RIVER CITY REVEALED:

Wayfinding to the Red, Assiniboine and Seine Rivers in Winnipeg, Manitoba

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EXECUTIVE SUMMARY

User-led and pedestrian-focused research reveals the links and disconnects between walkability, wayfinding, and Winnipeg's Red, Assiniboine and Seine Rivers. This study on wayfinding to the three rivers draws attention to discouraged pedestrians as well as the people-first strategies and infrastructure which currently have but a low profile in Winnipeg; a mode shift to more people on foot and a more walkable Winnipeg desperately needs a helping hand. The research draws out problems associated with wayfinding in Winnipeg as a fourfold opportunity and catalyst to: celebrate a new image of the city, contribute to the literature on and redefine wayfinding, improve pedestrian access, awareness and appreciation for the urban waterways, and support the development of key recommendations for a "3-Rivers Wayfinding System" in Winnipeg. In the carrying out of the research, a review of the wayfinding literature, an audit of Winnipeg's existing wayfinding signage, precedent research on effective wayfinding signs, a map of river access points in the study area within a 10-minute walking distance, and a pedestrian-centred postcard questionnaire uncovered seven significant findings to enrich and advance the development of a city-wide "3-Rivers Wayfinding System". What matters to Winnipeggers and for wayfinding to the Red, Assiniboine and Seine Rivers is local character and identity, history and culture, creativity and innovation, pedestrians and walkability, weather and seasons, accessibility and safety, plus connectivity and consistency; altogether, a wayfinding system to the three rivers in Winnipeg matters. The way to Winnipeg's urban waterways is via a proposed "3-Rivers Wayfinding System" – with wayfinding heightened to reveal Winnipeg's storied identity as "River City".

Keywords: Wayfinding, River City, Winnipeg Rivers, Walkability, Winnipeg

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CHAPTER 1 INTRODUCTION

Introduction

Wayfinding is the purposeful, directed, and motivated (Allen, 1999; Golledge, 1999) interaction between pedestrians and the environment to navigate from a starting place to a final destination. Absent in Winnipeg is wayfinding to show pedestrians how to wayfind to the city's Red, Assiniboine and Seine Rivers. The lack of wayfinding is a missed opportunity to draw awareness and appreciation for Winnipeg's "River City" identity. The proposed research involves a literature review, an audit of Winnipeg's existing wayfinding signage, best precedent research, a map of river access points within a 10-minute pedestrian shed, plus a pedestrian targeted postcard questionnaire to aid the development of key recommendations for a "3-Rivers Wayfinding System" in Winnipeg.

1.1 The Purpose of Researching Wayfinding to the Red, Assiniboine and Seine Rivers

1.1.1 For Pedestrians, By Pedestrians

My research engaged users of Winnipeg's Red, Assiniboine and Seine Rivers and participants who live, work, play and volunteer within walking distance of the three rivers. Collecting data from a pedestrian-centric audience, in particular, was essential to my research. Responses helped to answer how to enrich Winnipeg's wayfinding woes and how to improve access, awareness and appreciation for the three rivers. As the primary form of data collection, the information guided the development of recommendations for how best to implement a "3-Rivers Wayfinding System" in Winnipeg and build a strong foundation for improved wayfinding via a user-led, pedestrian focus.

1.2 The Problem with Wayfinding in Winnipeg

1.2.1 #PeopleFirst? #ModeShift? #WalkableWinnipeg?

Undeniably, Winnipeg is a car-centric rather than a human-centric city. My research scrutinizes Winnipeg's seeming lack of initiative to develop sound pedestrian-focused strategies to improve and build up the city's pedestrian infrastructure which includes wayfinding for people on foot. Shifting the mindset of Winnipeggers to "ditch the car" for alternative modes of transportation may be a difficult task. Despite walking being one of the cheapest and sustainable modes of commuting and travelling, the 2016 Census Data illuminates the car-centric habits of many Winnipeggers. Of the total population 15 years and over employed in the labour force, an astounding 77.4% commute via car, truck or van – either as a driver or as a passenger (City of Winnipeg & Statistics Canada, 2019b). Arguably, Winnipeg is not perceived as particularly walkable, according to this statistic.

1.2.2 Discouraged Pedestrians

Many considerations discourage pedestrians from appreciating Winnipeg's three rivers. One not so obvious factor is the lack of understanding where pedestrians actually are physically in relation to the three rivers and how long it takes them to get there. Addressing these two elements alone may encourage pedestrians to explore or navigate the local environment more confidently. Another circumstance unfavourable to pedestrians touches on how wayfinding signage in Winnipeg appears primarily intended for people in cars, according to my research. Even the wayfinding systems for people walking seem for the most part poorly designed, situated and maintained; plus they often feature unhelpful information.

1.3 The Significance of Researching Wayfinding to the Red, Assiniboine and Seine Rivers

1.3.1 Gap in the Literature

My research fills a gap in the literature on wayfinding. There is a wealth of literature on wayfinding and how, what, when, and why users move through the multitude of environments ranging from the built to the virtual; however, to my knowledge, there are limited sources covering the questions of wayfinding to urban waterways. A broader objective of the research is to contribute to the literature on pedestrian-centred wayfinding in the public realm, particularly in Winnipeg.

1.3.2 Placemaking – Celebrating the City

My research explores Winnipeggers' sense of place and their connections specifically to the Red, Assiniboine and Seine Rivers. The argument is wayfinding can uncover and celebrate the local character of places and the city as a whole. By implementing a "3-Rivers Wayfinding System", pedestrians may find both comfort and a new image of place and identity for Winnipeg.

1.4 Research Question

How can wayfinding be enriched to heighten Winnipeg's "River City" namesake and Winnipeggers' access, awareness and appreciation for the three rivers (Red, Assiniboine and Seine)?

1.5 Document Structure

The document comprises eight chapters. The first chapter introduces the purpose of the research, the problem with wayfinding, the significance of the research, and the research question. Chapter 2 offers an overview of the research methods as well as the limitations in the research. Chapter 3 reviews the literature on wayfinding to draw out definitions of the term, key findings, and gaps. Chapter 4 covers the Winnipeg context in terms of walkability, wayfinding and the three rivers to better interpret the research results. Chapter 5 extends the previous chapter and provides census data and details on the study area within Winnipeg, the neighbourhoods of Wolseley and West Broadway. Chapter 6 lays out the data results of four research methods: an audit of Winnipeg's existing wayfinding signage, precedent research for effective signs, a map of river access points, and a postcard questionnaire. Chapter 7 discusses the research findings and features analysis highlighting seven important elements. Chapter 8 closes out the document. It summarizes the research by-the-numbers, answers the research question, and draws together the key findings and discussion points to propose eight key recommendations for a "3-Rivers Wayfinding System" in Winnipeg. Finally, it reflects on the research and suggests future research directions, plus next steps.

CHAPTER 2 RESEARCH METHODS

Research Methods

An overview of the four pedestrian-focused research methods used to support and develop recommendations for a "3-Rivers Wayfinding System" in Winnipeg include an audit of Winnipeg's existing wayfinding signage, an effective signs precedent research, a map of river access points within a 10-minute walking distance, plus a postcard questionnaire. The purpose and fundamental determining aspects for each of the four research methods are mentioned below. The chapter ends with the limitations of the methods and research on the whole.

2.1 Audit of Winnipeg's Existing Wayfinding Signage

2.1.1 Purpose

An audit, in the form of a collection of photographs, was useful for identifying the current state of wayfinding in Winnipeg's urban public spaces. The audit narrowed in on publicly displayed signage placed within a 10-minute walking distance of Winnipeg's three rivers from three chosen sites. Streets and neighbourhoods for the audit included: Main Street in The Exchange District neighbourhood; Sherbrook Street and both Westminster and Portage Avenues in the neighbourhoods of Wolseley and West Broadway; and Youville, Marion and Archibald Streets in the St. Boniface neighbourhood. A product of the audit combined photographs and text to assess the consistency and effectiveness of information for thematic groupings of wayfinding signage **(see Appendix)**. The findings **(Chapter 6)** and discussion **(Chapter 7)** from the audit of Winnipeg's existing wayfinding signage factored into the final recommendations **(Chapter 8)** for a "3-Rivers Wayfinding System" in Winnipeg.

2.1.2 Determining Audit Sites

The audit of Winnipeg's existing wayfinding signage covered three local sites within a 10-minute walking distance of Winnipeg's three rivers. The sites were selected to represent a diverse demographic in terms of population, main mode of commuting, household types, plus dwelling type and tenure statistics. At the same time, the three sites possessed the characteristic of a compact urban space; the audit occurred in the neighbourhoods of Wolseley, West Broadway, The Exchange District, and St. Boniface. Of note, the audit included sites outside of the Wolseley and West Broadway study area to gain a broader scope of the current state of wayfinding in Winnipeg's urban public spaces. Expanding the audit to three rather than one site opened room for a more comprehensive gap analysis to inform a "3-Rivers Wayfinding System" in Winnipeg.

2.1.3 Determining What Signs to Audit

The audit of Winnipeg's existing wayfinding signage focused on signs targeting all wayfinders of the city: Motor vehicle drivers, public transit users, cyclists, and pedestrians. Again, the broader scope allowed for a well-rounded evaluation of the current condition and gaps in Winnipeg's wayfinding systems. On a similar note, wayfinding signage may serve multiple users and should thus be looked at together as a whole to avoid a narrowed view of what signs serve what users. My recommendations for a "3-Rivers Wayfinding System", however, prioritized strategies for users who walk in Winnipeg.

2.2 Effective Signs – Precedent Research

2.2.1 Purpose

A small sample of effective signs highlighted current wayfinding signs and practices both locally and from outside of Winnipeg. The goal was to uncover unique projects of value for the research. The precedent research for effective signs also tied in with the audit of Winnipeg's existing wayfinding signage to call attention to the successes and failures present with wayfinding in Winnipeg. The collective series of effective signs informed key recommendations for a "3-Rivers Wayfinding System" in Winnipeg.

2.2.2 Determining the Effectiveness of Signs

The search for effective signs centred on following the Instagram hashtag #Wayfinding. Social media helped to isolate a mix of traditional, current and exceptional wayfinding signs and practices to support my recommendations for a "3-Rivers Wayfinding System" in Winnipeg. Scrolling through the online hashtags revealed examples of effective signs both created and developed by not only professional wayfinding practitioners but via amateurs or innovators to the field. The results of the precedent research exposed eight characteristics which may be used to determine the effectiveness of wayfinding signs **(see Section 6.3.2)**.

2.3 Map of River Access Points

2.3.1 Purpose

A map revealed the current river access points for pedestrians to move to and from the Assiniboine River. The map featured a 10-minute walking distance boundary moving north from the river and within one site encompassing the neighbourhoods of Wolseley and West Broadway. The chosen site represented a place in Winnipeg with a reasonably high population density and with pedestrian infrastructure both formal and informal to access the river. The site also provided a diverse demographic who live, work, play or volunteer in the area and adjacent to major transportation arterials with medium to high-traffic pedestrian realms. Finally, the chosen study area exemplified two neighbourhoods in Winnipeg with strong identities and local character: Wolseley and West Broadway are walkable neighbourhoods **(see Section 5.3.1)**. The map of river access points also assisted to define the physical boundaries of the study area as well as a distribution area for the delivery of postcard questionnaires **(see Section 2.4)** to potential research participants.

2.3.2 Determining a Pedestrian Shed

A pedestrian shed is a common concept within the fields of urban design and city planning when speaking to or for walkable cities. The pedestrian shed demarcates the catchment area by which people are willing to walk over driving, typically represented by a 5-minute or 400-metre walking distance drawn in the shape of a circle outwards from a central node or destination. For my research, I mapped a 10-minute or 800-metre walking distance moving northwards from the Assiniboine River within the neighbourhoods of Wolseley and West Broadway, the shape was irregular not circular. Though "the 5-minute walk sets a scope for collecting both quantitative and qualitative data at a human scale" (Morphocode.com, 2019), I believe a 10-minute walk was certainly reasonable for assessing and accessing open spaces such as Winnipeg's Red, Assiniboine and Seine Rivers.

2.4 Postcard Questionnaire

2.4.1 Purpose

A 15-question postcard questionnaire was hand-delivered within a 10-minute walking distance from the Assiniboine River in the neighbourhoods of Wolseley and West Broadway. The designed and printed postcards provided a website URL (WinnipegRivers.com) and a QR code with accompanying instructions for participants to access the questionnaire online. The postcard questionnaire was also a creative outlet to engage willing participants and attract participation. The aim was to collect responses from participants to grasp the potential influence of wayfinding in Winnipeg: How do pedestrians find their way around Winnipeg? How Winnipeggers perceive the local character and identity of Winnipeg and the three rivers? How do Winnipeggers' celebrate or what are the barriers to celebrating the Red, Assiniboine and Seine Rivers? How can wayfinding heighten access, awareness and appreciation for Winnipeg's three rivers? If a good wayfinding system emphasizes user-led design, it was critical to engage with research participants to gather their thoughts, feedback and ideas. The data results were compiled into a spreadsheet for analysis. The task was to analyze the combined data to answer the research question at hand. The information provided by the collective responses served to frame recommendations for a Winnipeg "3-Rivers Wayfinding System".

2.4.2 Determining the Target Audience

The decision to hand-deliver 500 postcard questionnaires to the mailboxes of households in my study area of Wolseley and West Broadway was not an easy choice to arrive at. A multitude of factors came into play to determine whom my target audience would be. Initially, my plan for reaching research participants was to conduct face-to-face intercept surveys on the streets of Wolseley and West Broadway, in particular, at the busy pedestrian intersection where Sherbrook Street and Westminster Avenue meet. However, with the passing of time, winter weather worries, debating an iPad versus a paper survey, and if I could obtain a desirable amount of people to participate, I decided to focus on an online questionnaire. By producing a postcard, I would be able to direct potential participants to WinnipegRivers.com. In spite of the limitations surrounding the delivery of a postcard questionnaire **(see next section 2.5)**, I proceeded with this method as my primary means of targeting an audience for my research.

2.5 Limitations

The limitations are broken into two types, those which limit the research and those which have the potential to maximize the research, yet acted as a barrier to achieving a manageable project scope.

Starting with the former, only the Assiniboine River was chosen for collecting data from research participants versus the three rivers and excludes the La Salle River altogether. The decision to focus on one river and moving from five to three to only one study area to alleviate time constraints did not impede on generating a wealth of data and sufficient insights to inform key recommendations for a "3-Rivers Wayfinding System" in Winnipeg. However, neglecting the other rivers and other local sites would likely produce differing overall numbers and results from research methods such as the postcard questionnaire. Speaking of, the major areas of inquiry asked participants specifically about access, awareness and appreciation for Winnipeg and the Red, Assiniboine and Seine Rivers; not surprising, then, the open-ended responses leaned more towards the challenges and barriers alluded to within the 15 questions posed in the online questionnaire. Other aspects limiting the research related to budget, overall time, and weather constraints. With no working budget or funding, less than one year to complete the capstone project, and conducting research outdoors in the colder months meant any grand proposals and alternative research methods were restricted.

Parts which may have hindered the research to reach maximum potential related again to the postcard questionnaire. To begin with, an online questionnaire did not allow for additional probing or clarity of the information released by respondents, as well as, the clarity of the question for the respondent; a degree of misunderstanding and error was present. Finally, the research did not capitalize on an entirely user-led, pedestrian-focused set of research methods. Options for a focus group to wayfind to the three rivers or a focus group to conduct an evaluation or audit of the existing wayfinding signage may have elevated the research and recommendations for a "3-Rivers Wayfinding System" in Winnipeg.

Bearing in mind the limitations and the four research methods, the scope of the project was thus manageable and provided the data required to develop key recommendations. The addition of a literature review also helped to understand the problem with wayfinding and to ground the research methods, above, more directly linked to the user and pedestrian experience.

CHAPTER 3 LITERATURE REVIEW

3.1 Purpose

The purpose of the literature review is threefold: To place the key theoretical resources in the context of its contribution to the subject of wayfinding; to find gaps in the literature; and to synthesize the main arguments in the literature to guide and inform the development of recommendations for a "3-Rivers Wayfinding System" in Winnipeg.

3.2 Wayfinding Defined

What is wayfinding? A clear and generalized definition of wayfinding is as follows: "Wayfinding is knowing where you are in an environment, knowing where your desired location is, and knowing how to get there from your present location. Wayfinding refers to information systems that guide people through a physical environment and enhance their understanding and experience of the space" (SEGD.org, 2019). How, then, do the authors in the literature define wayfinding? Who defines wayfinding? Within the infinite resources, there are an infinite number of definitions for wayfinding; the term's meaning depends on the author's field of practice or expertise. A look at key resources in the wayfinding literature will break down and narrow in on an all-encompassing definition of the word.

3.2.1 Pioneers of Wayfinding

The first use of the term wayfinding links to Kevin Lynch, an urban theorist and professor of city planning widely known for his scholarly writing on urban design (Severo, 1984). Lynch claimed wayfinding as "a consistent use and organization of definite sensory cues from the external environment" (1960, p. 3). Romedi Passini, a professor of architecture "bridges environmental psychology and architectural design in his teaching and research activities" (Passini, 1984, p. 229). In his book, *Wayfinding in Architecture*, Passini (1984) defines wayfinding as "an act of solving spatial problems" (p. 53) and states "wayfinding is an activity that, like few others, demands a complete involvement with the environment. Perceptual and cognitive processes are constantly in action when a person sets out to reach a destination" (p. 160). Reginald Golledge was a professor of geography and "pioneered many significant innovations to research in cognitive mapping, individual decision-making, theories of spatial learning, [and] spatial choice modeling" (American Association of Geographers, n.d.). He termed wayfinding as a spatial cognitive process taking people from their origin to their destination (Golledge, 1999). Above are a few of the influential figures from other practices who shaped and defined the field of wayfinding. Many subsequent literary resources on wayfinding are both informed and grounded on the early uses and definitions of wayfinding from Lynch, Passini, and Golledge.

3.2.2 Modern Voices of Wayfinding

The aggregate of definitions on wayfinding grounded in the pioneer work of Lynch, Passini, and Golledge gives room for present day researchers and professionals in the study of wayfinding to voice a modern definition of the term, to expand the discussion on and understanding of wayfinding. Mollerup (2013), a professor of communication design, coined the term 'wayshowing' as "the professional activity of planning and implementing orientation systems in buildings and outdoor areas….wayfinding is what we do when finding our way in unknown quarters. Good wayshowing is user-led, built on how we practice wayfinding" (p. 6). Hussah Alotaishan (2017), a Ph.D. Candidate interested in urban wayshowing, extends on Mollerup's (2013) words to say, "wayshowing can be defined as those designed solutions that help users (wayfinders) to get from their current location to their desired destination within urban settings" (p. 643). Alotaishan (2017) begs the question: Do we really need signs? His argument goes against the majority of the literature on wayfinding and opens up a new definition of the term in order to "address how urban features may be used as clues to replace the literacy and language dependent wayfinding aids, and minimize their inherent exclusiveness in pedestrian urban settings to offer equal opportunities to people from different cultural backgrounds and various spoken languages" (p. 643). In the same vein as Mollerup (2013) and Alotaishan (2017), Symonds et al. (2017) voice another understanding of wayfinding while still referring to the word wayfinding as, "rarely a purely cognitive process that involves an individual person, who is entirely instrumental in navigating a direct and precise route, but instead that [wayfinding] is a process almost always directed according to embodied and sociocultural needs" (p. 1). The modern voices of wayfinding suggest there are innovative ways to plan and process wayfinding systems.

3.3 Wayfinding as a Simple Concept, Wayfinding as a Complex Process

The literature explains wayfinding as a simple concept. Farr et al. (2012) point out how "on the surface, wayfinding appears to be the straightforward process of moving oneself from a current location to a desired destination in a timely manner" (p. 715). Mustikawati et al. (2018) also provide an on the surface explanation of the wayfinding process that "involves some aspects such as knowing one's position, knowing the location of the destination, knowing the route to get to the destination, knowing the arrival to the destination and knowing the route to go back to the origin" (p. 7). Downs and Stea (1973) further simplify the concept of wayfinding into four-steps: orientation, route selection, route control, and recognition of destination. The question is, how is the practice and process of wayfinding in real life?

Other resources characterize the process of wayfinding as complex. Starting with Lynch (1960): "In the process of wayfinding, the strategic link is the environmental image, the generalized mental picture of the exterior physical world that is held by an individual. This image is the product both of immediate sensation and of the memory of past experience, and it is used to interpret information and to guide action" (p. 4). Next, Arthur and Passini (1991) suggest three processes are involved when people attempt to find their way: Decision making, decision executing, and information processing. This suggests "wayfinding [embodies] spatial problem solving. It involves a certain understanding and manipulation of space. It involves…a certain ability to cognitively map spaces that cannot be perceived from one vantage point alone" (p. 28). Finally, Allen (1999) states "among simple phenomena, wayfinding is rather complex. Few activities are as common, overt, and accessible for study as is destination-directed movement through the environment" (p. 554). To adequately grasp wayfinding as a process requires a grasp of the complex factors associated with wayfinding.

3.4 The Wayfinder's Mind and Body in Space

A strong current running through the literature on wayfinding touches on the wayfinder's mind and body in space. Allen (1999) discusses the pedestrian mind and body, one of either a commuter, explorer, or quester: "The first moves in known and familiar routes and destinations; the second navigates unfamiliar territory for the purpose of learning about the surrounding environment; and the third body moves in space from a familiar place of origin to a unfamiliar destination, a place which is known to exist but which the traveler has not visited previously" (p. 554). Symonds et al. (2017) speak to the socio-cultural mind and body: "Wayfinding studies have not focused on the experiential nature of wayfinding, with the body at the centre of this experience. It is vital… that wayfinding be seen as an embodied experience if the full dynamics of [the wayfinding] process are to be better understood" (p. 1). The authors' alternative definition of wayfinding strives to include notions of spatial cognition and the body in space: "The cognitive, social and corporeal process and experience of locating, following or discovering a route through and to a given space" (Symonds et al., 2017, p. 15). In terms of the anxious mind and body in space, Farr et al. (2012) mention "wayfinding is the process of finding your way to a destination in a familiar or unfamiliar setting using cues given by the environment" (p. 716). Passini (1996) agrees "disorientation and getting lost are commonly very frustrating experiences for travelers or visitors who are trying to reach a specific destination" (p. 319). The literature draws out a diverse set of wayfinders navigating space with varying degrees of spatial cognition and in the form of various bodies.

