Places for People:
Designing Pedestrian-friendly Streets in Winnipeg, Manitoba

By

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Abstract

This research explores street design as a means to creating pedestrian-friendly public street space in North American downtown neighbourhoods. Recent literature suggests pedestrian activity in urban environments depends upon both a dense mix of land uses and public spaces which are safe, comfortable, and accessible for pedestrians. This latter condition is the focus of this research, and is referred to as pedestrian-friendly. Focusing on the downtown neighbourhood of South Portage in Winnipeg, Manitoba, the research applies a theoretical framework and a detailed site assessment to understand current conditions of walkability in South Portage. This assessment helps to inform relevant design interventions for identified locations in the South Portage neighbourhood, in order to create improved conditions for pedestrians. It is hoped this research provides a better understanding of what role planners can play in the creation of pedestrian-friendly street space, and to explore what potential exists to make the street environment of the South Portage neighbourhood more pedestrian-friendly.

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This work is dedicated to my dear children, Sadie and Henry, whose thoughtful observations and questions continually inspire me to think about what makes a better city.

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“The street is the river of life of the city.” - William H. Whyte

1. Introduction

This research explores the design of public street space in downtown environments. Streets are one of the most important elements by which people mentally derive an image of a city, and are the basic unit of analysis through which most people interpret a city (Lynch, 1960; Mehta, 2014). Streets are an important part of the public space of a city and offer “an essential counterpoint” to the private spaces of the city, providing “the channels for movement, the nodes of communication, and the common grounds for play and relaxation” (Carr et al., 1992, 3). Public spaces are often seen as a retreat from the chaos and noise of the urban environment. However, they can also be destinations to experience urban life, rather than retreat from it. Connection with other people is an important draw of public space, ranging from the passive interaction involved in people-watching, to more active interactions with friends and acquaintances (Whyte, 1988; Carr, 1992).

More than just symbolic of the city, streets are a ubiquitous form of public space (Mehta, 2014). Citizens of the city depend on streets, “relying on their presence to go about their daily lives” (Moudon, 1987, 13). The streets of a city are in some ways a permanent and immovable feature of the city. While the geography, use, and form of cities in capitalist societies may change dramatically over time, the public right of ways laid out in the earliest stages of a city’s development often remain a constant feature long after its original surveyors have passed on, and long after the first buildings to line its edges have disappeared (Rae, 2003). This is particularly true in the downtown areas of large and medium-sized cities, where the costs of land assembly prohibit significantly altering the street system (Klemek, 2011). But within their basic

permanence is the capacity of streets to adapt to changes according to shifting needs. While the defined patterns and overall dimensions of the downtown street remain over time, streets have the capacity to adapt and change according to determined needs. Rae (2003) notes that, while streets largely remain in place, it is a superficial continuity, and the function and design of a street in one century can become unrecognizable in the next.

This research involves an exploration of downtown streets and how they can be designed to be places where a diversity of pedestrian activity is welcome to occur – an environment which is accessible, safe, comfortable, and enjoyable for users of the sidewalk (Carr, 1992; Alfonzo, 2005; Speck, 2012). In particular, this research focuses on the pedestrian environment of the public street: the sidewalks and crossings of the street's public rights-of-ways. Like many streets in what are now the downtown areas of cities in the North American prairie region, South Portage was originally surveyed and laid out as a grid of relatively wide and straight rights of ways. While this width and regularity enabled the streets of South Portage to be refashioned for automobile-oriented uses in the mid-20th century, this width can also easily accommodate an increase in pedestrian space through design interventions.

The current built form and design of space in South Portage presents unique challenges. The allotment of space within the public rights-of-way prioritizes moving vehicles over other uses, such as pedestrian travel or public gathering. South Portage also has few remaining historical streetscapes along the street edges, and much of the neighbourhood's built form is dominated by surface parking lots and buildings not oriented toward the pedestrian environment.

This research aims to determine the degree to which actually is pedestrian-friendly, considering a large area of South Portage and how pedestrian-friendly street design interventions could make its street spaces more inviting to pedestrian activity. In this research, pedestrians are

defined as all users of the sidewalk, including people who rely on wheelchairs (Michalos, ed., 2014). Pedestrian-friendly will be defined by the design of public street space which is accessible, safe, and comfortable to all pedestrian users (Forsyth, 2015; Handy and Clifton, 2001).

1.1 Problem Statement

Winnipeg has been characterized as a slow-growth city with high levels of urban sprawl development at its fringes (Leo & Anderson, 2006; Leo & Brown, 2000). This pattern of growth and development has led to a long period of decline for the city's downtown, as well as for a number of adjacent inner city residential and industrial neighbourhoods. For many years, the downtown area has been characterized by "an air of general dereliction" (Metropolitan Corporation, 1969, 22); "a feeling of listlessness and displacement" (Strauss, 2006); and "parking lots that seem to occasionally outnumber the cars that use them" (Agrell, 2011). The appearance of Winnipeg's downtown no doubt contributed to V.S. Pritchett writing the city had "the ugliness of the English industrial Midlands, relieved by fine trees and some pretty streets in the suburbs" (Pritchett, 1989, 317).

The revitalization of Winnipeg's downtown's economic and environmental conditions has been a topic of discussion since the 1950s (*Winnipeg Free Press*, 1959; Lyon and Fenton, 1984; Palmer, 2003; Bellamy, 2016; Galston, 2016). Much of this public discussion has "often focused on large-scale redevelopment projects which attempt to draw suburban residents downtown to regional destinations" located there, rather than focusing on creating a downtown neighbourhood oriented toward a residential population (Palmer, 2003, 30).

South Portage is a downtown neighbourhood where many of the negative physical characteristics (highlighted in both planning reports and the popular press) are present: large

surface parking lots; buildings with blank walls at street level; featureless, car-oriented street designs; and a corresponding lack of pedestrians at street level. There are few obvious focal points, architectural coherence, or streetscapes to provide a framework within which to begin the work of revitalizing. Nor is there a "unique spatial and historical situation" former industrial areas often found on the periphery of North American downtown districts offer (Helbrecht and Dirksmeier, 2012). This lack of centre is particularly true in the area of South Portage south of Graham Avenue, where street space is overwhelmingly oriented to the rapid movement of large volumes of automobiles. Perhaps it is unsurprising, then, that South Portage is also characterized by a lack of pedestrian activity.

Originally a residential neighbourhood built up at the turn of the 20th century, South Portage today has few remaining historical streetscapes, and much of the landscape has become dominated by surface parking lots and buildings not oriented toward pedestrians or a vibrant street life. The characteristics and conditions found throughout much of the South Portage Neighbourhood symbolize the unmet hope for a downtown district transformed by economic prosperity and urban renewal in the postwar years (Keshavjee, 2006).

In spite of this, many destinations of regional importance are located in South Portage. These include the Law Courts, RBC Convention Centre, MTS Centre, and a number of large hotels and office buildings. Recently, construction of a major mixed-use development, True North Square, has begun in South Portage (Schlesinger, 2016). Although much of South Portage is characterized by non-residential land uses, a number of apartment buildings are scattered throughout South Portage, and the neighbourhood had a residential population of 2,050 as of 2011. A major mixed-used development, Sky City, is set to begin construction on Graham

Avenue South Portage in 2017. This development will feature a residential tower with more than 350 residential units (McNeill, 2016).

A portion of the South Portage neighbourhood is included in the Sports Hospitality and Entertainment District (SHED), a recent designation which is part of an effort to create a cohesive district for sports, hospitality, and entertainment uses and attractions (Centre Venture, 2015). Central to the SHED is True North Square, a mixed-use development currently under construction on the south side of Graham Avenue between Carlton and Hargrave Streets. This will include a plaza space located between new buildings (CBC News, 2016). Pedestrian-scaled improvements to the street environment have been conducted within areas of the SHED located in the South Portage neighbourhood, including lighting, benches, and new sidewalks (Centre Venture, 2015). While these may benefit the pedestrian environment, they have been viewed simply as a "powerful investment tool to draw the attention of the private sector" (Centre Venture, 2015, 9). Continuing to approach the planning and designing of the public street environment simply to attract development may not effectively address gaps and challenges in implementing pedestrian-friendly streets. A broad pedestrian-focused approach is needed in Winnipeg's downtown.

South Portage is located in a key neighbourhood within Winnipeg's large downtown area, and the streets of South Portage link many of downtown's nodes of activity and destinations. As a fragmented neighbourhood located in the centre of a large downtown area, South Portage will continue to isolate physically downtown's existing defined clusters and corridors of activity.

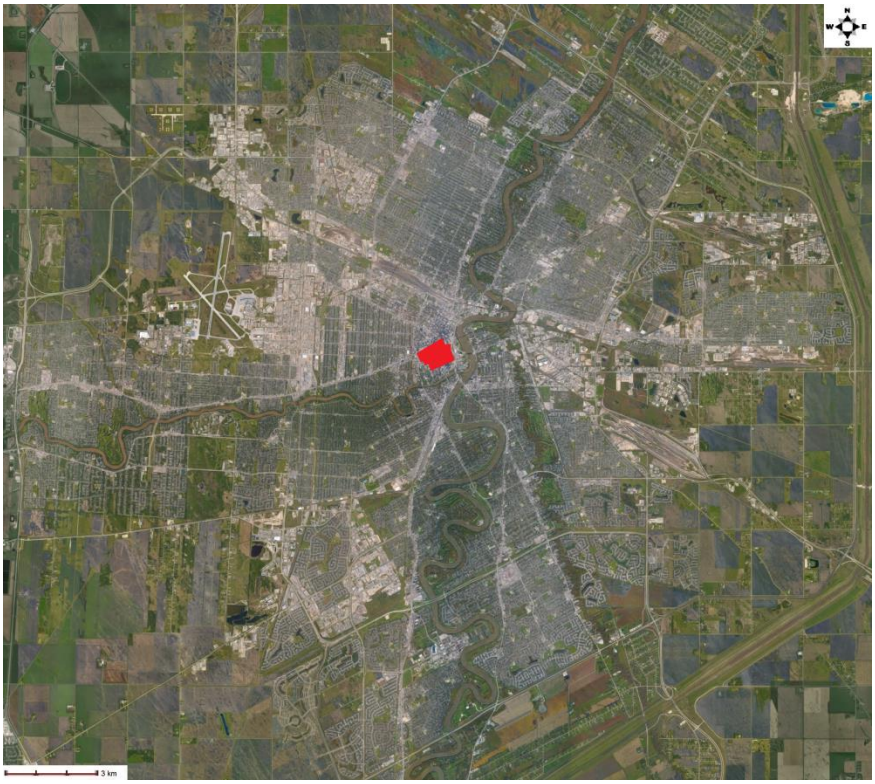

Figure 1: Satellite Image of South Portage in relation to Winnipeg, MB (Source: Google Maps, 2016)

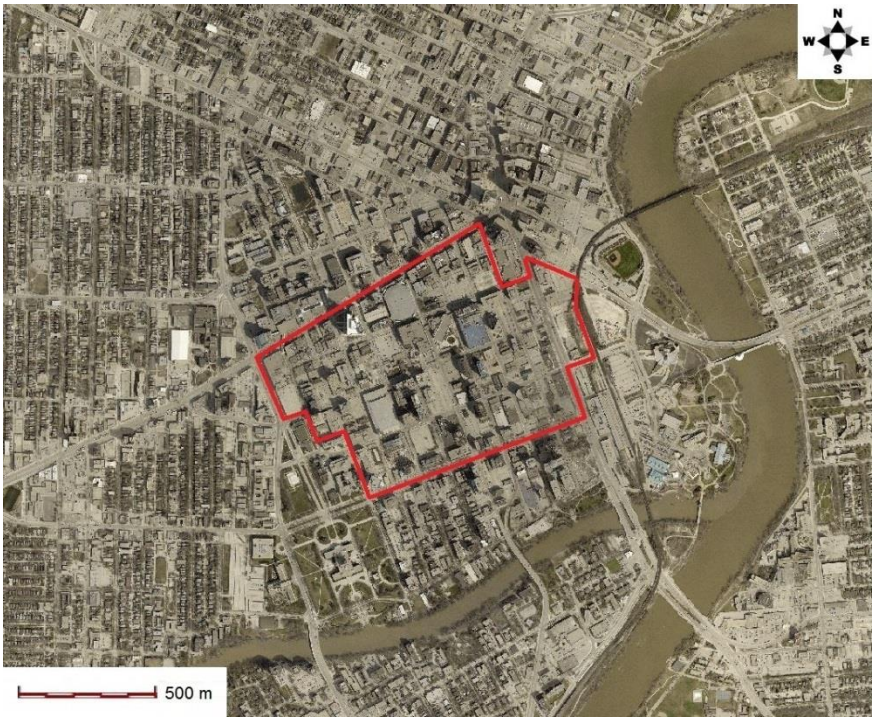

Figure 2: Satellite Image of South Portage (Source: City of Winnipeg iView, 2016)

1.2 Key Research Questions

The research was guided by the following questions:

1. To what degree is South Portage presently pedestrian-friendly?
2. What street design interventions could assist the area in becoming more pedestrian-friendly?

1.3 Significance of the Study

Recent policies for the downtown area have focused on attracting real estate development to downtown Winnipeg, creating a mix of land uses and ensuring new developments are designed to be of a high quality. This is meant to create a diverse and vibrant, and attractive downtown area (City of Winnipeg, 2004; City of Winnipeg, 2005; City of Winnipeg, 2011a). This focus is supported by the literature, which identifies density, mixed uses, and pedestrian-oriented building designs as ways to promote pedestrian activity (Jacobs, 1961; Mouldon, 2006; Hansen, 2014).

Missing from Winnipeg's policy focus has been the conditions and design of pedestrian space in public streets downtown, and the role it plays in revitalization there. This research focuses on the design of public street space, in order to create a safer and comfortable pedestrian environment. Research has shown a sense of safety and comfort is essential to creating active pedestrian-friendly streets (Carr et al., 1992; Alfonzo, 2005; Mehta, 2014).

This research contributes to ongoing discussions about the revitalization of downtown Winnipeg at a time when a number of significant real estate developments are underway (Centre Venture, 2015; McNeill, 2016). It emphasizes pedestrian-friendly street design as an important tool in improving downtown areas. This is particularly true in downtown neighbourhoods with few existing physical characteristics lending themselves to a pedestrian-friendly neighbourhood,

or with a lack of economic conditions suitable for the sustained development of private downtown real estate. More broadly, this research adds to the growing planning literature on the importance of pedestrian-friendly street space (McCann, 2013; Mehta, 2014; Leinberger and Rodriquez, 2016; Hoehner, et al., 2016).

A pedestrian environment which welcomes pedestrians to the neighbourhood will ensure South Portage does not just contain a collection of separate destinations to visit, but is a busy and cohesive neighbourhood to live and work in.

My interest in the South Portage neighbourhood began in the late 1990s, when I began frequently visiting downtown Winnipeg as a teenager. At the time, South Portage was perceived as a desolate and uninviting place relative to other nearby neighbourhoods, such as The Forks, the Exchange District, and Osborne Village. As a pedestrian, it became clearly established in my mind that no enjoyable pedestrian route through the South Portage area existed. Any route was primarily characterized by large surface parking lots, uninviting buildings, wide roadways, and little pedestrian activity.

In the years since I first began visiting South Portage, the character and uses of the neighbourhood have begun to change somewhat, particularly closer to Portage Avenue, as both land uses and policy began to transition away from retail uses and toward professional sports and major entertainment venues. A significant part of this change occurred with the closure of the Eaton's department store on Portage Avenue in 1999, and the opening of the MTS Centre on the same site in 2004. In spite of this change, South Portage continues to feature many of the same negative characteristics it had when I first began to visit the neighbourhood on foot almost 20 years ago.

New and proposed developments will cause South Portage to continue to grow in importance to the Winnipeg region, and its ability to be accessible, safe, and enjoyable for pedestrians at street level will be essential to this growth.

Winnipeg currently lacks meaningful planning strategies or policies to actively pursue the development of pedestrian-friendly streets in the downtown area. It is the aim of this research to explore applicable design concepts and guidelines from other North American cities, including other Canadian winter cities, in order to inform planning and design of the pedestrian environment in downtown streets.

1.3 Definitions of Terms

Street

Jacobs and Appleyard (1987) include the design and scale of buildings and non-public space along the public street as contributing to the liveability of the street, by providing activities, visual interest, or having an impact on sunlight, protection from the elements, or a sense of enclosure for pedestrians. While this research focuses on the conditions of the public rights of way and does not provide recommend interventions for the non-public street edge, the use of the term street . Additional discussion of this distinction in the research is found in Chapter 7: Conclusion.

Public Right-of-Way

This term is used in this research to provide a distinction between the overall street environment, which includes building edges and other non-public space along the street, and the public area of the street. This public right-of-way includes the sidewalks, roadways, and other elements of the public street.

Roadway

This document makes reference to roadways, which are a component of a public right of way where vehicles, rather than pedestrians, are accommodated. The roadway space is found "between the lips of the gutters, and can include parking lanes, bicycle lanes, transit lanes, general use travel lanes, and median" (Calgary, 2011, 62).

Pedestrian

The United States Department of Transportation (2001) defines pedestrians as all sidewalk users, including those who travel with the assistance of a wheelchair. According to the *Encyclopedia of Quality of Life and Well-Being Research*, the use of wheelchairs and scooters are considered variants of walking (Michalos, ed., 2014). Pedestrian space designed to be accessible to all sidewalk users is especially important because those with limited ability are not able to use other transportation options (U.S. Department of Transportation, 2001).

1.4 Limitations

The South Portage neighbourhood is a geographically large research site located in a downtown setting with many different land uses, issues, and challenges, within the context of a slow-growth winter city. This research attempted to remain focused on the issue of the pedestrian environment in South Portage, and design interventions which could make it more pedestrian-friendly. To keep this focus, there are several limitations to the research.

1.4.1. The [Non-Public] Built Environment

This research is focused on the design and function of public street space in the South Portage neighbourhood, rather than on design and use of non-public buildings or sites along the edges of the street space. This research refers to the buildings and plazas as the non-public built

environment. In focusing on public street space, non-public aspects of the built environment were looked at as part of the site assessment, since the design and function of non-public building and spaces influences the public street environment (Whyte, 1988; Mehta, 2014). However, the design recommendations of this research do not address the non-public built environment of South Portage streets. Including the non-public built environment in the assessment was useful, however, since these environments contribute to the level of pedestrian-friendliness and where pedestrian destinations within the study area currently exist (Whitby, 2014).

The development of non-public sites in the South Portage, such as new mixed use buildings constructed on South Portage's many surface parking lots, is an important objective and warrants further research. However, such development is dependent on factors related to economic conditions, and matters related to land ownership. This research instead focuses on the conditions of the pedestrian environment in public street spaces in South Portage.

1.4.2. One-way streets

All streets within the study area of South Portage feature one-way traffic. In recent decades, there has been some literature promoting the benefits of converting urban streets from one- way to two-way in urban areas (Walker, et al., 2000). These benefits include increased property values, and an increase in the number of pedestrians and cyclists (Gilderbloom, 2014), and even improvements to motor vehicle traffic flow (Gayah and Daganzo, 2012).

The scope of the interventions section focused on a defined area of the South Portage area, and on key locations identified in the assessment phase, rather than on the neighbourhood, and the downtown Winnipeg transportation network as a whole. Moreover, the literature suggests a

number of design interventions can work to slow motor vehicle traffic speeds through one-way traffic streets. The site assessment found opportunities for this to occur.

1.5 Chapter Outline

This practicum document includes seven chapters, as well as four appendices. Chapter One introduces the research and its objectives. Chapter Two provides a brief overview of South Portage's historical and contemporary development. It is important to note that, while the historical background is not the focus of this research, this overview enables a better understanding of the long-term development and trends which have shaped the current conditions of South Portage.

Chapter Three involves a review of the literature on the topic of pedestrian-friendly streets and design. It includes planning theory on, and design and policy tools for pedestrian-friendly streets from a number of North American cities. Chapter Four outlines the research methods used. Chapter Five summarizes the findings of the assessment of the South Portage neighbourhood, and Chapter Six presents recommendations for pedestrian-friendly design interventions.

Chapter Seven, the concluding chapter, includes a brief discussion of research questions arising. Appendices to this document include a completed sample of the site assessment checklist, a table showing lane widths of roadways within the assessment area, a table indicating the locations suitable for curb extensions, and notes from the unobtrusive observations.

