’ and ‘person ID’**

Rows: Landmark ID   Columns: Noticeability

	0	1	All
1	3	6	9
	33.33	66.67	100.00
	6.67	13.33	10.00
	3.333	6.667	10.000
2	5	4	9
	55.56	44.44	100.00
	11.11	8.89	10.00
	5.556	4.444	10.000
3	4	5	9
	44.44	55.56	100.00
	8.89	11.11	10.00
	4.444	5.556	10.000
4	3	6	9
	33.33	66.67	100.00
	6.67	13.33	10.00
	3.333	6.667	10.000
5	5	4	9
	55.56	44.44	100.00
	11.11	8.89	10.00
	5.556	4.444	10.000
6	6	3	9
	66.67	33.33	100.00
	13.33	6.67	10.00
	6.667	3.333	10.000
7	4	5	9
	44.44	55.56	100.00
	8.89	11.11	10.00
	4.444	5.556	10.000
8	5	4	9
	55.56	44.44	100.00
	11.11	8.89	10.00
	5.556	4.444	10.000

9	6	3	9
	66.67	33.33	100.00
	13.33	6.67	10.00
	6.667	3.333	10.000
10	4	5	9
	44.44	55.56	100.00
	8.89	11.11	10.00
	4.444	5.556	10.000
All	45	45	90
	50.00	50.00	100.00
	100.00	100.00	100.00
	50.000	50.000	100.000

Cell Contents:           Count  
                                   % of Row  
                                   % of Column  
                                   % of Total

**Chart 2: descriptive statistics for variables ‘noticeability’ and ‘landmark ID’**

Rows: Person	ID	Columns: Appeal					
	1	2	3	4	5	Missing	All
1	0	0	0	0	1	4	1
	0.00	0.00	0.00	0.00	100.00	*	100.00
	0.00	0.00	0.00	0.00	20.00	*	5.00
	0	0	0	0	5	*	5
2	0	1	0	0	1	3	2
	0.00	50.00	0.00	0.00	50.00	*	100.00
	0.00	25.00	0.00	0.00	20.00	*	10.00
	0	5	0	0	5	*	10
3	1	0	1	1	0	2	3
	33.33	0.00	33.33	33.33	0.00	*	100.00
	33.33	0.00	25.00	25.00	0.00	*	15.00
	5	0	5	5	0	*	15
4	0	0	1	0	0	4	1
	0.00	0.00	100.00	0.00	0.00	*	100.00
	0.00	0.00	25.00	0.00	0.00	*	5.00
	0	0	5	0	0	*	5
5	0	0	0	0	1	4	1
	0.00	0.00	0.00	0.00	100.00	*	100.00
	0.00	0.00	0.00	0.00	20.00	*	5.00
	0	0	0	0	5	*	5
6	0	1	1	0	0	3	2
	0.00	50.00	50.00	0.00	0.00	*	100.00
	0.00	25.00	25.00	0.00	0.00	*	10.00
	0	5	5	0	0	*	10
7	0	0	0	1	0	4	1
	0.00	0.00	0.00	100.00	0.00	*	100.00
	0.00	0.00	0.00	25.00	0.00	*	5.00

	0	0	0	5	0	*	5
8	1	1	1	1	1	0	5
	20.00	20.00	20.00	20.00	20.00	*	100.00
	33.33	25.00	25.00	25.00	20.00	*	25.00
	5	5	5	5	5	*	25
9	1	1	0	1	1	1	4
	25.00	25.00	0.00	25.00	25.00	*	100.00
	33.33	25.00	0.00	25.00	20.00	*	20.00
	5	5	0	5	5	*	20
All	3	4	4	4	5	*	20
	15.00	20.00	20.00	20.00	25.00	*	100.00
	100.00	100.00	100.00	100.00	100.00	*	100.00
	15	20	20	20	25	*	100

Cell Contents:           Count  
                                  % of Row  
                                  % of Column  
                                  % of Total

Chart 3: descriptive statistics for variables ‘appeal’ and ‘person ID’