3.5 Wayfinding and The Environment

Wayfinding involves interactions between the wayfinder and the environment. The literature uncovers how the environment influences wayfinding and what environments are present and absent from the research on wayfinding. A surprisingly high number of key resources focus on landmark-based wayfinding. Lynch (1960) provides a comprehensive description of the types of landmarks in the physical environment and how they ease wayfinding for people:

> [Landmarks] are usually a rather simply defined physical object: building, sign, store, or mountain. Their use involves the singling out of one element from a host of possibilities. Some landmarks are distant ones, typically seen from many angles and distances, over the tops of smaller elements, and used as radial references. They may be within the city or at such a distance that for all practical purposes they symbolize a constant direction. Such are isolated towers, golden domes, great hills. Even a mobile point, like the sun, whose motion is sufficiently slow and regular, may be employed. Other landmarks are primarily local, being visible only in restricted localities and from certain approaches. These are the innumerable signs, store fronts, trees, doorknobs, and other urban detail, which fill in the image of most observers. They are frequently used clues of identity and even of structure and seem to be increasingly relied upon as a journey becomes more and more familiar. (Lynch, 1960, p. 48)

Where Lynch refers to local cues, landmarks and urban elements, he thus provides insight to a new image or way by which pedestrians can wayfind in local environments from one starting place or point or destination to the next or end. A search for literature on wayfinding to river-specific or even aquatic environments produces few results. There is an opportunity to fill the gap in the literature with research on wayfinding connected to urban waterway environments. On a whole, absent are literary sources investigating the wayfinding challenges and successes city's face to link wayfinders to natural environments. How people find their ways in the physical environment must include the greatest environment, nature. The fact of the matter is that "human wayfinding takes place in large-scale spaces. Such spaces cannot be perceived from a single viewpoint therefore people have to navigate through large-scale spaces to experience them. Examples for large-scale spaces are landscapes, cities, and buildings" (Raubal & Winter, 2002, p. 244). Hartley et al. (2003) mention how "finding one's way in a large-scale environment may engage different cognitive processes than following a familiar route…[and] involves making decisions about which way to go based on one's current goals, internal representations, and perceptual cues" (p. 877). The literature on wayfinding and the environment brings to the table interesting finds and opportunities for research in the field.

3.6 Human Wayfinding and Technology

The most interesting and vast wayfinding environment within the literature centres on technology. Alotaishan (2017) affirms "the introduction of smart devices as navigational tools such as Google Map or What3words app in everyday wayfinding task has been raising good reviews" (p. 652); Allen (1999) maintains "on-line navigation aids, often featuring GIS interfaces with GPS links, are available to assist wayfinding in everyday situations involving quests, explores, and detours during commutes" (p. 560); Brunye et al. (2018) say "traditional turn-by-turn navigation systems as commonly found in smartphone apps provide an efficient means for guiding navigation through complex environments; Timpf (2002) asserts "moving around in unknown spaces will be made easier through the use of electronic devices providing location-based services" (p. 9); and Xia et al. (2008) express "navigation aids such as mobile phones…can be used by tourists to achieve their wayfinding goals" (p. 450). There is certainly mounting research and attention given to examine technology's impact on human wayfinding. At the same time, "mobile navigation systems take over guidance in real environments…[The authors] compared navigation with GPS devices to navigation with paper maps and to the direct experience, finding empirical evidence that users travelling with GPS devices acquire less survey knowledge" (Schwering et al., 2017, p.275). The difference is that "in such studies, the individuals navigate through a real or virtual environment and then different performance measures are analyzed. In daily life, however, before we start our journey, we usually plan the route by studying a map, asking other people, or – more recently – using a route planner" (Meilinger & Knauff, 2008, p. 13). In reality and across time, "humans have successfully undertaken this [wayfinding] process employing various means of guidance such as the stars, sextants, maps, and the compass" (Farr et al., 2012, p. 715). The literature does open dialogue and the question: what future technology or innovation will have an impact on human wayfinding?

3.7 Summary

The literature review has uncovered who defines wayfinding, what and how wayfinding is as a concept, process and system, who are the wayfinder minds and bodies moving in space, and what influence the built and virtual environments can possess. The literature further revealed what directions there are to find the way forward to new and revealing research. The literature provided a theoretical framework to guide and inform the development of key recommendations for a "3-Rivers Wayfinding System" in Winnipeg.

CHAPTER 4 THE WINNIPEG CONTEXT: WALKABILITY, WAYFINDING AND THE THREE RIVERS

The Winnipeg Context: Walkability, Wayfinding, and The Three Rivers

Transitioning from the theoretical context to the Winnipeg context, a quick briefing on the topics of walkability, wayfinding and the three rivers balanced with an understanding of the theory from the literature on wayfinding strengthens the recommendations for a "3-Rivers Wayfinding System" in Winnipeg and reinforces the significance of the research.

4.1 Walkability in Winnipeg

The 2016 Census Data illuminates the car-centric habits of Winnipeggers. Of the total population 15 years and over, employed in the labour force, 77.4% commute via car, truck or van – as a driver or as a passenger. Well behind in the main mode of commuting numbers is public transit at 14.9%, walk at 4.9%, bicycle at 1.8%, and other at 1.0% (City of Winnipeg & Statistics Canada, 2019b) **(Figure 1)**. A quick glance at comparable commuting statistics across Canada's eight largest census metropolitan areas (CMAs) – Toronto, Montreal, Vancouver, Calgary, Ottawa-Gatineau, Edmonton, Quebec, and Winnipeg - show "in 2016, the two CMAs with the largest proportion of within-city core commuters using active transportation [walking and cycling to work] were Toronto (47%) and Ottawa–Gatineau (42%). In contrast, Winnipeg had the lowest proportion of within-city core commuters walking or cycling to work, with about 1 in 5 such commuters opting for this commuting type" (Savage, 2019). The data raises the argument about Winnipeg, mainly, the city is not pedestrian-centric in comparison to other Canadian cities; overall, I argue Winnipeg does not compete well on a walkability scale, Winnipeg is not a walkable city.

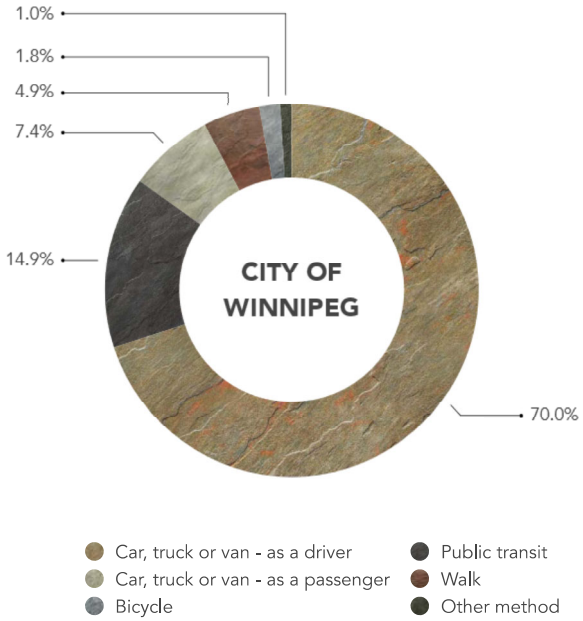


Figure 1. Main mode of commuting in Winnipeg (Source: Choi Ho)

4.2 Wayfinding in Winnipeg

The existing wayfinding systems in Winnipeg orient pedestrians, cyclists, transit users, and motor vehicle drivers to and from their destinations. The city's dominant wayfinding system, also typical in most cities, includes provincial road signage, a downtown Winnipeg wayfinding network on the streets, sidewalks and in the walkways (The "W"), Winnipeg Transit, a dedicated cycling network, as well as a pedestrian map kiosk system spread around the city's core. A closer look at Winnipeg's pedestrian-oriented and targeted wayfinding systems will be investigated in **Chapter 6**. A notable aspect of wayfinding in Winnipeg: The city currently has no unified or collaborative wayfinding system in place to help pedestrians navigate the public realm and built environment.

4.3 Winnipeg's Rivers

Winnipeg is geographically situated in the prairie province of Manitoba at the junction of the Red and Assiniboine Rivers. "The name Winnipeg has its origin in the Cree name given to the lake 40 miles north [Lake Winnipeg], meaning 'Win', muddy, 'nipee', water" (City of Winnipeg, 2016, para. 5) and reflects the "muddy waters" where the two rivers meet. People have been interacting at the meeting place of the Red and Assiniboine Rivers for at least 6,000 years. The Forks, as it is commonly known, has been the traditional territory and gathering place of the Cree, Ojibwe, Oji-Cree, Assiniboine, Dakota, and the birthplace of the Metis nation; a hub for fur trade and the Canadian Pacific Railway and a place to settle an influx of immigrants (The Forks, 2020). There is no doubt The Forks and Winnipeg on the whole possess a strong connection to the rivers; the city is likewise often referred to as "River City".

Winnipeg has four rivers within its municipal boundaries: The Red River, the Assiniboine River, the Seine River, and the La Salle River. The Red River starts in the American states of Minnesota and North Dakota and has its mouth at Lake Winnipeg. The Assiniboine River is a tributary of the Red River and flows from the province of Saskatchewan. The Seine River is also a tributary of the Red River and meanders north from the neighbourhood of St. Vital to the Red River in the neighbourhood of St. Boniface. The La Salle River flows through parts of southern Winnipeg and empties into the Red River in the neighbourhood of Saint Norbert **(Figure 2)**.

A decision was made early within my project scope to exclude the La Salle River from the research. The shift from Winnipeg's four rivers to Winnipeg's three rivers helped narrow my focus to urban waterways running through compact neighbourhoods with a pronounced link to central Winnipeg. An additional decision was made to only collect data from research participants with a link to the Assiniboine River, versus my initial aim of five local sites spread across Winnipeg's three rivers. Of note, the Assiniboine River is the longest in length at 1,070km, 180 kilometres longer than the Red River. The name Assiniboine takes from the Assiniboine people, an Ojibwa term meaning "one who roasts using stones" (The Editors of Encyclopedia Britannica, 2017, para. 2).

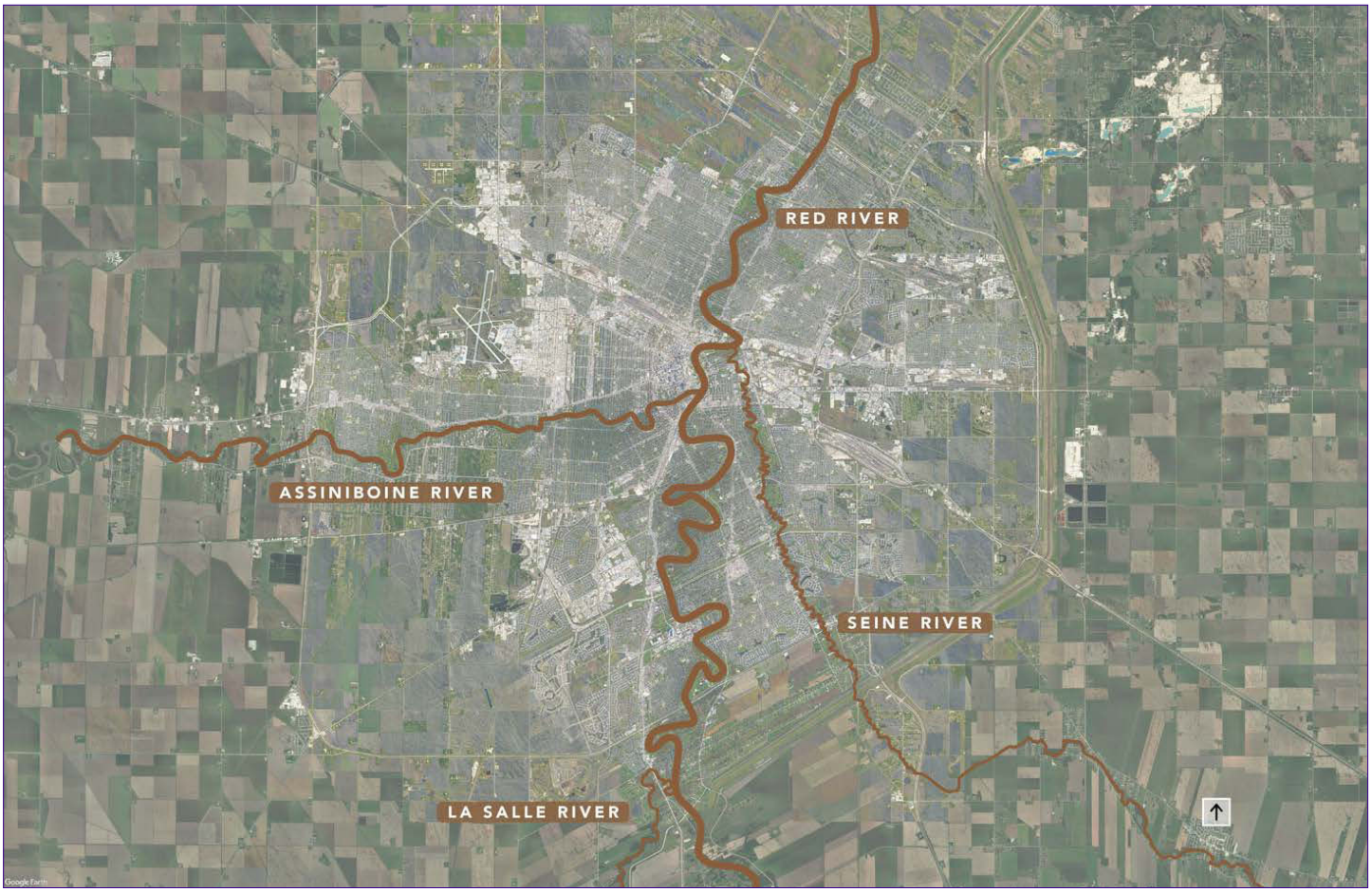


Figure 2. Winnipeg's four rivers (Source: Choi Ho)

4.4 Appreciation for the Three Rivers in Winnipeg

There are a growing number of local precedents demonstrating Winnipeg and Winnipeggers appreciation for the three rivers. A sample of river appreciation events, initiatives, and organizations are listed and pictured below. The range of initiatives include: River clean-ups which bring community stakeholders together to remove garbage from the river banks **(Figure 3)**; arts and design-focused events to celebrate the Winter **(Figure 4)** and Summer **(Figure 5)** river experiences; competitive, recreational and leisurely activities on, in and along the Winnipeg rivers **(Figures 6 and 7)**; transportation options to move Winnipeggers and visitors around the city by water **(Figure 8)**; and organizations and advocates who celebrate, protect and respect Winnipeg's connection to the land and water and to the Red, Assiniboine and Seine Rivers **(Figures 9 and 10)**.

- Red River Operation Clean Up
- Warming Huts – An Arts & Architecture Competition on Ice
- Long Take Collective: From the Seat of a Canoe
- Ironman Outdoor Curling Bonspiel
- Manitoba Paddling Association: $5 Canoe and Kayak Evenings
- Splash Dash: The River Spirit Water Bus
- Save Our Seine – A River Lies Waiting to be Discovered
- Water is Sacred Rally
- The Forks Riverwalk
- Winnipeg Trails: Take a Walk on the Wild Side



Figure 3. Red river operation clean up
(Source: Red River Operation Clean Up, URL: http://www.rroc.ca/the-garbage-collected-in-the-last-15-years/)

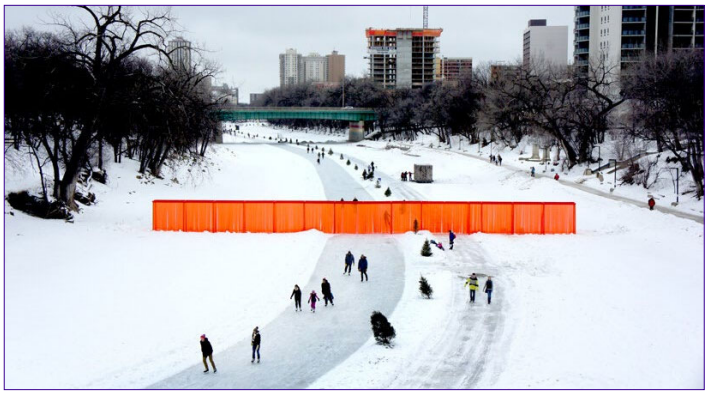


Figure 4. Open border warming hut
(Source: Atelier Ari, URL: https://www.atelierari.nl/#/template-open-border/)



Figure 5. From the seat of a canoe
(Source: Leif Norman, URL: http://www.leifnorman.net/from-the-seat-of-a-canoe-oct-8-2016/)

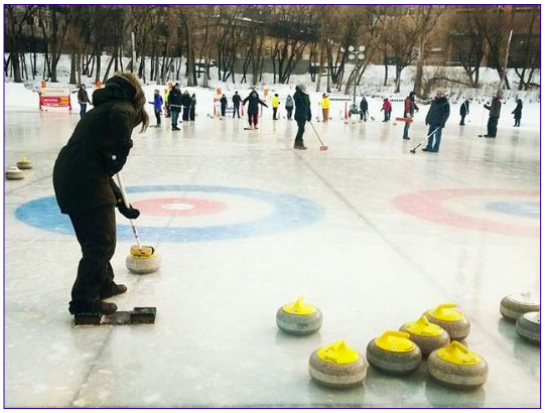


Figure 6. Ironman outdoor curling bonspiel
(Source: Choi Ho)

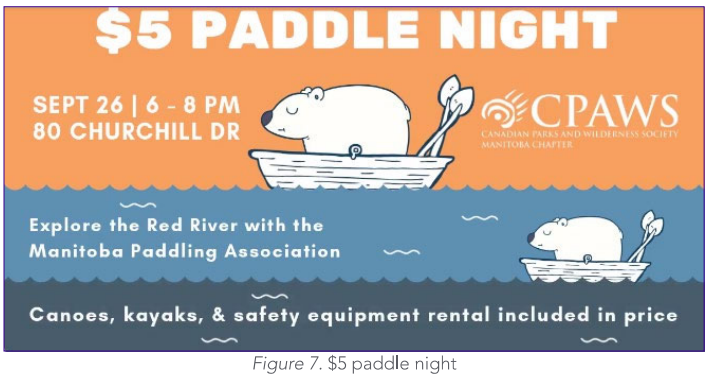


Figure 7. $5 paddle night
(Source: Manitoba Paddling Association, URL: https://www.facebook.com/events/731044914008058/)



Figure 8. Splash Dash water bus service
(Source: Choi Ho)



Figure 9. Save Our Seine
(Source: CBC News Manitoba, URL: https://www.cbc.ca/news/canada/manitoba/save-our-seine-winnipeg-budget-deliberations-1.5373302)



Figure 10. Water is sacred rally
(Source: Lita Fontaine, URL: https://resilienceproject.ca/en/artists/lita-fontaine)

On the same note, what are other Canadian cities doing to heighten appreciation for their rivers? Below is a select list of precedents from Toronto, Thunder Bay, Edmonton, and Calgary with a focus on getting people to and from urban waterways. The following examples may offer Winnipeg the push or next steps to implement a distinctive "3-Rivers Wayfinding System"; if other metropolitan cities can do it, even small city Thunder Bay, then so can Winnipeg with the proper tools, resources, and will. The wayfinding strategies and systems documented below further outline some Canadian cities dedicated to citizen engagement for feedback on how best to improve and build the pedestrian infrastructure necessary to navigate people to and from urban waterways. Some of the precedents below also represent projects and organizations across Canada dedicated to uncovering lost rivers, using technology to narrate people's experiences in the urban environment, and local wayfinders obsessed with boosting and bettering wayfinding in all cities.

- Don River Valley Park
- Hidden Hydrology/Lost Rivers
- Discovery Walks
- Toronto Parks & Trails Wayfinding Strategy
- Thunder Bay Wayfinding Plan 2016-2021
- River Valley Trail System Wayfinding Signage
- Edmonton Wayfinding Society
- Jack and Jean Leslie Riverwalk

The Winnipeg context provides a concise impression of walkability, wayfinding, and the three rivers within Winnipeg plus how the city and other places appreciate their urban waterways and as an impetus for a city-wide "3-Rivers Wayfinding System". As important to the research and developing recommendations is the necessity to look closer into the study area where the user-led and pedestrian-centred research is to take place within Winnipeg.

CHAPTER 5 STUDY AREA: WOLSELEY AND WEST BROADWAY

5.1 Study Area Boundaries

The study area for my research encompasses adjacent Winnipeg neighbourhoods, Wolseley and West Broadway. The outer-most boundaries include Trans-Canada Highway 1 to the north, Osborne Street (Osborne Street Bridge) to the east, the Assiniboine River to the south, and Omand's Creek (Omand Park) to the west, with Maryland Street separating the two neighbourhoods **(Figure 11)**. For pedestrians, the hearts of Wolseley and West Broadway are approximately 30 and 45 minutes, respectively, by foot from Winnipeg's iconic downtown intersection, Portage Avenue and Main Street. Of note, where my research involves participants, the neighbourhood of Armstrong Point to the south of West Broadway was not included. However, Armstrong Point is included in my research where I locate and map the existing access points along the Assiniboine River.