2. Background

This chapter is written in order to understand the context of the South Portage neighbourhood's present environmental conditions, and its function and level of importance to Winnipeg as a whole. By briefly looking back on the history of urban development and planning interventions in South Portage, a better understanding of the present context of the neighbourhood can be gained.

2.1 Historical Development of South Portage

In the early 1870s, a 450-acre tract of land which lay beyond Upper Fort Garry was owned by the Hudson's Bay Company. This reserve was bounded by the Assiniboine and Red Rivers, what is now Notre Dame Avenue, and Colony Creek, which ran near present-day Osborne Street North. (Artibise, 149-150).

As a small cluster of businesses and houses began to form around the intersection of Portage and Main after 1862, the Hudson's Bay Company began to subdivide their reserve into town lots on a grid plan. This grid remains largely intact today, including the wide boulevard, Broadway, which was laid out and planted with trees. The land which would become the South Portage neighbourhood was subdivided into lots measuring 50 feet by 120 feet (15.25 metres by 36.5 metres), on street rights of way measuring 66 feet (20.1 metres), with the exception of Portage, Main, and Broadway, which were 132 feet (40.2 metres) wide, respectively (Figure 4).

Figure 3: Detail of map showing the South Portage area, 1881 (Source: Library and Archives of Canada)

In spite of increasing urban development occurring growing town forming along Main Street and to points northward, development within the current South Portage neighbourhood was slow in these early years, and by 1880, the vicinity of Hargrave and St. Mary was the largely undeveloped edge of the young city (Rostecki, 1980).

This slow start to development in South Portage would not last, and demand for lots in the Company's reserve was heightened in 1881 when the Canadian Pacific Railway crossed the Red River through Point Douglas a mile to the north, and industrial and wholesale concerns began to locate there (Artibise, 1975). The railway would help solidify the reserve as a desirable location for residential development, as it was located a sufficient distance from industrial and commercial uses, while still being within walking distance of the business district. With the relatively large lot sizes, and the distance from the railway and industry, it was clear by the mid-1880s that the reserve, including the future South Portage neighbourhood, would develop into a middle and upper-class residential district (Rostecki, 1980; Artibise, 1975).

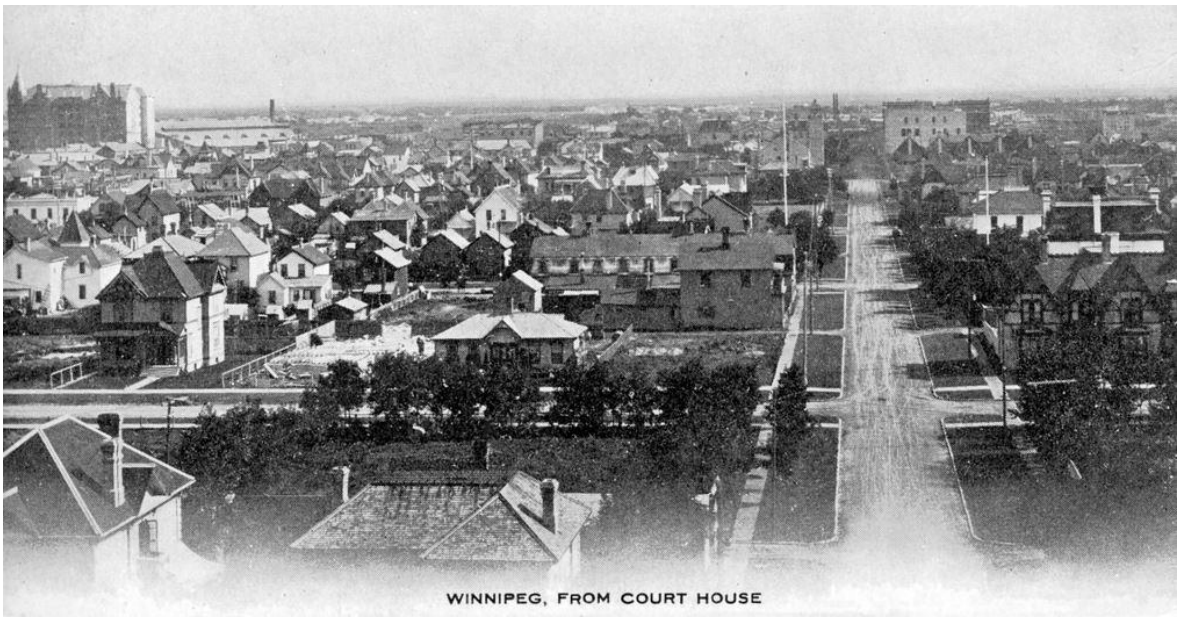

Figure 4: The residential character of South Portage can be seen in this photo from approximately 1910. York Avenue can be seen on the right, with streets such as Edmonton intersecting (Source: Provincial Archives of Manitoba)

In 1905, the T. Eaton Company built a massive department store on the south side of Portage Avenue between Donald and Hargrave Streets. Located a few blocks west of Winnipeg's business district along Main Street, the development of Eaton's Winnipeg store would mark the beginning of Portage Avenue's commercial importance, and the eventual expansion of the central business district into the South Portage neighbourhood (Artibise, 1975). Eaton's Winnipeg operations would expand further south from its department store on Portage Avenue in 1912, when the company opened a large mail order office building behind the store on Graham Avenue. Over time, Eaton's acquired additional properties in South Portage near its store, including several surface parking lots for the use of customers and employees. By the 1930s, many other retail stores and other commercial uses followed Eaton's to Portage Avenue and side streets on either side of it (Lyon and Fenton, 1984), most notably the Hudson's Bay Department store at Portage Avenue and Vaughan Street.

With the encroachment of non-residential uses, and as streetcars (and, later, automobiles) enabled middle-class families to live further from the central business district, South Portage began to fall out of favour as a middle-class residential district after the First World War (Lyon and Fenton, 1984). By 1920, many of the single-family houses in South Portage had been converted to boarding houses or to serve institutional purposes (Artibise, 1975). In the 1950s, the area of South Portage between St. Mary and Broadway was characterized by "cheap rooming houses, well on the down-grade, and yet one of high land values caused by the encroachment of the C.B.D." (Weir, 1957, 9).

The gradual transition away from residential and toward commercial uses in much of South Portage can be seen by looking through the annual Henderson's street directories for Winnipeg over the years. A survey of the north-south street of South Portage in 1901 showed non-residential uses in South Portage almost entirely confined to blocks north of Graham Avenue and east of Hargrave Street. By 1931, non-residential uses dominated Fort Street and all blocks north of Graham Avenue. Non-residential land uses would finally come to dominate all of South Portage by 1961, particularly north of St. Mary and east of Garry (Henderson Directories, 1901, 1931, and 1961).

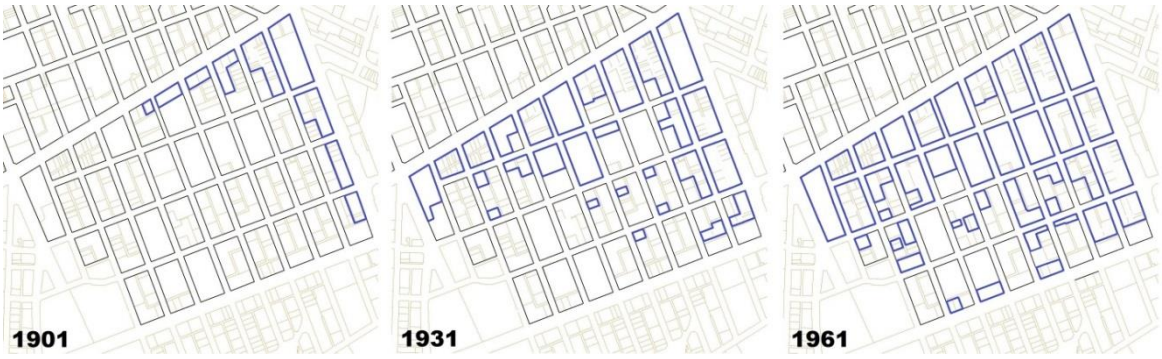

Figure 5: Commercial Uses in South Portage, 1901-1961 (Adapted from Henderson Directories)

In the 1950s and 1960s, many of the residential houses and apartment blocks lining Broadway were replaced with office buildings. Closer to the Legislative Building, and the Law Courts on Kennedy Street, many of these new office buildings were built to house law firms and government services. Meanwhile, Portage Avenue continued to be the city's main retail strip. In this era of postwar optimism and growth, it was believed the blocks between Portage and Broadway would gradually fill up with large, modern buildings. Civic authorities anticipated this change, and the boulevards and trees along streets south of Portage Avenue were removed to accommodate wider roadways (Keshavjee, 2006). A newspaper article from 1957 stated Winnipeg's traffic department had spent nearly $6-M on widening roadways, and installing traffic lights and median strips in the downtown area (*Winnipeg Free Press*, 1957).

By the late 1960s, South Portage began to show clear signs of economic and physical deterioration. The Metropolitan Corporation's plan for downtown Winnipeg summarized the state of the South Portage area by saying:

> "The sense of decline and abandonment is felt most strongly in this sector, at least as far [north] as Graham Avenue. This no doubt is due in considerable measure to the fact that vast areas of land are devoted to surface parking. … Scattered through the sector are still a number of single family dwellings, all in manifestly poor condition, emphasized by the fact that many are exposed to empty surroundings. There is therefore little wonder that the sector has an air of general dereliction" (Metropolitan Corporation, 1969, 22).

In contrast, the neighbourhood south of Broadway, which did not undergo significant land use changes or the removal of trees for road widening, experienced new residential development in the post-war years (Lyon and Fenton, 1984).

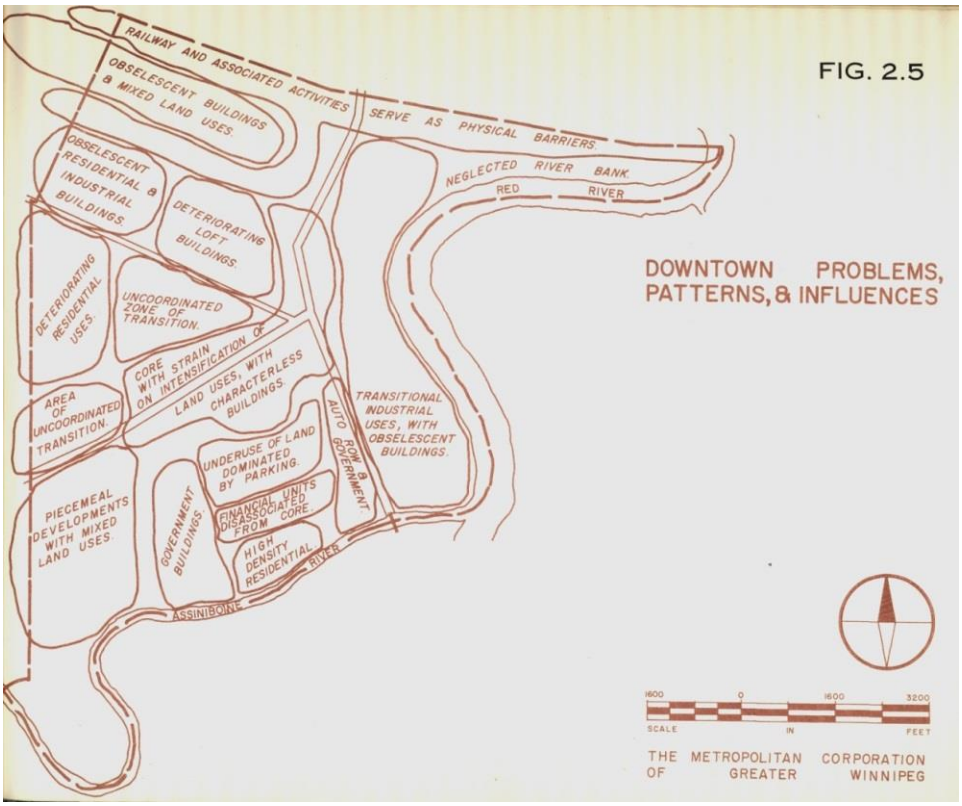

Figure 6: Map showing Winnipeg Downtown Problems, Patterns, and Influences, 1967. (Source: Metropolitan Corporation of Greater Winnipeg)

2.2 Early Planning Interventions

As South Portage continued to transition away from being a residential neighbourhood, planning interventions after 1945 would attempt to assist with improving the appearance of the area. In 1959, the planning commission for the Winnipeg area's Metropolitan government completed a conceptual plan for the area of South Portage between Donald and Smith Streets. A linear plaza would extend from Broadway to Graham Avenue, in order to provide open space to the downtown district. Underground parking garages would be located beneath the plaza, and they would be lined by new residential towers and office buildings (Winnipeg Free Press, 1959).

In 1967, the planning consultant firm Murray V. Jones was hired to produce a report on a large area of Downtown Winnipeg, including all of South Portage. The Murray V. Jones report identified problems inhibiting redevelopment in the downtown, including imbalances in the

downtown real estate market, zoning regulations, and institutional preferences for single-family development in suburban locations. The report recommended Winnipeg work toward a population of between 50,000 and 75,000 people (Warkentin and Vachon, 2011).

The Metropolitan Corporation plan for downtown focused on the downtown area, including South Portage. To attract population growth downtown, the plan called for the development of an above-ground walkway system in order to protect pedestrians from Winnipeg's extreme climate (Metropolitan Corporation, 1969).

Although the Metropolitan Corporation's plan would not see South Portage fill up with a mix of residential towers, major projects, and sweeping plazas, the plan did have a lasting effect. The Winnipeg Convention Centre, which opened in 1974, is one significant component of the plan which came to pass. Across the street from the Convention Centre, Holiday Towers was a large development following in the pattern of the plan. However, much of the area of South Portage between Graham and Broadway continued to be characterized by surface parking lots by the 1980s.

2.3 Current Zoning and Policy Context for Downtown Winnipeg

The City of Winnipeg currently has several policy documents relevant to the pedestrian environment in the city's downtown area. The Downtown Zoning Bylaw, which came into effect in 2004, zones most of the research site/South Portage neighbourhood for multiple uses. The zoning regulations are intended to encourage a mix of land uses "typical to a diverse and vibrant central business district" (Winnipeg, 2016, 37). The bylaw focuses on setting some controls over land uses and built form (such as signage dimensions, and the heights and setbacks of buildings), while issues of pedestrian comfort and urban design are the focus of urban design reviews of proposed new developments (Winnipeg, 2016).

Urban design reviews have two areas of focus: the pedestrian environment and urban realm of a development, and the architecture. A primary principle of the urban design review is to "enhance pedestrian comfort, safety, and accessibility" (Winnipeg, 2005, 7). Urban design guidelines in the Zoning Bylaw only apply to the development of new buildings, or to exterior changes to existing buildings. While urban design guidelines can focus on the relationship between the building and the street environment, they do not apply to the public street space generally.

The *Complete Communities Direction Strategy* focuses on land use and development in the downtown area, and promotes downtown as an area for continued development as a dense, mixed-use district. *Complete Community* supports pedestrian-oriented streets in order to create a high-quality public realm, with a particular focus on areas around high-density development and downtown's major destinations (Winnipeg, 2011a).

The City of Winnipeg's Transportation Master Plan (2011b) defines complete streets as streets "designed and operated to balance the safety and mobility of all users, respecting the relative regional and localized context of the street within the urban structure" (Winnipeg, 2011b, 5). A policy direction for creating complete streets is to ensure new transportation development "reflects accessibility and universal design principles," and "balance[s] the needs of all users of the street" (Winnipeg, 2011b, 6). However, developing a complete streets strategy is identified as requiring a low level of effort, and has not yet been undertaken (Winnipeg, 2011b).

2.4 Summary

The influence and encroachment of the business district on South Portage began in 1905, early in the development of the neighbourhood (Artibise, 1975). This would see South Portage move away from a residential neighbourhood with a variety of housing types, toward a business

district of regional importance. While this transition began early in the 20th century, it would accelerate significantly after the Second World War, when new offices and major destinations were constructed, and roadways were widened to accommodate motor vehicle traffic. In spite of this continued transition, and development plans to foster a cohesive and built-up area, much of South Portage would remain underbuilt, characterized by surface parking lots and "an air of general dereliction" (Metropolitan Corporation, 1969, 22).

Today, many of these poor physical characteristics remain, in spite of existing policy documents intended to support an active, pedestrian-friendly downtown. To understand the importance of pedestrian-friendly streets, and what design elements could help create this, a review of the literature is presented in the following chapter. The state of the physical conditions of South Portage, and the degree to which is it pedestrian-friendly, will be explored in Chapter Five.

3. Literature Review

This review explores the scholarly literature on the relationship between walking and condition of the urban environment, the role of public space in cities, concepts of walkable neighbourhoods, and pedestrian-friendly design for urban streets. This theorizing informs the framework for understanding the current state of pedestrian-friendliness in South Portage, and guides potential design interventions and concepts which could be applied there.

3.1 The Growing Demand for Pedestrian-friendly Cities

In recent years, there has been a growing understanding of the demand for walkable neighbourhoods and cities, which has been covered by the popular media (Benfield, 2016; Regional Plan Association, 2016; Kennedy, 2015). This growing demand is attributed to young adults entering the job market, and older adults entering retirement. Both cohorts demand a lifestyle where there are a diversity of transportation options, including walking, and access to quality public space to enjoy (Grabar, 2014).

A good walking environment reflects a significant consumer preference. A poll conducted by the National Association of Realtors (NAR) found more adults between the ages of 18 and 34 prefer living in walkable neighbourhoods than conventional car-oriented suburban areas. Moreover, this is coupled with a consumer preference to use walking, transit, and cycling as regular transportation modes (NAR, 2015).

Research also suggests urban regions with high numbers of walkable neighbourhoods do better economically. One report completed by the Urban Land Institute and The George Washington School of Business found rents on office space are significantly higher in walkable urban areas than in car-oriented suburban locations (Leinberger and Rodriquez, 2016).

3.2 The Relationship between Pedestrian Activity and the Urban Environment

Despite the apparently growing preference for pedestrian-friendly neighbourhoods, reflected in the stronger economic performance of neighbourhoods with a mix of uses and strong accessibility identified by researchers, many adults in North American cities do not achieve the recommended physical activity levels, including moderate-intensity exercises such as walking (Song et al., 2016; Ambrose et al., 2010; Tudor-Locke and Schuna, 2012). Researchers have found a link between rates of walking and the characteristics of the built environment. In a study of 14 cities around the world, Sallis et al. (2016) identified a direct correlation among instances of walking and the level of residential densities, street connections, and the presence of transit and public parks.

The relationship between levels of pedestrian activities and the conditions of the built environment of cities has also become increasingly understood in popular media (Senthilingham, 2016; McIntyre, 2016; Battersby, 2015; Bliss, 2015; Roberts, 2015; Montgomery, 2013). In the *New York Times*, Senthillingham (2016) notes planners in New York City have identified a correlation between neighbourhoods with a lack of properly maintained sidewalks and parks and higher rates of chronic disease and obesity.

3.3 Defining Walking and Walkability

Recent research has sought to define walkability, which has emerged over the last 20 years in the urban planning literature (Forsyth, 2015; Speck, 2012; Southworth, 1997). Forsyth (2015) found there remain varying interpretations of the term of walkability: some interpretations view walkability as highlighting environmental factors (such as the design of the urban environment), the very means for creating walkability; others focus on the outcomes of

walkability, such as social contacts and improving health; while still others use the term as a broad catch-all for "better urban places" (Forsyth, 2015).

Walkability is one aspect of the broader issue of accessibility within urban areas. Handy and Clifton (2001) define accessibility as the "ease of reaching needed or desired activities" (Handy and Clifton, 2001, 68). The degree to which an urban area is accessible is determined by land use and transportation patterns within the subject area (Handy and Clifton, 2001).

The United States Department of Transportation (2001) defines pedestrians as all sidewalk users, including those who travel with the assistance of a wheelchair. According to the *Encyclopedia of Quality of Life and Well-Being Research,* the use of wheelchairs and scooters are considered variants of walking (Michalos, ed., 2014). Pedestrian space designed to be accessible to all sidewalk users is especially important because those with limited ability are not able to use other transportation options (U.S. Department of Transportation, 2001

3.4 Pedestrian-friendly Neighbourhoods

Looking more broadly at neighbourhoods, Jacobs (1961) argues informal social contact in streets and other public spaces is an indicator of a neighbourhood's vitality and safety, and identifies four physical conditions necessary for generating diversity and dynamism in a neighbourhood: mixed uses, small blocks, a mix of older buildings, and a dense concentration of people, including people who live there. For Jacobs, concentration and diversity involve more than just aesthetic preferences; rather, they offer a very practical way to create informal surveillance and promote social cohesion between different residents (Jacobs, 1961).