Rows: Landmark	ID	Columns: Appeal					Missing	All
	1	2	3	4	5			
1	3	2	0	0	1	3	6	
	50.00	33.33	0.00	0.00	16.67	*	100.00	
	33.33	22.22	0.00	0.00	11.11	*	13.33	
	6.667	4.444	0.000	0.000	2.222	*	13.333	
2	1	2	1	0	0	5	4	
	25.00	50.00	25.00	0.00	0.00	*	100.00	
	11.11	22.22	11.11	0.00	0.00	*	8.89	
	2.222	4.444	2.222	0.000	0.000	*	8.889	
3	1	1	2	1	0	4	5	
	20.00	20.00	40.00	20.00	0.00	*	100.00	
	11.11	11.11	22.22	11.11	0.00	*	11.11	
	2.222	2.222	4.444	2.222	0.000	*	11.111	
4	0	0	2	3	1	3	6	
	0.00	0.00	33.33	50.00	16.67	*	100.00	
	0.00	0.00	22.22	33.33	11.11	*	13.33	
	0.000	0.000	4.444	6.667	2.222	*	13.333	
5	1	0	0	1	2	5	4	
	25.00	0.00	0.00	25.00	50.00	*	100.00	
	11.11	0.00	0.00	11.11	22.22	*	8.89	
	2.222	0.000	0.000	2.222	4.444	*	8.889	
6	1	1	1	0	0	6	3	
	33.33	33.33	33.33	0.00	0.00	*	100.00	
	11.11	11.11	11.11	0.00	0.00	*	6.67	
	2.222	2.222	2.222	0.000	0.000	*	6.667	
7	2	2	0	0	1	4	5	
	40.00	40.00	0.00	0.00	20.00	*	100.00	

	22.22	22.22	0.00	0.00	11.11	*	11.11
	4.444	4.444	0.000	0.000	2.222	*	11.111
8	0	1	2	0	1	5	4
	0.00	25.00	50.00	0.00	25.00	*	100.00
	0.00	11.11	22.22	0.00	11.11	*	8.89
	0.000	2.222	4.444	0.000	2.222	*	8.889
9	0	0	1	1	1	6	3
	0.00	0.00	33.33	33.33	33.33	*	100.00
	0.00	0.00	11.11	11.11	11.11	*	6.67
	0.000	0.000	2.222	2.222	2.222	*	6.667
10	0	0	0	3	2	4	5
	0.00	0.00	0.00	60.00	40.00	*	100.00
	0.00	0.00	0.00	33.33	22.22	*	11.11
	0.000	0.000	0.000	6.667	4.444	*	11.111
All	9	9	9	9	9	*	45
	20.00	20.00	20.00	20.00	20.00	*	100.00
	100.00	100.00	100.00	100.00	100.00	*	100.00
	20.000	20.000	20.000	20.000	20.000	*	100.000

Cell Contents:           Count  
                                   % of Row  
                                   % of Column  
                                   % of Total

Chart 4: descriptive statistics for variables ‘appeal’ and ‘landmark ID’

Category	Observed	Test Proportion	Expected	Contribution to Chi-Sq
0	25	0.5	22.5	0.277778
1	20	0.5	22.5	0.277778

N	N*	DF	Chi-Sq	P-Value
45	0	1	0.555556	0.456

Chart 5: Chi-square goodness-of-fit test for variable ‘noticeability’ for public art and historical landmarks

Category	Observed	Test Proportion	Expected	Contribution to Chi-Sq
1	6	0.2	5	0.2
2	5	0.2	5	0.0
3	5	0.2	5	0.0
4	5	0.2	5	0.0
5	4	0.2	5	0.2

N	N*	DF	Chi-Sq	P-Value
25	20	4	0.4	0.982

Chart 6: Chi-square goodness-of-fit test for variable 'appeal' for public art

Category	Observed	Test Proportion	Expected	Contribution to Chi-Sq
1	3	0.2	4	0.25
2	4	0.2	4	0.00
3	4	0.2	4	0.00
4	4	0.2	4	0.00
5	5	0.2	4	0.25

N	N*	DF	Chi-Sq	P-Value
20	25	4	0.5	0.974

5 cell(s) (100.00%) with expected value(s) less than 5.

Chart 7: Chi-square goodness-of-fit test for variable 'appeal' for historical landmarks