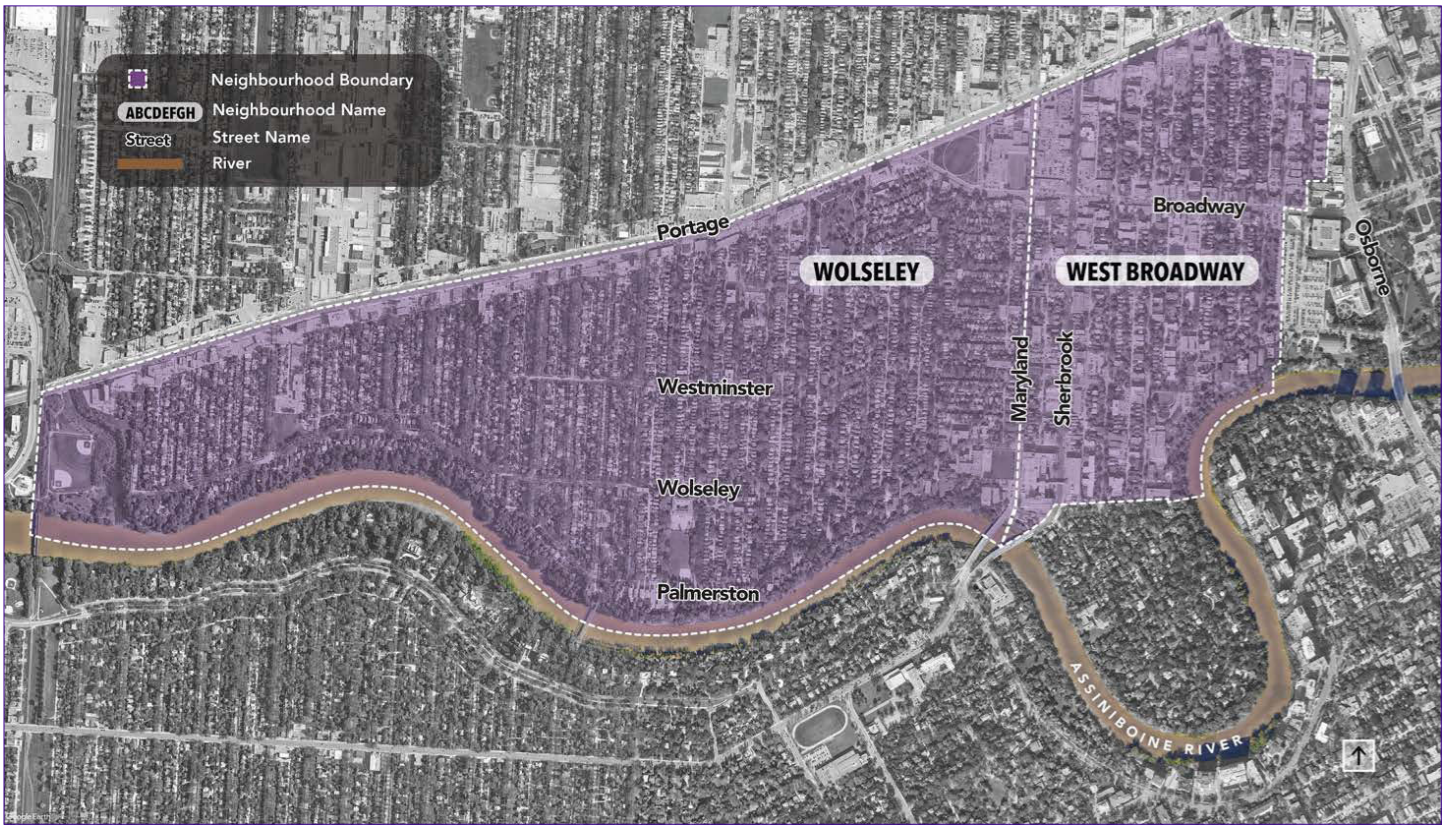


Figure 11. Study area boundaries (Source: Choi Ho)

5.2 Wolseley and West Broadway: Neighbourhood Statistics

5.2.1 Population

(Figure 12) In the 2016 Census Data, the total population for the Wolseley neighbourhood was 7,805 with a 3.3% rise in population from the previous census year. In the neighbourhood of West Broadway, the total population was 5,010, with a -3.9% drop from the previous census year (City of Winnipeg & Statistics Canada, 2019b).

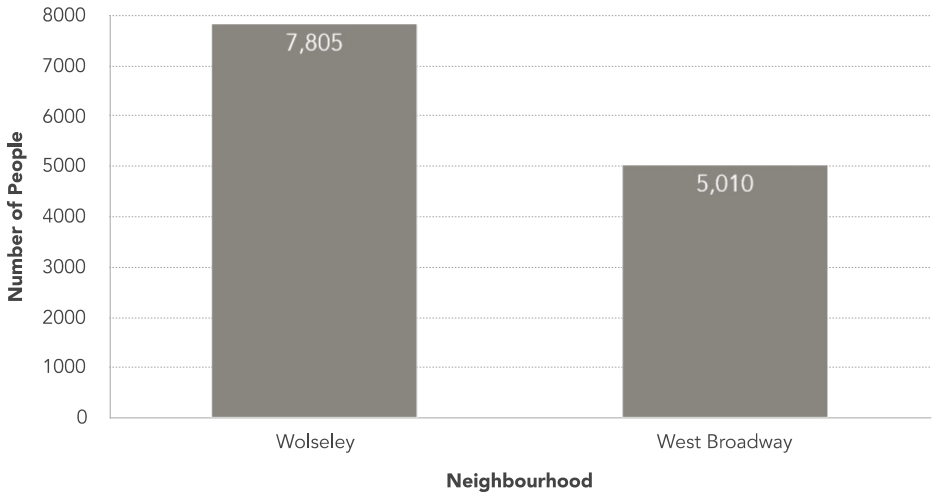


Figure 12. Total population (Source: Choi Ho)

5.2.2 Main Mode of Commuting

(Figure 13) In 2016, the main mode of commuting in Wolseley was dominated by car, truck or van – as a driver for the 15 years and over population employed in the labour force, accounting for 51.5% of the total percentage. In comparison, the combination of commuting by bus (17.9%), foot (12.4%) and bicycle (11.5%) equalled 41.8% in the Wolseley neighbourhood (City of Winnipeg & Statistics Canada, 2019b). In West Broadway, the statistics were balanced among the neighbourhood's top three main modes of commuting: Car, truck or van – as a driver led at 34.7% of the total, with public transit closely behind at 32.4%, and the labour force population who walk was third with 20.4% of the total percentage (City of Winnipeg & Statistics Canada, 2019a).

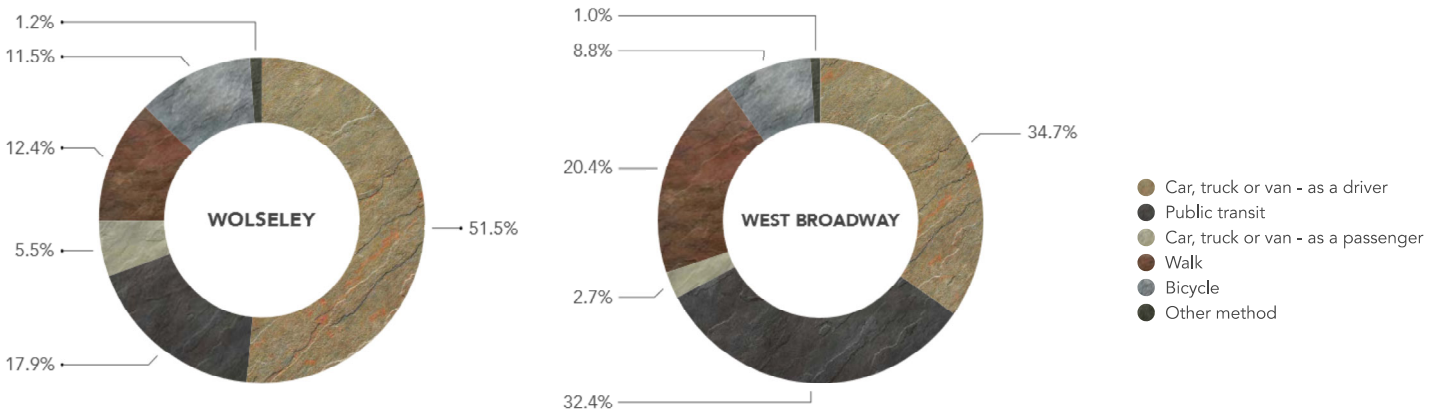


Figure 13. Main mode of commuting (Source: Choi Ho)

5.2.3 Household Types

(Figure 14) According to Census Data, the Wolseley neighbourhood was comprised of a total of 3,485 households, with 1,970 one-family household types (56.5% of total) (City of Winnipeg & Statistics Canada, 2019b). The numbers for the West Broadway neighbourhood presented a total of 1,985 households (66.9% of total) where the majority of household types fall under the non-family household category (City of Winnipeg & Statistics Canada, 2019a).

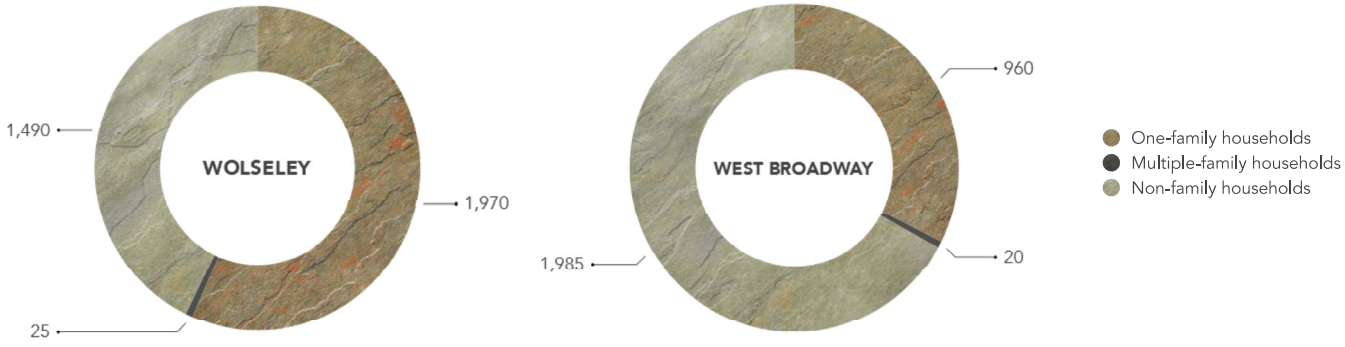


Figure 14. Household types (Source: Choi Ho)

5.2.4 Dwelling Type and Tenure

(Figure 15) In Wolseley, the principal type of dwelling was the single-detached house (1,950 of 3,480 total occupied private dwellings) (City of Winnipeg & Statistics Canada, 2019b) whereas in West Broadway, Apartment, building that has fewer than five storeys (2,015 of 2,950 total occupied private dwellings) topped the neighbourhood (City of Winnipeg & Statistics Canada, 2019b). **(Figure 16)** The dwelling tenure in Wolseley and West Broadway respectively revealed polarizing statistics, with 60.3% (City of Winnipeg & Statistics Canada, 2019b) versus 8.4% (City of Winnipeg & Statistics Canada, 2019a), respectively, who owned rather than rented their dwelling.

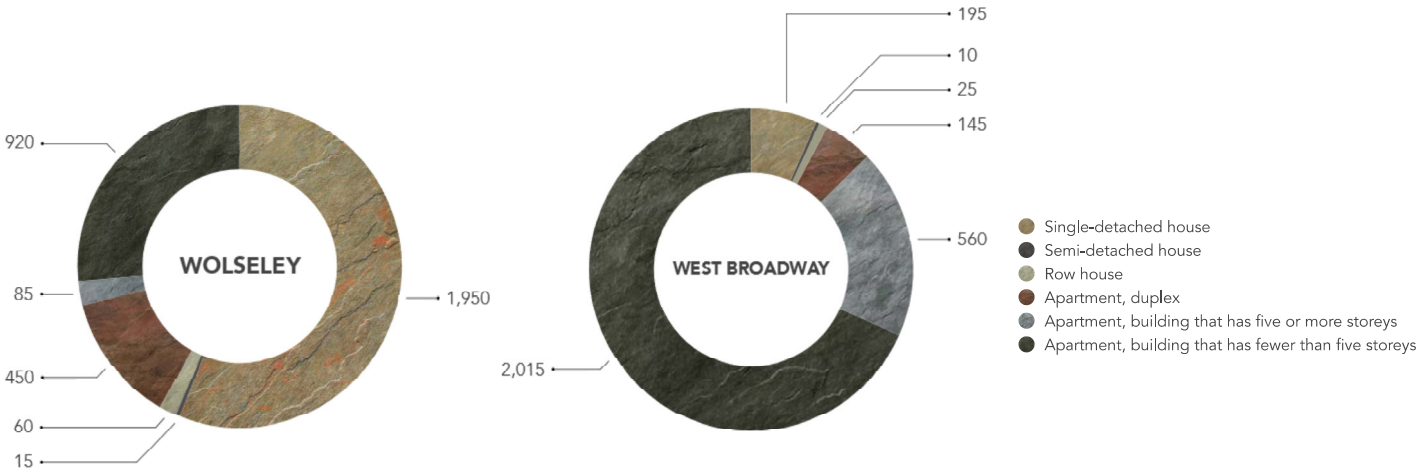


Figure 15. Dwelling type (Source: Choi Ho)

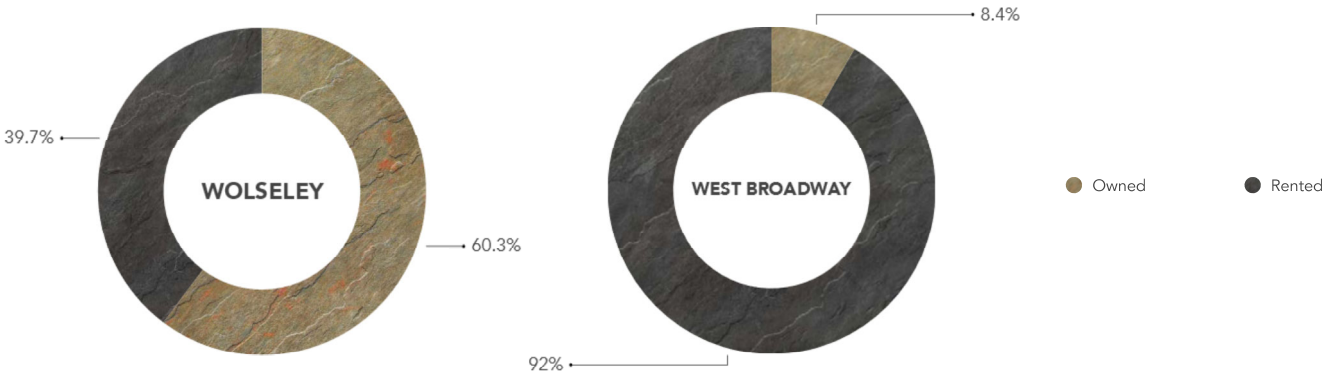


Figure 16. Dwelling tenure (Source: Choi Ho)

5.3 Wolseley and West Broadway: Local Character

Identifying and analyzing key neighbourhood statistics, individually and together, does tell a particular narrative about the local and unique character of Wolseley and West Broadway, and of Wolseley versus West Broadway. My intention is not to comparatively study the two adjacent neighbourhoods. Instead, I wish to combine the two research areas to understand their commonalities and connections as a singular area of study. Of note, I am a current resident of Wolseley living in a duplex along a major arterial; I am also a former tenant of West Broadway who lived on a quiet and community-engaged residential street. I certainly have my own characterization of the study area; it is important I share my impressions of Wolseley and West Broadway.

5.3.1 "The Image of Wolseley and West Broadway"

To focus my characterization of the study area, I use Kevin Lynch's concept of "paths, nodes, edges and districts" from his book entitled *The Image of the City* (1960) to communicate my image of Wolseley and West Broadway. Following Lynch's assessment of city form helps to convey the current elements of the urban structure which describe the local character of the neighbourhoods.

(Figure 17) The image of Wolseley and West Broadway represents my field experience of the study area. The paths have a hierarchy and include both major and minor routes plus a green pathway running parallel to or on the Assiniboine River. The latter mixes infrastructural and environmental elements, such as the Elm tree canopy, to enhance the pedestrian experience of connectivity created by the green pathway from Omand's Creek moving east to the Manitoba Legislature, and vice versa moving west. The nodes, mostly dotted along the river, range in scale and serve as community and public transportation hubs plus nature access points. Toward the study area's north, away from the Assiniboine River, is a hard and highway edge condition formed by Portage Avenue yet ideal for commercial and retail activities; the same goes for the linear districts formed along Westminster Avenue, Broadway, Maryland Street, and Sherbrook Street. The latter two streets form the central district of services and entertainment for both the Wolseley and West Broadway neighbourhoods. Finally, interspersing across the study area are landmarks which carry political, historical, economic, neighbourhood, and visual significance; the major landmarks tend to flank or surround the edges of the study area, while the minor landmarks occupy the major and minor paths. The image of Wolseley and West Broadway is locally characterized by hierarchical paths, hard and natural edges, riverside nodes, and linear districts.

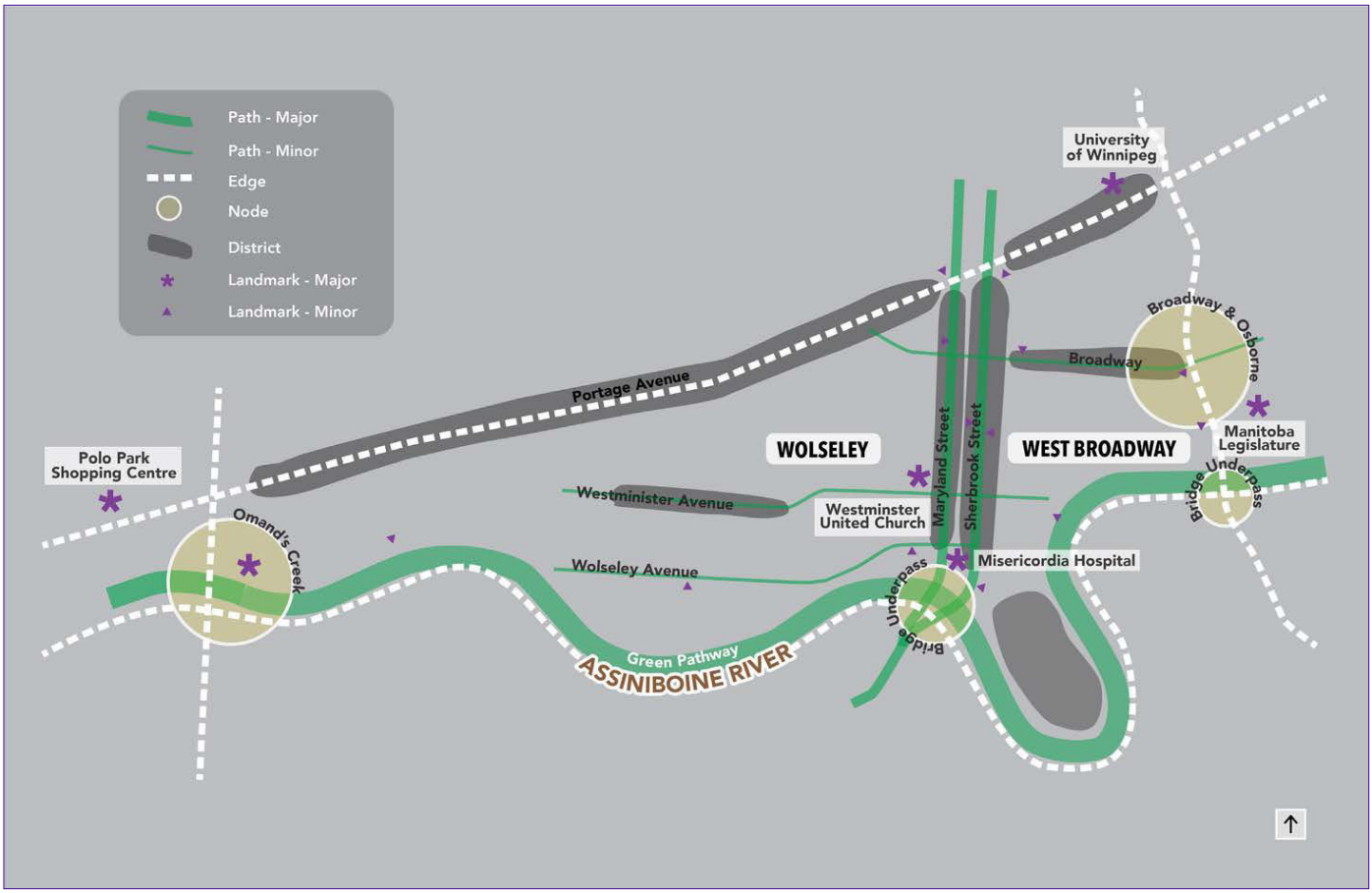


Figure 17. Image of Wolseley and West Broadway (Source: Choi Ho)

5.4 Wolseley and West Broadway: In The News

I wish to acknowledge the persistent issues and concerns in the neighbourhoods of Wolseley and West Broadway perceived as a potential barrier to accessing Winnipeg's three rivers. The headlines, below, from CBC News Manitoba articles, speak to the broad topics of homelessness and river flooding which in turn touches on the subtopics of all-season and public access, personal and water safety, and river governance. The depth and complexity of these two issues and concerns are relevant to my research; however, for the purpose of achieving a manageable project scope, my final recommendations will explicitly focus on strategies to enrich wayfinding to Winnipeg's Red, Assiniboine and Seine Rivers. Strategies to address and tackle homelessness and flooding along the three rivers will not be present in my final recommendations.

5.4.1 Homelessness

The homelessness crisis in Winnipeg is an ongoing concern for community stakeholders in the Wolseley and West Broadway neighbourhoods. The latter, especially, has seen a steady rise in the number of homeless people camping along the riverbanks of the Assiniboine at seasonally-frequented trails and green spaces. The article headlines, below, highlight the homelessness issue within my study area and across Winnipeg. To summarize, Winnipeggers' agree there is a homelessness problem in the city. The concerns go beyond the rise in "tent cities" popping up across Winnipeg. Concerned citizens and advocates for homeless people echo the lack of housing solutions and lack of health resources to shelter and to care for, respectively, the increasing homeless population. Winnipeggers and homelessness allies further express the government's lack of understanding to the situation homeless people face and the links between homelessness and the methamphetamine crisis. Finally, local municipal actions to tackle the homelessness crisis in Winnipeg are reoccurring headlines, such as the disrespectful dismantling of camp sites and the ongoing displacement of people from the streets.