Similar to the four conditions for generation diversity in city neighbourhoods outlined by Jacobs (1961), Moudon et al. (2006) found neighbourhood walkability depends on residential density, shorter blocks, and close proximity to a variety of daily amenities, such as grocery

stores. Surveying residents in different urban areas, this research found people walk more in places with higher population densities, a mixture of land uses, and a connecting grid of sidewalks.

Llewelyn Davies Yeang's *Urban Design Compendium* (2000), which acts as a guide for planning and development, defines walkability as the ability to practically walk from home to minor everyday services, such as a corner store, within two-three minutes (or 400 metres), and more important services such as a pharmacy or major transit station within 10 minutes (800 metres) (Llewelyn Davies Yeang, 2000). Moudon et al. (2006) identified distance thresholds for food and drink establishments is 262 metres; for large grocery stores it is 440 metres (Moudon et al., 2006). Walkability depends on local services within a neighbourhood unit, but also connection to areas beyond. While boundaries, such as a river or railroad, can create a distinct sense of place within a neighbourhood, accessible crossings of these boundaries, such as bridges and tunnels, increase the level of walkability (UDC, 36).

3.5 Pedestrian-friendly Streets

In addition to a concentrated mix of land uses and a connected street system, walkability is influenced by the design of the built environment. Hansen (2014) argues walkability of a street space is dependent on five factors: enclosure caused by vertical physical elements and their ability to define the space; transparency of buildings and other features enclosing the space; human scale of the physical elements; complexity, or variety of the physical environment; and imageability defining the space and creates a coherent whole (Hansen, 2014). Similarly, Speck (2012) identifies four conditions which must be present in a street in order for it to be walkable. It must be: useful, safe, comfortable, and interesting (Speck, 2012).

Alfonzo (2005) identifies a hierarchy of five levels of needs on which an individual will base their decision to walk: “feasibility; accessibility; safety; comfort; pleasurability” (Alfonzo, 2005, 818). The first, feasibility, is related to an individual’s personal ability to walk, the other four are related to the urban form and design elements of the street (Alfonzo, 2005).

The environmental quality necessary for walkable neighbourhoods can be negatively impacted by streets with high levels of automobile traffic, which has been accommodated by redesigning urban streets overwhelmingly for rapid and easy car use (Schloemer, 2015; Norton, 2007). Appleyard (1981) compared streets in San Francisco which were similar in land uses, built environment, and demographics, but varied in their levels of vehicle traffic, and found streets with higher traffic levels featured less social connections between neighbours. Appleyard argues this was caused by high levels of vehicle traffic (cars, trucks, and buses), which not only take away from the sense of safety and pleasantness on street, but also take away from the sense of territory residents of streets had for the streets they lived on (Appleyard, 1981). High traffic residential streets may still have pedestrians who walk out of necessity, such as to travel to a corner store or bus stop. However, there are few who use it for what Gehl (1987) identifies as optional or social activities, such as lingering or chatting with other people.

Many theorists have examined how public spaces are designed and used. Carr et al. (1992) writes the public spaces of the city represent “an essential counterpoint” to the private spaces of the city, as they provide “the channels for movement, the nodes of communication, and the common grounds for play and relaxation” (Carr et al., 1992, 3). Public spaces are frequently identified as a retreat from the chaos and noise of the urban environment. They can also act as destinations to experience urban life, rather than retreat from it. Connection with other people is an important draw of public space, ranging from passive interaction of people-watching, to the

more active interaction with friends (Carr et al., 1992). The understanding of public spaces should focus on the relationship between people and public spaces, and the impact this has on the function of a space. This method is what determines if a place is successful or not. Carr et al. identify five needs people have in the public spaces they use: "comfort, relaxation, passive engagement with the environment, active engagement with the environment, and discovery" (Carr et al., 1992, 91).

Mehta (2014) defines public space as spaces accessible and used by the public, regardless of their ownership. Within this definition, spaces along the street privately owned, such as a patio or front yard, contribute to the life of the public street. Mehta takes Carr's (1992) definition of public space, and Gehl's framework (1987) to determine what makes good public space. Streets should be "accessible and open" and provide "a sense of safety, physical and environmental comfort and convenience, a sense of control, and sensory pleasure" (Mehta, 2014, 57).

Gehl (1987) classifies public space activities as those necessary, optional, or social. Necessary activities are ones "more or less compulsory," such as going to work or school, or walking to the grocery store. Optional activities are done "if there is a wish to do so and if time and place make it possible." These include walking for pleasure and lingering in the street longer than necessary. Social activities are ones which "depend on the presence of others" in the public space of the street. These include children playing, formal and informal gatherings, and greetings and conversations. While necessary activities occur under all street conditions, optional and social activities occur when the environmental conditions of the street are inviting to pedestrians (Gehl, 1987).

The importance of streets as public space can be understood by studying human behaviour in street spaces, and how "streets are able to fulfill everyday needs and provide

aesthetic and interactional pleasures" (Mehta, 2013, 64-65). This understanding of human behaviour can form a basis for design interventions. Mehta uses sociology theory and empirical studies of people's behaviours in three different neighbourhood commercial streets in the Boston area to understand design factors related to pedestrian activity and the "interrelationships between the characteristics of the street… and the behaviors… of its users" (Mehta, 2013, 65). Looking at the social nature of pedestrians in street space, Mehta develops a typology of social behaviours: passive sociability, where people are among other people without communicating verbally with them; fleeting sociability, where quick words or short chats are exchanged between acquaintances; and enduring sociability, where verbal and physical contact is made between people with affiliations and intimate relationships (Mehta, 2013).

3.6 Types of Interventions

3.6.1 Complete Streets

In recent years, a number of North American cities have created sets of guidelines for streets more accommodating to pedestrians, as well as other active transportation users, particularly cyclists (Robert, 2015; Edmonton, 2013; Speak, 2012). This is done by reducing vehicle travel speeds through street design. In policy documents and other research sources, this is often referred to as creating "complete streets."

The definition of the term complete streets is largely vague. Laplante and McCann (2008) define a complete street as "a road that is designed to be safe for drivers; bicyclists; transit vehicles and users; and pedestrians of all ages and abilities" (24). There is no real definition of Complete Streets in the planning literature, but it is essentially streets where the needs and comforts of multiple users are considered in the design (Winnipeg, 2011b; Edmonton, 2013).

McCann (2013) argues the complete street movement aims to use policy to shape "the way *all* roads are built" (McCann, 2013, 21).

3.6.2. Shared Streets

Shared Streets is a specific design concept where multiple functions of the street space are shared equitably through design. These functions, "vehicular movement, social contact, and civic activities," can occur simultaneously (Southworth & Ben-Joseph, 2003, 117). Shared Streets is a specific measure often implemented as a site-specific project, rather than a policy which can be applied to a variety of urban areas and typologies.

The design of shared streets is characterized by a lack of grade separation between the sidewalk and roadway areas, though the distinction between the two is sometimes made through different paving colors or materials (Polus & Craus, 1996). This has been used in existing urban settings, as well as in the design of new residential suburbs in countries such as The Netherlands and Germany (Southworth & Ben-Joseph, 2003).

Although the literature on shared streets has focused on European cities, in both the older urban areas and newer residential suburbs, recent examples of shared streets in North American downtowns exist. Notably, Bell Street Park in Seattle's Belltown neighbourhood opened in 2014, as a four-block stretch of a shared street. This project reclaimed two automobile travel lanes on a downtown street, removed the street's curb in order to eliminate grade separation, and significantly slowed and limited automobile travel through the use of bollards, brick paving, and a narrow roadway (Seattle, 2016). San Francisco's *Better Streets Plan* (2011) includes shared streets, called Shared Public Ways, in their list of street types, though it only applies to narrow alleys or other low-traffic rights of way.

Criticisms of the shared street concept exist. For example, Imrie (2012), is critical of the shared street concept, because the unregulated nature of the street space can present risks to users who have disabilities such as vision impairment.

3.6.3 Accessibility

Asadi-Shekari et al. (2013) have sought to broaden the focus on the pedestrian environment to include pedestrians with varying needs and abilities. Their research looks at the pedestrian level of service (PLOS) in an urban environment, and defines a level of service for disabled pedestrians. While the literature on pedestrian-friendly streets and neighbourhoods tends to focus on able-bodied and active pedestrians using an urban environment, there is an awareness among smart growth advocates complete street interventions can benefit pedestrians with limited abilities (Smart Growth America, 2015).

To comfortably accommodate pedestrians who use chairs, the City of Ottawa recommends a minimum sidewalk width of 1.5 (4.9 feet) metres for all sidewalks in the urban areas of that city, with 1.8 metres (5.9 feet) “preferred”, and 2.0 (6.6 feet) metres considered “desirable” (Ottawa, 2009, 144).

The City of Toronto’s “Healthy Streets Evidence Review” report recommends standards be applied based on the local context to manage conflicts between street users. Common among these conflicts is between large vehicles and pedestrians, where the accommodation of one can limit the functionality of the other. By examining the use of a particular street, it can be determined what “trade-offs” are necessary (Toronto, 2014, 38-39). For example, limiting wider travel lanes (11’ or more) and wide turning lanes at intersections on streets which are not designated Transit or truck routes (Toronto, 2014).

The City of Winnipeg's *Accessibility Design Standards* (2015) provides a number of standards which apply to public street spaces. This document emphasizes the importance of a clear path of travel for all users of the public sidewalk. Objects in the public sidewalk space, such as patios, seating, or signs should be located where they do not impede this path of travel (Winnipeg, 2015a). Winnipeg's sidewalk patio guidelines (2015b) require a clear path of travel of 1.9 (6.2) metres, although the clear path of travel can be reduced to 1.5 metres (4.9 feet) on streets with "low pedestrian volumes" and "where the path of travel is buffered from the curb" (City of Winnipeg, 2015, 5). It is important to note these guidelines apply to temporary sidewalk patios operating between the months of May and October (City of Winnipeg, 2015b) and this clear path of travel width does not account for snowfall and ice during winter months in Winnipeg. For this reason, the clear path of travel for downtown sidewalks should be wider than 1.5 metres, in order to function throughout the year.

3.7 Elements of Pedestrian-Friendly Streets

Within the focus on advocating for complete street design, there are a number of elements common among design guidelines for pedestrian-oriented urban streets. These common elements are discussed below.

Narrower Lanes

Urban streets of all types can support travel lanes between 10 and 11 feet (3.0 and 3.3 metres) in width, with wider lanes of 12 feet (3.6 metres) only recommended on transit or freight routes with higher speeds (ITE, 2010). This is to support speed limits of 25 miles per hour (40 kilometres per hour). NACTO (2013) suggests lanes 10 feet (3.0 metres) in width do not have a negative impact on motor vehicle operations or traffic volume in urban contexts, while having the positive benefits of helping to reduce motor vehicle speeds, reduce crossing distances for

pedestrians, and to provide more space for wider sidewalks, curb extensions, or other design elements (NACTO, 2013). This width of 3.0 metres is supported in Edmonton's *Complete Streets Guidelines* (2013) in constrained urban environments, where street space is limited, while the standard suggested width is 3.2 metres.

Sidewalks

Sidewalks should have a clear path of travel between 5 and 7' (1.5 and 2.1 metres) in width, in general urban areas, and widths between 8 and 12' (2.4 and 3.6 metres) in downtown areas (NACTO, 2013). This is generally concurred with by the Institute of Transportation Engineers (2010), who recommend a clear path of travel of 6 feet (metres) on urban streets, and 8 feet (2.4 metres) on boulevards. This is part of the total sidewalk space which should be a minimum total width of 9 feet (2.7 metres), to accommodate landscaping and street furniture in additional to the clear path of travel (ITE, 2010).

Curb Extensions

A common type of intervention recommended in complete streets guidelines are curb extensions, or "bump-outs," where sidewalk space is extended into the roadway at intersections (Figure 9). Curb extensions are a way to define the pedestrian space in public streets, and to create greater comfort and safety for pedestrians with limited accessibility (U.S. Department of Transportation, 2001). It also provides more space to accommodate curb ramps at pedestrian crossings at intersection (NACTO, 2013).

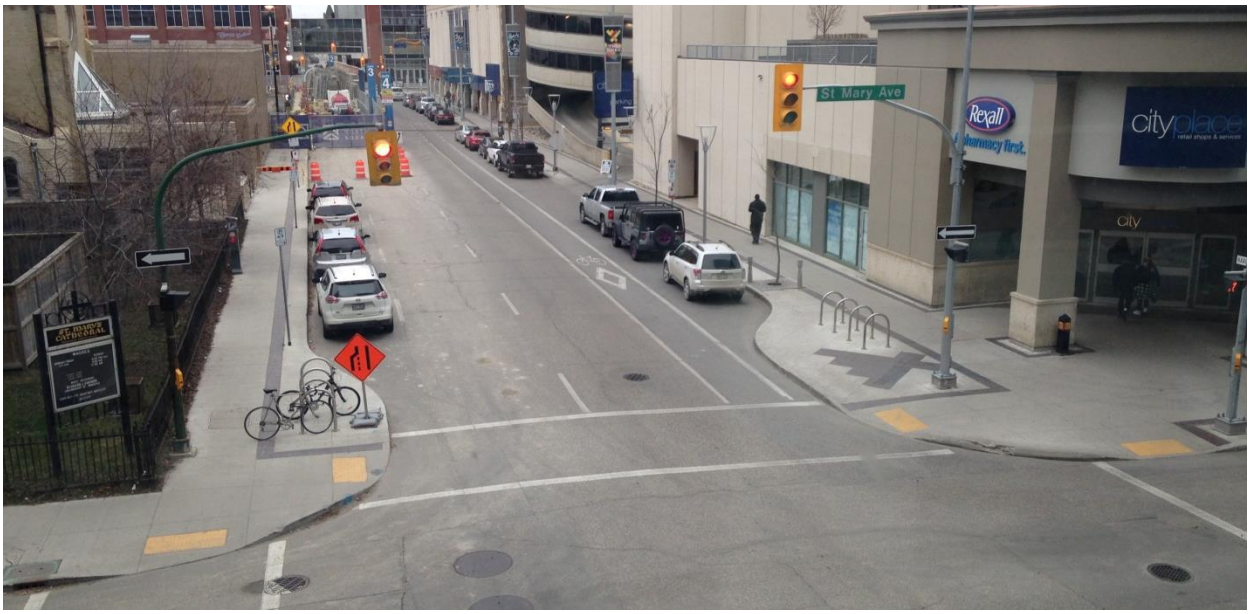

Figure 7: Existing Curb Extension at Hargrave and St. Mary (November, 2016)

Curb extensions can assist in creating safer streets through increased visibility for pedestrians waiting to cross a street, causing turning vehicles to slow, and slowing vehicle traffic by visually narrowing travel lanes and reducing the use of curb lanes as travel lanes (Ottawa, 2009; Boston, 2010; San Francisco, 2011). It also provides additional space for accessible curb ramps for pedestrians in chairs crossing an intersection (Federal Highway Administration, no date). In addition to reducing the crossing distance for pedestrians and calming vehicle traffic, curb extensions can be lengthened in order to provide additional public space for streetscaping elements, casual social spaces, bicycle storage, and transit stops (Edmonton, 2013).

Curb extensions are recommended as an appropriate design element for streets with on-street parking, so the extension does not block through travel lanes. The City of Edmonton suggests curb extensions as most effective in high foot traffic areas, such as retail districts and schools (Edmonton, 2013).

Street Trees

Street trees in urban environments "are a fundamental element for designing complete streets" by reducing motor vehicle traffic speeds, adding visual interest and a sense of enclosure for pedestrians, as well as provide aesthetic and environmental benefits (Edmonton, 2013, 42). The sense of enclosure provided by street trees is particularly desirable in urban environments, where there is a lower density of buildings (ITE, 2010).

3.8 Planning and Designing Streets to be Pedestrian-friendly

Planning has a role in determining the degree to which streets' environmental conditions can encourage human activity (Gehl, 1987). The design of public space in the framework of walkable neighbourhoods goes beyond the provision of attractive facilities for pedestrians, as well as pedestrian-oriented beautification efforts, such as planters, street lights, and banners. Public space design is also dependent on the urban fabric of the neighbourhood around it (Speck, 2012).

Speck (2012) argues city governments and community organizations should use a system of "urban triage" to identify improvements on streets demonstrating some existing mixed land uses and pedestrian-oriented built form, and streets not possessing any of these pedestrian-friendly land uses and design features. Healthy streets with strong walkable characteristics, as well as streets exhibiting almost no existing potential to become walkable, should be given less priority for intervention (Speck, 2012). Neighbourhood anchors, such as major destinations which generate large amounts of visitors, should be identified. Efforts at an "urban triage" for street design interventions are best applied to the downtown areas of cities, because of the importance of downtown in the urban structure (Speck, 2012, 259-260). Research has employed Speck's "urban triage" model in Wichita, Kansas based on "urban fabric, dense street network

and connectivity," in order to identify the most "complete" characteristics which would then undergo further analysis (Holt, 2015). This "triage" system may be useful to planners in helping determine where existing pedestrian amenities are, in order to accommodate future development.

Understanding different types of streets, in order to determine where pedestrian-friendly design interventions are feasible, has been used in practice. In 2011, the City of San Francisco's Better Streets Plan took effect. The plan is intended to guide the design of pedestrian space (San Francisco, 2011). This plan develops a classification of street types and a set of street design guidelines suitable to a given street type, in order to prioritize pedestrian space and ensure it is safer and more enjoyable to use (San Francisco, 2011). The plan also considers the various elements of the streetscape, such as street trees, pedestrian-scaled lighting, and paving materials. It also looks at the design of streets themselves, such as lane widths, crosswalks, and turning radii at intersections.

The City of Edmonton's *Complete Streets Guidelines* (2013) provides a number of ways to classify street types. Of these, the functional classification used by transport engineers and land use planners are one. They include: public street-oriented and non-public built environments; the land use context, such as residential, institutional, commercial and mixed-use; and the functional classification.

Similar to San Francisco's Better Streets Plan, the City of Boston's Transportation Department (2010) has classified different street types and outlined street design elements which can be used to help create safer and more comfortable streets for pedestrians. The respective state transportation departments of Pennsylvania and New Jersey (2008) have produced a report discussing how the design of the roadways is essential to creating good pedestrian environments

and highlights design elements. These reports were useful in understanding the range of design elements which help create pedestrian-friendly streets.

Methods of assessing the level of pedestrian-friendliness can provide a more detailed understanding of a street, beyond a set of classifications created by planners and transportation engineers. Assessing the degree to which streets are pedestrian-friendly is often done through walkability audits, which help determine the context of land uses, transportation importance of the street, and other special conditions to consider (Hoehner et al., 2006; Mouldon and Lee, 2003).

There are a number of considerations when choosing streets or zones for design interventions. These include existing conditions, plans for the future, existing regulations and policies, dominant land uses, residential densities, building types, current pedestrian and transit use, proximity to nearby activities and areas (Institute of Transportation Engineers, 2010).

Edmonton's Complete Streets does not have a set of criteria for identifying what street type should be first to have complete street interventions. Rather, the various street design elements "depends on the type of project being undertaken" (22). While a complete streets template can be easily applicable in new urban areas during the design stage, existing streets in built-up urban areas are far more variable. In downtown environments, the dimensions of a street, adjacent land uses, and traffic demand should all inform what design elements are appropriate and feasible.

Within these built up areas, there are trade-offs which can be made when determining what types of street interventions are feasible (Edmonton, 2013). Street space is typically limited by the dimensions of the public rights-of-way (particularly in downtown areas, where higher land

values make expropriation and assembly of private land cost-prohibitive), and often has a number of competing interests.

3.9 Summary

The growing understanding of the link between levels of pedestrian activity and the overall built environment is supported by scholarly research, not only in the urban planning profession but also in the field of medicine. Research also suggests there are many social and economic benefits to pedestrian-friendly neighbourhoods and good pedestrian environments. Pedestrians are defined as all users of the sidewalk, including people who rely on wheelchairs. This definition will guide the assessment of the research site in Chapter Five, and inform the recommendations for pedestrian-friendly street design elements in Chapter Six.

Overall, the literature suggests walkability, or pedestrian-friendly neighbourhoods, depend upon both a dense mix of land uses, which provide reasons for people to be there, and public spaces which are safe and comfortable to use. This latter condition is the focus of this research and is referred to as pedestrian-friendly street design. Further, the work cities such as Edmonton, San Francisco, and Boston have done in identifying street design elements will inform the proposed site assessment in South Portage. The theory of Mehtas (2014) and Gehl (1987) suggest the importance of observing how street space is used.

Within the realm of creating pedestrian-friendly street environments, there are a number of design concepts and guidelines from North American cities which may have application in Winnipeg's downtown environment, such as South Portage, including from Edmonton, a Canadian winter city, which recommends guidelines similar in type and dimension to many of those recommended for American non-winter cities. An assessment of the street design in the

South Portage site and how its street spaces are used helps to determine which street design concepts would be suitable there, and what processes may be suitable for creating them.

4. Methods

The purpose of this chapter is to outline the methods used to answer the key questions which guided this research. First, the literature review provides an understanding of pedestrian-friendly street design, why it is important in urban environments, and what design objectives and elements are applied in other cities and may be relevant to the Winnipeg context. A site assessment determines *to what extent South Portage is currently pedestrian friendly*. Finally, after reviewing the data from a site assessment and observations, a series of recommended interventions are presented in order to answer the question, *what street design interventions would assist the area in becoming more pedestrian-friendly*.

4.1 Methods of Data Collection

4.1.1 Literature Review

Literature reviews provide evidence of the current extent of research in a given field, by showing what research does exist, and what gaps may be missing (Callahan, 2014). They offer a strong basis for further research by allowing a researcher to take stock of the existing research. They also provide an opportunity for critical reflection and analysis and help to make a convincing case for work which "contribute(s) to the body of knowledge" (Callahan, 2014, 274). The literature review is an essential component of this research, as it presents the broader planning theory around pedestrian-friendly streets in downtown environments this research will explore and synthesize. This theorizing gives the research purpose and also helps to assess the conditions of the area and to test the recommended interventions.

This approach was taken in the literature review, which takes a number of theories, concepts, and street design interventions regarding pedestrian-friendly streets, and develops them into a coherent framework. The review of the literature is comprehensive, in order to activate a

theoretical understanding for pedestrian-friendly design before undertaking field research in the South Portage neighbourhood. This process helps to provide "sweeping ways of looking at the social world" (Neuman, 2004, 38).

This literature review considers scholarly sources on planning and urban design theory about pedestrian-friendly streets, including peer-reviewed articles, books, and reports from planning practitioners and academics, as well as studies and policy documents from other organizations and jurisdictions in North America. This will help to provide a broad perspective of both the theory and practice of pedestrian-friendly streets in the North American urban context. It also examines local newspaper articles and local government reports, guidelines, and policy documents, in order to better understand the contemporary and historic issues which have helped shape the current state of downtown Winnipeg. According to Kamins (1993), utilizing secondary sources for research can be effective, and often begins with a secondary analysis of one kind or another. Secondary source research "provides an opportunity to learn what is already known, and what remains to be learned, about a particular topic" (Kamins, 1993, 2).

4.1.2 Pedestrian-friendly Site Assessment

To understand current conditions and what street design interventions could make South Portage more pedestrian-friendly, a detailed understanding of the quality of the neighbourhood's physical environment was developed through a site assessment. The site assessment helped determine the locations where street design recommendations may be most appropriately applied. This assessment focuses on eight streets running north-south in South Portage, and their respective intersections with St. Mary and York Avenues.

To quantify the state of pedestrian-friendly street space in South Portage during the assessment process, a checklist and rating system was developed. Checklists and rating systems

for street and neighbourhood environments have become widely used by researchers, planners, and community organizations, in order to determine the degree of pedestrian-friendly conditions on a street or in a neighbourhood (Clifton et al., 2007; Shape Your World, 2012; Jane's Walk, 2014). To do this in South Portage, a five-point rating instrument was developed, based on a five-point walkability audit used in Whitby, Ontario (Whitby, 2014).

By using a five-point system like the one used in Whitby, it was felt that the checklist could be simple to use, while capturing variation in conditions by attributing a number (between 0 and 4) which most accurately captures the characteristic of each of the street elements, rather than a simple "yes" or "no." This instrument rates 18 design elements of the eight public streets within the study area of South Portage, including four elements of non-public built environment properties adjacent to the public street space. To ensure the checklist was comprehensive, the four sections and 18 items in the checklist were developed by looking at additional walkability audits discussed by Clifton et al. (2007), who found common areas, such as sidewalks, land uses and characteristics of the non-public built environment, lighting, and vehicle traffic.

This instrument was developed to quantify the conditions of the streets identified by theorists as necessary to create streets which are pedestrian-friendly (Carr et al., 1992; Moudon et al., 2006; Hansen, 2014). This instrument helped provide an objective understanding of South Portage's street environment and the degree to which it is pedestrian-friendly, with a focus on the condition of the public street space itself. (A sample of this checklist is found in Appendix A.)

The pedestrian-friendly checklist was divided into four sections, each with four specific elements. Elements which were never observed at any point on the subject street received a rating of zero (0). For elements rarely observed on the subject street, a rating of one (1); for elements sometimes observed, two (2); for most of the time, three (3); and for elements always

observed on the subject street were given a rating of four (4). The total number of points which could be awarded was 72.

The four sections and the aspects of the street space they examine are summarized as follows:

- *Sidewalks.* The condition of the public sidewalks on the street, any gaps or lack of sidewalks, their physical condition and accessibility, and any buffering separating the sidewalk from moving vehicle traffic.
- *Crossings.* Pedestrian crossings at the respective intersections of the subject street with York and St. Mary Avenues. This section rated the degree to which these crossings are accessible and clearly marked, have any material or grade differentiation, and the presence of bump-outs at intersections. This section also included an element rating the degree to which the roadway of the subject street had a maximum of two travel lanes. This was to differentiate between street with different numbers of lanes, and streets with varying on-street parking restrictions.
- *Streetscaping.* "Softer" elements of the street environment, which would provide additional comfort and visual interest to pedestrians, such as benches, pedestrian-oriented lighting, public art, or trees.
- *Non-public Built Environment.* Conditions and uses of private property adjacent to the subject streets, with particular attention paid to the relationship the form and use of the adjacent property had with the street environment.

4.1.3 Photography and Street Space Measurements

The street environment was captured by still photography taken with an iPhone camera, as a way to record the conditions of South Portage's pedestrian environment and potential sites

for pedestrian-friendly design interventions. Photographs were taken in order to record a general sense of each street at various points, provide a reference to the environment during the analysis and interpretation of the data, and to record any special element of the street either contributing or detracting from the street's pedestrian-friendly quality. It was not intended for the photographs to record human subjects and their use of the street space. However, people did appear in the background or middle distance of photographs, and this distance helped to sufficiently obscure their identities. All photography was shot from safe locations within the public realm, such as public sidewalks, weather-protected public walkways, or at controlled intersections.

In order to gain an understanding of the existing street dimensions within the assessment area, the sections of street space were measured and recorded. Since physically measuring travel lane width on busy streets would pose a risk to physical safety, elements of the street were carefully measured using satellite images through the City of Winnipeg's iView map tool (2016).

4.1.4 Unobtrusive Observations

The goal of unobtrusive observations is to ensure observation subjects are unaware they are being observed (Crossman, 2013), thus allowing normal behaviours in the environment to be exhibited.

Observations focus on pedestrian's behaviours in relation to the street space in South Portage: sidewalks, roadways, and other users of the street, such as motorists and cyclists, will be documented. Patterns and themes will be identified in the findings. Similar to the site assessments, these unobtrusive observations were conducted in both peak and non-peak times of the day and evening. Peak day and evening times provide an opportunity to observe higher volumes of pedestrian and vehicle traffic than what may exist during both peak day and evening

times. This provides information on the state of the pedestrian environment in the future, should further development lead to an increase in pedestrian activity in the South Portage area.

Unobtrusive observations were recorded through extensive notes taken during the observation sessions. Unlike the site assessment process, photography was not used in the observations of pedestrians, so as to avoid ethical issues or potential conflicts with subjects who did not wish to be documented. For a transcription of the field notes, see Appendix A: Unobtrusive Observation Field Notes.

4.2 Methods of Data Analysis

Data from the site assessment and unobtrusive observations, including the pedestrian-friendly checklist, sketches, and photographs, is organized by type, in order to understand their relevance and to act as a link between pedestrian-friendly streets theorizing and the South Portage context. This organized data will help to:

- Determine the locations for pedestrian-friendly design interventions;
- Understand how pedestrians use street space within South Portage;
- Determine what the final street design recommendations for creating more pedestrian-friendly streets in South Portage, and;
- Provide a better understanding of pedestrian-friendly streets in a downtown context.

The literature review will inform the practicality of considering how to accommodate and balance various uses of the street space, suggesting a variety of adjustments to pedestrian-friendly street designs, such as narrowing lane widths or removing vehicle parking lanes.

4.3 Presenting Findings

The recommendations are presented in Chapter Six: Interventions, and will be based on the analysis of the research findings, discussed above. To present these recommendations, hand-

drawn section views and maps of key locations are included, in order to illustrate the interventions and their impact on the street environment in South Portage.

- *Section Views.* These will be drawn in order to represent both current dimensions and conditions of particular locations in the assessment area, and those of the proposed interventions for that location.
- *Maps.* Maps will focus on identified intersections where curb extensions could be located, showing existing dimensions and proposed changes.

4.4 Summary

This research uses a literature review to develop a research framework for pedestrian-friendly streets to determine the scope of interventions which may be applied. Site assessments and observations are used to understand the types and locations of opportunities for interventions. Together, these research methods inform the importance of pedestrian-friendly downtown streets, and ways they can be created in the context of downtowns of many North American cities similar to Winnipeg. Similarly, the observations present an understanding of the conditions of the assessment site, and how it is currently being used by people.

5. Site Assessment

With the research guided by the question, *to what degree is South Portage presently pedestrian-friendly*, it was necessary to conduct a detailed assessment of the area. The site assessments looked at eight streets running north-south within the South Portage neighbourhood, and their respective intersections with St. Mary and York Avenues. It should be noted the following streets were not included in the assessment: Portage Avenue; Graham Avenue; Broadway Avenue; Memorial Boulevard; and Main Street. The area of South Portage located north of Graham Avenue was also left out. These streets and areas of the neighbourhood were omitted from the assessment area because of their distinct conditions and importance as regional traffic and transit corridors. Limiting the scope of the research site to this assessment with similar characteristics helped to focus the research.

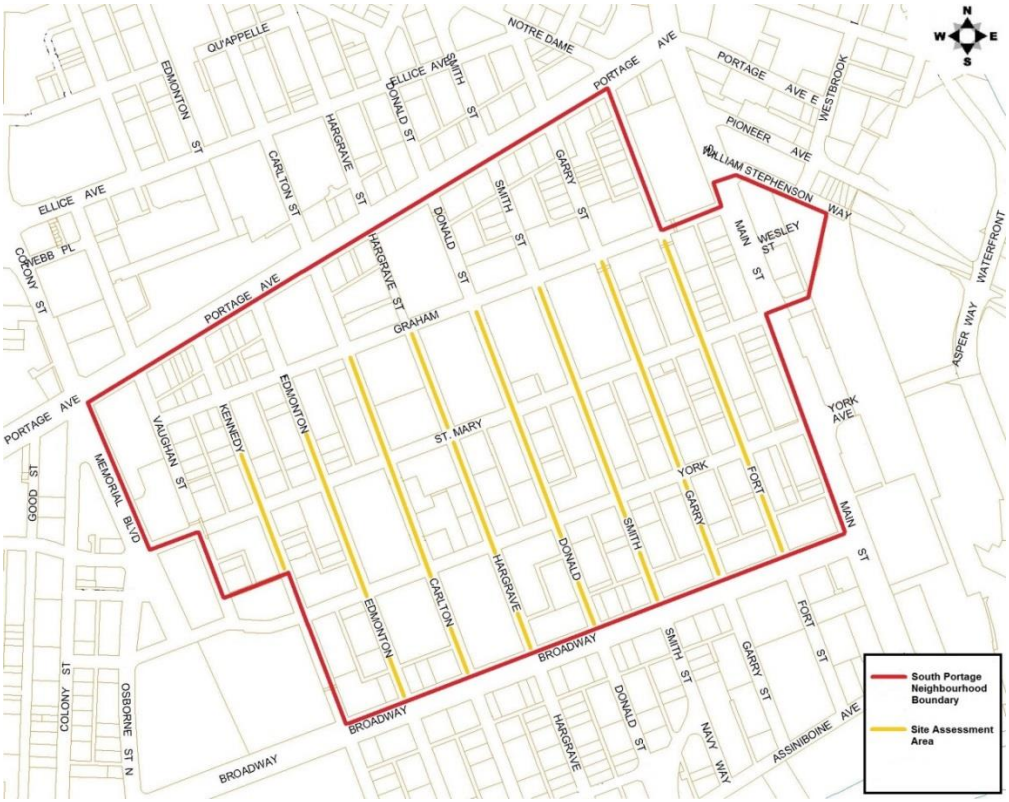

Figure 8: Map of Site Assessment Area (Adapted from City of Winnipeg iView, 2016)

5.1 Overall Impressions

Through measuring the width of the street right of ways, it was determined all subject streets have the same right of way width of 20.1 metres (66 feet). Within this total street right of way area, the widths of vehicle lanes vary somewhat, and there is no uniform standard of street dimensions found in the subject streets' roadway spaces. Measuring the widths of each sidewalk in the assessment area found a similar variation in widths, with sidewalks ranging from 2.4 to 3.8 metres. For a table showing all street widths for the assessment area, see Appendix C: Street Widths and Sections in the Assessment Area. Some of these widths exceed those recommended by the National Association of City Transportation Officials (2013).

When visiting the assessment area, there was no significant focal point or corridor with a readily identified higher importance, beyond importance as regional traffic arteries. The one significant public space as from public streets in the assessment area (and all of South Portage generally), Millennium Park, is largely obscured from the surrounding public environment, which significantly reduces its use, importance as a gathering or crossing place for the neighbourhood. There were a few areas with significant pedestrian-oriented buildings or uses, and no continuous corridor which could be seen by pedestrians as the main street of the neighbourhood. The closest street which comes to this was Hargrave Street, which appeared to have calmer motor vehicle traffic, a generous tree canopy, and a busy pedestrian intersection. However, even Hargrave's good qualities were discontinuous, with a significant loss of sidewalk space for one block.

Overall, the public street environment was largely oriented to motor vehicles. Sidewalks were often narrow, had virtually no pedestrian-scaled elements such as lighting or benches, and were frequently crossed by private approaches to off-street parking facilities.

Elsewhere in the assessment area, the presence of large surface parking lots detracted from the pedestrian environment, which provided no sense of enclosure or source of pedestrian activity or visual interest for pedestrians. This was particularly true on Donald Street, where the roadway felt wide and busy with rapidly-moving motor vehicles.

The following section looks at the site visit findings and impressions of each of the eight streets which comprise the assessment area.

5.1.1 Kennedy Street

Within the assessment area, the dominant landmark of Kennedy Street is the Provincial Law Courts and the associated Remand Centre located at the intersection of Kennedy and York. During the weekday, this was observed to be a source of relatively higher levels of pedestrian traffic at this intersection. North of St. Mary, a major land use is the Medical Arts Building and a large gravel parking lot.

Kennedy has two walk-up apartment blocks which appear to date back to the early 20th century, a time when Kennedy was nearly all residential. Today, these residential buildings stand in contrast to the large and sometimes blank facades of structures nearby (Figure 9). The street design on Kennedy is typical of those found elsewhere in the study area of South Portage, with four wide one-way vehicle lanes, with each curb-side lane utilized for parking and loading.

Figure 9: Kennedy Street looking south from St. Mary Avenue (November, 2016)

5.1.2 Edmonton Street

On Edmonton Street, the Winnipeg Convention Centre is the most dominant structure and use, occupying the east side of the street for nearly all of the two blocks between St. Mary and Broadway. As such a dominant structure, the Winnipeg Convention Centre is a significant factor in the degree to which Edmonton is pedestrian-friendly. This influence is most significant along the Convention Centres' facade between St. Mary and York, where the sidewalk on the east side of the street is diverted into a covered concourse with several right angle turns, preventing clear sightlines for pedestrians, and hides them from the street environment. This diversion accommodates a vehicle ramp into an upper floor of the Convention Centre from Edmonton Street. The concourse has poor lighting, even during daytime hours, and no views from either the street or from the interior of the Convention Centre are available, giving the concourse a dark tunnel effect for its users.

Between Graham and St. Mary, several buildings on Edmonton have blank walls facing the street, and private driveways crossing the sidewalk. Grade crossings for pedestrians travelling on the sidewalk are not always sufficiently level at these driveways, and the unwelcoming pedestrian environment of these developments overwhelm the few buildings on this block which have a good orientation to the sidewalk environment (Figure 11).

Figure 10: Edmonton Street north from York Avenue (November, 2016)

Figure 11: Edmonton Street north from St. Mary Avenue (November, 2016)

5.1.3 Carlton Street

Perhaps more than any other block in the study area, the non-public built environment of Carlton Street between Graham and St. Mary is in a state of transition. On the east side of Carlton is the True North Square project under construction, and the property of St. Mary's Roman Catholic Cathedral. On the west side, a vacant side is enclosed by screened fencing, and is expected to be developed in association with True North Square.

The Carlton side of the Convention Centre between St. Mary and York has a similar design as the west side, facing Edmonton Street. However, a sidewalk is provided alongside it, allowing pedestrians to travel on the west side of Carlton without using the dark and obscured

concourse. The east side of this block is relatively built up with a row of storefronts accessible from the sidewalk, including a hair salon, cafe, and pub.

South of York, the new section of the Convention Centre relates to the street better than the original building, and the property on the Carlton Street side provides some landscaping and seating in an area set back from the sidewalk (Figure 12). This adds visual interest and amenity to Carlton Street's overall built environment. On the east side of the street, a large surface parking lot encompassing most of the block, detracting from the physical condition of this part of Carlton Street.

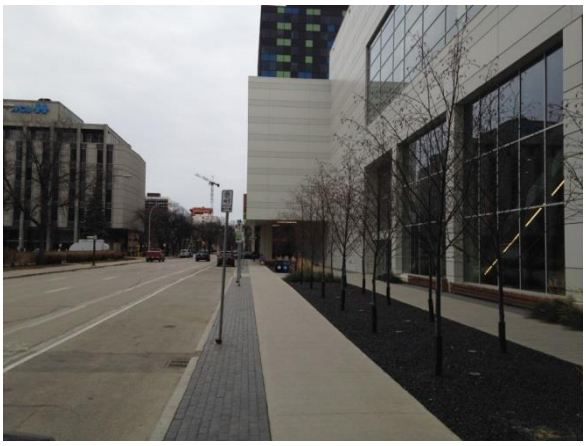

Figure 12: Carlton Street North from York Avenue (November, 2016)

5.1.4 Hargrave Street

Overall, Hargrave Street was observed to have more mature trees than other subject streets, with trees planted on both sides of the street south of St. Mary. The intersection of Hargrave and St. Mary is noticeably high pedestrian traffic relative to other intersections within the assessment area, owing to its entrance to City Place shopping and office complex at the Northeast corner of the intersection. A large historic church, and a large hotel and an office building are also located at this intersection (Figure 13).

Figure 13: Hargrave St. north to intersection with St. Mary (December, 2016)

At the intersection of Hargrave and St. Mary, two curb extensions are present, which reduce the crossing distance across Hargrave Street. These are the only curb extensions found within the assessment area. On the east side of Hargrave Street between Graham and St. Mary, there is pedestrian-scaled lighting and some streetscaping elements.

Between St. Mary and Broadway, Hargrave has one travel lane, with two additional lanes used as on-street loading and parking spaces. This is in contrast to every other street in the assessment area, which have two travel lanes. This reduced space for moving vehicles, and additional sidewalk space creates a more pleasant effect for pedestrians, causing the street space of Hargrave to seem narrower than other subject streets within the assessment area.

A significant detraction from Hargrave's relatively good pedestrian-friendly quality is located on the west side of the street between St. Mary and York, where the sidewalk diverts to accommodate a driveway serving the Holiday Tower apartment complex (Figure 14).

Figure 14: Hargrave St. north to Holiday Tower (November, 2016)

5.1.5 Donald Street

Donald Street is identified as an important street within the assessment area, with two significant public facilities, the Millennium Library and park, between Graham and St. Mary. At the northern end, it reaches the MTS Centre and newer developments occurring at the intersection of Donald and Portage. At the southern end, Donald extends into Broadway-Assiniboine and River-Osborne neighbourhoods, via the Midtown Bridge.