- How do people view the homeless situation in Winnipeg? (CBC News, 2019a)
- Homeless camp cleared by police, but the problem isn't going away: city councillor (CBC News, 2019f)
- Winnipeg seeks help to remove homeless camps, needles from public areas (CBC News, 2019g)
- 'These people have to survive': City's about-face on plan to dismantle homeless camps praised (CBC News, 2019h)
- City shifts strategy after outcry on plans to dismantle Winnipeg homeless camps (CBC News, 2019i)

5.4.2 River Flooding

Flooding is a serious issue affecting access to Winnipeg's three rivers. Spring flooding is an anticipated annual occurrence for the city and every year, public access to the Red, Assiniboine and Seine Rivers is anticipated to be at risk. The article headlines, below, speak to the severity, challenges and impacts of flooding for "River City". The themes arising from the articles touch on flood management and preparedness, flood forecasting and outlooks, the history of flooding in Manitoba, the lessons learned from past natural disasters related to flooding in the region, private property and residents at risk due to flooding, the infrastructural costs tied to flood damages, and the resiliency of people to overcome the impacts of flooding in Winnipeg and across the province.

- 'Well-oiled' flood-fighting machine will protect Winnipeg this spring, expert says (CBC News, 2019b)
- 'The water passes and we're moving on' — but there are lessons in 5 of Manitoba's worst floods, expert says (CBC News, 2019c)
- Flood outlook: Water could reach highest level since 1997 'Flood of the Century' (CBC News, 2019d)
- 123 Winnipeg properties at risk of river flooding, may require dikes (CBC News, 2019e)
- Winnipeg prepares for spring flood on scale of second-worst in recent memory, purely as a precaution (CBC News, 2019j)

5.5 Wolseley and West Broadway Study Area

The Wolseley and West Broadway study area has a number of contexts to take note of: Physical boundaries, census data related to the population, commuting habits, plus household and dwelling types; the visual form and local character of Wolseley and West Broadway; and the issues in the news which concern and impact the two neighbourhoods. A grasp of the Wolseley and West Broadway study area also helps to begin connecting the relevant contexts within the study area to the findings from my four research methods.

CHAPTER 6 FINDINGS

6.1 Introduction: Four Research Methods

The research on wayfinding to Winnipeg's Red, Assiniboine and Seine Rivers involved four methods to answer the research question at hand. An audit of Winnipeg's existing wayfinding signage, precedent research for effective signs, a map of river access points, and a postcard questionnaire aided the development of key recommendations for a "3-Rivers Wayfinding System" in Winnipeg.

6.2 Audit of Winnipeg's Existing Wayfinding Signage

6.2.1 Photograph Collection

The audit of Winnipeg's existing wayfinding signage spanned two days in the Fall of 2019 (October 19-20th) and required two modes of transportation (by foot and bicycle) to photo-document the signage in Wolseley, West Broadway, The Exchange District, and St. Boniface **(Figure 18)**. The audit routes covered streets directly adjacent to the Red, Assiniboine and Seine Rivers as well as major streets within an approximate 10-minute walking distance of the respective rivers **(Figures 19, 20 and 21)**. Equipped with a camera, I captured a total of 909 photographs across all three sites: 392 at the Assiniboine River study area, 337 at the Red River site, and 180 at the Seine River site.

6.2.2 Intuitive On-site Evaluation

I conducted the walk-through and bike-through wayfinding signage audit without a predetermined audit checklist. Instead, I strictly relied on my intuition and inklings when on-site to guide me through the photo-documenting process and from one street to the next. On foot, pedestrian-focused and pedestrian-scaled wayfinding signage was limited and lacking. As I progressed along the walking audit routes, I shifted my attention to the location of signs on sidewalk infrastructure, any signs placed at pedestrian eye level, as well as visual cues in my surroundings to gain insight into the current state of wayfinding in Winnipeg. On my biking audit route, around St. Boniface, signage was far and fewer compared to the other audited neighbourhoods; this created the sense of a less cluttered wayfinding environment. However, I observed no wayfinding signage to direct people to the active transportation bridge on Tremblay Street crossing the Seine River. My intuition provided a less structured though more mindful evaluation of current wayfinding signage in Winnipeg.

6.2.3 Framework for Evaluating Winnipeg's Wayfinding System

After the audit was complete in Wolseley, West Broadway, the Exchange District, and St. Boniface, I was unsure how best to proceed with my data, so I referred to the literature on wayfinding assessment to develop my own framework for evaluating Winnipeg's existing wayfinding system. The City of Toronto engaged stakeholders to improve wayfinding across City parks and trails. Public consultations revealed comments and concerns such as: Identity, diversity, uniqueness of place; sustainable and low maintenance signage; and positive and consistent messaging (City of Toronto, 2017, p. 3). In a wayfinding system audit conducted for the Queensland Government in Australia, "the optimal readability of signs viewed from a distance included: Colour contrast, luminance contrast, lighting to reduce glare, informative content, combination of pictograms and tactile indicators, plus suitable font style and spacing between letters and words (Apelt, Crawford and Hogan, 2007, p. 28). Finally, a student-led wayfinding assessment in Iowa, USA, used five criteria to characterize signage: The type of wayfinding signage, the purpose of the wayfinding sign, and the legibility, clarity, plus design of the sign; the latter criteria evaluated the way by which the sign portrayed information or a sense of place (Fockler, 2016, p. 7). The literature on wayfinding assessment brought structure to my on-site audit intuitions and inklings. I established a framework modelled on what was heard from stakeholders in Toronto, best and standard practices followed in Queensland, as well as, consistent criteria or checklist items used by students in Iowa to support and strengthen my audit on the state of signage and the wayfinding systems altogether across Winnipeg.

A formal evaluation framework helped to refine the categorization and theming of my findings and remained consistent with the concerns and observations I intuitively formed and felt while conducting the audit of Winnipeg's existing wayfinding signage. The audit identified a list of eight overlapping measures to framework my overall assessment of Winnipeg's wayfinding system based on the three navigated audit routes. The eight criteria break down and group the collection of 909 photographs based on the following:

1. Ownership of Sign
    - Who has ownership?
    - Who is responsible for the installation/maintenance?
2. Type of Sign
    - Destination/Identification
    - Information/Interpretative
    - Directional
3. Sign Typology
    - Post
    - Free-standing
    - Ground
    - Guerrilla
4. Intended User of Sign
    - Multiple
    - Motor Vehicle Driver
    - Public Transit User
    - Cyclist
    - Pedestrian
5. Visibility of Sign
    - Placement
    - Frequency
    - Lighting/Luminance
    - Nighttime Visibility
6. Legibility of Sign
    - Typography
    - Letter Case and Spacing
    - Colour Use
    - Logos/Pictograms
7. Character/Identity of Sign
    - Local/Unique
    - No/Uniform Character
8. Quality/Condition of Sign
    - Aging
    - Sun/Light Exposure
    - Materiality/Durability/Sustainability

6.2.4 Formal Evaluation of Winnipeg's Existing Wayfinding System

Using the framework above to assess Winnipeg's current wayfinding system uncovered the following results. Provided below is a solid picture of the state of wayfinding in the city as well as discussion points for developing a city-wide "3-Rivers Wayfinding System". Examples from the photograph collection in connection to the formal evaluation of Winnipeg's existing wayfinding system are found in the **Appendix**.

Ownership of Sign. With the audit of existing wayfinding signage focused on publicly displayed signs, the majority of the ownership of signage is under the City of Winnipeg or the Province of Manitoba; the two are also responsible for the installation or maintenance of wayfinding signage throughout Winnipeg. The exceptions were signs found to be under the typologies of "ground" or "guerrilla", to be discussed below.

Type of Sign. With respect to the type of signs observed at the three audit sites, three categories were apparent: Destination/identification signs, information/interpretative signs, and directional signs. There were none more dominant than the next; all three types of signs displayed standalone information, and each played a role in the wayfinding process to navigate people from a starting point to an end point.

Sign Typology. The sign typology can be grouped under four types: Post, free-standing, ground, and guerrilla. The bulk of the wayfinding signage existing in Winnipeg is affixed to posts, for example, fingerposts or lamp posts. Free-standing signs are few but dispersed at certain nodes or points at the three audit sites. Ground signs tended to be rare or one-of-a-kind examples of sign typologies; these were also wayfinding signs typically found on sidewalk infrastructure. Guerrilla signs were discovered at all three audit sites from a pedestrian point of view, on foot.

Intended User of Sign. People who drive in motor vehicles were the dominant intended user of existing wayfinding signage at the three audit sites. Bear in mind, signs for public transit users, cyclists, and pedestrians are meant to guide motor vehicle drivers as well and vice versa for wayfinding in and around the city. Every photo-documented sign may be classified for multiple users, and the intended user may be clearer and more based on the variables below such as the visibility or legibility of the sign.

Visibility of Sign. A look at the visibility of existing wayfinding signage in Winnipeg highlighted the practical considerations to take into account for a wayfinding system. The first consideration was placement, where signs are affixed to or positioned on a given sign typology. In general, there were little issues with placement, however, it was clear the placement of signs helped to navigate motor vehicle drivers more and less to move people on foot to and from destinations. In terms of the frequency of signs at critical decision points, the wayfinding signage was consistent at individual audit sites and across all the neighbourhoods observed; there was a logic to the frequency of signs along wayfinding routes. Finally, the lighting, luminance and nighttime visibility of signs were evaluated and found to be adequate across the three audit sites. The main and strategic source for illuminating signs in poorly-visible weather conditions or before dawn and after dusk hours was a lamp on a post.

Legibility of Sign. The audit of existing wayfinding signage in Winnipeg revealed the universal legibility standards followed for typography, letter case and spacing, colour use, and logos or pictograms; the majority of signs made use of common fonts, colours, and icons to help wayfinders move around the three audit sites.

Character/Identity of Sign. Also revealed in the audit was the distinct or indistinct character or identity of wayfinding signage in Winnipeg. Each audit site had particular sign types and typologies of signs which emphasized the local characteristics and identities unique to the three neighbourhoods. Overall, the audit of existing wayfinding signage depicted no character or uniformity of signage between the three sites and across Winnipeg.

Quality/Condition of Sign. On the plus side, signs in the Wolseley, West Broadway, Exchange District and St. Boniface neighbourhoods were of good quality and condition in regard to ageing, sun and light exposure, as well as in materiality, durability, and sustainability. Some were in excellent quality or condition; fewer were of poor quality or in poor condition.

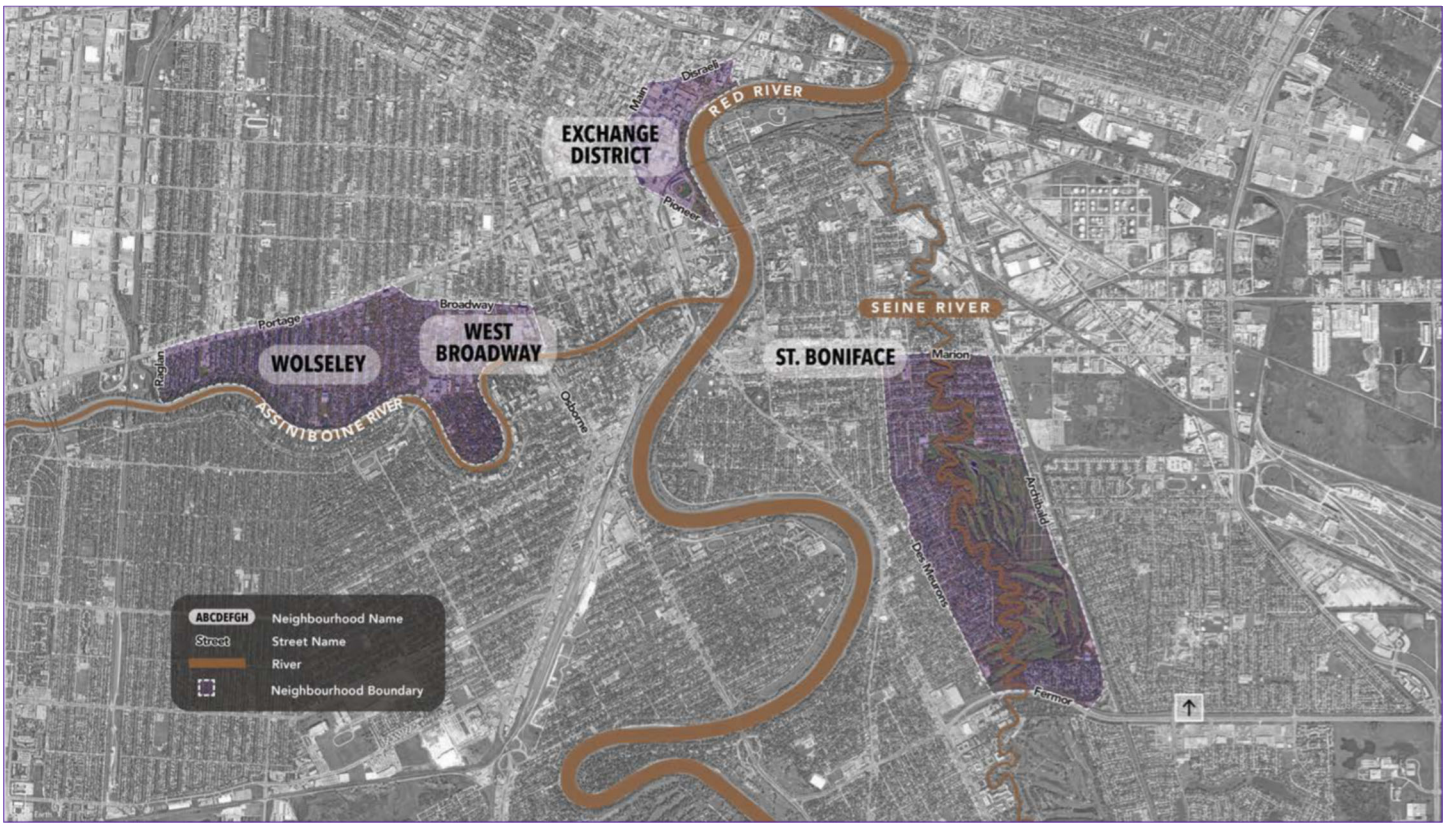


Figure 18. Three wayfinding signage audit sites in Winnipeg (Source: Choi Ho)

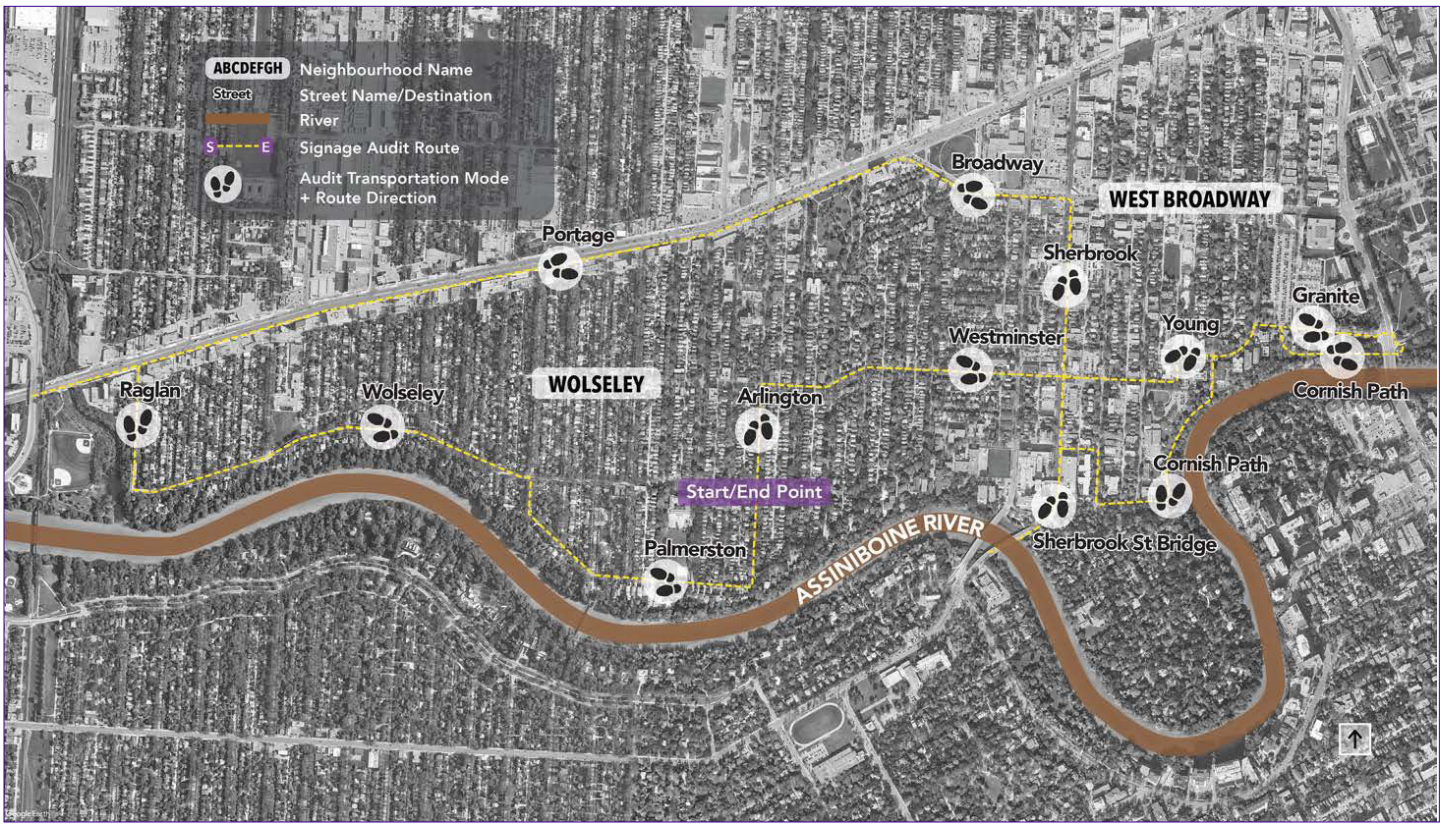


Figure 19. Wolseley and West Broadway wayfinding signage audit route (Source: Choi Ho)

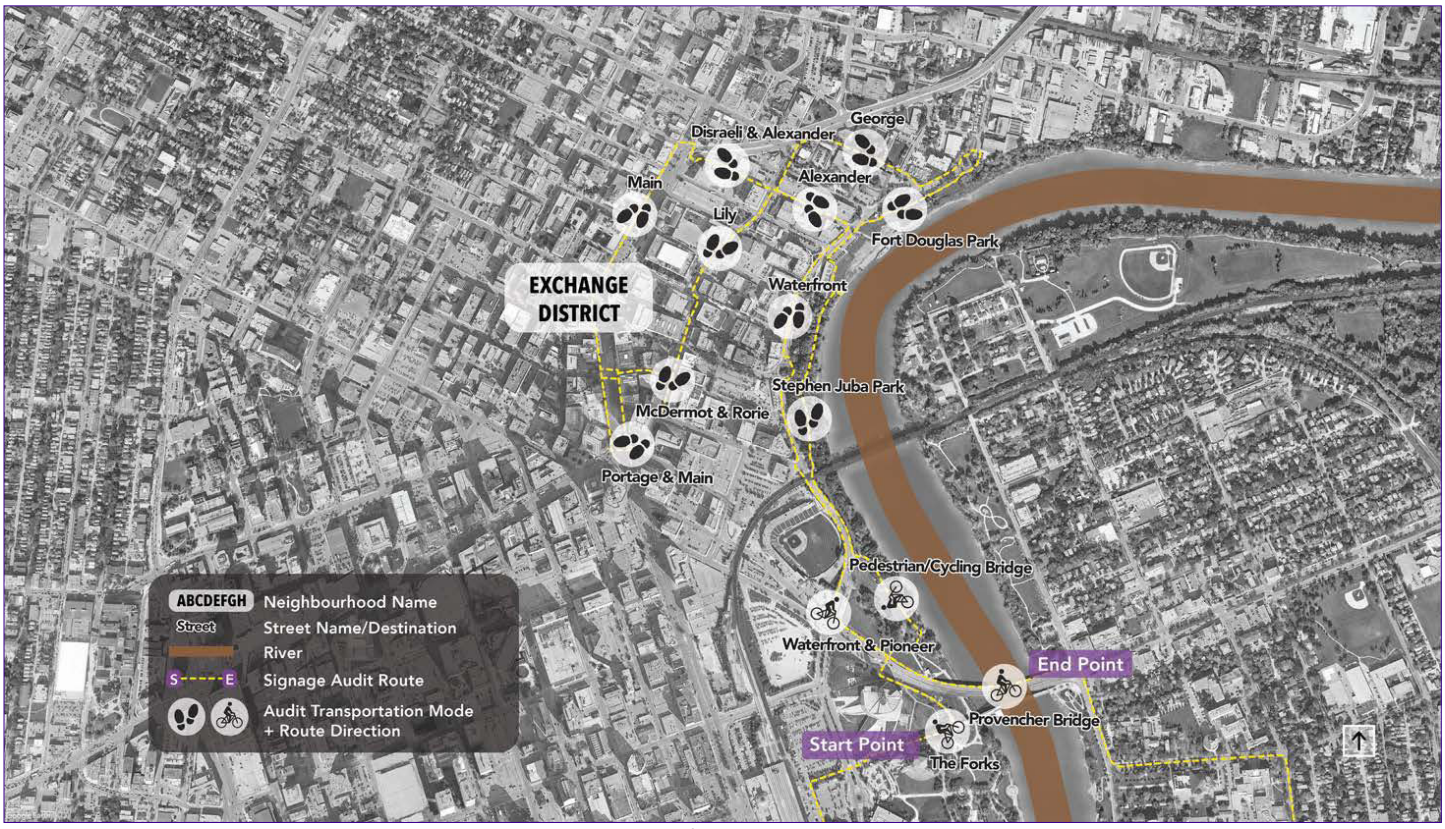


Figure 20. The Exchange District wayfinding signage audit route (Source: Choi Ho)