In spite of the importance of Donald, the most obvious physical characteristic of the street within the assessment area is the presence of several large surface parking lots lining Donald between St. Mary and Broadway. Moreover, there are practically no landmarks or visual points of interest except for the Millennium Park, a public park space which is partially obstructed by an underground parking entrance running parallel to Donald.

Sidewalks on Donald were not always found to be in good conditions, including at crossings over public laneways, which limits the accessibility of the street. Motor vehicle traffic was high on Donald, and the on-street parking spaces on both curb lanes were subject to parking restrictions during morning and afternoon rush hours.

Taken together, the absence of buildings of any kind, the dominance of vehicle traffic, and poor sidewalk conditions make Donald one of the most dreary and uninviting streets within

the assessment area. North of St. Mary, physical conditions improve somewhat, including a new sidewalk (on the east side of the street), which was constructed in 2015 (Figure 15).

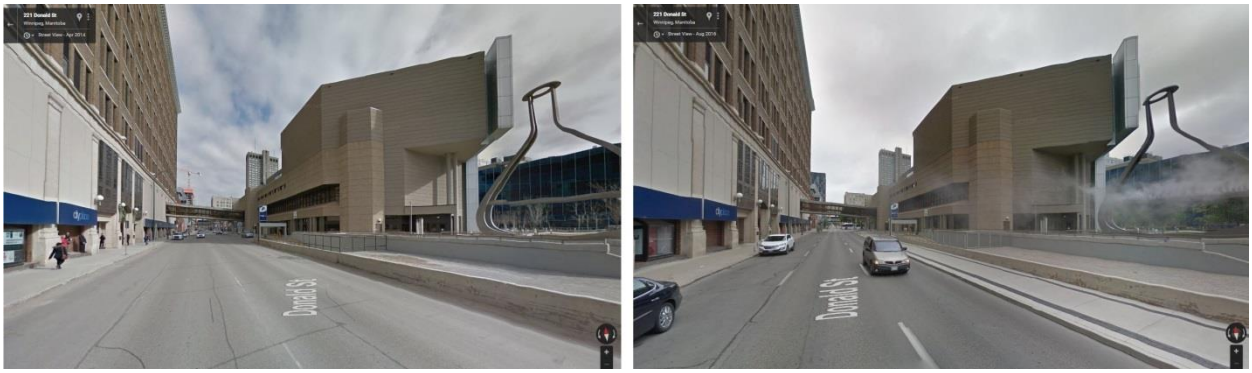

Figure 15: Donald St. between Graham and St. Mary, before (left) and after (right) east sidewalk installed (Source: Google Streetview)

Figure 16: Donald St. north toward intersection with St. Mary (January, 2017)

5.1.6 Smith Street

Compared to Garry and Donald Streets on either side of it, surface parking is less of a dominant feature of adjacent properties along Smith Street. This street was observed to have taller buildings (between 15 and 20 stories in height) with little to no setbacks from the sidewalk edge, a perception further enforced by taller buildings located further north at the intersection of

Smith and Portage. A few of these taller buildings are residential, and two were observed having small grocery stores accessible from the sidewalk on the ground floor.

In spite of these residential towers between St. Mary and Broadway, there is little sense of a residential neighbourhood on Smith. The street's function as a busy downtown arterial limits the environmental quality, and cars were observed to travel faster on Smith than on any other subject street. Sidewalks are of a similar with as Donald Street, and Smith's four roadway lanes are subject to morning and afternoon rush hour parking restrictions, and during morning rush hour, all four lanes are used by rapidly-moving motor vehicles. These restrictions are likely because of Smith Street's function as the north-bound Route 42, a major cross-town route, and an entry point into the downtown area from the Midtown Bridge.

Concrete barricades line the building on the east side of Smith Street between Graham and St. Mary, which have reduced the width of the sidewalk's throughway (Figure 17). On the west side of the street, adjacent to the eastern edge of the Millennium Park, a new sidewalk has recently been installed.

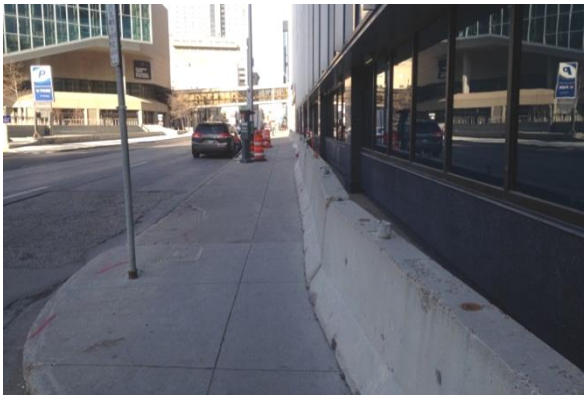

Figure 17: Sidewalk on the east side of Smith Street, looking north from St. Mary (November, 2016)

5.1.7 Garry Street

The blocks of Garry Street in the study area is predominantly characterized by a variety of office buildings and parking lots. There is also a scattering of commercial services, including

a few restaurants, bars, and a small grocery and convenience store. Although Garry between Portage and Graham has an impressive row of commercial buildings built before 1920, Garry south of Graham, within the assessment area, has very little in the way of historical architecture and detail. The Windsor Hotel and its associated bar is both one of the few historic buildings on Garry Street, and the only one observed to have a residential purpose.

Similar to Smith Street, the Garry side of the Police Headquarters building is lined with concrete barricades. However, this does not impact the sidewalk environment the same way it does on Smith Street, owing to Garry's sidewalks being wider. In addition, Garry has no on-street parking restrictions on the west curb lane, and a painted cycling lane provides additional setback from the sidewalk to moving vehicle traffic (Figure 19).

A significant detriment to Garry's pedestrian environment is the high number of vehicle approaches to private property cross the sidewalk. A total of 13 approaches crossing the sidewalk were counted. This number was higher than any other street in the study area. Five of these private approaches are on the east side of Garry between Graham and St. Mary, and are frequently used. During peak traffic times at the start and the end of the work day, the sidewalk path can be blocked at multiple points by cars waiting to enter or exit these parking facilities.

Figure 18: Garry St. looking north from York (November, 2016)

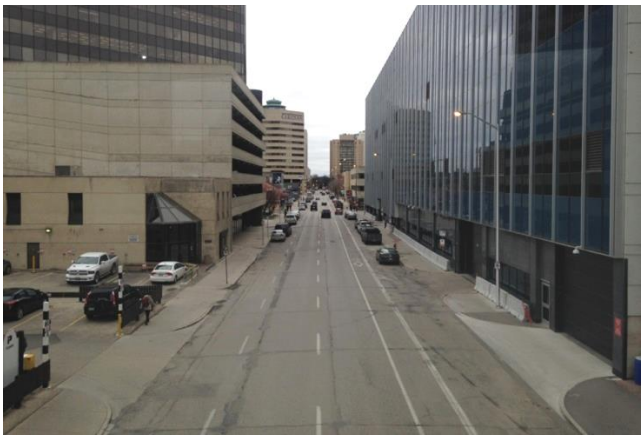

Figure 19: Garry St. looking south from Graham (November, 2016)

5.1.8 Fort Street

A few elements of Fort Street's early commercial uses are present, including a garage built at some point in the 1920s, which has housed the popular Pyramid Cabaret in recent decades. While the Pyramid Cabaret remains an active music venue, it stands alone as a night-time destination on Fort. Although Fort was one of the first subject streets in the study area to experience the expansion of non-residential uses, the only remaining single-family house within the assessment area is located on Fort, on the west side of the street, between York and Broadway.

Despite being located closest to the office cluster at Portage and Main, Fort was observed to have an absence of taller and larger-scaled buildings relative to other streets within the assessment area. One exception at the Northwest corner of Fort and St. Mary is also the one residential building observed on Fort.

Sidewalks and roadways are similar to other subject streets in South Portage in the assessment area. On-street parking on both sides of the street is not restricted at rush hour, and the east side of Fort has a painted cycling lane, which provides additional buffering (Figure 20). A high rate of traffic turning north onto Fort from St. Mary was observed during weekday peak times.

Figure 20: Fort St. looking south from Graham (November, 2016)

5.2 Assessment Scores

The assessment checklist provided an opportunity to quantify the condition of the pedestrian environment by identifying streets in the assessment area with existing pedestrian-friendly design features (Speck, 2012). This was conducted by creating and utilizing a checklist (discussed in Chapter Four). The data from this checklist supported the general observations of the street environment in the assessment area. Of a possible score of 72, the eight subject streets received an average score of 25 (or 35 per cent). Hargrave Street received the highest rating of all subject streets, with a score of 33; while Edmonton and Donald Streets received the lowest

ratings, with scores of 21, respectively. All subject streets in the study area had scores which were less than half the maximum 72 points (Figure 21).

Street Checklist Scores

SIDEWALKS	Kennedy	Edmonton	Carlton	Hargrave	Donald	Smith	Garry	Fort
On both sides of the street	4	2	3	3	4	4	4	4
Min. 1.8 metre throughway	3	1	3	2	3	2	4	3
Free of driveways	2	1	2	2	2	2	1	1
Buffers from moving vehicles	2	2	3	3	1	1	3	3
Good repair	2	2	3	3	2	3	2	2
SUBTOTAL	**13**	**8**	**14**	**13**	**12**	**12**	**14**	**13**
CROSSINGS								
Accessible and marked	2	3	3	3	2	3	3	2
Material differentiation	0	0	0	0	0	0	0	0
Curb extensions	0	0	0	1	0	0	0	0
Max. two travel lanes	2	2	3	4	2	2	3	2
SUBTOTAL	**4**	**5**	**6**	**8**	**4**	**5**	**6**	**4**
STREETSCAPING								
Mature trees	1	1	2	3	1	1	1	2
Other landscaping	0	0	0	1	0	0	0	0
Places to sit	0	0	0	0	0	0	0	0
Pedestrian lighting	0	0	0	1	0	0	0	0
Banners, public art, etc.	0	0	0	1	0	0	0	0
SUBTOTAL	**1**	**1**	**2**	**6**	**1**	**1**	**1**	**2**
NON-PUBLIC ENVIRONMENT								
Active storefronts etc	1	2	1	1	1	1	1	1
Active doors and windows	2	3	2	2	1	2	1	2
Free of surface lots	2	1	2	2	1	2	1	1
Visual landmarks, etc.	1	0	1	1	1	1	1	1
SUBTOTAL	**6**	**6**	**6**	**6**	**4**	**6**	**4**	**5**
TOTAL	**24**	**21**	**29**	**33**	**21**	**24**	**27**	**24**

Figure 21: Pedestrian-Friendly Street Checklist Scores

The assessment found the subject streets have very little design elements oriented to pedestrians. There are no crossings with material differentiation, no landscaping elements other than street trees, no places to sit, and almost no pedestrian-scaled lighting.

5.3 Underused Roadway Space at Street Corners

Figure 22: Excess roadway space visible after snowfall, Garry and St. Mary (left), and Carlton and St. Mary (right)

In addition to a general assessment phase, which included extensive photographing of the site, and the assessment checklist phase, the site assessment included gathering information on locations for possible curb extensions. This was a simple process involving observation of street space. The one-way traffic system in South Portage, as well as unrestricted (metred) on-street parking on many of the streets provides opportunities for curb extensions by creating roadway space at some intersection corners unused by motor vehicles. (See Appendix D: Curb Extension Locations). This involved observing the direction motor vehicle traffic travelled (and did not travel), as well as on-street parking instruction signs, which indicate if there are peak rush-hour restrictions on parking.

Many of these excess roadway spaces identified as suitable locations for curb extensions were clearly seen during periods of the assessment conducted following a snowfall. The spaces were observed by snow on the roadway which did not show tire tracks (Figure 22).

5.4 Unobtrusive Observations

Unobtrusive observations were made at key locations where design interventions are recommended. These observations help provide an understanding of pedestrian behaviour within

the assessment area of the South Portage neighbourhood, and, more broadly, how pedestrian-friendly the environment of South Portage is.

5.4.1 Findings

The first unobtrusive observation occurred between 12:00 pm and 1:00 pm on Tuesday, December 20, 2016, at the intersection of Carlton and St. Mary. The same location was observed on Wednesday, December 21, 2016, between 8:00 pm and 9:00 pm. The purpose of these observations were to gain a better understanding of the social interactions between people and between people and the street space at varying times of the day.

Unobtrusive observations were made from the elevated walkway system located at the Southeast corner of the Carlton and St. Mary intersection. This location provided an unobstructed view of the four corners of the intersection, without being seen as an obtrusive to pedestrians at the intersection, or from any passer-by using the elevated walkway system. This location was also beneficial because it was weather protected, which enabled continuous one-hour unobtrusive observations where extensive field notes were recorded by hand. While Winnipeg is a city with a winter climate, these observations were made in a relatively temperate winter climate, with daytime temperatures noted as -2 Celsius, and evening temperatures of – Celsius. This allowed observations of higher volumes of pedestrians using the street due to temperate conditions, while still occurring within a winter context.

5.4.2 Daytime Observations

Sidewalks at the intersection were relatively busy during the lunch hour, with enough pedestrian traffic to mean there was at least one person crossing the intersection, or waiting to cross, at any given time. However, it was not so busy as to cause “bunches” of pedestrians to

form at intersections waiting to cross the street. The greatest concentrations of people occurred when a group of three or more would walk near another group of a similar size.

Character of Pedestrians

A significant number of the pedestrians crossing the intersection were dressed in typical business casual clothing, with winter or spring coats overtop. Owing to the mild temperatures, a number of pedestrians had their coats unbuttoned or unzipped. Some males wearing suits were observed crossing the street with no coat at all, while a few other people were observed very much bundled up in heavy coats, toques, gloves, and scarves. No children were observed during this time period.

Pedestrian Travel Directions

For a 15-minute interval, the frequency of pedestrians was indicated on a map of the intersection with a single pen stroke for each pedestrian crossing (Figure 23). Viewing this map upon completion, the highest crossing was across Carlton on the north side of St. Mary, where pedestrians travelling either east or west across Carlton were seen. Most of those observed crossing here continued on St. Mary in either direction, rather than turning north or south on Carlton. This higher volume may be due to the lack of elevated walkway on the north side of St. Mary, which provides an alternative pedestrian route. Additionally, St. Mary's Cathedral (at the northwest corner of St. Mary and Hargrave) seemed to be a source of some pedestrian traffic heading west on St. Mary near the end of this 15-minute period.

Pedestrian Behaviours

Overall, pedestrians unobtrusively observed tended not to cross the intersection against the traffic control light. This was particularly true when travelling in groups of two or more. The majority of people who would cross a street against the traffic light were pedestrians walking

alone. All crossings against the light observed were done after looking for oncoming vehicle traffic before crossing, and would only do so when no vehicles were close enough to be a concern for their safety. There were no observances pedestrians risking their personal safety by crossing in front of nearby oncoming traffic. There were many instances of people curving from the crossing area in order to proceed down the other side of the street. This included a male in a motorized wheelchair, who crossed Carlton and curved to the left in order to travel south on the west side of the street (Figure 24).

A number of the people travelling in groups tended to be talking among themselves and generally exhibiting a happy demeanour. One group of males, each wearing convention nametags around their neck, were observed laughing, talking excitedly, and shaking hands with each other as they crossed Carlton eastbound on St. Mary. Some groups were less jovial, and two woman were seen walking east on St. Mary at a brisk pace, eyes downcast to a middle point, not speaking.

Only one pedestrian was observed lingering at a corner of the intersection longer than a duration of a traffic signal light. This was a male waiting at the south-west corner of the intersection, checking his mobile phone regularly. After approximately one minute, he began walking slowly south on Carlton, waving toward a delivery truck. Despite mild winter weather, and a general air of conviviality among many pedestrians, particularly on the southeast corner, there were no observations of people stopping for the purpose of conversation.

A significant observation made was how a number of pedestrians would wait for the light to cross while standing at the curb edge, as close to the roadway as they could without standing in it, even if it was in a relatively safe roadway space, such as in the curb-side lanes buffered

from oncoming vehicles by on-street parking. These pedestrians would wait for the light to change, with both feet resting on the edge of the curve ramp.

Not all pedestrians were averse to entering the roadway. A few pedestrians, notably three separate males wearing stylish suits, walked confidently to the edge of the curb lane and looked toward oncoming motor vehicle traffic for safe opportunities to cross.

Excess roadway spaces, particularly at the north-east corner of the intersection, were used by a number of pedestrians, on a few occasions, this was to step out into the curb lane to look for opportunities to cross against the light, but mostly this space was observed as being used by pedestrians crossing one street then the other.

5.4.3 Evening Observations

A significant difference between the daytime and evening observations was the reduced pedestrian traffic during the evening observation period. This disparity is visible on the map showing pedestrian crossing directions during a 15-minute interval (Figure 23), where pedestrians which crossed the intersection are indicated by a pen stroke (in blue). Pedestrian traffic at this intersection seemed to decline toward the end of the observation period, and in the last 20 minutes, there were several periods as long as four minutes without pedestrians seen at this intersection.

The route of travel for pedestrians also varied in the evening, with significantly fewer pedestrians crossing Carlton on the north side (Figure 23). Pedestrians travelling to or from St. Mary west of Carlton made up a smaller proportion of pedestrians, with most travelling north or south on Carlton. This was the reverse of what was observed during the daytime, when most pedestrian travel was observed going east-west on St. Mary. While the crossing maps did not show the instances where pedestrians rounded either one of the four corners of the intersection, it

was observed much of the pedestrian activity was made up of people rounding the southeast corner. This included a group of four middle-aged adults walking south on Carlton with rolling suitcases, who may have been leaving the Delta Hotel at the southwest corner of St. Mary and Hargrave. The location of two pubs on these blocks of St. Mary and Carlton, respectively, may also have contributed to traffic at this corner.

Generally, groups of pedestrians were less frequent, and in smaller numbers than during the day time, with the majority of pedestrians travelling alone or with one other person.

There were children observed during the evening period, mostly accompanied by one or two parents, though two young teenaged boys (perhaps 13 to 15 years old) were seen.

5.4.4 Summary and Discussion

There were some differences identified between the observations made during the day and observations made in the evening. Most significantly, pedestrian traffic was lower overall in the evening.

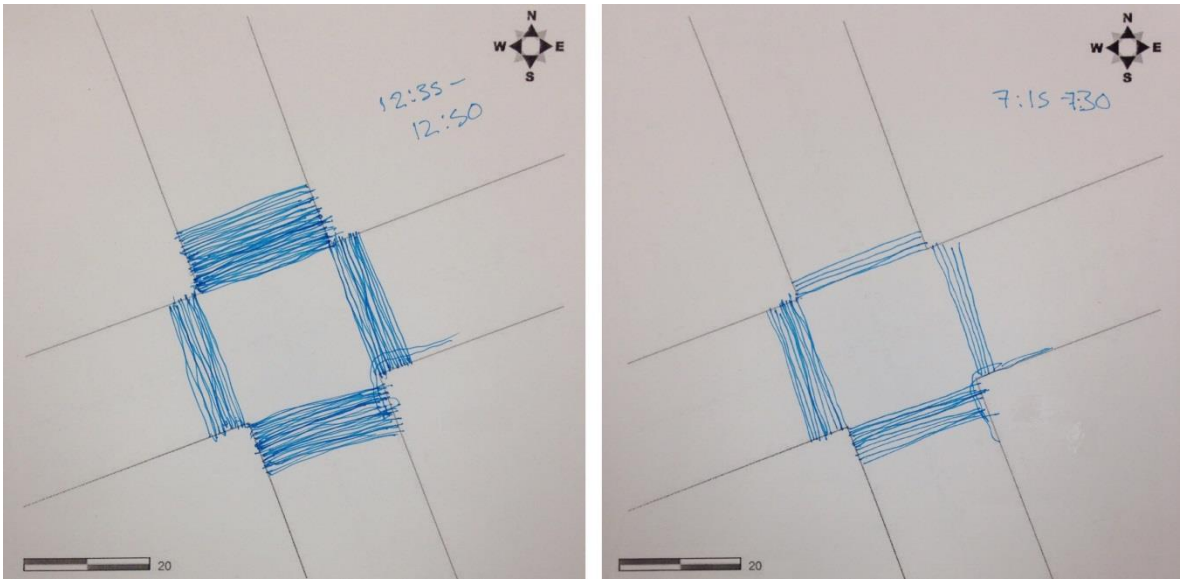

Figure23: Volume of pedestrians crossing through Carlton and St. Mary intersection during 15-minute intervals during the day (left) and evening (right) observations. One pen stroke represents one crossing

Travel patterns were also different between the day and night, with pedestrians travelling north-south on Carlton, or turning east on St. Mary in the evening, while daytime traffic had a higher proportion of travel on St. Mary west of Carlton.

Pedestrian behaviour was also different between the day and night observation, with pedestrians more likely to step into the curb lane and cross the street against the traffic light, provided there was no oncoming traffic. However, this tendency may be explained by there being significantly fewer large groups of pedestrians travelling together in the evening, and even during the day, pedestrians in larger groups would not step into the roadway space, or cross against the light.

Excess roadway spaces, particularly at the north-east corner of the intersection, were used by a number of pedestrians. The use of this excess space by pedestrians may be accounted for by the space being clearly visible by the snow on the ground (Figure 23).

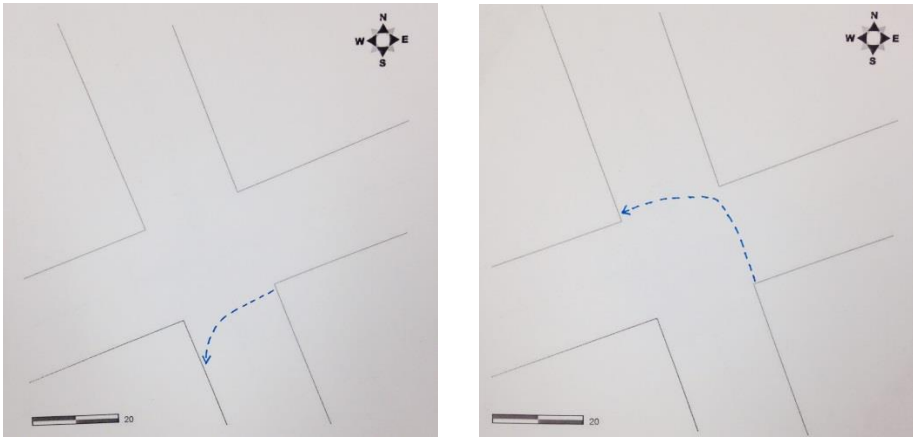

Figure 24: Illustrations of ways pedestrians would curve away from Carlton and St. Mary intersection crossing paths during unobtrusive observations

Non-public built environment conditions and land uses particular to this intersection and its immediate surroundings are likely to have a role in the level and patterns of pedestrian activity. For example, pedestrian activity was generated by St. Mary's Cathedral and the

Winnipeg Convention Centre during the day. However, the observations show how street space is used, which could have application to the rest of the site assessment area, where the design elements and dimensions of the street are similar to the Carlton and St. Mary intersection.

Unobtrusive observations occurred on two separate one-hour time periods on the same day. This was a limitation to the observations. Additional observations at other intersections could provide a greater understanding of pedestrian behaviours and design conditions in South Portage. However, the ability to conduct these additional observations is limited during the winter period due to colder temperatures. It was also due to the characteristics of the overall built environment in South Portage, which does not provide many opportunities to observe pedestrians unobtrusively, such as from a sidewalk café or bench where the researcher could "blend in" with the surroundings.)

5.5 Summary

The streets within the assessment area of South Portage are in many ways as dull and unwelcoming to pedestrians as South Portage is popularly perceived. Overwhelmingly, the design of the street space is oriented to toward motor vehicles, while a dominant use of the land adjacent to the streets was devoted to motor vehicle storage, either in surface parking lots, or above-grade parking structures. No obvious cluster, corridor, or centre was identified, and there was often a lack of uses at sidewalk level which could help facilitate higher levels of pedestrian activity. While there are sidewalks nearly everywhere, and it is a downtown environment with a number of street-oriented buildings, there is little else within the assessment area to make the pedestrian feel welcome in this area of South Portage.

In spite of these dominant negative characteristics, the assessment identified some degree of variation within the assessment area. Hargrave Street, for example, had generally better design

than other streets, in spite of much of adjacent land uses being surface parking. And while the design of the street spaces is overwhelmingly oriented to motor vehicles, this design did not always meet demand by motor vehicles. This was revealed by the number of roadway spaces at intersections not utilized by motor vehicles. This suggests that, while South Portage has many negative design characteristics, there is an opportunity to reorient more street space to pedestrians there.

6. Interventions

The purpose of this chapter is to provide recommendations of design interventions for South Portage, answering the research question guiding this research. Recommended interventions focus on the eight identified streets running north-south from Broadway to Graham Avenue, identified in Chapter Five.

There are a number of considerations when choosing streets or zones for design interventions, including existing conditions, plans for the future, existing regulations and policies, dominant land uses, residential densities, building types, current pedestrian and transit use, proximity to nearby activities and areas (Designing Walkable Urban Thoroughfares, 48).

Priorities were identified by considering significant gaps in the existing sidewalk network found during the assessment phase, including an absence of functional sidewalks, or accessible ramps at curbs, or other key safety issues. In addition, priorities were determined by looking at appropriate interventions recommended in other winter cities (Edmonton, 2013), and identifying priority areas near major destinations (San Francisco, 2011; Edmonton, 2013). A number of plans and reports on pedestrian environments in cities were useful in understanding the range of design elements which help create pedestrian-friendly streets. Understanding different types of streets, in order to determine where particular pedestrian-friendly design interventions are feasible (NACTO, 2013).

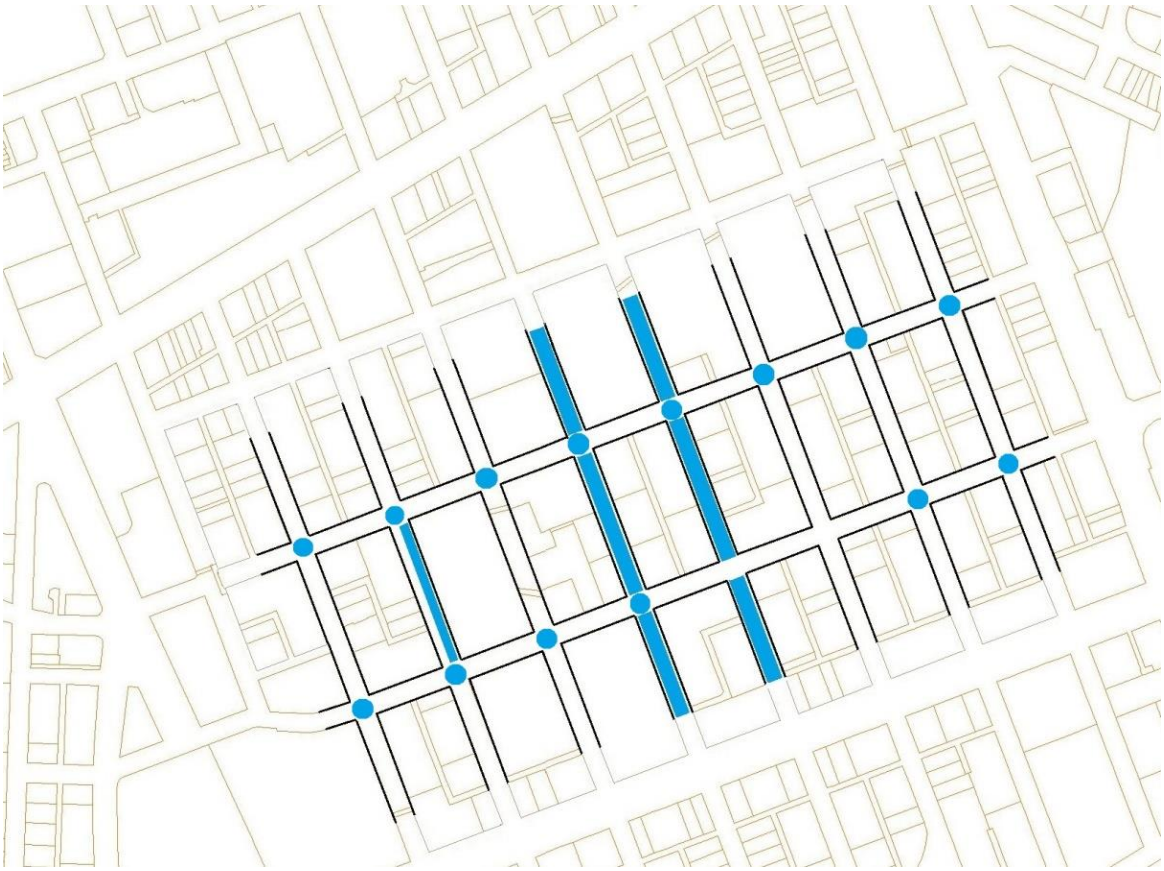

Figure 25: Map showing areas of South Portage affected by recommended design interventions (Adapted from City of Winnipeg iView, 2016)

6.1 Complete Street Concepts

In presenting ways in which pedestrian-friendly interventions could be applied in the assessment area, Donald and Hargrave Streets were two streets selected in order to show the types of interventions which can be applied to streets of two distinct hierarchies. Within downtown areas, there are a number of different street types, depending on their size, transportation demands, land use, and built form (San Francisco, 2011; ITE, 2010). As Mehta (2014) writes, flexibility based on the existing context and use of a street should be considered when making recommendations, and there is no standard which can be applied universally. Similar concepts could be applied to other streets with similar characteristics, such as Smith and Carlton. For the purposes of this chapter, interventions focus on the particular conditions of

Donald and Hargrave Streets. Because implementing a network of pedestrian-friendly streets is something which may take long periods of time (Edmonton, 2013), these represent the highest priorities within the South Portage area, based on the assessment.

6.1.1 Donald Street

Donald Street currently functions as a higher priority traffic corridor within the South Portage neighbourhood, including as a current and future transit route (Figure 26). For this reason, it is important a complete street concept for Donald Street provide space for a travel lane 3.75 metres wide, to accommodate a transit bus (Boston, 2010). In addition to this motor vehicle lane shared by transit buses and private vehicles, another vehicle travel lane is included, as well as a curb lane which can accommodate on-street loading and parking (Figure 27).

Removing a vehicle travel lane and narrowing other lanes provides enough space to accommodate wider sidewalks for pedestrian travel, as well as for streetscaping elements such as seating, wayfinding and information kiosks, pedestrian-scaled lighting, and additional trees.

Intersections

Because of Donald Street's current importance as a major traffic corridor, there are fewer opportunities to create curb extensions relative to other streets with less traffic demand. At the Donald and York intersection, there is no opportunity to create curb extensions. At the Donald and St. Mary intersection, a curb extension would be applied to both sides of the Northwest and Northeast corners. The Northeast extension would align this portion of the Donald Street sidewalk to the recently added sidewalk just to the north, along the Millennium Library Park, as well as reduce the crossing distance for pedestrians crossing St. Mary.

These north-south extensions at Donald and St. Mary are important, as they are one of only two opportunities to reduce the crossing distance across St. Mary in the entire study area under the criteria for identifying possible curb extension locations, outlined in Chapter Five.

By using the checklist to measure improvement on Donald Street, the checklist score would improve significantly after the proposed interventions, from 21 to 44. This represents a change from one of the lowest ranked streets in the assessment area, to the second-highest ranked street.

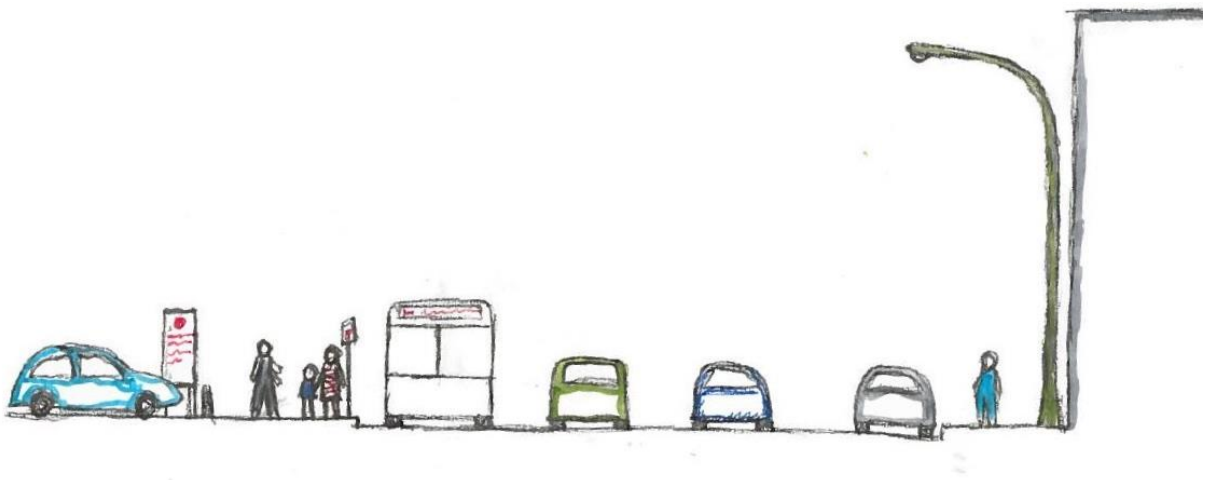

Figure 26: Section drawing of existing conditions of Donald St. between St. Mary and York

Figure 27: Section drawing of proposed conditions of Donald St. between St. Mary and York

6.1.2 Hargrave Street

The process for developing a complete street concept for Hargrave Street was similar to what was done for the Donald Street concept. Section drawings of Hargrave's current and proposed conditions are based on dimensions and elements of Hargrave in the middle of the block between York and Broadway.

Section drawings show existing conditions on Hargrave, looking north from the middle of the block between Broadway and York (Figure 28). A proposed complete street concept for Hargrave Street is shown from the same location. The mature trees planted along Hargrave are kept, but the sidewalks are widened on both sides. This widening is provided by reducing Hargrave Street's motor vehicle lanes from three to two, and reducing the widths of these remaining two lanes. Of these two lanes, one will be utilized for travel, while the other will allow on-street parking. The existing painted cycling lane on Hargrave Street will be retained, with the

addition of bollards to protect it from motor vehicle traffic. The wider sidewalks provide opportunities for street furniture, such as benches to sit.

While the existing pedestrian-friendly conditions were generally better on Hargrave than on many other streets within the assessment area, one significant detriment to its pedestrian environment was identified in front of the Holiday Towers apartment complex, on the west side of Hargrave Street between York and St. Mary (Figure 30). This gap is an important consideration in the preparation of a complete street concept for Hargrave. This gap is addressed by providing a sidewalk wide enough to accommodate an accessible clear path of travel, as well as new trees which contribute to Hargrave Street's existing number of mature trees (Figure 31).

Other elements not included in the section drawings, such as pedestrian-scaled lighting bicycle storage, could also be applied here, while continuing to allow street trees. Similar to Donald Street, the checklist measured improvements on Hargrave Street after these proposed interventions, increasing the score from 33 to 45.

Figure 28: Section drawings of existing conditions of Hargrave St. between York and Broadway

Figure 29: Section drawing of proposed conditions of Hargrave St. between York and Broadway

Figure 30: Section drawing of existing conditions of Hargrave St. in front of Holiday Tower

Figure 31: Section drawing of proposed conditions of Hargrave St. in front of Holiday Tower

Intersections

Compared to Donald Street, Hargrave Street offers more opportunities to create curb extensions. Every corner of both intersections within the assessment/study area would have curb extensions which reduce the crossing distance across Hargrave. However, no opportunities to extend sidewalks into the roadway of either St. Mary or York were identified.

The opportunity for a curb extension crossing the west side of Hargrave at intersections with St. Mary and York is addressed through additional design interventions, which would significantly reduce the roadway along the entire length of the street within the assessment area. Curb extensions would be added to the east side of Hargrave at intersections with St. Mary and York, reducing the crossing distance across Hargrave to approximately one vehicle lane and one cycling lane.

6.2 Curb extensions at intersections

The assessment of the South Portage study area identified a number of opportunities for curb extensions which would not significantly disrupt motor vehicle traffic during peak times, but rather would utilize roadway space as additional pedestrian space. (See Appendix B: List of Curb Extensions.) Two example locations where curb extensions could be provided are the intersections of Carlton and St. Mary, and Garry and St. Mary. Using the checklist to measure improvement on the streets where curb extensions would be applied, an additional three points are added to the scores for Kennedy, Carlton, Garry, and Fort Streets. On Smith, where few opportunities for curb extensions were identified, one point would be added.

6.2.1 Garry and St. Mary

Curb extensions would reduce crossing distances across Garry Street on both the north and south sides of the intersection. An extension into the existing roadway on St. Mary Avenue

at the Northeast corner of the intersection would reduce the crossing distance across St. Mary Avenue (Figure 32).

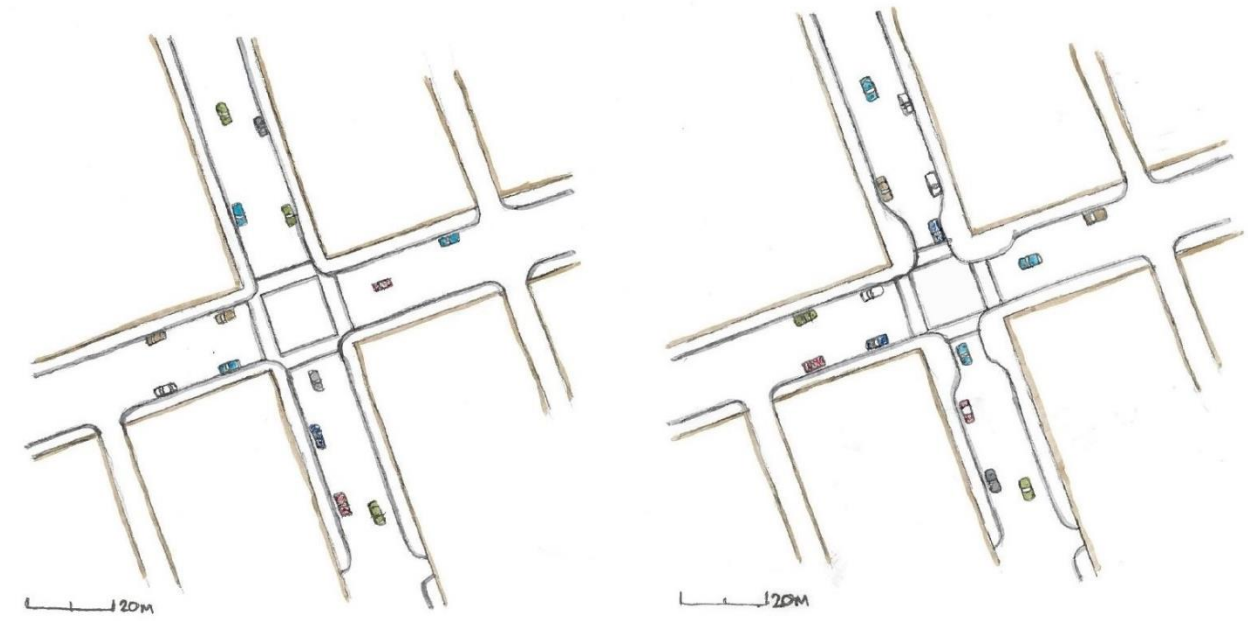

Figure 32: Maps of Garry and St. Mary intersection, existing conditions (left) and proposed curb extensions (right)

6.2.2 Carlton and St. Mary

On the north side of the intersection, curbs could be extended into Carlton and south into St. Mary. On the south side, curbs could be extended into Carlton, with no opportunities to extend them north into St. Mary's roadway space (Figure 33). Similar to Garry and St. Mary, site visits occurring recently following snowfall revealed excess space not utilized by motor vehicle traffic was revealed by snowfall (Figure 22).

Unobtrusive observations at this intersection found that during both day and evening periods, some pedestrians would use roadway space identified as being suitable for curb extensions as waiting space before crossing the street. This was particularly true at the northeast corner, where some pedestrians observed would cross on side of the intersection, then the next,

while only touching this excess roadway space – as if a curb extension was already there (Figure 24).