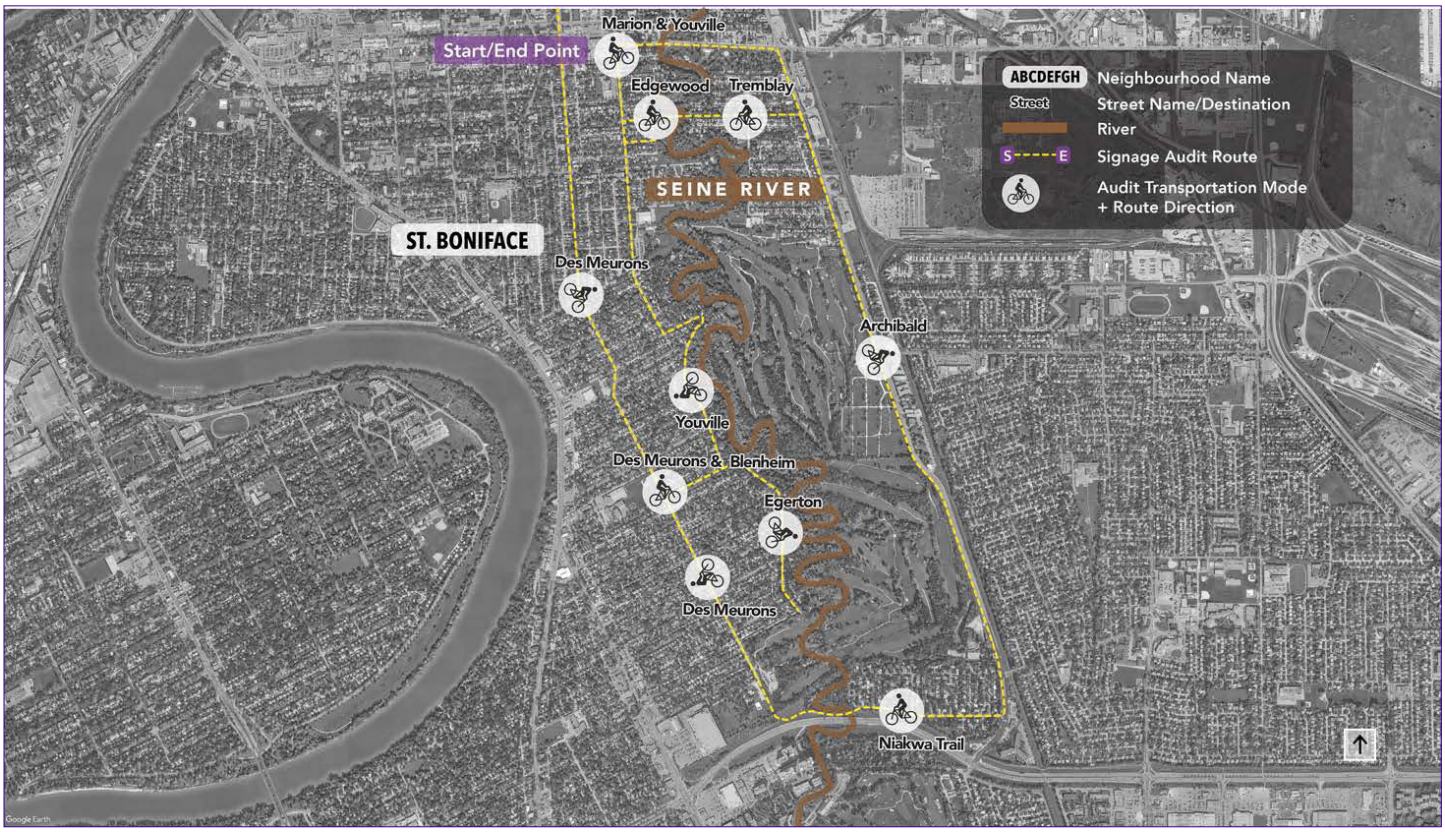


Figure 21. St. Boniface wayfinding signage audit route (Source: Choi Ho)

6.3 Thirteen Effective Signs – Precedent Research

6.3.1 Twelve Effective Wayfinding Hashtags Plus One

Thirteen local to international, and amateur to professionally created wayfinding signs emerged over the course of my precedent research. I followed the hashtag #Wayfinding on Instagram to uncover 12 of the 13 signs and one was a local precedent I was previously aware of (Assiniboine Forest wayfinding). Below are the 13 effective signs from my precedent research as well as the accompanying text from the respective Instagram posts, a project statement from the wayfinding signage creator or my own comments on the effectiveness of the sign. The examples represented some best practices to consider for a "3-Rivers Wayfinding System" in Winnipeg and spoke to eight characteristics which encompass the 12 effective wayfinding hashtags plus one: Integration, innovation, intuition, interaction, inspiration, identity, implications, and impact.

6.3.2 The Eight I's of Effectiveness

The eight I's listed above are exemplified across the 13 effective signs: Integration referred to the signs which touched on connectivity within wayfinding systems, the desire to identify missing systems links **(Figure 22)**, to visually link system trails or to build community **(Figure 23)**; innovation was the most prevalent find, ranging from hand-made to mass-produced guerrilla-type and low-budget signs **(Figures 24, 25 and 26)**; intuition played a role in the signs with a client or end-user in mind **(Figure 27)**; interaction featured signs for pedestrians and sidewalk users **(Figures 28 and 29)** or signs which added playfulness and colour **(Figures 30 and 31)**; inspiration came from conventional **(Figure 32)** and unconventional avenues to make and maintain the accessibility and creativity of local wayfinding **(Figure 33)**; identity was within signs to identify local peoples and ecosystems **(Figure 34)**; the implications and impacts jointly comprise all the effective sign precedents found below, and outline issues with weather, budget, as well as the short-term risks and rewards, and long-term effect.

(Figure 22) "Something is missing. Have you seen our Missing Links signs? If you do see 'em, and you engage with these active infrastructure gaps share your experience, with the hashtag #yegmissinglinks" (Paths for People, 2019).



Figure 22. Missing links sign. Edmonton, Canada.
(Source: Paths for People, URL: https://www.instagram.com/pathsforpeople/)

(Figure 23) "A curated destination experience of Winnipeg's walkable core, fostering a community of local retail + design culture" (Design Quarter Winnipeg, n.d.).



Figure 23. Discover the Quarter wayfinding sign. Winnipeg, Canada.
(Source: Design Quarter Winnipeg, URL: https://www.instagram.com/p/B11SwyygvEF/)

(Figure 24) "Helpful wayfinding for Santa here from my cousin's kid. The tree isn't right beside the chimney/fireplace so good idea to make sure. #thiswaytothetree #christmassigns #wayfinding" (Scott Ingram, 2019)

(Figure 25) Anonymous installation of guerrilla wayfinding signs in Winnipeg's downtown core. Signs in the same fashion as Walk [Your City]: "Boost your community's walkability, linking informational street signs for people with web-based campaign management and data collection to complement traditional approaches to wayfinding" (Walk [Your City], n.d.).

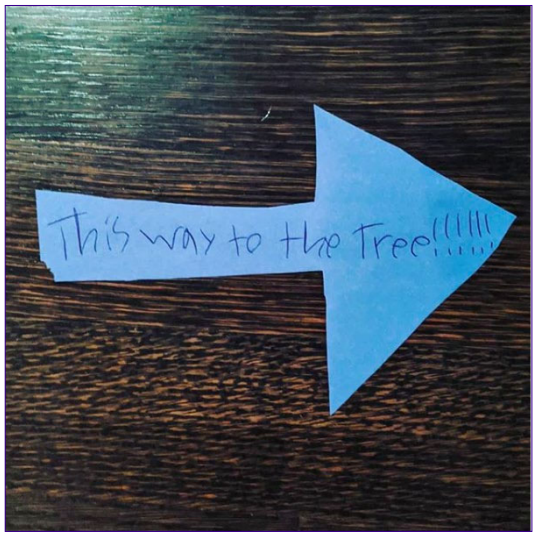


Figure 24. Wayfinding for Santa. Toronto, Canada.
(Source: Scott Ingram, URL: https://www.instagram.com/p/B6esIJmgQjv/)



Figure 25. Guerrilla Wayfinding in Central Park. Winnipeg, Canada.
(Source: Central Park Winnipeg, URL: https://www.instagram.com/p/Bzi739yAfiR/)

(Figure 26) "Got tape? I love these, especially the first one. And I bet that each one of these costs less than $50. Get on it!" (Epic Small, 2019).



Figure 26. Masking tape wayfinding. USA.
(Source: Epic Small, URL: https://www.instagram.com/p/B4UoTepgUY-/)

(Figure 27) "The Westerbegraafpark is one of the largest and most beautiful cemeteries in Ghent: a green oasis of peace and serenity. A new series of information carriers has been designed to match the signage with the atmosphere that a cemetery is worthy and to make the signage 'customer-friendly'. We focus on clear and intuitive wayfinding, with attention to the environment and visitors. A total approach that you feel in every detail" (Bailleul Design, 2020).



Figure 27. Westerbegraafpark cemetery welcome beacon. Ghent, Belgium.
(Source: Bailleul Design, URL: https://www.instagram.com/p/B4UKqLdAwgx/)

(Figure 28) "A fun take on wayfinding with light" (Nulty Lighting, 2019).



Figure 28. Wayfinding with light. Croydon, UK.
(Source: Nulty Lighting, URL: https://www.instagram.com/p/B3t_kVHBp77/)

(Figure 29) "Sidewalk signage near 30 high-traffic downtown intersections directs pedestrians to the nearest public restrooms" (Minneapolis Downtown Improvement District, n.d.).



Figure 29. 100 restrooms project sidewalk signage. Minneapolis, MN.
(Source: Minneapolis Downtown Improvement District, URL: https://www.instagram.com/p/B3u8A5Gnyte/)

(Figure 30) Pedestrian targeted wayfinding signs in both Japanese and English with directional arrows, cartoon graphics and distance in metres indicators to local and popular destinations.

(Figure 31) "A simple colour-coding system that demarcates the trail routes in the forest, with maps that are mounted on folded weathering steel plates, displaying information at key locations throughout the forest and correspond to coloured tree banding that provide visual identity along the trail" (Public City Architecture, 2014).



Figure 30. Hakodate wayfinding signs. Hakodate, Japan.
(Source: Edmonton Wayfinding Society, URL: https://www.instagram.com/p/B1KESOWAz3U/)



Figure 31. Assiniboine Forest wayfinding by Public City Architecture. Winnipeg, Canada.
(Source: Choi Ho)

(Figure 32) "Numbers become fundamental in the dense network of paths. Here in Italy it is easy to find them on a trunk or boulder, painted in black on a red-white-red flag. They are rigorously handmade…even if their characteristics of clarity, simplicity and easy reading deviates them a bit. This wayfinding system is today part of the horizontal signage of hiking, and it is the legacy of a long work over the years of individuals…so as not to lose the way during outdoors walks" (Zibi Labs, 2020).



Figure 32. Hand painted path numbers. Italy.
(Source: Zibi Labs, URL: https://www.instagram.com/p/B6-8NFVialM/)

(Figure 33) "The conceptual artist's first institutional solo exhibition. #WayfindingInHarlem features twenty-four site-specific sculptures that gesture toward the structural and visual vernacular of public wayfinding signage" (Chloe Bass, 2019).

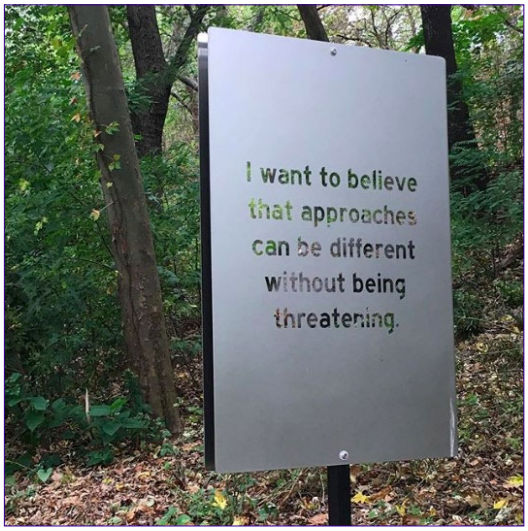


Figure 33. Wayfinding art installation by Chloe Bass. Harlem, NY.
(Source: Emily A. Gibson, URL: https://www.instagram.com/p/B3hfCpPlfkd/)

(Figure 34) "The objective was to create a sign system identifying recreational routes in and around Winnipeg. Each sign was to depict a natural or historical aspect of a specific trail. The goal: Get local volunteer groups excited about their individual identifiers while developing a larger, visually connected system that encourages people to recognize trails throughout the city" (Kirk Warren Studio, n.d.).



Figure 34. Chief Peguis Greenway wayfinding by Kirk Warren. Winnipeg, Canada. (Source: Sheldon Birnie for Canstar News, URL: https://www.instagram.com/p/BzGxCJ6g11F/)

6.4 Map of River Access Points

6.4.1 Ten River Access Points

In the Fall of 2019, I walked my study area of Wolseley and West Broadway to refamiliarize myself with the location and names of the public access points along the Assiniboine River. I used imagery from Google Earth as well as Google Maps to pinpoint a total of ten river access points to map using digital software (Adobe Illustrator) **(Figure 35)**. The ten river access points included parks, greenspaces, semi-public spaces and trails. A few are lesser known depending who you ask, and they ranged in size and the infrastructure present to experience or enter/exit the Assiniboine River. Eight of the river access points were within my study area and two access points were situated within the neighbourhood of Armstrong Point; I excluded this neighbourhood for sake of limiting the number of research participants for my postcard questionnaire research method. However, I did not discount the two river access points in Armstrong Point for the mapping exercise since they both formed a continuous and nestled link between the eight other access points within Wolseley and West Broadway.

Seven of the ten river access points, regardless of the formality or informality of the entry or exit, were designated a name and had destination signage, sometimes obvious and sometimes at a more obscured vantage point **(see Appendix)**. Two of the three unidentifiable river access points had names found on Google Map (William Marshal Park and Cornish Path); surprisingly, there was no known name for the central river access point under the Maryland and Sherbrook Bridges. Omand Park and Cornish Path were two of the largest green spaces and anchored the eight other and smaller scaled green spaces strewn along the Assiniboine River; a visual connection between all ten river access points came through in the mapping exercise and viewed from an aerial perspective. However, the physical connection was unclear when experienced on the ground and walking through the study area; access to and awareness of the Assiniboine River was hidden from plain sight for almost all ten of the mapped river access points.



Figure 35. Ten river access points within ten-minute pedestrian shed (Source: Choi Ho)

6.5 Postcard Questionnaire

6.5.1 Participant Responses

Though there are more than 500 people who live, work, play and volunteer in the neighbourhoods of Wolseley and West Broadway and who are within a 10-minute walking distance from the Assiniboine River, I was limited by budget and thus chose to print only 500 postcards. I covered all 45 streets in my study area by foot to distribute roughly 10-12 postcards per street at random households, dwellings and businesses over a two-day period. I received a total of 50 online responses (10% response rate) from my 15-question questionnaire between December 3rd to December 16th, 2019; the deadline for submission as noted on the postcards was December 15th, 2019. **(Figure 36)** From all the responses, 43 of 50 responses came from unique postal codes; 40 of 50 responses were from postal codes in the study area of Wolseley and West Broadway; 10 of 50 responses were from postal codes outside the study area, with 1 of the 10 responses from a postal code found outside the City of Winnipeg.



Figure 36. 50 Postcard questionnaire responses by postal code (Source: Choi Ho)



Figure 37. WinnipegRivers.com landing webpage (Source: Choi Ho)

6.5.2 Fifty Online Responses to Fifteen Questions

(Figure 37) The WinnipegRivers.com website I created on Squarespace redirected willing participants to a Google Form of my 15-question survey on the topics of walkability, wayfinding, and the Winnipeg rivers. The Google Form platform provided an efficient way of gathering and storing research data from online respondents, the data was then automatically compiled into a Google Sheet for easy transfer to Microsoft Excel and to synthesize the information received. A summary of the questionnaire results are in the following sections and figures.

Walkability, Wayfinding, and the Winnipeg Rivers. **(Figure 38)** When research participants were asked about the navigation tools they use to walk their way around Winnipeg, the top three responses selected from a list of seven answers were building/landmark (86% or 43 of 50 responses), digital map (72% or 36 of 50 responses), and wayfinding signage (50% or 25 of 50 responses). The bottom four responses included unofficial signage, people, printed map, and digital signage. With the option to type in an "other" response, 2% of the respondents mentioned "sense of direction", "stories usually referencing vernacular landmarks like grocery stores", "I know my way around", "familiarity", "general knowledge of area", and "personal exploration", respectively.

When questionnaire participants were asked to specify examples of navigation tools respondents use to walk their way around Winnipeg, the top three responses were Google Maps, street signs, and landmarks. The majority of responses did not deviate from the examples I provided in the questionnaire. Exceptions included "memory", "footprints in snow", and "Sherlock" paper maps.

When asked if respondents walk to, around, or along any of the four Winnipeg rivers, the response was a unanimous yes from the 50 online participants. As well, 41 of the 50 respondents (82%) indicated they walk the Winnipeg rivers across all-seasons **(Figure 39)**.

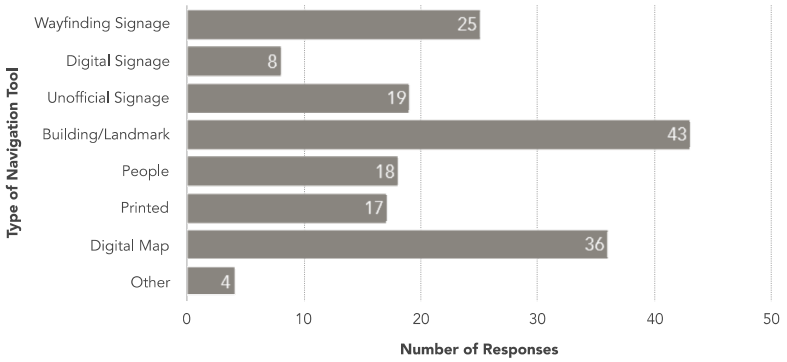


Figure 38. Questionnaire responses to what navigation tools Winnipeggers use to walk Winnipeg (Source: Choi Ho)

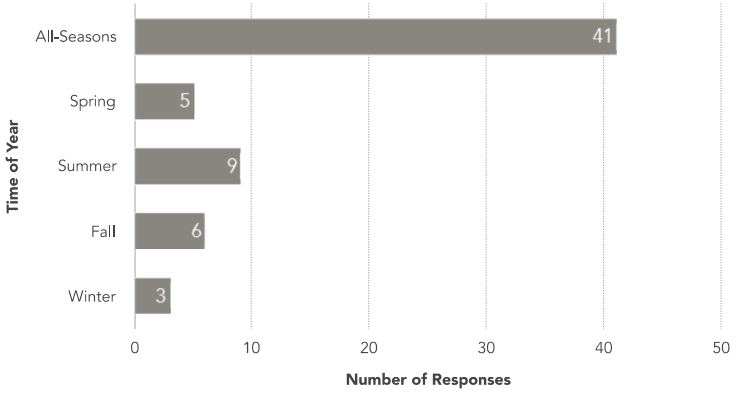


Figure 39. Questionnaire responses to what seasons Winnipeggers walk the three rivers (Source: Choi Ho)

Appreciation for and Barriers to the Winnipeg Rivers. An open-ended and optional question within my questionnaire asked participants what ways they themselves or Winnipeg celebrates or appreciates the Winnipeg rivers. Recreational activities (such as walking, skating, canoeing, and biking) appeared in the data 37, 24, 8, and 4 times, respectively. Locations indicated by words such as "trail", "The Forks", "path" and "park" appeared 18, 9, 7, and 6 times, respectively as well. Finally, the word "winter" appeared 18 times in the online data collection to the question of how Winnipeggers and Winnipeg celebrated and appreciated the three rivers.

When asked what barriers limit participants' celebration or appreciation of the Winnipeg rivers, the most prevalent responses focused on access to the urban waterways. Examples from the 49 respondents to the above question included:

- "Lack of access to our rivers"
- "Often the riverbank is inaccessible due to location; personal safety around the river can be a concern"
- "It's not usually safe and it's hard to know how to access the rivers"
- "Not knowing at what points we can get down to the river"
- "A lot of it is inaccessible due to private property along the banks. There's only a few good access points"
- "Not having a list (or if there is a list, not knowing where to find it) of all parks along Winnipeg Rivers and/or public access points"
- "Lack of safe and clearly marked access points"

Winnipeg and the Three Rivers: Local Character and Identity. Research participants were asked to use up to three words to describe what makes the Winnipeg rivers unique? As well as, up to three words to describe Winnipeg's local character/identity, what makes Winnipeg unique?

For the former, the use of qualitative data analysis software (NVivo) to calculate word frequency resulted in the following number word appearances to describe what makes the Winnipeg rivers unique **(Figure 40)**:

- "History", "Historic" or "Ancient" in 10 of 50 responses (20%)
- "Access", "Accessible" or "Inaccessible" in 6 of 50 responses (12%)
- "The Forks" in 4 of 50 responses (8%)
- "Winter" in 4 of 50 responses (8%)
- "Muddy" (4 responses), "Brown" (3 responses), "Slow" (3 responses), and "Winding" (3 responses)

For the latter, the use of qualitative data analysis software (NVivo) to calculate word frequency resulted in the following number of word appearances to describe what makes Winnipeg unique **(Figure 41)**:

- "Culture", "Multicultural", and "Diverse" in 12 of 50 responses (24%)
- "Arts", "Artistic", and "Artsy" in 6 of 50 responses (12%)
- "Friendly" in 6 of 50 responses (12%)
- "Cold" in 5 of 50 responses (10%)
- "Rivers" in 4 of 50 responses (8%)
- "Historic" in 3 of 50 responses (6%)
- "Isolated" in 3 of 50 responses (6%)

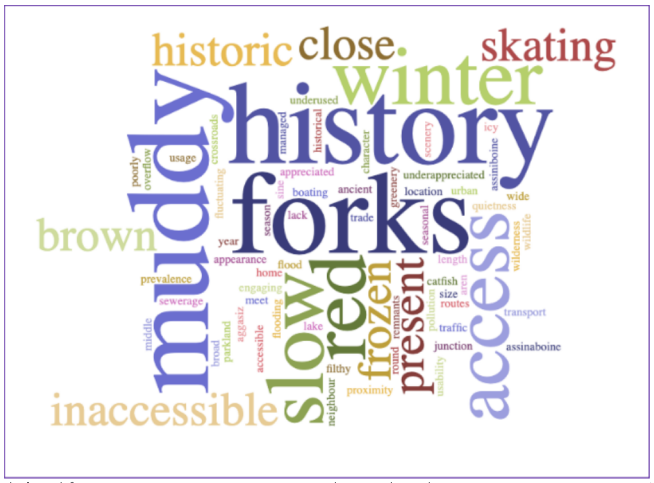


Figure 40. Word cloud for questionnaire responses to what makes the Winnipeg rivers unique (Source: NVivo)



Figure 41. Word cloud for questionnaire responses to what makes the Winnipeg unique (Source: NVivo)

A "3-Rivers Wayfinding System" in Winnipeg. Participants were asked if Winnipeg's local character and identity would benefit from a "Rivers Wayfinding System" (a system of signage/information which provides people directional guidance to the Winnipeg rivers) and to explain why or why not?