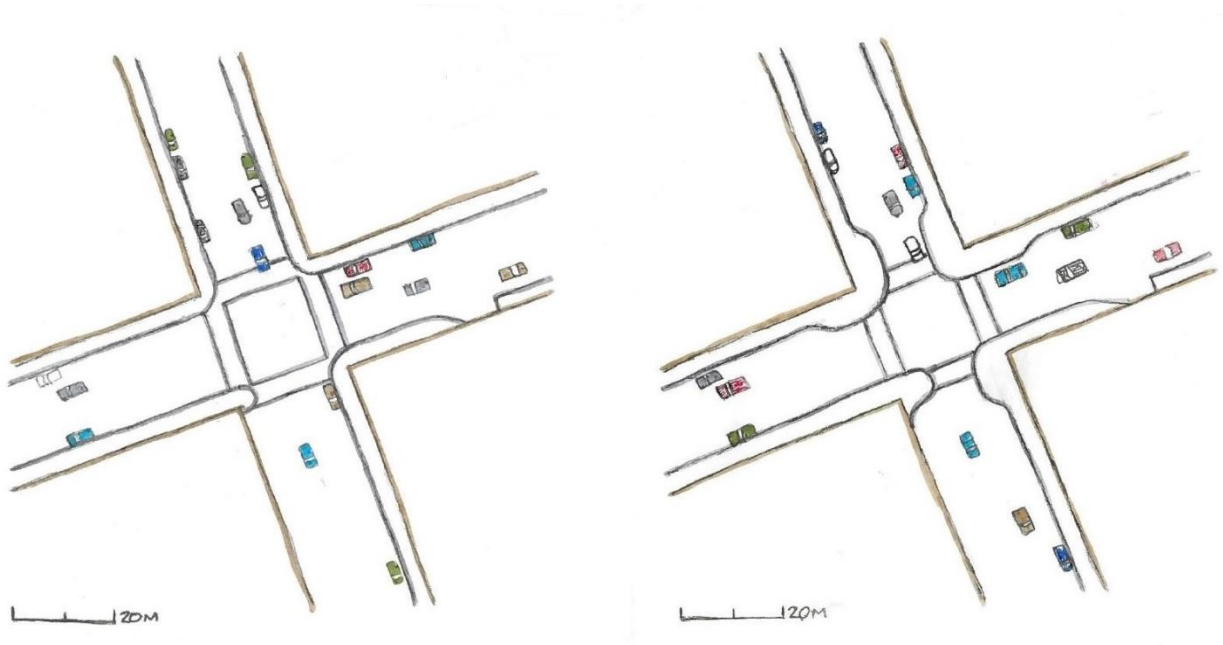

Figure 33: Maps of Carlton and St. Mary intersection, existing conditions (left) and proposed curb extensions (right)

6.3 Edmonton Street Sidewalk

Every intersection observed in the assessment phases of the research was served by curb ramps. Where sidewalks crossed public lanes or private approaches such as driveways to parking lots, there is opportunity to repair and improve accessibility by reducing steep grade changes. While small interventions, these can greatly improve the degree to which streets are accessible for users with mobility issues, such as those who rely on wheelchairs.

Two significant exceptions were identified. The first was found on Hargrave Street in front of the Holiday Towers complex. The second was on Edmonton Street, on the east side of the street, between St. Mary and York (Figure 34).

Figure 34: Edmonton Street side of Winnipeg Convention Centre (November, 2016)

The complete street concept for Hargrave Street addressed this gap in front of Holiday Towers. An additional sidewalk would be placed on the east side of Edmonton Street, creating a pedestrian path which is safe and accessible by being located in an open, clearly public space with a clear path of travel. In addition to a clear path of travel, this sidewalk would be wide enough to accommodate the planting of trees or other streetscape elements. This extended sidewalk would also work to reduce the width of the Edmonton Street roadway between St. Mary and York (Figure 36). Using the checklist to measure the difference this intervention would have on the degree of pedestrian-friendliness on Edmonton Street, the score improves modestly, from 21 to 29.

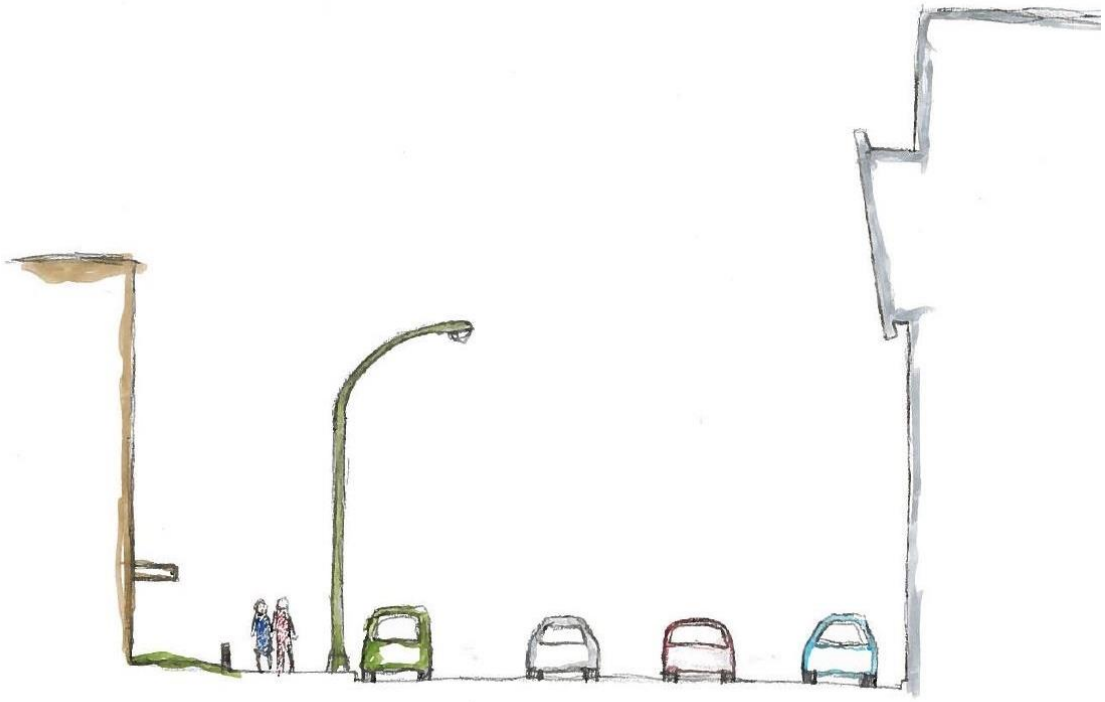

Figure 35: Section drawing of existing conditions of Edmonton St. beside the Winnipeg Convention Centre

Figure 36: Section drawings of proposed conditions of Edmonton St. beside the Winnipeg Convention Centre

6.4 Summary

By developing complete streets on Donald and Hargrave Streets between Graham and Broadway, two separate pedestrian-friendly north-south routes are created in the centre of the South Portage assessment area (Figure 25). These routes connect important destinations within the South Portage neighbourhood, including the MTS Centre and Millennium Library, as well as residential neighbourhoods near South Portage, such as Broadway-Assiniboine, Central Park, River-Osborne, and the Exchange District. These streets could form the basis of future pedestrian-friendly interventions on streets to the east and west.

The assessment also identified two significant gaps in the sidewalk network in the assessment area, and reducing the roadway space to accommodate new public sidewalks at these locations would add to South Portage's pedestrian environment being more safe and welcoming to pedestrians. These interventions applied a number of design concepts for pedestrian-friendly streets and applied them to South Portage. Testing these interventions against the checklist used in the site assessment, the differences in the level of pedestrian-friendliness varied (see Appendix E: Street Checklist Scores – After Interventions).

7. Conclusion

The development of South Portage has long been influenced by the encroachment of the Winnipeg's business district and a number of major destinations. This has caused development to move away from being small-scaled and primarily residential, large-scaled developments of various uses, including motor vehicle parking facilities. The present form of public street space has become oriented to motor vehicle travel, a process that began in the 1950s, when streets were widened to accommodate four lanes of one-way vehicle traffic (Keshavjee, 2006).

Because of this, South Portage presents a number of challenges related to its built form and street design. Within the assessment area itself, the research found few identifiable assets to form the basis, or centre, of a great urban space. Beyond much of the buildings in South Portage not being oriented to pedestrian activity, the design of the public street space does not create a safe and comfortable environment for pedestrians. The literature suggests streets which are safe and comfortable are essential for pedestrian activity to occur. This can be achieved through design interventions such as providing sufficient sidewalk space, safer roadway crossings, and slowing or reducing motor vehicle traffic. The recommendations for street interventions presented in Chapter Six are a relatively modest starting point in the journey toward a more pedestrian-friendly downtown Winnipeg. More broadly, this research demonstrates ways North American cities such as Winnipeg need not rely on real estate development alone to revitalize and shape the design of downtown neighbourhoods. A better downtown starts with the streets, ensuring they are safe, comfortable, and accessible places for people.

7.1 Discussion

In concluding this research, this section briefly looks at barriers to implementing pedestrian-friendly design strategies experienced in other cities. Reviewing the literature, there is

a significant gap between policy guidelines for pedestrian-friendly streets and the actual redesign of pedestrian-friendly streets. The research did not reveal recent precedents for pedestrian-friendly street designs in the cities where complete street policy guidelines have been implemented. It is clear these types of complete streets policies do not necessarily lead to the creation of pedestrian-friendly streets (Chicago, 2013; Edmonton, 2013). As their name suggests, design guidelines simply encourage pedestrian-friendly design elements in street renewal projects rather than lead pedestrian-friendly street design projects.

A significant barrier to implementation of pedestrian-friendly design of streets is transportation departments in cities, which rely heavily on transportation engineering manuals for street design. These manuals are often slow to respond to complete street planning theory, and to pedestrian-friendly guidelines or other policy documents (McCann, 2013). This gap is not due to complete streets guidelines ignoring implementation and process. As an example, Edmonton's Complete Streets Guidelines (2013) provides recommendations related to process, in order to determine what street interventions are feasible and desirable, and how to implement and evaluate them. This includes political considerations, and trade-offs with the various stakeholders who have an interest in the street space, such as transportation engineering departments, transit, utility companies, business associations, and community groups (Edmonton, 2013).

In order to plan and design pedestrian-friendly streets, Edmonton (2013) provides the following recommendations to planners:

- Define the objectives and scope of the project, including determining how ambitious the interventions are intended to be.

- Identify existing priorities for the different transportation modes on a specific street or within an area. These could include existing plans or policies for an existing commercial street or area, active transportation routes, or transit corridors.
- Examine the built form and land use in order to identify the street type, looking at existing conditions.
- Select elements appropriate for the priorities and street type. Along with the selection process is the importance to make trade-offs in order to accommodate appropriate elements within a limited roadway space where uses are contested.
- Confirm the recommended final design "re-examine whether the project design meets the goals and objectives established at the beginning of the design process" (Edmonton, 2013, 23).

Chicago's *Complete Streets Chicago* (2013) recommends the use of pilot projects as a way to bridge the gap between policy and implementation. Pilot projects are temporary implementations of street design elements, such as temporary bollards placed in such a way as to decrease the width of the roadway, reduce lanes, or implement curb extensions (Chicago, 2013). This can "offer the advantage of real world simulation," in order to assess the effect on other streets and services, such as transit and emergency vehicle movement (Chicago, 2013, 132).

Future research could explore implementation processes and involve conducting interviews with transportation engineers and other stakeholders. This process could better inform barriers to implementation which may exist in Winnipeg.

7.2 Answering the Research Questions

This research set out to answer two questions guiding the research process:

1. To what degree is South Portage presently pedestrian-friendly?
2. What street design interventions could assist the area in becoming more pedestrian-friendly?

In order to answer the first question, an understanding of what is considered pedestrian-friendly streets within the context of North American cities needed to be determined. In addition, an understanding why streets are important elements of the city's public space was first needed. These were done by conducting and analyzing the literature review. This understanding provided the basis with which to conduct an assessment of a specific area of South Portage, which was done through research methods such as photographic documentation and a pedestrian-friendly checklist. This process revealed that the assessment area in South Portage is not currently pedestrian-friendly, both in terms of the buildings and the design of the street space. However, this level of unfriendliness varied somewhat throughout the assessment area.

In answering this research question, it was determined there are numerous opportunities within the assessment area to create street design interventions, which could help create a pedestrian-friendly environment. Notably, this included unused roadway spaces at certain intersections where curb extensions could be installed.

Answering the second question also began with a review of the literature on pedestrian-friendly streets. This review was necessary in order to provide a brief understanding of what pedestrian-friendly street design strategies or interventions may have been implemented in other North American cities. This was done to determine what interventions may be applicable to South Portage. Particular attention was paid to the City of Edmonton's *Complete Street*

Guidelines (2013), as Edmonton shares similarities with Winnipeg, in that they are both Western Canadian winter cities.

The assessment process sought to understand what pedestrian-friendly design elements may exist in South Portage already. Finding no significant pedestrian-friendly design elements in the public right-of-ways of streets in the assessment area, it was determined that a series of interventions could be used to address identified gaps in the existing pedestrian environment. These gaps include the absence of accessible public sidewalks and design elements such as curb extensions. Design interventions which address these gaps would have significant benefit to the pedestrian environment and provide better links between downtown neighbourhoods and destinations.

In applying the checklist to the assessment area after design recommendations were applied, scores did improve significantly on Hargrave and Donald Streets. However, there remained room for improvement, with both streets falling short of the total possible score. On Edmonton Street, and on streets where curb extensions were applied, this reinforces how pedestrian-friendly streets involve many design elements, both in the public right-of-way space and overall street environment.

This minor improvement in checklist scores after pedestrian-friendly interventions may also suggest further development and testing of the checklist, in order to better capture and prioritize design elements which are essential to pedestrian-friendly streets. Such adapting or improving of the checklist could include weighting some items on the checklist, or refining items to assess more accurately the degree of accessibility for all pedestrians. In the case of Edmonton Street, for example, the proposed interventions focus on providing a public sidewalk on a side of the street where there is none. However, this essential intervention, plus the addition of curb

extensions and mature street trees, only increases the checklist score by eight points, from 21 to 29.

7.3 Reflections

Throughout the research process, the methods were challenged and adapted, based on site conditions and what the literature was saying about pedestrian friendly street interventions. Despite this process, there was significant opportunity to reflect on the research, and what may have been done differently. Overall, this research has answered the research questions which guided it, but there are, upon reflection, things that could have been done differently. The characteristics of South Portage present a number of research opportunities, particularly regarding the physical conditions of the overall street environment. Though this research attempted to employ some focus by not considering interventions for pedestrian unfriendly private land, this approach meant the role building edges play in the sense of safety and comfort for pedestrians was largely not looked at. This was done to demonstrate how pedestrian friendly interventions can be applied on downtown streets (such as those found in South Portage) characterized by surface parking lots, rather than buildings. In doing so, the relationship between the design and use of the non-public built environment (building edges) and the design and use of the public built environment (public street right-of-ways) was not considered to any great degree. This relationship is significant (Mehta, 2014), and "isolating" the public rights-of-way from the building edges ultimately made the research a challenge.

A number of other considerations arose during the reflection process, which could have been addressed through being guided by additional research questions. These are discussed in the following section "Research Questions Arising."

7.4 Research Questions Arising

The following are potential research questions which arose during the reflection process, briefly discussed in the preceding "Reflections" section. Research exploring the following questions would provide additional insight into more specific demands on public space, particularly in the downtown areas of winter cities such as Winnipeg.

How do pedestrian-friendly street designs perform in winter climates and high amounts of snowfall?

While the site assessment phase of this research was conducted over the winter months of November, December, and January, when temperatures were below freezing and snow was on the ground, there was no significant focus on how the use of a pedestrian environment can be influenced by winter, or how cold and snow can impact pedestrian-friendly design elements. Further research could examine: how pedestrian space is used during winter months; how snowfall might limit pedestrian accessibility, particularly for pedestrians with existing limited accessibility issues; and how pedestrian-friendly design could consider snowfall and snow clearing during winter months.

What interventions can improve accessibility with pedestrians with disabilities?

All users of the sidewalk, including pedestrians who rely on chairs guided the assessment of the research site in Chapter Five, and inform the recommendations for pedestrian-friendly street design elements in Chapter Six. Many of the recommendations may contribute to an environment which is more easily navigated and comfortable for pedestrians with mobility issues. However, this research did not fully address accessibility requirements for pedestrians with disabilities and mobility issues. This may suggest a gap in the literature on pedestrian-

friendly streets, which may emphasize the needs of active, able-bodied pedestrians over those which are disabled (Asadi-Shekari et al., 2013). Further research guided by this question could seek to develop a better understanding of accessible streets for pedestrians with a variety of disabilities and mobility issues. This research could build on the design standards found in the City of Winnipeg's *Accessibility Design Standards* (2015), and explore how they could apply in South Portage.

How can the design of public streets impact street use and street people?

The preceding research attempted to provide basic design recommendations which would benefit all pedestrian users of public streets generally. However, further research could take a critical look at how the design of public space can limit or exclude certain groups of society. For example, public spaces in downtown environments can be designed to discourage homeless people from using the space, or through the private ownership and management of ostensibly public spaces (Nemeth and Schmidt, 2011). This research could be particularly relevant to the South Portage context, given the use of SHED branding of the street environment as a tool to leverage private investment (Centre Venture, 2015).

To what degree is roadway space in South Portage currently needed?

Relying on observations of vehicle traffic direction and on-street parking signs to determine opportunities for curb extensions does not likely present a complete assessment of the opportunities for pedestrian-friendly interventions. Research into current demand for traffic, and the appropriateness of current roadway design could be conducted by quantifying existing motor vehicle traffic volumes and patterns of travel in South Portage. Consultation with professional traffic engineers, such as through semi-structured interviews, would benefit this further research.

For example, interviews could help understand how traffic engineers determine what characteristics or traffic volumes determine if a street is a high-traffic or low-traffic artery.

7.5 Summary

This research comes at a time when a number of significant real estate developments are underway in the South Portage neighbourhood (Centre Venture, 2015; McNeill, 2016). Recent planning policy and popular press places a strong emphasis on developments such as these contributing to the revitalization of downtown. I set forth with this research in order to discuss improvements to the South Portage area of Winnipeg's downtown which do not focus on real estate development, or be reliant on market conditions which would support it. Rather, planning and policy should also focus on the design of public streets. This research shows that South Portage lacks a pedestrian-friendly street environment, and presents several ways to address this.

A safer and more comfortable pedestrian environment is essential. Not only are streets the most ubiquitous routes of pedestrian travel in South Portage, they are the most ubiquitous form of public space in which to encounter city life (Mehta, 2013). Pedestrian-friendly streets would benefit everyone, from the pedestrian walking from their car to the latest major destination, to the pedestrian walking home in the neighbourhood they live in. Improving the pedestrian environment of streets would make people feel they belong there.