Of the 50 responses, “yes” and “absolutely” were the dominant answers:

- “Yes, it would be a visual reminder of the rivers’ presence and their importance”
- “Yes. People are aware of the rivers at places like The Forks, but not in other areas of the city. It would be helpful for people to know where to access the rivers”
- “Yes. It would strengthen people’s experiences of the rivers”
- “Yes, it would increase people’s awareness and appreciation for the beautiful rivers we have”
- “Yes--there are public footpaths to access the rivers but mostly you hear by word of mouth. It would be great if they were marked. I work in Wolseley and don’t know many access points to the river here”
- “Absolutely - it’s easy to lose track of where you are in relation to the city when you’re cycling or walking along the river - signage indicating location and attractions would be helpful”
- “Yes. The rivers are ever present, people reference the rivers constantly. Plus, they are so meandering, they feel like they are everywhere!”
- “Absolutely. I lament the cities lack of celebration of its downtown and rivers”
- “Yes. It would formalize an experience. It would give points of reference beyond “that spot where the big stump is” in the same way that a park or a street has a name: It would connect us to a substance that makes up 95% our body and geological time”
- “Yes. Another way to connect with a significant part of our city’s character and identity that is not accessible to most people”
- “Absolutely. The rivers tie us together through time - they’re the only constant”

Participants who answered “no” offered the following explanations:

- “No. We need better access to our rivers”
- “No, if you can’t find our rivers you aren’t trying”
- “No. It’s nice that not a lot of people use it and those who do, know how to access it. Better road signs would be appreciated”
- “We’d need to actually provide access first. Rivers are an afterthought unless they’re in your backyard”
- “Honestly, I don’t think people want to travel to the rivers. I mean why? If people really want to see them The Forks offers the river walk. Which is safer than just wandering about. I think you’re on to something however I’m not sure the rivers of Winnipeg should be what is navigated”
- “I feel it’s so intuitive that I have a difficult time imagining why we would need wayfinding to the rivers”

Online respondents were also asked: What information/considerations must be in a "Rivers Wayfinding System" to heighten Winnipegger's appreciation for the rivers? The range of responses included:

- "Plaques with historical information at every location"
- "Historic, prehistoric and info on flora and fauna along river and biology of rivers i.e. what's in them and beside them"
- "Indigenous knowledge and place names, canoe access points, sites of ecological significance to avoid, low and high water continuously accessible routes, important winter crossings, where public property on either side currently act like a bridge in winter months"
- "History at various points of interest. With an emphasis on our aboriginal coexistence"
- "Our connection to water, Indigenous-based knowledge sharing"
- "Treaty Land acknowledgement"
- "Discussions with Indigenous elders to find out the importance of the rivers to their cultures, and then incorporating this in the Wayfinding System is important!"
- "Information about the wildlife that lives there"
- "Safety protocol"
- "Safety precautions -warning of criminal activity and drug use on riverbanks and around bridges"
- "Safety information - they might look slow and shallow, but they can be dangerous"
- "Season-specific information re ice safety, water levels, etc. Respect that rivers can be dangerous"
- "The dangers of falling in. The unforgiving undertow and the fact that most who go in don't come out"
- "Safety info, type of access available (e.g. walking, boating, wheelchair accessible)"

- "A list of access points for the public online and on paper"
- "Cardinal directions and walking distances (in metres and in minutes.... that's how most of us judge distances anyway) to the rivers and to the closest access points on those rivers. Accessibility information (if any access points are accessible) would also be necessary"
- "Pedestrian/biking directions showing the way to the river"
- "Pointing out how close they are, all the time! markers of where things used to be on the rivers"
- "Indicate public footpaths to access the river, stair ways to get down and up or workable paths, map and marked pathways along river"
- "Nearby street names to help locals recognize where they are (hard to do sometimes when the tree cover is heavy for example) and locations/ landmarks that are targeted to tourist requirements - nearby attractions, nearby ATMs, nearby washrooms, etc."
- "N S W E directions landmarks"
- "Distance markings"
- "How to get there and what can you see there"
- "Tell people where they can catch a low price river bus to get to places of interest"
- "Overall pathways system to plan a walk or to know where you are on it"
- "Maps to show easy access, information about the location (current) and also historically relevant information"
- "Fun facts or artists renderings of the natural habitat/wildlife in the area?"
- "An app for phones"

Participants were subsequently asked what would be nice to have in a "Rivers Wayfinding System" to heighten Winnipegger's appreciation for the rivers:

- "Auditory cues like a trickling water sound emitted from signs"
- "How much water flows by in an hour, wildlife who navigate or use the rivers, where the water originates and where it's going"
- "Could have codes to scan which bring people to historical info or natural info (birds, trees, animals, foliage)"
- "Also, a map of the closest suggested walks to the rivers, followed by an app or a digital version"
- "Colour coding and engaging graphics"
- "Car traffic signage"
- "Allow roving food carts in the most popular areas"
- "Deeper info on the ecology of the system, plants and animal life, potentially an interactive mobile app"
- "Nice to have 24 hour webcam to show the rise of the river during breakup and flooding"

Participants also expressed similar responses from what must be a "Rivers Wayfinding System" in what would be nice to have in a "Rivers Wayfinding System" to heighten Winnipegger's appreciation for the rivers:

- "Historical information"
- "Fascinating historical and ecological facts about the rivers"
- "Markers for historic sites/events"
- "Historical significance, local vegetation, you are here info"
- "Historical info at specific locations"
- "Plaques with historical information"
- "History. How the rivers have been important to the history of the area for millennia"
- "The history of them. Where they meet and what it used to represent"
- "Some history"
- "Historic roles"
- "Historic and biological info"
- "History or habitat info"
- "Some history at specific points"
- "Locations marked with pertinent information about events, locations, and people associated with the rivers"

The final question of the questionnaire asked research participants to share any other comments or thoughts about the rivers, wayfinding and walkability in Winnipeg:

- "Just that it's a damn shame that we haven't built a city that allows everyone to enjoy them"
- "Too many to put down here, except that any project that improves and public spaces and walkability in Winnipeg is a great initiative. People have been meeting at the junction of the Red and Assiniboine for 6000 years, and these rivers form the basis of our identity as Winnipeggers. Anything that elevates them must be celebrated and encouraged"
- "I would like to see the safety levels along the riverways improved, so if city planning can manage to fix that in some way, I would appreciate it!"
- "Encouraging greater access to rivers for leisure activities might encourage interest in riverbank maintenance, keeping garbage & sewage out of the water, more appreciation of the role rivers play in shaping urban geography"
- "Need more access points and paths along the rivers. In a very real way, while the rivers are always there, they are disconnected from Winnipeg for the most part. You mostly drive over them as opposed to interact with them"
- "Many cities celebrate the connection to their rivers; it doesn't seem like we've reached that level of connection in Winnipeg yet"

- "I find the perception of the river spaces throughout the city but most specifically downtown (aside from The Forks) is that it's dirty, scary, and unsafe. Changing this perception will take more than clear signage however if focused on tourists, there may be an increase in the number of Winnipeg residents who also use the spaces and paths as the perception changes"
- "Winnipeg is exceptionally walkable for those located in and around the city, but the climate does limit who is willing to walk. The rivers I never take because I have had issues of harassment there before and it is usually littered with trash. Wayfinding in Winnipeg is pretty awful and needs improvement everywhere, but the rivers are a nice place to start especially considering their importance to local history"

6.6 Summary: River City Revealed

The results from the four research methods uncovered a wealth of practical and insightful data: a photograph collection of current wayfinding signage in Winnipeg **(see Appendix)**; an intuitive and formal process for evaluating Winnipeg's wayfinding systems plus eight criteria to guide an audit of signage in the city; 13 effective signs from online which demonstrate the eight I's of effectiveness; a map of ten river access points in the Wolseley and West Broadway study area; and the collective results of 50 online participant responses to 15 questions from a postcard questionnaire. The findings revealed the status of wayfinding in Winnipeg, effective wayfinding precedent and practices, the opportunities and gaps found through mapping, and the interrelatedness of wayfinding, walkability, and Winnipeg's three rivers via questions to pedestrians and users of the Red, Assiniboine and Seine Rivers - all of which revealed "River City".

CHAPTER 7 DISCUSSION

7.1 Introduction: Revealing River City

My project involved a literature review, an audit of Winnipeg's existing wayfinding signage, precedent research for effective signs, a map of river access points within a 10-minute pedestrian shed, plus a pedestrian-targeted postcard questionnaire. An analysis of the results uncovers seven matters critical to my development of key recommendations for a "3-Rivers Wayfinding System" in Winnipeg. The importance and implications of each matter are open for discussion.

7.2 Local Character and Identity Matters

The methods carried out for my research show local character and identity matter for wayfinding in Winnipeg to the three rivers. My analysis of the results reveal three stand-out local matters; the impact each and all three matters possess help to form my recommendations for a "3-Rivers Wayfinding System" in Winnipeg.

7.2.1 Local Materials

The benefits of using local materials to thoughtfully design and cohesively define a local wayfinding system comes through in the literature, the existing wayfinding signage audit, and in my precedent research. In the literature, Lynch (1960) speaks broadly to the use of local environmental cues to navigate one's surroundings. He underscores building an "image of the city" via urban elements with materiality such as trees and doorknobs found in the local environment. For the audit, two of the three sites (The Exchange District and the Wolseley and West Broadway study area) include sets of wayfinding signage fabricated from Tyndall stone quarried just outside of Winnipeg. The names of riverside trails and greenspaces are carved into the Tyndall stone to give a sense of permanence and prestige, and pay homage to one of the city's commonplace and historical building materials **(see Appendix)**. My search for effective precedent wayfinding signage also draws attention to the importance of local materials to enrich Winnipeg's "River City" identity. An often used and best strategy for designing and defining a local wayfinding system incorporates locally sourced materials, such as steel, stone, brick, and timber to speak to and celebrate the history, presence and future of a place or city.

7.2.2 Local Site Context

Local site context plays a major role in my research and in framing my key recommendations for a "3-Rivers Wayfinding System" in Winnipeg. Context is crucial to understand and interpret a site. The considerations are numerous: Census statistics frames one picture of the site; the "image of Wolseley and West Broadway" frames another; the media in the news frames a third, and so on. Only when conducting my research on-site and with research participants did I gain a comprehensive understanding and interpretation of the local site context. The audit of existing wayfinding signage helped to disclose the gaps and opportunities formed both intuitively and through a post-audit evaluation and to inform a "3-Rivers Wayfinding System" in Winnipeg; the map of river access points was an excellent assessment exercise to determine the lack and limited points of entry to the three rivers; and the postcard questionnaire provided invaluable insight to how those who work, live, play and volunteer in my study area understand and interpret the local site context. A user-led, pedestrian-focused and site-based research approach and process allows for a well-rounded characterization of a place and to identify the unique qualities of a place to be aware of and appreciate.

7.2.3 Local Ecosystems

Winnipeg's natural ecosystems are a worthwhile local matter to discuss. A knowledge and appreciation of local ecosystems must be present in a "3-Rivers Wayfinding System" for Winnipeg. The location of formal and informal access points along the Red, Assiniboine and Seine Rivers for pedestrians to enjoy and experience mostly lie in the riparian areas, the transition zone between the aquatic and terrestrial ecosystems. "These areas support some of the most diverse and productive ecosystems on the prairies" (Manitoba Habitat Heritage Corporation, 2009, para. 2). Recognizing and respecting the organisms who inhabit, pass through, and are native to Winnipeg's bodies of water and land-based communities is an important inclusion to the recommendations for how wayfinding can enrich an appreciation for the Winnipeg rivers and how to heighten Winnipeg's "River City" identity with wayfinding.

7.3 History and Culture Matters

The consensus among participants who completed my 15-question questionnaire indicate a strong need for wayfinding in Winnipeg to appreciate and celebrate the history and culture tied to the three rivers. One in five people in the study area use the word "history", "historical", and "ancient" to describe the uniqueness of the Red, Assiniboine and Seine Rivers. There is also a strong awareness of the three rivers' ever-presence and existence over thousands of years. The questionnaire responses to what must be or will be nice to have in a "3-Rivers Wayfinding System" repeatedly mention the impact of developing recommendations to encompass Winnipeg's Indigenous roots. It is certainly of value for wayfinding to the rivers to address and respect the Indigenous history attached to the rivers.

In terms of culture, the questionnaire results also reveal approximately one in four questionnaire participants use the word "culture", "multicultural" or "diverse" to describe what is centrally unique about Winnipeg. The audit of existing wayfinding signage in all three local sites also highlight elements tying back to the culture and diversity in the city, for example, a street name or neighbourhood wayfinding sign to heighten awareness of Winnipeg's Indigenous, British and French heritage **(see Appendix)**. The results of the research prove there are myriad local opportunities and effective wayfinding practices to successfully factor matters of history and culture into my recommendations for a "3-Rivers Wayfinding System" in Winnipeg.

7.4 Creativity and Innovation Matters

On matters of creativity and innovation, the prospects are endless for a "3-Rivers Wayfinding System" in Winnipeg. Not only is Winnipeg labelled as "creative", "cool", and "artsy" by respondents to my postcard questionnaire, Winnipeg and Winnipeggers also have innovative ideas and digital platforms to explore and use to heighten wayfinding to the three rivers. The literature on wayfinding underscores the prevalent use of technology to navigate pedestrians in and around the built and urban environments. The postcard questionnaire research participants also indicate their fondness and familiarity with digital forms of wayfinding in Winnipeg (some 72% use digital maps such as Google Maps to get to and from destinations), and respondents also mention the possibilities of developing digital or interactive mobile apps or wayfinding signage to enrich wayfinding to the Winnipeg rivers.

The literature also raises the question: Do we need wayfinding signs? Alotaishan's (2017) line of inquiry is based on the premise the built environment already provides local cues both intrinsically and visually to help people move around the city with confidence and without wayfinding signage. Another way to spin the question is to begin by uncovering what urban details or elements in the built environment heighten wayfinding to the Red, Assiniboine and Seine Rivers? The mapping of river access points, the audit of existing wayfinding signage in Winnipeg, and the questionnaire responses (regarding what examples of navigation tools Winnipeggers use to wayfind in the city) highlight local landmarks. There is an opportunity to shape the design and development of a "3-Rivers Wayfinding System" to focus on the existing elements in the built environment and to also respond and adapt to the ever-changing built environment by incorporating creative and innovative applications and tactics.

7.5 Pedestrians and Walkability Matters

The data confirms 100% of research participants within the study area of Wolseley and West Broadway walk to/from/along/around the three rivers at some point in time or another. The numbers implicate the potential of river environments or "River City" to influence and increase walkability numbers at sites within a 10-minute walking distance of the Red, Assiniboine and Seine Rivers. Within these environments, it may be beneficial to implement strategies to encourage and target pedestrian uses and activities. A pedestrian scaled and walkable environment can also be achieved through wayfinding signage to direct people to the three rivers, with the addition of indicators such as the distance and time to reach an urban waterway. To develop sound recommendations for a "3-Rivers Wayfinding System" in Winnipeg, people-centric approaches must precede car-centric approaches to heighten wayfinding in the city. Putting pedestrians first is the clearest and directly impactful way to heighten Winnipeggers access, awareness and appreciation for the three rivers.

7.6 Weather and Seasons Matters

Distinctive to Winnipeg and the three rivers, as described by online questionnaire research participants, is the "cold", "frozen" and "winter" seasonal aspects. There is no denying the climate and weather conditions unique to Winnipeg and endured by Winnipeggers must factor into my recommendations for a "3-Rivers Wayfinding System". With 82% of respondents declaring their use of the three rivers including the fourth La Salle River across all-seasons, there must be considerations which take into account year-round wayfinding. Equally important, there must be considerations made to develop a wayfinding system to celebrate and appreciate the rivers, Winnipeg's winter identity, and the pride Winnipeggers associate with the weather and seasons.

7.7 Accessibility and Safety Matters

The research results demonstrate a pressing need to improve access and safety to the Red, Assiniboine and Seine Rivers. Some research participants contend the matter of access and safety is fundamental to a "3-Rivers Wayfinding System" in Winnipeg. Similarly, a few participants do not believe a wayfinding system focused on the Winnipeg rivers is of value for the city if access and safety to the three rivers are not tackled above the issue of wayfinding. Respondents provide varying opinions and interests when speaking to accessibility and safety matters. The solutions gear towards strategies with varying scales, scopes and budgets: Make the rivers and river lot properties publicly accessible, improve the pedestrian infrastructure leading to and from the three rivers, provide signage indicating access and safety information, or educate the public on the matters of accessibility and safety in order to properly wayfind to the rivers.

7.8 Connectivity and Consistency Matters

The matter of connectivity and consistency comes through in the literature, the audit of existing wayfinding signage, precedent research for effective signs, the map of river access points, and the postcard questionnaire research results. In the literature, there is a consistent reminder of the connection between the wayfinder and the environment, the mind with the body in space, and human wayfinding and technology. In the audit and subsequent precedent research for effective signs, there are many unconnected gaps and inconsistencies. There is proven lack of consistency between the existing large-scale and local wayfinding systems in Winnipeg; transitioning from one system to another is unclear. Existing wayfinding signs provide inconsistent and inadequate information to help pedestrians wayfind effectively. In the map of river access points, there are linkages worth exploring to heighten the physical presence of ten river access points; solutions as inexpensive and simple as placing wayfinding signage a 10-minute walking distance from the rivers, and grander solutions such as connecting the ten river access points via a continuous river dock. The point being, people want to own a connection to the water, not necessarily own a piece of the city's urban waterways. Expanding the wayfinding system to include and encompass all three urban rivers enables connectivity and consistency currently lacking in Winnipeg.

7.9 Summary: A "3-Rivers Wayfinding System" Matters

A common issue revealed in my research methods regards the presence of signage itself. With the audit of existing wayfinding signage in Winnipeg, the most apparent absence is signage to navigate pedestrians to and from the three rivers. Pedestrian-targeted signage does not exist, only driver-targeted signage exists with merely the name of the river posted ten feet or greater from any comfortable pedestrian viewing level to inform drivers what river their vehicle is crossing **(see Appendix)**. Furthermore, the literature lacks content on wayfinding to and from urban waterways, let alone in Winnipeg or across Canada. Lastly, the precedent research does not offer many examples of wayfinding to the rivers, in particular.

However, when my research explored user-led methods such as the postcard questionnaire, participants clearly took an interest to the role wayfinding can play to enrich an appreciation for the three rivers and Winnipeg's "River City" identity. In fact, 33 out of 50 respondents approved of developing a wayfinding system to the three rivers, even the respondents who were borderline maybes appreciated the idea for Winnipeg adding their wish for other considerations and priorities to take place first is all. The opinions were direct and easily understood: Provide a "list of access points", "cardinal directions and walk distances", "pedestrian/biking directions showing the way to the river", "indicate public footpaths to access the river", "nearby street names to help locals recognize where they are", "N S W E directions landmarks", and "how to get there" wayfinding.

There is currently no wayfinding in Winnipeg to direct pedestrians to the Red, Assiniboine and Seine Rivers. Developing a thoughtful user-led, pedestrian-focused "3-Rivers Wayfinding System" in Winnipeg matters to Winnipeggers. People absolutely recognize the value in using wayfinding to heighten Winnipeg's "River City" identity and they have their opinions how wayfinding can heighten an appreciation and awareness for the Winnipeg rivers.

CHAPTER 8 CONCLUSION

8.1 Research-by-the-Numbers

Many research components were integral to forming key recommendations for a "3-Rivers Wayfinding System" in Winnipeg:

3 Rivers:

- Red River
- Assiniboine River
- Seine River

1 Study Area:

- Wolseley neighbourhood
- West Broadway neighbourhood

4 Research Methods:

- Audit of Winnipeg's existing wayfinding signage
- Precedent research for effective signs
- Map of river access points
- Postcard questionnaire

1 Literature Review:

- Many voices and connections within resources on wayfinding

Findings:

- 909 audit photographs
- 1 intuitive mind and 8 criteria to evaluate the state of and gaps in Winnipeg's current wayfinding systems
- 13 effective signs and 8 I's of effectiveness (Integration, innovation, intuition, interaction, inspiration, identity, implications, and impact)
- 10 river access points within a 10-minute pedestrian shed
- 50 postcard questionnaire participants and respective responses

Discussion:

- 7 matters revealing "River City"
- A "3-Rivers Wayfinding System" matters

8.2 A Return to the Research Question

This section returns to the research question: How can wayfinding be enriched to heighten Winnipeg's "River City" namesake and Winnipeggers' access, awareness and appreciation for the three rivers (Red, Assiniboine and Seine)? To answer this question, the two sections following feature recommendations for actively developing a "3-Rivers Wayfinding System" in Winnipeg, as well as future research directions and next steps.

8.3 Recommendations for Developing a "3-Rivers Wayfinding System" in Winnipeg

The analysis of the findings from the aggregate of research regarding wayfinding to the Red, Assiniboine and Seine Rivers in Winnipeg reveals the following eight key recommendations for a "3-Rivers Wayfinding System":

8.3.1 Capitalize On Local Winnipeg Resources

The unique character and identity of "River City" will reveal itself in a "3-Rivers Wayfinding System" which capitalizes on local Winnipeg resources. The city's unique river ecosystem, historical and present-day site context, and natural building materials are a few of the local resources to consider when developing a wayfinding system to the Red, Assiniboine and Seine Rivers. The acknowledgement, understanding, and use of local resources will contribute to a distinct wayfinding system to the Winnipeg rivers and be distinct to the city.

8.3.2 Remind, Respect, and Rejoice in Winnipeg's Indigenous Past and Presence

A "3-Rivers Wayfinding System" in Winnipeg will remind, respect, and rejoice in Winnipeg's Indigenous past and presence. There are a number of strategies worth pursuing; however, making a concerted effort to recognize Indigenous history and culture in a wayfinding system to the three rivers is essential. The process to remind and rejoice will involve meaningful collaborations and conversations. The implementation will involve respectful interventions and wayfinding practices.

8.3.3 Remind, Respect, and Rejoice Winnipeg's Three Rivers' Past and Presence

Similar, and separate, a "3-Rivers Wayfinding System" in Winnipeg will remind, respect, and rejoice in Winnipeg's three rivers' past and presence. Recognizing what the Winnipeg rivers mean to Winnipeggers will shift and celebrate in a new image for "River City". A wayfinding system to the Red, Assiniboine and Seine Rivers will further allow citizens to remember, respect, and rejoice in the historical significance and ever-presence of the three rivers.

8.3.4 Find Creative and Innovative Solutions or Cues in the Built Environment

Winnipeg's local and built environment is an unexpected yet real-life place to find creative and innovative solutions or cues for developing a "3-River Wayfinding System". Navigating from the urban environment of the city to the natural environments of the city will require ingenuity and uncommon ideas visible within the common spaces and places in Winnipeg. There are examples of effective precedents promoting creativity and innovation, however, the best cues are those already present and also ever-changing in Winnipeg's built environment.

8.3.5 Prioritize and Push Pedestrian-centric Wayfinding Strategies

Putting people first and pushing wayfinding strategies to target and attract pedestrian interests is a priority for a "3-Rivers Wayfinding System" in Winnipeg. Without a legitimate focus on strategies centred on people who walk in Winnipeg to wayfind to the rivers, the outcome will always be a detriment to the well-being of the city and its citizens. Breaking down the barriers preventing Winnipeggers from accessing, enjoying, and experiencing the three rivers will demonstrate a first and forward step in prioritizing and pushing for a more walkable Winnipeg and a city of people more appreciative of the rivers.

8.3.6 Shape and Design Wayfinding for Winnipeg Winters

Winnipeg has the nickname of "River City" for the four rivers; the city is also referred to by Winnipeggers as "WinterPeg" for the cold winters. Developing a "3-Rivers Wayfinding System" in Winnipeg to account for seasonal changes and impacts will enhance and embrace Winnipeg's winter city status and prominence. To shape and design wayfinding for Winnipeg winters will further boost the enjoyment of activities to do year-round in/on/along/around the three rivers and improve the safety and comfortability of wayfinding activities for Winnipeggers over the cold "WinterPeg" months.

8.3.7 Implement Strategies for Consistent and Effective River Wayfinding

A "3-Rivers Wayfinding System" in Winnipeg will implement strategies for consistent and effective river wayfinding. Consistency among sign typology, and the legibility, character and visibility of wayfinding signs will provide a maximum impact and an effective wayfinding process to the Red, Assiniboine and Seine Rivers. Attention to detail goes a long way and will guide people regardless of their level of familiarity with wayfinding to and from the three rivers.

8.3.8 Build Connections Through Wayfinding For People and with the Red, Assiniboine and Seine Rivers

The way to heighten access, awareness and appreciation for the Winnipeg rivers is to build connections through wayfinding for people and with the Red, Assiniboine and Seine Rivers. The connections are physical in the form of pedestrian-scaled wayfinding for people to reach the three rivers. The connections are also inherent - the kind of attachments humans possess with nature, with the Winnipeg rivers.

8.4 Future Research and Next Steps

The research raises a number of future research directions and next steps worth pursuing, to complement the recommendations for a "3-Rivers Wayfinding System" in Winnipeg. Notably, the directions for future research and next steps are not necessarily bound by resources, time or budget:

8.4.1 Think Small: Exploration of Small-Scale Wayfinding Interventions

The scale and scope of issues such as accessibility and safety to the Winnipeg rivers and in relation to the development of a "3-Rivers Wayfinding System" is beyond the scope of the present research. Thus, an exploration of small-scale wayfinding interventions will open room for discussions on the larger scale and scope of infrastructural and investment challenges required to improve access and safety to the three rivers. As well, small-scale wayfinding interventions will potentially uncover a way to scale up or carry a city-wide impact.

8.4.2 Act Big: Implementation of "3-Rivers Wayfinding System" in the Real-Life Environment

A number of routes are possible in terms of implementing a wayfinding system to help Winnipeggers navigate to and from the three rivers. A logical next step may be to conduct a digital pop-up engagement event with interested research participants or new recruits via social media, to gain user feedback on the eight recommendations for a "3-Rivers Wayfinding System" in Winnipeg. With data responses collected over a digital and interactive platform (e.g., Squarespace), the research can then move towards real-life implementation in the study area of Wolseley and West Broadway (Assiniboine River) or in all three initial local sites, including The Exchange District (Red River) and St. Boniface (Seine River). Depending on budget and resources, the implementation may involve 1) the installation of wayfinding signage (either make-shift or more permanent in design and quality) placed throughout the local site(s) 2) directional signage painted on empty facades or building/store fronts or 3) a renovation or new-build landmark leading to and from river access points. The research will evolve in the manner of a pilot project in the real environment to authentically grasp how to enrich wayfinding and how wayfinding can enrich access, awareness and appreciation for the three rivers.

8.4.3 Planning Policy Implications

A potential next step may involve future research to challenge and develop planning policy and laws related to property rights and ownership of the land and water alongside the Red, Assiniboine and Seine Rivers. The issue of wayfinding to heighten access to the three rivers is tied closely to river lot properties often being in the hands of mostly private owners. Research to review and analyze existing city and/or mandated documents and data collection in the form of interviews with city planners, river advocates, and property owners will aid in drafting planning policies to uncover and break down the barriers associated with trying to access the Winnipeg rivers.

8.4.4 Other Canadian Cities with Urban Waterways

Future research may also shift focus to other Canadian cities with urban waterway identities (e.g., Toronto, Thunder Bay, Edmonton, and Calgary). It would be interesting to know if the research on wayfinding to the rivers conducted in Winnipeg translates to similar results in Canada's other prominent cities and waterways.

8.4.5 Wayfinding Redefined

The literature provides definition after definition about wayfinding. Mollerup's (2013) term wayshowing, though, is well worth further in-depth research to ascertain how people understand, perceive and move from a starting destination to a final destination. Wayfinding involves more than just signage, and the term wayshowing highlights this fact. Further research may be worthwhile to explore a new definition or redefinition of wayfinding, to provide an all-encompassing perspective on the topic.

8.5 "Purposeful, Directed, and Motivated" to Heighten "Access, Awareness and Appreciation"

In closing, a user-led and pedestrian-focused study revealed ways to heighten Winnipeg's storied identity as "River City". The research methods involving an audit of Winnipeg's existing wayfinding signage, precedent research for effective signs, a map of river access points within a 10-minute pedestrian shed, plus a postcard questionnaire for online participants uncovered eight recommendations for developing a distinct "3-Rivers Wayfinding System" in Winnipeg. The research on wayfinding to the three rivers found the purposeful, directed and motivated way to heighten Winnipeggers' access, awareness and appreciation for the Red, Assiniboine and Seine Rivers.

REFERENCES

Allen, G. L. (1999). Cognitive abilities in the service of wayfinding: A functional approach. *Professional Geographer, 51*(4), 555–561. https://doi.org/10.1111/0033-0124.00192.

Alotaishan, H. K. (2017). Do we really need signs? Urban wayshowing designed from within the surroundings. *WIT Transactions on Ecology and the Environment, 226*(1), 643–654. https://doi.org/10.2495/SDP170561.

American Association of Geographers. (n.d.). Reginald Golledge. Retrieved February 18, 2020, from http://www.aag.org/cs/membership/tributes_memorials/gl/golledge_reginald.

Apelt, R., Crawford, J., & Hogan, D. (2007). Wayfinding system audit. Retrieved from https://www.hpw.qld.gov.au/__data/assets/pdf_file/0019/5077/wayfindingsystemaudit.pdf

Arthur, P., & Passini, R. (1991). *Wayfinding : people, signs, and architecture*. Whitby, Ont: McGraw-Hill Ryerson.

Bailleul Design. (2020). Respectvolle boodschappen voor de Gentse Begraafparken. Retrieved from https://bailleul.be/nl/projecten/respectvolle-boodschappen-voor-de-gentse-begraafparken.

Brunyé, T. T., Gardony, A. L., Holmes, A., & Taylor, H. A. (2018). Spatial decision dynamics during wayfinding: intersections prompt the decision-making process. C*ognitive Research: Principles and Implications, 3*(1). https://doi.org/10.1186/s41235-018-0098-3.

CBC News. (2019a, February 7). How do people view the homeless situation in Winnipeg? | CBC News. Retrieved from https://www.cbc.ca/news/canada/manitoba/how-do-people-view-the-homeless-situation-in-winnipeg-1.4703499.

CBC News. (2019b, March 1). 'Well-oiled' flood-fighting machine will protect Winnipeg this spring, expert says | CBC News. Retrieved from https://www.cbc.ca/news/canada/manitoba/winnipeg-spring-flooding-1.5038996.

CBC News. (2019c, March 23). 'The water passes and we're moving on' - but there are lessons in 5 of Manitoba's worst floods, expert says | CBC News. Retrieved from https://www.cbc.ca/news/canada/manitoba/manitoba-5-worst-floods-1.5047030.

CBC News. (2019d, March 27). Flood outlook: Water could reach highest level since 1997 'Flood of the Century' | CBC News. Retrieved from https://www.cbc.ca/news/canada/manitoba/manitoba-flood-outlook-1.5073367.

CBC News. (2019e, March 29). 123 Winnipeg properties at risk of river flooding, may require dikes | CBC News. Retrieved from https://www.cbc.ca/news/canada/manitoba/flooding-properties-winnipeg-dikes-1.5076790.

CBC News. (2019f, May 7). Homeless camp cleared by police, but the problem isn't going away: city councillor | CBC News. Retrieved from https://www.cbc.ca/news/canada/manitoba/maryland-bridge-homeless-camp-1.5125634.

CBC News. (2019g, May 15). Winnipeg seeks help to remove homeless camps, needles from public areas | CBC News. Retrieved from https://www.cbc.ca/news/canada/manitoba/temporary-shelters-needles-pickup-1.5134471.

CBC News. (2019h, June 26). 'These people have to survive': City's about-face on plan to dismantle homeless camps praised | CBC News. Retrieved from https://www.cbc.ca/news/canada/manitoba/winnipeg-homeless-camp-rfp-plan-scrapped-1.5190237.

CBC News. (2019i, July 23). City shifts strategy after outcry on plans to dismantle Winnipeg homeless camps | CBC News. Retrieved from https://www.cbc.ca/news/canada/manitoba/winnipeg-homeless-camps-1.5220270.

CBC News. (2019j, December 31). Winnipeg prepares for spring flood on scale of second-worst in recent memory, purely as a precaution | CBC News. Retrieved from https://www.cbc.ca/news/canada/manitoba/winnipeg-flood-preparation-1.5411819.

Chloe Bass. (2019). Chloe Bass on Instagram: ""Chloë Bass: Wayfinding" opens THIS SATURDAY in St. Nicholas Park (for details). See you then. ----- Posted @withrepost •...". Retrieved from https://www.instagram.com/p/B24TzT6FTQk/.

City of Winnipeg. (2016). Winnipeg's History. Retrieved from https://winnipeg.ca/History/HistoricalProfile.stm.

City of Winnipeg, & Statistics Canada. (2019a). 2016 Census Data – West Broadway. Retrieved November 13, 2019 from https://winnipeg.ca/Census/2016/Community%20Areas/Downtown%20Neighbourhood%20Cluster/Neighbourhoods/Downtown%20West/Downtown%20West%20Neighbourhoods/Wolseley/Wolseley.pdf.

City of Winnipeg, & Statistics Canada. (2019b). 2016 Census Data - Wolseley. Retrieved November 13, 2019 from https://winnipeg.ca/Census/2016/Community%20Areas/Downtown%20Neighbourhood%20Cluster/Neighbourhoods/Downtown%20West/Downtown%20West%20Neighbourhoods/Wolseley/Wolseley.pdf.

City of Toronto. (2017). Toronto Parks & Trails Wayfinding Strategy. Retrieved April 11, 2020, from https://www.toronto.ca/wp-content/uploads/2017/11/91d9-Open-House-Consultation-Display-FINAL_ACC.pdf.

Design Quarter Winnipeg. (2019). Design Quarter Winnipeg on Instagram: "@rubiadarya's sign lookin' fine against a backdrop of their beautiful hand woven textiles! . . . #DiscoverTheQuarter #supportlocal...". Retrieved from https://www.instagram.com/p/B11SwyygvEF/.

Downs, R., & Stea, D. (1973). Image and environment; cognitive mapping and spatial behavior. Chicago: Aldine Pub. Co.

Edmonton Wayfinding Society. (2019). Edmonton Wayfinding Society on Instagram: "Today's #wayfinding inspo: Cute signs in #Hakodate". Retrieved from https://www.instagram.com/p/B1KESOWAz3U/.

Epic Small. (2019). Jess Mathews on Instagram: "Friday Street Treats! Got tape? I love these, especially the first one. And I bet that each one of these cost less than $50 Get on it!...". Retrieved from https://www.instagram.com/p/B4UoTepgUY-/.

Farr, A. C., Kleinschmidt, T., Yarlagadda, P., & Mengersen, K. (2012). Wayfinding: A simple concept, a complex process. *Transport Reviews, 32*(6), 715–743. https://doi.org/10.1080/01441647.2012.712555.

Fockler, M. (2016). Clinton Iowa Wayfinding Assessment. 2015-2016: Clinton, Iowa. Retrieved from https://digitalcommons.augustana.edu/cgi/viewcontent.cgi?article=1003&context=swliclinton

Golledge, R. (1999). *Wayfinding behaviour: cognitive mapping and other spatial processes*. Baltimore: Johns Hopkins University Press.

Hartley, T., Maguire, E. A., Spiers, H. J., & Burgess, N. (2003). The well-worn route and the path less traveled: Distinct neural bases of route following and wayfinding in humans. Neuron, 37(5), 877–888. https://doi.org/10.1016/S0896-6273(03)00095-3.

Kirk Warren. (n.d.). Signage. Retrieved from http://www.kirkwarrenstudio.com/signage.

Lynch, K. (1960). *The image of the city*. Cambridge, Mass: M.I.T. Press.

Manitoba Habitat Heritage Corporation. (2009). Riparian Area Assessment for the East Duck Mountain/Sagemace Bay Watershed. Retrieved from https://www.gov.mb.ca/sd/water/watershed/iwmp/east_duck/documentation/mb_habitat_heritage_eastduck.pdf.

Meilinger, T., & Knauff, M. (2008). Ask for directions or use a map: A field experiment on spatial orientation and wayfinding in an urban environment. *Journal of Spatial Science, 53*(2), 13–23. https://doi.org/10.1080/14498596.2008.9635147.

Minneapolis Downtown Improvement District. (n.d.). 100 Restrooms. Retrieved from https://www.mplsdid.com/100restrooms.

Mollerup, P. (2013). *Wayshowing enables wayfinding*: Rotterdam: BIS Publishers.

Morphocode. (2019, December 6). The 5-minute walk. Retrieved from https://morphocode.com/the-5-minute-walk/.

Mustikawati, T., Yatmo, Y. A., & Atmodiwirjo, P. (2018). Wayfinding beyond signage: Rethinking the role of spatial objects and object relations. *IOP Conference Series: Earth and Environmental Science, 195*(1). https://doi.org/10.1088/1755-1315/195/1/012083.

Nulty Lighting. (2019). NULTY on Instagram: "A fun take on wayfinding with light. New project coming soon . . . Lighting design by Nulty #lightingdesign #lighting #light #wayfinding...". Retrieved from https://www.instagram.com/p/B3t_kVHBp77/.

Passini, R. (1984). *Wayfinding in architecture* . New York: Van Nostrand Reinhold.

Paths for People. (2019). Paths for People on Instagram: "Something is missing. Have you seen our Missing Links signs? If you do see 'em, and you engage with these active infrastructure gaps share...". Retrieved from https://www.instagram.com/p/BxdKfKcgsXm/.

Public City Architecture. (2014). Assiniboine forest wayfinding masterplan and strategy. Retrieved from https://www.publiccityarchitecture.com/assiniboine-forest-wayfinding-and-interpretive-strategy.

Romedi, P. (1996). Wayfinding design: logic, application and some thoughts on universality. Design Studies, 17(3), 319–331. Retrieved from http://www.sciencedirect.com/science/article/pii/0142694X96000014.

Raubal, M., & Winter, S. (2002). Enriching wayfinding instructions with local landmarks. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), 2478*, 243–259. https://doi.org/10.1007/3-540-45799-2_17.

Romedi, P. (1996). Wayfinding design: logic, application and some thoughts on universality. *Design Studies, 17*(3), 319–331. Retrieved from http://www.sciencedirect.com/science/article/pii/0142694X96000014.

Savage, K. (2019, May 29). Results from the 2016 Census: Commuting within Canada's largest cities. Retrieved February 2, 2020, from https://www150.statcan.gc.ca/n1/pub/75-006-x/2019001/article/00008-eng.htm.

Schwering, A., Krukar, J., Li, R., Anacta, V. J., & Fuest, S. (2017). Wayfinding Through Orientation. Spatial Cognition and Computation, 17(4), 273–303. https://doi.org/10.1080/13875868.2017.1322597.

Scott Ingram. (2019). Scott Ingram on Instagram: "Helpful wayfinding for here from my cousin's kid. The isn't right beside the chimney / fireplace so good idea to make sure....". Retrieved from https://www.instagram.com/p/B6esIJmgQjv/.

Severo, R. (1984, May 3). Kevin A. Lynch, 66, pioneer urban theorist. Retrieved February 18, 2020, from https://www.nytimes.com/1984/05/03/obituaries/kevin-a-lynch-66-pioneer-urban-theorist.html.

Symonds, P., Brown, D. H. K., & Lo Iacono, V. (2017). Exploring an absent presence: Wayfinding as an embodied sociocultural experience. *Sociological Research Online, 22*(1), 1–20. https://doi.org/10.5153/sro.4185.

The Editors of Encyclopedia Britannica. (2017, December 25). Assiniboin. Retrieved from https://www.britannica.com/topic/Assiniboin.

The Forks. (2020). History. Retrieved from https://www.theforks.com/about/history.

Timpf, S. (2002). Ontologies of Wayfinding: a Traveler's Perspective. *Networks and Spatial Economics, 2*(1), 9–33. https://doi.org/10.1023/A:1014563113112.

Walk [Your City]. (n.d.). It's not too far. Retrieved from https://walkyourcity.org/.

Xia, J. (Cecilia), Arrowsmith, C., Jackson, M., & Cartwright, W. (2008). The wayfinding process relationships between decision-making and landmark utility. *Tourism Management, 29*(3), 445–457. https://doi.org/10.1016/j.tourman.2007.05.010.

Zibi Labs. (2020). Z on Instagram: "Numbers become fundamental in the dense network of paths. Here in Italy it is easy to find them on a trunk or boulder, painted in black on...". Retrieved from https://www.instagram.com/p/B6-8NFViaIM/.