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Appendices

Appendix A: Sample of Pedestrian-Friendly Checklist

Pedestrian-friendly Checklist

Street (circle): Kennedy – Edmonton – Carlton – Hargrave – Donald – Smith – Garry – Fort

		Never (0)	Rarely (1)	Sometimes (2)	Mostly (3)	Always (4)	Subtotals
1.0	**SIDEWALKS**						
1.1	Sidewalks are present on both sides of the street					0	4
1.2	Sidewalks have a minimum 6' throughway without obstructions			X			2
1.3	Sidewalks are free of driveways to adjacent properties			X			2
1.4	Buffer exists between throughway and curb (parked cars, cycling lane)		X				1
1.5	Sidewalks are in good repair				X		3
2.0	**CROSSINGS**						
2.1	All pedestrian crossings are accessible and clearly marked				X		3
2.2	Crossings have material differentiation	X					0
2.3	Bump-outs are present	X					0
2.4	Maximum of two travel lanes			X			2
3.0	**STREETSCAPING**						
3.1	Mature trees are present		X				1
3.2	Other landscaping elements are present		X				1
3.3	Places to sit	X					0
3.4	Lighting	X					0
3.5	Banners or other pedestrian-oriented decorative elements are present						
4.0	**BUILT ENVIRONMENT**						
4.1	Active storefronts, sandwich boards, sidewalk cafes or outdoor display areas are present		X				1
4.2	Active doorways and windows at ground level			X			2
4.3	Street is free of surface parking lots adjacent to sidewalk			X			2
4.4	Visual landmarks, vistas, parks, architectural interest or detail		X				1
						TOTAL:	25 / 72
						Percent:	35 %

Appendix B: Possible Curb Extension Locations

	Kennedy		Edmonton		Carlton		Hargrave		Donald		Smith		Garry		Fort	
ST MAR	NW	both	NW	both	NW	both	NW	both*	NW	n-s	NW	n-s	NW	e-w	NW	e-w
	NE	both	NE	both	NE	both	NE	both*	NE	both	NE	n-s	NE	both	NE	e-w
	SW	e-w	SW	e-w	SW	e-w	SW	e-w	SW	none	SW	none	SW	e-w	SW	e-w
	SE	e-w	SE	e-w	SE	e-w	SE	e-w	SE	none	SE	none	SE	e-w	SE	e-w
YORK	NW	e-w	NW	e-w	NW	e-w	NW	e-w	NW	none	NW	none	NW	e-w	NW	e-w
	NE	e-w	NE	e-w	NE	e-w	NE	e-w	NE	none	NE	none	NE	e-w	NE	e-w
	SW	e-w	SW	e-w	SW	e-w	SW	e-w	SW	none	SW	none	SW	e-w	SW	e-w
	SE	e-w	SE	e-w	SE	e-w	SE	e-w	SE	none	SE	none	SE	e-w	SE	e-w

* Curb extensions are currently located here

Appendix C: Street Widths and Sections in the Assessment Area

	From	To	Sidewalk Width WS	Lane width WS curb	Lane width inside1	Lane width Inside2	Lane width ES curb	Sidewalk Width ES	Bike Lane	TOTAL
Kennedy	Graham	St. Mary	10.5	12.5	11	11	11	10	na	66
	St. Mary	York	12	9.5	11	11	10.5	12	na	66
	York	Broadway	12	9.5	11	11	10.5	12	na	66
Edmonton	Graham	St. Mary	10	11.5	11.5	11	12	10	na	66
	St. Mary	York	10	11.5	11.5	11	22*	9*	na	66
	York	Broadway	10	11.5	11.5	11	12	10	na	66
Carlton	Graham	St. Mary	10	10	11	11	9.5	9.5	5	66
	St. Mary	York	9**	19**	11	11	10	10	5	66
	York	Broadway	10	10	10	10	11	10	5	66
Hargrave	Graham	St. Mary	8.5	8	11	11	10	12.5	5	66
	St. Mary	York	14.5	9	12.5	na	11	14	5	66
	York	Broadway	14.5	9	12.5	na	11	14	5	66
Donald	Graham	St. Mary	10.5	12.5	11	11	11	10	na	66
	St. Mary	York	10.5	12.5	11	11	11	10	na	66
	York	Broadway	10.5	12.5	11	11	11	10	na	66
Smith	Graham	St. Mary	8***	12.5	11.5	11.5	12.5	10	na	66
	St. Mary	York	10	11	11.5	11.5	12	10	na	66
	York	Broadway	10	12	11.5	11.5	11	10	na	66
Garry	Graham	St. Mary	11	10	9	11	10	10	5	66
	St. Mary	York	12	9	9	11	8	12	5	66
	York	Broadway	12	9	9	11	8	12	5	66
Fort	Graham	St. Mary	10	10	10.5	11	9.5	10	5	66
	St. Mary	York	10	10	10.5	11	9.5	10	5	66
	York	Broadway	10	10	10.5	11	9.5	10	5	66
		averages	10.8409091	10.565217	10.89583	11.022727	10.5	10.782609		
	*	Portion Edmonton's ES sidewalk are lost for west driveway ramp of Convention Centre								
	**	Portion Carlton's WS sidewalk are lost for west driveway ramp of Convention Centre								
	***	Portion of the total street width is occupied by a berm bordering Millennium Library Park								

Appendix D: Unobtrusive Observation Notes

Unobtrusive Observation – Tuesday, Dec. 20, 2016, 12:15 – 1:15 pm
Sun and cloud, light wind, - 2 C

12:16

- 2 females wait for light without traffic – SE corner
    - Cross at angle to walk WS Carlton southbound
- Well-dressed wealthy-looking middle aged man in navy suit walks across St. M without an overcoat; against traffic light
- Male convention-goers (with nametags on lanyards around their necks) cross Carlton walking E on St. M, 3 abreast
- 3 females wait at traffic light to cross St. M
- People wearing winter coats, gloves, etc. walk eastbound on SS St. M – not from the Convention Centre
- Another convention-goer walks east on St. M – without jacket

12:22

- Two well-dressed females briskly cross Carlton (south side), walking with heads down, talking to each other
- People in groups don't seem as likely to walk against the light – wait until walk signal
- Well-dressed females waits for light, standing with both feet on the edge of the sidewalk (at SE corner)
- Middle-aged business male crosses Carlton (eastbound) against light then curves to cross St. Mary (northbound) with the light

12:31

- Four shabby-dressed people cross St. Mary (northbound) – looking east down St. Mary. Two of these points to something(s) in the east distance, talking to each other
- Middle-aged business man stands at curb edge waiting to cross St. Mary. Both toes at the curb edge – like he's teetering on the edge of a cliff
- People do not tend to run to beat the traffic signal countdown (for pedestrians) or amber light (for cars) – unless there's cars waiting.
- Young woman looks then crosses Carlton (North side) against the light

12:35

- Shabby-dressed man walks into excess space at NE corner then turns west across Carlton without touching NE sidewalk
- Man with shopping cart loaded with objects travels in south curb lane of St. Mary – crosses Carlton – continues west on St. Mary. When he gets to cars parked in curb lanes, he veers into the south driving lane of St. Mary
- Man crosses Carlton on the south side on an angle to continue on ES Carlton southbound

12:43

- Car parks in the NE bumpout area to drop off passengers

- 3 male convention-goers laugh and shake hands as they cross Carlton, travelling east on St. Mary
- Group of four hip-looking young people dart across Carlton on south side of St. Mary, against the light, then proceed across St. Mary from SE corner
- Woman slowly walks across Carlton (north side) even as the countdown expires – no increase in her pace
- Well-dressed young business-looking man waits to cross St. Mary in the NE bump-out area

12:50

- Elderly woman stands with both toes on curb edge, waiting to cross St. Mary from NE corner
- Shabby-dressed older man waits in NE bump-out area before crossing St. Mary
- Convention is going on at the WCC – a number of pedestrians wearing lanyards/name tags
- Mass at St. Mary's Cathedral (NW corner St. Mary and Hargrave) appears to be letting out – could be part of higher volume of pedestrian traffic on north side St. Mary
- Two men wait at curb edge to cross Carlton
- Woman curves to the right as she cross St. Mary from SE corner to go east on Carlton

12:57

- Man waits to cross Carlton with toes over the edge of the curb
- Well-dressed older woman curves to the right as she crosses Carlton from SW corner to go to SE corner
- Man in motorized chair curves while crossing Carlton from SE corner to go southbound on Carlton
- Young wealthy-looking man in suite stands at SW corner of St. Mary curb lane – crosses St. Mary when traffic clears, against the light
- Man waits to cross Carlton in SE bump-out area – crosses when light changes to walk signal

1:03

- Older male hesitates, slows down as he walks into curb lane of south side of Carlton, then crosses against the light after seeing no cars are coming
- No one has been observed stopped longer than to wait for the walk signal so far
- Man waits on NW corner with both feet standing on the edge of the curb, waiting to cross Carlton
- Vehicle traffic is fairly light; moving rapidly when not stopped at lights.
- St. Mary seems busier with vehicle traffic than Carlton

1:11

- Well-dressed man in casual clothes waits at SW corner looking around while light counts down. Checks his phone. He stands off to the side, out of the main path of sidewalk travel
    - After about a minute, he walks southbound on Carlton, waving at a delivery truck of some kind which is turning from St. Mary onto Carlton
- Hipster-dressed male stands with both feet on curb – SW corner. Stares at the Portage Avenue skyline as he waits for the light to change

Unobtrusive Observation – Tuesday, Dec. 20, 2016, 12:15 – 1:15 pm
Sun and cloud, light wind, - 2 C

7:01

- Two women wait at NE corner, traffic on Carlton moving fast through intersection. They cross at light, curve north to walk north on west side of Carlton
- Family (2 adults, 4 kids) round SE corner, heading east on St. Mary. Parents look around, kids talk
- Four adults round SE corner, heading east on St. Mary
- An interval of 1 minute without pedestrians
- Man crosses Carlton on the west side, then north side of St Mary, slowly, stepping on all corners – no curving
- Woman crosses west side St. Mary, talking on her phone, hurriedly
- Vehicle traffic moves fast down St. Mary
- Couple wait in NE bump-out space, check for traffic, then dart across St. Mary
- Same couple crosses St. Mary again, retracing their steps
- Another couple cross Carlton diagonally from SE corner to west side and keep walking south on Carlton

7:10

- Shabby man in wheelchair pushes himself backwards with his foot, around the SE corner and east on St. Mary
- Traffic is light – fewer delivery trucks – but moves fast when the light is green
- Well-dressed trio waits at the SE bump-out to cross Carlton with traffic light
- Some activity in WCC; most pedestrian activity so far is on the south side of intersection
- Dad and young son cross west side St. Mary against the light, looking around, pointing. They cross Carlton with the light

7:19

- Hipster-looking couple crosses west side St. Mary with the light, toward Graham
- Two well-dressed young woman cross north side Carlton against the light
- Another young stylish woman crosses north side Carlton, curving north to walk up Carlton
- Well-dressed young woman cross in the same direction, slow their pace in the NE bump-out area, then cross St. Mary against the light, curve east to go east on St. Mary on south side

7:28

- 3 minutes without a pedestrian crossing; only one seen, rounding SE corner
- 3 people, male and female, round the SE corner with roller suitcases. From the hotel?
- Trio of bro-type males cross St. Mary on the west side, coming north from Graham – not a lot of pedestrian traffic crossing St. Mary from the north
- Young man stands at SW corner a distance from the curb, focused on his phone screen. Looks up before crossing with the light
- Well-dressed pair walk east on St. Mary, turn abruptly south on Carlton at SW corner – like they found a place they were looking for

7:34

- Southbound Carlton vehicle traffic held up south of intersection, blocking the southside Carlton crossing. Two rough-looking males have to manoeuvre around cars blocking the crossing
- Intersection clears up after two minutes

7:41

- Woman bundled up using a walking stick waits for light at SW corner, both feet on the curb edge. Crosses Carlton, stops at NE corner to look around, then proceeds east on St. Mary
- Tall man walks briskly across St. Mary with the light, curves across Carlton at the NE bump-out
- Low pedestrian traffic; a lot of it rounding the SE corner. Hotel and nearby pubs the source of this activity?

7:50

- Two middle-aged men wait at NE curb edge, then dart across St. Mary against the light
- Mother with a small child cross St. Mary on the west side
- Four minutes without seeing a pedestrian
- Vehicle traffic rapid with the light, heading south on Carlton
- Young guy on BMX darts across St. Mary, then across Carlton against light, then up the WCC vehicle ramp
- A lone woman bundles up her coat as she crosses the south side of Carlton, then crosses the west side of St. Mary, with the traffic lights
- Hooded male carrying a duffle bag walks slowly across south side of Carlton with the light
- Another 2 minutes without pedestrians seen
- [Pedestrian traffic is also sparse in the elevated walkway. In the time in there so far, private security guards have made three passes, two WPS officers walked through, and two DT BIZ patrollers. No WPS or BIZ on street level]
- Two young teenage boys with Slurpees dart across St. Mary against the traffic light, curving to the far NW corner of the NE bump-out area (Carlton curb lane before crossing Carlton and walking west of St. Mary
- Pedestrian traffic slower overall now than it was at 7 pm

Appendix E: Street Checklist Scores – After Interventions

SIDEWALKS	Kennedy	Edmonton	Carlton	Hargrave	Donald	Smith	Garry	Fort
On both sides of the street	4	3	3	4	4	4	4	4
Min. 1.8 metre throughway	3	2	3	4	4	2	4	3
Free of driveways	2	1	2	2	2	2	1	1
Buffers from moving vehicles	2	3	3	4	4	1	3	3
Good repair	2	3	3	4	4	3	2	2
SUBTOTAL	**13**	**12**	**14**	**18**	**18**	**12**	**14**	**13**
CROSSINGS								
Accessible and marked	2	3	3	4	4	3	3	2
Material differentiation	0	0	0	0	0	0	0	0
Curb extensions	3	3	3	3	3	1	3	3
Max. two travel lanes	2	2	3	4	4	2	3	2
SUBTOTAL	**7**	**8**	**9**	**11**	**11**	**6**	**9**	**7**
STREETSCAPING								
Mature trees	1	3	2	4	4	1	1	2
Other landscaping	0	0	0	2	2	0	0	0
Places to sit	0	0	0	2	3	0	0	0
Pedestrian lighting	0	0	0	1	2	0	0	0
Banners, public art, etc.	0	0	0	1	0	0	0	0
SUBTOTAL	**1**	**3**	**2**	**10**	**11**	**1**	**1**	**2**
NON-PUBLIC ENVIRONMENT								
Active storefronts etc	1	2	1	1	1	1	1	1
Active doors and windows	2	3	2	2	1	2	1	2
Free of surface lots	2	1	2	2	1	2	1	1
Visual landmarks, etc.	1	0	1	1	1	1	1	1
SUBTOTAL	**6**	**6**	**6**	**6**	**4**	**6**	**4**	**5**
TOTAL	**27**	**29**	**31**	**45**	**44**	**25**	**28**	**27**

Appendix F: Whitby checklist

Walkability Checklist for Community Planning - Baldwin Street

A walkability checklist is a tool for the assessment of how pedestrian-friendly a neighbourhood is. It is noted that this is a subjective assessment of walkability that is intended to generate discussion about how neighbourhoods can become more pedestrian friendly, as opposed to a measure of the pedestrian safety within the neighbourhood. The results are based on site visits to the study area.

The following is a breakdown of the number of points is awarded for each of the categories (sidewalks, crossings, traffic, safety, and ambience) to gauge the perceived walkability in a neighbourhood. The overall score per category provides the specific neighbourhood with an indication of major areas of improvement for a neighbourhood's walkability.

Never 0 points
Rarely 1 point
Sometimes 2 points
Most of the time 3 points
All the time 4 points

	Sidewalks, Stairs, Ramps, and Winter Safety	Score	Comment
1	Are facilities accessible to all pedestrians?	4	All pedestrian facilities are accessible to all pedestrians.
2	Are there sidewalks all along the route? (Are sidewalks continuous, with no missing segments?)	4	There are continuous sidewalk segments on both sides of the street.
3	Are there sidewalks on both sides of the street?	4	There are sidewalks on both sides of the street.
4	Are sidewalks smooth, wide and even, with no cracks or holes?	4	The sidewalks are in good condition with no cracks or holes.
5	Are sidewalks level?	4	All sidewalks are level.
6	Is there enough space to walk on the sidewalk?	4	The sidewalks are approximately 1.5m in width with little encroaching into the pavement.
7	Are sidewalks free of obstructions (poles, signs, bushes, dumpsters, trash, parked bicycles, etc.)?	4	All utilities are located in the kill strip located between the sidewalk and road.
8	Are sidewalks separated from traffic by a parkway?	3	There is no parkway in between the road and sidewalk, however, the downtown core has on-street parking providing a buffer between pedestrians and active traffic.
9	Are the edges of stairs and ramps marked with a contrasting color?	0	There are no contrasting colours used at edges.
10	Do stairs and ramps feel safe to use (not too steep, no cracks or breaks)?	3	There are very few steps within the sidewalk network in Brooklin. The exception is Grass Park which has both disabled access as well as stairs.
11	Do stairs and ramps have railings on both sides?	3	The stairs at Grass Park have railings on both sides of the stairs.
12	Are stairs safe to use in wet weather (not slippery)?	3	The stairs are made of concrete and have sufficient texture to maintain traction in wet weather.
13	Are sidewalks safe to use in winter (clear, well salted or sanded)?		
14	Are there grit boxes in the neighbourhood?	0	There were no grit bxes observed in the neighbourhood. It is unknown if there are temporary grit boxes set up in the winter.

	Crossings		
1	Do pedestrians confident about crossing the road?	3	Because the street has 2 travel lanes, there is a very short distance to cross.
2	Are there safe places to cross every 100 metres?	0	There are very few east-west crossings on Baldwin Street (Baldwin/Winchester and Baldwin/Campbell). The remaining north-south crossings have drop curbs but no striped crossings.
3	Do curbs have ramps at sidewalks and crosswalks?	4	All road crossings have drop curbs.
4	Can you clearly see traffic before crossing the street? (Nothing blocks your view, for example parked cars, trees, or signs)	2	The only cross walk in Brooklin prohibits on-street parking in the vicinity of the cross-walk.
5	On wide roads, is there an island or median in the middle of the road to wait for the next light?	1	There are two raised medians.
6	Can you use an underpass or overpass to cross very busy streets?	0	There are no underpasses/overpasses available for use.
7	Is there a crosswalk where you need one (you don't have to walk all the way to a corner to get across the street)?	1	Striped crosswalks are only provided at all-way-stop-controlled interesections.
8	Do drivers give pedestrians the right of way at crosswalks and at stop signs and stop lights?	2	The only cross walk in Brooklin prohibits on-street parking in the vicinity of the cross-walk.
9	Can you get across the street before the light changes?	2	Yes
10	Does the traffic light change soon after you push the crosswalk button?	3	Yes
11	Can you cross the street in time and within the crosswalk lines even if there are many people crossing at the same time?	4	Yes.
12	At unsignalized crossings, do you have to wait long for a gap in traffic? Do you have time to cross safely?	4	No.

Traffic

1	What is the level of interaction between vehicles and pedestrians?	3	The interaction between vehicles and pedestrians are generally limited to intersections.
2	Is there sufficient space between the sidewalk and the street?	3	There is sufficient buffer and distance that a pedestrian does not feel crowded.
3	In crossing areas, is your view of traffic free of obstructions (parked cars, trees, signs)?	3	Pedestrian visibility is maintained at designated crossing areas.
4	Is traffic light enough to make walking pleasant (not too many large trucks, exhaust fumes and noise)?	3	Trucks are prohibited from Baldwin Street.
5	Is the speed limit suitable for this neighbourhood?	3	There is a posted speed limit of 50 km/h within the neighbourhood which is suitable for the historic nature of the downtown core.
6	Do drivers obey the speed limit and other traffic laws?	3	Some speeding occurs.
7	Do drivers yield when appropriate?	3	Yes.
8	Does road design (for example speed bumps and extended curbs at corners) help slow down traffic?	2	There are two raised medians.
9	Are drivers careful (they watch out for pedestrians at driveways, crosswalks and parking lots)?	2	Yes.
10	Are drivers careful not to splash walkers when there are puddles on the streets?		
11	Are cyclists careful around pedestrians? Do they dismount when approaching pedestrians or do they drive slowly, use their bells and leave plenty of room between their bike and the walkers?		
12	Do the parking lots you walk through have sidewalks and/or crosswalks?		

Personal Safety

1	Do pedestrian feel safe in their environment?	3	
2	Are you able to cross at crosswalks or where you can see and be seen by drivers?	2	Very few cross walks on Baldwin Street for pedestrians, however the on-street parking is generally prohibited in the vicinity of an intersection to provide adequate site distance for pedestrians and drivers.
3	Are you able to cross with the light?	3	There is adequate time for a pedestrian to cross.
4	Is the street well lit at night?	3	Yes.
5	Do you feel safe walking at night?		
6	Are there lots of other people around?		
7	Are there people who scare you or make you uncomfortable?	3	
8	Are there houses and stores where you could go in case of trouble?	3	The stores fronting Baldwin Street may provide safe refuge.
9	Are there phones you could use to call for help?	3	Yes.
10	Is your route free of suspicious people, vandalism, crime and disturbing graffiti?	3	Baldwin Street in maintained to a clean and friendly environment.
11	Are there police, security guards, or a park or pathway patrol on your walking route?	1	Did not notice any.
12	Are dogs properly controlled by their owners?	3	All dogs that were observed were on leashes.

Walking Experience

1	Ambience: pleasant and supportive routes for walkers?	3	Very nice environment.
2	Does the route have natural elements such as water, gardens, green space, birds, flowers, trees or wildlife to look at?	2	There are trees along the street.
3	Is it well lit?	4	Yes.
4	Is it clean (no litter or trash including houses and businesses)?	3	Yes.
5	Is there a lot of air pollution due to automobile exhaust?	2	No, however you are very close to the road.
6	Are there interesting things to see such as statues, fountains, interesting old buildings or beautiful architecture?	4	Downtown Brooklin is a very interesting place to walk.
7	Are there other people out walking?	2	Few people.
8	Are there shady places with benches that can give you a comfortable place to sit and take a rest?	1	Very little shelter is provided to pedestrians.
9	Are there public washrooms that you can use easily and safely?	1	No.
10	Are there trees, building awnings and bus shelters that give protection from sun, rain and wind?	1	No.
11	Can you access public transit nearby, so that you can take a bus home if you get tired, for example?	1	The 302 Brock/Brooklin Weekday serves Brooklin which has 20 minute headways during the week. There is no weekend service.
12	Can you get a drink at a water fountain?	1	Generally.
13	Is the overall walking environment pleasant?	3	Yes.