APPENDIX

Audit of Winnipeg's Existing Wayfinding Signage

The following appendix displays 45 of the 909 pictures I photographed across all 3 audit sites: St. Boniface, The Exchange District, and my study area which includes the neighbourhoods of Wolseley and West Broadway. This smaller though sufficient sample of 45 photographs helped to draw out key findings and to exhibit the current state of wayfinding in Winnipeg based on the 8 criteria from my framework for evaluating Winnipeg's wayfinding system **(see Section 6.2.3)**:



Audit Site: St. Boniface
Audit Street/Location: Marion Street
Ownership of Sign: City of Winnipeg
Type of Sign: Destination/Identification/Information/Directional
Sign Typology: Post
Intended User of Sign: Multiple
Visibility of Sign: High Placement/Regular Frequency/Unlit Location
Legibility of Sign: Serif and Sans Serif Font/Uppercase, Sentence Case and Lowercase Letters/White Background/Tree Pictogram
Character/Identity of Sign: Local/Unique/Bilingual
Quality/Condition of Sign: Good Quality and Condition



Audit Site: St. Boniface
Audit Street/Location: Des Meurons Street
Ownership of Sign: City of Winnipeg
Type of Sign: Directional/Destination
Sign Typology: Post
Intended User of Sign: Multiple/Motor Vehicle Driver
Visibility of Sign: High Placement/One-time Frequency/Lit Location
Legibility of Sign: Sans Serif Font/Sentence Case Letters/Brown Background/Arrow Pictogram
Character/Identity of Sign: Uniform Facilities Sign
Quality/Condition of Sign: Good Quality and Condition



Audit Site: St. Boniface
Audit Street/Location: Des Meurons Street
Ownership of Sign: City of Winnipeg
Type of Sign: Directional/Information
Sign Typology: Post
Intended User of Sign: Cyclist/Multiple
Visibility of Sign: Entry/Exit Point Placement/Regular Frequency/Unlit Location
Legibility of Sign: Sans Serif Font/Uppercase Letters/Green Background/Bike Pictogram
Character/Identity of Sign: Uniform Bike Route Sign
Quality/Condition of Sign: Excellent Quality and Condition



Audit Site: St. Boniface
Audit Street/Location: Morier Park
Ownership of Sign: City of Winnipeg
Type of Sign: Destination/Identification
Sign Typology: Free-standing
Intended User of Sign: Pedestrian/Motor Vehicle Driver/Multiple
Visibility of Sign: Park Entry/Exit Point Placement/One-time Frequency/Unlit Location
Legibility of Sign: Serif Font/Uppercase Letters/White Background/No Pictogram
Character/Identity of Sign: Uniform Park Sign/Bilingual
Quality/Condition of Sign: Good Quality and Condition



Audit Site: St. Boniface
Audit Street/Location: Lariviere Street
Ownership of Sign: City of Winnipeg
Type of Sign: Information
Sign Typology: Post
Intended User of Sign: Pedestrian
Visibility of Sign: End of sidewalk Placement/One-time Frequency/Unlit Location
Legibility of Sign: Sans Serif Font/Uppercase Letters/Yellow Background/No Pictogram
Character/Identity of Sign: No Character
Quality/Condition of Sign: Good Quality and Condition



Audit Site: St. Boniface
Audit Street/Location: Tremblay Bridge
Ownership of Sign: CoolStreetsWPG
Type of Sign: All
Sign Typology: Ground/Guerrilla
Intended User of Sign: Pedestrian/Multiple
Visibility of Sign: N/A
Legibility of Sign: Multiple Colours
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: St. Boniface
Audit Street/Location: Des Meurons Street
Ownership of Sign: City of Winnipeg
Type of Sign: Information/Directional
Sign Typology: Post
Intended User of Sign: Motor Vehicle Driver
Visibility of Sign: Street Intersection Placement/One-time Frequency/Unlit Location
Legibility of Sign: Sans Serif Font/Uppercase and Lowercase Letters/White Background/Arrow Pictogram
Character/Identity of Sign: No Character/Bilingual
Quality/Condition of Sign: Excellent Quality and Condition



Audit Site: St. Boniface
Audit Street/Location: Marion Street
Ownership of Sign: City of Winnipeg
Type of Sign: Destination/Identification
Sign Typology: Post
Intended User of Sign: Motor Vehicle Driver
Visibility of Sign: High Placement/One-time Frequency/Lit Location
Legibility of Sign: Sans Serif Font/Sentence Case Letters/Brown Background/No Pictogram
Character/Identity of Sign: Uniform Waterways Sign/Bilingual
Quality/Condition of Sign: Good Quality and Condition



Audit Site: St. Boniface
Audit Street/Location: Archibald Street
Ownership of Sign: City of Winnipeg
Type of Sign: Destination/Identification
Sign Typology: Post
Intended User of Sign: Multiple
Visibility of Sign: High Placement/One-time Frequency/Lit Location
Legibility of Sign: Serif Font/Uppercase Letters/Blue Background/Tree Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: St. Boniface
Audit Street/Location: Archibald Street
Ownership of Sign: Unknown
Type of Sign: Destination/Identification
Sign Typology: Free-standing
Intended User of Sign: Multiple
Visibility of Sign: Intersection Placement/One-time Frequency/Lit Location
Legibility of Sign: Serif Font/Uppercase Letters/Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: St. Boniface
Audit Street/Location: Cherokee Bay
Ownership of Sign: Unknown
Type of Sign: Destination/Identification
Sign Typology: Post
Intended User of Sign: Multiple
Visibility of Sign: Intersection Placement/One-time Frequency/Unlit Location
Legibility of Sign: Sans Serif Font/Uppercase and Lowercase Letters/White Background/Tipi Pictogram
Character/Identity of Sign: Local/Unique/Bilingual
Quality/Condition of Sign: Good Quality and Condition



Audit Site: The Exchange District
Audit Street/Location: Waterfront Drive
Ownership of Sign: City of Winnipeg
Type of Sign: Destination/Information/Directional
Sign Typology: Post
Intended User of Sign: Pedestrian/Public Transit User/Cyclist
Visibility of Sign: High Placement/One-time Frequency/Lit Location
Legibility of Sign: Serif Font/Uppercase Letters/White Background/River and Sun Pictogram
Character/Identity of Sign: Local/Unique/Bilingual
Quality/Condition of Sign: Poor Quality and Condition



Audit Site: The Exchange District
Audit Street/Location: William Stephenson Way
Ownership of Sign: City of Winnipeg
Type of Sign: Information
Sign Typology: Post
Intended User of Sign: Cyclist
Visibility of Sign: Medium Placement/One-time Frequency/Lit Location
Legibility of Sign: Sans Serif Font/Uppercase Letters/White Background/Bike Pictogram
Character/Identity of Sign: No Character
Quality/Condition of Sign: Good Quality and Condition



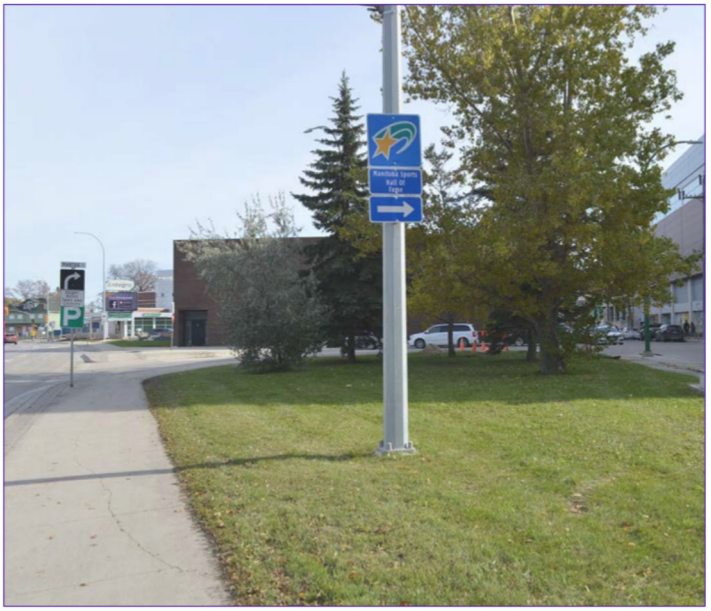
Audit Site: The Exchange District
Audit Street/Location: Waterfront Drive
Ownership of Sign: City of Winnipeg
Type of Sign: Information/Destination/Directional
Sign Typology: Free-standing
Intended User of Sign: Multiple
Visibility of Sign: End of Sidewalk Placement/One-time Frequency/Unlit Location
Legibility of Sign: Sans Serif Font/Uppercase Letters/White Background/Downtown Spirit Logo and Arrow Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: The Exchange District
Audit Street/Location: Pacific Avenue
Ownership of Sign: City of Winnipeg
Type of Sign: Identification
Sign Typology: Post
Intended User of Sign: Multiple
Visibility of Sign: Intersection Placement/Regular Frequency/Unlit Location
Legibility of Sign: Serif Font/Uppercase Letters/Blue Background/No Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: The Exchange District
Audit Street/Location: North Winnipeg Parkway
Ownership of Sign: City of Winnipeg/Province of Manitoba
Type of Sign: Destination/Identification
Sign Typology: Free-standing
Intended User of Sign: Pedestrian/Cyclist
Visibility of Sign: Entry/Exit Point Placement/Regular Frequency/Unlit Location
Legibility of Sign: Serif Font/Sentence Case Letters/Trail Sign/Tree and Pathway Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: The Exchange District
Audit Street/Location: Disraeli Freeway
Ownership of Sign: City of Winnipeg/Province of Manitoba
Type of Sign: Destination/Directional
Sign Typology: Post
Intended User of Sign: Motor Vehicle Driver
Visibility of Sign: High Placement/One-time Frequency/Lit Location
Legibility of Sign: Sans Serif Font/Sentence Case Letters/Blue Background/Star Pictogram
Character/Identity of Sign: Uniform Destination Sign
Quality/Condition of Sign: Excellent Quality and Condition



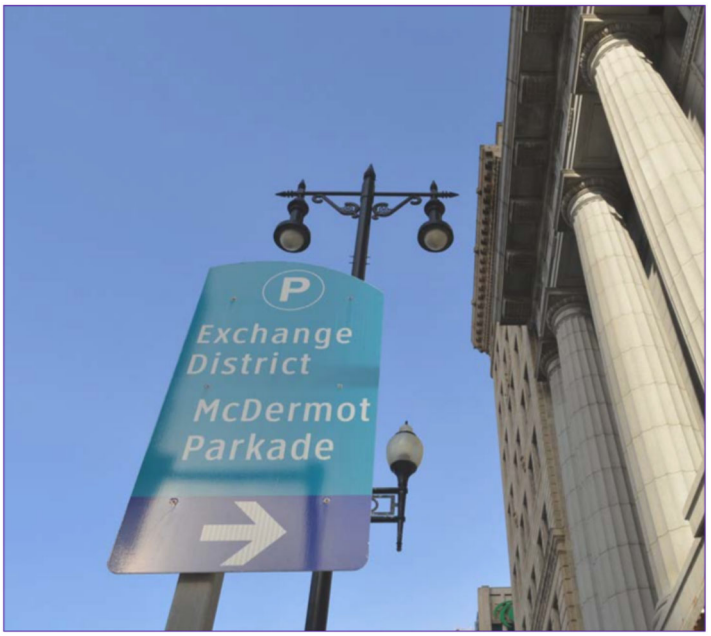
Audit Site: The Exchange District
Audit Street/Location: Disraeli Freeway
Ownership of Sign: Unknown
Type of Sign: Information
Sign Typology: Free-standing
Intended User of Sign: Pedestrian
Visibility of Sign: Intersection Placement/One-time Frequency/Lit Location
Legibility of Sign: Sans Serif Font/Uppercase Letters/Information Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: The Exchange District
Audit Street/Location: Main Street
Ownership of Sign: Unknown
Type of Sign: Destination/Interpretative
Sign Typology: Post
Intended User of Sign: Multiple
Visibility of Sign: High Placement/Regular Frequency/Lit Location
Legibility of Sign: N/A
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Excellent Quality and Condition



Audit Site: The Exchange District
Audit Street/Location: Main Street
Ownership of Sign: City of Winnipeg
Type of Sign: Information/Destination/Identification
Sign Typology: Post
Intended User of Sign: Public Transit User
Visibility of Sign: High Placement/Regular Frequency/Lit Location
Legibility of Sign: Sans Serif Font/Uppercase and Sentence Case Letters/Blue Background/Downtown Spirit Logo and Transit Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: The Exchange District
Audit Street/Location: Main Street
Ownership of Sign: City of Winnipeg
Type of Sign: Destination/Information/Directional
Sign Typology: Post
Intended User of Sign: Motor Vehicle Driver
Visibility of Sign: High Placement/Regular Frequency/Lit Location
Legibility of Sign: Sans Serif Font/Sentence Case Letters/Blue Background/Parking and Arrow Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Excellent Quality and Condition



Audit Site: The Exchange District
Audit Street/Location: Portage and Main
Ownership of Sign: City of Winnipeg
Type of Sign: Information
Sign Typology: Free-standing
Intended User of Sign: Pedestrian
Visibility of Sign: Entry/Exit Point Placement/Regular Frequency/Unlit Location
Legibility of Sign: N/A
Character/Identity of Sign: Local
Quality/Condition of Sign: Poor Quality and Condition



Audit Site: The Exchange District
Audit Street/Location: Rorie Street
Ownership of Sign: Unknown
Type of Sign: Information/Destination/Directional
Sign Typology: Guerrilla/Post
Intended User of Sign: Pedestrian
Visibility of Sign: High Placement/Regular Frequency/Lit Location
Legibility of Sign: Sans Serif Font/Sentence Case Letters/Multi-colour Signs/Arrow and Pedestrian Pictogram
Character/Identity of Sign: Uniform Character
Quality/Condition of Sign: Good Quality and Condition



Audit Site: The Exchange District
Audit Street/Location: Bannatyne Avenue
Ownership of Sign: City of Winnipeg
Type of Sign: Identification
Sign Typology: Post
Intended User of Sign: Multiple
Visibility of Sign: High Placement/Regular Frequency/Lit Location
Legibility of Sign: Serif Font/Uppercase Letters/Blue Background/No Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: The Exchange District
Audit Street/Location: John Hirsch Place
Ownership of Sign: City of Winnipeg
Type of Sign: Information/Interpretative
Sign Typology: Free-standing
Intended User of Sign: Pedestrian
Visibility of Sign: Entry/Exit Point Placement/One-time Frequency/Lit Location
Legibility of Sign: N/A
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: The Exchange District
Audit Street/Location: Lily Street
Ownership of Sign: City of Winnipeg
Type of Sign: Identification
Sign Typology: Ground
Intended User of Sign: Pedestrian/Motor Vehicle Driver
Visibility of Sign: Intersection Placement/Regular Frequency/Lit Location
Legibility of Sign: Serif Font/Uppercase Letters
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: The Exchange District
Audit Street/Location: Stephen Juba Park
Ownership of Sign: City of Winnipeg
Type of Sign: Destination
Sign Typology: Free-standing
Intended User of Sign: Multiple
Visibility of Sign: Entry/Exit Point Placement/One-time Frequency/Lit Location
Legibility of Sign: Serif Font/Uppercase Letters/No Pictogram
Character/Identity of Sign: Local/Unique/Bilingual
Quality/Condition of Sign: Excellent Quality and Condition



Audit Site: Wolseley
Audit Street/Location: Wolseley and Arlington Intersection
Ownership of Sign: City of Winnipeg
Type of Sign: Identification
Sign Typology: Post
Intended User of Sign: Multiple
Visibility of Sign: Intersection Placement/Regular Frequency/Unlit Location
Legibility of Sign: Sans Serif Font/Uppercase Letters/White Background/No Pictogram
Character/Identity of Sign: No Character
Quality/Condition of Sign: Poor Quality and Condition



Audit Site: Wolseley
Audit Street/Location: Arlington Street
Ownership of Sign: City of Winnipeg
Type of Sign: Information
Sign Typology: Post
Intended User of Sign: Public Transit User
Visibility of Sign: High Placement/Regular Frequency/Unlit Location
Legibility of Sign: Sans Serif Font/Uppercase Letters/White Background/Bus and Transit Pictogram
Character/Identity of Sign: Uniform Public Transit Sign
Quality/Condition of Sign: Good Quality and Condition



Audit Site: Wolseley
Audit Street/Location: Assiniboine River
Ownership of Sign: City of Winnipeg
Type of Sign: Information
Sign Typology: Post
Intended User of Sign: Pedestrian
Visibility of Sign: Riverside Placement/Regular Frequency/Unlit Location
Legibility of Sign: Sans Serif Font/Uppercase Letters/White Background/No Pictogram
Character/Identity of Sign: No Character
Quality/Condition of Sign: Good Quality and Condition



Audit Site: Wolseley
Audit Street/Location: Wolseley Avenue
Ownership of Sign: Unknown
Type of Sign: Destination
Sign Typology: Post
Intended User of Sign: Pedestrian/Multiple
Visibility of Sign: High Placement/Regular Frequency/Lit Location
Legibility of Sign: Serif Font/Uppercase Letters/Stained Glass Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: Wolseley
Audit Street/Location: Omand Park
Ownership of Sign: Unknown
Type of Sign: Destination/Information
Sign Typology: Free-standing
Intended User of Sign: Pedestrian/Cyclist
Visibility of Sign: Entry/Exit Point Placement/One-time Frequency/Lit Location
Legibility of Sign: Serif Font/Uppercase Letters/Black Background/Tree Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



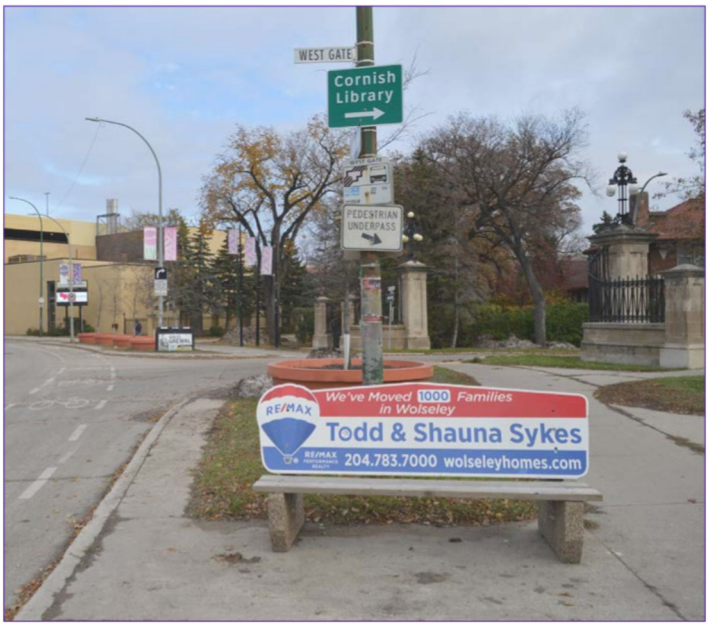
Audit Site: Wolseley
Audit Street/Location: Omand's Creek
Ownership of Sign: City of Winnipeg
Type of Sign: Destination/Identification
Sign Typology: Post
Intended User of Sign: Motor Vehicle Driver
Visibility of Sign: High Placement/One-time Frequency/Lit Location
Legibility of Sign: Sans Serif Font/Sentence Case Letters/Brown Background/No Pictogram
Character/Identity of Sign: Uniform Waterways Sign
Quality/Condition of Sign: Good Quality and Condition



Audit Site: Wolseley
Audit Street/Location: Portage Avenue
Ownership of Sign: City of Winnipeg/Province of Manitoba
Type of Sign: Information/Directional
Sign Typology: Post
Intended User of Sign: Motor Vehicle Driver
Visibility of Sign: High Placement/Regular Frequency/Lit Location
Legibility of Sign: Sans Serif Font/Uppercase Letters/Green and White Backgrounds/ Highway Logos and Pictograms
Character/Identity of Sign: Uniform Character
Quality/Condition of Sign: Good Quality and Condition



Audit Site: Wolseley
Audit Street/Location: Portage Avenue
Ownership of Sign: City of Winnipeg
Type of Sign: Information
Sign Typology: Post
Intended User of Sign: Pedestrian
Visibility of Sign: Medium Placement/One-time Frequency/Unlit Location
Legibility of Sign: White Background/Pedestrian Pictogram
Character/Identity of Sign: No Character
Quality/Condition of Sign: Good Quality and Condition



Audit Site: West Broadway
Audit Street/Location: Sherbrook Street
Ownership of Sign: City of Winnipeg
Type of Sign: Information/Directional
Sign Typology: Post
Intended User of Sign: Pedestrian
Visibility of Sign: Medium Placement/One-time Frequency/Lit Location
Legibility of Sign: Sans Serif Font/Uppercase Letters/White Background/Arrow Pictogram
Character/Identity of Sign: No Character
Quality/Condition of Sign: Poor Quality and Condition



Audit Site: West Broadway
Audit Street/Location: Assiniboine River
Ownership of Sign: City of Winnipeg
Type of Sign: Destination/Identification
Sign Typology: Post
Intended User of Sign: Motor Vehicle Driver
Visibility of Sign: High Placement/One-time Frequency/Lit Location
Legibility of Sign: Sans Serif Font/Sentence Case Letters/Brown Background/No Pictogram
Character/Identity of Sign: Uniform Waterways Sign
Quality/Condition of Sign: Good Quality and Condition



Audit Site: West Broadway
Audit Street/Location: Cornish Path
Ownership of Sign: City of Winnipeg
Type of Sign: Destination/Identification
Sign Typology: Free-standing
Intended User of Sign: Pedestrian/Cyclist
Visibility of Sign: Entry/Exit Point Placement/Regular Frequency/Unlit Location
Legibility of Sign: Serif Font/Uppercase Letters/No Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: West Broadway
Audit Street/Location: Osborne Street
Ownership of Sign: City of Winnipeg
Type of Sign: Directional
Sign Typology: Ground
Intended User of Sign: Cyclist/Pedestrian
Visibility of Sign: Lit Location
Legibility of Sign: Bike and Pedestrian Pictograms
Character/Identity of Sign: No Character
Quality/Condition of Sign: Good Quality and Condition



Audit Site: West Broadway
Audit Street/Location: Westminster Avenue
Ownership of Sign: City of Winnipeg
Type of Sign: Information
Sign Typology: Guerrilla/Post
Intended User of Sign: Pedestrian
Visibility of Sign: High Placement/One-time Frequency/Unlit Location
Legibility of Sign: Pedestrian Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: Wolseley
Audit Street/Location: Arlington Street
Ownership of Sign: City of Winnipeg
Type of Sign: Identification/Directional
Sign Typology: Post
Intended User of Sign: Multiple
Visibility of Sign: Intersection Placement/Regular Frequency/Unlit Location
Legibility of Sign: Sans Serif Font/Uppercase Letters/White Background/Stained Glass Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Excellent Quality and Condition



Audit Site: Wolseley
Audit Street/Location: Canora Street
Ownership of Sign: Unknown
Type of Sign: Destination/Identification
Sign Typology: Guerrilla/Ground
Intended User of Sign: Pedestrian
Visibility of Sign: N/A
Legibility of Sign: Sans Serif Font/Uppercase Letters/No Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: Wolseley
Audit Street/Location: Canora Green
Ownership of Sign: City of Winnipeg
Type of Sign: Destination/Identification
Sign Typology: Post
Intended User of Sign: Pedestrian/Multiple
Visibility of Sign: Lit Location
Legibility of Sign: Serif Font/Sentence Case Letters/City of Winnipeg Logo
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: Wolseley
Audit Street/Location: Arctic Alley
Ownership of Sign: Arctic Alley
Type of Sign: Directional
Sign Typology: Guerrilla/Ground
Intended User of Sign: Pedestrian
Visibility of Sign: N/A
Legibility of Sign: Polar Bear Paw Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition



Audit Site: Wolseley
Audit Street/Location: Wolseley Avenue
Ownership of Sign: City of Winnipeg
Type of Sign: Identification
Sign Typology: Ground
Intended User of Sign: Pedestrian
Visibility of Sign: N/A
Legibility of Sign: Sans Serif Font/Uppercase Letters/No Pictogram
Character/Identity of Sign: Local/Unique
Quality/Condition of Sign: Good Quality and Condition


ASSINIBOINE RIVER
RED RIVER

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